iCOM

Icom Inc.

INSTRUCTION MANUAL

HF/VHF/UHF TRANSCEIVER

IC-9100

Icom Inc.

FOREWORD

Thank you for making the IC-9100 your radio of choice. We hope you agree with Icom's philosophy of "technology first." Many hours of research and development went into the design of your IC-9100.

FEATURES

❍ *The IC-9100 fully covers HF to 1200 MHz*[1] *multiband in one transceiver*
❍ *Independent dual receivers in one radio; receives two different bands simultaneously*
❍ *Optional D-STAR (Digital Smart Technology for Amateur Radio) allows you to operate in the DV mode*[2] *for digital voice and low speed data communication. Linking of D-STAR repeaters over the Internet allows you to communicate virtually anywhere.*
❍ *Satellite mode operation*

[1] The optional UX-9100 is required for 1200 MHz frequency band operation.
[2] The optional UT-121 is required for the DV mode operation.

IMPORTANT

READ THIS INSTRUCTION MANUAL CAREFULLY before attempting to operate the transceiver.

SAVE THIS INSTRUCTION MANUAL. This manual contains important safety and operating instructions for the IC-9100.

EXPLICIT DEFINITIONS

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

Spurious signals may be received near some frequencies.
These are created in the internal circuit and does not indicate a transceiver malfunction.

SUPPLIED ACCESSORIES

The transceiver comes with the following accessories.
Qty.
① Hand microphone 1
② DC power cable* 1
③ Spare fuse (ATC 5 A) 1
④ Spare fuse (ATC 30 A) 2
⑤ ACC cable 1
⑥ 6.3 (d) mm plug... 1
⑦ Double-sided tape... 1

For European versions
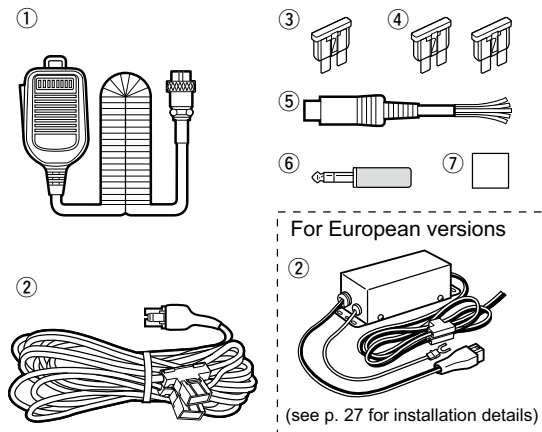
*Differs depending on the version.

FCC INFORMATION

• FOR CLASS B UNINTENTIONAL RADIATORS:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

  • Reorient or relocate the receiving antenna.
  • Increase the separation between the equipment and receiver.
  • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  • Consult the dealer or an experienced radio/TV technician for help.

PRECAUTIONS

⚠ **DANGER HIGH RF VOLTAGE! NEVER** attach an antenna or internal antenna connector during transmission. This may result in an electrical shock or burn.

⚠ **WARNING! NEVER** operate the transceiver with a headset or other audio accessories at high volume levels. Hearing experts advise against continuous high volume operation. If you experience a ringing in your ears, reduce the volume or discontinue use.

⚠ **WARNING! NEVER** operate or touch the transceiver with wet hands. This may result in an electric shock or damage to the transceiver.

⚠ **WARNING! NEVER** apply AC power to the [DC13.8V] socket on the transceiver rear panel. This could cause a fire or damage the transceiver.

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

⚠ **WARNING! NEVER** apply more than 16 V DC to the [DC13.8V] socket on the transceiver rear panel, or use reverse polarity. This could cause a fire or damage the transceiver.

⚠ **WARNING! NEVER** let metal, wire or other objects protrude into the transceiver or into connectors on the rear panel. This may result in an electric shock.

⚠ **WARNING!** Immediately turn OFF the transceiver power and remove the power cable if it emits an abnormal odor, sound or smoke. Contact your Icom dealer or distributor for advice.

⚠ **WARNING! NEVER** put the transceiver in any unstable place (such as on a slanted surface or vibrated place). This may cause injury and/or damage to the transceiver.

CAUTION: NEVER change the internal settings of the transceiver. This may reduce transceiver performance and/or damage to the transceiver.

In particular, incorrect settings for transmitter circuits, such as output power, idling current, etc., might damage the expensive final devices.

The transceiver warranty does not cover any problems caused by unauthorized internal adjustment.

CAUTION: NEVER block any cooling vents on the top, rear, sides or bottom of the transceiver.

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

CAUTION: NEVER install the transceiver in a place without adequate ventilation. Heat dissipation may be reduced, and the transceiver may be damaged.

DO NOT use harsh solvents such as benzine or alcohol when cleaning, as they will damage the transceiver surfaces.

DO NOT push the PTT switch when you don't actually desire to transmit.

DO NOT use or place the transceiver in areas with temperatures below ±0°C (+32°F) or above +50°C (+122°F).

DO NOT place the transceiver in excessively dusty environments or in direct sunlight.

DO NOT place the transceiver against walls or putting anything on top of the transceiver. This may overheat the transceiver.

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

BE CAREFUL! If you use a linear amplifier, set the transceiver's RF output power to less than the linear amplifier's maximum input level, otherwise, the linear amplifier will be damaged.

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

USE only the specified microphone. Other manufacturers' microphones have different pin assignments, and connection to the IC-9100 may damage the transceiver or microphone.

During maritime mobile operation, keep the transceiver and microphone as far away as possible from the magnetic navigation compass to prevent erroneous indications.

Turn OFF the transceiver's power and/or disconnect the DC power cable when you will not use the transceiver for long period of time.

For U.S.A. only
CAUTION: Changes or modifications to this device, not expressly approved by Icom Inc., could void your authority to operate this device under FCC regulations.

D-STAR INTRODUCTION

◇ About the D-STAR system

In the original D-STAR (Digital Smart Technologies for Amateur Radio) plan, JARL envisioned a system of repeaters grouped together into Zones. A zone would be a group of up to 4 repeaters, linked by 10 GHz "backbone" microwave Link repeaters. Each individual repeater would be call an Area repeater, and would be the Access repeater to begin communications. Calls could be made to other Area repeaters within the Zone, using the backbone Link repeater system. One of the repeaters in the Zone would have an Internet connection, and so in addition to being an Area repeater, it also became the Zone Gateway repeater. The Internet gateway provided a way to communicate to other Zones, giving access to the Area repeaters within them, and eventually to the entire world.

Call signs are the heart of D-STAR operation. Four call signs are used:

- MY : This is your own call sign. You enter it once and then basically leave it set, with only a few exceptions.
- UR : This is your Destination call sign; that of the actual ham or repeater you wish to contact. CQCQCQ can also be used to make a general call.
- R1 : This is the Area/Access repeater call sign; the one you enter to begin your D-STAR repeater communication.
- R2 : This is the Link/Gateway repeater call sign; the repeater and Internet connection you go through when you want contact a ham, or another repeater, anywhere else in the world.
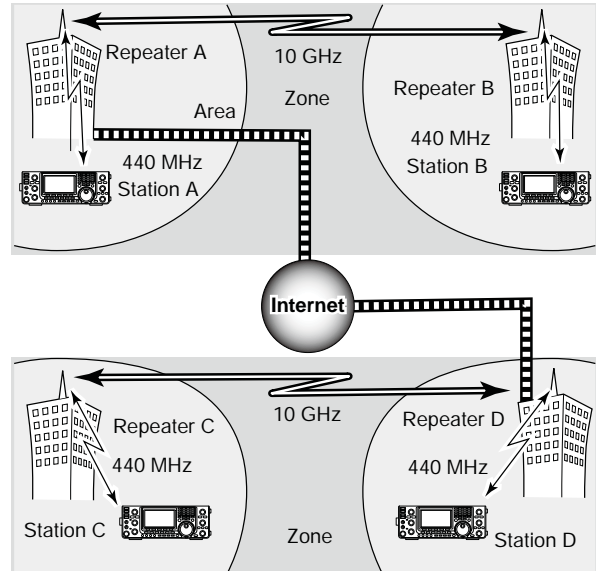
Call sign routing, one of the main features of D-STAR, allows hams to contact other hams, or other repeaters using just the ham's or repeater's call sign. The D-STAR system will automatically route your signal to the desired ham or repeater. Call sign capture allows hams using an Icom radio to "capture" a call sign and automatically program their radio for a reply.

Like other communication modes, you can operate simplex D-STAR with other hams, for direct communication.
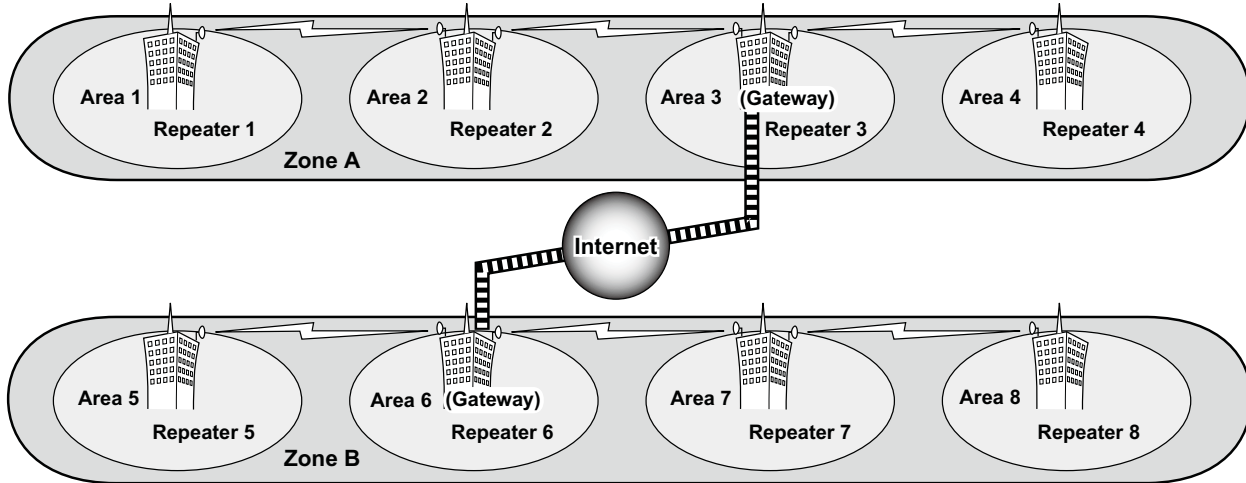
See pages 85 to 120 for the D-STAR operation details.

NOTE: The optional UT-121 is required for the D-STAR operation with the IC-9100.

• **D-STAR system outline**

◇ D-STAR system description

Area 1

Repeater 1

Area 2

Repeater 2

Area 3 (Gateway)

Repeater 3

Area 4

Repeater 4

Zone A

Internet

Area 5

Repeater 5

Area 6 (Gateway)

Repeater 6

Area 7

Repeater 7

Area 8

Repeater 8

Zone B

Area:
The Area is the communication range that is covered by a single repeater.
The repeater is called an area, or access repeater in the D-STAR system.

Link repeater:
The microwave (10 GHz) link repeater provides linking with another repeater site (Area) for zone construction.

Zone:
The Zone is composed of several areas, that are linked by a 10 GHz microwave link.
Areas 1 to 4 and 5 to 8 make up a zone in the example above.

Gateway repeater:
Gateway repeaters provide communications between different zones via the internet.
Repeater 3 and 6 are gateway repeaters at the example above.

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■ Front panel
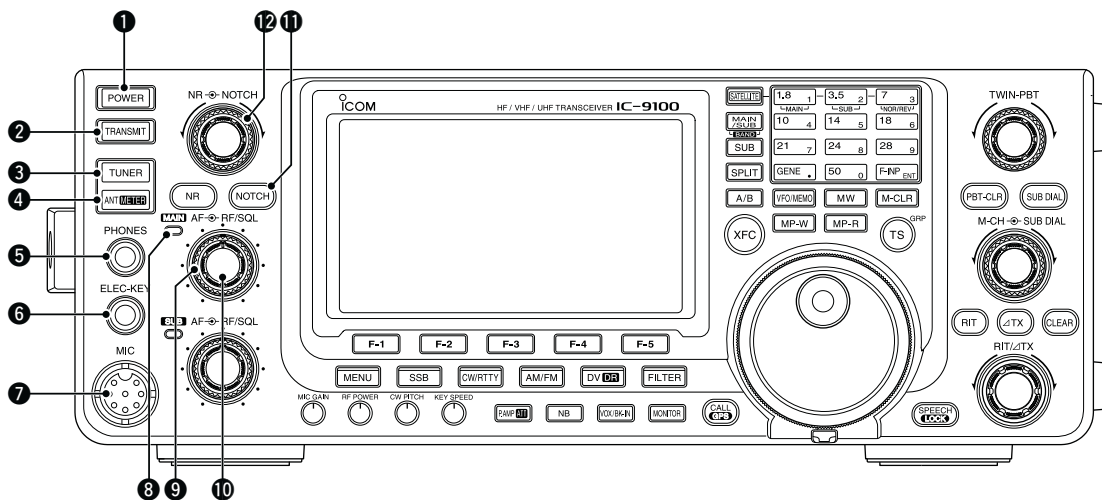
q POWER SWITCH [POWER] (p. 31)
➥ Push to turn ON the transceiver power.
• First, confirm the DC power source is turned ON.
➥ Hold down for 1 second to turn OFF the power.

w TRANSMIT SWITCH [TRANSMIT] (p. 46)
Push to select transmit or receive.
• While transmitting, the MAIN or SUB Band's TX/RX indicator (**i** or **⓯**) lights red.
• While receiving or when the squelch opens, the indicator lights green.

e ANTENNA TUNER SWITCH [TUNER] (p. 159)
(Frequency band: HF/50 MHz)
➥ Push to turn the internal antenna tuner ON or OFF (bypass).
• "TUNE" appears when the tuner is turned ON.
• The internal antenna tuner settings can be memorized in each frequency band.
➥ Hold down for 1 second to manually start the antenna tuner.
• If the tuner cannot tune the antenna within 20 seconds, the tuning circuit is automatically bypassed.

r ANTENNA•METER SWITCH [ANT•METER]
ANTENNA SWITCH Operation (p. 158)
(Frequency band: HF/50 MHz)
➥ Push to select either the ANT1 or ANT2 connector.

METER SWITCH Operation (p. 45)
(Frequency band: ALL)
➥ Hold down for 1 second to toggle the transmit meter function between ALC, COMP and SWR.

t HEADPHONE JACK [PHONES]
Plug in standard stereo headphones (impedance: 8 to 16 Ω).
• Output power: More than 5 mW with an 8 Ω load.
• When headphones are connected, the internal speaker, and any external speaker, are disabled.
• The MAIN and SUB Band audio can be mixed or separated when using stereo headphones, depending on the "Phone Separate" option in the Set mode. (p. 160)

y ELECTRONIC KEYER JACK [ELEC-KEY]
Plug in a bug or paddle type key to use the internal electronic keyer for CW operation. (p. 22)
• Set the keyer type to ELEC-KEY, BUG KEY or Straight key in the "Keyer Type" item of the Keyer Set mode.
• A straight key jack is located on the rear panel. See [KEY] on page 55.
• You can reverse the keyer paddle polarity (dot and dash) in the "Paddle Polarity" item of the Keyer Set mode. (p. 55)
• Four keyer memory channels are available for your convenience. (p. 51)
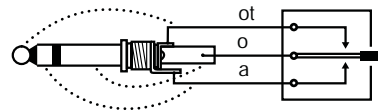
u MICROPHONE CONNECTOR [MIC]
Plug in the supplied or an optional microphone.
• See page 199 for appropriate microphones.
• See page 30 for microphone connector information.

i MAIN BAND TX/RX INDICATOR
➥ Lights green when the squelch opens, or a signal is received on the MAIN Band; lights red during transmit.
➥ Blinks green when an off-frequency signal is received, depending on the "FM/DV Center Error" option in the Set mode. (p. 162)

**⑨ MAIN BAND RF GAIN CONTROL/
SQUELCH CONTROL [RF/SQL]**
(outer control; p. 44)
Rotate to adjust the RF gain and squelch threshold level for the MAIN Band.
The squelch removes noise output to the speaker when no signal is received. (closed condition)
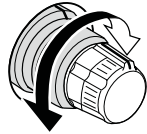
- The squelch is particularly effective for AM and FM, but also works in other modes.
- The 12 to 1 o'clock position is recommended for the most effective use of the **[RF/SQL]** control.
- **[RF/SQL]** operates as only an RF gain control in SSB, CW and RTTY (Squelch is fixed open), or a squelch control in AM, FM and DV (RF gain is fixed at maximum sensitivity), when "Auto" is selected as the "RF/SQL Control" item option in the Set mode. (p. 162)

• When used as an RF gain/squelch control
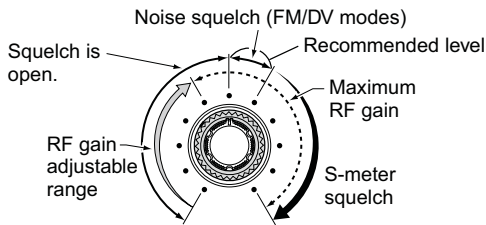
• When used as an RF gain control
(Squelch is fixed open; SSB, CW and RTTY only)
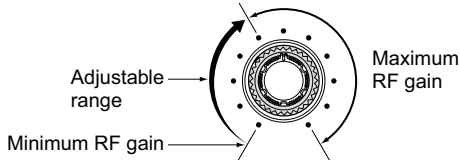
While rotating the RF gain control, a faint noise may be heard. This comes from the DSP unit and does not indicate an equipment malfunction.

• When used as a squelch control
(RF gain is fixed at maximum.)
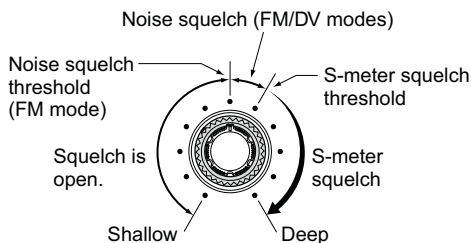
⑩ MAIN BAND AF CONTROL [AF]
(inner control; p. 45)
Rotate to adjust audio output level to the speaker or headphones on the MAIN Band.
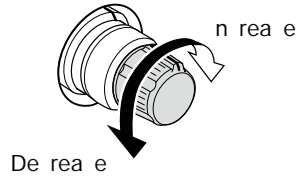
⑪ NOTCH SWITCH [NOTCH] (p. 77)
**(Mode = Auto notch   : SSB/AM/FM
Manual notch : SSB/CW/RTTY/AM)**
➥ In the SSB and AM modes, push to toggle the notch function between auto, manual and OFF.
  • Either the Auto or Manual notch function can be turned OFF in the "[NOTCH] SW" item of the Set mode. (p. 36)
➥ In the FM mode, push to turn the Auto Notch function ON or OFF.
➥ In the CW or RTTY mode, push to turn the Manual Notch function ON or OFF.
  • "MNF" appears when the Manual Notch function is ON.
  • "ANF" appears when the Auto Notch function is ON.
  • No indicator appears when the notch filter is OFF.
➥ Hold down for 1 second to switch the manual filter characteristics from wide, mid and narrow, when the Manual Notch function is selected.

✔ What is the notch filter?
The notch filter is a narrow filter that eliminates unwanted CW or AM carrier tones, while preserving the desired voice signal. The DSP circuit automatically adjusts the notch frequency to effectively eliminate unwanted tones.

⑫ MANUAL NOTCH FILTER CONTROL [NOTCH]
(outer control; p. 77)
Rotate to adjust the notch frequency to reject an interfering signal while the manual function is ON.
• Notch filter center frequency:
  SSB/RTTY   : –1040 Hz to +4040 Hz
  CW   : CW pitch freq. –2540 Hz to
                     CW pitch freq. +2540 Hz
  AM   : –5060 Hz to +5100 Hz
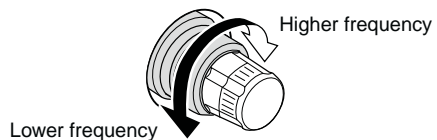
The optional UX-9100 is required for 1200 MHz frequency band operation.
The optional UT-121 is required for DV mode operation.

■ Front panel (continued)
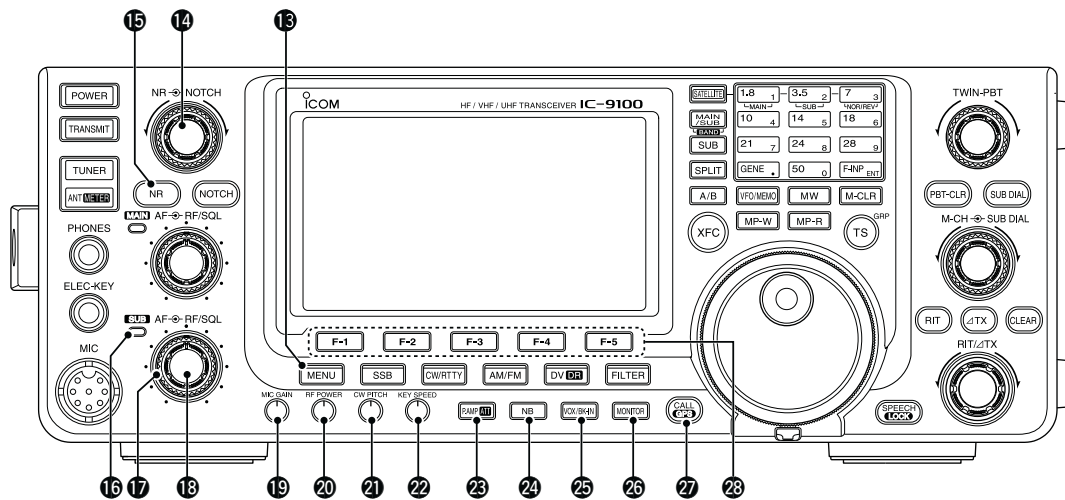
⑬ **MENU SWITCH [MENU]** (p. 19)
➥ Push to change the set of functions assigned to switches ([F-1] to [F-5]).
• Toggles the function display menu between M1 (Menu 1), M2 (Menu 2), M3 (Menu 3), D1 and D2.
➥ Hold down for 1 second to enter the Set mode. Push to return to the previous screen display.

⑭ **NOISE REDUCTION LEVEL CONTROL [NR]**
(inner control; p. 77)
Rotate to adjust the DSP noise reduction level when the noise reduction function is in use. Set for maximum readability.
• To use this control, first push **[NR]** (⑮).

Increases

Decreases
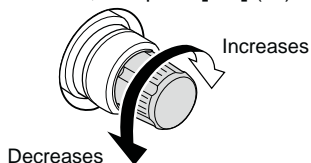
⑮ **NOISE REDUCTION SWITCH [NR]** (p. 77)
Push to turn DSP noise reduction ON or OFF.
• "NR" appears when noise reduction is ON.

⑯ **SUB BAND TX/RX INDICATOR**
Lights green when the squelch opens, or a signal is received on the SUB Band; lights red during transmit in the satellite mode.
➥ Blinks green when an off-frequency signal is received, depending on the "FM/DV Center Error" option in the Set mode. (p. 162)

⑰ **SUB BAND RF GAIN CONTROL/**
SQUELCH CONTROL [RF/SQL]
(outer control; p. 44)
Rotate to adjust the RF gain and squelch threshold level on the SUB Band.
The squelch stops noise output to the speaker when no signal is received. (closed condition)
See ⑨ on page 2 for details.

⑱ **SUB BAND AF CONTROL [AF]** (inner control; p. 45)
Rotate to adjust audio output level to the speaker or headphones on the SUB Band.

⑲ **MIC GAIN CONTROL [MIC GAIN]** (p. 46)
Rotate to adjust the microphone gain.
• The transmit audio tone in the SSB, AM and FM modes can be independently adjusted in the tone control Set mode. (p. 169)

✔ *How to set the microphone gain.*
Set the meter function to ALC. (p. 45) While speaking at normal voice level, adjust the [MIC GAIN] control so that in the SSB or AM modes, the ALC meter swings within the ALC range.

Recommended level for Icom microphones
Decreases   Increases

⑳ **RF POWER CONTROL [RF POWER]** (p. 46)
Rotate to continuously vary the RF output power.

Decreases   Increases

Frequency band	RF output power range
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

㉑ **CW PITCH CONTROL [CW PITCH]**
(outer control; p. 49)
(Mode: CW)
Rotate to shift the received CW audio pitch and the CW sidetone pitch without changing the operating frequency.
• The pitch can be adjusted from 300 to 900 Hz in approximatly 5 Hz steps.

Lower pitch   Higher pitch

**⑫ ELECTRONIC CW KEYER SPEED CONTROL
[KEY SPEED]** (p. 49)
(Mode: CW)
Rotate to adjust the keying speed of the internal
electronic CW keyer to between 6 wpm (minimum)
and 48 wpm (maximum).

Slow ↓ (○) ↓ Fast

**⑬ PREAMP•ATTENUATOR SWITCH [P.AMP•ATT]
PREAMP SWITCH Operation** (p. 71)
(Frequency band: HF/50 MHz)
➡ Push to select one of two receive RF preampli-
fiers, or to bypass them.
 • "P. AMP❶" is a wide dynamic range preamplifier. It is
 most effective for the 1.8 to 21 MHz bands.
 • "P. AMP❷" is a high-gain preamplifier. It is most ef-
 fective for the 24 to 50 MHz bands.
 • No indicator appears when the preamplifiers are not
 selected.
(Frequency band: 144/430/1200 MHz)
➡ Push to turn an optional AG-25, AG-35 or AG-
1200* pre-amplifier unit ON or OFF, if installed.
 • "P.AMP" appears when the preamplifier unit is ON.
 *AG-1200 has been discontinued, but it can be still be
 used.

✔ What is the preamplifier?
The preamplifier amplifies signals in the front end to
improve the S/N ratio and sensitivity. Select "P. AMP
❶" or "P. AMP❷" when receiving weak signals.

ATTENUATOR SWITCH Operation (p. 71)
➡ Hold down for 1 second to turn ON the attenua-
tor.
 • "ATT" appears when the attenuator is ON.
➡ Push to turn OFF the attenuator.
 • "ATT" disappears.

✔ What is the attenuator?
The attenuator prevents a desired signal from being
distorted when very strong signals are near it, or
when very strong electromagnetic fields, such as
from a broadcasting station, are near your location.

⑭ NOISE BLANKER SWITCH [NB] (p. 76)
➡ Push to turn the noise blanker ON or OFF. The
noise blanker reduces pulse-type noise such as
that generated by vehicle ignition systems. The
noise blanker is not effective for non-pulse-type
noise.
 • "NB" appears when the noise blanker is ON.
➡ Hold down for 1 second to display the "NB"
screen. Push to return to the previous screen
display.

**⑮ VOX/BK-IN SWITCH [VOX/BK-IN]
VOX SWITCH Operation** (p. 78)
(Mode: SSB/AM/FM/DV)
➡ Push to turn the VOX function ON or OFF.
➡ Hold down for 1 second to display the "VOX"
screen. Push to return to the previous screen
display.

✔ What is the VOX function?
The VOX function (voice operated transmission)
automatically starts transmission when you speak
into the microphone; then automatically returns to
receive when you stop speaking.

BK-IN SWITCH Operation (p. 79)
(Mode: CW)
➡ Push to toggle the break-in operation between
semi break-in and full break-in, or to turn OFF
the break-in function.
➡ Hold down for 1 second to display the "BKIN"
screen (Break-in). Push to return to the previous
screen display.

✔ What is the break-in function?
The break-in function automatically switches be-
tween transmit and receive with your CW keying.
Using Full break-in function (QSK), you can hear
the receive frequency in-between keying.

⑯ MONITOR SWITCH [MONITOR] (p. 81)
➡ Push to turn the Monitor function ON or OFF to
listen to your own transmitted audio.
 • "MONI" appears when this function is ON.
 • In CW mode, the CW sidetone can be heard, regard-
 less of the **[MONITOR]** switch setting.
➡ Hold down for 1 second to display the "MONI"
screen (Monitor) to set the monitor level. Push to
return to the previous screen display.

**⑰ CALL•GPS SWITCH [CALL•GPS]
CALL SWITCH Operation** (p. 139)
Push to select the call channel.

GPS SWITCH Operation (p. 121)
Hold down for 1 second to display the "GPS" screen.
Push to return to the previous screen display.

⑱ FUNCTION SWITCHES [F1]–[F5]
Push to select the function which is indicated on the
LCD display above each switch. (p. 19)
 • The functions vary, depending on the selected menu
 and the operating mode.

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

■ Front panel (continued)
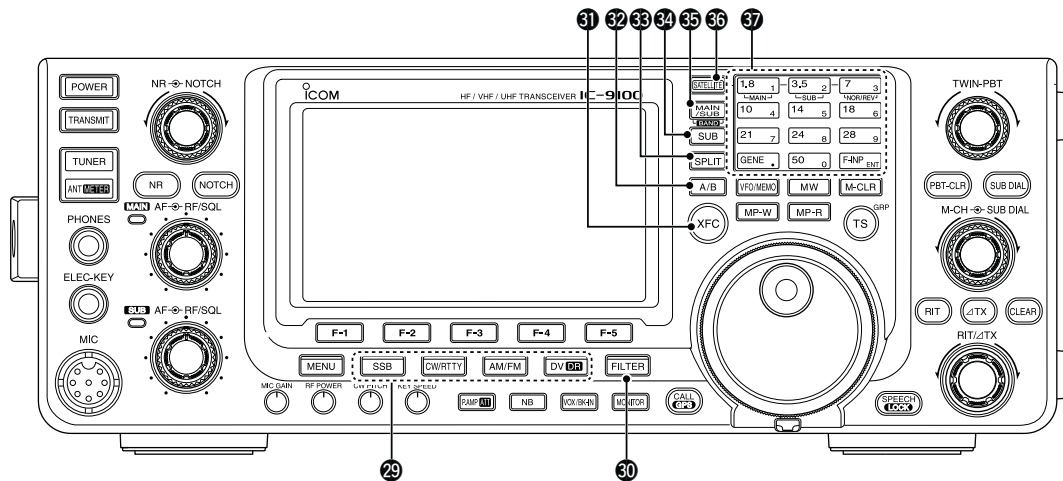
㉙ MODE SWITCHES

Push to select your desired operating mode. (p. 43)
• The built-in speech synthesizer announces the selected mode when the "SPEECH [MODE] SW" item is set to "ON" in the Set mode. (p. 164)

[SSB] (p. 47)
➥ Push to alternately select the USB or LSB modes.
  • "USB" or "LSB" appears.
➥ In the SSB mode, hold down for 1 second to select the SSB data mode (USB-D, LSB-D).
  • "**D**" appears in addition to "USB" or "LSB."
➥ In the SSB data mode, push to return to the normal SSB mode.

[CW/RTTY] (pp. 48, 56)
➥ Push to alternately select the CW or RTTY modes.
  • "CW" or "RTTY" appears.
➥ Hold down for 1 second to switch between the CW and CW-R (CW reverse) modes, in the CW mode.
  • "CW-R" appears when the CW reverse mode is selected.
➥ Hold down for 1 second to switch between the RTTY and RTTY-R (RTTY reverse) modes in the RTTY mode.
  • "RTTY-R" appears when the RTTY reverse mode is selected.

[AM/FM] (p. 61)
➥ Push to alternately select the AM or FM modes.
  • "AM" or "FM" appears.
➥ Hold down for 1 second to select the AM or FM data mode (AM-D/FM-D).
  • "**D**" appears in addition to "AM" or "FM."
➥ In the data mode, push to return to the normal AM or FM mode.

NOTE:
• In the AM mode, you can transmit on only the HF/50MHz frequency bands.
• The AM mode cannot be selected on the 1200 MHz frequency band.

[DV•DR] (p. 85)
➥ Push to select the DV mode.
  • "DV" blinks.
➥ Hold down for 1 second to select the DR mode.
  • "DV," "**DR**" and "r" appear.
➥ In the DR mode, push to cancel it.
  • "**DR**" and "r" disappear.

㉚ FILTER SWITCH [FILTER] (p. 73)

➥ Push to select one of three IF filter settings (**1**/**2**/**3**).
  • The selected filter passband width and shifting value are displayed for 2 seconds on the LCD display.
➥ Hold down for 1 second to display the "FIL" screen (Filter) to set the filter passband width.
➥ When the "FIL" screen is displayed, hold down for 1 second to return to the previous screen display.

㉛ TRANSMIT FREQUENCY CHECK SWITCH [XFC]

➥ During split frequency or repeater operation, hold down to listen to the transmit frequency. (p. 82)
  • While holding down this switch, the transmit frequency can be changed with the main dial, keypad or memo pad.
  • When the split lock function is turned ON, push **[XFC]** to cancel the dial lock function. (pp. 82, 162)
➥ When the RIT function is turned ON, hold down to listen to the receive frequency. (RIT is temporarily cancelled.) (p. 69)
➥ When the ⊿TX function is turned ON, hold down to listen to the transmit frequency (including ⊿TX frequency offset). (p. 81)
➥ In the simplex operation, hold down to listen to the receive frequency.
  • The squelch is closed and the interference reject function is temporary OFF while holding down this switch.
➥ In the DV mode, the RX monitoring mode is selected by holding down this switch. (p. 118)

1

㉜ VFO SELECT SWITCH [A/B] (pp. 32, 34)
➡ Push to select either VFO A or VFO B.
➡ Hold down for 1 second to equalize the undisplayed VFO settings to that of the displayed VFO.

㉝ SPLIT SWITCH [SPLIT] (p. 82)
➡ Push to turn the split function ON or OFF.
  • "SPLIT" appears when the split function is ON.
  • The split function is not selectable on the SUB Band.
➡ Hold down for 1 second to activate the quick split function.
  • The transmit frequency shifts from the receive frequency according to the "SPLIT Offset" option in the Set mode. (p. 162)
  • The quick split function can be turned OFF in the "Quick SPLIT" item of the Set mode. (p. 162)

㉞ SUB SWITCH [SUB]
➡ Push to turn the SUB Band setting mode ON or OFF. (p. 33)
  • "SUB" appears when the SUB Band setting mode is ON.
➡ Hold down for 1 second to turn the SUB Band display ON or OFF. (p. 32)

㉟ MAIN/SUB•BAND SWITCH [MAIN/SUB•BAND]
➡ Push to toggle between the MAIN Band and the SUB Band. (p. 32)
➡ Hold down for 1 second several times to select HF/50 MHz, 144 MHz, 430 MHz or 1200 MHz frequency band as your operating band. (p. 35)
  • The frequency band, selected in either the MAIN or SUB Band, cannot be selected on the other Band.

㊱ SATELLITE SWITCH [SATELLITE] (p. 153)
➡ Push to enter the satellite mode (receive on MAIN Band, transmit on SUB Band).
  • "SATELLITE" appears.
  • The last operated frequencies (downlink and uplink) and tracking icon ("NORMAL"/"REVERSE") appears.
➡ In the satellite mode, push to return to the previous screen display.

  NOTE: In the DR mode, pushing [SATELLITE] cancels DR, 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.

➡ Hold down for 1 second to transfer the uplink and downlink frequencies into the satellite VFO.
  • The satellite mode is automatically selected after transferring.
  • "SATELLITE" appears.
  • The last operated tracking icon ("NORMAL"/"REVERSE") appears.
  • To toggle the tracking operation between normal and reverse, push [NOR/REV] (7 3).
➡ In the satellite mode, hold down for 1 second to return to normal operation using the displayed frequencies.

㊲ BAND KEYS/KEYPAD
BAND KEYS Operation (pp. 35, 36)
When the HF/50 MHz frequency band is not selected in both the MAIN or SUB Band, you can select the HF/50 MHz frequency band by just holding down the band key for 1 second.

(Frequency band: HF/50 MHz)
➡ Push to select the operating band.
  • [GENE •] selects the general coverage band.
➡ Pushing the same key two or three times calls up other stacked frequencies in the frequency band.
  • Icom's triple band stacking register memorizes three frequencies in each frequency band.

(Frequency band: 144/430/1200 MHz)
➡ Pushing [GENE •] two or three times calls up other stacked frequencies in the frequency band, after selecting the 144 MHz, 430 MHz or 1200 MHz frequency band by holding down [BAND](MAIN/SUB) for 1 second.
➡ Hold down for 1 second to switch the operating band to the HF/50 MHz frequency band.
  • [GENE •] selects the general coverage band.
  • Pushing the same key two or three times calls up other stacked frequencies in the frequency band.

KEYPAD Operation (p. 37)
After pushing [F-INP ENT], push the keys on the keypad to enter a frequency. After entering, push [F-INP ENT] to set the frequency.
• Example: To enter 14.195 MHz;
  Push [F-INP ENT] [1] [4] [•] [1] [9] [5] [F-INP ENT].

  NOTE: The frequency band, selected in either the MAIN or SUB Band, cannot be selected on the other Band.

While in the satellite mode, the keypad operation is different than described above. See page 154 for details.

The optional UX-9100 is required for 1200 MHz frequency band operation.
The optional UT-121 is required for DV mode operation.

■ Front panel (continued)
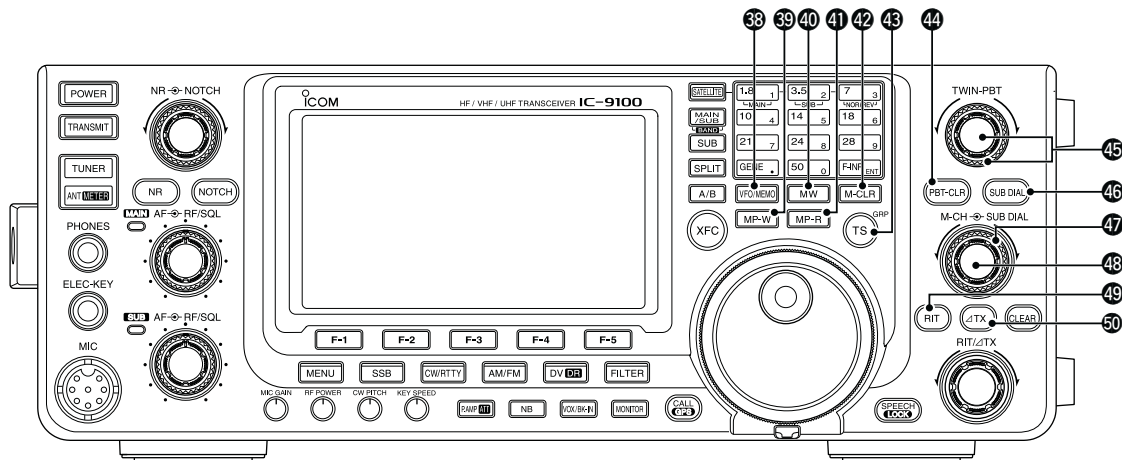
㊳ VFO/MEMORY SWITCH [VFO/MEMO]
➥ Push to switch between the VFO and memory modes. (pp. 34, 139)
➥ Hold down for 1 second to copy the memory contents to the displayed VFO on the MAIN Band. (p. 142)

㊴ MEMO PAD-WRITE SWITCH [MP-W] (p. 144)
Push to write the displayed data into a memo pad.
• The 5 most recent entries remain in the memo pads.
• The memo pad capacity can be extended from 5 to 10 in the "Memopad Numbers" item of the Set mode. (p. 164)

㊵ MEMORY WRITE SWITCH [MW] (p. 140)
Hold down for 1 second to store VFO data into the selected memory channel.
• This can be done in both the VFO and memory modes.

