ICOM

INSTRUCTION MANUAL

VHF/UHF DIGITAL TRANSCEIVER

# ID-800H


Icom Inc.

# FOREWORD

Thank you for purchasing this Icom product. The ID-800H VHF/UHF DIGITAL TRANSCEIVER is designed and built with Icom's state of the art technology and craftsmanship. With proper care, this product should provide you with years of trouble-free operation.

We want to take a couple of moments of your time to thank you for making your ID-800H your radio of choice, and hope you agree with Icom's philosophy of "technology first." Many hours of research and development went into the design of your ID-800H.

## ◇ *FEATURES*

- ❍ *DV mode (Digital voice + low-speed data communication) available*
  *– GPS receiver connection*
  *– Text message and call sign exchange*
- ❍ *Switchable VHF and UHF transceiver*
- ❍ *55 W*—high transmit output power*
  *VHF band; 50 W for UHF band
- ❍ *Detachable controller for flexible installation*
- ❍ *Large tuning dial and band switch button*
- ❍ *Selectable backlit color from amber, green and yellow*
- ❍ *Total 512 memory channels with bank link scan*
- ❍ *Remote control microphone standard*

# IMPORTANT

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

**SAVE THIS INSTRUCTION MANUAL—** This instruction manual contains important operating instructions for the ID-800H.



# EXPLICIT DEFINITIONS

| WORD | DEFINITION |
|---|---|
| ⚠ **WARNING!** | Personal injury, fire hazard or electric shock may occur. |
| **CAUTION** | Equipment damage may occur. |
| **NOTE** | Recommended for optimum use. No risk of personal injury, fire or electric shock. |

# PRECAUTIONS

⚠**WARNING RF EXPOSURE!** This device emits Radio Frequency (RF) energy. Extreme caution should be observed when operating this device. If you have any questions regarding RF exposure and safety standards please refer to the Federal Communications Commission Office of Engineering and Technology's report on Evaluating Compliance with FCC Guidelines for Human Radio frequency Electromagnetic Fields (OET Bulletin 65).

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

⚠**WARNING! NEVER** operate the transceiver while driving a vehicle. Safe driving requires your full attention—anything less may result in an accident.

**NEVER** connect the transceiver to a power source of more than 16 V DC. This will damage the transceiver.

**NEVER** connect the transceiver to a power source using reverse polarity. This will damage the transceiver.

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

**NEVER** expose the transceiver to rain, snow or any liquids. The transceiver may be damaged.

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

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

**NEVER** let objects impede the operation of the cooling fan on the rear panel.

**DO NOT** push the PTT when not actually desiring to transmit.

**DO NOT** allow children to play with any radio equipment containing a transmitter.

During mobile operation, **DO NOT** operate the transceiver without running the vehicle's engine. When the transceiver's power is ON and your vehicle's engine is OFF, the vehicle's battery will soon become exhausted.

**AVOID** using or placing the transceiver in direct sunlight or in areas with temperatures below –10°C (+14°F) or above +60°C (+140°F).

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

**AVOID** setting the transceiver in a place without adequate ventilation. Heat dissipation may be affected, and the transceiver may be damaged.

**AVOID** the use of chemical agents such as benzine or alcohol when cleaning, as they can damage the transceiver's surfaces.

**USE** Icom microphones only (supplied or optional). Other manufacturer's microphones have different pin assignments and may damage the transceiver if attached.

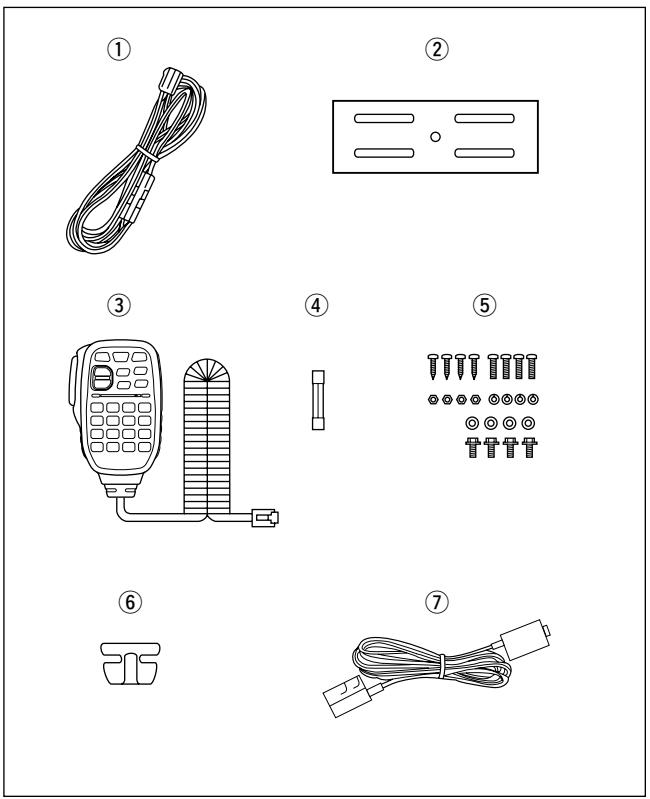
***For U.S.A. only***

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

# SUPPLIED ACCESSORIES

① DC power cable (3 m) .....1
② Mobile mounting bracket .....1
③ Microphone (HM-133)* .....1
④ Fuse (20 A) .....1
⑤ Mounting screws, nuts and washers .....1 set
⑥ Microphone hanger .....1
⑦ Separation cable† (3.5 m; 11.5 ft) .....1

*HM-118N HAND MICROPHONE supplied versions are also available.
†A ferrite core is adapted for the USA version.

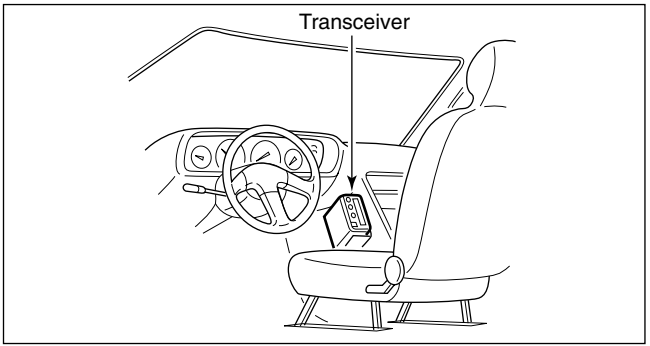


# TABLE OF CONTENTS

# ■ Installation

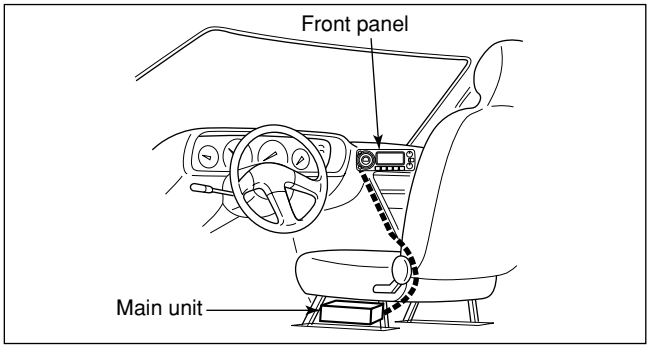
## ◇ Installation methods

***• Single body installation***




• The supplied mounting bracket (or optional MB-17A) can be used for the main unit installation.

***• Remote installation***




• The supplied OPC-600/R SEPARATION CABLE can be used for remote installation.
• Optional OPC-601/R SEPARATION CABLE (7 m; 23 ft) is available for extend installation.
• Optional MB-58 REMOTE CONTROLLER BRACKET and MB-65 MOUNTING BASE are available for increasing front panel mounting possibilities.
• Optional OPC-440 MICROPHONE CABLE (5.0 m; 16.4 ft) and OPC-647 (2.5 m; 8.2 ft) are available to extend the microphone cable.
• Optional OPC-441 SPEAKER CABLE (5.0 m; 16.4 ft) is available to extend the speaker cable.

## ◇ Location

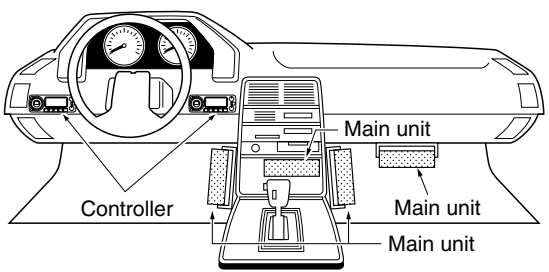
Select a location which can support the weight of the transceiver and does not interfere with driving. We recommend the locations shown in the diagram below.

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

**NEVER** place the transceiver or remote controller where air bag deployment may be obstructed.

**DO NOT** place the transceiver or remote controller where hot or cold air blows directly onto it.

**AVOID** placing the transceiver or remote controller in direct sunlight.

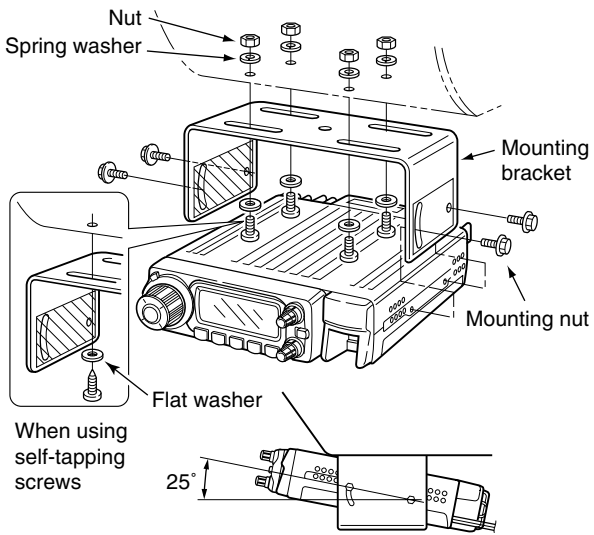



## ◇ Using the mounting bracket

①Drill 4 holes where the mounting bracket is to be installed.
- Approx. 5.5–6 mm (¼″) when using nuts; approx. 2–3 mm (⅛″) when using self-tapping screws.

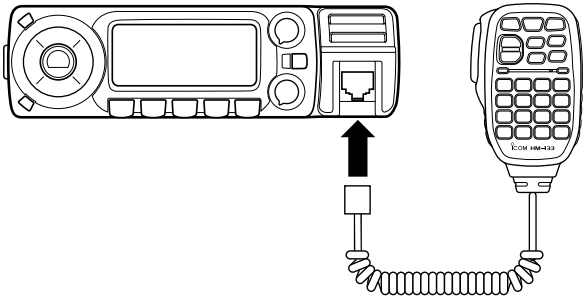
②Insert the supplied screws, nuts and washers through the mounting bracket and tighten.

③Adjust the angle for your suitable position.



## ◇ Microphone connection

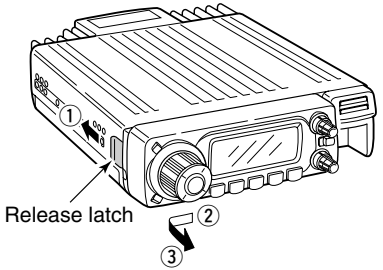
Connect the supplied microphone as illustrated below.



## ◇ Separation cable connection

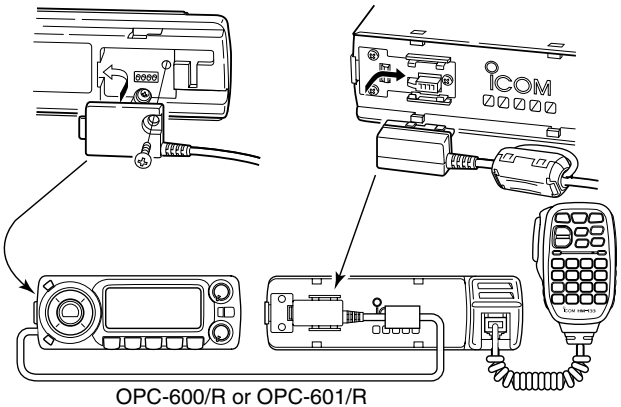
Using the supplied separation cable (3.5 m; 11.5 ft) or the optional separation cable (7 m; 23 ft), the controller can be separated from the main unit, doubling as a remote controller.

①Detach the controller as below.




②Connect a separation cable between the controller and main unit using the supplied screws as illustrated below.

**• Controller's rear panel** **• Main unit**

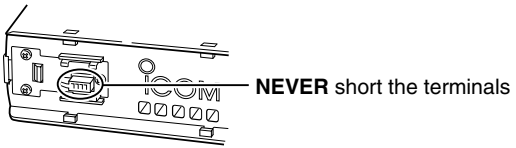


OPC-600/R or OPC-601/R

A ferrite core is adapted for the USA version.

**CAUTION!**

**NEVER** short the terminals of the separation connector. The 13.8 V power line is available in the connector, so the transceiver may damage when short circuited.



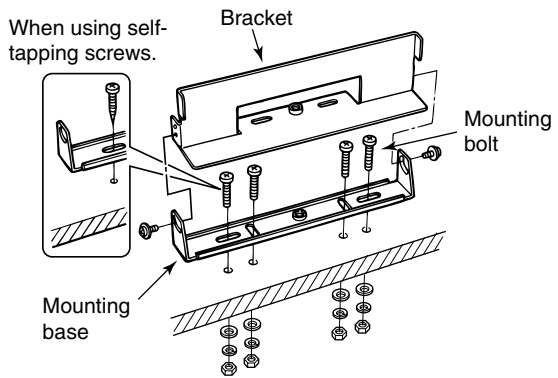
## ◇ Optional MB-58 installation

The optional MB-58 REMOTE CONTROLLER BRACKET is available for separate installation.

①Drill 2 or 4 holes where the bracket is to be installed.
- Approx. 4 mm (1/8″) when using nuts; approx. 1–2 mm (1/16″) when using self-tapping screws.

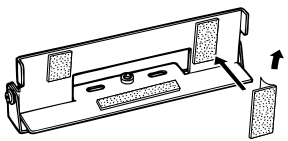
②Insert the supplied screws, bolts and washers through the mounting base and tighten.

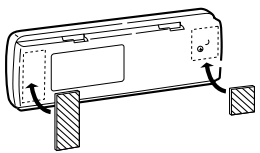
③Adjust the angle for the clearest view of the function display and tighten 2 screws when the mounting base is used.



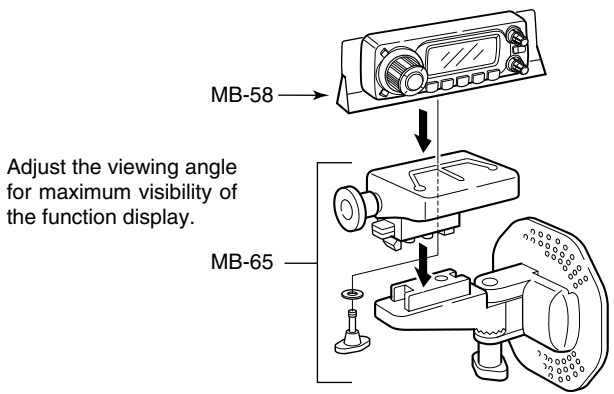

④Attach the supplied Velcro pads (large) to the remote controller and bracket.

⑤Attach the supplied Velcro pads (small) or rubber pad to the bracket as shown below; then attach the remote controller.