㊶ MEMO PAD-READ SWITCH [MP-R] (p. 144)
Push to sequentially call up the contents from the memo pads.
The 5 (or 10) most recently programmed frequencies and operating modes can be recalled, starting from the most recent.
• The memo pad capacity can be increased from 5 to 10 in the "Memopad Numbers" item of the Set mode. (p. 164)

㊷ MEMORY CLEAR SWITCH [M-CLR] (p. 141)
In the Memory mode, hold down for 1 second to clear the memory channel.
• The channel becomes a blank channel.
• This switch is disabled in the VFO mode.

㊸ TUNING STEP•REPEATER GROUP SWITCH [TS•GRP]
TUNING STEP SWITCH Operation (p. 38)
➥ Push to toggle between the kHz and MHz* quick tuning step, or turn OFF the quick tuning.
* When the HF/50 MHz frequency band is selected, MHz step cannot be selected.
• When the "▼" quick tuning icon is displayed above the kHz or MHz digit, the frequency is changed in programmed quick tuning steps or 1 MHz steps.
• When the quick tuning is OFF, the frequency is changed in 10 Hz steps.
➥ When the quick tuning is ON, hold down for 1 second to display the "TS" screen (Tuning Step) to select the quick tuning step. (p. 38)
• 0.1, 1, 5, 6.25, 9, 10, 12.5, 20, 25, 50 and 100 kHz steps are independently selectable for each operating mode.
➥ When the quick tuning is OFF, hold down for 1 second to turn the minimum tuning step of 1 Hz ON or OFF. (p. 39)

CALL SIGN GROUP SWITCH Operation (p. 93)
➥ Push to switch the call sign group.
➥ Hold down for 1 second to enter the repeater call sign group selection mode.
• "▶" blinks.
➥ When in the repeater group selection mode, push to cancel it.

⓮ PBT CLEAR SWITCH [PBT-CLR] (p. 75)
(Mode: SSB/CW/RTTY/AM)
➥ Push to display the filter passband width and shifting value for 1 second on the function display.
➥ Hold down for 1 second to reset the PBT settings.

⓯ PASSBAND TUNING CONTROLS [TWIN-PBT]
(p. 75)
(Mode: SSB/CW/RTTY/AM)
Adjusts the receiver's IF filter passband width using the DSP circuit.
• Rotate this control or push [PBT-CLR] to display the PBT settings (passband width and shifting value) for 2 seconds on the function display.
• Hold down [PBT-CLR] for 1 second to clear the PBT settings.
• The adjustment range is half of the passband width, and the value is adjustable in 25 Hz steps for the SSB, CW, and RTTY modes, and 100 Hz steps for the AM mode.
• These controls function as an IF shift control.

✔ **What is the PBT control?**
The PBT function electronically modifies the IF passband width to reject interference. This transceiver uses the DSP circuit for the PBT function.

High cut   Center   Low cut
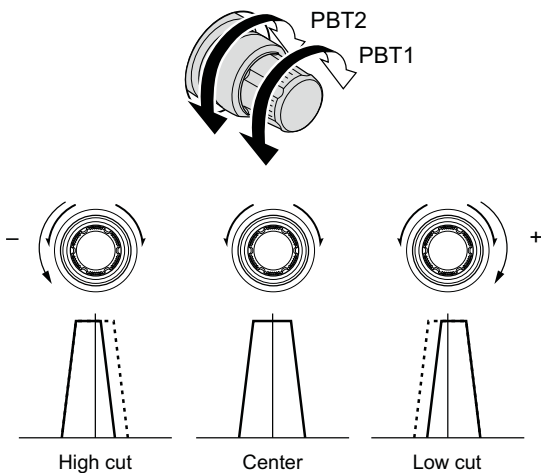
⓰ SUB DIAL SWITCH [SUB DIAL] (p. 33)
Push to turn the SUB Dial function ON or OFF.
• "SUB DIAL" appears when the SUB Dial function is ON.

⓱ SUB DIAL CONTROL
(outer control; p. 33)
Rotate to change the SUB Band frequency.

Increases
Decreases
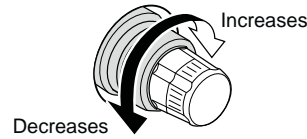
The [SUB DIAL] control's tuning Band (MAIN or SUB) and frequency steps differ, depending on the combination of the SUB Dial function and SUB Band setting mode status, and the status of the quick tuning function. See page 33 for details.

⓲ MEMORY CHANNEL CONTROL [M-CH]
(inner control; p. 139)
Select a memory channel.
• Rotate clockwise to select a higher memory channel number; rotate counterclockwise to select a lower memory channel number.

Higher channel
Lower channel
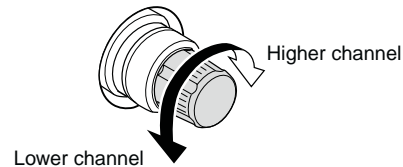
⓳ RIT SWITCH [RIT] (p. 69)
➥ Push to turn the RIT function ON or OFF.
• Use [RIT/⊿TX] control to vary the RIT frequency.
➥ Hold down for 1 second to add the shift frequency of the RIT function to or subtract it from the displayed frequency.

✔ **What is the RIT function?**
The RIT (Receiver Incremental Tuning) shifts the receive frequency without shifting the transmit frequency.
This is useful for fine tuning stations calling you off-frequency or when you prefer to listen to slightly different-sounding voice characteristics, etc.

⓴ ⊿TX SWITCH [⊿TX] (p. 81)
➥ Push to turn the ⊿TX function ON or OFF.
• Use [RIT/⊿TX] control to vary the ⊿TX frequency.
➥ Hold down for 1 second to add the shift frequency of the ⊿TX function to or subtract it from the displayed frequency.

✔ **What is the ⊿TX function?**
⊿TX shifts the transmit frequency without shifting the receive frequency. This is useful for simple split frequency operation in CW, etc.

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

■ Front panel (continued)
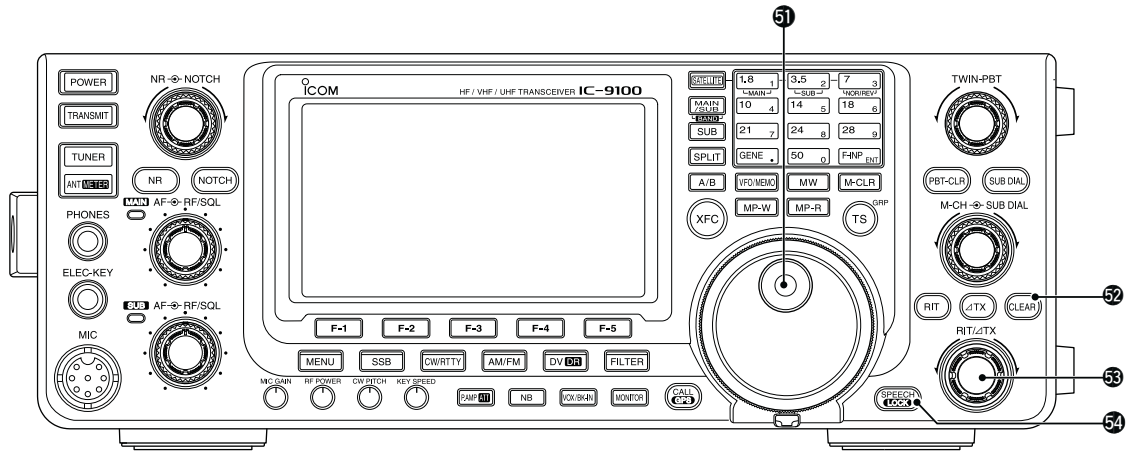
⑤ **MAIN DIAL** (pp. 37, 161)
Rotate to change the displayed frequency, select the Set mode settings, etc.

When the SUB Band setting mode is ON, rotating [MAIN DIAL] changes the SUB Band frequency. (p. 33)

⑤ **CLEAR SWITCH [CLEAR]** (pp. 69, 81)
Hold down for 1 second* to clear the RIT/⍙TX shift frequency.
* When the "Quick RIT Clear" item in the Set mode is ON, push momentarily to reset the shift frequency. (p. 164)

⑤ **RIT/⍙TX CONTROL [RIT/⍙TX]** (pp. 69, 81)
When either or both the RIT/⍙TX functions are ON, rotate to adjust the RIT/⍙TX frequency shift.
• Rotate the control clockwise to increase the frequency, or counterclockwise to decrease the frequency.
• The frequency shift range is ±9.99 kHz in 10 Hz steps. The control tunes in 1 Hz steps when the operating frequency readout is set to the 1 Hz step readout. However, the 1 Hz digit is not displayed on the frequency shift readout.

Shift high

Shift low
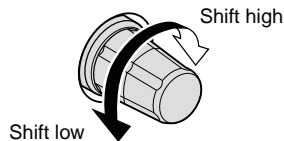
⑤ **SPEECH/LOCK SWITCH [SPEECH/LOCK]**
SPEECH SWITCH Operation (p. 45)
➥ Push to audibly announce the S-meter level, the displayed frequency and the operating mode.
• The S-Level announcement can be turned OFF in the "SPEECH S-Level" item of the Set mode. (p. 164)
• When RIT and/or ⍙TX are ON, the RIT/⍙TX offset is not included in the frequency announcement.

LOCK SWITCH Operation (p. 77)
➥ Hold down for 1 second to turn the Dial Lock function ON or OFF.
• The function electronically locks the Main dial.
• "🔑" appears when the function is ON.

NOTE: The [SPEECH/LOCK] switch operation to activate the voice synthesizer or the dial lock functions can be replaced in the "[SPEECH/ LOCK] SW" item of the Set mode. (p. 164)

■ **Rear panel**
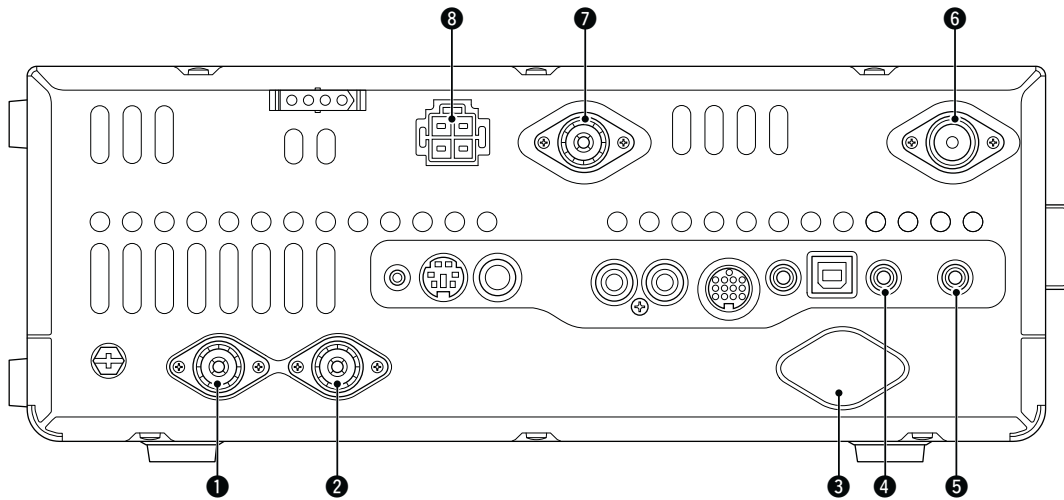
➊ **ANTENNA CONNECTOR 1 [ANT1]**
➋ **ANTENNA CONNECTOR 2 [ANT2]**
(pp. 24, 25, 158)

Connect a 50 Ω antenna with a PL-259 plug connector for the HF/50 MHz frequency band.

///When using an optional AH-4 HF/50 MHz AUTO-
///MATIC ANTENNA TUNER, connect it to the [ANT1]
///connector. Connecting the AH-4 switches the in-
///ternal antenna tuner from [ANT1] to [ANT2].

➌ **1200 MHz BAND ANTENNA CONNECTOR**
[1200MHz ANT] (pp. 24, 158)

Connect a 1200 MHz 50 Ω antenna with a type-N connector, when the optional UX-9100, 1200 MHz band unit, is installed.

➍ **MAIN BAND EXTERNAL SPEAKER JACK**
[EXT-SP (MAIN)]
➎ **SUB BAND EXTERNAL SPEAKER JACK**
[EXT-SP (SUB)] (p. 25)

Connect to an external speaker (4 to 8 Ω).
By connecting an external speaker to each or both jacks, the audio output for both the MAIN and SUB Bands can be configured as shown below.

External speaker connection	MAIN AF	SUB AF
No connection	Internal speaker	
To the MAIN jack	External speaker	Internal speaker
To the SUB jack	Internal speaker	External speaker
Both	External speakers	

➏ **430 MHz ANTENNA CONNECTOR [430MHz ANT]**
(pp. 24, 25, 158)

Connect a 50 Ω antenna with a type-N connector for the 430 MHz frequency band.

➐ **144 MHz ANTENNA CONNECTOR [144MHz ANT]**
(pp. 24, 25, 158)

Connect a 50 Ω antenna with a PL-259 connector for the 144 MHz frequency band.

➑ **DC POWER SOCKET [DC 13.8V]** (p. 27)
Connect 13.8 V DC through the supplied DC power cable.
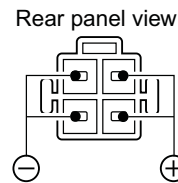
Rear panel view

■ Rear panel (Continued)
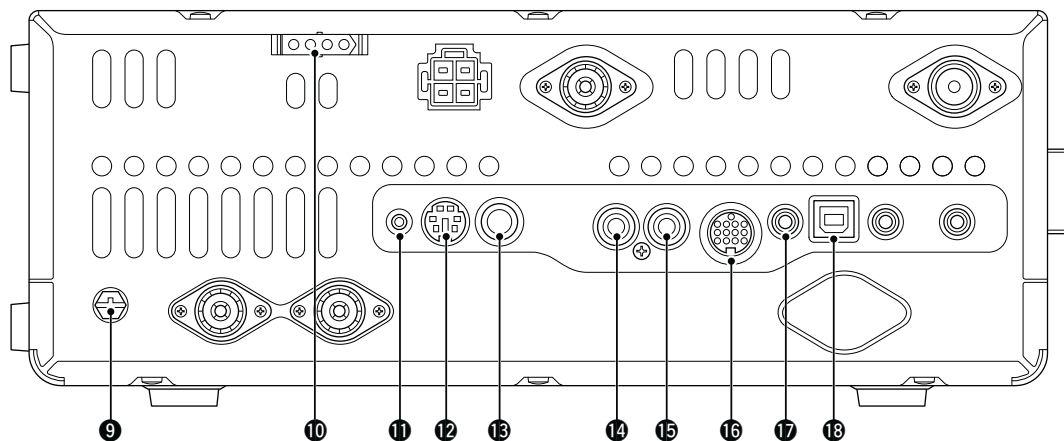
➒ **GROUND TERMINAL [GND]** (p. 22)
Connect this terminal to a ground to prevent electrical shocks, TVI, BCI and other problems.

➓ **TUNER CONTROL SOCKET [TUNER]** (p. 29)
Connect the control cable from an optional AH-4 HF/50 MHz AUTOMATIC ANTENNA TUNER.

⓫ **DATA1 JACK [DATA1]** (p. 26, 168)
➥ Connect a PC through the optional OPC-1529R DATA COMMUNICATION CABLE, for low-speed data communication in the DV mode. (p. 117)
➥ Connect a GPS receiver through the optional OPC-1529R DATA COMMUNICATION CABLE, for GPS operation. (p. 121)

⓬ **DATA2 SOCKET [DATA2]** (pp. 26, 171)
Connect a TNC (Terminal Node Controller), etc. for high speed data communications.

⓭ **STRAIGHT KEY JACK [KEY]** (p. 24)
Connect a straight key or external electronic keyer output using a standard ¼ inch plug.
• [ELEC-KEY] on the front panel can be used for a straight key or external electronic keyer. First you must turn OFF the internal electronic keyer in the Keyer Set mode. (p. 55)
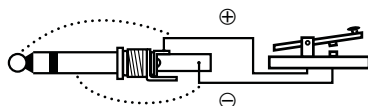
⓮ **ALC INPUT JACK [ALC]** (p. 25)
Connect to the ALC output jack of a non-Icom linear amplifier.

⓯ **SEND CONTROL JACK [SEND]** (p. 25)
When transmitting, goes to ground to control an external unit, such as a non-Icom linear amplifier.

⓰ **ACCESSORY SOCKET [ACC]**
Connect control lines for external equipment such as a linear amplifier, an automatic antenna selector/tuner, a TNC for data communications, etc.
• See page 13 for socket information.

⓱ **CI-V REMOTE CONTROL JACK [REMOTE]**
(pp. 26, 183)
➥ Connect a PC, using the optional CT-17 CI-V LEVEL CONVERTER, for external control of the transceiver.
➥ Use for transceive function with another Icom CI-V transceiver or receiver.
When the transceive function 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. (p. 167)
➥ Connect another IC-9100, using a mini plug cable*, for transceiver to transceiver cloning.
  * Purchase separately

⓲ **USB (Universal Serial Bus) PORT [USB]**
Using a USB cable, connect a PC to do the following:
- Input modulation (p. 167)
- Remotely control the transceiver using CI-V commands (p. 183)
- Send the received audio to the PC
- Send the decoded characters to the PC (pp. 59, 167)
- Low-speed data communication in the DV mode (p. 167)
- Cloning using the optional CS-9100 CLONING SOFTWARE (p. 182)

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

The following items are required:
PC
• Microsoft® Windows® XP,
 Microsoft® Windows Vista® or
 Microsoft® Windows® 7 OS
• A USB 1.1 or 2.0 port

Other items
• USB cable (purchase separately)
• PC software (such as optional RS-BA1 or CS-9100)

NEVER connect the transceiver to a PC until the USB driver installation has been completed.

About the modulation input:
Select "USB" in the Set mode item "DATA OFF MOD" or "DATA MOD." The modulation input level from the USB jack can be set in the Set mode item "USB MOD Level." (p. 167)

1

■ Rear panel (Continued)

◇ **ACC socket information**

• **ACC socket**

ACC	PIN No.	NAME	DESCRIPTION		SPECIFICATIONS	
	1	8 V	Regulated 8 V output.		Output voltage Output current	: 8 V ± 0.3 V : Less than 10 mA
	2	GND	Connects to ground.		———	
	3	HSEND *1, 2	Input/out-put pin.	An external equipment controls the transceiver. When this pin goes low, the transceiver transmits.	Input voltage (High) Input voltage (Low) Current flow	: 2.0 V to 20.0 V : −0.5 V to +0.8 V : Max. 20 mA
				The transceiver outputs a low signal to control external equipment.	Output voltage (Low) Current flow	: Less than 0.1 V : Max. 200 mA
	4	NC	———		———	
	5	BAND	Band voltage output.		Output voltage	: 0 to 8 V
	6	ALC	ALC voltage input.		Control voltage Input impedance	: −3 V to 0 V : More than 3.3 kΩ
	7	VSEND *1, 2	Input/out-put pin.	An external equipment controls the transceiver. When this pin goes low, the transceiver transmits.	Input voltage (High) Input voltage (Low) Current flow	: 2.0 V to 20.0 V : −0.5 V to +0.8 V : Max. 20 mA
				The transceiver outputs a low signal to control external equipment.	Output voltage (Low) Current flow	: Less than 0.1 V : Max. 200 mA
	8	13.8 V	13.8 V output when power is ON.		Output current	: Less than 1 A
	9	NC	———		———	
	10	FSKK	Controls RTTY keying		"High" level "Low" level Output current	: More than 2.4 V : Less than 0.6 V : Less than 2 mA
	11	MOD	Modulator input.		Input impedance Input level	: 10 kΩ : Approx. 100 mV rms
	12	AF*3	AF detector output. Fixed level, regardless of the [AF] control position.		Output impedance Output level	: 4.7 kΩ : 100 to 300 mV rms
	13	SQL S*3	Squelch output. Grounded when squelch opens.		SQL open SQL closed	: Less than 0.3 V/5 mA : More than 6.0 V/100 μA

⑬
⑨ ⑩ ⑪ ⑫
⑤ ⑥ ⑦ ⑧
① ② ③ ④

Rear panel view

① brown ⑧ gray
② red ⑨ white
③ orange ⑩ black
④ yellow ⑪ pink
⑤ green ⑫ light
⑥ blue   blue
⑦ purple ⑬ light
       green

Color refers to the cable strands of the supplied cable.

*1 When the SEND terminal controls the inductive load (such as a relay), a counter-electromotive force can cause the transceiver's malfunction or damage. To prevent this, we recommend adding a switching diode, such as an "1SS133," on the load side of the circuit to the counter-electromotive force absorption.
When the diode is added, a switching delay of the relay may occur. Be sure to check its switching action before operation.
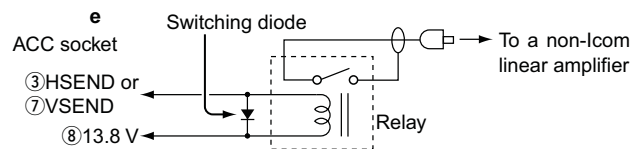
*2 VSEND is used for the 144 MHz, 430 MHz, and 1200 MHz bands, and HSEND is used for the HF/50 MHz bands by default. You can change this setting in "VSEND Select" of the Set mode. (p. 166)
*3 The pin 12 (AF) and pin 13 (SQLS) output capabilities are for the MAIN Band's AF and squelch by default. You can change this setting in "ACC AF/SQL Select" of the Set mode. (p. 166)
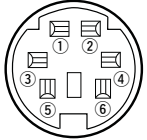
• When connecting the ACC conversion cable (OPC-599)

Connect to ACC socket

ACC 1

① FSKK ⑤ AF
② GND ⑥ SQLS
③ HSEND ⑦ 13.8 V
④ MOD ⑧ ALC

ACC 2

① 8 V ⑤ ALC
② GND ⑥ VSEND
③ HSEND ⑦ 13.8 V
④ BAND
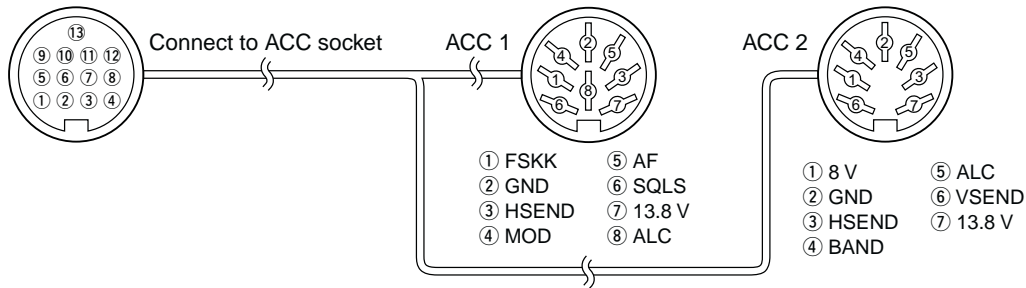
1

◇ **DATA2 socket information**

DATA2	PIN No.	NAME	DESCRIPTION	SPECIFICATIONS	
Rear panel view	1	DATA IN	Input terminal for data transmit. (1200 bps: AFSK/ 9600 bps: G3RUH, GMSK)	Input level (1200 bps) : 100 mV Input level (9600 bps) : 0.2 to 0.5 Vp-p	
	2	GND	Common ground for DATA IN, DATA OUT and AF OUT.	⎯⎯⎯⎯	
	3	PTT	PTT terminal for packet operation. Connect to ground to activate the transmitter.	Input voltage (High) : 2.0 V to 20.0 V Input voltage (Low) : −0.5 V to +0.8 V	
	4	DATA OUT*	Data out terminal for 9600 bps operation only.	Output impedance : 10 kΩ Output level : 1.0 Vp-p	
	5	AF OUT*	Data out terminal for 1200 bps operation only.	Output impedance : 4.7 kΩ Output level : 100–300 mV rms	
	6	SQL*	Squelch out terminal. This pin is grounded when the transceiver receives a signal which opens the squelch. • To avoid interfering transmissions, connect squelch to the TNC to inhibit transmission when squelch is open. • Keep RF gain at a normal level, otherwise a "SQL" signal will not be output.	SQL open : Less than 0.3 V/ 5 mA SQL closed : More than 6.0 V/ 100 µA	

* The pin 4 (DATA), pin 5 (AF) and pin 6 (SQL) output capabilities are for the MAIN Band's AF and squelch by default. You can change this setting in "DATA AF/SQL Select" of the Set mode. (p. 166)

■ LCD display
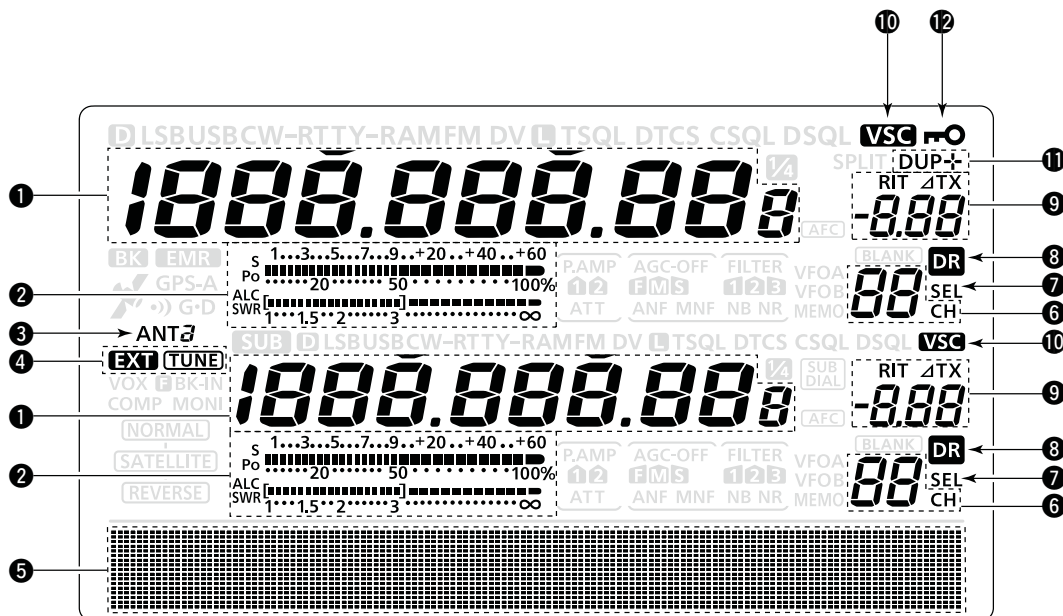
❶ **FREQUENCY READOUTS**

Displays the operating frequency.
- When the quick tuning icon "▼" is displayed, the frequency changes in pre-set kHz or 1 MHz quick tuning steps. (p. 38)
- When the quick tuning icon "▼" is not displayed, the frequency changes in 10 Hz or 1 Hz steps. (pp. 37, 39)

❷ **MULTI-FUNCTION METER INDICATION**
- ➥ Displays the signal strength while receiving.
- ➥ Displays the relative output power, SWR, ALC or compression levels while transmitting.
- ➥ When the Meter Peak Hold function is ON, the peak level of a received signal strength or the output power is displayed for approximately 0.5 seconds.

❸ **ANTENNA ICON** (p. 158)

Displays which antenna connector is selected for HF/50 MHz.
- "ANT1" appears when the [ANT1] connector is selected.
- "ANT2" appears when the [ANT2] connector is selected.

❹ **ANTENNA TUNER ICONS** (pp. 159, 160)
- ➥ "TUNE" appears when the antenna tuner is turned ON; "TUNE" blinks during tuning.
- ➥ "EXT" appears when the optional AH-4 external antenna tuner is connected to the [ANT1] connector, and [ANT1] is selected.

❺ **FUNCTION DISPLAY** (p. 19)

Shows the function of the function switches ([F1]–[F5]), Set mode items and IF passband width.

❻ **MEMORY CHANNEL READOUTS**

Displays the selected memory channel.

❼ **SELECT MEMORY CHANNEL ICON**
- ➥ Appears when the selected memory channel is set as a select memory channel. (p. 151)
- ➥ Appears when the repeater can be selected as the access repeater in the DR mode. (p. 100)

❽ **DR MODE ICON** (p. 43)

Appears when the DR mode is selected.

❾ **RIT/ΔTX ICONS** (pp. 69, 81)
- ➥ "RIT" appears when the RIT function is turned ON.
- ➥ "ΔTX" appears when the ΔTX function is turned ON.
- ➥ Shows the shift frequency of the RIT or ΔTX function.

❿ **VOICE SQUELCH CONTROL ICON** (p. 146)

Appears when the VSC (Voice Squelch Control) function is turned ON.

⓫ **DUPLEX ICON** (p. 65)

"DUP+" appears when plus duplex, "DUP –" appears when minus duplex (repeater) operation is selected.

⓬ **KEY LOCK ICON** (p. 77)

Appears when the Key Lock function is turned ON.

1
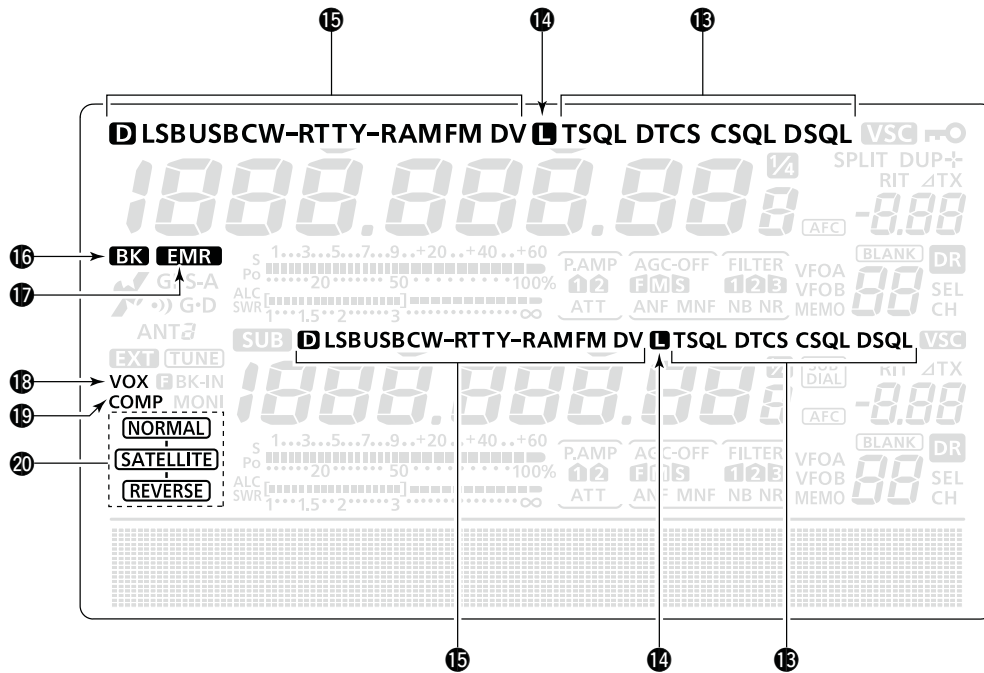
⑬ TONE SQUELCH ICONS
(Mode: FM)
➥ "T" appears when the repeater tone function is ON. (p. 65)
➥ "TSQL" appears when the tone squelch function is ON. (p. 62)
➥ "DTCS" appears when the DTCS code squelch function is ON. (p. 63)

(Mode: DV)
➥ "DSQL" appears when the digital call sign squelch function is ON. (p. 114)
➥ "CSQL" appears when digital code squelch function is ON. (p. 114)

⑭ PACKET LOSS ICON
(Mode: DV)
Appears when the Packet Loss occurs.
• 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). (p. 117)

⑮ MODE ICONS (p. 43)
Displays the selected operating mode.
• "**D**" appears when SSB data, AM data or FM data mode is selected.

⑯ BREAK-IN ICON (p. 116)
➥ Appears when the Break-in function is turned ON.
• The Break-in function allows you to break into a conversation, where the two original stations are communicating with call sign squelch enabled.
➥ Blinks when receiving a break-in call.

⑰ EMR MODE ICON (p. 115)
➥ Appears when the EMR (Enhanced Monitor Receive) communication mode is selected.
• In the EMR communication mode, no call sign setting is necessary when operating in the DV mode.
➥ Blinks when receiving an EMR signal.

⑱ VOX ICON (p. 78)
Appears when the VOX function is activated.

⑲ SPEECH COMPRESSOR ICON (p. 80)
Appears when the Speech Compressor function is turned ON.

⑳ SATELLITE ICON (p. 153)
Appears while the satellite mode is selected.

NORMAL SATELLITE : Normal satellite mode is selected.
• When [MAIN DIAL] is rotated, both downlink and uplink frequencies simultaneously increase or decrease in the same step.

SATELLITE REVERSE : Reverse satellite mode is selected.
• When [MAIN DIAL] is rotated to the right, downlink frequency increase, and uplink frequency decrease in the same step.
• When [MAIN DIAL] is rotated to the left, downlink frequency decrease, and uplink frequency increase in the same step.

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

■ LCD display (Continued)
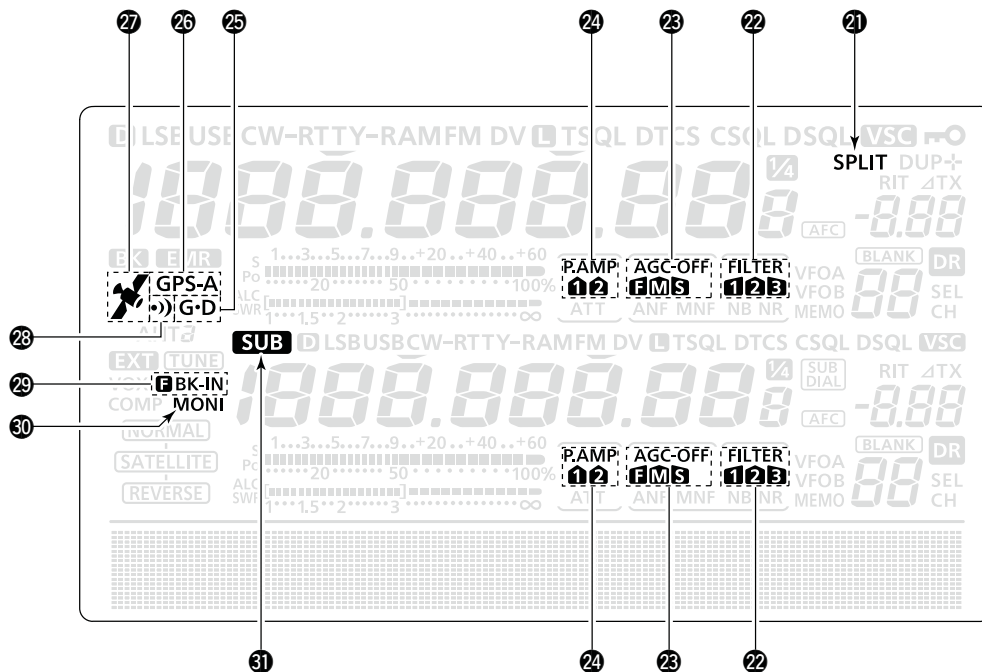
㉑ SPLIT ICON (p. 82)
Appears when the Split function is turned ON.

㉒ DSP FILTER ICON (p. 73)
Displays the selected IF filter.

㉓ AGC ICONS (p. 72)
Displays the selected AGC time constant.
• "**F**" for AGC fast; "**M**" for AGC middle; "**S**" for AGC slow; "-OFF" for AGC OFF.
• In the FM and DV mode, "**F**" for AGC fast is fixed.

㉔ PREAMP ICON (p. 71)
Appears when a preamplifier is turned ON.
• In HF/50 MHz frequency band, either "P. AMP**1**" or "P. AMP**2**" is displayed when the preamp 1 or preamp 2 is ON.

㉕ GPS DATA COMMUNICATION ICON
Appears while the GPS data communication function is selected in the "GPS Out" item of the Set mode. (p. 168).
• A GPS data from the GPS receiver, which is connected to the [DATA1] jack, is output to the [USB] port.

㉖ GPS TX ICON (p. 134)
➥ "GPS" appears when the GPS transmission mode is set to GPS.
➥ "GPS-A" appears when GPS transmission mode is set to GPS-A.

㉗ GPS ICON (p. 132)
➥ Appears when a valid position data is received from a GPS receiver that is connected to the [DATA1] jack.
➥ Blinks when an invalid data is received from the GPS receiver.

㉘ GPS ALARM ICON (p. 130)
Appears when the GPS alarm function is turned ON.

㉙ BREAK-IN ICON (p. 79)
➥ "**F** BK-IN" appears when the Full Break-in function is turned ON.
➥ "BK-IN" appears when the Semi Break-in function is turned ON.

㉚ MONITOR ICON (p. 81)
Appears when the Monitor function is turned ON.

㉛ SUB ICON (p. 33)
Appears when the SUB Band setting mode is ON.

1
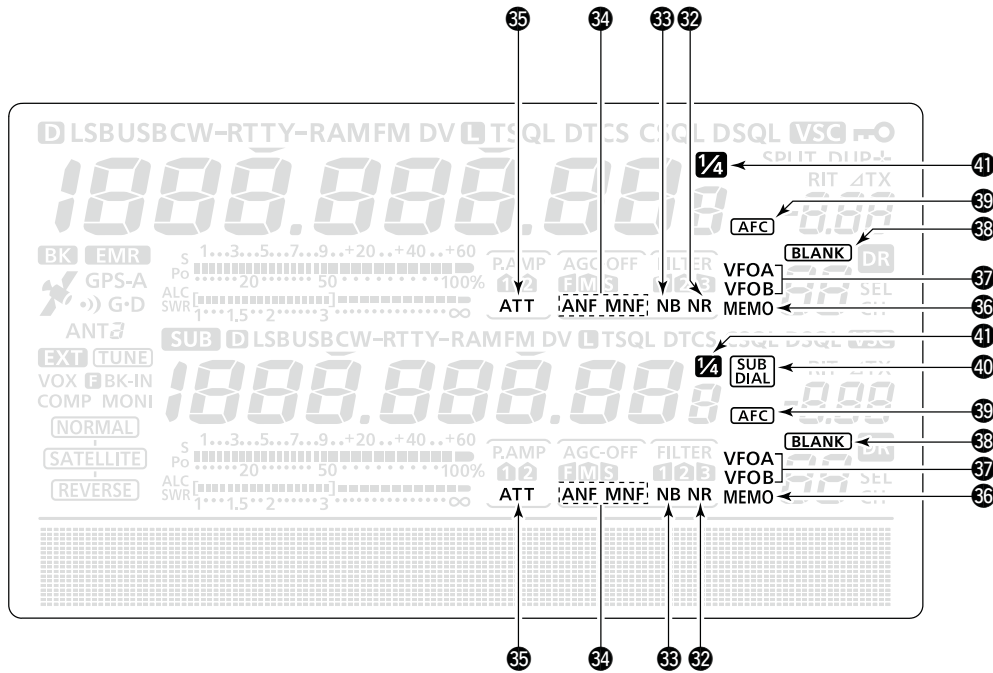
㉜ NOISE REDUCTION ICON (p. 77)
Appears when the Noise Reduction function is turned ON.

㉝ NOISE BLANKER ICON (p. 76)
Appears when the Noise Blanker function is turned ON.

㉞ NOTCH ICONS (p. 77)
(Mode: SSB/CW/RTTY/AM)
➥ "MNF" appears when the Manual Notch function is turned ON.
(Mode: SSB/AM/FM)
➥ "ANF" appears when the Automatic Notch function is turned ON.

㉟ ATTENUATOR ICON (p. 71)
Appears when the Attenuator function is turned ON.

㊱ MEMORY ICON (pp. 34, 139)
Appears when the memory mode is selected.

㊲ VFO ICONS (p. 34)
Displays whether VFO A or VFO B is selected.

㊳ BLANK MEMORY ICON (p. 139)
Appears when the selected memory channel is blank.

㊴ AFC ICON (p. 69)
(Mode: FM/DV)
Appears when the AFC (Automatic Frequency Control) function is turned ON.

㊵ SUB DIAL ICON (p. 33)
Appears when the SUB Dial function is turned ON.

㊶ ¼ TUNING DIAL SPEED ICON (p. 39)
(Mode: SSB-D/CW/RTTY)
Appears when the tuning dial speed is set so that one rotation is equal to ¼ of the normal rotation.
• This function is available only when the quick tuning function is turned OFF.

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

■ Function display

Push [MENU] to toggle the function display menu.
• The set of functions assigned to the function switches change according to the selected menu and operating mode.
• In the DV mode, M3 (menu 3) display can be selected after selecting menu 2.
• In the DR mode, the D1 and D2 displays can be selected.

Push to select the functions displayed in the display above switches ([F-1] to [F-5])
• Functions vary, depending on the operating mode.

◇ M1 (Menu 1) display

<MODE> SSB

AGC	DUP	COMP	TBW	SCP
F-1	F-2	F-3	F-4	F-5

<MODE> SSB-D

AGC	DUP	1 / 4		SCP
F-1	F-2	F-3	F-4	F-5

<MODE> CW

AGC	DUP	1 / 4	KEY	SCP
F-1	F-2	F-3	F-4	F-5

<MODE> RTTY

AGC	DUP	1 / 4	RTTY	SCP
F-1	F-2	F-3	F-4	F-5

<MODE> AM

AGC	DUP			SCP
F-1	F-2	F-3	F-4	F-5

<MODE> FM

AGC	DUP	AFC	TON	SCP
F-1	F-2	F-3	F-4	F-5

<MODE> DV

AGC	DUP	AFC	DSQ	SCP
F-1	F-2	F-3	F-4	F-5

◇ M2 (Menu 2) display

SCAN	MEM	SWR	TCON	VSC
F-1	F-2	F-3	F-4	F-5

◇ M3 (Menu 3) display

<MODE> DV

CS	CD	R>CS	UR	DSET
F-1	F-2	F-3	F-4	F-5

◇ D1 display

<MODE> DV (Only when "**DR**" is displayed.)

CS	CD	R>CS	UR	DSET
F-1	F-2	F-3	F-4	F-5

◇ D2 display

<MODE> DV (Only when "**DR**" is displayed.)

SCAN	SEL	AFC	DSQ	TCON
F-1	F-2	F-3	F-4	F-5

◇ Function keys on M1 (Menu 1) display

AGC KEY [AGC](F-1) (p. 72)
➥ Push to select the time constant of the AGC circuit.
➥ Hold down for 1 second to display the "AGC" screen.

DUPLEX KEY [DUP](F-2) (p. 65)
➥ Push to select the duplex direction, or to turn OFF the function.
  • "DUP–" or "DUP+" is displayed during duplex operation.
➥ In the FM mode, hold down for 1 second to turn the one-touch repeater function ON or OFF.

SPEECH COMPRESSOR KEY [COMP](F-3) (p. 80)
(Mode: SSB)
➥ Push to turn the speech compressor function ON or OFF.
  • "COMP" is displayed when the speech compressor is ON.
➥ Hold down for 1 second to display the "COMP" screen.

¼ TUNING FUNCTION KEY [¼](F-3) (p. 39)
(Mode: SSB-D/CW/RTTY)
Push to turn the ¼ Tuning function ON or OFF.
• "🎴" is displayed when the ¼ Tuning function is ON.

AFC KEY [AFC](F-3) (p. 69)
(Mode: FM/DV)
Push to turn the AFC function ON or OFF.
• "AFC" is displayed when the AFC function is ON.

TRANSMISSION BANDWIDTH KEY [TBW](F-4)
(p. 80)
(Mode: SSB)
➥ Push to display the selected transmission bandwidth.
➥ Hold down for 1 second to select the transmission bandwidth.
  • Bandwidth is selectable from wide (WIDE), middle (MID) and narrow (NAR).

MEMORY KEYER MENU KEY [KEY](F-4) (p. 50)
(Mode: CW)
Push to display the "KEY" screen (memory keyer) or the "SEND" screen (keyer send), depending on the "KEYER 1st Menu" option in the Set mode (p. 165).

RTTY MENU KEY [RTTY](F-4) (p. 57)
Push to display the "RTTY" screen.

TONE SQUELCH KEY [TON](F-4) (pp. 62–64)
(Mode: FM)
➥ Push to select a tone function between subaudible (repeater) tone, tone squelch and DTCS code.
➥ Hold down for 1 second to display the "TON" screen of the selected tone function.

DIGITAL SQUELCH KEY [DSQ](F-4) (p. 114)
(Mode: DV)
➥ Push to select a digital squelch function between digital call sign squelch and digital code squelch.
➥ Hold down for 1 second to display the "DSQ" screen (digital squelch).

BAND SCOPE FUNCTION KEY [SCP](F-5) (p. 70)
Push to display the "SCP" screen (band scope).

◇ Function keys on M2 (Menu 2) display

SCAN KEY [SCAN](F-1) (p. 147)
Push to display the "SCAN" screen.

MEMORY NAME KEY [MEM](F-2) (p. 143)
Push to display the "MEM" screen (memory name edit).

SWR GRAPH FUNCTION KEY [SWR](F-3) (p. 84)
Push to display the "SWR" screen.

TONE CONTROL SET MODE KEY [TCN](F-4)
(p. 169)
Push to enter the Tone Control Set mode.

VSC FUNCTION KEY [VSC](F-5) (p. 146)
(Mode: SSB/AM/FM)
Push to turn the VSC (Voice Squelch Control) function ON or OFF.
• "VSC" appears when the VSC function is ON.

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

■ Function display (Continued)

◇ **Function keys on M3 (Menu 3) display**

(Mode: DV)
CALL SIGN KEY [CS](F-1) (p. 85)
Push to display the "CS" screen.
• The current call sign for DV operation appears.

CALL RECORD KEY [CD](F-2) (p. 95)
Push to display the "CD" screen.
• The call record channel appears. (RX01 to RX20)

R>CS KEY [R>CS](F-3) (p. 96)
Hold down for 1 second to copy and set the previously received station call sign as the station call sign for making a call.

UR KEY [UR](F-4) (p. 101)
Push to toggle the UR and the repeater call sign selection screen.
• The desired station or repeater call sign can be selected.

DSET KEY [DSET](F-5) (p. 118)
Push to enter the DV Set mode.

◇ **Function keys on D1 display**

(Mode: DV) (Only when "**DR**" is displayed.)
CALL SIGN KEY [CS](F-1) (p. 85)
Push to display the "CS" screen.
• The current call sign for DV operation appears.

CALL RECORD KEY [CD](F-2) (p. 95)
Push to display the "CD" screen.
• The RX call sign data appears.

R>CS KEY [R>CS](F-3) (p. 96)
Hold down for 1 second to copy and set the previously received station call sign as the station call sign for making a call.

UR KEY [UR](F-4) (p. 101)
Push to toggle the UR and the repeater call sign selection screen.
• The desired station or repeater call sign can be selected.

DSET KEY [DSET](F-5) (p. 118)
Push to enter the DV Set mode.

◇ **Function keys on D2 display**

(Mode: DV) (Only when "**DR**" is displayed.)
SCAN KEY [SCAN](F-1)
➥ Push to start or cancel the Access repeater scan. (p. 100)
➥ Hold down for 1 second to enter the Scan Set mode. (p. 147)

SEL KEY [SEL](F-2) (p. 100)
Hold down for 1 second to set the repeater as a access repeater scan target.

AFC KEY [AFC](F-3) (p. 69)
Push to turn the AFC function ON or OFF.
• "AFC" is displayed when the AFC function is ON.

DSQ KEY [DSQ](F-4) (p. 114)
➥ Push to select a digital squelch function between digital call sign squelch and digital code squelch.
➥ Hold down for 1 second to display the "DSQ" screen (digital squelch).

TCON KEY [TCON](F-5) (p. 169)
Push to enter the Tone Control Set mode.

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

■ Selecting a location

Select a location for the transceiver that allows adequate air circulation, free from extreme heat, cold, or vibrations, and away from TV sets, TV antenna elements, radios and other electromagnetic sources.

The base of the transceiver has adjustable feet for desktop use. Set the feet to one of two angles, to meet your operating preference.
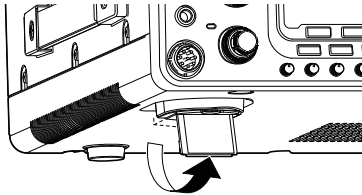
■ Grounding

To prevent electrical shock, television interference (TVI), broadcast interference (BCI) and other problems, ground the transceiver using the GROUND terminal on the rear panel.
For best results, connect a heaviest gauge wire or strap to a long ground rod. Make the distance between the [GND] terminal and ground as short as possible.

⚠ **WARNING! NEVER** connect the [GND] terminal to a gas or electric pipe, since the connection could cause an explosion or electric shock.

[GND]
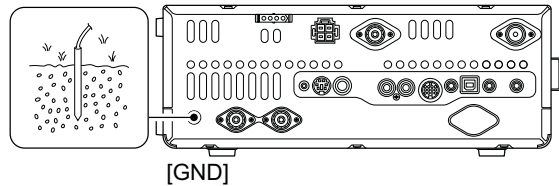
■ Electronic keyer and microphone connections

ELEC-KEY

(dot)
(com)
(dash)

A straight key can also be connected. However, "Straight key" must be selected in the "Keyer Type" item of the Keyer Set mode. (p. 55)
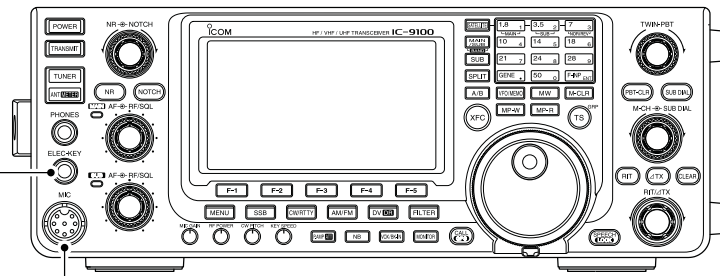
MICROPHONES (p. 30)

HM-36

SM-50
(Option)

SM-30
(Option)

■ Antenna connection

For radio communications, the antenna is of critical importance, along with output power and receiver sensitivity. Select a well-matched 50 Ω antenna and coaxial cable feedline. We recommend 1.5:1 or better of Voltage Standing Wave Ratio (VSWR) on your operating bands. The transmission line should be a coaxial cable.
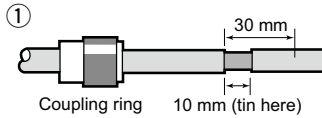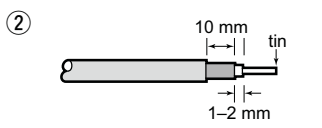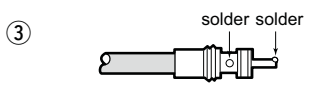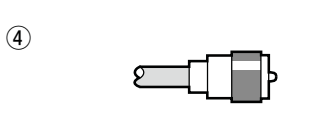
When using a single antenna (for the HF/50 MHz band), use the [ANT1] connector.

⚠ **CAUTION:** Protect your transceiver from lightning by using a lightning arrestor.
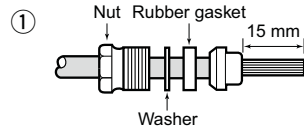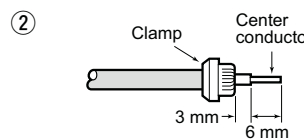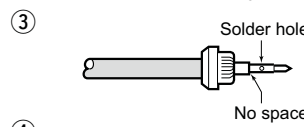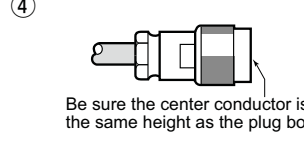
Antenna SWR

Each antenna is tuned for a specified frequency range and the SWR usually increases outside the range. When the SWR is higher than approximately 2.0:1, the transceiver automatically reduces the TX power to protect the final transistors. In that case, an antenna tuner is useful to match the transceiver and antenna. Low SWR allows full power for transmitting. The IC-9100 has an SWR meter to continuously monitor the antenna SWR.

PL-259 CONNECTOR INSTALLATION EXAMPLE

① 30 mm / Coupling ring / 10 mm (tin here) — Slide the coupling ring down. Strip the cable jacket and tin the shield.

② 10 mm / tin / 1–2 mm — Strip the cable as shown at left. Tin the center conductor.

③ solder solder — Slide the connector body on and solder it.

④ Screw the coupling ring onto the connector body.

TYPE-N CONNECTOR INSTALLATION EXAMPLE

① Nut Rubber gasket / 15 mm / Washer — Slide the nut, rubber gasket and clamp over the coaxial cable, then cut the end of the cable evenly.

② Clamp / Center conductor / 3 mm / 6 mm — Strip the cable and fold the braid back over the clamp.

③ Solder hole / No space — Tin the center conductor. Install the center conductor pin and solder it.

④ Be sure the center conductor is the same height as the plug body. — Carefully slide the plug body into place aligning the center conductor pin on the cable. Tighten the nut onto the plug body.

30 mm (⅝ in) 10 mm (⅜ in) 1–2 mm (1/16 in)

■ Required connections

◇ Rear panel

DC POWER SUPPLY (p. 27)

PS-126

[144MHz ANT] (p. 158)

[430MHz ANT] (p. 158)

HF/50MHz ANTENNA 1, 2 (p. 158)
Connection example:
[ANT1] for 1.8–18 MHz bands antenna
[ANT2] for 21–28 MHz bands antenna

GROUND (p. 22)

Use the heaviest possible gauge wire or strap and make the connection as short as possible.

Grounding prevents electrical shocks, TVI and other problems.

STRAIGHT KEY

[1200MHz ANT] (p. 158)

The optional UX-9100 is required.

2

■ Advanced connections

◇ Front panel

HEADPHONES

MIC
The AFSK modulation signal can also be input to [MIC]. (p. 171)

◇ Rear panel

PREAMP (p. 71)
(144 MHz and 430 MHz)

144 MHz : AG-25 (option)
430 MHz : AG-35 (option)

External all-weather, mast-mounted preamplifiers are available.

CAUTION: NEVER connect a power or SWR meter, or other device between the transceiver and preamplifier.

with

AH-4 (option)
(p. 29)

AH-2b (option)
or long wire

[ALC], [SEND] (p. 29)
Used for connecting a non-Icom linear amplifier.

[ANT1], [ANT2] (pp. 28, 29)
Connect a linear amplifier, antenna selector, etc.

EXTERNAL SPEAKER
(MAIN/SUB)

SP-23
(option)

■ External keypad connections

EXTERNAL KEYPAD

Connect an external keypad for keyer memory control.

When using a external keypad, select "KEYER SEND" in the "External Keypad" item of the Set mode. (p. 167)

| 4.7 kΩ ±5% | 2.2 kΩ ±5% | 1.5 kΩ ±5% | 1.5 kΩ ±5% | |
| S4 (M4) | S3 (M3) | S2 (M2) | S1 (M1) | |

To pin ③

To pin ⑦

EXTERNAL KEYPAD

[MIC] (Front view)
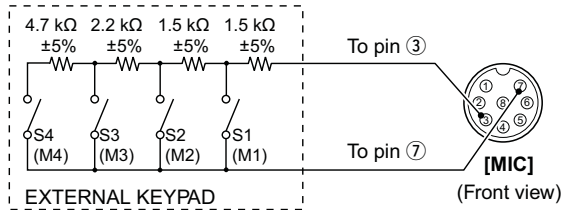
■ Optional and the external units connections

REMOTE JACK, **USB CONNECTOR** (p. 183)

Used for computer control and transceive operation. The optional CT-17 is required when connecting a PC to [REMOTE].
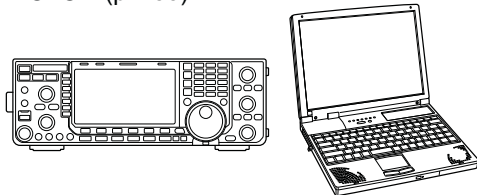
DATA1 JACK (pp. 117, 121)
Connect the optional OPC-1529R for low speed data communication using a PC and the transceiver, or for the GPS receiver connection.
A third-party serial data communication software is required.
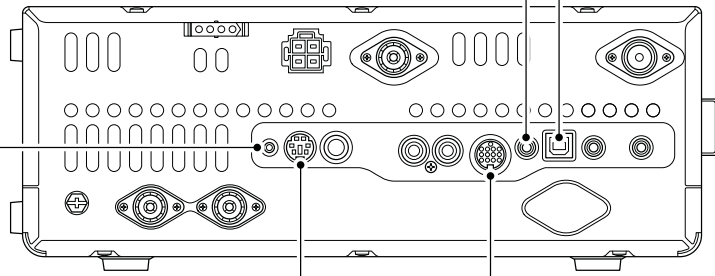
DATA2 SOCKET (pp. 14, 171)
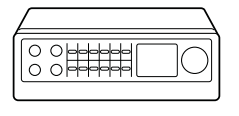
ACC SOCKET (pp. 13, 171)

■ Power supply connections

When operating the transceiver with AC power, use a power supply with 13.8 V DC output and a capacity of at least 24 Amperes.
Refer to the diagrams below.

CAUTION: Before connecting the DC power cable, check the following important items.
Make sure:
• The [POWER] switch is OFF.
• Output voltage of the power source is 12 to 15 V when you use a non-Icom power supply.
• DC power cable polarity is correct.
　　Red　: Positive ⊕ terminal
　　Black : Negative ⊖ terminal

■ Connecting a DC power supply

◇ Connecting the PS-126 DC POWER SUPPLY
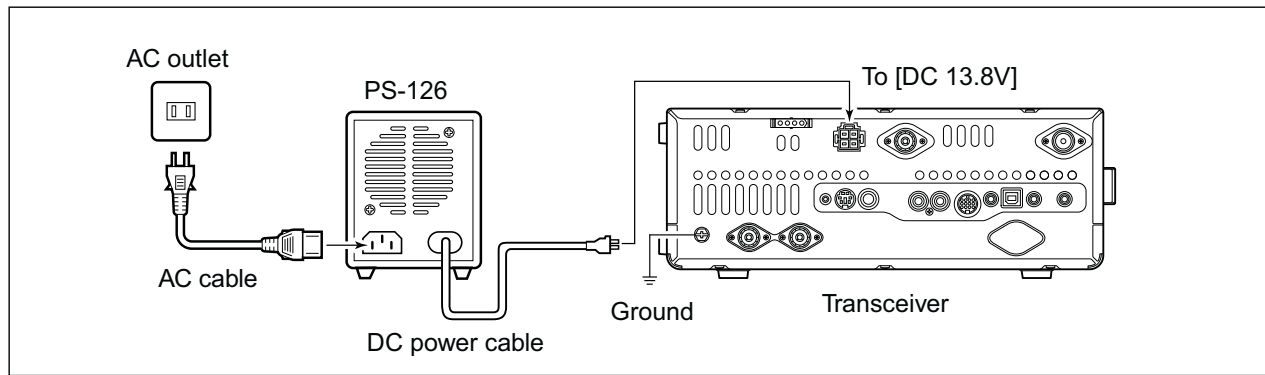
◇ Connecting a non-Icom DC POWER SUPPLY
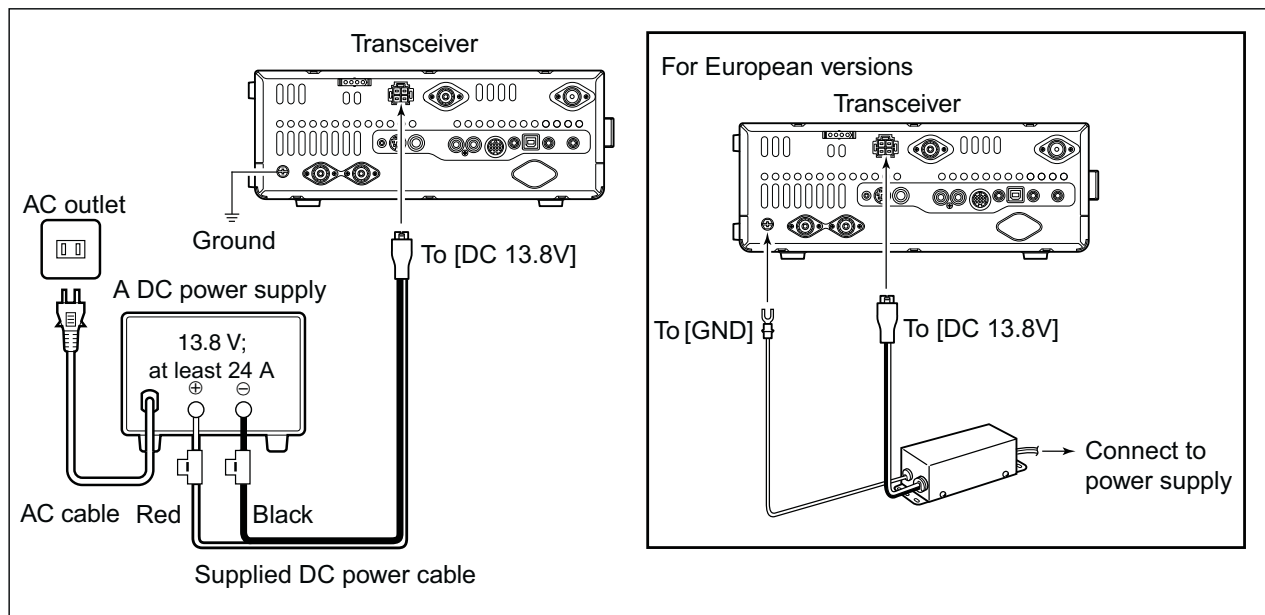
■ Linear amplifier connections

◇ Connecting the IC-PW1/PW1EURO

Remote control cable (supplied with the IC-PW1/PW1EURO)

To an antenna

[ACC1]

7-pin side

ACC cable (supplied with the IC-PW1/PW1EURO)

[ANT]

[REMOTE]

Coaxial cable
(supplied with the IC-PW1/
PW1EURO)

[INPUT1]

OPC-599 →

Coaxial cable*

[INPUT2]

[ANT1]   [ANT2]   [ACC]   [REMOTE]

EXCITER
1   1&2

[GND]

IC-PW1/EURO

[GND]

Ground

Transceiver

AC outlet
(Non-European versions: 100–120/200–240 V
European version   : 230 V)

*Purchase separately, and connect
to [INPUT2], if necessary.

■ Linear amplifier connections (Continued)

◇ **Connecting a non-Icom linear amplifier**
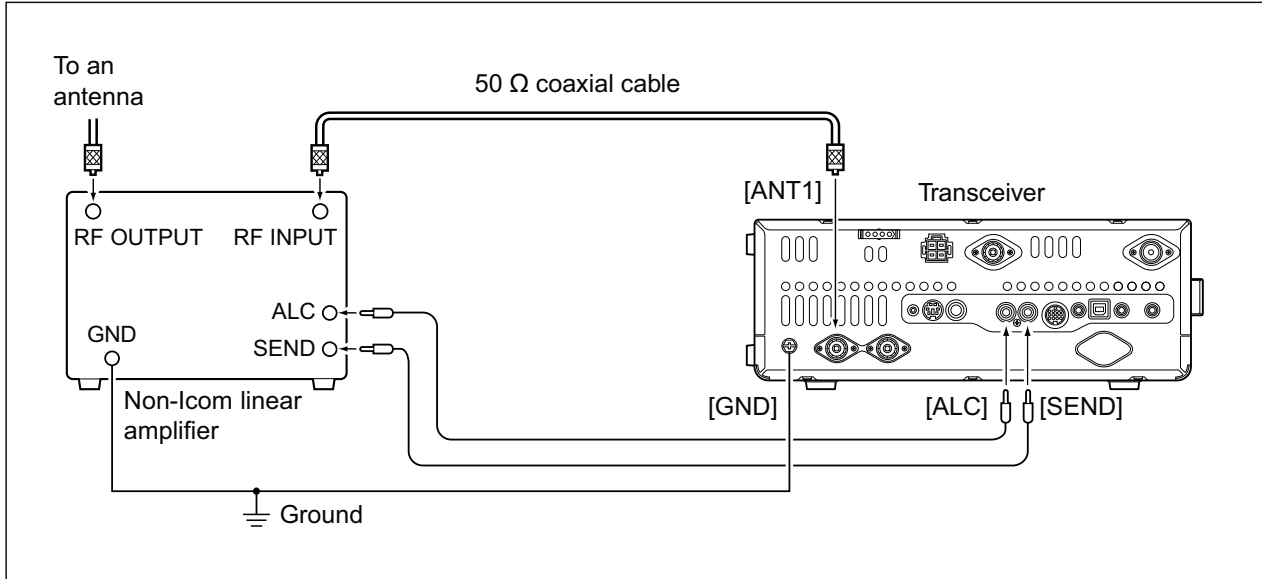
⚠ **WARNING!**
• Set the transceiver output power and linear amplifier ALC output level after referring to the linear amplifier instruction manual.
• The ALC input level must be in the range 0 V to –3 V. The transceiver does not accept a positive voltage. Non-matched ALC and RF power settings could overheat or damage the linear amplifier.
• The IC-9100 SEND terminal (ACC connector pin 3) is rated at 16 V/0.5 A DC. If this value is exceeded, a larger external relay must be used.

■ External antenna tuner connection

◇ **Connecting the AH-4**

▨ The AH-4 must be connected to **[ANT1]**.
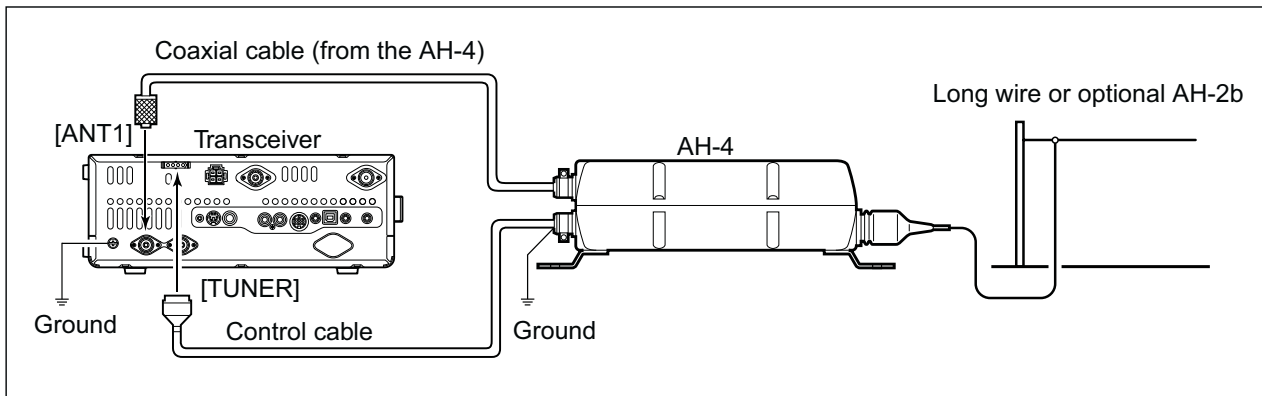
■ Microphone connector information

(Front panel view)

① Microphone input
② +8 V DC output
③ Frequency up/down
④ Main band's squelch switch
⑤ PTT
⑥ GND (PTT ground)
⑦ GND (Microphone ground)
⑧ Main band's AF output (varies with [AF])
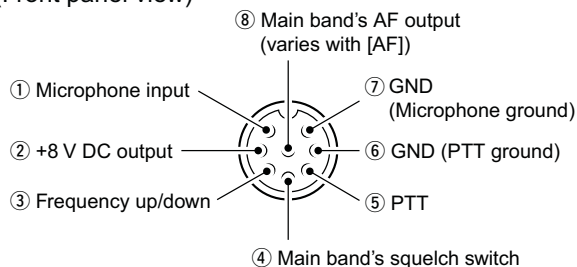
[MIC] Pin No.	FUNCTION	DESCRIPTION
②	+8 V DC output	Max. 10 mA
③	Frequency up	Ground
	Frequency down	Ground through 470 Ω
④	Squelch open	"Low" level
	Squelch closed	"High" level

CAUTION: DO NOT short pin 2 to ground as this can damage the internal 8 V regulator. DC voltage is applied to pin 1 for microphone operation. Use caution when using a non-Icom microphone.

■ Microphones

◇ HM-36
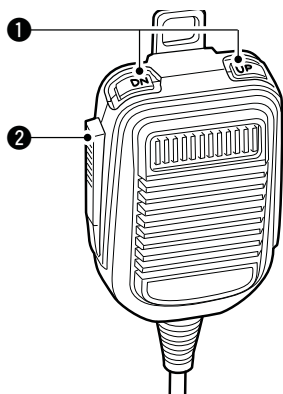
◇ SM-50 (Option)
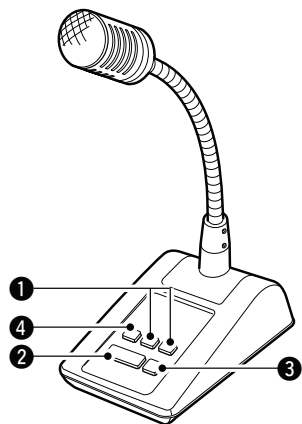
❶ **UP/DOWN SWITCHES [UP]/[DN]**
Push to change the frequency or memory channel.
- While holding down, the frequency or memory channel number continuously increases or decreases.
- While in the split frequency mode, and holding down [XFC], push to change the transmit frequency.
- The [UP]/[DN] switch can be used as a key paddle if the "MIC Up/Down Keyer" item setting is "ON" in the Keyer Set mode. In such case, the frequency and memory channel cannot be changed using the [UP]/[DN] switches. (p. 55)
- You can set the dot-dash polarity of the [UP]/[DN] switch in the "Paddle Polarity" item of the Keyer Set mode. When "Normal" is selected, [UP] sends a dash, and [DN] sends a dot. (p. 55)

❷ **PTT SWITCH**
Hold down to transmit; release to receive.

❸ **PTT LOCK SWITCH** (available on only the SM-50)
Push to toggle between transmit and receive.

❹ **LOW CUT SWITCH** (available on only the SM-50)
Push to cut out the low frequency components of input voice signals.

■ Before first applying power

Before turning ON your transceiver for the first time, make sure all connections required for your system are complete by reviewing them in Section 2 of this manual.

After all connections have been made, set controls and switches as shown in the illustration below.

CW : Max. clockwise
CCW : Max. counterclockwise

[NOTCH]
: 12 o'clock

[RF/SQL]
: 12 o'clock

[NR]
: Max. CCW

[AF]
: Max. CCW

[MIC GAIN]
: 12 o'clock

[RF POWER]
: Max. CW

[CW PITCH]
: 12 o'clock

[KEY SPEED]
: 10–12 o'clock
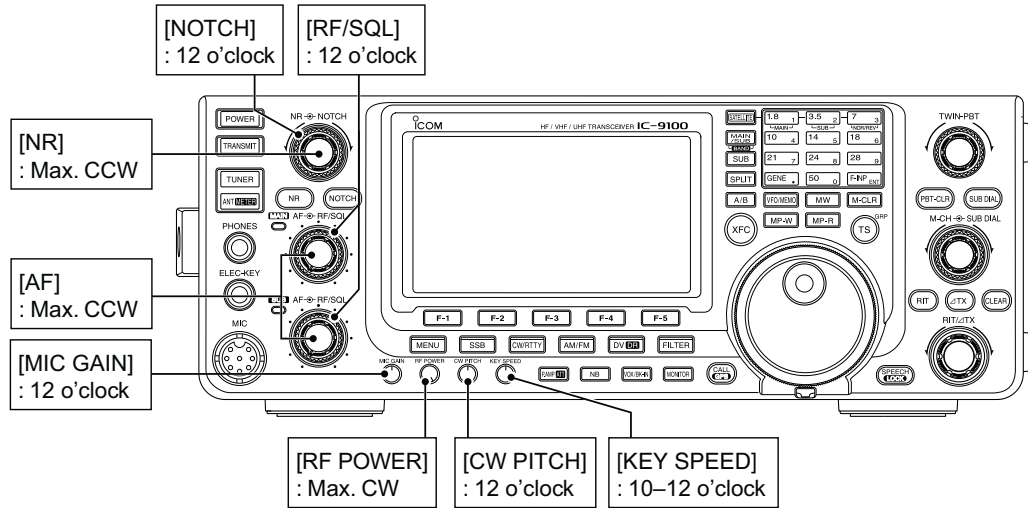
■ Turning ON (Partial resetting)

First time to Power ON:
Reset the transceiver using the following procedure.

A partial resetting **CLEARS** the operating parameters to their default values (VFO frequency, VFO settings, menu group's contents) without clearing certain data. See page 181 for details.

① Make sure the transceiver's power is OFF.
② While holding down both [F-INP ENT] and [VFO/MEMO], push [POWER] to turn ON the transceiver.
  • 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 Change the Set mode settings to suit your operating needs. (p. 161)

Normal Power ON:
Push [POWER] to turn ON the transceiver.

Power OFF:
Hold down [POWER] for 1 second to turn OFF the transceiver.

[POWER]　　　　　　[VFO/MEMO] [F-INP ENT]
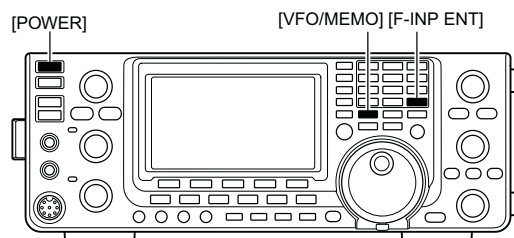
◄ PARTIAL RESET ►
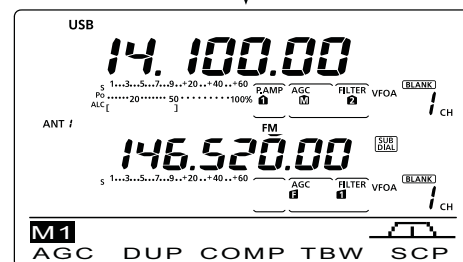
Initial VFO display

■ MAIN and SUB Bands

The IC-9100 can operate on the HF/50 MHz, 144 MHz, 430 MHz and 1200 MHz* frequency bands. These frequency bands can be assigned to the MAIN and SUB Bands for operating convenience.

The MAIN and SUB Bands cannot simultaneously operate on frequency bands within the HF/50 MHz band. For example, if the MAIN Band is set to operate on any frequency within the HF/50MHz band, the SUB Band can simultaneously receive on only the 144 MHz, 430 MHz and 1200 MHz* frequency bands, or visa versa.

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

◇ MAIN/SUB Band selection

The LCD display shows both the MAIN and SUB Band frequencies. Both Bands can receive signals simultaneously, but not on the same frequency band. Set the frequency band you want to transmit or be called on, as the MAIN Band.

➥ Push [MAIN/SUB] to toggle the MAIN and SUB Bands.

Both MAIN and SUB Bands have independent features.
MAIN Band : Used for both transmitting and receiving. The MAIN Band area is in the upper half of the LCD display.
SUB Band : Used for only receiving. The SUB Band area is in the lower half of the LCD display.

About transmitting

You can transmit on only the MAIN Band— not on the SUB Band. However, while operating in the Satellite mode, you can transmit on the SUB Band.

[MAIN/SUB]

MAIN Band display (14.100 MHz USB)

MAIN Band display (146.520 MHz FM)

Push

SUB Band display (146.520 MHz FM)

SUB Band display (14.100 MHz USB)

◇ SUB Band display

The SUB Band display can be turned OFF to simplify operation.

➥ Hold down [SUB] for 1 second to turn the SUB Band display ON or OFF.
  • Nothing is displayed on the SUB Band display when it is turned OFF.

[SUB]
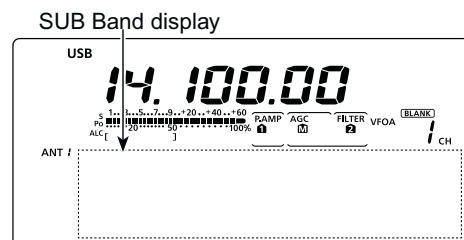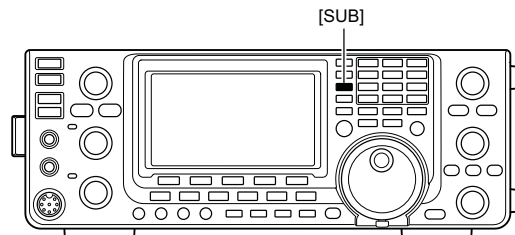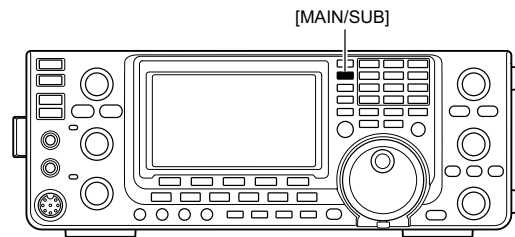
SUB Band display

When the SUB Band display is OFF

◇ SUB Band setting mode operation

Normally, tuning, operating mode selection, memory channel selection and programming, are made for the MAIN Band.