MB-58


ID-800H remote controller

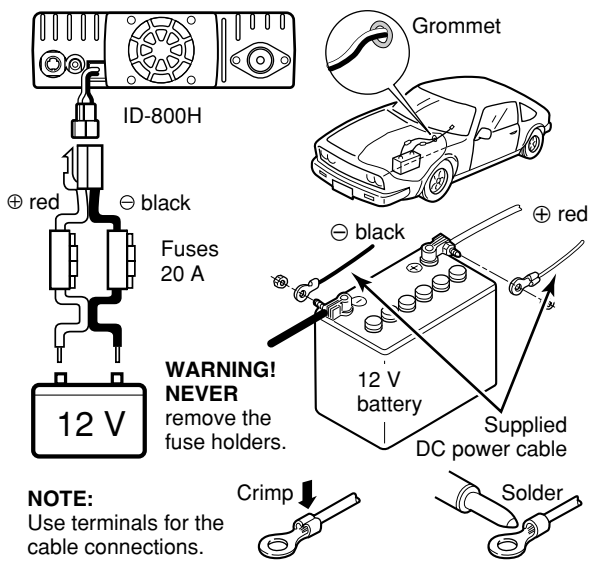
**• When using the optional MB-65**



## ◇ Battery connection

⚠**WARNING! NEVER** remove the fuse holders from the DC power cable.
**NEVER** connect the transceiver directly to a 24 V battery.
**DO NOT** use the cigarette lighter socket for power connections. (See p. 6 for details)
Attach a rubber grommet when passing the DC power cable through a metal plate to prevent a short circuit.

**• CONNECTING TO A DC POWER SOURCE**

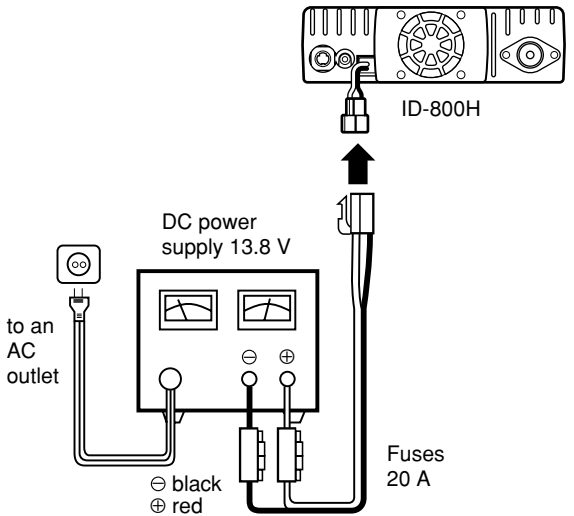



## ◇ DC power supply connection

Use a 13.8 V DC power supply with at least 15 A capacity.

Make sure the ground terminal of the DC power supply is grounded.

**• CONNECTING TO A DC POWER SUPPLY**

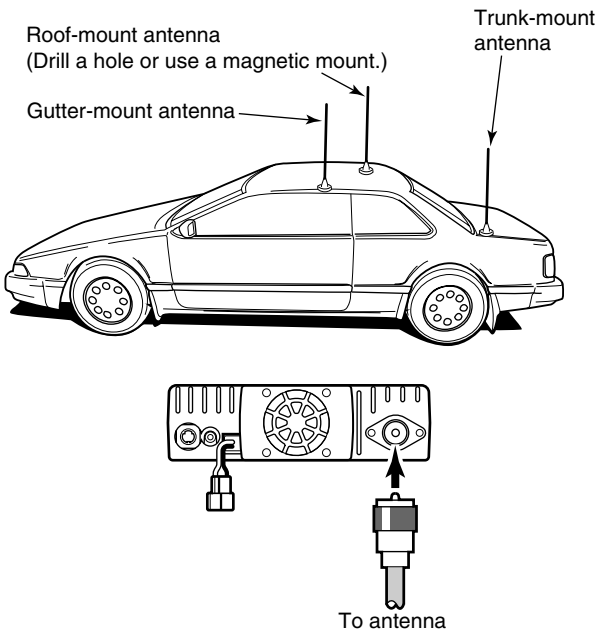



See p. 108 for fuse replacement.

## ◇ Antenna installation

**• Antenna location**

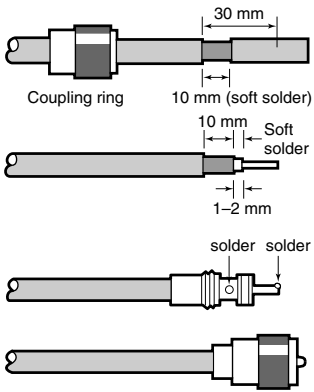
To obtain maximum performance from the transceiver, select a high-quality antenna and mount it in a good location. A non-radial antenna should be used when using a magnetic mount.




**• Antenna connector**

The antenna uses a PL-259 connector.

• PL-259 CONNECTOR




① Slide the coupling ring down. Strip the cable jacket and soft solder.

② Strip the cable as shown at left. Soft solder the center conductor.

③ Slide the connector body on and solder it.

④ Screw the coupling ring onto the connector body.

(10 mm ≈ 3⁄8 in)

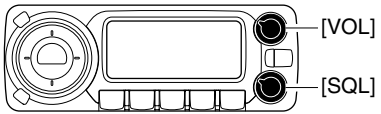
**NOTE:** There are many publications covering proper antennas and their installation. Check with your local dealer for more information and recommendations.

# ■ Your first contact

Now that you have your ID-800H installed in your car or shack, you are probably excited to get on the air. We would like to take you through a few basic operation steps to make your first “On The Air” an enjoyable experience.

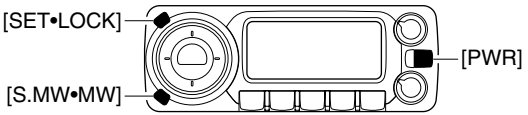
### 1. Turning ON the transceiver

Before powering up your ID-800H, you may want to make sure the audio volume and squelch level controls are set in 9–10 o’clock positions.




Although you have purchased a brand new transceiver, some settings may be changed from the factory defaults because of the quality control process. Resetting the CPU is necessary to start from factory default.

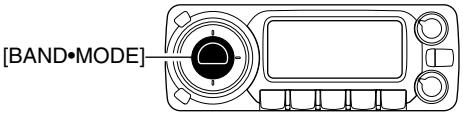
➥ While pushing both **[SET•LOCK]** and **[S.MW•MW]**, push and hold **[PWR]** for 1 sec. to reset the CPU.



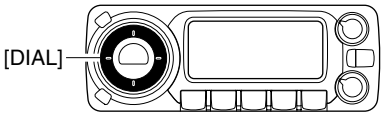

### 2. Selecting the operating frequency band

The ID-800H has 2 m and 70 cm transmittable bands.

➥ Push **[BAND•MODE]** momentarily to enter band selection mode.

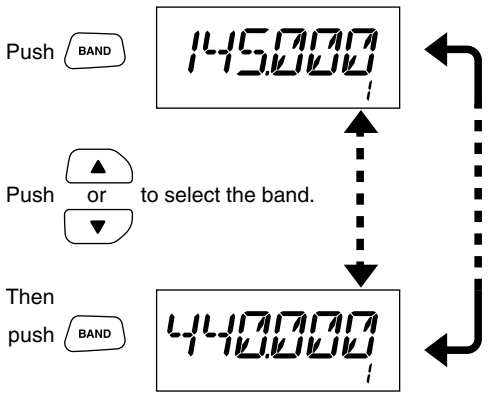



➥ Rotate **[DIAL]** to select the desired frequency band, then push **[BAND•MODE]** to set the selected band.



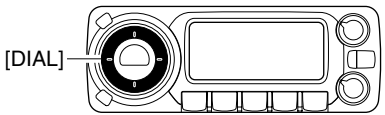
### *Using the HM-133*

You can select the desired frequency band from the HM-133.




## 3. Tune the frequency

The tuning dial will allow you to dial in the frequency you want to operate. Pages 12 and 13 will instruct you on how to adjust the tuning step size.

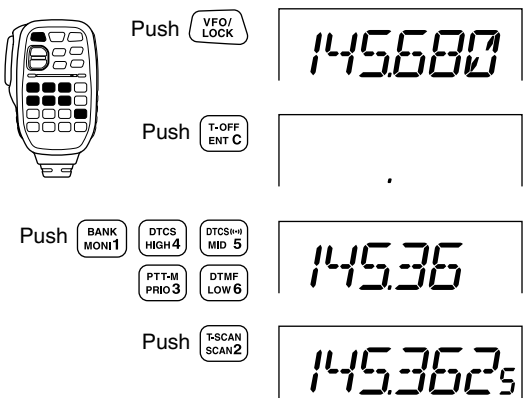



Rotate [DIAL] to tune to the frequency.

### *Using the HM-133*

You can directly enter the frequency with the HM-133 keypad for the main band.

**[EXAMPLE]:** Setting frequency to 145.3625 MHz.



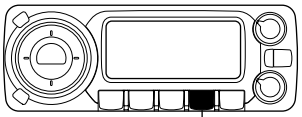
# ■ Repeater operation

### 1. Setting duplex

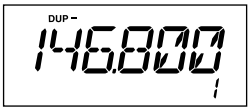
➥ Push **[BAND•MODE]** and rotate **[DIAL]**, then push **[BAND•MODE]** to select the desired frequency band.

➥ Push and hold **[LOW•DUP]** for 1 sec. once or twice to select minus duplex or plus duplex.

• The USA version has an auto repeater function, therefore, setting duplex is not required.

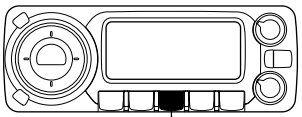


[LOW•DUP]

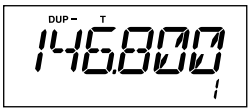



### 2. Repeater tone

Push **[TONE•T-SCAN]** several times until "T" appears, if the repeater requires a subaudible tone to be accessed.



[TONE•T-SCAN]

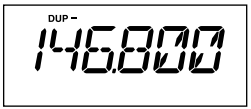



***Using the HM-133***

Plus or minus duplex selection and the repeater tone setting can be made easily via HM-133.

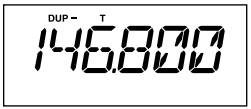
Push and hold **[DUP– 7(TONE)]** for minus duplex; **[DUP+ 8(TSQL ((•)) )]** for plus duplex selection, push **[FUNC]** then **[DUP– 7(TONE)]** to turn the repeater tone ON.

Push TONE DUP- 7




Push TSQL((•)) DUP+ 8


Push FUNC, then TONE DUP- 7



# ■ Programming memory channels

The ID-800H has a total of 512 memory channels (including 10 scan edges and 2 call channels) for storing often used operating frequency, repeater settings, etc.

### 1. Setting a frequency

In VFO mode, set the desired operating frequency with repeater, tone and tuning steps, etc.

➥ Push **[V/MHz•SCAN]** to select VFO.

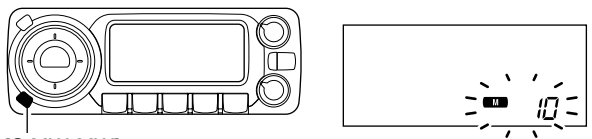
➥ Rotate **[DIAL]** to set the desired frequency.

• Set other data, such as repeater tone, duplex information, tuning step, if desired.

### 2. Selecting a memory channel

Push **[S.MW•MW]**, then rotate **[DIAL]** to select the desired memory channel.

• "M" indicator and memory channel number blink.




### 3. Writing a memory channel

Push and hold **[S.MW•MW]** for 1 sec. to program.

• 3 beeps sound

• Return to VFO mode automatically after the program.

• Memory channel number automatically increases when continuing to push **[S.MW•MW]** after programming.

### *Using the HM-133*

① In VFO mode, set the desired operating frequency, including offset direction, tone settings, etc.

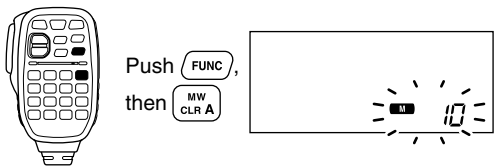
➥ Push **[VFO/LOCK]** to select VFO.

➥ Push **[ENT C(T-OFF)]** first, then enter the desired operating frequency via the keypad.

• Set other data, such as repeater tone, duplex information, tuning step, if necessary.

② Push **[FUNC]** then **[CLR A(MW)]**.

• "M" indicator and memory channel number blink.




③ Push **[▲]**/**[▼]** to select the desired memory channel.

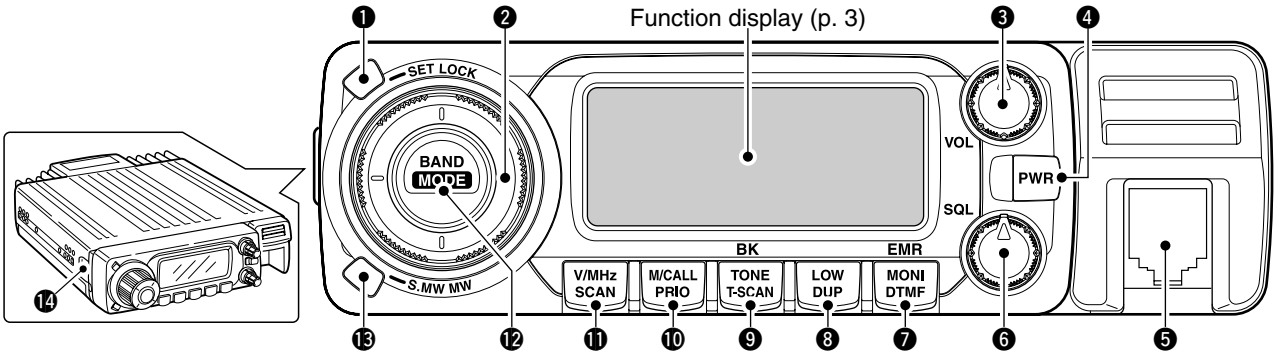
④ Push **[FUNC]** then push and hold **[CLR A(MW)]** for 1 sec. to program.

• 3 beeps sound

• Memory channel number automatically increases when continuing to push **[CLR A(MW)]** after programming.

# 1 PANEL DESCRIPTION

## ■ Front panel—controller




**❶SET•LOCK SWITCH [SET•LOCK]**

- ➥ Enters set mode when pushed. (p. 92)
- ➥ Switches the lock function ON and OFF when pushed and held for 1 sec. (p. 14)

**❷TUNING DIAL [DIAL]**

Selects the operating frequency (p. 12), memory channel (p. 28), the setting of the set mode item and the scanning direction (p. 43).

**❸VOLUME CONTROL [VOL]** (p. 16)

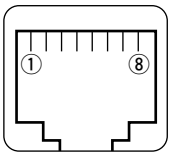
Adjusts the audio level.

**❹POWER SWITCH [PWR]**

Turns power ON and OFF when pushed and held for 1 sec.

**❺MICROPHONE CONNECTOR**

Connects the supplied or an optional microphone.




Front panel view

① +8 V DC output (Max. 10 mA)
② Channel up/down
③ 8 V control IN
④ PTT
⑤ GND (microphone ground)
⑥ MIC (microphone input)
⑦ GND
⑧ Data IN

**❻SQUELCH CONTROL [SQL]**

Varies the squelch level. (p. 16)

- The RF attenuator activates and increases the attenuation when rotated clockwise to the center position and further. (p. 17)

**❼MONITOR•DTMF•EMR SWITCH [MONI•DTMF•EMR]**

➥ Push to switch the monitor function ON and OFF. (p. 16)

❍ While in the analog (FM) mode operation

➥ Turns DTMF memory encoder ON and OFF when pushed and held for 1 sec. (p. 51)

❍ While in the digital (DV) mode operation

➥ Push and hold to turn the EMR function ON and OFF. (p. 87)

**❽OUTPUT POWER•DUPLEX SWITCH [LOW•DUP]**

➥ Each push changes the output power selection. (p. 19)

➥ Push and hold for 1 sec. to select DUP–, DUP+ and simplex operation. (p. 21)

**❾TONE•TONE SCAN•BREAK-IN SWITCH [TONE•T-SCAN•BK]**

❍ While in the analog (FM) mode operation

➥ Each push selects a tone function. (pgs. 21, 55)

• Subaudible tone encoder, pocket beep (CTCSS), tone squelch, pocket beep (DTCS), DTCS squelch or tone function OFF can be selected.