When the SUB Band setting mode is ON, the settings and selections are for only the SUB Band.
• You cannot transmit on the SUB Band.
• You cannot make Main Band settings.

➥ Push [SUB] to turn the SUB Band setting mode ON or OFF.
 • " **SUB** " appears when the SUB Band setting mode is ON.

[SUB]

Disappears — Push [SUB] — Appears

The SUB Band setting mode is OFF.   The SUB Band setting mode is ON.
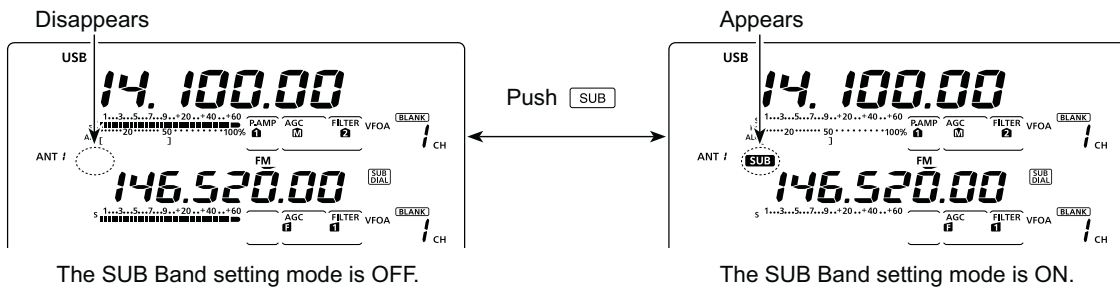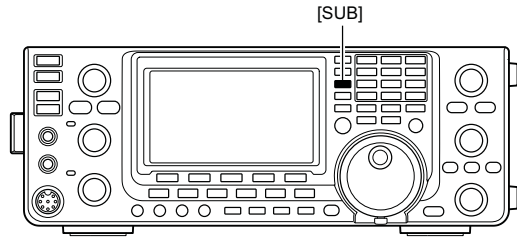
◇ The SUB Dial function

The [SUB DIAL] control's tuning Band and frequency steps differ, depending on the combination of the SUB Dial function and SUB Band setting mode, and the status of the quick tuning function.

➥ Push [SUB DIAL] to turn the SUB Dial function ON or OFF.
 • " 𝖲𝖴𝖡⁄𝖣𝖨𝖠𝖫 " appears when the function is ON.
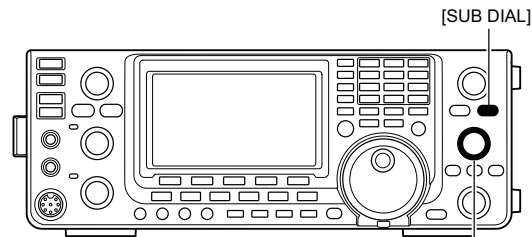
[SUB DIAL]

[SUB DIAL] control

About the Tuned Band with the [SUB DIAL] control

SUB Dial function ("𝖲𝖴𝖡⁄𝖣𝖨𝖠𝖫" appears when ON is selected.)	SUB Band setting (" **SUB** "appears when ON is selected.)	Tuned Band
ON	ON	SUB Band*
ON	OFF	SUB Band*
OFF	ON	SUB Band†
OFF	OFF	MAIN Band†
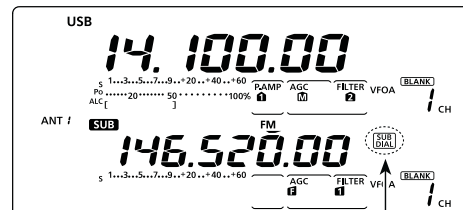
* The frequency changes in 1 Hz, 10 Hz, 1 MHz or pre-set kHz steps, depending on the quick tuning step setting. (p. 38)

† The frequency changes in the programmed kHz steps, even if the quick tuning is OFF.

Appears when the SUB Dial function is ON.

■ VFO description

The IC-9100 has two VFOs; "A" and "B," for each MAIN and SUB Bands, and are convenient for quickly selecting two frequencies, or split frequency operation. You can use either VFO to call up a frequency and operating mode.

VFO is an abbreviation of Variable Frequency Oscillator.

◇ Selecting the VFO A/B

➥ Push [A/B] to switch between the VFO A and VFO B.
  • "VFO A" or "VFO B" appears when the VFO is selected.

◇ VFO equalization

➥ Hold down [A/B] for 1 second to equalize the data in both VFOs.
  • 3 beeps sound when the equalization is complete.

CONVENIENT!
Use two VFOs as quick memories:
When you find a new station, but wish to continue searching, the dual VFO system can be used for quick memory storage.

① Hold down [A/B] for 1 second to store the displayed contents into the undisplayed VFO.
② Continue searching for stations.
③ Push [A/B] to show the stored contents on the undisplayed VFO.
④ To continue searching for stations, push [A/B] again to show the displayed VFO.

[A/B]

The selected VFO icon

Displayed VFO

① Hold down
③ Push

Undisplayed VFO

■ Selecting VFO/memory mode

➥ Push [VFO/MEMO] to switch between the VFO and memory modes.
  • "VFO A" or "VFO B" appears when in the VFO mode, or "MEMO" and the selected memory channel number appear when in the memory mode.
  • Holding down [VFO/MEMO] for 1 second copies the contents of the selected memory channel into the displayed VFO. (p. 142)

[VFO/MEMO]
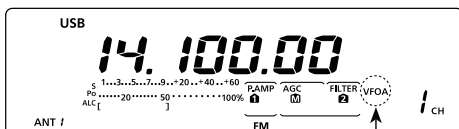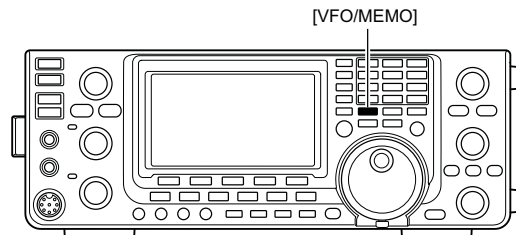
The selected VFO icon
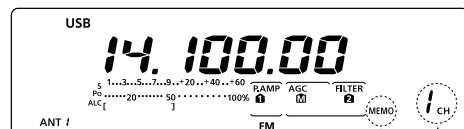
Memory icon

Memory channel number

■ Selecting a frequency band

The frequency band you want to use can be selected in the MAIN and SUB Bands.
Before changing the frequency band on the SUB Band, push [SUB] to turn ON the SUB Band setting mode.
In addition to the HF/50 MHz, 144 MHz and 430 MHz frequency bands, the IC-9100 can operate on the 1200 MHz frequency band*[1].

① Hold down [BAND](MAIN/SUB) for 1 second several times until the desired frequency of the bands that are stored in the MAIN or SUB Band, whichever you selected.
② To call up the previously selected frequency and operating mode, push a band key or [GENE •] if the HF/50 MHz frequency band was selected in step ①, or push [GENE •] if the 144 MHz, 430 MHz or 1200 MHz frequency band*[1] was selected.

[BAND](MAIN/SUB) Band keys

[GENE •]
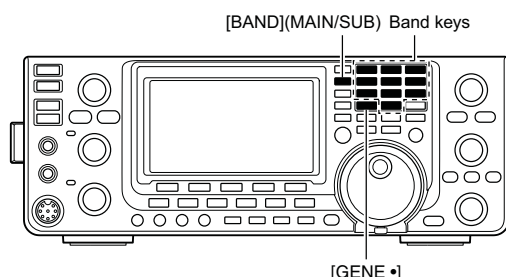
NOTE: The same frequency band cannot be simultaneously selected in both MAIN and SUB Bands. The frequency band, selected in either the MAIN or SUB Band, cannot be selected on the other Band.

◇ Using the band stacking registers

The triple band stacking register provides 3 memories for each band key to store frequencies and operating modes.
This function is convenient when you operate 3 operating modes on one frequency band.
For example, one register can be used for a CW frequency, another for an SSB frequency and the other one for an RTTY frequency.

If a band key or [GENE •]* is pushed once, the last used frequency and operating mode are called up. When the key is pushed again, another stored frequency and operating mode are called up.
* If you are using a frequency band other than HF/50 MHz, you can call up the HF/50 MHz frequency band by pushing the band keys ([1.8 1] to [50 0] or [GENE •]).

See the table below for a list of the available frequency bands and their default frequency and mode settings.

BAND	REGISTER 1	REGISTER 2	REGISTER 3
1.8 MHz	1.900000 MHz CW	1.910000 MHz CW	1.915000 MHz CW
3.5 MHz	3.550000 MHz LSB	3.560000 MHz LSB	3.580000 MHz LSB
7 MHz	7.050000 MHz LSB	7.060000 MHz LSB	7.020000 MHz CW
10 MHz	10.120000 MHz CW	10.130000 MHz CW	10.140000 MHz CW
14 MHz	14.100000 MHz USB	14.200000 MHz USB	14.050000 MHz CW
18 MHz	18.100000 MHz USB	18.130000 MHz USB	18.150000 MHz USB
21 MHz	21.200000 MHz USB	21.300000 MHz USB	21.050000 MHz CW
24 MHz	24.950000 MHz USB	24.980000 MHz USB	24.900000 MHz CW
28 MHz	28.500000 MHz USB	29.500000 MHz USB	28.100000 MHz CW
50 MHz	50.100000 MHz USB	50.200000 MHz USB	51.000000 MHz FM
144 MHz	146.520000 MHz FM	145.100000 MHz FM	145.200000 MHz FM
430 MHz	446.000000 MHz FM	440.100000 MHz FM	440.200000 MHz FM
1200 MHz*[1]	1294.500000 MHz FM	1295.100000 MHz FM	1294.200000 MHz FM
General*[2]	15.000000 MHz USB	15.100000 MHz USB	15.200000 MHz USB

*[1] The optional UX-9100 is required for the 1200 MHz frequency band operation.
*[2] [GENE •] selects the general coverage band.

(Frequency band: HF/50 MHz)

① Hold down [BAND](MAIN/SUB) for 1 second several times until a HF/50 MHz frequency band is displayed.

② Push a band key ([1.8 1] to [50 0] or [GENE •]).
  • The previously selected frequency and operating mode are called up as the first band stacking register of that frequency band.

③ Select a frequency and an operating mode, and then push the band key.
  • The selected frequency and mode are memorized as that frequency band's first band stacking register.

④ Select another frequency and operating mode, and then push the band key.
  • The selected frequency and mode are memorized as that frequency band's second band stacking register.

⑤ Select another frequency and operating mode, and then push the band key.
  • The selected frequency and mode are memorized as that frequency band's third band stacking register.

⑥ The first band stacking register set in step ③, is called up.
  • When the frequency band key is pushed, the memorized triple band stacking registers are sequentially called up.

(Frequency band: 144/430/1200 MHz)

① Hold down [BAND](MAIN/SUB) for 1 second several times until a 144 MHz, 430 MHz or 1200 MHz frequency band is displayed.
  • The previously selected frequency and an operating mode are called up as the first band stacking register of that frequency band.

② Select a frequency and an operating mode, and then push [GENE •].
  • The selected frequency and mode are memorized as that frequency band's first band stacking register.

③ Select another frequency and operating mode, and then push [GENE •].
  • The selected frequency and mode are memorized as that frequency band's second band stacking register.

④ Select another frequency and operating mode, and then push [GENE •].
  • The selected frequency and mode are memorized as that frequency band's third band stacking register.

⑤ The first band stacking register set in step ②, is called up.
  • When [GENE •] is pushed, the memorised triple band stacking registers are sequentially called up.

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

[Example]: 14 MHz frequency band

[Example]: 430 MHz frequency band
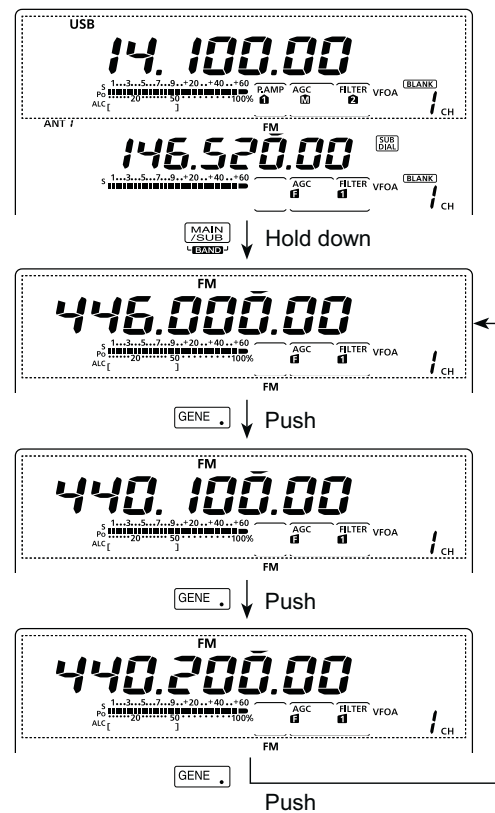
■ Frequency setting

You can select the transceiver's frequency by using [MAIN DIAL], or you can enter it using the keypad.

◇ Tuning with [MAIN DIAL]

① Select the desired frequency band.
  • Hold down [BAND](MAIN/SUB) for 1 second several times until the desired frequency band is displayed.
  • Push the desired band key on the keypad or [GENE •] 1–3 times.
    3 different frequencies on each frequency band can be selected with the band key. (See previous page "Using the band stacking registers.")
  • The default tuning step differs, depending on the operating mode.
    SSB/CW/RTTY: 10 Hz
    AM   : 1 kHz ("▼" is displayed)
    FM/DV   : 10 kHz ("▼" is displayed)
② Rotate [MAIN DIAL] to set the desired frequency.

///// If the Dial Lock function is ON, "🔒" is displayed, and [MAIN DIAL] does not function.
In this case, hold down [SPEECH/LOCK] for 1 second to turn OFF the lock function. (p. 77)
When "LOCK/SPEECH" is selected in the "[SPEECH/LOCK] SW" item of the Set mode, pushing [SPEECH/LOCK] turns OFF the lock function. (see p. 164 for details)

Band keys

[MAIN DIAL]

◇ Direct frequency entry with the keypad

The transceiver has a keypad for direct frequency entry, as described below.

① Push [F-INP ENT] to enter frequencies with the keypad.
  • All frequency digits disappear.
② Push the numeric keys to input the desired frequency.
  • Push [GENE •] to input a "." (decimal point) between the 1 MHz digits and 100 kHz digits.
③ Push [F-INP ENT] to set the input frequency.
  • To cancel the input, push [EXIT/SET] before pushing [F-INP ENT].

///// **NOTE:** The frequency band, selected in either the MAIN or SUB Band, cannot be selected on the other Band.

Keypad
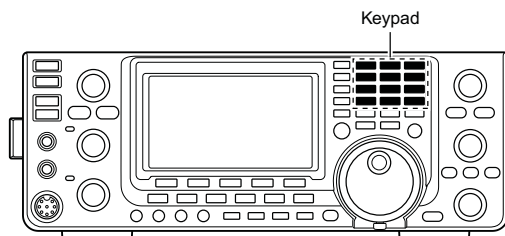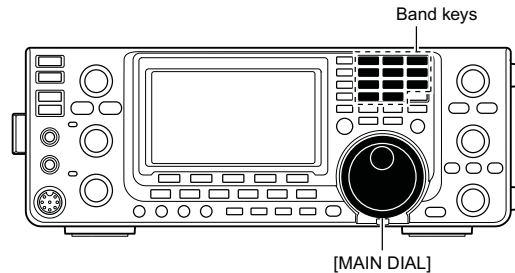
[EXAMPLE]

14.025 MHz
[F-INP ENT] [1.8 1] [10 4] [GENE •] [50 0] [3.5 2] [14 5] [F-INP ENT]

18.0725 MHz
[F-INP ENT] [1.8 1] [24 8] [GENE •] [50 0] [21 7] [3.5 2] [14 5] [F-INP ENT]

706 kHz
[F-INP ENT] [50 0] [GENE •] [21 7] [50 0] [18 6] [F-INP ENT]

5.100 MHz
[F-INP ENT] [14 5] [GENE •] [1.8 1] [F-INP ENT]

7.000 MHz
[F-INP ENT] [21 7] [F-INP ENT]

21.280 MHz ➪ 21.245 MHz
[F-INP ENT] [GENE •] [3.5 2] [10 4] [14 5] [F-INP ENT]

◇ Quick Tuning function

The operating frequency can be changed in 1 kHz or 1 MHz steps for quick tuning.
Select the desired tuning step in each operating frequency band and mode.

① Push [TS] to select the 1 kHz or 1 MHz Quick Tuning function step, or turn it OFF.
  • While the quick tuning icon, "▼," is displayed above the 1 kHz or 1 MHz digit, the frequency will be changed in 1 kHz or 1 MHz steps.
  • When the function is OFF, the frequency will be changed in 10 Hz steps.
② Rotate [MAIN DIAL] to change the frequency in the selected steps.

NOTE:
• To turn OFF the Quick Tuning function, push [TS] again. ("▼" disappears)
• When the Quick Tuning function is OFF, the frequency will be changed in 10 Hz steps.

◇ Selecting "kHz" step

When the 1 kHz quick tuning is selected, the frequency can be changed in the selected "kHz" steps.
The MAIN and SUB Bands use the common "kHz" tuning step. You can select it in both Band's.

① Push [TS] to turn ON the Quick Tuning function.
  • "▼" appears.
② Hold down [TS] for 1 second to display the "TS" screen to select the quick tuning step.
③ Select the desired operating mode.
④ Rotate [MAIN DIAL] to select the desired "kHz" step.
  • 0.1, 1, 5, 6.25, 9, 10, 12.5, 20, 25, 50 and 100 kHz are selectable.
  • Hold down [F-3] for 1 second to return to the default setting, if desired.
⑤ Repeat steps ③ and ④ to select quick tuning steps for other modes.
⑥ Push [TS] to exit the "TS" screen.

NOTE: To display the "TS" screen, the Quick Tuning function must be turned ON first.

[TS]

[MAIN DIAL]

Appears

[F-3]   [TS]

Mode selection   [MAIN DIAL]
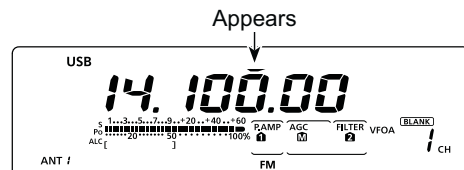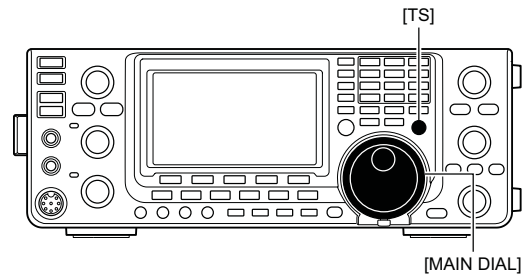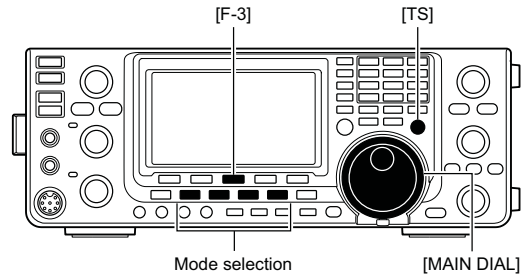
■ Frequency setting (Continued)

◇ **Selecting 1 Hz step**
You can change the frequency in 1 Hz steps for fine tuning.

① Push [TS] to turn OFF the Quick Tuning function.
② Hold down [TS] for 1 second to turn the 1 Hz tuning step ON or OFF.

NOTE:
• When RIT and/or ⊿TX are used, they also tune in 1 Hz tuning steps.
• The frequency changes in 50 Hz steps when the [UP]/[DN] switches of the microphone are used for frequency tuning (if the quick tuning function is not selected.)
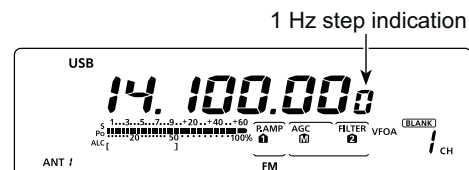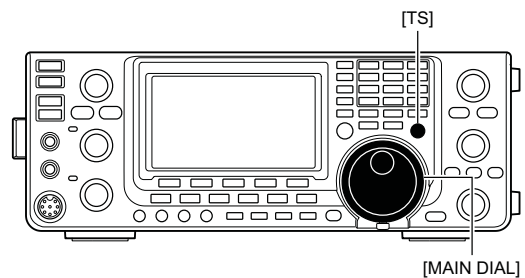
◇ **Auto tuning step function**
When you rotate [MAIN DIAL] rapidly, the tuning speed can automatically accelerate, depending on the "MAIN DIAL Auto TS" option in the Set mode.

① Hold down [MENU] for 1 second to enter the Set mode.
② Push [▲](F-1) or [▼](F-2) to select "MAIN DIAL Auto TS."
③ Rotate [MAIN DIAL] to select the HIGH or LOW tuning speed acceleration, or to turn OFF the function.
  • HIGH: When the tuning step is set to 1 kHz or smaller steps, the tuning speed is approximately five times faster.
    When the tuning step is set to 5 kHz or larger steps, the tuning speed is approximately two times faster.
    (default)
  • LOW : Approximately two times faster
  • OFF : Auto tuning step is turned OFF.
  • Hold down [CLR] (F-3) for 1 second to reset to the default value.
④ Push [MENU] to save, and exit the Set mode.
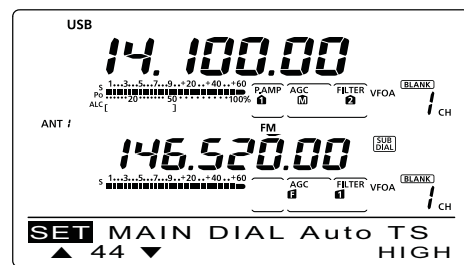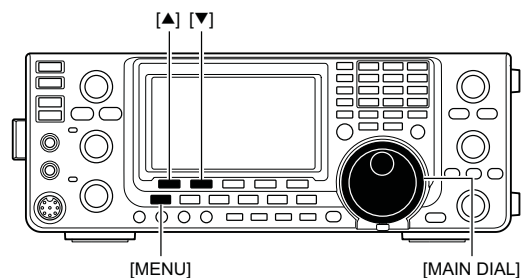
◇ **¼ tuning step function**

(Mode: SSB-D/CW/RTTY)
The dial speed is reduced to ¼ of the normal speed when the ¼ tuning function is ON, for finer tuning control.
You can set the ¼ tuning function in each operating mode.
This function is selectable only when the quick tuning function is turned OFF.

① Push [MENU] to display the "M1" screen (menu 1).
② Push [¼](F-3) to turn the ¼ tuning function ON or OFF.
  • "⊠" appears when the ¼ tuning function is ON.

[TS]
[MAIN DIAL]

1 Hz step indication

[▲] [▼]
[MENU]
[MAIN DIAL]

HIGH (default)

[¼]
[MENU]

Appears
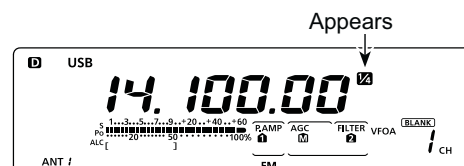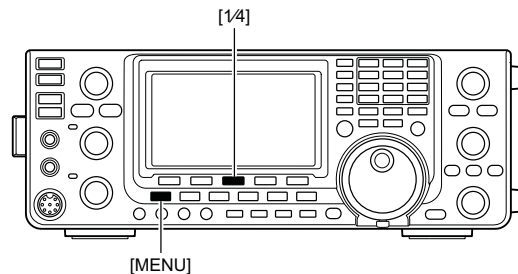
◇ About the 5 MHz frequency band operation (only USA version)

Operation on the 5 MHz frequency band is allowed on 5 discrete frequencies and must adhere to the following:
• The USB, USB Data and CW modes
• Maximum of 100 watts ERP (Effective Radiated Power)
• 2.8 kHz bandwidth (maximum)

It is your responsibility to set all controls so that transmission in this frequency band meets the stringent conditions under which amateur operations may use these frequencies.

NOTE: We recommend that you store these frequencies, modes and filter settings into memory channels, for easy recall.

To assist you in operating within the rules specified by the FCC, transmission is illegal on any frequencies other than the five shown in the tables below.

• For the USB and USB Data modes
The FCC specifies center frequencies on the 5 MHz frequency band. However, the transceiver displays carrier frequency. Therefore, tune the transceiver to 1.5 kHz below the specified FCC channel center frequency.

Transceiver Displayed Frequency	FCC Channel Center Frequency
5.33050 MHz	5.33200 MHz
5.34650 MHz	5.34800 MHz
5.35700 MHz	5.35850 MHz
5.37150 MHz	5.37300 MHz
5.40350 MHz	5.40500 MHz

• For the CW mode
The transceiver displays the center frequency. Therefore, tune the transceiver to the specified FCC channel frequency when you operate in these modes.

Transceiver Displayed Frequency	FCC Channel Center Frequency
5.33200 MHz	5.33200 MHz
5.34800 MHz	5.34800 MHz
5.35850 MHz	5.35850 MHz
5.37300 MHz	5.37300 MHz
5.40500 MHz	5.40500 MHz

3

■ Frequency setting (Continued)

◇ **Band edge warning beep**

You can hear a beep tone when you tune into or out of an amateur band's frequency range. A regular beep sounds when you tune into a range, and an lower tone error beep sounds when you tune out of a range.

① Hold down [MENU] for 1 second to enter the Set mode.
② Push [▲](F-1) or [▼](F-2) to select "Band Edge Beep."
③ Rotate [MAIN DIAL] to select the desired band edge warning beep setting.
   • 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. (default)
   • 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. Also transmission is inhibited outside the programmed range.
   • Hold down [CLR] (F-3) for 1 second to reset to the default value.
④ Push [MENU] to save, and exit the Set mode.

※ The beep output level can be set in the "Beep Level" item of the Set mode. (p. 161)

About the user band edge frequencies

When "ON (User)" or "ON (User) & TX" is selected in the "Band Edge Beep" item, a total of 30 band edge frequencies can be programmed in the "User Band Edge" item. See the next page for details.
If "OFF" or "ON (Default)" is selected, the "User Band Edge" item does not appear in the Set mode.

[▲] [▼]

[MENU]   [MAIN DIAL]

```
┌─────────────────────────────────┐
│ SET  Band Edge Beep              │
│   ▲  6  ▼          ON(Default)   │
└─────────────────────────────────┘
```
ON (Default)
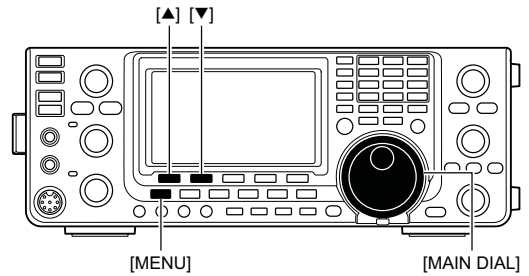
```
┌─────────────────────────────────┐
│ SET  Band Edge Beep              │
│   ▲  6  ▼          ON(User)      │
└─────────────────────────────────┘
```
ON (User) selection

[F-2]

↓ Push

```
┌─────────────────────────────────┐
│ SET  User Band Edge              │
│   ▲  7  ▼          DEF  EDT      │
└─────────────────────────────────┘
```
[User Band Edge] item

◊ Programming the user band edge

When "ON (User)" or "ON (User) & TX" is selected in the "Band Edge Beep" item, the "User Band Edge" item appears in the Set mode.
A total of 30 band edge frequencies can be programmed in the "User Band Edge" item.

NOTE:
• All frequency ranges are set to default, so you should delete or change them to add the desired band edge frequency.
• Program each channel from left to right and each frequency must be higher than the preceding frequency.
• The frequency that is duplicated, or out of an amateur band, cannot be programmed.

① Hold down [MENU] for 1 second to enter the Set mode.
② Push [▲](F-1) or [▼](F-2) to select "Band Edge Beep."
③ Rotate [MAIN DIAL] to select either "ON (User)" or "ON (User) & TX" option.
④ Push [▼](F-2) to select "User Band Edge."
⑤ Push [EDT](F-4) to display the "EDG" screen (band edge program).
⑥ Push [▲](F-1) or [▼](F-2) to select the desired band edge.
   • Holding down [▲](F-1) or [▼](F-2) continuously selects the band edges.
   • Push [◄ ►](F-3) to select the upper or lower band edge frequency entry status.
   • Hold down [DEL](F-5) for 1 second to delete the selected band edge.
   • Push [INS](F-4) to insert a new blank band edge.
⑦ Input the desired frequency with the keypad, then push [F-INP ENT].
   • Push [GENE •] to input decimal point (".") between the MHz and kHz digits.
⑧ Push [MENU] to save.
⑨ Push [MENU] again to exit the Set mode.

To reset the band edge frequencies

If you want to reset the band edge frequencies to their default (initial) value, select the "User Band Edge" item, then hold down [DEF](F-3) for 1 second.

The band edge initialize screen appears, then hold down [YES](F-4) for 1 second to reset all band edge frequency settings to their default values.

[▲] [▼] [◄►]   Keypad

[MENU]   [INS] [DEL]   [MAIN DIAL]

SET Band Edge Beep
▲ 6 ▼   ON(User)

ON (User) setting in the "Band Edge Beep" item

F-2
↓ Push

SET User Band Edge
▲ 7 ▼   DEF EDT

"User Band Edge" item

F-4
↓ Push

EDG 1.800.000– 1.999.999
▲ 1 ▼ ◄► INS DEL

"EDG" screen

SET User Band Edge
▲ 7 ▼   DEF EDT

"User Band Edge" item

F-3
↓ Hold down

SET Initialize Edges?
YES NO

Band edge initialize screen

F-4
↓ Hold down

SET User Band Edge
▲ 7 ▼   DEF EDT

■ Operating mode selection

The usable operating modes in the IC-9100 are listed to the right.
You can select the desired operating mode by pushing the mode switch.
See the diagram to the right for the order of selection.

⫸ You can mute the microphone signals when the data mode is selected, depending on the "DATA MOD" option in the Set mode (p. 167).

• Selecting the SSB mode
➥ Push [SSB] to select the USB or LSB mode.
  • "LSB" or "USB" appears.
  • When operating above 10 MHz, USB is selected first; when operating below 10 MHz, LSB is selected first.
  • Push [SSB] again to toggle between USB and LSB.
  • After USB or LSB is selected, hold down [SSB] for 1 second to select the data mode. ("**D**" appears)
  • In the data mode, push [SSB] to return to the normal SSB mode.

• Selecting the CW/RTTY mode
➥ Push [CW/RTTY] to select the CW or RTTY mode.
  • "CW" or "RTTY" appears.
  • Push [CW/RTTY] again to toggle between CW and RTTY.
  • After CW or RTTY is selected, hold down [CW/RTTY] for 1 second to toggle between normal and reverse modes. ("CW-R" or "RTTY-R" appears.)

• Selecting the AM/FM mode
➥ Push [AM/FM] to select the AM or FM mode.
  • "AM" or "FM" appears.
  • Push [AM/FM] again to toggle between AM and FM.
  • After AM or FM is selected, hold down [AM/FM] for 1 second to select the data mode. ("**D**" appears)
  • In the data mode, push [AM/FM] to return to the normal AM or FM mode.

⫸ **NOTE:**
• In the AM mode, you can transmit on only the HF/50MHz frequency bands.
• The AM mode cannot be selected on the 1200 MHz frequency band.

• Selecting the DV mode (including DR mode)*
➥ Push [DV•DR] to select the DV mode.
  • "DV" appears.
  • DV mode (digital voice + low-speed data communication) allows you to exchange the text message and call sign, and transmit a position data with a third-party GPS receiver.
➥ Hold down [DV•DR] to turn the DR (D-STAR® Repeater) mode operation ON or OFF.
  • "DV" and "**DR**" appears.
  • The DV mode is automatically selected when the DR mode is ON.
  • DR (D-STAR Repeater) mode allows you to use a repeater list to operate a D-STAR repeater simply.

• Usable operating modes

Mode switch	Operating mode	
[SSB]	USB	USB Data
	LSB	LSB Data
[CW/RTTY]	CW	CW Reverse
	RTTY	RTTY Reverse
[AM/FM]	AM	AM Data
	FM	FM Data
[DV•DR]	DV*	

Mode switches

SSB
D USB ⇆ USB ◄┄┄┄► LSB ⇄ **D** LSB

CW/RTTY
CW-R ◄──► CW ◄┄┄┄► RTTY ◄──► RTTY-R

AM/FM
D AM ⇄ AM ◄┄┄┄► FM ⇄ **D** FM

DV **DR**
DV ──► DR ◄┄┄┄

◄┄┄► : Push momentary
◄──► : Hold down for 1 second
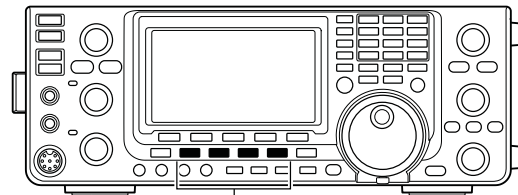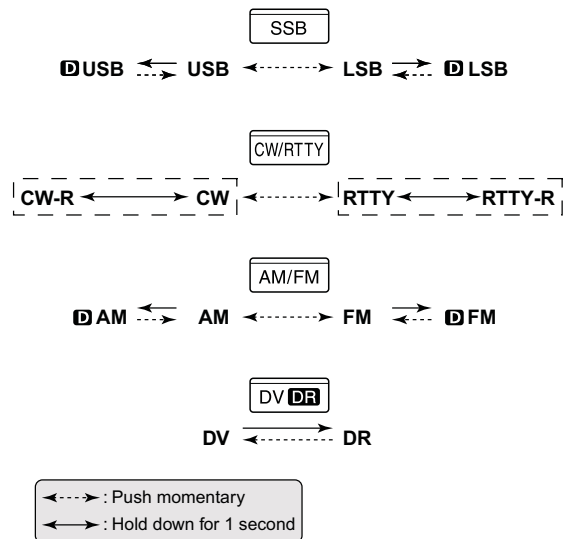
INFORMATION!
The DV mode can be selected in either MAIN or SUB band. If you select the DV mode in both Bands, the transceiver cannot receive on the SUB Band.

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

■ Squelch and receive (RF) sensitivity

Adjusts the RF gain and squelch threshold level. The squelch removes noise output to the speaker when no signal is received (closed squelch).
• The squelch is particularly effective for AM and FM, but can also be used in other modes.
• The 12 to 1 o'clock position is recommended for the most effective use of the [RF/SQL] control.
• [RF/SQL] can operate as only an RF gain control (Squelch is fixed open) or only a squelch control (RF gain is fixed at maximum sensitivity) depending on the "RF/SQL Control" option in the Set mode. (p. 162)

[RF/SQL](MAIN Band)

[RF/SQL](SUB Band)

SET MODE SETTING	OPERATING MODE	[RF/SQL] OPERATION
RF+SQL (default)	FM/DV	Operates as an RF gain control, and a noise squelch or Smeter squelch.
	SSB/CW/RTTY/AM	Operates as an RF gain control, and an Smeter squelch.
SQL	ALL	Operates as only a squelch control. • RF gain is fixed at maximum sensitivity.
AUTO	SSB/CW/RTTY	Operates as only an RF gain control. • Squelch is fixed open.
	AM/FM/DV	Operates as only a squelch control. • RF gain is fixed at maximum sensitivity.

❍ **Adjusting RF gain** (Receive sensitivity)
Normally, [RF/SQL] is set to the 12 o'clock position. Rotate [RF/SQL] to the 11 o'clock position for maximum sensitivity.
• Rotating counterclockwise from the maximum position reduces sensitivity.
• The S-meter indicates receive sensitivity.

░ While rotating the RF gain control, noise may be heard. This comes from the DSP unit and does not indicate an equipment malfunction.

❍ **Adjusting squelch** (Removing non-signal noise)
Rotate [RF/SQL] clockwise when no signal is received, until the noise just disappears.
• The TX/RX indicator light goes out.
• Rotating [RF/SQL] past the threshold point activates the S-meter squelch— this allows you to set a minimum signal level needed to open the squelch.
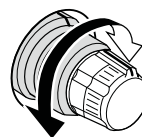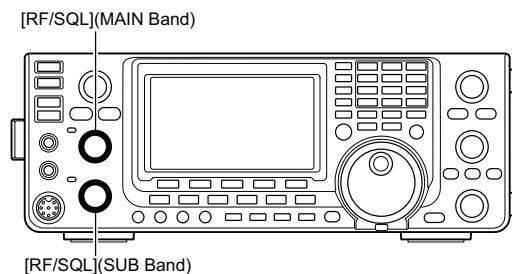
3

• **When functioning as an RF gain/squelch control**

Noise squelch (FM/DV modes)
Squelch is open.
Recommended level
Maximum RF gain
RF gain adjustable range
S-meter squelch
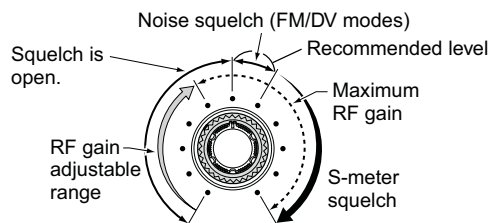
• **When functioning as an RF gain control**
(Squelch is fixed open; SSB, CW, RTTY only)

Adjustable range
Maximum RF gain
Minimum RF gain
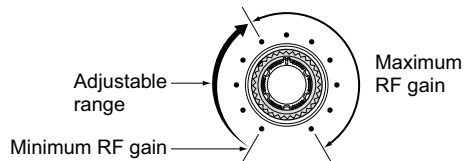
• **When functioning as a squelch control**
(RF gain is fixed at maximum.)

Noise squelch (FM/DV modes)
Noise squelch threshold (FM mode)
S-meter squelch threshold
Squelch is open.
S-meter squelch
Shallow
Deep
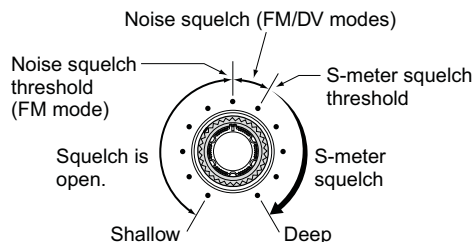
■ Volume setting

➥ Rotate the [AF] control clockwise to increase the audio output level, counterclockwise to decrease it.