➥ Push and hold for 1 sec. to start the tone scan. (p. 59)

❍ While in the digital (DV) mode operation

➥ Each push selects a digital squelch function. (pgs. 85, 86)

• Pocket beep (DSQL), digital call sign squelch, pocket beep (CSQL), digital code squelch or digital squelch function OFF can be selected.

➥ Push and hold until 2 short and 2 long beeps sound to turn the break-in function ON. (p. 84)

**❿MEMORY/CALL•PRIORITY SWITCH [M/CALL•PRIO]**

➥ Push to select and toggle memory, call and weather channel* modes. (pgs. 11, 28, 40, 111)

*Weather channels are available for USA version only.

➥ Starts priority watch when pushed and held for 1 sec. (p. 50)

**⓫VFO/MHz TUNING•SCAN SWITCH [V/MHz•SCAN]**

➥ Selects and toggles VFO mode and 1 MHz (or 10 MHz for some versions) tuning when pushed. (pgs. 11, 12)

➥ Starts scan when pushed and held for 1 sec. (p. 43)

• Cancels a scan when pushed during scan.

**⓬BAND•MODE SWITCH [BAND•MODE]**

➥ While VFO operation, push to select the operating frequency band. (p. 11)

➥ While call channel operation, push to select the call channel 1or 2 during call channel operation. (p. 40)

➥ While memory channel operation, push to select memory bank condition. (p. 37)

➥ Push and hold for 1 sec. and rotate **[DIAL]** to select the operating mode. (p. 15)

**⓭MEMORY WRITE SWITCH [S.MW•MW]** (pgs. 29, 41, 45)

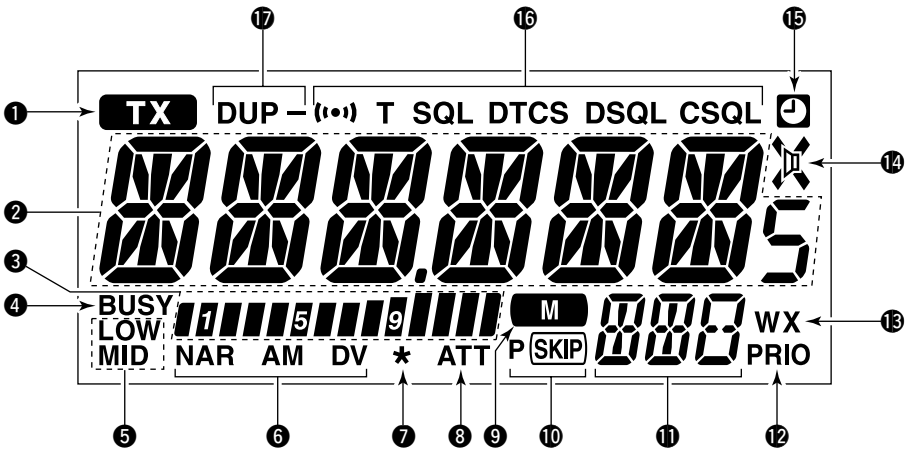
➥ Selects a memory channel for programming when pushed.

➥ Programs the selected memory channel when pushed and held for 1 sec.

**⓮CONTROLLER RELEASE LATCH**

While pushing this latch, slide the controller to the left to remove it.

## ■ Function display




**❶TRANSMIT INDICATOR**
- ➥ Appears while transmitting. (p. 18)
- ➥ Blinks while transmitting with the one-touch PTT function. (p. 19)

**❷FREQUENCY READOUT**

Shows the operating frequency, channel names, set mode contents, call signs, message, and etc.
- Frequency decimal point blinks while scanning. (p. 43)
- "d" appears in place of the 1st digit while the DTMF memory function is in use. (p. 51)

**❸S/RF INDICATORS**
- ➥ Shows the relative signal strength while receiving signals. (p. 16)
- ➥ Shows the output power level while transmitting. (p. 19)

**❹BUSY INDICATOR**
- ➥ Appears when a signal is being received or the squelch is open. (p. 16)
- ➥ Blinks while the monitor function is activated. (p. 16)

**❺OUTPUT POWER INDICATORS** (p. 19)
- ➥ "LOW" appears when low output power is selected.
- ➥ "MID" appears when middle output power is selected.
- ➥ No indicator appears when high output power is selected.

**❻MODE INDICATORS** (p. 15)
- ➥ "AM" appears while in the AM mode operation.
- ➥ "NAR" appears while in the FM/AM narrow mode operation.
- ➥ "DV" appears while in the digital mode operation.
- ➥ No indication appears while in the FM mode operation.
  - Blinking all indication indicates the FM mode selection while setting.

**❼DIGITAL MESSAGE INDICATOR** (p. 83)

Blinks when a digital message is received.
- The indication disappears when any key is pushed.

**❽SQUELCH ATTENUATOR INDICATOR** (p. 17)

Appears when the squelch attenuator function is activated.
- The attenuator can be switched OFF in initial set mode. (p. 104)

**❾MEMORY INDICATOR** (pgs. 11, 28)

Appears when memory mode is selected.

**❿SKIP INDICATORS** (p. 47)
- ➥ "(SKIP)" appears when the displayed memory channel is specified as a skip channel.
- ➥ "P (SKIP)" appears when the displayed frequency is specified as a program skip frequency.

**⓫MEMORY CHANNEL NUMBER INDICATORS**
- ➥ Shows the selected memory channel number. (p. 28)
- ➥ Shows the selected bank initial. (p. 37)
- ➥ "C" appears when the call channel is selected. (p. 40)
- ➥ "L" appears when the lock function is activated. (p. 14)

**⓬PRIORITY INDICATOR** (p. 50)

Appears while priority watch is activated; blinks while the watch is paused.

**⓭WEATHER ALERT INDICATOR** (p. 111)

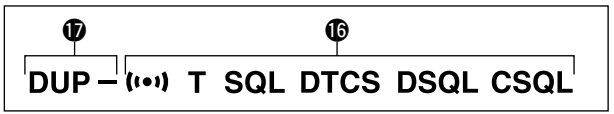
Appears when the weather alert function is activated.
- The either alert function is available with the USA version only.

**⓮AUDIO MUTE INDICATOR** (p. 18)

Appears when the audio mute function is activated.
- The mute can only be switched ON and OFF from the HM-133 only.

**⓯AUTO POWER-OFF INDICATOR** (p. 107)

Appears while the auto power OFF function is in use.




**⓰TONE/DIGITAL SQUELCH INDICATORS**

❍ While in the analog (FM) mode operation

➥ "T" appears while the subaudible tone encoder is in use. (p. 21)

➥ "T SQL" appears while the tone squelch function is in use. (p. 55)

➥ "DTCS" appears while the DTCS squelch function is in use. (p. 55)

➥ "((•))" appears with the "T SQL" or "DTCS" indicator while the pocket beep function (with CTCSS or DTCS) is in use. (p. 55)

❍ While in the digital (DV) mode operation

➥ "DSQL" appears while the digital call sign squelch function is in use. (p. 86)

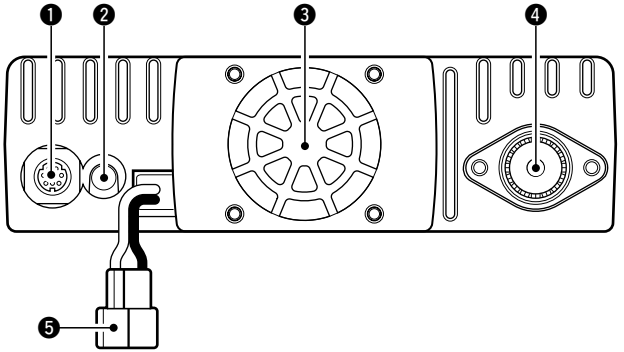
➥ "CSQL" appears while the digital code squelch function is in use. (p. 86)

➥ "((•))" appears with the "DSQL" or "CSQL" indicator while the pocket beep function (with DSQL or CSQL) is in use. (p. 85)

**⓱DUPLEX INDICATORS** (p. 21)

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

## ■ Rear Panel




**❶DATA SOCKET [DATA]**

Connects a TNC (Terminal Node Controller), etc. for data communications.

• See p. 6 for connection information.

**❷EXTERNAL SPEAKER JACK [SP]**

Connects an 8 Ω speaker.

• Audio output power is more than 2.0 W.

**❸COOLING FAN**

Rotates while transmitting.

Also rotates while receiving depending on the setting in initial set mode. (p. 107)

**❹ANTENNA CONNECTOR [ANT]**

Connects a 50 Ω antenna with a PL-259 connector and a 50 Ω coaxial cable.

**ANTENNA INFORMATION**

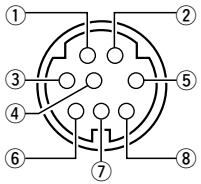
For radio communications, the antenna is of critical importance, to maximize your output power and receiver sensitivity. The transceiver accepts a 50 Ω antenna and less than 1:1.5 of Voltage Standing Wave Ratio (VSWR). High SWR values not only may damage the transceiver but also lead to TVI or BCI problems.

**❺POWER RECEPTACLE [DC13.8V]**

Accepts 13.8 V DC ±15% with the supplied DC power cable.

**NOTE: DO NOT** use a cigarette lighter socket as a power source when operating in a vehicle. The plug may cause voltage drops and ignition noise may be superimposed onto transmit or receive audio.

## ◇DATA socket Pin assignment



Rear panel view

①DATA IN
Input terminal for data transmit. See p. 100 for details on how to toggle data speed between 1200 (AFSK) and 9600 bps (G3RUH, GMSK).

②GND
Common ground for DATA IN, DATA OUT and AF OUT.

③PTT P
PTT terminal for packet operation only. Connect ground to transmit data.

④RS232 OUT
Data out terminal for RS232 connection (GPS operation).

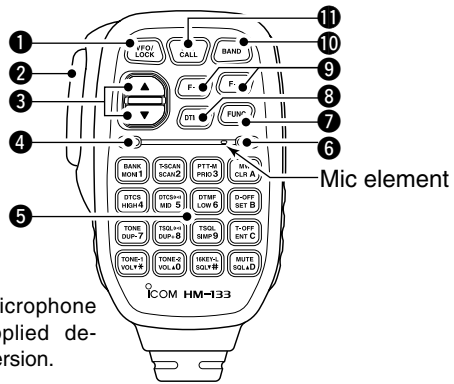
⑤DATA OUT
Data out terminal for 9600 bps operation only.

⑥AF OUT
Data out terminal for 1200 bps operation only.

⑦RS232 IN
Input terminal for RS232 input.

⑧P SQL
Becomes high (+5 V) when the transceiver receives a signal which opens the squelch.
- To avoid unnecessary TNC transmission, connect squelch to the TNC to inhibit transmission when receiving signals.
- Keep audio output at a normal level, otherwise a “P SQL” signal will not be output.

# ■ Microphone (HM-133*)




*A different microphone may be supplied depending on version.

**❶VFO/LOCK SWITCH [VFO/LOCK]**
- ➥ Push to select VFO mode. (p. 11)
- ➥ Push and hold for 1 sec. to switch the lock function ON and OFF. (p. 14)

**❷PTT SWITCH**
- ➥ Push and hold to transmit; release to receive.
- ➥ Switches between transmitting and receiving while the one-touch PTT function is in use. (p. 19)

**❸UP/DOWN SWITCHES [▲]/[▼]**
- ➥ Push either switch to change operating frequency, memory channel, set mode setting, etc. (pgs. 12, 28, 92)
- ➥ Push and hold either switch for 1 sec. to start scanning. (p. 44)

**❹ACTIVITY INDICATOR**
- ➥ Lights red while any key, except **[FUNC]** and **[DTMF-S]**, is pushed, or while transmitting.
- ➥ Lights green while the one-touch PTT function is in use.

**❺KEYPAD** (pgs. 8, 9)

**❻FUNCTION INDICATOR**
- ➥ Lights orange while **[FUNC]** is activated—indicates the secondary function of switches can be accessed.
- ➥ Lights green when **[DTMF-S]** is activated—DTMF signals can be transmitted with the keypad.

**❼2nd FUNCTION SWITCH [FUNC]**

**❽DTMF SELECT SWITCH [DTMF-S]** (p. 53)

**❾FUNCTION SWITCHES [F-1]/[F-2]** (p. 115)
Program and recall your desired transceiver conditions.

**❿BAND SWITCH [BAND]**
- ➥ Push to enter the band selection mode and then push **[▲]**/**[▼]** to select the frequency band. (p. 11)
- ➥ Push and hold for 1 sec. and then push **[▲]**/**[▼]** to select the operating mode. (p. 15)

**⓫MEMORY/CALL SWITCH [MR/CALL]**
- ➥ Push to select memory mode. (p. 11)
- ➥ Push and hold for 1 sec. to select call channel. (p. 40)

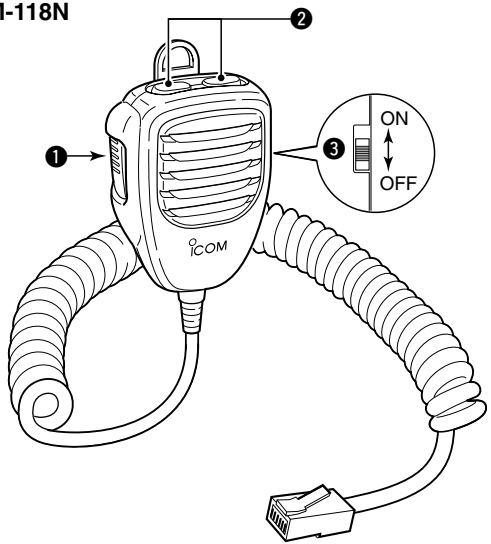
## ■ Microphone keypad

| KEY | FUNCTION | SECONDARY FUNCTION ( FUNC +key) | OTHER FUNCTIONS |
|---|---|---|---|
| BANK MONI 1 | Switches between opening and closing the squelch. (p. 16) | In memory mode enters bank selecting condition. (p. 37) | After pushing DTMF-S: Transmits the appropriate DTMF code. (pgs. 25, 53) When the DTMF memory encoder is activated, push [0] to [9] to transmit the appropriate DTMF memory contents. (p. 53) |
| T-SCAN SCAN 2 | Starts and stops scanning. (p. 44) | Starts and stops tone scanning. (p. 59) | |
| PTT-M PRIO 3 | Starts and stops priority watch. (p. 50) | Turns the one-touch PTT function ON and OFF. (p. 19) | |
| DTCS HIGH 4 | Selects high output power. (p. 19) | Turns the DTCS squelch ON. (p. 58) | |
| DTCS MID 5 | Selects mid. output power. (p. 19) | Turns the DTCS pocket beep function ON. (p. 56) | |
| DTMF LOW 6 | Selects low output power (p. 19) | Turns the DTMF memory encoder function ON. (p. 53) | |
| TONE DUP- 7 | Selects minus duplex operation. (p. 22) | Turns the subaudible tone encoder ON. (p. 22) | |
| TSQL DUP+ 8 | Selects plus duplex operation. (p. 22) | Turns the CTCSS pocket beep function ON. (p. 56) | |
| TSQL SIMP 9 | Selects simplex operation. (p. 22) | Turns the tone squelch function ON. (p. 58) | |
| TONE-2 VOL▲ 0 | Increases audio output level. (p. 16) | Sends a 1750 Hz tone signal while pushing and holding. (p. 25) | |

| KEY | FUNCTION | SECONDARY FUNCTION ( FUNC +key) | OTHER FUNCTIONS |
|---|---|---|---|
| MW CLR A | ➥ Cancels frequency entry. (p. 12)<br>➥ Cancels the scan or priority watch. (pgs. 44, 50)<br>➥ Exit set mode. (p. 92) | ➥ Selects a memory channel for programming. (p. 30)<br>➥ Advances the memory channel number when continuously pushed after programming is completed. (p. 30) | After pushing DTMF-S: Transmits the appropriate DTMF code. (pgs. 25, 53) |
| D-OFF SET B | ➥ Enters set mode (p. 92)<br>➥ Advances the set mode selection order after entering set mode. (p. 92) | DTMF memory encoder function OFF. (p. 53) | |
| T-OFF ENT C | ➥ Sets the keypad for numeral input. (p. 12)<br>➥ Reverses the set mode selection order after entering set mode. (p. 92) | Turns the subaudible tone encoder, pocket beep or CTCSS/DTCS tone squelch OFF. (pgs. 22, 56) | |
| MUTE SQL▲D | Adjusts the squelch level increments. (p. 16) | Mutes the audio. (p. 18)<br>• Mute function is released when any operation is performed. | |
| TONE-1 VOL▼∗ | Decreases audio output level. (p. 16) | Sends a 1750 Hz tone signal for 0.5 sec. (p. 25) | |
| 16KEY-L SQL▼# | Adjusts the squelch level decrement. (p. 16) | Locks the digit keys on the keypad (including the A to D, # and ∗ keys). (p. 14) | |

# ■ Optional Microphone (HM-118N)

**• HM-118N**




**❶PTT SWITCH**
Push and hold to transmit; release to receive.

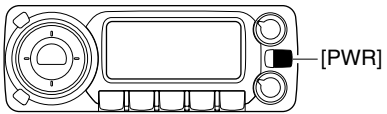
**❷UP/DOWN SWITCHES [UP]/[DN]**
- ➥ Push either switch to change operating frequency, memory channel, set mode setting, etc. (pgs. 12, 28, 92)
- ➥ Push and hold either switch for 1 sec. to start scanning. (p. 44)

**❸UP/DN LOCK SWITCH**
Slide to toggle **[UP]/[DN]** switches function ON and OFF.

# 2 SETTING A FREQUENCY

## ■ Preparation

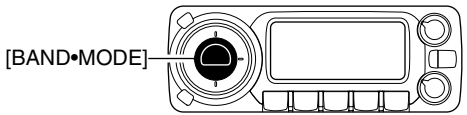
### ◇ Turning power ON/OFF




➥ Push and hold **[PWR]** for 1 sec. to turn power ON and OFF.

### ◇ Operating frequency band selection

The ID-800H has 2 m and 70 cm bands for transmission and reception. In addition, extra frequency bands 127, 220, 350, 500 and 900 MHz bands are available for wide-band receiver capability (except Taiwan and Korean version).



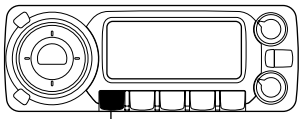

➥ Push **[BAND•MODE]** and rotate **[DIAL]**, then push **[BAND•MODE]** to select the desired frequency band.

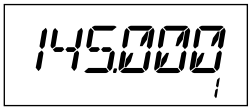

➥ Push **[BAND]** and **[▲]/[▼]**, then push **[BAND]** to select the desired band.

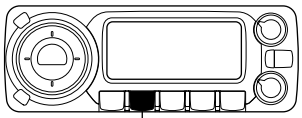
Note that in this manual, sections beginning with a microphone icon (as above), designate operation via the HM-133 microphone.

### ◇ VFO and memory modes

The transceiver has 2 basic operating modes: VFO mode and memory mode. Select VFO mode first to set an operating frequency.





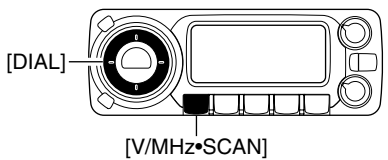
➥ Push **[V/MHz•SCAN]** to select VFO mode.
- When VFO mode is already selected, the digit below 10 MHz (the digit below 1 MHz or 100 kHz disappear depending on versions) disappear. In this case, push **[V/MHz•SCAN]** again (or twice or 3 times depending on version).

➥ Push **[M/CALL•PRIO]** to select memory mode.
- "M" indicator appears when memory mode is selected.


➥ Push **[VFO/LOCK]** to select VFO mode.
➥ Push **[MR/CALL]** to select memory mode.

## ■ Using the tuning dial

①Rotate **[DIAL]** to set the frequency.
- If VFO mode is not selected, push **[V/MHz•SCAN]** to select VFO mode.
- The frequency changes in the selected tuning steps. (p. 13)




②To change the frequency in 1 MHz (10 MHz for some versions) steps, push **[V/MHz•SCAN]**, then rotate **[DIAL]**.
- Pushing and holding **[V/MHz•SCAN]** for 1 sec. starts scan function. If scan starts, push **[V/MHz•SCAN]** again to cancel it.


While 1 MHz tuning step is selected, the digit below 100 kHz disappear.

While 10 MHz tuning step is selected, the digit below 1 MHz disappear.

## ■ Using the [▲]/[▼] keys


➥ Push **[▲]** or **[▼]** to select the desired frequency.
- Pushing and holding **[▲]**/**[▼]** for 1 sec. activates a scan. If scan starts, push **[▲]**/**[▼]** or **[CLR A(MW)]** to cancel it.

## ■ Using the keypad

The frequency can be directly set via numeral keys on the microphone.


1 Push **[VFO/LOCK]** to select VFO mode, if necessary.
2 Push **[ENT C(T-OFF)]** to activate the keypad for digit input.
3 Push 6 keys to input a frequency.
- When a digit is mistakenly input, push **[ENT C(T-OFF)]** to clear the input, then repeat input from the 1st digit.
- Pushing **[CLR A(MW)]** clears input digits and retrieves the frequency.

**[EXAMPLE]:** Setting frequency to 145.3625 MHz.

Push VFO/LOCK — 145.680

Push T-OFF ENT C — .

Push BANK MONI 1, DTCS HIGH 4, DTCS MID 5, PT-M PRIO 3, DTMF LOW 6 — 145.36

Push T-SCAN SCAN 2 — 145.3625

## ■ Tuning step selection

USING *SET MODE*

Tuning steps are the minimum frequency change increments when you rotate **[DIAL]** or push **[▲]**/[▼] on the microphone. Independent tuning step for each frequency bands can be set for individual tuning convenience. The following tuning steps are available.

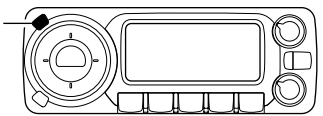
| | | | |
|---|---|---|---|
| • 5 kHz* | • 6.25 kHz* | • 10 kHz | • 12.5 kHz |
| • 15 kHz | • 20 kHz | • 25 kHz | • 30 kHz |
| • 50 kHz | • 100 kHz | • 200 kHz | |

*Not selectable in 900 MHz band.

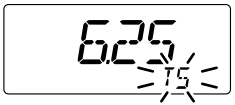
**NOTE:** For convenience, select a tuning step that matches the frequency intervals of repeaters in your area.

①Push **[BAND•MODE]** and rotate **[DIAL]**, then push **[BAND•MODE]** to select the desired frequency band.
- Push **[V/MHz•SCAN]** to select VFO mode, if necessary.

②Push **[SET•LOCK]** to enter set mode.
- Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.




③Push **[SET•LOCK]** or **[S.MW•MW]** several times until "TS" appears as shown below.




④Rotate **[DIAL]** to select the desired tuning step.
⑤Push any key below the display to exit set mode.

SET
B

1 Push **[BAND]** and **[▲]/[▼]**, then push **[BAND]** to select the desired frequency band.
- Push **[VFO/LOCK]** to VFO mode, if necessary.

2 Push **[SET B(D-OFF)]** to enter set mode.
- Push **[▲]** or **[▼]** to select "SET," if necessary.

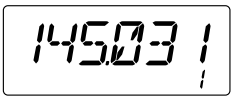
3 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "TS" appears.

4 Push **[▲]** or **[▼]** to select the desired tuning step.

5 Push **[CLR A(MW)]** to exit set mode.

**NOTE:** During the "6.25 kHz" tuning step selection, the operating frequency indication below 1 kHz, 0.25 kHz and 0.75 kHz indications, won't be displayed on the function display.

**Indication example;**
When 145.03125 MHz is set.

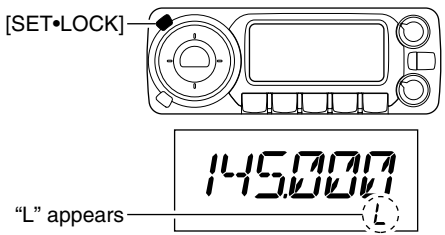


# ■ Lock functions

To prevent accidental frequency changes and unnecessary function access, use the lock function. The transceiver has 2 different lock functions.

## ◇ Frequency lock

This function locks **[DIAL]** and switches electronically and can be used together with the microphone lock function.




➥ Push and hold **[SET•LOCK]** for 1 sec. to turn the lock function ON and OFF.
- **[PTT]**, **[MONI•DTMF]** (monitor function only), **[VOL]** and **[SQL]** can be used while the channel lock function is in use. Also, TONE-1, TONE-2, DTMF tones or DTMF memory contents can be transmitted from the microphone.


➥ Push and hold **[VFO/LOCK]** for 1 sec. to switch the lock function ON and OFF.

## ◇ Microphone keypad lock

This function locks the microphone keypad.


➥ Push **[FUNC]** then **[SQL▼ #(16KEY-L)]** to switch the microphone keypad lock function ON and OFF.
- **[PTT]**, **[VFO/LOCK]**, **[MR/CALL]**, **[BAND]**, **[▲]**, **[▼]**, **[F-1]**, **[F-2]** and **[FUNC]** on the microphone can be used.
- All switches on the transceiver can be used.

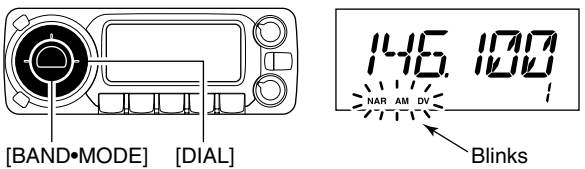
## ■ Mode selection

The ID-800H has several operating modes, FM/FM narrow modes, DV mode and AM/AM narrow modes (AM mode is reception only) are available. Typically, AM mode is used for the air band (118–135.995 MHz).

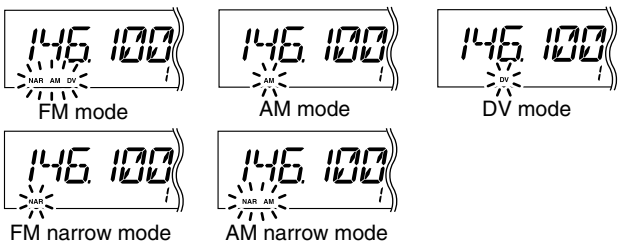
①Select the desired frequency band in VFO mode, or the desired memory channel.

②Push and hold **[BAND•MODE]** for 1 sec. then rotate **[DIAL]** to select the desired operating mode.

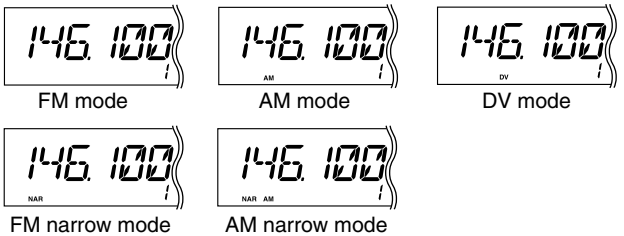
- "NAR" (FM narrow), "AM," "NAR AM" and "DV" appears in sequence.
- All indications blink for FM mode selection and no indication stands for FM mode operation.




**• Mode indication while selection**




**• Mode indication while operation**




BAND

1 Push **[BAND]** or **[MR/CALL]** to select the desired frequency band or memory channel.

2 Push and hold **[BAND]** for 1 sec. then push **[▲]/[▼]** to select the desired operating mode.

- "NAR," "AM," "NAR AM" and "DV" appears in sequence.
- All indications blink for FM mode selection and no indication stands for FM mode.

**NOTE:** Digital (DV) mode operation is described at section 11. See p. 60 for details.

## ■ Receiving

①Set the audio level.
- ➥ Push **[MONI•DTMF]** to open the squelch.
- ➥ Rotate **[VOL]** to adjust the audio level.
- ➥ Push **[MONI•DTMF]** to close the squelch.

②Set the squelch level.
- ➥ Rotate **[SQL]** fully counterclockwise in advance, then rotate **[SQL]** clockwise until the noise just disappears.
  - When interference is received, rotate **[SQL]** clockwise again for attenuator operation. (p. 17)

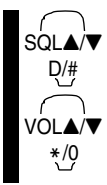
③Set the operating frequency. (pgs. 11, 12)

④When receiving a signal on the set frequency, squelch opens and the transceiver emits audio.

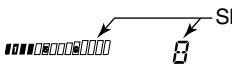

Appears when receiving a signal

- "BUSY" appears and the S/RF indicator shows the relative signal strength for the received signal.

***✔CONVENIENT!***

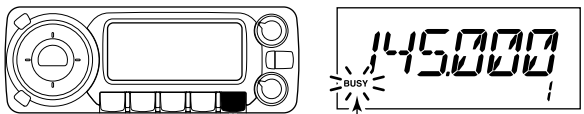



The audio and squelch level can also be adjusted with **[VOL▲(TONE-1)]**/**[VOL▼ 0(TONE-2)]** and **[SQL▲ D(MUTE)]**/**[SQL▼ #(16KEY-L)]**, respectively.
- "VOL" for audio or "SQL" for squelch appears during set.




## ■ Monitor function

This function is used to listen to weak signals without disturbing the squelch setting.




➥ Push **[MONI•DTMF]** to open the squelch.
- "BUSY" blinks.
- Push **[MONI•DTMF]** again to cancel the function.

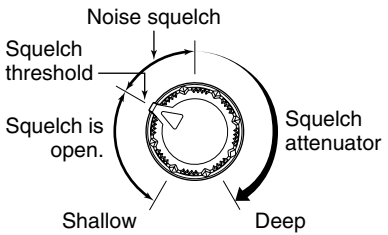

➥ Push **[MONI 1(BANK)]** to open the squelch.
- Push **[MONI 1(BANK)]** again to cancel the function.

**NOTE:** When **[SQL]** adjustment is set too far clockwise, (12–17 o'clock position) the squelch attenuator is activated. To monitor weak signals on the operating frequency, deactivate the squelch attenuator function. See p. 17 for details.

# ■ Squelch attenuator

The transceiver has an RF attenuator related to the squelch level setting. Approx. 10 dB attenuation is obtained at maximum setting.
The squelch attenuator allows you to set a minimum signal level needed to open the squelch. The attenuator function can be deactivated in initial set mode.

➥ Rotate **[SQL]** clockwise past the 12 o'clock position to activate the squelch attenuator.
- "ATT" appears when the squelch attenuator is activated.
- Attenuation level can be adjusted up to 10 dB (approx.) between 12 o'clock and fully clockwise position.
- When setting the squelch from the microphone, a level greater than '19' activates the squelch attenuator.

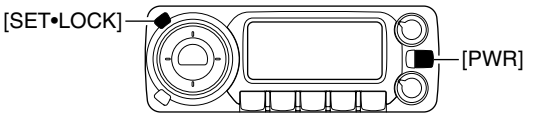



**NOTE:** The squelch attenuator functions even when the monitor function is in use. Thus set **[SQL]** control within 10 to 12 o'clock position is recommended when using the monitor function.

*USING INITIAL SET MODE*

## ◇ Squelch attenuator setting

①Turn the transceiver power OFF.
②While pushing **[SET•LOCK]**, turn the power ON to enter initial set mode.




③Push **[SET•LOCK]** or **[S.MW•MW]** to select "ATT" (squelch attenuator) item.
④Rotate **[DIAL]** to toggle the function ON and OFF.
- Select "OF" to deactivate the squelch attenuator function.