Increases

Decreases

[AF](MAIN Band)

[AF](SUB Band)
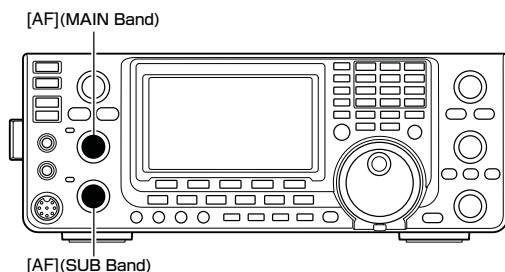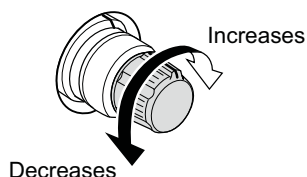
■ Voice synthesizer operation

The IC-9100 has a built-in voice synthesizer to announce the operating frequency, mode and S-meter level in clear, electronically-generated voice, in English (or Japanese).
First, select the desired parameters to be announced in the Set mode. (p. 164)

Initial values for the voice synthesizer parameters

• SPEECH Level   : 50%
• SPEECH Language   : English
• SPEECH Speed   : HIGH
• SPEECH S-Level   : ON
• SPEECH [MODE] SW : OFF
• [SPEECH/LOCK] SW : SPEECH/LOCK
                                  (See **NOTE** as described below.)

➥ Push [SPEECH/LOCK] to announce the currently selected frequency, mode and S-meter level*.
  * The S-meter level announcement can be turned OFF. (p. 164)

  NOTE: If "SPEECH/LOCK" is not selected in the "[SPEECH/LOCK] SW" item of the Set mode, you should hold down [SPEECH/LOCK] for 1 second to activate the voice synthesizer. (p. 164)

➥ Push a mode switch to announce the appropriate mode, when the "SPEECH [MODE] SW" item is set to "ON" in the Set mode. (p. 164)

Mode switches   [SPEECH/LOCK]
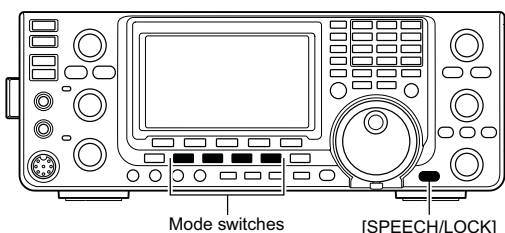
■ Meter Display selection

The transmit meter can be toggled between three functions for your convenience.
The RF power meter is always displayed.

➥ Hold down [ANT•METER] for 1 second to toggle the transmit meter function between SWR, ALC and COMP.
  • SWR   : Displays the SWR of the antenna at the frequency.
  • ALC   : Displays the ALC level. When the meter movement shows the input signal level exceeds the allowable level, the ALC limits the RF power. In such cases, decrease the microphone gain level.
  • COMP : Displays the compression level when the speech compressor is in use.

[ANT•METER]

S 1...3...5...7...9..+20..+40..+60
Po ••••••••20••••••50••••••••••100%
ALC

← RF output power is displayed in % (percent), and it becomes the S-meter in receive.

When ALC meter is selected.
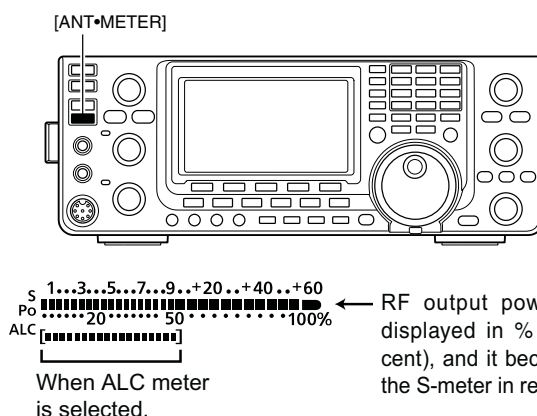
■ Basic transmit operation

Before transmitting, monitor the operating frequency to make sure transmitting won't cause interference to other stations on the same frequency. It's good amateur practice to listen first, and then, even if nothing is heard, ask "Is the frequency in use?" once or twice, before you begin operating on that frequency.

◇ Transmitting

CAUTION: Transmitting without an antenna may damage the transceiver.

In the AM mode, you can transmit on only the HF/50MHz frequency bands.

① Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
  • The MAIN Band TX/RX indicator lights red.
  • When in the satellite mode, the SUB Band TX/RX indicator lights red. (p. 156)
② Release [PTT] again to receive. (or push [TRANSMIT])

✔ *Adjusting the transmit output power*
➥ Rotate [RF POWER].

Decreases ↙ 🎛 ↘ Increases

Frequency band	RF output power range
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

◇ Microphone gain adjustment

(Mode: SSB/AM/FM/DV)
① Push [PTT] to transmit.
  • Speak into the microphone at your normal voice level.
② **In the SSB mode:**
Hold down [ANT•METER] for 1 second to select the ALC meter. And then, while speaking into the microphone, rotate [MIC GAIN] so that the ALC meter reading stays within the ALC zone.

In the AM, FM and DV modes:
While speaking into the microphone, rotate [MIC GAIN] with another station listening to your voice for clarity.

Recommended level for
Icom microphones
Decreases ↙ 🎛 ↘ Increases

③ Release [PTT] to receive.

[TRANSMIT]   MAIN Band TX/RX indicator

[RF POWER]   SUB Band TX/RX indicator
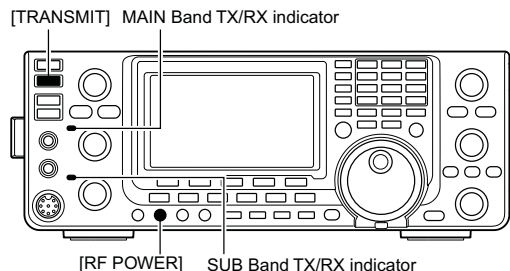
NOTE: When you transmit on the HF/50 MHz frequency bands, while monitoring an out of the amateur band frequency on VHF or UHF on the SUB band, the squelch on the SUB Band closes. Therefore, you cannot receive on the VHF or UHF frequency.

[ANT•METER]

[MIC GAIN]

S 1...3...5...7...9..+20..+40..+60
PO ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
    •••••20•••••••50••••••••••100%
ALC [▮▮▮▮▮▮▮▮▮▮▮]

ALC zone

4 RECEIVE AND TRANSMIT
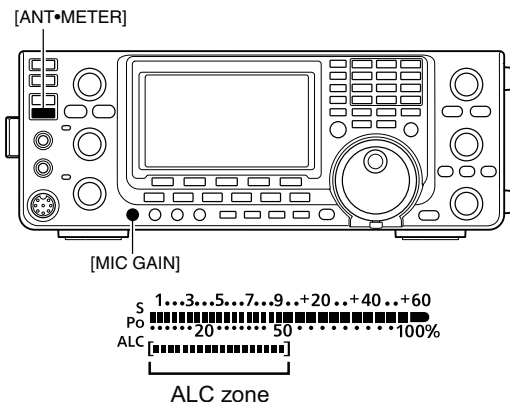
■ Operating SSB

① Select the desired frequency band. (p. 35)
② Push [SSB] to select the LSB or USB mode.
  • When operating above 10 MHz, USB is selected first; when operating below 10 MHz, LSB is selected first.
  • After USB or LSB is selected, hold down [SSB] for 1 second to select the data mode, if needed.
③ Rotate [MAIN DIAL] to tune a desired signal.
  • The S-meter indicates the received signal strength.
  • The tuning step can be changed using the tuning step program mode. (p. 38)
④ Rotate [AF] (MAIN Band) to adjust the audio to a comfortable listening level.
⑤ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
  • The TX/RX indicator (MAIN Band) lights red.
⑥ Speak into the microphone at your normal voice level.
  • Rotate [MIC GAIN] to adjust the microphone gain at this step, if necessary.
⑦ Release [PTT] to receive. (or push [TRANSMIT] again)
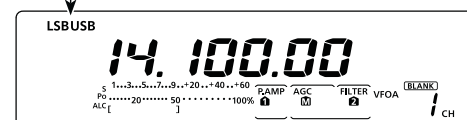
[TRANSMIT]   TX/RX indicator (MAIN Band)

[AF]   [MIC GAIN]   [SSB]   [MAIN DIAL]
(MAIN Band)

"LSB" or "USB" appears

Convenient Receive functions

• Preamp and attenuator (p. 71)
• Twin PBT (passband tuning) (p. 75)
• AGC (auto gain control) (p. 72)
• Noise blanker (p. 76)
• Noise reduction (p. 77)
• Notch filter (p. 77)
• VSC (voice squelch control) (p. 146)

Convenient Transmit functions

• Speech compressor (p. 78)
• VOX (voice operated transmit) (p. 80)
• Tone control (p. 169)
• Transmit quality monitor (p. 81)
• Transmit filter width (p. 80)

■ Operating CW

① Select the desired frequency band. (p. 35)
② Push [CW/RTTY] to select CW.
  • After the CW mode is selected, hold down [CW/RTTY] for 1 second to toggle between CW and CW-R modes, if necessary.
③ Rotate [MAIN DIAL] to tune a desired signal.
  • The S-meter displays the received signal strength.
  • The tuning step can be changed using the tuning step program mode. (p. 38)
④ Rotate [AF] (MAIN Band) to adjust the audio to a comfortable listening level.
⑤ Push [TRANSMIT] to transmit.
  • The TX/RX indicator (MAIN Band) lights red.
⑥ Use the electric keyer or paddle to key your CW signals.
  • The Po meter indicates transmitted CW output power.
⑦ Adjust CW speed with [KEY SPEED].
  • Adjustable between 6 and 48 wpm (words per minute).
⑧ Push [TRANSMIT] to receive.

[TRANSMIT]   TX/RX indicator (MAIN Band)

[AF]   [CW/RTTY]   [MAIN DIAL]
(MAIN Band)

"CW" or "CW-R" appears

CW-R

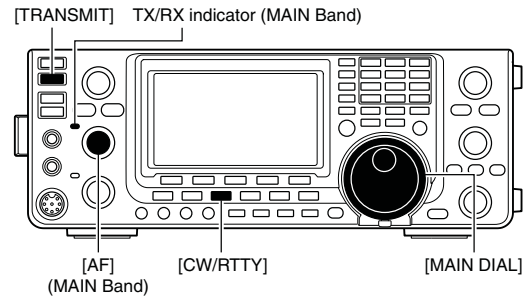14.100.00
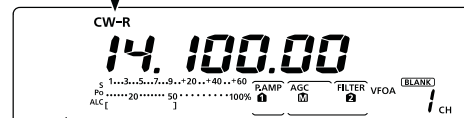
4

Convenient Receive functions

• Preamp and attenuator (p. 71)
• Twin PBT (passband tuning) (p. 75)
• AGC (auto gain control) (p. 72)
• Noise blanker (p. 76)
• Noise reduction (p. 77)
• Manual Notch filter (p. 77)
• CW pitch control (p. 49)
• ¼ function (p. 39)

Convenient Transmit functions

• Break-in function (p. 79)
• Keying speed setting (p. 49)
• Memory keyer (p. 50)

■ Operating CW (Continued)

◇ **About the CW reverse mode**

The CW reverse mode receives signals with a reverse side CW carrier point similar to voice LSB and USB modes.
Use when interfering signals are near a desired signal and you want to reduce the interfering tone.

① Push [CW/RTTY] once or twice to select the CW mode.
② Hold down [CW/RTTY] for 1 second to toggle between CW and CW-R mode, if necessary.
 • Check that the interfering tone can be reduced.
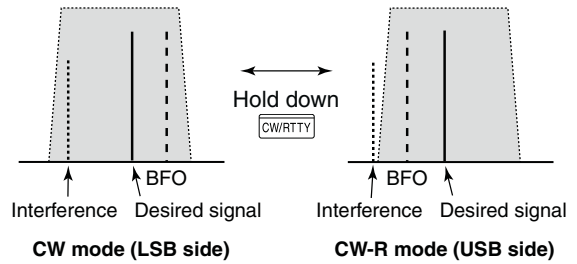
◇ **About CW pitch control**

The received CW audio pitch and CW sidetone can be adjusted to suit your preference without changing the operating frequency.

➥ Rotate [CW PITCH] to suit your preference.
 • Adjustable from 300 to 900 Hz (in 5 Hz steps)
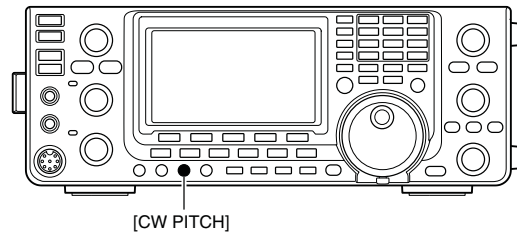
◇ **About keying speed**

The transceiver's internal electronic keyer speed can be adjusted to between 6 and 48 wpm (words per minute).

➥ Rotate [KEY SPEED] clockwise to increase keying speed; counterclockwise to decrease it.
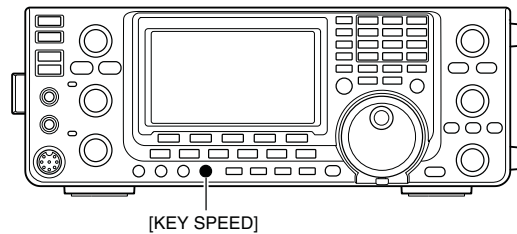
◇ **CW sidetone function**

When the transceiver is in the receive mode (and the Break-in function is OFF— p. 79), you can listen to the CW sidetone without actually transmitting.
You can also use the CW sidetone to practice CW sending, but be sure to turn OFF the Break-in function.

The CW sidetone level can be adjusted in the "Side Tone Level" item of the Keyer Set mode (p. 54).

Hold down
[CW/RTTY]

BFO
Interference Desired signal
CW mode (LSB side)

BFO
Interference Desired signal
CW-R mode (USB side)

[CW PITCH]

[KEY SPEED]

■ Electronic keyer functions

You can access a number of convenient functions of the built-in electronic keyer in the memory keyer menu.

① In the CW mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [KEY](F-4) to display the "KEY" screen (Memory Keyer).
③ Push [SEND](F-2), [EDT](F-3), [001](F-4) or [SET] (F-5) to select the desired menu.
  See the diagram below.
  • Push [MENU] to return to the previous display.

[SEND] [EDT] [SET]

[MENU]   [KEY]/[001]
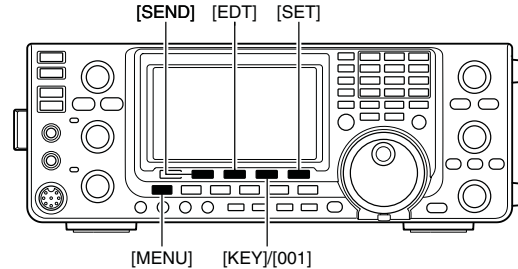
◇ Memory keyer menu construction

CW
21.085.00

S 1...3...5...7...9...+20..+40..+60   P.AMP AGC   FILTER   VFOA   BLANK
Po ·······20········50·········100%   ■   M   ❷   1 CH
ALC [   ]
ANT↓   FM
146.520.00   SUB
                                  DIAL
S 1...3...5...7...9...+20..+40..+60   AGC   FILTER VFOA   BLANK
                                         F   1   1 CH

M1
AGC   DUP   1/4   KEY   SCP
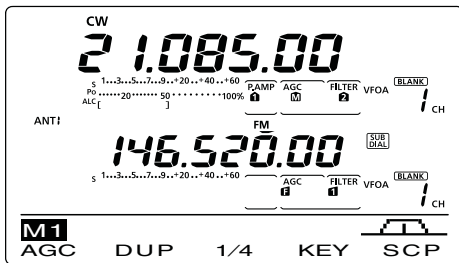
F-4

↓ Push

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

• **Keyer Send screen** (p. 51)

SEND   001
M1   M2◢   M3   M4   −1

MENU

• **Memory Keyer screen**

KEY
      SEND   EDT   001   SET

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

[F-2]

[F-3]

• **Keyer Edit screen** (p. 52)

EDT CQ TEST CQ TEST DE
M1   ◄   ►   DEL SPC

• **Contest Number Set mode** (p. 53)

001 Number Style
      ▲   1   ▼   Normal

[F-4]

• **Keyer Set mode** (p. 54)

SET Side Tone Level
      ▲   1   ▼   ▬▬▬▬▬___   50%
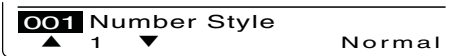
[F-5]

4
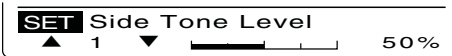
■ Electronic keyer functions (Continued)

◇ **Memory keyer send menu**

Pre-set characters can be sent using the Keyer Send menu. Contents of the memory keyer are set in the Edit menu.

• Transmitting
① In the CW mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [KEY](F-4) to display the "KEY" screen (Memory Keyer).
③ Push [SEND](F-2) to display the "SEND" screen (Keyer Send).
④ Push [TRANSMIT] to switch the transceiver to transmit, or turn ON the Break-in function. (p. 79)
⑤ Push one of the function keys, [M1](F-1) to [M4](F-4), to send the memory keyer contents.
   • Holding down a function key for 1 second repeatedly sends the contents; push any function key to cancel the transmission.
   • The contest number counter advances each time the contents are sent.
   • Push [−1](F-5) to reduce the contest number advances by 1 before sending the memory keyer contents to a station a second time.
   • Set the memory keyer repeat interval to between 1 and 60 seconds (1 second steps) in the "Keyer Repeat Time" item of the Keyer Set mode. (p. 54)
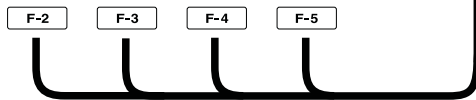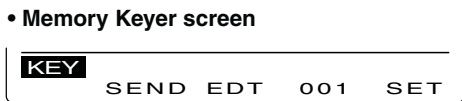⑥ Push [MENU] to return to the "KEY" screen (Memory Keyer).
⑦ Push [MENU] to return to the "M1" screen (Menu 1).

For your information
When an external keypad is connected to pin 3 and pin 7 of the [MIC] connector, the contents of M1 to M4 can be transmitted without selecting the keyer send menu.
See page 167 for details.
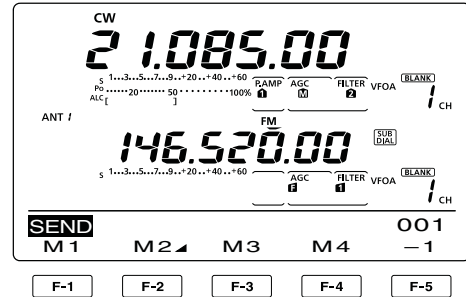
• M1 sending display

• M2 sending display
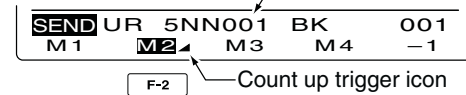
• M3 sending display
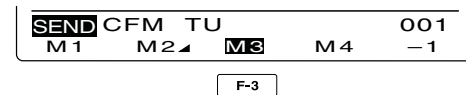
• M4 sending display
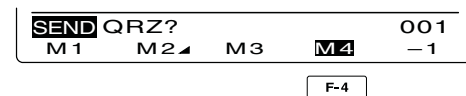
• While transmitting repeatedly
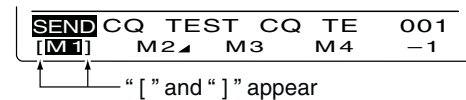
◇ Editing a memory keyer

The contents of the memory keyer memories can be set using the memory keyer edit menu. The memory keyer can memorize and re-transmit 4 CW key codes for often-used CW sentences, contest numbers or a count up trigger. The total capacity of the memory keyer is 70 characters per memory channel.

• Programming contents
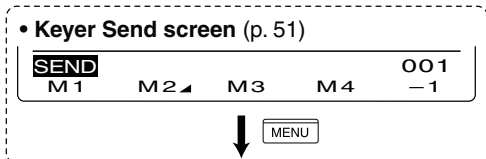
① In the CW mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [KEY](F-4) to display the "KEY" screen (Memory Keyer).
③ Push [EDT](F-3) to display the "EDT" screen (Keyer Edit).
  • The memory keyer content of Channel 1 (M1) is displayed.
④ Push [F-1] one or more times to select the memory keyer channel to be edited.
⑤ Rotate [MAIN DIAL] to select the desired character or symbol.
  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 the pre-programmed memory keyer reaches 70 characters, an error beep sounds. In this case, push [◀] (F-2) or [▶](F-3) to select a character, then push [DEL] (F-4) to delete it.

Selectable characters and symbols
A to Z, /? ^ . , @ ✱

⑥ Push [◀](F-2) to move the cursor backwards, or push [▶](F-3) to move the cursor forwards.
⑦ Repeat steps ⑤ and ⑥ to program up to 70 characters memory keyer contents.
⑧ Push [MENU] to save, and return to the "KEY" screen (Memory Keyer).
⑨ Push [MENU] to return to the "M1" screen (Menu 1).

NOTE:
"^" is used to transmit a string of characters with no inter-character space. Put "^" before a text string such as ^AR, and the string "A̅R̅" is sent with no space.
"✱" is used to insert the CW contest number. The number automatically advances by 1. This function is available for only one memory keyer channel at a time. "✱" is used in memory keyer channel M2 by default.

Input a space
Delete a character
Move the cursor forwards
Move the cursor backwards
Select M1 to M4

• M2 default indication

When inputting an asterisk, the counter is incremented by 1.
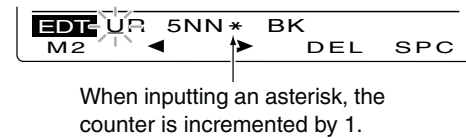
• M3 default indication

• M4 default indication

Example display— Inputting "QSL TU DE JA3YUA TEST" into the memory keyer channel 3 (M3).

Pre-programmed memory keyer contents

Memory keyer channel	Contents
M1	CQ TEST CQ TEST DE JA1 JA1 TEST
M2	UR 5NN✱ BK
M3	CFM TU
M4	QRZ?

■ Electronic keyer functions (Continued)

◇ **Contest number Set mode**

This mode is used to set the contest number, count up trigger and Present number.

• **Setting contents**
① In the CW mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [KEY](F-4) to display the "KEY" screen (Memory Keyer).
③ Push [001](F-4) to enter the Contest Number Set mode.
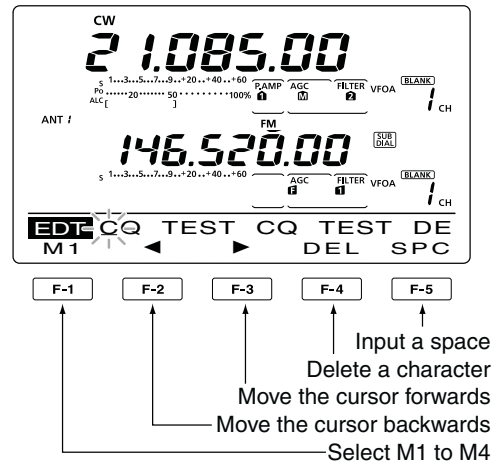④ Push [▲](F-1) or [▼](F-2) to select the desired item.
⑤ Rotate [MAIN DIAL] to select the desired option.
  • Hold down [F-3] for 1 second to reset to the default setting, if desired.
⑥ Push [MENU] to save, and return to the "KEY" screen (Memory Keyer).
⑦ Push [MENU] to return to the "M1" screen (Menu 1).
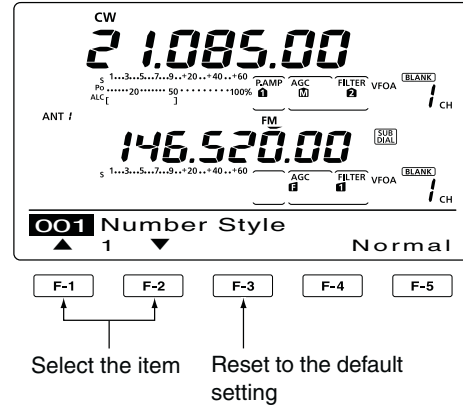
1. Number Style   (Default: Normal)

This item sets the numbering system used for contest numbers— normal or short morse numbers.

░ Short morse numbers are also referred to as "cut" ░ numbers.

• Normal   : Does not use short morse numbers
• 190➡ANO : Sets 1 as A, 9 as N and 0 as O.
• 190➡ANT : Sets 1 as A, 9 as N and 0 as T.
• 90➡ NO : Sets 9 as N and 0 as O.
• 90➡ NT : Sets 9 as N and 0 as T.

2. Count Up Trigger   (Default: M2)

Set the count-up trigger to one of four memory slots for the contest number exchange. The count-up trigger allows the contest number to automatically advance after each complete number exchange is sent.

• M1, M2, M3 or M4 can be set.

3. Present Number   (Default: Up/Down)

This item shows the current number for the count-up trigger channel set above.

• Rotate [MAIN DIAL] to change the number, or hold down [CLR](F-3) for 1 second to reset the current number to 001.

Select the item   Reset to the default setting

◇ Keyer Set mode

This Set mode is used to set the CW sidetone, memory keyer repeat time, dash weight, paddle specifications, keyer type, etc.

• Setting contents
① In the CW mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [KEY](F-4) to display the "KEY" screen (Memory Keyer).
③ Push [SET](F-5) to enter the Keyer 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 "KEY" screen (Memory Keyer).
⑦ Push [MENU] to return to the "M1" screen (Menu 1).

Select the item   Reset to the default setting
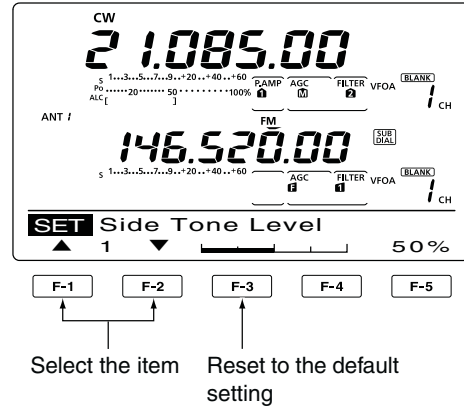
1. Side Tone Level   (Default: 50%)

Select the CW sidetone output level.

• 0 to 100% in 1% steps can be selected.

2. Side Tone L-Limit   (Default: ON)

Set the CW sidetone level limit. When the [AF] control is rotated above a specified level, the CW sidetone does not increase.

• ON : CW sidetone level is limited.
• OFF : CW sidetone level is not limited.

3. Keyer Repeat Time   (Default: 2s)

When sending CW using the repeat timer, set the time between transmission.

• 1 to 60 seconds in 1 second steps can be selected.

4. Message Display   (Default: Normal)

When you are in the "SEND" screen (Keyer Send), channel numbers are displayed above the function keys. However, you can display the first three characters of the keyer message instead of the channel number.

Select whether to display the channel number or the first three characters of the keyer.

• Normal   : Displays the channel number.
• Message : Displays the first three characters of the keyer message.

5. Dot/Dash Ratio   (Default: 1:1:3.0)

Set the dot/dash ratio.

• 1:1:2.8 to 1:1:4.5 (in 0.1 steps) can be selected.

Keying weight example: Morse code "K"
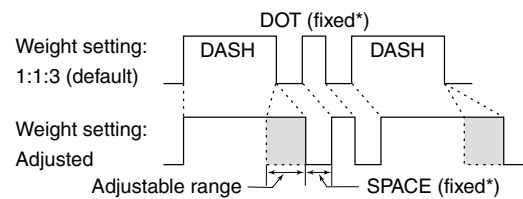
*SPACE and DOT length can be adjusted with only [KEY SPEED].

6. Rise Time   (Default: 4ms)

Set the rise time of the transmitted CW envelope.

• 2, 4, 6 or 8 milliseconds can be selected.

About rise time
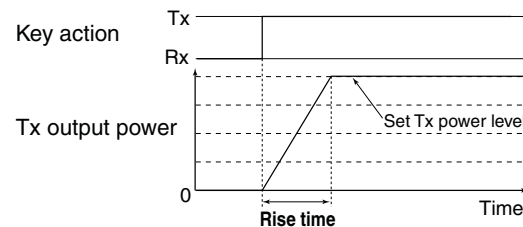
⧅ Key clicks on nearby frequencies can be generated if the rise time of a CW waveform is too short.

■ Electronic keyer functions
◇ Keyer Set mode (continued)

7. Paddle Polarity   (Default: NORMAL)

Set the paddle polarity.

• Normal or reverse polarity can be selected.

8. Keyer Type   (Default: ELEC-KEY)

Select the keyer type for [ELEC-KEY] connector on the front panel.

• Straight key, BUG-KEY or ELEC-KEY can be selected.

9. MIC Up/Down Keyer   (Default: OFF)

Set the microphone [UP]/[DN] switches to be used as a key. (The microphone [UP]/[DN] switches do not work as a "squeeze key.")

• ON : The [UP]/[DN] switches can be used as a key for CW.
• OFF: The [UP]/[DN] switches cannot be used as a key for CW.

NOTE: When "ON" is selected, the frequency and memory channels cannot be changed using the [UP]/[DN] switches.

■ Operating RTTY (FSK)

When using your RTTY terminal or TNC, consult the manual that comes with the equipment.

① Select the desired frequency band. (p. 35)
② Push [CW/RTTY] once or twice to select the RTTY mode.
  • After the RTTY mode is selected, hold down [CW/RTTY] for 1 second to toggle between normal and reverse modes, if needed.
③ Rotate [MAIN DIAL] to tune a desired signal.
  • The S-meter indicates received signal strength.
  • If the received signal cannot be demodulated, try to select the RTTY reverse mode in step ②.
  • The tuning step can be changed using the tuning step program mode. (p. 38)
④ Push [TRANSMIT] to set the transceiver to the transmit mode, or transmit a SEND signal from your TNC.
  • The TX/RX indicator (MAIN Band) lights red.
  • The Po meter displays the transmitted RTTY signal strength.
⑤ Use your connected PC or TNC (TU) to transmit RTTY (FSK) signals.
⑥ Push [TRANSMIT] to receive.

Convenient Receive functions

• Preamp and attenuator (p. 71)
• Twin PBT (passband tuning) (p. 75)
• AGC (auto gain control) (p. 72)
• Noise blanker (p. 76)
• Noise reduction (p. 77)
• Notch filter (p. 77)
• ¼ function (p. 39)
• Twin Peak Filter (p. 58)

[TRANSMIT]

MAIN Band TX/RX indicator   [CW/RTTY]   [MAIN DIAL]

"RTTY" or "RTTY-R" appears
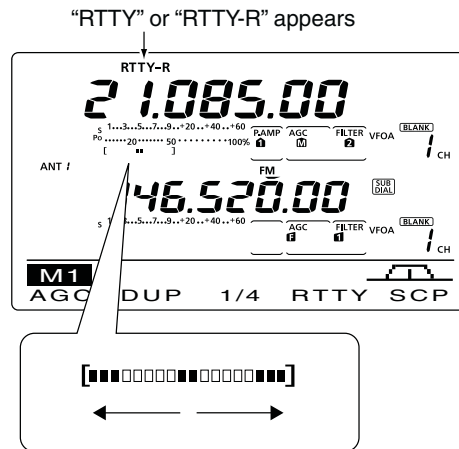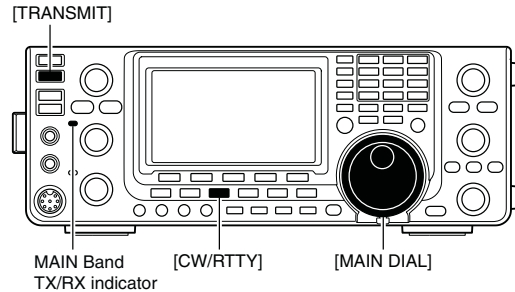
While receiving, the meter functions as the RTTY tuning meter to make correct tuning easier.
Rotate [MAIN DIAL] to the point where both sides of the dots appear equally.
• While transmitting, the meter functions as the transmit meter, SWR, ALC or COMP, selected with [ANT•METER]. (p. 45)

■ **RTTY functions**

The RTTY menu has a number of convenient functions for RTTY operation.

① Push [CW/RTTY] once or twice to select the RTTY mode.
  • After the RTTY mode is selected, hold down [CW/RTTY] for 1 second to toggle between normal and reverse modes, if needed.
② Push [MENU] to display the "M1" screen (Menu 1).
③ Push [RTTY](F-4) to display the "RTTY" screen.
④ Push [DEC](F-2), [TPF](F-4) or [SET](F-5) to select the desired menu. See the diagram below.
  • Push [MENU] to return to the previous display.

[DEC] [RTTY]/[TPF] [SET]

[MENU] [CW/RTTY]
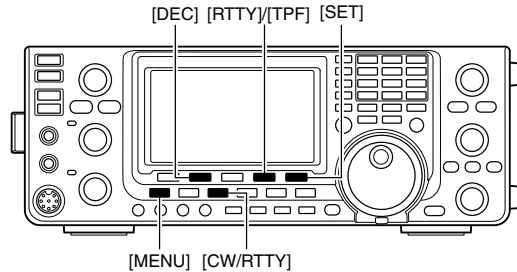
◇ **Construction of RTTY menu**

RTTY
2 1.085.00
S 1...3...5...7...9..+20..+40..+60
Po ....20.......50.........100% P.AMP AGC FILTER VFOA BLANK
[▬] 🔒 Ⓜ 🔒 *1* CH
ANT *1* FM
146.520.00 SUB DIAL
S 1...3...5...7...9..+20..+40..+60 AGC FILTER VFOA BLANK
🔒 🔒 *1* CH
M1
AGC DUP 1/4 RTTY SCP

F-4

Push

• **RTTY screen**

RTTY
DEC TPF SET

F-2 F-4 F-5

[F-2]

• **RTTY Decoder screen** (p. 59)

DEC 45BPS BAUDOT
MK/SFT 2125/170
ADJ◨F2 : HOLD F3 : CLR

[F-4]

• **Twin Peak Filter setting screen** (p. 58)

RTTY RTTY–TPF ON
DEC TPF SET

[F-5]

• **RTTY Set mode** (p. 60)

SET RTTY Mark Freq
▲ 1 ▼ 2125

◇ About RTTY reverse mode

Received characters are occasionally garbled when the Mark and Space signals are reversed. This reversal can be caused by incorrect TNC connections, setting or commands.
To receive reversed RTTY signals correctly, select the RTTY reverse mode.

➥ In the RTTY mode, hold down [CW/RTTY] for 1 second to select the RTTY reverse mode.
  • "RTTY-R" appears when the RTTY reverse mode is selected.
  • Hold down [CW/RTTY] for 1 second again to select the normal mode.
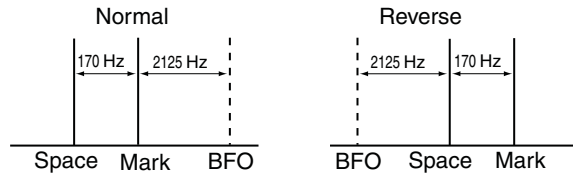
◇ Twin Peak Filter

The Twin Peak Filter changes the receive frequency response by boosting 2125 and 2295 Hz for better copying of RTTY signals.

① In the RTTY mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [RTTY](F-4) to display the "RTTY" screen.
③ Push [TPF](F-4) to turn the Twin Peak Filter ON or OFF.
④ Push [MENU] to return to the previous display.

NOTE: When the Twin Peak Filter is in use, the received audio output may increase. This is normal; not a malfunction.
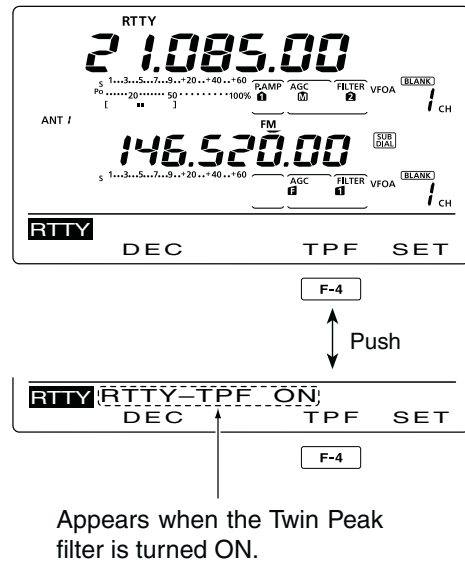
Appears when the Twin Peak filter is turned ON.

4

■ RTTY functions (Continued)

◇ **RTTY decoder**

The transceiver has an RTTY decoder for Baudot (mark freq.: 2125 Hz, shift freq.: 170 Hz, 45 bps).

An external terminal unit (TU) or terminal node connector (TNC) is not necessary for receiving a Baudot signal.

① In the RTTY mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [RTTY](F-4) to display the "RTTY" screen.
③ Push [F-2](DEC) to turn ON the RTTY decoder.
   • RTTY decoder screen appears.
④ Push [F-2] to turn ON the Hold function to hold the current screen.
   • "🅗" appears when this function is turned ON.
   • Push [F-2] again to turn OFF the Hold function.
⑤ Hold down [F-3] for 1 second to clear the displayed characters.
   • "🅗" disappears at the same time as the displayed characters are cleared. (The hold function is cancelled.)
⑥ Push [MENU] to return to the previous display.
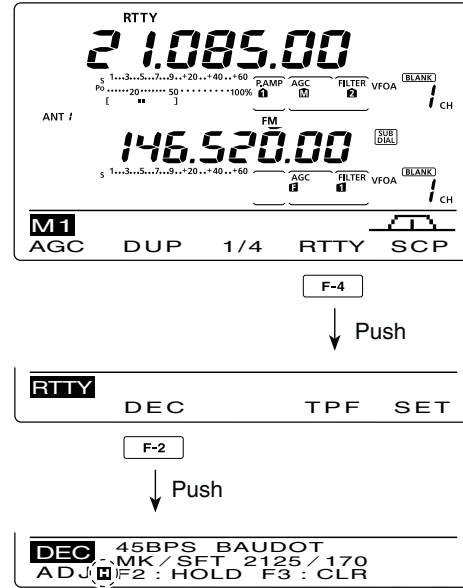
Appears when the Hold function is turned ON.

• **Setting the decoder threshold level**
If some characters are displayed when no signal is received, adjust the RTTY decoder threshold level.

① Select the RTTY decoder screen as described above.
② Push [F-1](ADJ) to select the threshold level adjustment mode.
③ Rotate [MAIN DIAL] to adjust the RTTY decoder threshold level.
   • Hold down [F-3] for 1 second to reset to the default setting, if desired.
④ Push [MENU] to return to the previous display.

▧ The number of the decoder display lines, the Un-
▧ Shift On Space (USOS) function and new line code
▧ can be set in the RTTY Set mode. (p. 60)
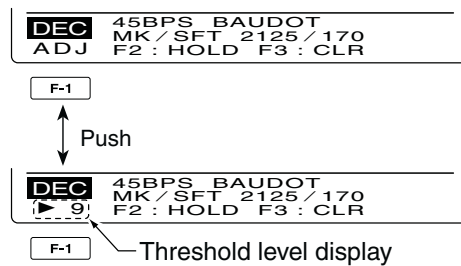
Threshold level display

◇ RTTY Set mode

The RTTY Set mode is used to set the mark and shift frequencies, keying type, decode USOS function, RTTY decoder new line code and the number of decode screen display lines.

• Setting contents
① In the RTTY mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [RTTY](F-4) to display the "RTTY" screen.
③ Push [SET](F-5) to enter the RTTY 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 "RTTY" screen.
⑦ Push [MENU] to return to the "M1" screen (Menu 1).

Select the item   Reset to the default setting
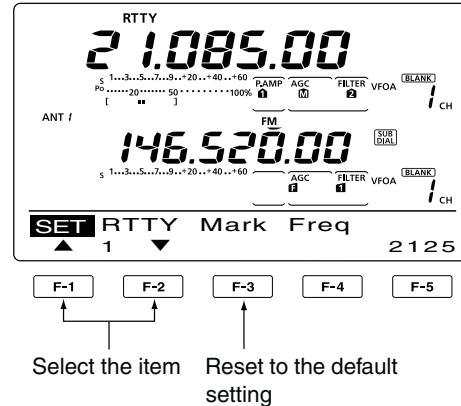
1. RTTY Mark Freq   (Default: 2125)

Select the RTTY mark frequency.

• 1275, 1615 and 2125 Hz are selectable.

2. RTTY Shift Width   (Default: 170)

Select the RTTY frequency shift.

• 170, 200 and 425 Hz are selectable.

3. RTTY Keying Pol   (Default: NORMAL)

Select normal or reverse keying polarity.

• NORMAL   : Key open/close = Mark/Space
• REVERSE : Key open/close = Space/Mark

4. Decode USOS   (Default: ON)

Turn the USOS (UnShift On Space) function ON or OFF. This function decodes a letter code after receiving a "space."

• OFF : Decodes as a character code
• ON : Decodes as a letter code

5. Decode New Line (Default: CR,LF,CR+LF)

Select the internal RTTY decoder new line code.
CR: Carriage Return, LF: Line Feed

• CR,LF,CR+LF : Makes a new line with any code.
• CR+LF   : Makes a new line with only the CR+LF code.

6. Decode Screen   (Default: 3 line)

Set the decoder screen display mode to 2 or 3 lines.

■ Operating AM/FM

① Select the desired frequency band. (p. 35)
② Push [AM/FM] to select the AM or FM mode.
   • After AM or FM is selected, hold down [AM/FM] for 1 second to select the data mode, if needed.
③ Rotate [MAIN DIAL] to tune a desired signal.
   • The S-meter displays the received signal strength.
   • The tuning step can be changed in the tuning step program mode. (p. 38)
④ Rotate [AF] (MAIN Band) to adjust the audio to a comfortable listening level.
⑤ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
   • The TX/RX indicator (MAIN Band) lights red.
⑥ Speak into the microphone at your normal voice level.
   • Rotate [MIC GAIN] to adjust the microphone gain in this step, if necessary.
⑦ Release [PTT] to receive. (or push [TRANSMIT] again)

NOTE:
• In the AM mode, you can transmit on only the HF/50MHz frequency bands.
• The AM mode cannot be selected on the 1200 MHz frequency band.

[TRANSMIT]   TX/RX indicator (MAIN Band)

[AF]
(MAIN Band)   [MIC GAIN] [AM/FM]   [MAIN DIAL]

• AM mode

Appears

AM
50.500.00

• FM mode

Appears

FM
53.500.00
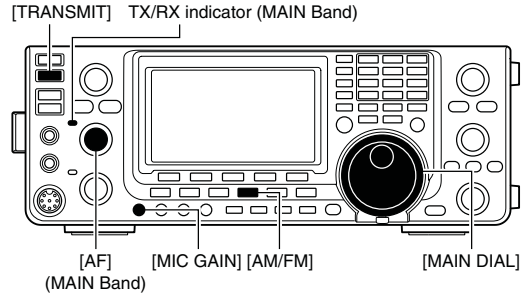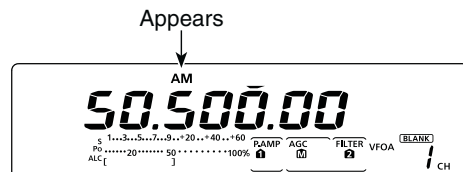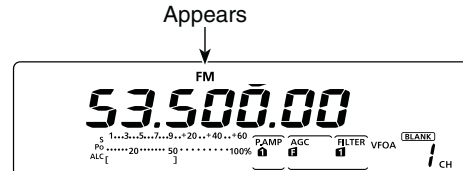
Convenient Receive functions

• Preamp and attenuator (p. 71)
• Twin PBT (passband tuning) (p. 75)
• AGC (auto gain control) (p. 72)
• Noise blanker (p. 76)
• Noise reduction (p. 77)
• Notch filter (p. 77)
• VSC (voice squelch control) (p. 146)

*AM only

Convenient functions for transmit

• Speech compressor (p. 78)
• VOX (voice operated transmit) (p. 80)
• Tone control (p. 169)
• Transmit quality monitor (p. 81)

■ Tone squelch operation

The tone squelch opens only when you receive a sig-
nal containing a matching subaudible tone. You can
silently wait for calls from others using the same tone.

① Push [AM/FM] once or twice to select the FM
   mode.
② Push [MENU] to display the "M1" screen (Menu 1).
③ Push [TON](F-4) one or more times to turn ON the
   Tone squelch function.
   • "TSQL" appears
④ Hold down [TON](F-4) for 1 second to display the
   "TON" screen.
   • "TSQL Tone" appears on the function display.
⑤ Rotate [MAIN DIAL] to select the desired tone
   squelch frequency. (See the table shown below.)
   • Hold down [F-3] for 1 second to reset to the default set-
     ting, if desired.
⑥ Push [MENU] to save, and exit the "TON" screen.
⑦ Communicate in the usual manner.

• **Available tone squelch frequencies**   (Unit: Hz)

67.0	85.4	107.2	136.5	165.5	186.2	210.7	254.1
69.3	88.5	110.9	141.3	167.9	189.9	218.1	
71.9	91.5	114.8	146.2	171.3	192.8	225.7	
74.4	94.8	118.8	151.4	173.8	196.6	229.1	
77.0	97.4	123.0	156.7	177.3	199.5	233.6	
79.7	100.0	127.3	159.8	179.9	203.5	241.8	
82.5	103.5	131.8	162.2	183.5	206.5	250.3	
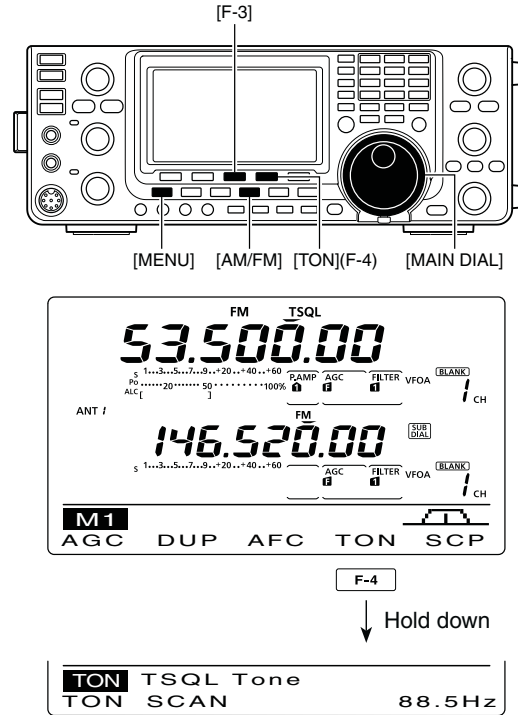
■ DTCS operation

The DTCS function is another method of communications using selective calling. Only received signals having a matching 3-digit code will open the squelch.

① Push [AM/FM] once or twice to select the FM mode.
② Push [MENU] to display the "M1" screen (Menu 1).
③ Push [TON](F-4) one or more times to turn ON the DTCS function.
  • "DTCS" appears
④ Hold down [TON](F-4) for 1 second to display the "TON" screen.
  • "DTCS Code" appears on the function display.
⑤ Rotate [MAIN DIAL] to select the desired DTCS code number, and push [F-5] to select the desired code polarity.
  NN : Normal polarity is used for both transmit and receive.
  NR : Normal polarity is used for transmit, reversed polarity is used for receive.
  RN : Reversed polarity is used for transmit, normal polarity is used for receive.
  RR : Reversed polarity is used for both transmit and receive.
  • Hold down [F-3] for 1 second to reset to the default setting, if desired.
⑥ Push [MENU] to save, and exit the "TON" screen.
⑦ Communicate in the usual manner.
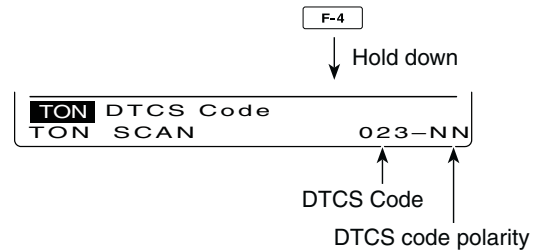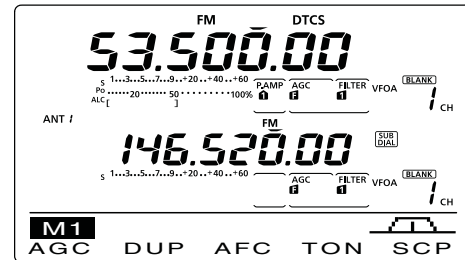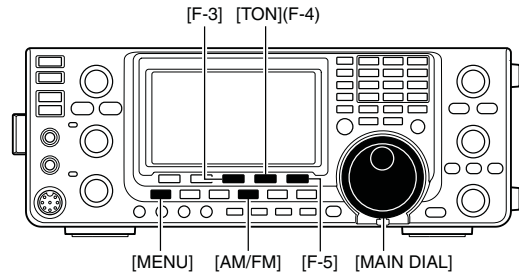
• **Available DTCS codes**

023	072	152	244	311	412	466	631
025	073	155	245	315	413	503	632
026	074	156	246	325	423	506	654
031	114	162	251	331	431	516	662
032	115	165	252	332	432	523	664
036	116	172	255	343	445	526	703
043	122	174	261	346	446	532	712
047	125	205	263	351	452	546	723
051	131	212	265	356	454	565	731
053	132	223	266	364	455	606	732
054	134	225	271	365	462	612	734
065	143	226	274	371	464	624	743
071	145	243	306	411	465	627	754

[F-3] [TON](F-4)

[MENU] [AM/FM] [F-5] [MAIN DIAL]

FM   DTCS

53.500.00

ANT 1

146.520.00

M1
AGC   DUP   AFC   TON   SCP

F-4

Hold down

TON DTCS Code
TON SCAN   023−NN

DTCS Code

DTCS code polarity

■ Tone scan/DTCS code scan operation

To search for a repeater's sub-audible tone frequency, a tone scan is available.
By monitoring a repeater signal with a tone squelch or DTCS, you can determine the tone frequency necessary to open the repeater or the squelch.

① In the FM mode, push [MENU] to display the "M1" screen (Menu 1).
② Hold down [TON](F-4) for 1 second to enter the "TON" screen.
③ Push [TON](F-1) one or more times to select the tone type to be scanned.
  • "Rptr Tone" for a repeater tone, "TSQL Tone" for tone squelch or "DTCS Code" for a DTCS code can be selected.
  • When selecting a DTCS code to be scanned, the DTCS code and its polarity is displayed. You can select the desired polarity by pushing [F-5].
    "NN" : Normal polarity for both transmit and receive.
    "NR" : Normal polarity for transmit and reverse polarity for receive.
    "RN" : Reverse polarity for transmit and normal polarity for receive.
    "RR" : Reverse polarity for both transmit and receive.
④ Push [SCAN](F-2) to start the Tone scan.
  • "Rptr Tone SCAN," "TSQL Tone SCAN" or "DTCS Code SCAN" blinks, depending on the type you selected.
  • 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)
⑤ When a matched tone or code is found, the scan pauses, and the detected sub-audible tone frequency or DTCS code is set.
  • Hold down [F-3] for 1 second to reset to the default setting, if desired.
⑥ Push [SCAN](F-2) to cancel the Tone scan.

When the tone scan or DTCS code scan is used in the Memory or Call channel mode, the detected tone frequency or code can be used temporarily. To save the detected tone frequency or code setting, you must over-write the Memory or Call channel data. (pp. 140, 141)
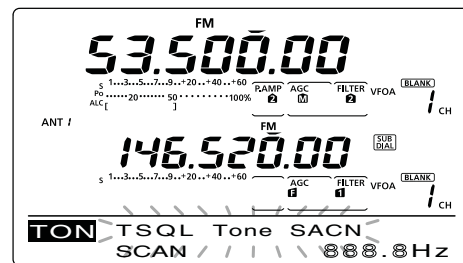
[TON] [SCAN]

[MENU]   [F3]   [F-5]   [MAIN DIAL]
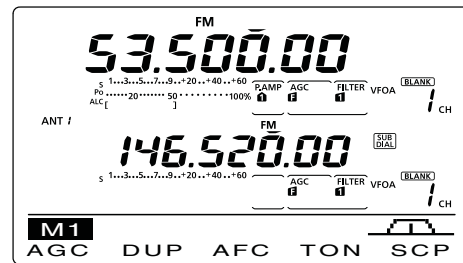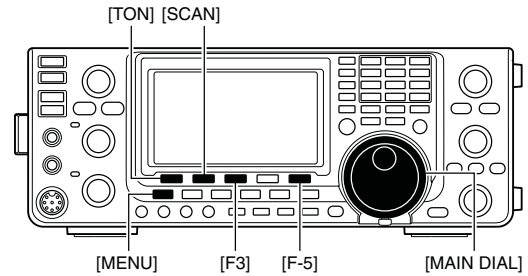
F-4

Hold down

F-1

Push to select the tone type.

F-2

Push to start or cancel the scan.

■ Repeater operation

A repeater receives transmitted signals and re-transmits them on a different frequency. When using a repeater, the transmit frequency is shifted from the receive frequency by a frequency offset.
A repeater can be accessed using the duplex operation to set the frequency shift to the same value as the repeater's frequency offset.

See page 94 for details on accessing a D-STAR® repeater.

① Select the desired frequency band. (p. 35)
② Push [VFO/MEMO] to select the VFO mode.
③ Push [A/B] to select VFO A.
④ Push [AM/FM] to select the FM mode.
⑤ Rotate [MAIN DIAL] to set the receive frequency (repeater output frequency).

▨ When the auto repeater function is turned ON (available in only the U.S.A. and Korea versions), steps ⑥ and ⑦ are not necessary. (p. 67)

⑥ Push [MENU] to display the "M1" screen (Menu 1), then push [DUP](F-2) one or more times to set the offset direction.
  • "DUP–" or "DUP+" appears.
  • The transmit frequency (repeater input frequency) appears on the function dislay.
  • The frequency offset (amount of shift) can be set in the "DUP Offset" item of the Set mode. (p. 163)
⑦ Push [TON](F-4) to turn ON the repeater tone.
  • "T" appears.
  • The tone frequency can be set in the "TON" screen. 88.5 Hz is set by default. (p. 62)
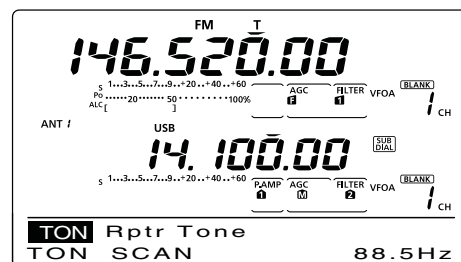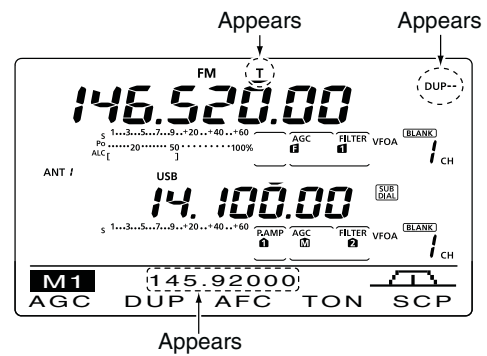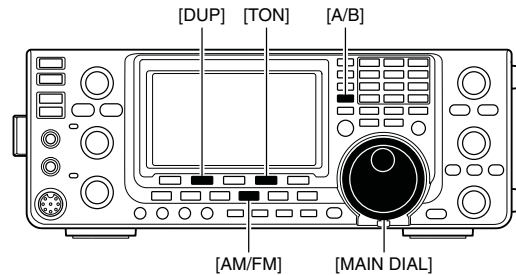
  ▨ NOTE: To transmit a 1750 Hz European repeater tone, hold down [TON](F-4) while transmitting.

⑦ Communicate in the normal way.

◇ Repeater access tone frequency setting

Some repeaters require a subaudible tone to be accessed. Subaudible tones are superimposed on your normal signal and must be set first. You can select 50 tones from 67.0 Hz to 254.1 Hz.

① In the FM mode, push [MENU] to display the "M1" screen (Menu 1).
② Push [TON](F-4) one or more times to turn ON the tone encoder function.
  • "T" appears.
③ Hold down [TON](F-4) for 1 second to display the "TON" screen.
  • "Rptr Tone" appears on the function display.
④ Rotate [MAIN DIAL] to select the desired repeater tone frequency. (See the table to the right.)
⑤ Push [MENU] to save, and exit the "TON" screen.

[DUP] [TON]   [A/B]

[AM/FM]   [MAIN DIAL]

Appears   Appears

FM   T

146.520.00

S 1...3...5...7...9..+20..+40..+60   AGC   FILTER VFOA   BLANK
Po ....20..........50..........100%   F   1   1 CH
ALC [   ]
ANT 1   USB   SUB
                                                      DIAL
14.100.00
S 1...3...5...7...9..+20..+40..+60 P.AMP AGC FILTER VFOA BLANK
                                    1   M   2   1 CH

M1   (145.92000)
AGC   DUP AFC   TON   SCP

Appears

FM   T

146.520.00

S 1...3...5...7...9..+20..+40..+60   AGC   FILTER VFOA   BLANK
Po ....20..........50..........100%   F   1   1 CH
ALC [   ]
ANT 1   USB   SUB
                                                      DIAL
14.100.00
S 1...3...5...7...9..+20..+40..+60 P.AMP AGC FILTER VFOA BLANK
                                    1   M   2   1 CH

TON   Rptr Tone
TON   SCAN   88.5Hz

• Available tone frequencies   (unit: Hz)

67.0	85.4	107.2	136.5	165.5	186.2	210.7	254.1
69.3	88.5	110.9	141.3	167.9	189.9	218.1	
71.9	91.5	114.8	146.2	171.3	192.8	225.7	
74.4	94.8	118.8	151.4	173.8	196.6	229.1	
77.0	97.4	123.0	156.7	177.3	199.5	233.6	
79.7	100.0	127.3	159.8	179.9	203.5	241.8	
82.5	103.5	131.8	162.2	183.5	206.5	250.3	

◇ **One-touch repeater function**

This function allows you to set the repeater operation by holding down one switch.

First, set the frequency offset as well as the repeater access tone frequency (p. 163).

① Select the desired frequency band. (p. 35)
② In the FM mode, push [A/B] to select VFO A.
③ Rotate [MAIN DIAL] to set the desired receive frequency (repeater output frequency).
④ Push [MENU] to display the "M1" screen (Menu 1).
⑤ Hold down [DUP](F-2) for 1 second to turn ON the One-touch repeater function.
  • "T" and "DUP–" appears.
  • The repeater receive frequency appears on bottom of the function display.
  • The Split frequency operation is automatically turned OFF, if it is ON.
⑥ Push [DUP](F-2) once or twice to switch the offset direction.
  • "DUP–" or "DUP+" appears.
⑦ Communicate in the normal way.

Hold down

Appears   Appears

Transmit (repeater receive) frequency appears
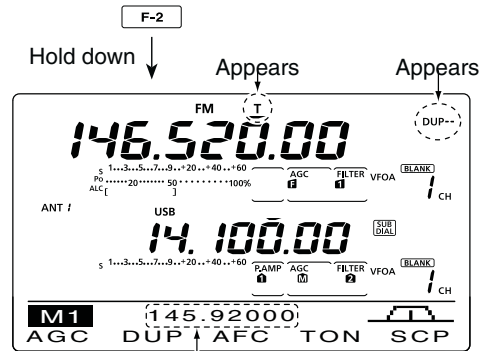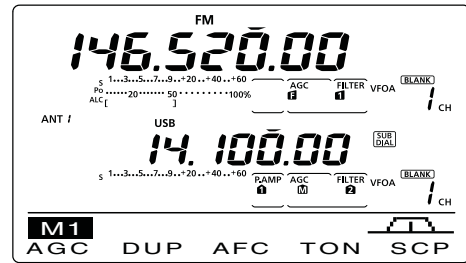
◇ **Transmit frequency monitor check**

You may be able to directly receive the other party's transmitted signal without having to go through a repeater. This function helps you to check whether the direct communication can be done, or not.

➥ While receiving, hold down [XFC] to see if you can directly receive the other party's transmitted signal.
  • While holding down [XFC], the offset direction and frequency offset are displayed on the function display.


[XFC]

Hold down
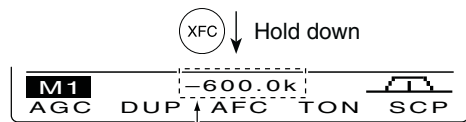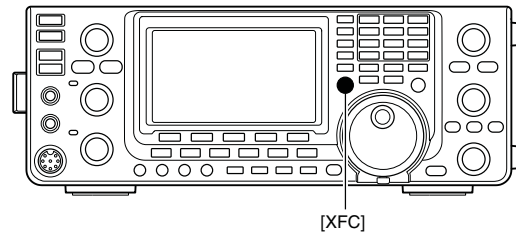
Frequency Offset direction and value.

■ Repeater operation (Continued)

◇ **Setting the Auto Repeater ranges**
   (U.S.A. and Korea versions only)

The transceiver has three Auto Repeater ranges that can be used for each frequency band. And you can set the desired Auto Repeater ranges by programming the lower and higher edge frequencies into the allowable Memory channel of each band as described below.

① Select the desired frequency band. (p. 35)
② Push [AM/FM] once or twice to select the FM mode.
③ Set the desired lower edge frequency.
④ Turn ON the duplex operation, then select the duplex direction. (pp. 65, 163)
   • "DUP–" or "DUP+" is displayed when the duplex is ON.
   • Both one-touch repeater and manual repeater settings are available.
⑤ Rotate [M-CH] to select a Memory channel of the selected frequency band.
   • See the Memory channel combination list to the right. If the HF band is selected in step ①, and you want to set Range 1, select Memory channel 1 for the lower edge frequency programming.
⑥ Hold down [MW] for 1 second to program the data into the Memory channel.
   • 3 beeps sound when the memory programming is complete.
⑦ Set the upper edge frequency.
⑧ Rotate [M-CH] to select the opposite Memory channel.
   • Select Memory channel 2 if Memory channel 1 is selected in step ⑤.
⑨ Hold down [MW] for 1 second to program the data into the selected Memory channel.
   • 3 beeps sound when the memory programming is complete.
⑩ Repeat steps ① to ⑨ to program other ranges.

   NOTE: We recommend that all repeater ranges are programmed into the Memory channel of each band. The previously programmed ranges will be lost.

⑪ Hold down [SPEECH/LOCK] for 1 second to turn ON the Dial Lock function.
   • "🔒" appears.
⑫ Hold down [POWER] for 1 second to turn OFF the power.
⑬ While holding down [AM/FM] and [F-INP ENT], push [POWER] to turn ON the power.
   • "◀ Auto Rptr Set ▶" appears.
   • The programmed auto repeater ranges are set.
   • The memory channels can be used for normal operation after programming.
⑭ Hold down [SPEECH/LOCK] for 1 second to turn OFF the Dial Lock function.
   • "🔒" disappears.
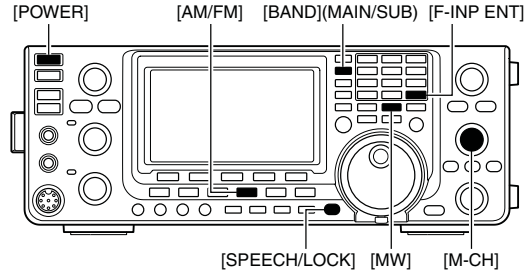
• **Frequency range and shift direction (Default)**

(U.S.A. version)

Band	Frequency range (MHz)	Shift direction
50 MHz	51.620000 – 51.999999 52.500000 – 52.999999 53.500000 – 53.999999	"DUP–"
144 MHz	145.200000 – 145.999999 146.610000 – 146.999999	"DUP–"
	147.000000 – 147.399999	"DUP+"
430 MHz	442.000000 – 444.999999	"DUP+"
	447.000000 – 449.999999	"DUP–"
1200 MHz	1282.000000 – 1295.000000	"DUP–"

(Korea version)

Band	Frequency range (MHz)	Shift direction
430 MHz	439.000000 – 440.000000	"DUP–"
1200 MHz	1290.000000 – 1293.000000	"DUP–"

• **Memory channel combination of the Auto Repeater ranges**

(Frequency band: HF/144/430/1200 MHz)

	Lower frequency	Higher frequency
Range 1	Memory CH 1	Memory CH 2
Range 2	Memory CH 3	Memory CH 4
Range 3	Memory CH 5	Memory CH 6

(Frequency band: 50 MHz)

|	Lower frequency	Higher frequency
Range 1	Memory CH 7	Memory CH 8
Range 2	Memory CH 9	Memory CH 10
Range 3	Memory CH 11	Memory CH 12

NOTE: Auto Repeater ranges must be programmed into the Memory channel of **EACH** band.

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

◇ Turning ON the Auto Repeater function
(U.S.A. and Korea versions only)

When the operating frequency falls within the repeater output frequency range, the Auto Repeater function automatically sets the repeater settings (duplex ON/OFF, duplex direction, tone encoder ON/OFF).

① Hold down [MENU] for 1 second to enter the Set mode.
② Push [▲](F-1) or [▼](F-2) to select "Auto Repeater."
③ Rotate [MAIN DIAL] to turn ON the Auto Repeater function.
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.
④ Push [MENU] to save, and exit the Set mode.
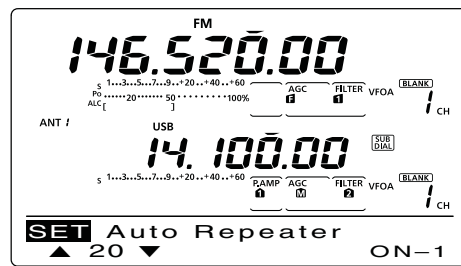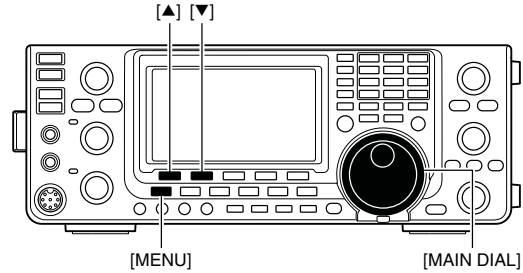
ON–1 (default for the U.S.A. version)

◇ Storing a non standard repeater
① Turn OFF the Auto Repeater function in the Set mode. (p. 163)
② Push [A/B] to select VFO A.
③ Rotate [MAIN DIAL] to set the repeater output frequency.
④ Push [A/B] to select VFO B.
⑤ Rotate [MAIN DIAL] to set the repeater input frequency.
⑥ Push [A/B] to select VFO A.
⑦ Push [SPLIT] to turn ON the Split function.
⑧ Push [TON](F-4) to turn ON the previously set tone encoder.
⑨ Rotate [M-CH] to select the desired memory channel.
  • "BLANK" appears when a blank channel is selected.
⑩ Hold down [MW] for 1 second to store the set contents into the selected memory channel.
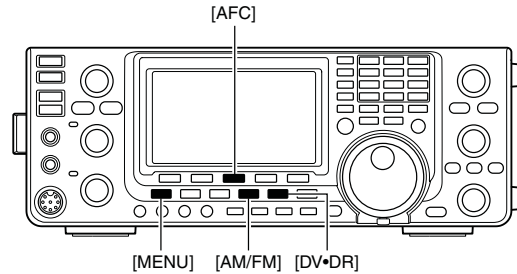
FUNCTIONS FOR RECEIVE
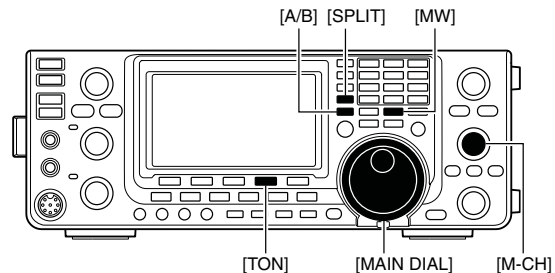
■ AFC operation

(Mode: FM/DV)
AFC stands for Automatic Frequency Control. The AFC function tunes the displayed frequency automatically when an off-center frequency is received.

① Push [AM/FM] or [DV•DR] once or twice to select the FM or DV mode.
② Push [MENU] to display the "M1" screen (Menu 1).
③ Push [AFC](F-3) to turn ON the AFC function.
   • "$\boxed{\text{AFC}}$" appears when the AFC function is ON.

▨ The AFC limit can be set in the Set mode. (p. 164)
▨ While the AFC limit is ON, AFC stops tuning when
▨ the received frequency exits the frequency limit
▨ range.

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

[AFC]

[MENU] [AM/FM] [DV•DR]

■ RIT function

The RIT (Receive Increment Tuning) function compensates for off-frequency operation of the received station.
The function shifts the receive frequency up to ±9.99 kHz in 10 Hz steps*, without changing the transmit frequency.
*The [RIT/ΔTX] control tunes in 1 Hz steps when the operating frequency readout is set to the 1 Hz step readout. However, the 1 Hz digit is not displayed on the frequency shift readout.

① Push [RIT] to turn ON the RIT function.
   • "RIT" and the frequency shift appear when this function is ON.
② Rotate the [RIT/ΔTX] control.
   • Hold down [CLEAR] for 1 second to reset the RIT frequency.
   • Push [CLEAR] momentarily to reset the RIT frequency when the quick RIT clear function is ON. (p. 164)
   • Hold down [RIT] for 1 second to add the frequency shift to the operating frequency.
③ To cancel the RIT function, push [RIT] again.
   • "RIT" and the frequency shift disappear.

[RIT] [CLEAR]

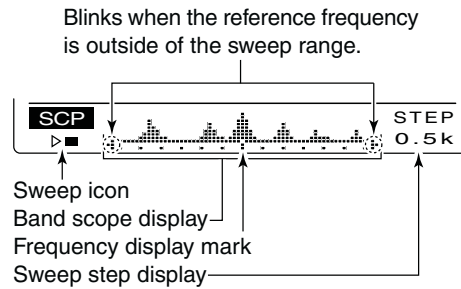[RIT/ΔTX] control

Appear
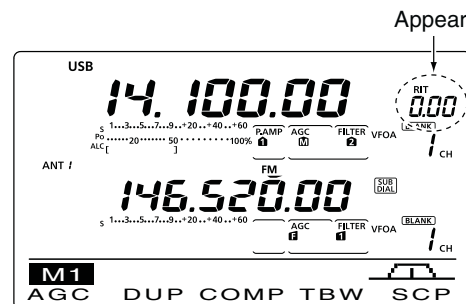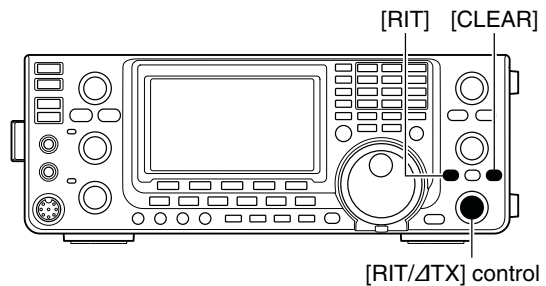
◇ RIT monitor function

When the RIT function is ON, holding down [XFC] allows you to listen to the displayed frequency (RIT is temporarily cancelled).

[XFC]
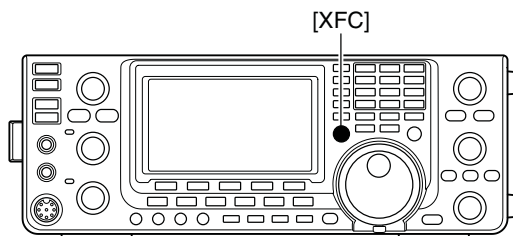
■ Simple band scope

The Band Scope function allows you to visually check the location and strength of signals around a specified frequency.
The IC-9100's Band Scope function can be used in any operating mode and any frequency band.
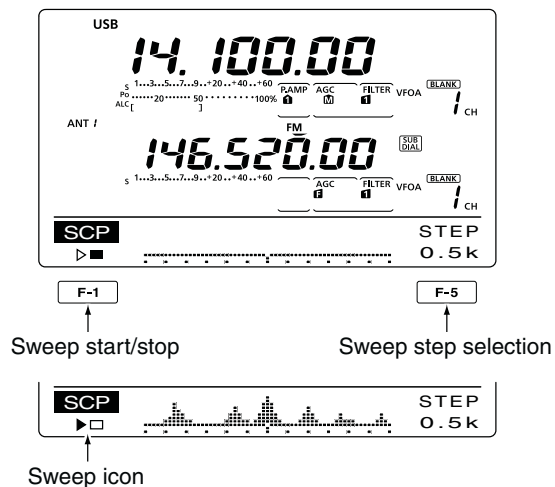
Blinks when the reference frequency is outside of the sweep range.

SCP   STEP
▷■   0.5k

Sweep icon
Band scope display
Frequency display mark
Sweep step display

INDICATOR	DESCRIPTION
Sweep icon	While the band scope is sweeping, "▶☐" is displayed; while stopped, "▷■" is displayed. **Received audio is not heard from the speaker while the band scope is sweeping.**
Band scope display	Displays the signal location and strength in relation to the center (displayed) frequency. Signal strength is relative to the S-meter level, S1 to S9, with each vertical dot in the band scope indicator equal to one segment of the S-meter. Signal activity is measured ±30 steps from the center frequency, with each step equal to the selected sweep step.
Frequency display mark	After a sweep, displays the relative position of the reference frequency. When the reference frequency is outside of the sweep range, "⋮" or "⋮" blinks. After changing the frequency, hold down [F-3] for 1 second to automatically return to the center frequency.
Sweep step display	Displays the selected sweep step. 0.5, 1, 2, 5, 10, 20 and 25 kHz are selectable. Each dot of the band scope display is approximately equal to the selected sweep step.

The band scope measures receive signal location and strength over a specified range on either side of a selected frequency, in either the VFO or memory modes.

① Rotate [MAIN DIAL] to select a frequency.
② Push [MENU] to display the "M1" screen (Menu 1), then push [SCP](F-5) to display the "SCP" screen (Band Scope).
  • Automatically starts sweeping with the previously selected sweeping step.
  • During a sweep, received signals cannot be heard.
③ Push [F-5] one or more times to select the desired sweep step.
  • 0.5, 1, 2, 5, 10, 20 and 25 kHz are selectable.
④ Push [F-1] to start sweeping, then automatically stop after sweeping.
  • Hold down [F-1] for 1 second to start continuous sweeping. In this case, push [F-1] again to stop the sweeping.
  • During a sweep, "▶☐" is displayed and received signals cannot be heard.
  • If there is a lot of signal noise, turn OFF the Preamplifer to reduce the signal input level, and turn ON the Attenuator to improve the readability of the band scope.
⑤ Rotate [MAIN DIAL] to find a signal that you wish to communicate with. If you find the signal, communicate in the normal way.
  • If you want to return to the frequency you were using before rotating [MAIN DIAL], hold down [F-3] for 1 second.
  • If the selected frequency is set outside of the swept range, "⋮" or "⋮" blinks.
⑥ If you want to update the band conditions while receiving, repeat steps ③ and ④.

USB
14.100.00

ANT I

FM
146.520.00

SCP   STEP
▷■   0.5k

F-1   F-5

Sweep start/stop   Sweep step selection

SCP   STEP
▶☐   0.5k

Sweep icon

NOTE:
If you select a large sweep step, a wide frequency range can be displayed on the band scope, but some signals may be skipped and not displayed.

■ Preamplifier

The preamplifier amplifies weak signals in the receiver front end, to improve the S/N ratio and sensitivity. Turn this function ON when receiving weak signals.

The AG-25, AG-35 or AG-1200[*1] pre-amplifier unit is required for 144, 430 or 1200 MHz[*2] frequency band.
• Be sure to set the "EXT-P.AMP" item for each frequency band in the Set mode. (pp. 165, 166)

(Frequency band: HF/50 MHz)
➥ Push [P.AMP•ATT] one or more times to set the pre-amp OFF, preamp 1 ON or preamp 2 ON.
  • Either "P. AMP❶" or "P. AMP❷" is displayed when the preamp 1 or preamp 2 is ON.
  • No indicator is displayed when the preamp is OFF.

|	
P. AMP❶	Wide dynamic range preamplifier. It is most effective for the 1.8 to 21 MHz bands.
P. AMP❷	High-gain preamplifier. It is most effective for the 24 to 50 MHz bands.

(Frequency band: 144/430/1200 MHz[*2])
➥ Push [P.AMP•ATT] once or twice to turn an optional pre-amplifier unit ON or OFF, if installed.
  • "P.AMP" appears when the preamplifier unit is ON.
  • No indicator is displayed when the preamplifier unit is OFF.

■ Attenuator

The attenuator prevents a desired signal from being distorted when very strong signals are near the signal's frequency, or when very strong electromagnetic fields, such as from broadcast stations are near your location. These can both be independently set for each band.

➥ Hold down [P.AMP/ATT] for 1 second to turn ON the Attenuator.
  • "ATT" appears on the display when the Attenuator is ON.
➥ Push [P.AMP/ATT] momentarily to turn it OFF.