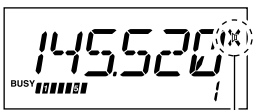
⑤Push **[PWR]** to exit initial set mode.

## ■ Audio mute function

This function temporarily mutes the audio without disturbing the volume setting.

MUTE

➥ Push **[FUNC]** then **[SQL▲ D(MUTE)]** to mute audio signals.
- The audio mute indicator, "🔇" appears.
- Push **[CLR A(MW)]** (or any other key) to cancel the function.




Appears

## ■ Transmitting

**CAUTION:** Transmitting without an antenna will damage the transceiver.

**NOTE:** To prevent interference, listen on the channel before transmitting by pushing **[MONI•DTMF]** on the front panel or **[MONI 1(BANK)]** on the microphone.

① Select the frequency band. (p. 11)
② Set the operating frequency. (pgs. 11, 12)
- Select output power if desired. See p. 19 for details.

③ Push and hold **[PTT]** to transmit.
- "TX" appears.
- The S/RF indicator shows the output power selection.
- A one-touch PTT function is available. See p. 19 for details.

④ Speak into the microphone using your normal voice level.
- DO NOT hold the microphone too close to your mouth or speak too loudly. This may distort the signal.

⑤ Release **[PTT]** to return to receive.

***IMPORTANT!*** *(for 55/50 W transmission)**:***
The ID-800H is equipped with a current detector circuit to protect the power amplifier circuit from high current flowing. When a high SWR (Standing wave Ratio) antenna or no antenna is connected, or when the connected power supply's voltage includes, the transceiver reduces transmit output power to 10–20 W (approx.) automatically.

## ■ Selecting output power

The transceiver has 3 output power levels to suit your operating requirements. Low output powers during short-distance communications may reduce the possibility of interference to other stations and will reduce current consumption.

➥ Push **[LOW•DUP]** once or twice to select the output power.

| S/RF INDICATOR | POWER OUTPUT | |
|---|---|---|
| | VHF | UHF |
| High: ▮▮▮▮▮ | 55 W | 50 W |
| Mid: ▮▮▮▮ | 15 W* | 15 W* |
| Low: ▮▮▮ | 5 W* | 5 W* |

*approx

• The output power can be changed while transmitting.

The microphone can also be used to select output power.

HIGH 4
MID 5
LOW 6

➥ Push **[HIGH 4(DTCS)]** for high output power; **[MID 5(DTCS ((•)))]** for middle output power; and **[LOW 6(DTMF)]** for low output power.
• The output power can be changed via the microphone during receive only.

## ■ One-touch PTT function

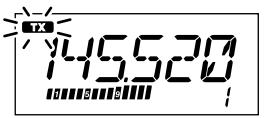
The PTT switch can be operated as a one-touch PTT switch (each push toggles between transmit/receive). Using this function you can transmit without pushing and holding the PTT switch.

To prevent accidental, continuous transmission with this function, the transceiver has a time-out timer. See p. 106 for details.

PTT-M

1 Push **[FUNC]** then **[PRIO 3(PTT-M)]** to turn the one-touch PTT function ON.
• The activity indicator lights green.

2 Push **[PTT]** to transmit and push again to receive.
• A beep sounds when transmission is started and a long beep sounds when returning to receive.
• "TX" blinks when transmitting with the one-touch PTT function.




TX indicator blinks

3 Push **[FUNC]** then **[PRIO 3(PTT-M)]** to turn the one-touch PTT function OFF.
• The activity indicator goes out.

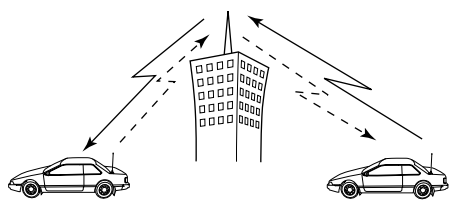
## ■ General

Repeaters allow you to extend the operational range of your radio because a repeater has much higher output power than the typical transceiver.

Normally, a repeater has independent frequencies for each receiver and transmitter.
A subaudible tone may also be required to access a repeater.

Reference amateur radio hand books and local ham magazines for details of local repeaters such as repeater input/output frequencies and locations.

**Repeater example;**
Receives the 444.540 MHz signal and the detected audio signals are transmitted on 449.540 MHz simultaneously.



Station A:
Tx: 444.540 MHz
Rx: 449.540 MHz

Station B:
Tx: 444.540 MHz
Rx: 449.540 MHz

**• Repeater operation flow chart**

***Step 1:***
Set the desired band to operate the repeater.

↓

***Step 2:***
Set the desired receive frequency (repeater output frequency).

↓

***Step 3:***
Set the duplex (shifting) direction (– duplex or +duplex).
- Set the offset frequency (shifting value), if required.

↓

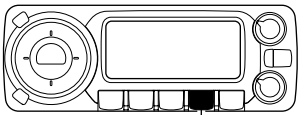
***Step 4:***
Set the subaudible tone (repeater tone) encoder function ON.
- Set the subaudible tone frequency, if required.

• The ID-800H USA version has the auto repeater function. Thus the steps 3 and 4 may not be necessary, depending on the setting.
• Repeater settings can be stored into a memory channel.

# ■ Accessing a repeater

① Set the receive frequency (repeater output frequency). (pgs. 11, 12)

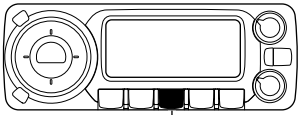
② Push and hold **[LOW•DUP]** for 1 sec. once or twice, to select minus duplex or plus duplex.
- "DUP–" or "DUP" appears to indicate the transmit frequency for minus shift or plus shift, respectively.
- When the auto repeater function is turned ON (available for the USA version only), steps ② and ③ are not necessary. (p. 27)



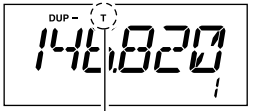
[LOW•DUP]


"DUP–" or "DUP" appears

③ Push **[TONE•T-SCAN]** several times to turn ON the subaudible tone encoder, according to repeater requirements.
- "T" appears
- 88.5 Hz is set as the default; refer to p. 23 for tone frequency settings.
- When the repeater requires a different tone system, see p. 25.



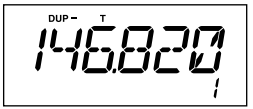
[TONE•T-SCAN]




"T" appears

④ Push and hold **[PTT]** to transmit.
- The displayed frequency automatically changes to the transmit frequency (repeater input frequency).
- If "OFF" appears, confirm that the offset frequency (p. 26) is set correctly.

⑤ Release **[PTT]** to receive.




While receiving


While transmitting

⑥ Push **[MONI•DTMF]** to check whether the other station's transmit signal can be received directly.

⑦ To return to simplex operation, push **[LOW•DUP]** once or twice, to clear the "DUP–" or "DUP" indicator.

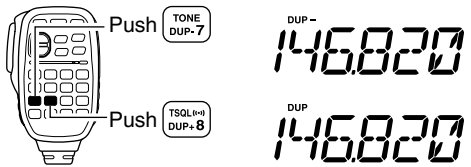
⑧ To turn OFF the subaudible tone encoder, push **[TONE•T-SCAN]** several times until no tone indicators appear.

DUP– 7

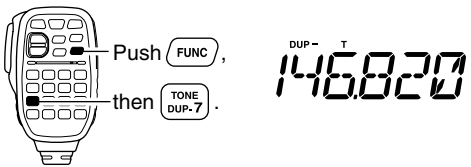
DUP+ 8

1 Set the receive frequency (repeater output frequency). (pgs. 11, 12)

2 Push **[DUP– 7(TONE)]** to select minus duplex; push **[DUP+ 8(TSQL ((•)) )]** to select plus duplex.




3 Push **[FUNC]** then **[DUP– 7(TONE)]** to turn ON the subaudible tone encoder according to repeater requirements.
- Refer to p. 24 for the tone frequency setting.
- When the repeater requires a different tone system, see p. 25.




4 Push and hold **[PTT]** to transmit.

5 Release **[PTT]** to receive.

6 Push **[MONI 1(BANK)]** to check whether the other station's transmit signal can be received directly.

SIMP 9

7 Push **[SIMP 9(TSQL)]** to return to simplex operation.
- "DUP" or "DUP–" indicator disappears.

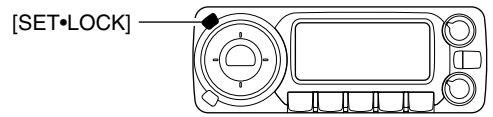
8 To turn OFF the subaudible tone encoder, push **[FUNC]** then **[ENT C(T-OFF)]**.

# ■ Subaudible tones (Encoder function)

USING SET MODE

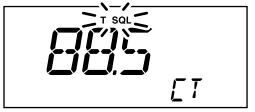
## ◇ Subaudible tones

① Select the frequency band, mode/channel you wish to set the subaudible tones, such as VFO mode or memory/call channel.
② Push **[SET•LOCK]** to enter set mode.
• Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.
③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "T" and "rT" appear; or until "T SQL" and "CT" appear for tone squelch or pocket beep use.
• When "d" is displayed in place of the 100 MHz digit, cancel the DTMF memory encoder in advance. (p. 53)




"T" and "rT" appears


"TSQL" and "CT" appears




④ Rotate **[DIAL]** to select and set the desired subaudible frequency.
⑤ Push any key below the display to exit set mode.

**• Subaudible tone frequency list** (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 | |

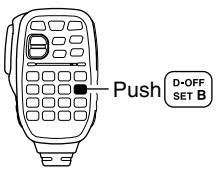
**NOTE:** The subaudible tone encoder frequency can be set in a memory/call channel temporarily. However, the set frequency is cleared once another memory channel or VFO mode is selected. To store the tone frequency permanently, overwrite the channel information.

SET B

1 Set the frequency band, mode/channel you wish to set the subaudible tones, such as VFO mode or memory/call channel.
- The subaudible tone frequency is independently programmed into each mode or channel.

2 Push **[SET B(D-OFF)]** to enter set mode.
- Push **[▲]** or **[▼]** to select "SET," if necessary.

3 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "T" and "rT" appears; or until "T SQL" and "CT" appears for tone squelch or pocket beep use.
- When "d" is displayed in place of the 100 MHz digit, cancel the DTMF memory encoder in advance. (p. 53)





4 Push **[▲]** or **[▼]** to select and set the desired subaudible tone frequency.
- Push and hold **[▲]**/**[▼]** to change the above tones continuously.

5 Push **[CLR A(MW)]** to exit set mode.

## ◇ DTMF tones

DTMF-S

➥ Push **[DTMF-S]**, then push the keys of the desired DTMF digits.
- The function indicator lights green.
- 0–9, A–D, ∗(E) and #(F) are available.
- When "d" is displayed in place of the 100 MHz digit, cancel the DTMF memory encoder in advance. (p. 53)
- Push **[DTMF-S]** again to return the keypad to normal function control.


***✔ For your convenient!***

The transceiver has 16 DTMF memory channels for autopatch operation. See p. 51 for details.

## ◇ 1750 Hz tone

The microphone has 1750 Hz tone capability, used for ring tone when calling, etc.

TONE-1

TONE-2

1 Push **[FUNC]**.
- The function indicator lights orange.

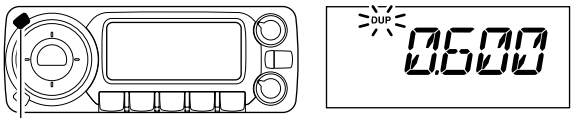
2 Push **[∗(TONE-1)]** to transmit a 1750 Hz tone call signal for 0.5 sec.; push and hold **[0(TONE-2)]** to transmit a 1750 Hz tone call signal for an arbitrary period.
- The function indicator goes out automatically.

## ■ Offset frequency

USING *SET MODE*

When communicating through a repeater, the transmit frequency is shifted from the receive frequency by an amount determined by the offset frequency.
Independent offset frequencies can be set for each operating frequency.

①Push **[BAND•MODE]** and rotate **[DIAL]**, then push **[BAND•MODE]** to select the desired frequency band.
②Select the desired mode/channel you wish to set the offset frequency, such as VFO mode or memory/call channel.
• The offset frequency can be independently programmed into each mode or channel.
③Push **[SET•LOCK]** to enter set mode.
• Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.
④Push **[SET•LOCK]** or **[S.MW•MW]** until "DUP" and offset frequency appear.

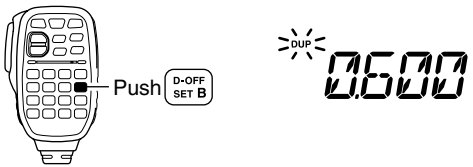



[SET•LOCK] "DUP" and offset frequency appear

⑤Rotate **[DIAL]** to set the desired offset frequency.
⑥Push any key (other than **[V/MHz•SCAN]**) below the display to exit set mode.

SET B

1 Push **[BAND]** and **[▲]/[▼]**, then push **[BAND]** to select the desired band.
• Enter the desired frequency via the keypad if necessary.
2 Select the desired mode/channel you wish to set the offset frequency, such as VFO mode or memory/call channel.
• The offset frequency can be independently programmed into each mode or channel.
3 Push **[SET B(D-OFF)]** to enter set mode.
• Push **[▲]** or **[▼]** to select "SET," if necessary.
4 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** until "DUP" and offset frequency appear.




5 Push **[▲]** or **[▼]** to set the desired offset.
• Direct frequency entry from the keypad is not possible.
6 Push **[CLR A(MW)]** to exit set mode.

**NOTE:** The offset frequency can be set in a memory/call channel temporarily. However, the set frequency is cleared once another memory channel or VFO mode is selected. To store the offset frequency permanently, overwrite the channel information.

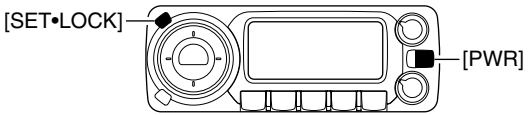
## ■ Auto repeater (USA version only)

The USA version automatically activates the repeater settings (DUP– or DUP+ and tone encoder ON/OFF) when the operating frequency falls within the general repeater output frequency range and inactivate them when outside of the range.

### ◇ Setting the auto repeater function ON/OFF

① Push **[PWR]** to turn power OFF.

② While pushing **[SET•LOCK]**, turn power ON to enter initial set mode.




③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "RPT" appears as shown above right.

*USING INITIAL SET MODE*

④ Rotate **[DIAL]** to select the auto repeater function from "R1," "R2" or OFF.


| Auto DUP: ON<br>Auto tone set: OFF | Auto DUP: ON<br>Auto tone set: ON |
|---|---|

- "R1": auto repeater is ON, tone encoder is OFF.
- "R2": auto repeater is ON, tone encoder is ON.

⑤ Push **[PWR]** to exit initial set mode.

### ◇ Frequency range and offset direction

| Frequency range | Duplex direction |
|---|---|
| 145.200–145.495 MHz<br>146.610–146.995 MHz | "DUP–" appears |
| 147.000–147.395 MHz | "DUP" appears |
| 442.000–444.995 MHz | "DUP" appears |
| 447.000–449.995 MHz | "DUP–" appears |

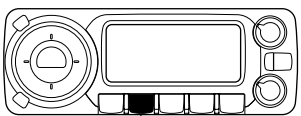
# ■ General description

The transceiver has 512 memory channels including 10 scan edge memory channels (5 pairs), and 2 call channels. Each of these channels can be individually programmed with operating frequency (pgs. 11, 12), duplex direction (pgs. 21, 22) and offset (p. 26), subaudible tone encoder or tone squelch and its tone frequency (pgs. 21–24, 55, 56), skip information (p. 47) and call sign memory number (station and repeater; pgs. 61–64).
In addition, a total of 10 memory banks, A to J, are available for usage by group, etc.

# ■ Memory channel selection

## ◇ Using the tuning dial

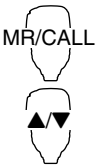
① Push **[M/CALL•PRIO]** several times to select memory mode.
• "M" indicator appears


[M/CALL•PRIO]

"M" appears

② Rotate **[DIAL]** to select the desired memory channel.
• Programmed memory channels only can be selected.

## ◇ Using the [▲]/[▼] keys




1 Push **[MR/CALL]** to select memory mode.
2 Push **[▲]** or **[▼]** to select and set the desired memory channel.
• Pushing and holding **[▲]/[▼]** for 1 sec. activates a scan.
• If scan is activated, push **[▲]/[▼]** again or push **[CLR A(MW)]** to stop it.

## ◇ Using the keypad


1 Push **[MR/CALL]** to select memory mode.
2 Push **[ENT C(T-OFF)]** to activate the keypad for numeral input.
3 Push 3 appropriate digit keys to input a channel number.
• Blank channel can be selected.
• Push only 1 appropriate digit key, **[MONI 1(BANK)]**, **[SCAN 2(T-SCAN)]**, **[PRIO 3(PTT-M)]**, **[HIGH 4(DTCS)]** or **[MID 5(DTCS ((•)))]** then push **[∗(TONE-1)]** or **[SQL▼ #(16KEY-L)]** to select scan edge channels. "∗" and "#" can be used for "A" and "B" respectively.

# ■ Programming a memory channel

VFO settings, including the set mode contents such as sub-audible tone frequency or offset, can be programmed into a memory channel.

①Set the desired frequency.
- ➥ Push **[V/MHz•SCAN]** to select VFO mode.
- ➥ Set the frequency using **[DIAL]**.
- ➥ Set other data (e.g. tone frequency, duplex information, etc.) if required.

②Push **[S.MW•MW]**.
- "M" indicator and the memory channel number blink.

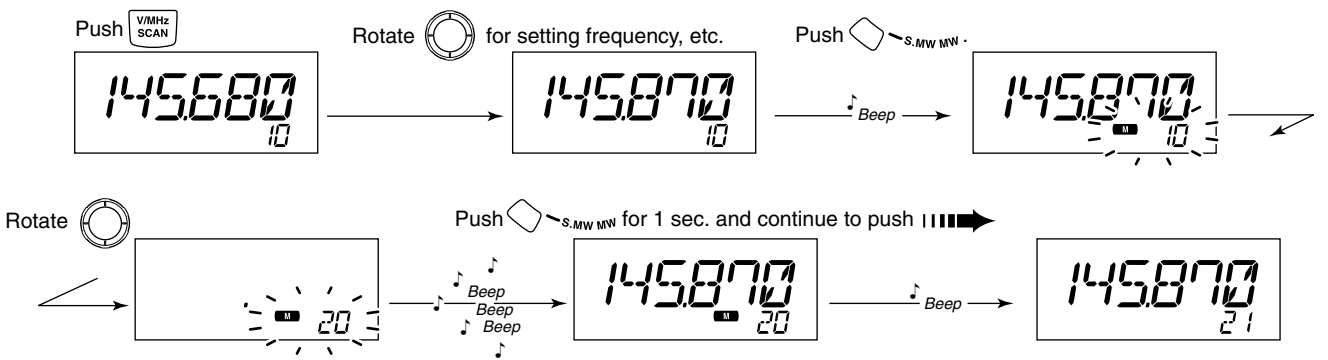
③Rotate **[DIAL]** to select the memory channel to be programmed.
- Memory channels not yet programmed are blank.

④Push and hold **[S.MW•MW]** for 1 sec. to program.
- 3 beeps sound
- Memory channel number automatically increases when continuing to push **[S.MW•MW]** after programming.

***✔CONVENIENT***

Memory programming can be performed in versatile ways e.g. memory channel to the same (or different) memory channel, memory channel to the call channel, etc.

**[EXAMPLE]:** Programming 145.870 MHz into memory channel 20 (blank channel) via the controller.



## ◇ Programming a memory channel via the microphone

MW

The microphone can also be used to program memory channels.

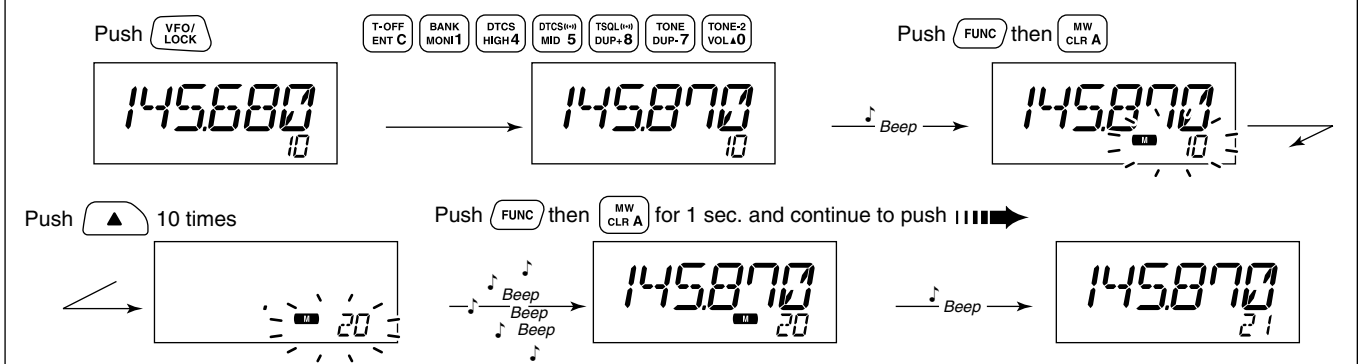
1 Set the desired frequency in VFO mode.
- ➥ Push **[VFO/LOCK]** to select VFO mode.
- ➥ Set the frequency using the keypad.
- ➥ Set other data (e.g. offset frequency, duplex direction, subaudible tone encoder ON/OFF and its frequency), if necessary.

2 Push **[FUNC]** then **[CLR A(MW)]** momentarily.

3 Push **[▲]** or **[▼]** to select the memory channel.
- Direct numeral input cannot be used.

4 Push **[FUNC]**, and then push and hold **[CLR A(MW)]** for 1 sec. to program.
- ➥ 3 beeps may sound and the VFO contents (including the subaudible tone frequency, etc.) are programmed.
- ➥ Memory channel number increases when continuing to push **[CLR A(MW)]** after programming.

**[EXAMPLE]:** Programming 145.870 MHz into memory channel 20 (blank channel) via the microphone.

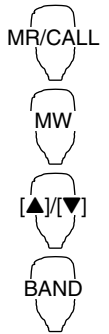


# ■ Copying memory contents

This function copies a memory channel's contents to VFO (or another memory/call channel). This is useful when searching for signals around a memory channel frequency and for recalling the offset frequency, subaudible tone frequency etc.

## ◇ Memory/call⇨VFO

① Select the desired memory or call channel.
  ➥ Push **[M/CALL•PRIO]** several times to select memory mode or call channel, then rotate **[DIAL]** or push **[BAND•MODE]** to select the desired memory or call channel respectively.
② Push and hold **[S.MW•MW]** for 1 sec. to transfer the selected memory/call channel contents to the VFO.
  • VFO mode is selected automatically.

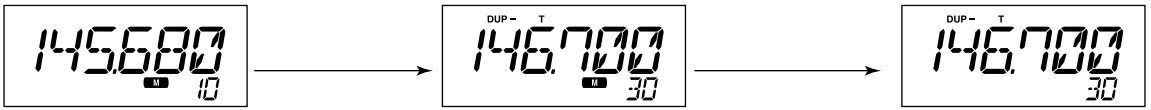



1 Select the memory/call channel to be transferred.
  ➥ Push **[MR/CALL]** to select memory mode, then select the desired memory channel via **[▲]/[▼]** or keypad.
  ➥ Push and hold **[MR/CALL]** for 1 sec. then push **[BAND]** to select the desired call channel.
2 Push **[FUNC]**, and then push and hold **[CLR A(MW)]** for 1 sec. to transfer the selected memory/call channel contents to the VFO.
  • VFO mode is selected automatically.

**[EXAMPLE]:** Transferring memory channel 30 contents to VFO.

***Front panel operation:***

Push [M/CALL PRIO] to select memory mode. Rotate for selecting memory channel. Push [S.MW MW] for 1 sec.




***HM-133 operation:***

Push [MR/CALL] to select memory mode. Push [▲]/[▼] to select memory channel. Push [FUNC] then push [MW CLR A] for 1 sec.

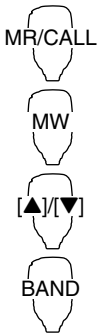
## ◇ Memory/call➪call/memory

① Select the memory/call channel to be transferred.
➥ Push **[M/CALL•PRIO]** several times to select memory mode or call channel, then rotate **[DIAL]** or push **[BAND•MODE]** to select the desired memory or call channel respectively.

② Push **[S.MW•MW]** momentarily.
• "M" indicator and "-- -- --" indication blink, and shows VFO conditions.

③ Rotate **[DIAL]** to select the target memory channel.
• "C1" or "C2" blinks when the call channel is selected.
• Scan edge channels, 1A/1B, 2A/2B, 3A/3B, 4A/4B, 5A/5B can also be selected.

④ Push and hold **[S.MW•MW]** for 1 sec. to transfer the selected memory/call channel contents to the target memory.
• The targeted memory and transferred contents are indicated.




1 Select the memory/call channel to be transferred.
➥ Push **[MR/CALL]** to select memory mode, then select the desired memory channel via **[▲]/[▼]** or keypad.
➥ Push and hold **[MR/CALL]** for 1 sec. then push **[BAND]** to select the desired call channel.

2 Push **[FUNC]**, then **[CLR A(MW)]** momentarily.
• "M" indicator and "-- -- --" indication blink, and shows VFO conditions.

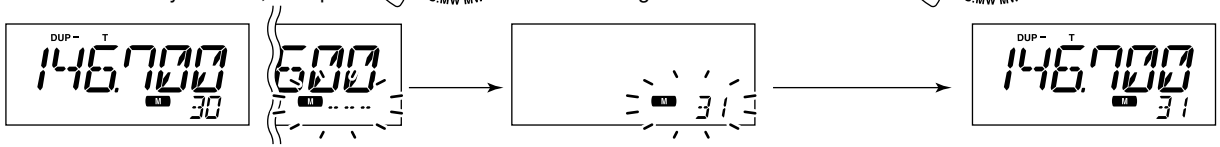
3 Push **[▲]/[▼]** to select the target memory channel.
• "C1" or "C2" blinks when the call channel is selected.
• Scan edge channels can also be selected.
• The keypad cannot be used for the selection.

4 Push **[FUNC]** then push **[CLR A(MW)]** for 1 sec. to transfer the selected memory/call channel contents to the target channel.
• The targeted channel and transferred contents are indicated.

**[EXAMPLE]:** Transferring memory channel 30 contents to channel 31.

***Front panel operation:***

Select the memory channel, then push S.MW MW. Select the target channel. Push S.MW MW for 1 sec.




***HM-133 operation:***

Select the memory channel, push FUNC then push MW CLR A. Push FUNC then push MW CLR A for 1 sec.

## ■ Programming channel names

Each memory channel and the call channel can be programmed with an alphanumeric channel name for easy recognition and can be indicated independently by channel. Names can be a maximum of 6 characters— see the table below for available characters.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| (space) | + (+) | - (–) | = (=) | * (*) | / (/) | ( (() | ) ()) | \| (\|) | 0 (0) |
| 1 (1) | 2 (2) | 3 (3) | 4 (4) | 5 (5) | 6 (6) | 7 (7) | 8 (8) | 9 (9) | A (A) |
| B (B) | C (C) | D (D) | E (E) | F (F) | G (G) | H (H) | I (I) | J (J) | K (K) |
| L (L) | M (M) | N (N) | O (O) | P (P) | Q (Q) | R (R) | S (S) | T (T) | U (U) |
| V (V) | W (W) | X (X) | Y (Y) | Z (Z) | | | | | |

① Push **[S.MW•MW]** momentarily.
- "M" and memory channel number blink.

② Rotate **[DIAL]** to select the desired memory or call channel.

③ Push **[BAND•MODE]** to select the memory name programming condition.
- Frequency readouts disappear and a cursor blinks.

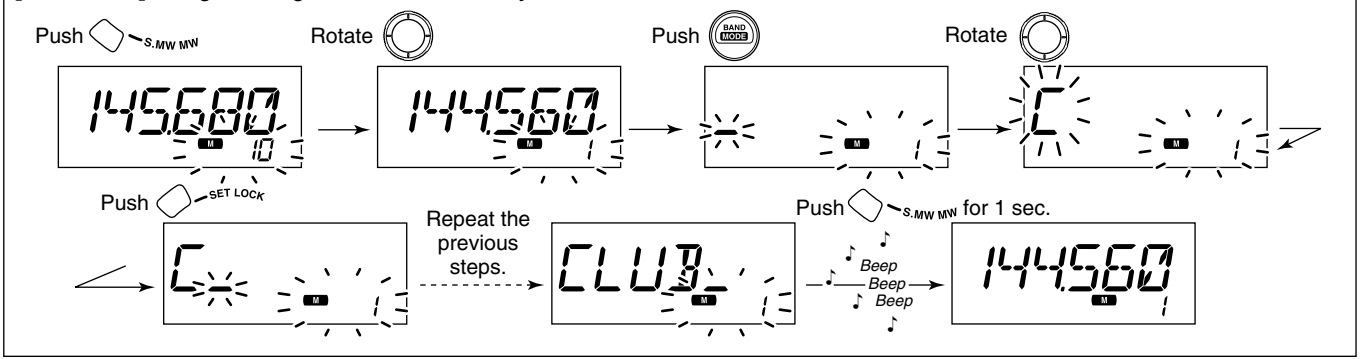
④ Rotate **[DIAL]** to select the desired character.
- The selected character blinks.

⑤ Push **[SET•LOCK]** to move the cursor to the right.

⑥ Repeat steps ④ and ⑤ until the desired channel names are displayed.

⑦ Push and hold **[S.MW•MW]** for 1 sec. to program the name and exit the channel name programming condition.

**[EXAMPLE]:** Programming "CLUB" into memory channel 1.



Channel names can also be programmed via the microphone.

1 Push **[FUNC]** then **[CLR A(MW)]** momentarily.
- "M" and memory channel number blink.

2 Push **[▲]**/**[▼]** to select the memory/call channel to be assigned memory names.

3 Push **[BAND]**.
- Frequency readouts disappear and a cursor blinks.

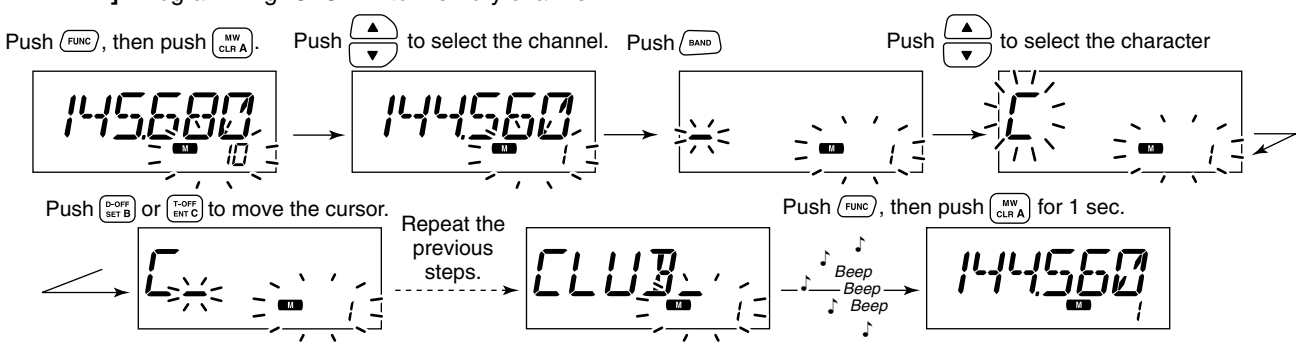
4 Push **[▲]**/**[▼]** to select the desired character.
- The selected character blinks.