[P.AMP•ATT]
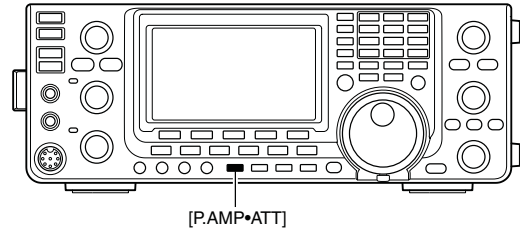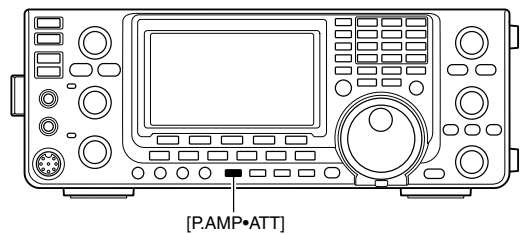
✔ About the "P.AMP2" preamplifier
The preamp 2 is a high gain receive amplifier. When it is used in the presence of strong electromagnetic fields, distortion sometimes results. In such cases, use either the "P.AMP 1" or "P.AMP OFF" setting.

Preamp 2 is most effective when:
• Used on bands above 24 MHz and when signals are weak.
• Receive sensitivity is insufficient when using low-gain antennas, or while using a narrow band antenna. (such as small loop, a Beverage antenna or a short Yagi antenna)

[*1] AG-1200 has been discontinued, but it can be still be used.
[*2] The optional UX-9100 is required for 1200 MHz frequency band operation.
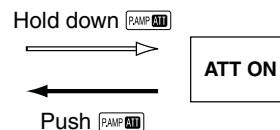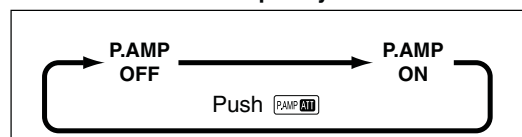
[P.AMP•ATT]

About the Preamplifier and Attenuator switching procedure

The Preamplifier and Attenuator are switched with [P.AMP/ATT], as shown below.

• **HF/50 MHz frequency bands**

P.AMP OFF → P.AMP ❶ → P.AMP ❷
Push [P.AMP ATT]

Hold down [P.AMP ATT] → **ATT ON**
Push [P.AMP ATT] ←
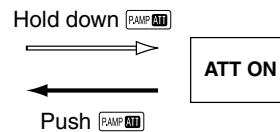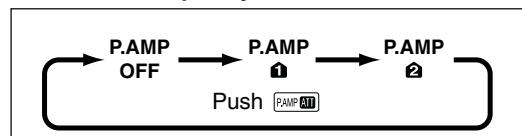
• **144/430/1200 MHz frequency bands**

P.AMP OFF → P.AMP ON
Push [P.AMP ATT]

Hold down [P.AMP ATT] → **ATT ON**
Push [P.AMP ATT] ←

■ AGC function

The AGC (Auto Gain Control) controls receiver gain to produce a constant audio output level, even when the received signal strength varies greatly.
The transceiver has 3 pre-set AGC time constants: fast, mid and slow for SSB, CW, RTTY and AM modes.

In the FM and DV modes, the AGC time constant is fixed as "FAST" (0.1 second).

◇ AGC speed selection

① Select either the SSB, CW, RTTY or AM mode. (p. 43)
② Push [MENU] to display the "M1" screen (Menu 1), then push [AGC](F-1) one or more times to select AGC fast (**F**), AGC mid (**M**) or AGC slow (**S**).
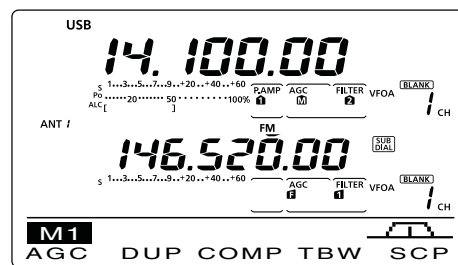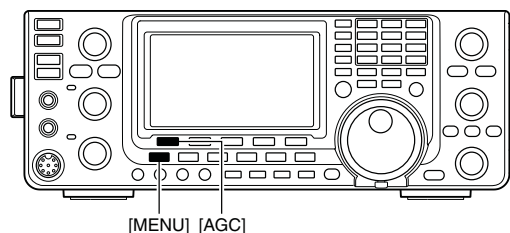
"AGC OFF" appears when the selected AGC speed's time constant is set to OFF.

◇ Setting the AGC time constant

① Select either the SSB, CW, RTTY or AM mode. (p. 43)
② Push [MENU] to display the "M1" screen (Menu 1), then hold down [AGC](F-1) for 1 second to display the "AGC" screen.
③ Push either [FAST](F-2), [MID](F-3) or [SLOW](F-4) to select the desired AGC speed to be set.
 • An underline appears below the time constant display.
④ Rotate [MAIN DIAL] to set the desired time constant.
 • AGC time constant can be set to between 0.1 to 8.0 seconds (depending on the mode) or turned OFF.
 • Hold down [FAST](F-2), [MID](F-3) or [SLOW](F-4) for 1 second to reset to the default setting for the selected time constant, if desired.
⑤ Select another mode (except for FM and DV), then repeat steps ③ and ④, if desired.
⑥ Push [MENU] to save, and exit the "AGC" screen.

• Selectable AGC time constant (unit: seconds)

Mode	Default	Selectable AGC time constant
SSB	0.3 (FAST)	OFF, 0.1, 0.2, 0.3, 0.5, 0.8, 1.2, 1.6, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0
	2.0 (MID)	
	6.0 (SLOW)	
CW/RTTY	0.1 (FAST)	OFF, 0.1, 0.2, 0.3, 0.5, 0.8, 1.2, 1.6, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0
	0.5 (MID)	
	1.2 (SLOW)	
AM	3.0 (FAST)	OFF, 0.3, 0.5, 0.8, 1.2, 1.6, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0
	5.0 (MID)	
	7.0 (SLOW)	
FM/DV	0.1 (FAST)	Fixed

[MENU] [AGC]

F-1 → Hold down

• When AGC medium is selected

AGC	FAST	MID	SLOW	SSB
	0.3s	2.0s	6.0s	
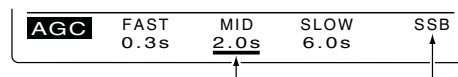
Appears under the selected AGC speed's time constant display.   Selected mode

• When AGC fast is selected

AGC	FAST	MID	SLOW	SSB
	0.3s	2.0s	6.0s	
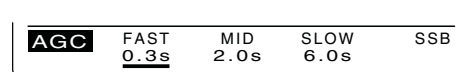
• When AGC slow is selected

AGC	FAST	MID	SLOW	SSB
	0.3s	2.0s	6.0s	
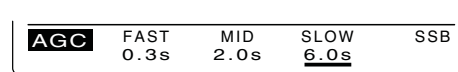
For your information
When you are receiving a weak signal, and a strong signal is momentarily received, the AGC function quickly reduces the receiver gain. When that signal disappears, the transceiver may not receive the weak signal because of the AGC action. In that case, hold down [AGC](F-1) for 1 second, and rotate [MAIN DIAL] to set the time constant to OFF.

■ IF filter selection

The transceiver has 3 passband width IF filters for each mode.

▧ The filter selection is automatically memorized in each mode.
▧ The PBT shift frequencies are automatically memorized in each filter.
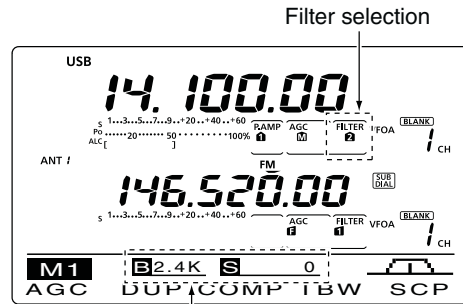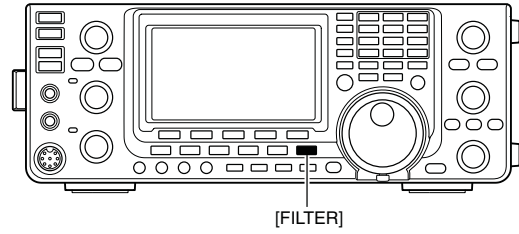

[FILTER]

◇ IF filter selection

① Select the desired mode.
② Push [FILTER] one or more times to select IF filter 1, 2 or 3.
 • The selected passband width and filter number is displayed on the LCD.

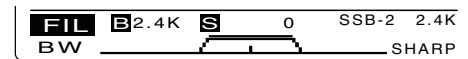### ◇ Filter passband width setting

(Mode: SSB/CW/RTTY/AM)

① Hold down [FILTER] for 1 second to display the "FIL" screen (Filter) to set the filter passband width.
② Select either the SSB, CW, RTTY or AM mode.
 • Passband widths for FM and DV modes are fixed and cannot be set.
③ Push [FILTER] one or more times to select IF filter 1, 2 or 3.
④ Push [BW](F-1), then rotate [MAIN DIAL] to adjust the desired passband width. Then push [BW](F-1) to set it.
 • While holding down [BW](F-1), rotating [MAIN DIAL] also adjusts the passband width. After adjustment, release [BW](F-1) to set it.
 • Hold down [F-3] for 1 second to reset to the default setting, if desired.
⑤ Repeat steps ② to ④ if desired.
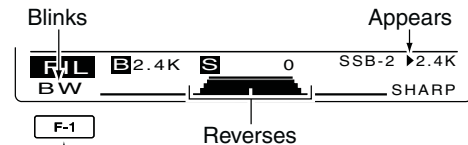⑥ Push [MENU] to save, and exit the "FIL" screen.

Filter selection

The selected filter width is displayed when [FILTER] is pushed.

• **"FIL" screen display**

Shows the selected filter and passband width.

• **While adjusting the passband width**

Blinks   Appears

F-1   Reverses

Push [BW](F-1), then rotate [MAIN DIAL] to adjust the passband width. Then push [BW](F-1),

▧ The PBT shift frequencies are cleared when the passband width is changed.

▧ This "FIL" screen (Filter) graphically displays the PBT shift frequencies and passband width.

| Mode	IF filter	Adjustable range (steps)
SSB	FILTER1 (3.0 kHz)	50 to 500 Hz (50 Hz) 600 to 3600 Hz (100 Hz)
	FILTER2 (2.4 kHz)	
	FILTER3 (1.8 kHz)	
SSB-D CW	FILTER1 (1.2 kHz)	50 to 500 Hz (50 Hz) 600 to 3600 Hz (100 Hz)
	FILTER2 (500 Hz)	
	FILTER3 (250 Hz)	
RTTY	FILTER1 (2.4 kHz)	50 to 500 Hz (50 Hz) 600 to 2700 Hz (100 Hz)
	FILTER2 (500 Hz)	
	FILTER3 (250 Hz)	
AM AM-D	FILTER1 (9.0 kHz)	200 Hz to 10 kHz (200 Hz)
	FILTER2 (6.0 kHz)	
	FILTER3 (3.0 kHz)	
FM FM-D DV	FILTER1 (15 kHz)	Fixed
	FILTER2 (10 kHz)	
	FILTER3 (7.0 kHz)	

◇ 1st IF filter selection

(Mode: SSB/CW/RTTY/AM)

The IC-9100 has a 15 kHz filter passband width at the 1st IF frequency. The 1st IF filters reduce interference from strong nearby signals.

If the optional FL-430 1ST IF FILTER (6 kHz) is installed, a 6 kHz filter width can be used. Or, if the FL-431 1ST IF FILTER (3 kHz) is installed, a 3 kHz filter width can be used.

• The filter passband width can be selected on only the HF/50 MHz band frequency.

① Hold down [FILTER] for 1 second to display the "FIL" screen (Filter).

② Select SSB, CW, RTTY or AM mode.
   • The passband widths for FM and DV modes are fixed, and have no options.

③ Hold down [F-5] for 1 second to select the desired filter width from 15 kHz, 6 kHz and 3 kHz.
   • Hold down [F-3] for 1 second to reset to the default filter setting, if desired. (The filter passband width setting is also reset to the default setting.)

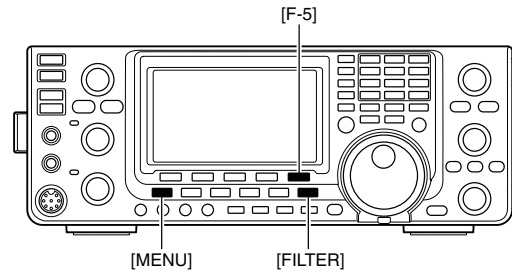④ Push [MENU] to save, and exit the "FIL" screen.
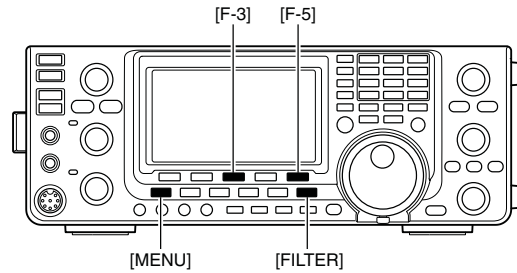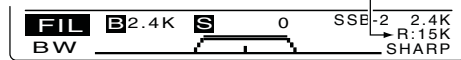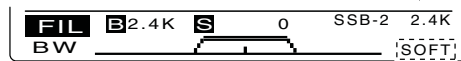
◇ IF (DSP) filter shape

(Mode: SSB/CW)

A soft or sharp type of DSP filter shape for both SSB and CW can be independently selected.

① Hold down [FILTER] for 1 second to display the "FIL" screen (Filter).

② Select the SSB or CW mode.

③ Push [F-5] once or twice to select either the soft or sharp filter shape.

④ Push [MENU] to save, and exit the "FIL" screen (Filter).

[F-3]   [F-5]

[MENU]   [FILTER]

15 kHz is selected.

FIL B2.4K S   0   SSB-2 2.4K
BW   R:15K
                            SHARP

[F-5]

[MENU]   [FILTER]

FIL B2.4K S   0   SSB-2 2.4K
BW   SHARP

F-5

↕ Push

FIL B2.4K S   0   SSB-2 2.4K
BW   SOFT

F-5

5

■ Twin PBT operation

(Mode: SSB/CW/RTTY/AM)
To reject interference, PBT (Passband Tuning) electronically narrows the IF passband width by shifting the IF frequency slightly outside of the IF filter passband. The IC-9100 uses DSP for the PBT function. Moving both [TWIN-PBT] controls shift the IF passband center frequency both above and below the received frequency.

➥ The LCD graphically shows the passband width and frequency shift.
➥ Hold down [FILTER] for 1 second to display the "FIL" screen (Filter). Current passband width and frequency shift are displayed in the "FIL" screen.
➥ Hold down [PBT-CLR] for 1 second to set the IF frequency to the center position.
 • The "dot" disappears.

The variable range depends on the passband width and mode. The edge of the variable range is half of the passband width. The PBT is adjustable in 25 Hz steps in the SSB/CW/RTTY modes, and 100 Hz in the AM mode.

⚠ • The [TWIN-PBT] controls should normally be set to the center positions when there is no interference. The PBT setting should be cleared.
  • When the PBT is used, the audio tone may change.
  • The controls do not function in the FM and DV modes.
  • While rotating the [TWIN-PBT] controls, noise may occur. This comes from the DSP unit and does not indicate an equipment malfunction.
  • Pushing [PBT-CLR] displays the filter passband width and shift value for 1 seconds on the function display.
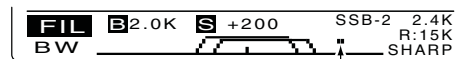
[PBT-CLR] [TWIN-PBT]
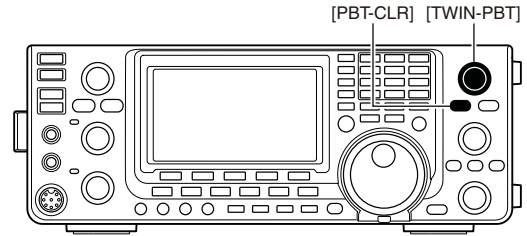
Passband width and shift value are displayed while [TWIN PBT] is used.

Appears when passband is shifted.

• **"FIL" screen (Filter) display**
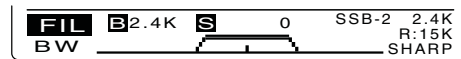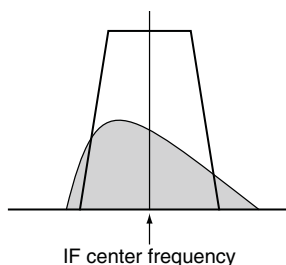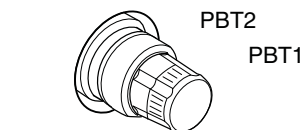
Shows the selected filter and passband width.
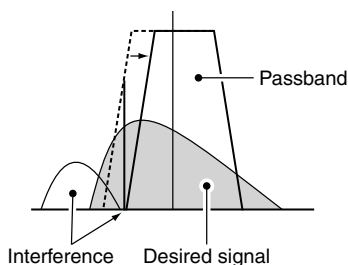
• **While adjustiong the PBT setting**
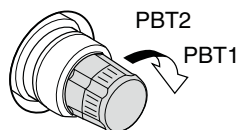
Appears when the passband is shifted.

PBT OPERATION EXAMPLE
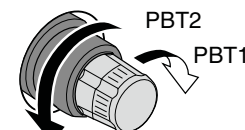
Both controls in the center positions (or hold down [PBT-CLR] for 1 second.)

PBT2
PBT1

IF center frequency

Cutting the lower passband edge

PBT2
PBT1

Passband

Interference Desired signal

Cutting both lower and higher passband edges

PBT2
PBT1

Passband

Interference Desired signal Interference
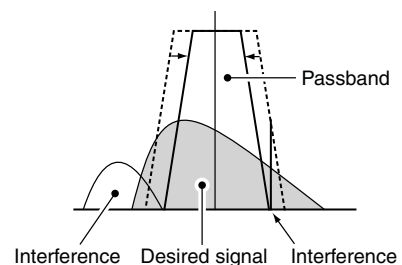
■ Noise Blanker

(Mode: SSB/CW/RTTY/AM)
The Noise Blanker eliminates pulse-type noise such as noise from car ignitions.

➥ Push [NB] to turn the Noise Blanker function ON or OFF.
• "NB" is displayed when the Noise Blanker is ON.

When using the Noise Blanker function, received signals may be distorted if they are excessively strong or when used for noise other than pulses. In this case, set the Noise Blanker threshold level to a shallow position, or turn OFF the function. (see below)

[NB]

Appears

◇ NB Set mode

To deal with various types of noise, the attenuation level and noise blanking duration can be set in the NB set mode.

① Hold down [NB] for 1 second to display the "NB" screen (Noise blanker).
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 [NB] to save, and return to the previous screen.

Select the item   Select a default setting

1. NB Level   (Default: 50%)

Set the noise blanker threshold level to between 0% and 100%.

2. NB Depth   (Default: 8)
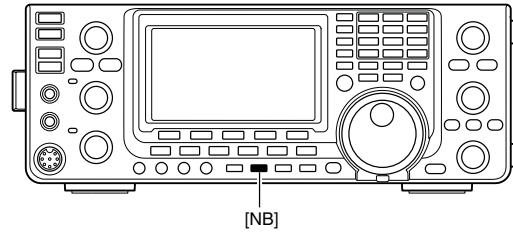
Set the noise attenuation level to between 1 and 10.
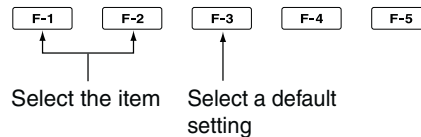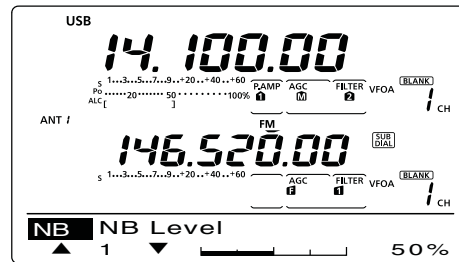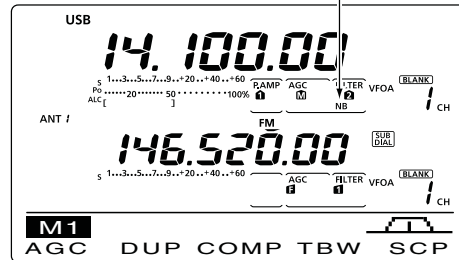
3. NB Width   (Default: 50)

Set the blanking duration to between 1 and 100.

■ Meter peak hold function

When the "Meter Peak Hold" item is set to ON in the Set mode, the peak level of a received signal strength or the output power is displayed for approximately 0.5 seconds. (p. 162)
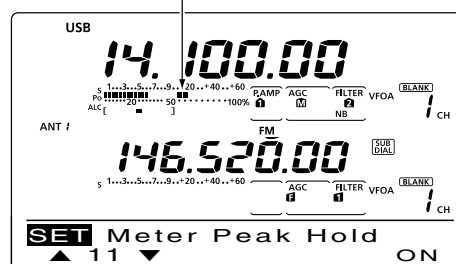
Appears for 0.5 seconds.

■ Noise Reduction

The Noise Reduction function reduces random noise components and enhances audio signals which are buried in noise. The received signals are converted to digital signals and then the audio signals are separated from the noise.

① Push [NR] to turn ON the Noise Reduction.
  • "NR" appears.
② Rotate the [NR] control to adjust the noise reduction level.
③ Push [NR] to turn OFF the Noise Reduction.
  • "NR" disappears.

A large rotation of the [NR] control results in audio signal masking or distortion. Set the [NR] control for maximum readability.

[NR] [NR] control

Noise reduction OFF

Noise components

Noise reduction ON

Desired signal (CW)
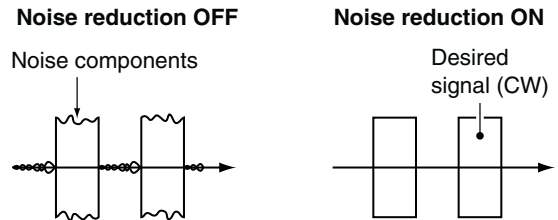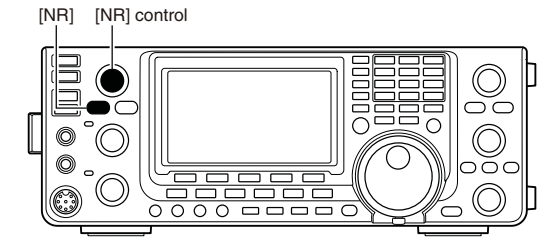
■ Dial Lock function

The Dial Lock function prevents frequency changes by accidental movement of [MAIN DIAL] by electronically locking it.

➥ Hold down [SPEECH/LOCK] to turn the Dial Lock function ON or OFF.
  • "🔒" appears when the function is ON.

NOTE: When the "[SPEECH/LOCK] SW" item is set to "LOCK/SPEECH" in the Set mode, pushing [SPEECH/LOCK] turns ON the Dial Lock function. (p. 164)

[SPEECH/LOCK]
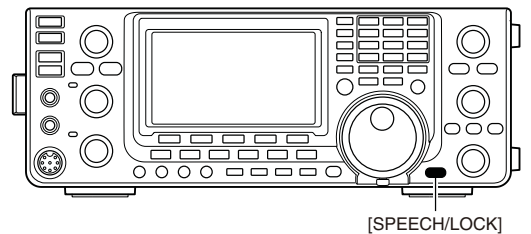
■ Notch function

(Mode = Auto notch : SSB/AM/FM
**   Manual notch : SSB/CW/RTTY/AM)**
This transceiver has Auto and Manual Notch functions. The Auto Notch function uses DSP to automatically attenuate beat tones, tuning signals, etc., even if their frequencies are changing. The Manual Notch function allows you to manually attenuate a frequency via the [NOTCH] control.

➥ In the SSB or AM mode, push [NOTCH] to toggle the Notch function between auto, manual and OFF.
  • Either the Auto or Manual notch function can be turned OFF in the Set mode. (p. 165)
➥ In the CW or RTTY mode, push [NOTCH] to turn the Manual Notch function ON or OFF.
➥ In the FM mode, push [NOTCH] to turn the Auto Notch function ON or OFF.
  • "MNF" appears when the Manual Notch function is ON.
  • "ANF" appears when the Auto Notch function is ON.
  • No indicator appears when the notch filter is OFF.
  • When the Manual Notch function is ON, hold down [NOTCH] for 1 second to select the wide, mid, or narrow manual notch filter width.

[NOTCH] control [NOTCH]
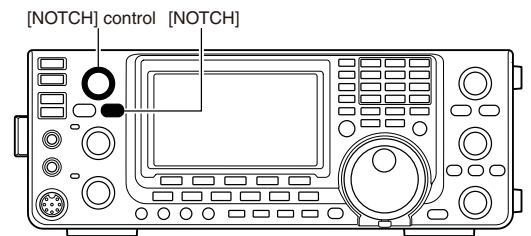
While tuning the manual notch filter, noise may be heard. This comes from the DSP unit and does not indicate an equipment malfunction.

■ VOX function

(Mode: SSB/AM/FM/DV)
The VOX (Voice-Operated Transmission) function switches the transceiver between transmit and receive with your voice. This function provides hands-free operation.
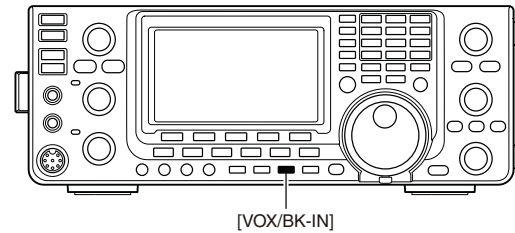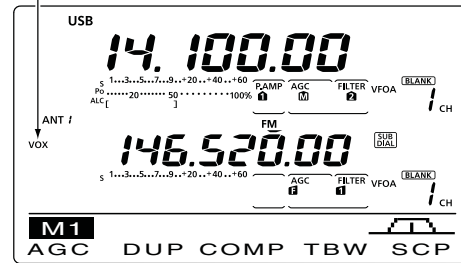
◇ Using the VOX function

① Select a phone mode (SSB, AM, FM, DV). (p. 43)
② Push [VOX/BK-IN] to turn ON the VOX function.
  • "VOX" appears.

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

[VOX/BK-IN]

Appears

◇ Adjusting the VOX function

① Select a phone mode (SSB, AM, FM, DV). (p. 43)
② Hold down [VOX/BK-IN] for 1 second to display the "VOX" screen.
③ Push [▲](F-1) or [▼](F-2) to select the VOX Gain item.
④ While speaking into the microphone, rotate [MAIN DIAL] to the point where the transceiver is continuously transmitting.
⑤ If the receive audio from the speaker causes the VOX circuit to switch to transmit, push [▲] (F-1) or [▼] (F-2) to select the Anti-VOX item. Then adjust the anti-VOX setting to the point where receive audio does not activate the VOX.
⑥ Adjust the VOX delay for a convenient interval before returning to receive after you stop speaking.
⑦ Set the VOX voice delay, if desired.
⑧ Push [MENU] to return to the previous menu.

[▲] [▼]

[VOX/BK-IN]   [MAIN DIAL]

1. VOX Gain   (Default: 50%)

Adjust the VOX gain to between 0% and 100%, in 1% steps.
Higher values make the VOX function more sensitive to your voice.

2. Anti-VOX   (Default: 50%)

Adjust the ANTI-VOX gain to between 0% and 100%, in 1% steps.
Higher values make the VOX function less sensitive to the received audio from a speaker or headphones.

3. VOX Delay   (Default: 0.2s)

Set the VOX delay to between 0.0 and 2.0 seconds, for normal pauses in speech before returning to receive.

4. VOX Voice Delay   (Default: OFF)

Set the VOX voice delay to prevent clipping of the first few syllables of a transmission when switching to transmit.

OFF, Short, Mid and Long settings can be set.

When using the VOX voice delay, turn OFF the TX monitor function to prevent transmitted audio from being echoed.
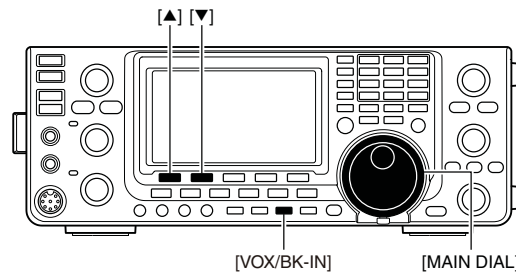
■ Break-in function

(Mode: CW)
The Break-in function is used in the CW mode to automatically toggle the transceiver between transmit and receive when keying. The IC-9100 is capable of Full Break-in or Semi Break-in.

[MENU]   [CW/RTTY]

[KEY SPEED] [VOX/BK-IN]   [MAIN DIAL]
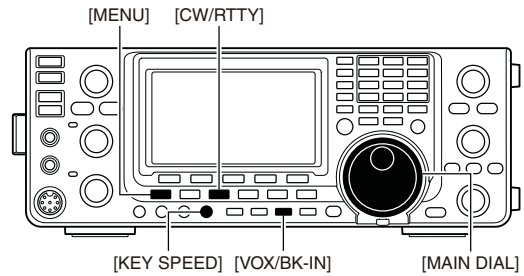
◇ Semi Break-in operation

During Semi Break-in operation, the transceiver immediately transmits when you key down, then returns to receive after a pre-set delay time has passed after you stop keying.

① Push [CW/RTTY] to select the CW or CW-R mode.
② Push [VOX/BK-IN] one or more times to turn ON the Semi Break-in function.
   • "BK-IN" appears.
③ Set the break-in delay time (the delay from transmit to receive).
   ➡ Hold down [VOX/BK-IN] for 1 second to display the "BKIN" screen (Break-in).
   ➡ Rotate [MAIN DIAL] to select the desired delay.
      • Hold down [F-3] for 1 second to reset to the default setting, if desired.
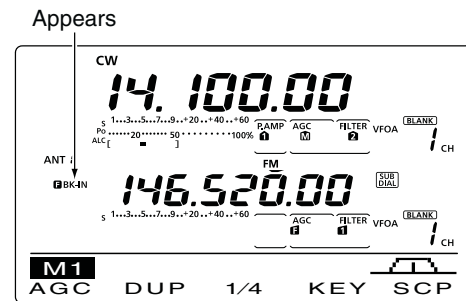④ Push [MENU] to return to the previous menu.

※ When using a paddle, rotate [KEY SPEED] to adjust the keying speed.

Appears

CW
14.100.00

S 1...3...5...7..9..+20..+40..+60
Po ┌─────20───────50··········100%
ALC [   ]

P.AMP AGC FILTER VFOA   BLANK
  1   M   2   1 CH

ANT

BK-IN

FM
146.520.00

S 1...3...5...7..9..+20..+40..+60

AGC FILTER VFOA   BLANK
 1   1   1 CH

BKIN Break-IN Delay   7.5d

Shows break-in delay time

◇ Full Break-in operation

During Full Break-in operation, the transceiver transmits when you key down, then immediately returns to receive when you release.

① Push [CW/RTTY] to select the CW or CW-R mode.
② Push [VOX/BK-IN] one or more times to turn ON the Full Break-in function.
   • "FBK-IN" appears.

※ When using a paddle, rotate [KEY SPEED] to adjust the keying speed.

Appears

CW
14.100.00

S 1...3...5...7..9..+20..+40..+60
Po ┌─────20───────50··········100%
ALC [   ]

P.AMP AGC FILTER VFOA   BLANK
  1   M   2   1 CH

ANT

FBK-IN

FM
146.520.00

S 1...3...5...7..9..+20..+40..+60

AGC FILTER VFOA   BLANK
 1   1   1 CH

M1
AGC   DUP   1/4   KEY   SCP
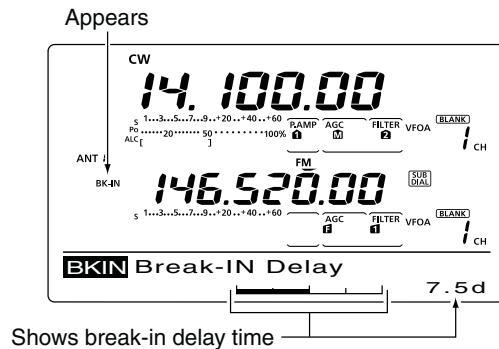
■ Speech compressor

(Mode: SSB)
The Speech Compressor function increases average RF output power, improving signal strength and readability.

① Push [SSB] to select the USB or LSB mode.
② Adjust the [MIC GAIN] control so that the ALC meter reads within the ALC zone, whether or not you speak softly or loudly.
③ Push [MENU] to display the "M1" screen (Menu 1), then push [COMP](F-3) to turn ON the Speech Compressor.
④ Hold down [COMP](F-3) for 1 second to display the "COMP" screen (Compressor).
⑤ While speaking into the microphone at your normal voice level, rotate [MAIN DIAL] so the COMP meter reads within the COMP zone.
  • Hold down [F-3] for 1 second to reset to the default setting, if desired.
  ▨ When the COMP meter peaks above the COMP level zone, your transmitted voice may be distorted.
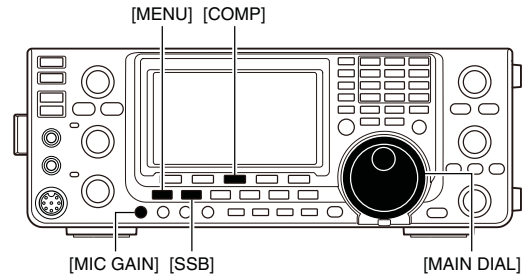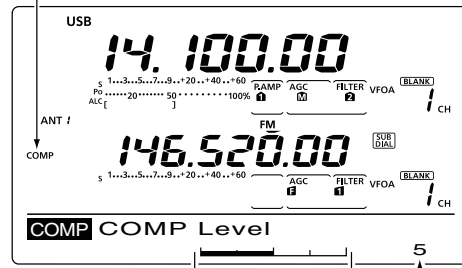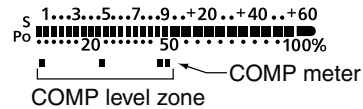⑥ Push [MENU] to return to the previous menu.

[MENU] [COMP]

[MIC GAIN] [SSB]   [MAIN DIAL]

Appears

Shows the compression level
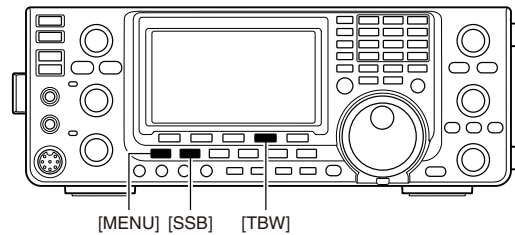
COMP meter
COMP level zone

■ Transmit filter width selection

(Mode: SSB)
The transmit filter width for the SSB mode can be selected from Wide, Mid or Narrow.

① Push [SSB] to select the USB or LSB mode.
② Push [MENU] to display the "M1" screen (Menu 1), then hold down [TBW](F-4) for 1 second, one or more times, to select a Wide, Mid or Narrow transmission passband width.
  • Push [TBW](F-4) momentarily to display the selected TX filter width for approximately 1 second.
  • The following filters are specified as the defaults. Each of the filter widths can be set in the Tone control Set mode. (pp. 169, 170)
  - WIDE : 100 Hz to 2900 Hz
  - MID   : 300 Hz to 2700 Hz
  - NAR   : 500 Hz to 2500 Hz

[MENU] [SSB]   [TBW]

M1
AGC   DUP COMP TBW   SCP

F-4

Hold down

M1   TBW WIDE
AGC   DUP COMP TBW   SCP

The selected transmit filter width is displayed for approximately 1 second.

■ ⊿TX function

The ⊿TX function shifts the transmit frequency up to ±9.99 kHz in 10 Hz steps* without changing the receive frequency.

*The [RIT/⊿TX] control tunes in 1 Hz steps when the operating frequency readout is set to the 1 Hz step readout. However, the 1 Hz digit is not displayed on the frequency shift readout.

① Push [⊿TX] to turn ON the ⊿TX function.
  • "⊿TX" and the frequency shift appear when the function is ON.
② Rotate [RIT/⊿TX].
③ To reset the ⊿TX frequency, hold down [CLEAR] for 1 second.
  • Push [CLEAR] momentarily to reset the ⊿TX frequency when the Quick RIT Clear function is ON. (p. 164)
④ To cancel the ⊿TX function, push [⊿TX] again.
  • "⊿TX" and the frequency shift disappear.

////When the RIT and ⊿TX functions are ON at the same time, [RIT/⊿TX] shifts both the transmit and receive frequencies from the displayed frequency at the same time.

✔ **For your convenience— Calculate function**
The frequency shift of the ⊿TX function can be added to or subtracted from the displayed frequency.

➥ While displaying the ⊿TX frequency shift, hold down [⊿TX] for 1 second.


◇ ⊿TX Monitor function

When the ⊿TX function is ON, holding down [XFC] allows you to listen to the transmit frequency (including the ⊿TX frequency offset).

■ Monitor function

The Monitor function allows you to monitor your transmit IF signals in any mode. Use this to check voice characteristics while adjusting SSB transmit parameters. (p. 169)
The CW sidetone functions regardless of the [MONITOR] setting.

① Push [MONITOR] to turn ON the Monitor function.
  • "MONI" appears when the Monitor function is ON.
② Hold down [MONITOR] for 1 second to display the "MONI" screen (Monitor).
③ Rotate [MAIN DIAL] to adjust the monitor level.
  • For the clearest audio output, adjust while holding down [PTT] and speaking into the microphone.
  • Hold down [F-3] for 1 second to reset to the default setting, if desired.
④ Push [MENU] to return to the previous menu.