5 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** to move the cursor to left or right, respectively.

6 Repeat steps 4 and 5 until the desired channel names are displayed.

7 Push **[FUNC]**, and then push and hold **[CLR A(MW)]** for 1 sec. to program the name and exit the channel name programming condition.

**[EXAMPLE]:** Programming "CLUB" into memory channel 1.



## ◇ To indicate the channel name

USING SET MODE

The channel name indication can be set for independent memory channels.

① Push **[M/CALL•PRIO]** to select the memory mode.
② Rotate **[DIAL]** to select the desired memory channel to be indicated the channel name.
③ Push **[SET•LOCK]** to enter set mode.
• Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.
④ Push **[SET•LOCK]** or **[S.MW•MW]** several times to select "ANM" item.
⑤ Rotate **[DIAL]** to turn the memory name indication ON.

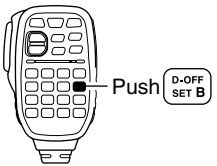


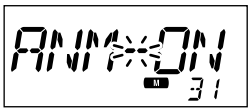
⑥ Push any key below the display to exit set mode.

**NOTE:** When no memory name is programmed, the stored frequency is displayed.

SET B

1 Push **[MR/CALL]** to select the memory mode.
2 Push **[▲]** or **[▼]** to select the desired memory channel to be indicated the channel name.
3 Push **[SET B(D-OFF)]** to enter set mode.
• Push **[▲]** or **[▼]** to select "SET," if necessary.
4 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** until "ANM" appear.




5 Push **[▲]** or **[▼]** to set the memory name indication ON and OFF.
6 Push **[CLR A(MW)]** to exit set mode.

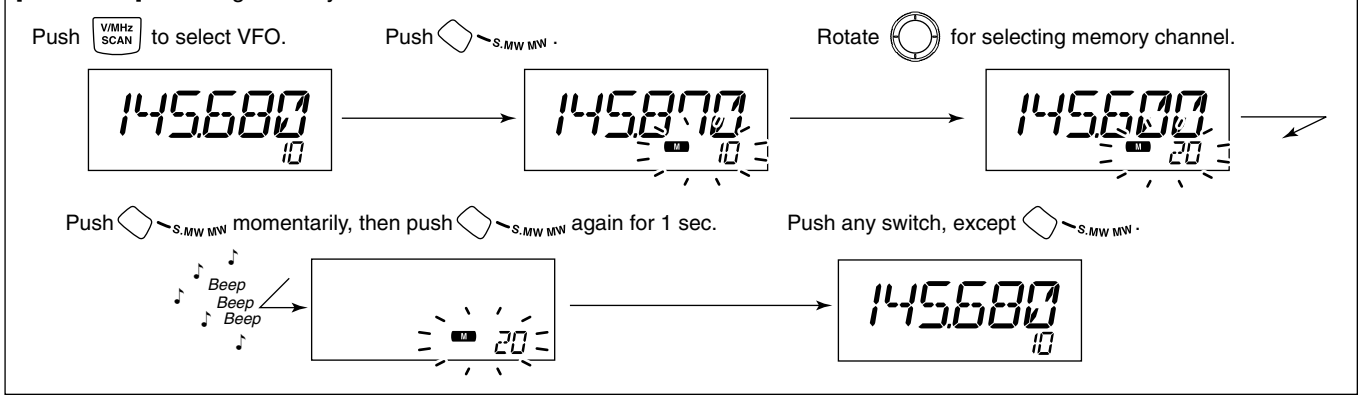
# ■ Memory clearing

Contents of programmed memories can be cleared (blanked), if desired.

① Push **[V/MHz•SCAN]** to select VFO mode.
② Push **[S.MW•MW]** momentarily.
• "M" indicator and the memory channel number blink.
③ Rotate **[DIAL]** to select the memory channel to be cleared.
• Memory channels not yet programmed are blank.
④ Perform the following operation within 1.5 sec.
- Push **[S.MW•MW]** momentarily.
- Push and hold **[S.MW•MW]** for 1 sec.
• 3 beep sound, then the contents of the selected memory are cleared.
• "M" indicator and the channel number blink.
• When clearing the call channel, the current VFO conditions are re-programmed into the call channel automatically.
⑤ Push **[V/MHz•SCAN]** to return to VFO mode.

**NOTE: BE CAREFUL!** — the contents of cleared memories CANNOT be recalled.

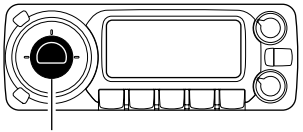
[EXAMPLE]: Clearing memory channel 20.



# ■ Memory bank selection

The ID-800H has a total of 10 banks (A to J). Each memory channel, 1 to 500, may be assigned to one of the banks for easy memory management.

① Push **[M/CALL•PRIO]** several times to select memory mode, if desired.
② Push **[BAND•MODE]** to enter memory bank selection.
- Bank indicator blinks.
- When no memory bank is set, error beep sounds and the memory channel indicator nothing change. See the next page for memory bank setting details.



[BAND•MODE]

Bank indicator blinks

③ Rotate **[DIAL]** to select the desired bank, A to J.
- Banks that have no programmed contents are skipped.

④ Push **[BAND•MODE]** to select the bank.
- Bank indicator stops blinking.

⑤ Rotate **[DIAL]** to select the channel in the bank.
- No channel numbers are displayed for memory bank operation.

⑥ To return to regular memory mode, push **[BAND• MODE]** twice.



1 Push **[MR/CALL]** to select memory mode, if desired.
2 Push **[FUNC]** then **[MONI 1(BANK)]** to enter memory bank selection.
- Bank indicator blinks.
- When no memory bank is set, error beep sounds and the memory channel indicator nothing change. See the next page for memory bank setting details.

3 Push **[▲]/[▼]** to select the desired bank, A to J.
- Only programmed memory bank can be selected.

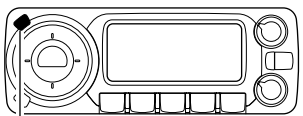
4 Push **[CLR A(MW)]** to select the bank.
- Bank indicator stops blinking.

5 Push **[▲]/[▼]** to select the channel in the bank.
- No channel numbers are displayed for memory bank operation.

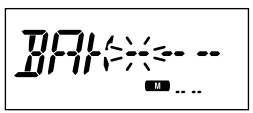
6 To return to regular memory mode, push **[FUNC]**, **[MONI 1(BANK)]** then push **[CLR A(MW)]**.

## ■ Memory bank setting

① Push **[M/CALL•PRIO]** several times to select memory mode, then select the desired memory channel via **[DIAL]**.
② Push **[SET•LOCK]** to enter set mode.
• Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.
③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "BAK" appears.



[SET•LOCK]




④ Rotate **[DIAL]** to select the desired bank.


⑤ Push any key below the display to assign the channel to the bank and exit set mode.

USING *SET MODE*

SET
B

1 Push **[MR/CALL]** then select the desired memory channel via **[▲]**/**[▼]** or keypad.
2 Push **[SET B(D-OFF)]** to enter set mode.
• Push **[▲]** or **[▼]** to select "SET," if necessary.
3 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "BAK" appears.
4 Push **[▲]**/**[▼]** to select the desired bank.
5 Push **[CLR A(MW)]** to assign the channel to the bank and exit set mode.

# ■ Transferring bank contents

USING SET MODE

Contents of programmed memory banks can be cleared or transferred to another bank.

**INFORMATION:** Even if the memory bank contents are cleared, the memory channel contents still remain programmed.

① Select the desired bank contents to be transferred or erased.
- ➥ Push **[M/CALL•PRIO]** several times to select memory mode.
- ➥ Push **[BAND•MODE]** then rotate **[DIAL]** to select the desired memory bank.
  - Bank indicator blinks.

- ➥ Push **[BAND•MODE]** to select the bank then rotate **[DIAL]** to select the desired contents.
  - Bank indicator stops blinking.

② Push **[SET•LOCK]** to enter set mode.
- Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.

③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "BAK" appears.
- The bank indicator for the selected memory channel is displayed.

④ Rotate **[DIAL]** to select the desired bank to receive the transferred information or erase the bank contents.
- Select "-- --" indication when erasing the contents from the bank.

⑤ Push any key below the display to set the bank and exit set mode.

⑥ Repeat steps ① to ⑤ for transferring or erasing an another bank's contents.

BANK

SET

[▲]/[▼]

1 Select the desired bank contents to be transferred or erased.
- ➥ Push **[MR/CALL]** to select memory mode.
- ➥ Push **[FUNC]**, **[MONI 1(BANK)]** then select the desired memory bank via **[▲]**/**[▼]**.
- ➥ Push **[CLR A(MW)]** to select the bank then select the desired contents via **[▲]**/**[▼]**.

2 Push **[SET B(D-OFF)]** to enter set mode.
- Push **[▲]** or **[▼]** to select "SET," if necessary.

3 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "BAK" appears.

4 Push **[▲]**/**[▼]** to select the desired bank to transfer or erase.
- Select "-- --" indication when erasing the contents from the bank.

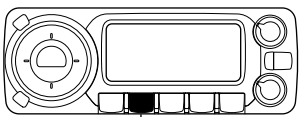
5 Push **[CLR A(MW)]** to set the bank and exit set mode.

6 Repeat steps 1 to 5 for transferring or erasing an another bank's contents.

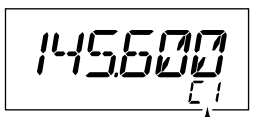
## ■ Call channel selection

Call channel is pre-programmed memory channel that can be accessed by simply pushing call channel button.

➥ Push **[M/CALL•PRIO]** several times to select the call channel mode then push **[BAND•MODE]** to select the desired call channel.
- "C1" or "C2" appears instead of memory channel number indication.
- Push **[M/CALL•PRIO]** several times to select memory mode, or push **[V/MHz•SCAN]** to select VFO mode.



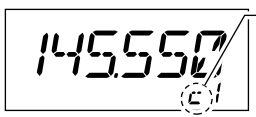
[M/CALL•PRIO]




"C1" or "C2" appears


➥ Push and hold **[MR/CALL]** for 1 sec. to select the call channel mode then push **[BAND]** to select the desired call channel in the main band.
- Push **[MR/CALL]** to select memory mode, or push **[VFO/LOCK]** to select VFO mode.

***✔INFORMATION***



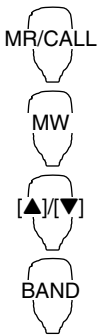

When the VFO mode is selected from the call channel, a small "c" appears instead of memory channel number.

## ■ Call channel transferring

① Push **[M/CALL•PRIO]** several times then push **[BAND•MODE]** to select the desired call channel.
- "C1" or "C2" appears.

② Push **[S.MW•MW]** then rotate **[DIAL]** to select the memory channel to receive the transferred information.
- "M" indicator and memory channel number blink.
- To transfer to the VFO, select "-- -- --" with **[DIAL]** then push.

③ Push and hold **[S.MW•MW]** for 1 sec. to transfer the contents.




1 Push and hold **[MR/CALL]** for 1 sec. then push **[BAND]** to select the desired call channel.

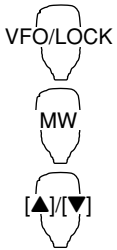
2 Push **[FUNC]**, **[CLR A(MW)]** momentarily, then push **[▲]/[▼]** to select the memory channel to receive the transferred information.
- To transfer to the VFO, push **[▲]/[▼]** to select "-- -- --".

3 Push **[FUNC]**, and then push and hold **[CLR A(MW)]** for 1 sec. to transfer the contents.

# ■ Programming a call channel

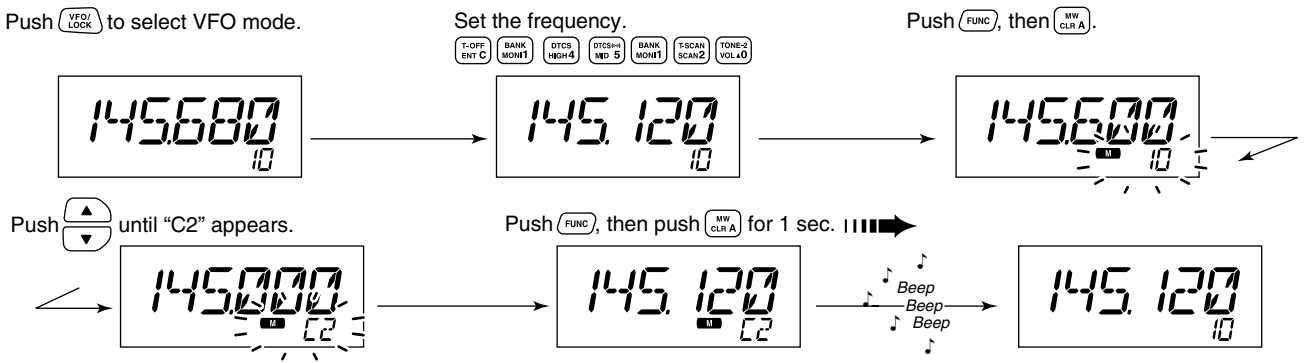
Operating frequency, duplex information, subaudible tone information (tone encoder or tone squelch ON/OFF and its frequency) can be programmed into the call channel.

① Set the desired frequency in VFO mode.
  ➥ Push **[V/MHz•SCAN]** to select VFO mode.
  ➥ Set the frequency using **[DIAL]**.
  ➥ Set other data as desired.
② Push **[S.MW•MW]** momentarily.
③ Rotate **[DIAL]** to select the desired call channel.
  • "M" indicator and "C1" or "C2" blink.
④ Push and hold **[S.MW•MW]** for 1 sec. to program.
  • 3 beeps sound and the unit returns to VFO mode automatically.




1 Set the desired frequency in VFO mode.
  ➥ Push **[VFO/LOCK]** to select VFO mode.
  ➥ Set the frequency.
  ➥ Set other data as desired.
2 Push **[FUNC]**, then **[CLR A(MW)]** momentarily.
3 Select the call channel via **[▲]** or **[▼]**.
4 Push **[FUNC]**, and then push and hold **[CLR A(MW)]** for 1 sec. to program.
  • 3 beeps sound and the unit returns to VFO mode automatically.

**[EXAMPLE]:** Programming 145.120 MHz into the call channel 2 via the microphone.

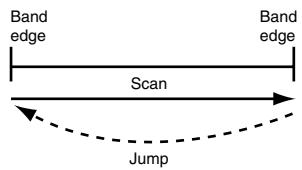


## ■ Scan types

Scanning searches for signals automatically and makes it easier to locate new stations for contact or listening purposes.

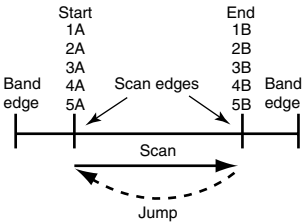
There are 3 scan types and 4 resume conditions to suit your operating needs.

**BAND SCAN** (pgs. 43, 44)



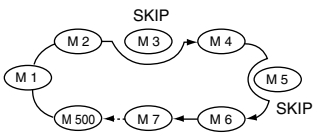

Repeatedly scans all frequencies over the entire band. Used as the simplest scan without any preliminary settings necessary.

**PROGRAMMED SCAN** (pgs. 43, 44)



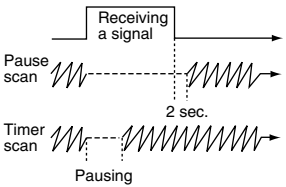

Repeatedly scans between two user-programmed frequencies. Used for checking for frequencies within a specified range such as repeater output frequencies, etc.
5 pairs of scan edges are available and scans 1A–1B (P1), 2A–2B (P2), 3A–3B (P3), 4A–4B (P4), 5A–5B (P5).