[CLEAR]

[⊿TX] [RIT/⊿TX]

Appears

[XFC]

[MENU]   [F-3] [MONITOR]   [MAIN DIAL]

Appears
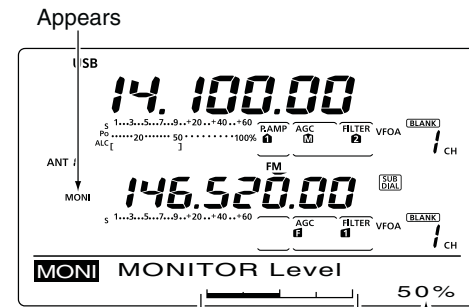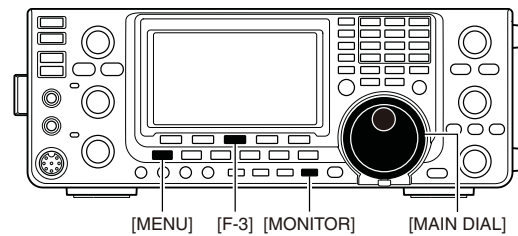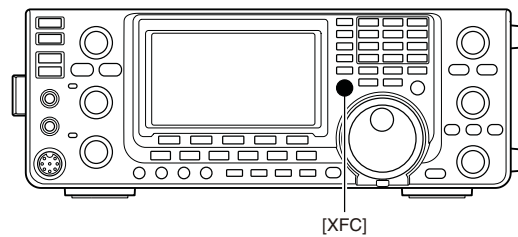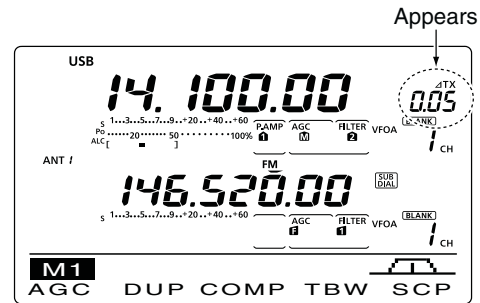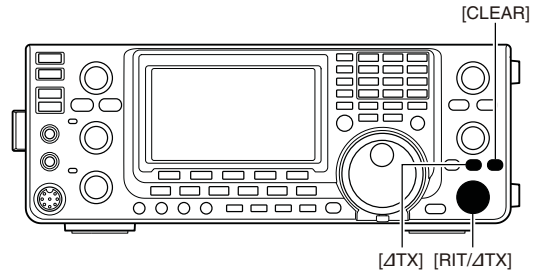
MONITOR Level   50%

Shows the monitor level

■ Split frequency operation

Split frequency operation allows you to transmit and receive on two different frequencies. Split frequency operation is performed using frequencies in VFO A and VFO B.
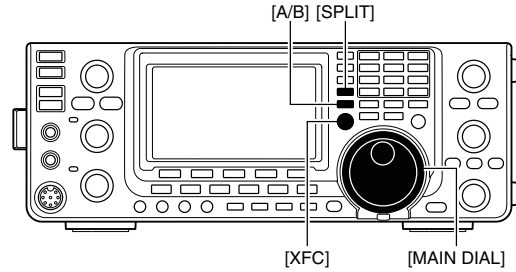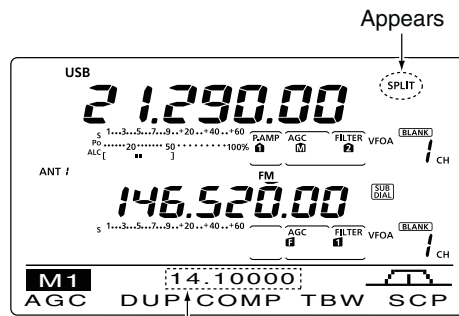• The Split frequency operation is automatically turned OFF when turning ON the One-touch repeater function.

The following is an example of setting 21.290 MHz for receiving and 21.310 MHz for transmitting.

① Set 21.290 MHz in VFO A.
② Push [SPLIT] to turn ON the Split operation.
  • The transmit (VFO B) frequency and "SPLIT" appear.
③ Hold down [A/B] for 1 second to equalize the transmit (VFO B) frequency to the receive (VFO A) frequency.
  • The equalized transmit (VFO B) frequency appears.
  • The Quick Split function is much more convenient for selecting the transmit frequency. See the next section for details.
④ While holding down [XFC], rotate [MAIN DIAL] to set the transmit frequency to 21.310 MHz.
  • The transmit frequency is displayed while holding down [XFC].
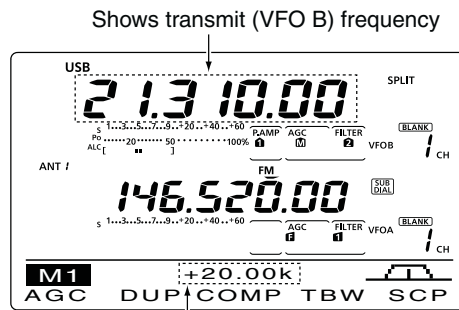⑤ Now you can receive on 21.290 MHz and transmit on 21.310 MHz.

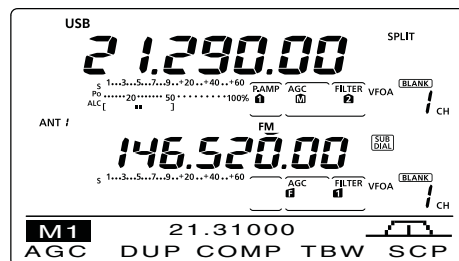To change the transmit and receive frequencies, push [A/B] to exchange VFO A and VFO B.

✔ CONVENIENT
• Direct frequency shift input
The frequency shift can be entered directly.
① Push [F-INP ENT].
② Enter the desired frequency shift with the digit keys.
  • 1 kHz to 1 MHz can be set.
  • When you require a minus shift direction, first push [GENE •].
③ Push [SPLIT] to input the frequency shift to the transmit frequency, and the Split function is turned ON.
[Example]
To transmit on a 1 kHz higher frequency:
  - Push [F-INP ENT], [1] then [SPLIT].
To transmit on 3 kHz lower frequency:
  - Push [F-INP ENT], [GENE •], [7] then [SPLIT].

• Split Lock function
Accidentally releasing [XFC] while rotating [MAIN DIAL] changes the receive frequency. To prevent this, use both the Split Lock and Dial Lock functions to change the transmit frequency only. The Split Lock function cancels the Dial Lock function while holding down [XFC] during split frequency operation.
The Split Lock function is OFF by default, but can be turned ON in the Set mode. (p. 162)

[A/B] [SPLIT]

[XFC]   [MAIN DIAL]

• After pushing [SPLIT]

Appears

Shows transmit (VFO B) frequency

• While holding down [XFC]

Shows transmit (VFO B) frequency

Shows frequency shift and direction

• After setting up

■ Quick Split function

When you hold down [SPLIT] for 1 second, the Split frequency operation is turned ON. The undisplayed VFO is automatically changed according to the plus/minus frequency shift programmed in the Set mode. Or the VFOs are equalized when 0 kHz (default setting) is programmed as the split frequency shift. (p. 162)

The Quick Split function is ON by default. For your convenience, it can be turned OFF in the Set mode. (p. 162) In this case, holding down [SPLIT] does not equalize the VFO A and VFO B frequencies.

① Suppose you are operating at 21.290 MHz (USB) in VFO A.
② Hold down [SPLIT] for 1 second.
  • Split frequency operation is turned ON.
  • The transmit (VFO B) frequency is equalized to the re-ceive (VFO A) frequency.
③ While holding down [XFC], rotate [MAIN DIAL] to set the frequency offset between transmit and re-ceive.
  • When [XFC] is released, the receive frequency is dis-played.

◊ Split frequency offset setting

By setting an often-used split frequency offset in ad-vance, you can use the Quick Split function to select split operation at the push of one switch.
Set the split frequency offset in advance in the "SPLIT Offset" item of the Set mode. (p. 162)
The example at right shows the split offset is set to +0.020 MHz.

➥ Hold down [SPLIT] for 1 second. to activate the Quick Split function.
  • The transmit frequency shifts from the receive frequency according to the "SPLIT Offset" option in the Set mode. (p. 162)

◊ Split Lock function

The Split Lock function is convenient for changing only the transmit frequency. When the Split Lock function is not used, accidentally releasing [XFC] while rotating [MAIN DIAL], changes the receive frequency.
The Split Lock function is OFF by default, but can be turned ON in the Set mode.

① While split frequency operation is ON, hold down [SPEECH/LOCK] for 1 second to activate the split lock function.
  • "🔒" appears.
② While holding down [XFC], rotate [MAIN DIAL] to change the transmit frequency.
  • If you accidentally release [XFC] while rotating the [MAIN DIAL], the receive frequency does NOT change.

[SPLIT]

[XFC]   [MAIN DIAL]

• After holding down [SPLIT]

Appears
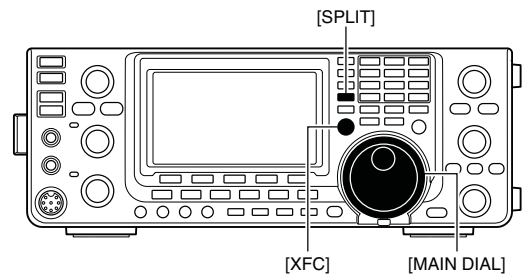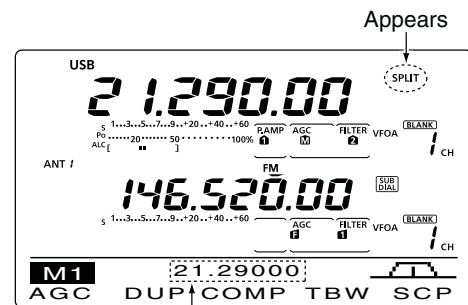
Shows the equalized transmit (VFO B) frequency

• After holding down [SPLIT] when the split offset is set to "+0.020" in the Set mode

SET SPLIT Offset
▲ 16 ▼   +0.020MHz

(Set mode screen)   Appears

Shows the shifted transmit (VFO B) frequency

[XFC] [MAIN DIAL] [SPEECH/LOCK]
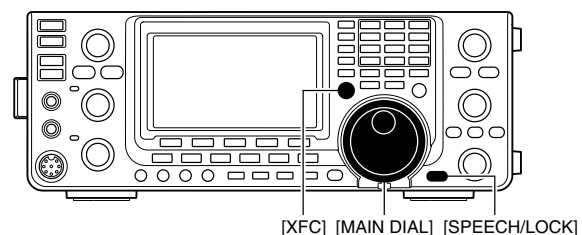
■ Measuring SWR

(Band: HF/50/144/430 MHz)
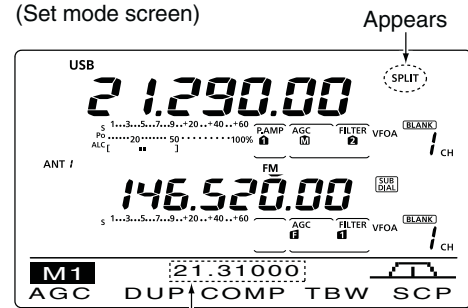The IC-9100 has a built-in circuit for measuring antenna SWR— no external equipment or special adjustments are necessary.

The IC-9100 can measure SWR two ways— spot measurement and plot measurement.

◇ Spot measurement

① Push [TUNER] once or twice to turn OFF the antenna tuner.
② Hold down [ANT•METER] for 1 second, one or more times, to select the SWR meter.
③ Push [CW/RTTY] once or twice to select the RTTY mode.
④ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver).
⑤ Rotate [RF POWER] clockwise past the 12 o'clock position for more than 30 W of output power (30%).
⑥ Read the SWR on the SWR meter.
⑦ Release [PTT] to receive. (or push [TRANSMIT] again)

///The built-in antenna tuner matches the transmitter to the antenna when the SWR is less than 3:1.

◇ Plot measurement

Plot measurement allows you to measure the SWR over an entire band.

① Push [MENU] to display the "M2" screen (Menu 2), then push [SWR](F-3).
  • The SWR graph screen appears.
② Rotate [RF POWER] clockwise past the 12 o'clock position for more than 30 W of output power (30%).
③ Set the center frequency for the SWR to be measured.
④ Hold down [F-5] for 1 second one or more times to select 10, 50, 100 or 500 kHz steps as the SWR measuring step.
⑤ Push [F-3] one or more times to select 3, 5, 7, 9, 11 or 13 steps as the number of measuring steps.
⑥ Push [F-1] to start the measuring.
⑦ Push [TRANSMIT] or hold down [PTT] on the microphone to measure the SWR.
  • A frequency marker, "▲," appears below the SWR graph.
⑧ Push [TRANSMIT] again or release [PTT] to move the frequency marker and frequency indication to the next frequency to be measured.
⑨ Repeat steps ⑦ and ⑧ to measure SWR over the entire frequency range.
⑩ When the measured SWR is more than 1.5:1, adjust the antenna to match with the transceiver.

The antenna SWR cannot be measured on the 1200 MHz frequency band*.
* The optional UX-9100 is required.
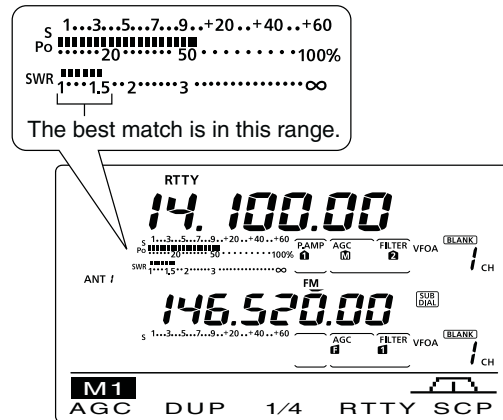
The best match is in this range.
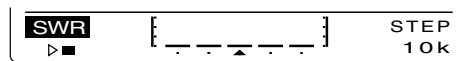
Push

Start measuring
Select number of SWR measuring steps
Select SWR measuring step

• **Measuring** (after pushing [F-1])
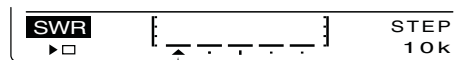
Frequency marker appears and moves after measurement.
When mesurement points are set outside of the operatable frequency band, the frequency marker blinks.

Typical display SWR varying between 1 and 2, full scale up to SWR 4.0:1.

7 DV MODE PROGRAMMING

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

■ Call sign programming

Four types of call signs are used; "MY" (your own call sign) "UR" (destination call sign, whether it is an individual or a repeater.) "R1" (your access/area repeater call sign) and "R2" (a destination or gateway repeater call sign). Each call sign can be programmed with up to 8 characters.

In addition, you can store up to 6 "MY" call signs, and up to 60 "UR" call signs in the call sign memory. Up to 300 repeater call signs can be stored in the repeater list.

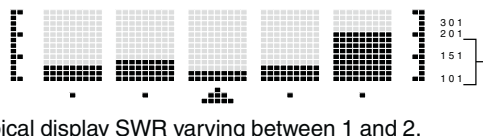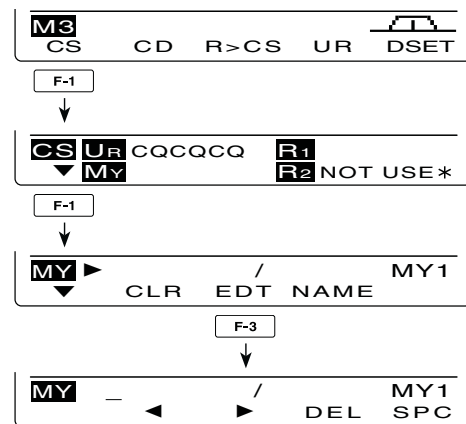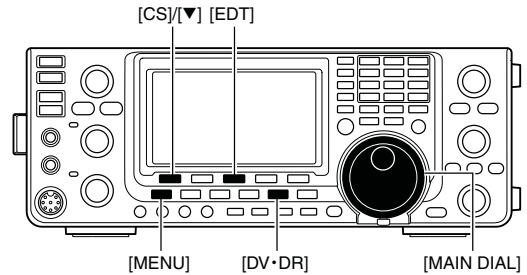### ◇ "MY" (Your own call sign) programming

Your own call sign must be programmed for both digital voice and low-speed data communications (including GPS transmission).

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) one or more times to display the "MY" screen (MY call sign setting).
⑤ Rotate [MAIN DIAL] to select MY1, 2, 3, 4, 5, or 6 call sign memory.
⑥ Push [EDT](F-3) to enter the call sign programming mode.
  • A cursor appears and blinks.
⑦ Rotate [MAIN DIAL] to select the first character to input.
  When inputting numbers, push the appropriate keypad key.
  • Push [DEL](F-4) to delete the selected character or number.
  • Push [SPC](F-5) to input a space.
⑧ Push [◀](F-2) to move the cursor backwards, or push [▶](F-3) to move the cursor forwards.
⑨ Repeat steps ⑦ and ⑧ to enter your own call sign.
  • A call sign of up to 8 digits can be set.
  • To program a note (up to 4 characters, for operating radio type, area, etc.), go to step ⑩, otherwise go to step ⑫.
⑩ Push [▶](F-3) to move the cursor right side of "/".
⑪ Repeat steps ⑦ and ⑧ to program the desired 4 character note.
⑫ Push [MENU] to store the programmed call sign and note.
⑬ Push [MENU] again to return to the "CS" screen.

[CS]/[▼] [EDT]

[MENU]   [DV•DR]   [MAIN DIAL]

• **Programing a call sign**

[◀] [▶]   Number input

[DEL][SPC]   [MAIN DIAL]

Cursor

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

◇ **"UR" (Destination call sign) programming**

A destination call sign must be programmed to a specific individual station or a repeater, for both digital voice and low-speed data communications.
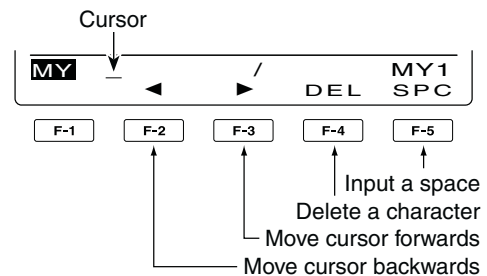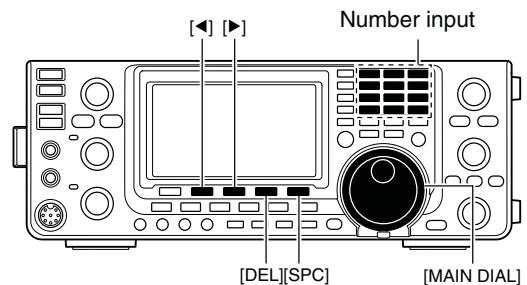
① Push [DV•DR] to select the DV mode.
② Push [MENU] one or more times to display the "M3" screen (Menu 3).
　• In the DR mode, push [MENU] once or twice to select the "D1" screen.
③ Push [CS](F-1) to display the "CS" screen (Call Sign).
④ Push [▼](F-1) one or more times to display the "UR" screen (UR call sign setting).
⑤ Rotate [MAIN DIAL] to select the desired call sign memory between "U01" and "U99."
⑥ Push [EDT](F-3) to enter the call sign programming mode.
　• A cursor appears and blinks.
⑦ Rotate [MAIN DIAL] to select the first character to input.
　When inputting numbers, push the appropriate keypad key.
　• Push [DEL](F-4) to delete the selected character or number.
　• Push [SPC](F-5) to input a space.
⑧ Push [◄](F-2) to move the cursor backwards, or push [►](F-3) to move the cursor forwards.
⑨ Repeat step ⑦ to enter UR call sign.
　• A call sign of up to 8 digits can be set.
⑩ Push [MENU] to store the programmed call sign.
⑪ Push [MENU] again to return to the "CS" screen.
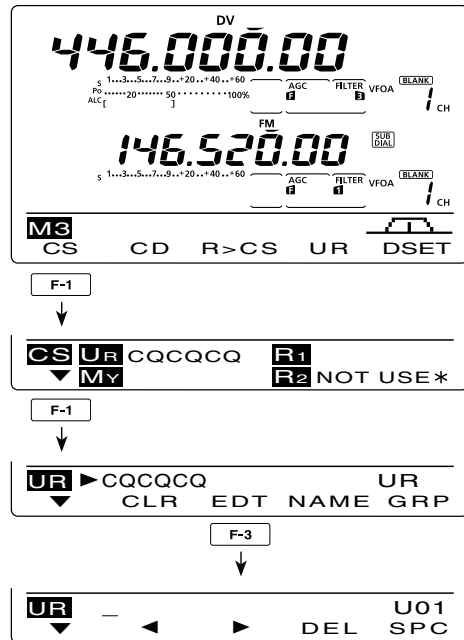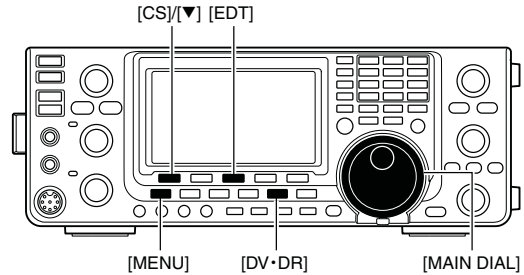
✔ *For your information*
The IC-9100 has a call sign edit record function.
When you edit a call sign that is stored in a call sign memory, the edited call sign is automatically programmed into a blank channel.
If all call sign memories are already programmed, the edited call sign will overwrite the selected channel's call sign.
The programmed call sign can be over-written anytime, when the "Edit Record" item is set to OFF or Select, in the DV Set mode. (p. 119)
However, the call sign that is stored in a regular memory or call channel must be manually overwritten. (Temporary operation is possible).

■ Call sign programming (Continued)

◇ **"R1" (Access/Area repeater call sign) and "R2" (Link/Gateway repeater call sign) programming**

The access/area and link/gateway repeater call signs must be programmed in "R1" and "R2."
Other repeater call signs can be stored in the "RP-L" screen (Repeater list) (p. 88).

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) one or more times to display the "R1" or "R2" screen (Repeater call sign setting).
⑤ Push [EDT](F-3) to enter the call sign programming mode.
  • A cursor appears and blinks.
⑥ Rotate [MAIN DIAL] to select the first character to input.
  When inputting numbers, push the appropriate key-pad key.
  • Push [DEL](F-4) to delete the selected character or number.
  • Push [SPC](F-5) to input a space.
⑦ Push [◄](F-2) to move the cursor backwards, or push [►](F-3) to move the cursor forwards.
⑧ Repeat steps ⑥ and ⑦ to enter a desired repeater call sign.
  • A call sign of up to 8 digits can be set.
⑨ Push [MENU] to store the programmed call sign.
⑩ Push [MENU] again to return to the "CS" screen.
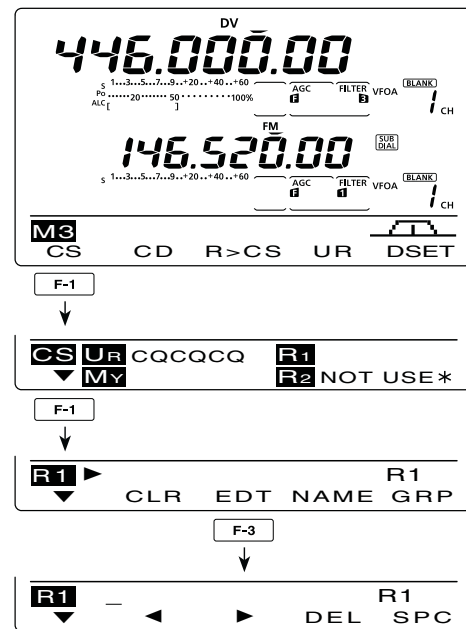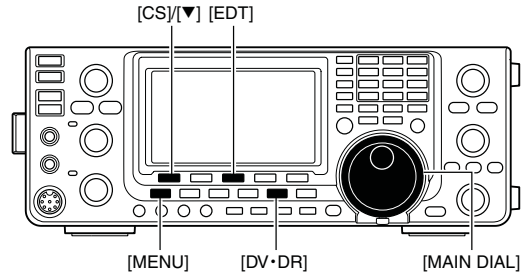
■ Repeater list

You can store repeater information for quick and simple communication in up to 500 repeater memory channels (Repeater list) in up to 10 Groups. Programming the repeater list is required for DR mode operation.

The outline of the repeater list is as follows:
① Adding new repeaters or editing a list
② Selecting a repeater to edit
③ Programming repeater data (Repeater name, Call sign, Gateway repeater call sign, Repeater group, etc.)

////// If a call sign has been programmed, you can skip other data programming, and write only the call sign into the Repeater list.

④ Programming access repeater data (Receive frequency, Duplex direction, Frequency offset)

◇ Repeater list contents

The following contents are included in the repeater list:
❍ CLR (Repeater list clearing) (p. 92)
❍ ADD (Repeater list addition) (p. 89)
❍ EDT (Repeater list editing) (p. 91)
❍ NAME (Repeater name) (p. 89)
❍ CS (Repeater call sign) (p. 89)
❍ GW (Gateway repeater's call sign) (p. 90)
❍ GROUP (Repeater group) (p. 90)
❍ R1 USE (Access repeater use) (p. 90)
❍ FREQ (Repeater input frequency)* (p. 90)
❍ DUP (Duplex direction)* (p. 91)
❍ OFFSET (Frequency offset)* (p. 91)
❍ ADD Write (Save and add to the repeater list) (pp. 91, 92)
❍ OVER Write (Save and overwrite to the repeater list) (p. 92)

*Appears when R1 USE is selected as YES.

• To select the Repeater list entry mode

① In the DV mode, push [MENU] one or more times to select 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 [RP-L](F-4) to display the "RP-L" screen (Repeater list).

In the DV mode
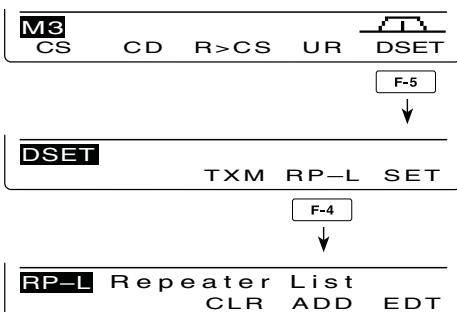
In the DR mode
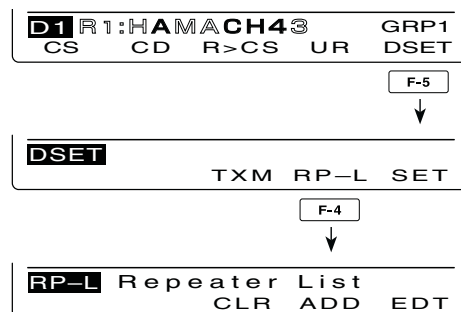
NOTE: Repeater lists can be erased by static electricity, electric transients, etc. In addition, they can be erased by an equipment malfunction, and during repairs. Therefore, we recommend that memory data be backed up externally, or be saved to a PC using the optional CS-9100 CLONING SOFTWARE.

■ Repeater list programming

1. New repeater list programming

➊ Push [DV•DR] to select the DV mode.
➋ 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.
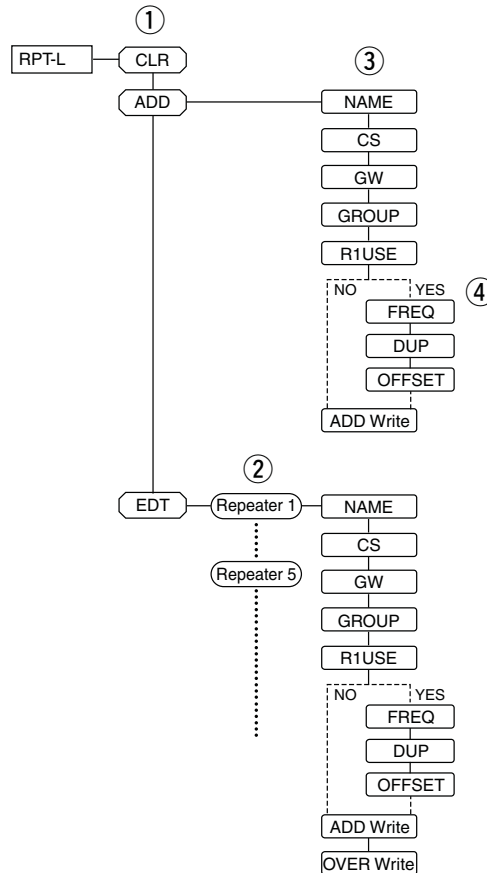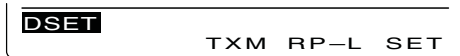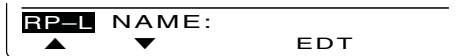
```
M3                        ⊓
  CS    CD   R>CS   UR   DSET
```
When the "M3" screen is selected.

➌ Push [DSET](F-5) to display the "DSET" screen.

```
DSET
              TXM  RP−L  SET
```

➍ Push [RP-L](F-4) to display the "RP-L" screen (Repeater list).

```
RP−L  Repeater List
             CLR   ADD   EDT
```

➎ Push [ADD](F-3) to display the "NAME" item (Repeater name).

```
RP−L  NAME:
  ▲      ▼         EDT
```

▨ **To cancel the programmed data:**
After programming, push [MENU] to display "Cancel OK?." Push [YES](F-4) to cancel programming and return to the "RP-L" screen (Repeater list), or push [NO](F-5) to keep programming and return to the previous screen which was selected before pushing [MENU].

2. Repeater name programming

➏ Push [EDT](F-4) to enter the repeater name programming mode.
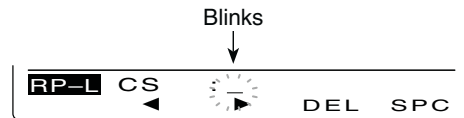 • A cursor appears and blinks.

Blinks

```
RP−L  NAME:⠶⠶
ABC     ◄   ►    DEL  SPC
```
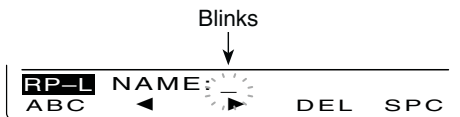
➐ Push [ABC](F-1) one or more times to select the desired character type.

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

➑ 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 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.
➒ Push [◄](F-2) to move the cursor backward, or push [►](F-3) to move the cursor forward.
➓ Repeat steps ➐ through ➑ to program a name of up to 9 characters.
⓫ Push [MENU] to save the name.

3. Repeater call sign programming

⓬ Push [▼](F-2) to display the "CS" item (Repeater Call Sign).
⓭ Push [EDT](F-4) to enter the repeater call sign programming mode.
  • A cursor appears and blinks.

Blinks

```
RP−L  CS    ⠶:⠶
        ◄    ►    DEL   SPC
```

⓮ Rotate [MAIN DIAL] to select the first character or symbol ('/'only) to input.
When inputting numbers, 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 8 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.
⓯ Push [◄](F-2) to move the cursor backward, or push [►](F-3) to move the cursor forward.
⓰ Repeat steps ⓮ through ⓯ to program a repeater call sign of up to 8 characters.
⓱ Push [MENU] to save the call sign.

```
RP−L  CS   :JP3YHH B
  ▲      ▼        EDT
```

▨ Be sure to add a letter after a repeater call sign, as the repeater node (port), according to the repeater frequency, as shown below. Note that Japanese repeater node letters are different.
 • 1200 MHz : A (B in Japan)
  • 430 MHz : B (A in Japan)
  • 144 MHz : C (no D-STAR repeaters in Japan)
Cross band operation between different nodes in the same repeater area can be made.

4. Gateway repeater call sign programming

When the repeater that was programmed in the previous item has its own gateway capability, skip this setting and go to the next item. If the programmed repeater uses a different gateway repeater, program gateway repeater's call sign as described below.

⑱ Push [▼](F-2) to display the "GW" item (Gateway Repeater Call Sign).
 • The programmed repeater's call sign is displayed, and "G" is automatically added as, or overwrites, the 8th digit.

> RP–L GW   :JP3YHHG
>   ▲   ▼   EDT
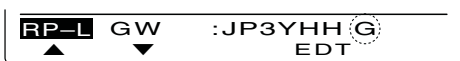
⑲ Push [EDT](F-4) to enter the repeater call sign programming mode.
 • A cursor appears and blinks.
⑳ Push [◀](F-2) or [▶](F-3) to select the character to program.
㉑ Rotate [MAIN DIAL] to select the first character or symbol ('/' only) to input.
 When inputting numbers, push the appropriate keypad key.
 • Push [DEL](F-4) to delete the selected character, symbol or number.
 • Push [SPC](F-5) to input a space.
 • When all 8 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.
㉒ Repeat steps ⑳ through ㉑ to program a repeater call sign of up to 8 characters.
 • The 8th digit must be "G."
 • For repeaters in a zone with no gateway, enter a common name or call sign, up to 7 digits, in all their gateway repeater cells. The 8th digit must be blank.
㉓ Push [MENU] to save the programmed call sign.

5. Repeater group programming

The IC-9100 has a total of 10 groups (0–9). You can assign and organize up to 500 repeaters in the 10 groups. Group selection is helpful for quick recall of a desired repeater.

㉔ Push [▼](F-2) to display the "GROUP" item (Repeater group).
 • Selected group number appears.

> RP–L GROUP: ▶GRP1
>   ▲   ▼

㉕ Rotate [MAIN DIAL] to select the desired repeater group.

6. Access repeater setting (R1 USE)

The programmed repeaters can be set as an access repeater (R1) in the DR mode. To use as R1, the repeater frequency, duplex direction and frequency offset must be programmed.

㉖ Push [▼](F-2) to display the "R1USE" item (Access Repeater Programming).
 • The access repeater programming screen appears.

> RP–L R1USE: ▶YES
>   ▲   ▼

㉗ Rotate [MAIN DIAL] to select "YES" or "NO."
 • When "NO" is selected, the repeater cannot be selected as an access repeater (R1) in the DR mode.
 • When "YES" is selected, the repeater can be selected as an access repeater (R1) in the DR mode.

➥ When "NO" is selected in step ㉗, skip 'Frequency programming (FREQ)' and go to 'Duplex direction setting (DUP).'
➥ When "YES" is selected in step ㉗, push [▼](F-2) to go to step ㉘ for the access repeater (R1) programming.

7. Frequency programming (FREQ)

This content appears when "YES" is selected in "R1 USE," as described in 'Access repeater setting (R1 USE)' above.

㉘ Push [▼](F-2) to display the "FREQ" item (Frequency Programming).
 • The frequency programming screen is displayed.

> RP–L FREQ: .   .
>   ▲   ▼   CLR EDT

㉙ Push [EDT](F-4) to enter the frequency programming mode.
 • A cursor appears and blinks.

> RP–L F-INP :   .   .
>   ▲   ▼

㉚ Push the keypad key to input the frequency, then push [F-INP ENT].
 • Hold down [CLR](F-3) for 1 second to clear the displayed frequency.

■ Repeater list programming (Continued)

8. Duplex direction setting (DUP)

This content appears when "YES" is selected in "R1 USE" as described in 'Access repeater setting (R1 USE)' on page 90.

㉛ Push [▼](F-2) to display the "DUP" item (Duplex direction setting).
  • The duplex direction setting screen is displayed.

```
RP-L  DUP  : ▸OFF
   ▲        ▼
```

㉜ Rotate [MAIN DIAL] to select the duplex direction.
  • OFF   : The duplex function is OFF.
  • 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.
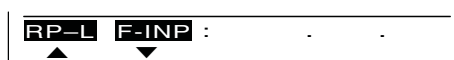
9. Frequency offset programming (OFFSET)

This content appears when "YES" is selected in "R1 USE" as described in 'Access repeater setting (R1 USE)' on page 90.

㉝ Push [▼](F-2) to display the "OFFSET" item (Frequency offset Programming).
  • Frequency offset programming screen is displayed.

```
RP-L  OFFSET: ▸ 0.000.0
   ▲        ▼      CLR
```

㉞ Rotate [MAIN DIAL] to select the frequency offset.
  • Hold down [CLR](F-3) for 1 second to clear the displayed frequency offset.

10. Storing the repeater list (ADD Write)

㉟ Push [▼](F-2) to display the "ADD Write" item (Repeater list Storing).

```
RP-L  ADD  Write
   ▲        ▼          WR
```

㊱ Hold down [WR](F-5) to store the entry.
  • "ADD Write OK?" appears.

```
RP-L  ADD  Write OK?
   ▲        ▼      YES   NO
```
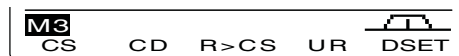
㊲ Hold down [YES](F-4) to store the entry, and return to the RP-L screen.
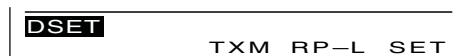
■ Editing a repeater list

This function re-programs a repeater's data. This is useful when already-programmed data is incorrect or some data should be added to the list.

1. Repeater list selection

❶ Push [DV•DR] to select the DV mode.
❷ Push [MENU] one or more times to display the "M3" screen (Menu 3).

```
M3                          ⊓
  CS    CD   R>CS   UR   DSET
```

❸ Push [DSET](F-5) to display the "DSET" screen.

```
DSET
              TXM  RP-L  SET
```

❹ Push [RP-L](F-4) to display the "RP-L" screen (Repeater list).

```
RP-L   Repeater  List
              CLR   ADD   EDT
```

❺ Push [EDT](F-5) to display the repeater list.

```
RP-L  ▸HAMACH43    SEL   GRP1
EDT               SEL   GRP
```

❻ Rotate [MAIN DIAL] to select the desired repeater to be changed.

```
RP-L  ▸KOUTOU43    SEL   GRP1
EDT               SEL   GRP
```

  • Hold down [GRP](F-5) for 1 second to enter the repeater group selection mode. ("▶" moves next to the repeater group name, and then blinks.)
    Rotate [MAIN DIAL] to select the desired group (0 to 9), then push [GRP](F-5).
    Or, you can select the repeater group using the keypad key.
  • "SEL" appears when "R1 USE" setting is set to "YES." The selected repeaters can be used as an access repeater (R1) in the DR mode, and are scanned during an access repeater scan.
    You can set the "SEL" setting by pushing [SEL](F-4).

2. Repeater data programming

❼ Push [EDT](F-1) to enter the repeater data programming mode.
❽ Push [▲](F-1) or [▼](F-2) to select the item to be changed.
❾ Program the selected item data. See pages 89–91 for new repeater list programming details.

```
RP-L   NAME:KOUTOU43
   ▲        ▼          EDT
```

NOTE: If you are reprogramming a repeater with its own gateway, you must also edit the gateway repeater call sign.

3. After programming

To add the programmed data as a new list:
⓾ Push [▼](F-2) to select the "ADD Write" item, then hold down [WR](F-5) for 1 second.
• "ADD Write OK?" appears.

| RP-L ADD Write |
| ▲ ▼   WR |

⓫ Hold down [YES](F-4) for 1 second to add a new list, and return to the "RP-L" screen.

| RP-L ADD Write OK? |
| ▲ ▼   YES   NO |

To overwrite the programmed data to the selected list:
⓾ Push [▼](F-2) to select "OVER Write" item, then hold down [WR](F-5) for 1 second.
• "OVER Write OK?" appears.

| RP-L OVER Write |
| ▲ ▼   WR |

⓫ Hold down [YES](F-4) for 1 second to overwrite to the selected list, and return to the "RP-L" screen.

| RP-L OVER Write OK? |
| ▲ ▼   YES   NO |

■ Clearing a repeater list

Contents of programmed list can be cleared (erased).

① Push [DV•DR] to select the DV mode.
② Push [MENU] one or more times to display the "M3" screen (Menu 3).

| M3 |
| CS   CD   R>CS   UR   DSET |

③ Push [DSET](F-5) to display the "DSET" screen.

| DSET |
| TXM RP-L SET |

④ Push [RP-L](F-4) to display the "RP-L" screen (Repeater list).

| RP-L Repeater List |
| CLR   ADD   EDT |

⑤ Push [CLR](F-3) to display the repeater list.
⑥ Rotate [MAINDIAL] to select the desired repeater list to be erased.
• Hold down [GRP](F-5) for 1 second to enter the repeater group selection mode. ("▶" moves next to the repeater group name, and then blinks.)
Rotate [MAIN DIAL] to select the desired group (0 to 9), then push [GRP](F-5).
Or, you can select the repeater group using the keypad key.
⑦ Hold down [CLR](F-1) for 1 second.
• "Clear OK?" appears.
⑧ Hold down [YES](F-4) to clear the selected list, and return to the "RP-L" screen.

7