**MEMORY SCAN** (pgs. 43, 44)




Repeatedly scans memory channels except those set as skip channels. Used for often-called channels and for bypassing normally busy channels such as repeater frequencies.

**SCAN RESUME CONDITION** (p. 48)




4 resume conditions are available: 3 timer scans and pause scan. When receiving a signal, pause scan pauses until the signal disappears; timer scans pause for 5, 10 or 15 sec.

# ■ Scan start/stop

## ◇ Preparation

Scan resume condition (p. 48); program the scan edges (pgs. 45, 46); program 2 or more memory channels (pgs. 29, 30); set skip settings (p. 47), if desired.

## ◇ Operation

① Select VFO mode for full/programmed scan with **[V/MHz•SCAN]**; or memory mode for memory scan with **[M/CALL•PRIO]**.
- Select the desired bank for bank scan.

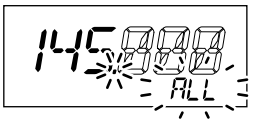
② Set the squelch to the point where noise is just muted.

③ Push and hold **[V/MHz•SCAN]** for 1 sec. to start the scan.
- To change the scanning direction, rotate **[DIAL]**.
- The memory channel readout blinks the scan type as follows:

④ Push **[SET•LOCK]** to switch full and programmed scan (P1, P2, P3, P4 and P5), if VFO is selected in step ①.

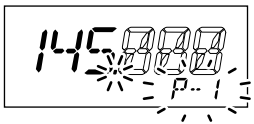
⑤ To stop the scan, push **[V/MHz•SCAN]**.

**• During full scan**



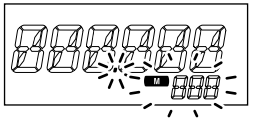

Push [SET•LOCK] to select full (ALL), band* (A-8, A-5, A-4, A-3, A-2, A-1, A-A) or programmed scan (P1, P2, P3, P4 and P5) in sequence. (*Depends on versions)

**• During programmed scan**

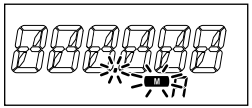



Indicates scan edge channels.
- P1 stands for 1A/1B
- P1 to P5 are available when they are programmed, and switches with [SET•LOCK].

**• During memory scan**



**• During bank scan**



Indicates bank initial.


1 Push **[VFO/LOCK]** to select VFO mode for full/programmed scan; push **[MR/CALL]** to select memory mode for memory scan.
- Push **[FUNC]** then **[MONI 1(BANK)]** to select a bank for bank scan.

2 Push **[SQL▲ D(MUTE)]** or **[SQL▼ #(16KEY-L)]** to set the squelch to the point where noise is just muted.

3 Push **[SCAN 2(T-SCAN)]** to start the scan.
- Push and hold **[▲]** or **[▼]** for 1 sec. also starts the scan.

4 Push **[SET B(D-OFF)]** to switch full and programmed scan (P1, P2, P3, P4 and P5), if VFO is selected in step 1.

5 To stop the scan push **[SCAN 2(T-SCAN)]** or **[CLR A(MW)]**.

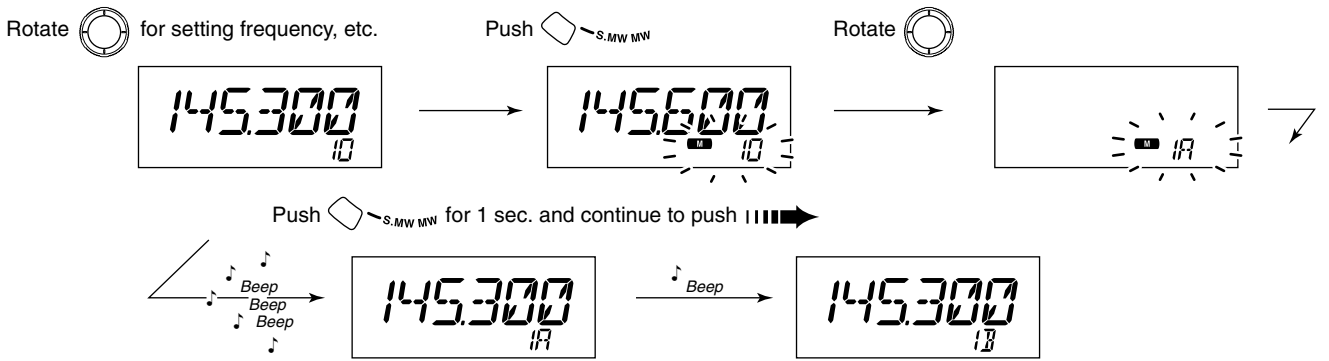
**NOTE:** When AM, FM or DV mode frequencies are programmed into memory channels disorderly, memory scan takes a lot of time (very slow). Because changing modes takes a time. In this case, assign the AM, FM and DV mode frequencies into the separate bank respectively. And using the bank scan is helpful.

## ■ Scan edges programming

Scan edges can be programmed in the same manner as memory channels. Scan edges are programmed into scan edges, 1A/1B to 5A/5B, in memory channels.

① Set the edge frequency of the desired frequency range in VFO mode:
  ➥ Set the frequency using **[DIAL]**.
  ➥ Set other data (e.g. repeater settings, etc.) if desired.
② Push **[S.MW•MW]**.
  • "M" indicator and channel number blink.
③ Rotate **[DIAL]** to select one of scan edge channel, 1A, 2A, 3A, 4A or 5A.
④ Push and hold **[S.MW•MW]** for 1 sec. to program.
  • 3 beeps sound and VFO is automatically selected.
  • Scan edge 1B, 2B, 3B, 4B or 5B is automatically selected when continuing to push **[S.MW•MW]** after programming.
⑤ To program a frequency for the other pair of scan edges, 1B, 2B, 3B, 4B or 5B, repeat steps ① to ④.
  • If identical frequency are programmed into a pair of scan edges, programmed scan will not function.

**[EXAMPLE]:** Programming 145.300 MHz into scan edges 1A.



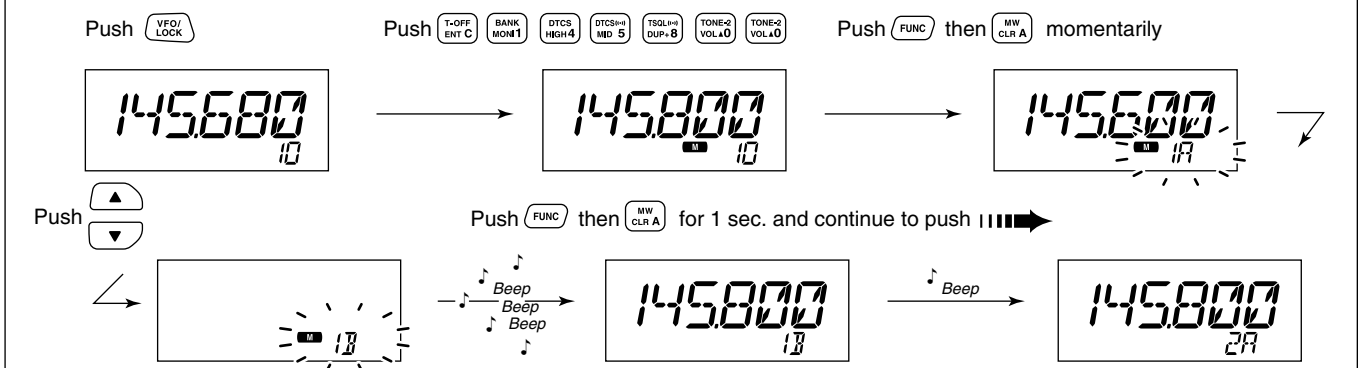
## ◇ Programming scan edges via microphone

MW

1 Set the desired frequency in VFO mode.
   ➥ Push **[VFO/LOCK]** to select VFO mode.
   ➥ Set the frequency via the keypad or **[▲]**/**[▼]**.
2 Push **[FUNC]** then **[CLR A(MW)]** momentarily.
3 Push **[▲]** or **[▼]** to select scan edge channels, 1A, 2A, 3A, 4A or 5A.
4 Push **[FUNC]**, and then push and hold **[CLR A(MW)]** for 1 sec. to program.
   • 3 beeps sound and VFO is automatically selected.
   • Memory channel number advances to the next scan edge channel, 1B, 2B, 3B, 4B or 5B when continuing to push **[CLR A(MW)]** after programming.

5 To program a frequency for the other scan edge channels, repeat steps 1 to 4.

**[EXAMPLE]:** Programming 145.800 MHz into scan edge 1B.



## ■ Skip channel setting

USING SET MODE

The memory skip function speeds up scanning by checking only those memory channels not set as skip channels. Set skip channels as follows.


The display shows that memory channel 16 is set as a skip channel.

① Select a memory channel:
- ➥ Push **[M/CALL•PRIO]** to select memory mode.
- ➥ Rotate **[DIAL]** to select the desired channel to be a skip channel.

② Push **[SET•LOCK]** to enter set mode.
- Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.

③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "CHS" appears as shown above.

④ Rotate **[DIAL]** to turn the skip function ON or OFF for the selected channel.
- "SKIP" appears (CHS-ON); The channel is skipped during scan.
- "P SKIP" appears (CHS-ON); The channel is skipped during scan and the programmed frequency is skipped during VFO scan, such as programmed scan.
- "SKIP" disappears (CHS-OF); The channel is scanned during scan.

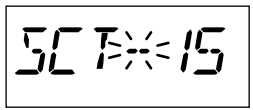
⑤ Push any key below the display to exit set mode.

SET B

1. Select a memory channel.
   - ➥ Select memory mode by pushing **[MR/CALL]**.
   - ➥ Push **[▲]** or **[▼]** to select the desired channel to be a skip channel.
     - Direct memory channel selection is also available.
2. Push **[SET B(D-OFF)]** to enter set mode.
   - Push **[▲]** or **[▼]** to select "SET," if necessary.
3. Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "CHS" appears as shown at left.
4. Push **[▲]** or **[▼]** to set or cancel the skip setting.
   - See item ④ at left for skip indicator details.
5. Push **[CLR A(MW)]** to exit set mode.

## ■ Scan resume condition

The scan resume condition can be selected as timer or pause scan. The selected resume condition is also used for priority watch. (p. 50)



The display shows that the scan will resume 15 sec. after it stops.

① Push **[SET•LOCK]** to enter set mode.
- Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.

② Push **[SET•LOCK]** or **[S.MW•MW]** several times until "SCT" or "SCP" appears as shown above.
- When "d" is displayed in place of the 100 MHz digit, cancel the DTMF memory encoder in advance. (p. 53)

③ Rotate **[DIAL]** to set the desired timer:
- "SCT-15" : Scan pauses 15 sec. while receiving a signal.
- "SCT-10" : Scan pauses 10 sec. while receiving a signal.
- "SCT-5" : Scan pauses 5 sec. while receiving a signal.
- "SCP-2" : Scan pauses until the signal disappears and then resumes 2 sec. later.

④ Push any key below the display to exit set mode.

USING *SET MODE*

SET B

1 Push **[BAND]** and **[▲]/[▼]**, then push **[BAND]** to select the desired band.
2 Push **[SET B(D-OFF)]** to enter set mode.
- Push **[▲]** or **[▼]** to select "SET," if necessary.

3 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "SCT" or "SCP" appears as shown at left.
4 Push **[▲]** or **[▼]** to select the scan resume condition.
- See item ③ at left for scan resume condition details.

5 Push **[CLR A(MW)]** to exit set mode.

# 8 PRIORITY WATCH

## ■ Priority watch types

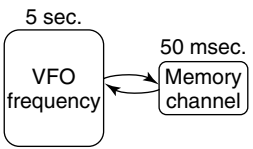
Priority watch checks for signals on a VFO frequency every 5 sec. while operating in memory mode. The transceiver has 3 priority watch types to suit your needs. You can also transmit on the VFO frequency while priority watch operates.

The watch resumes according to the selected scan resume condition. See previous page for details.

**NOTES:**
If the pocket beep function is activated, the transceiver automatically selects the tone squelch function when priority watch starts.

### MEMORY CHANNEL WATCH

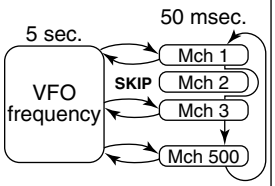
While operating on a VFO frequency, priority watch checks for a signal on the selected memory channel every 5 sec.




### MEMORY SCAN WATCH

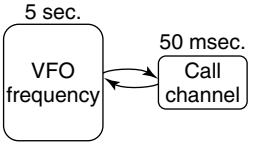
While operating on a VFO frequency, priority watch checks for signals on each memory channel in sequence.

- The memory skip function is useful to speed up the scan.



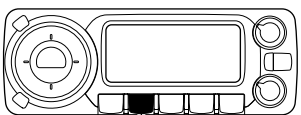

### CALL CHANNEL WATCH

While operating on a VFO frequency, priority watch checks for signals on the call channel every 5 sec.



# ■ Priority watch operation

① Select VFO mode; then, set an operating frequency.
② Set the watching channel(s).
***For memory channel watch:***
Select the desired memory channel.
***For memory scan watch:***
Select memory mode; then, push **[V/MHz•SCAN]** for 1 sec. to start memory scan.
***For call channel watch:***
Select the desired call channel by pushing **[M/CALL•PRIO]** once or twice, then push **[BAND•MODE]**.
③ Push **[M/CALL•PRIO]** for 1 sec. to start the watch.


[M/CALL•PRIO]

"PRIO" appears

- The transceiver checks the memory or call channel every 5 sec.
- The watch resumes according to the selected scan resume condition. (p. 48)
- While the watch is pausing, pushing **[M/CALL•PRIO]** resumes the watch manually.

④ Push **[M/CALL•PRIO]** for 1 sec. to stop the watch.

PRIO 3

1 Select VFO mode; then, set the desired frequency.
2 Set the watching channel(s).
***For memory channel watch:***
Push **[MR/CALL]** then **[▲]** or **[▼]** to select the desired memory channel.
***For memory scan watch:***
Push **[MR/CALL]**, then push **[SCAN 2(T-SCAN)]** to start the memory scan.
***For call channel watch:***
Push **[MR/CALL]** for 1 sec. then push **[BAND]** to select the call channel.
3 Push **[PRIO 3(PTT-M)]** to start the watch.
- The transceiver checks the memory or call channel every 5 sec.
- The watch resumes according to the selected scan resume condition. (p. 48)
- To resume the watch manually when paused, push **[PRIO 3(PTT-M)]** or **[CLR A(MW)]**.

4 To stop the watch, push **[CLR A(MW)]** once (or twice while watch is paused).

# 9 DTMF MEMORY ENCODER

## ■ Programming a DTMF code

DTMF tones are used for autopatching, controlling other equipment, etc. The transceiver has 16 DTMF memory channels (D0–DF) for storage of often-used DTMF codes of up to 24 digits.

① Push **[MONI•DTMF]** for 1 sec. to turn the DTMF encoder ON.
- "d" appears in place of 100 MHz digit.

***— For U.S.A. version only! —***

In DV mode, make sure to release the button just after the second beep. Holding the button too long (for too many beeps) will send the radio into EMR mode (see "Be careful!," below).
- Push and hold **[MONI•DTMF]** until 1 short and 1 long beeps sound to turn the DTMF memory encoder OFF. Again, do not hold button past 2 beeps.

**Be careful!:** EMR mode is turned ON when pushing and holding **[MONI•DTMF]** until 4 beeps sound.

② Push **[SET•LOCK]** to enter the DTMF memory programming condition.
- The DTMF memory channel indication blinks.

③ Rotate **[DIAL]** to select the desired DTMF memory channel.

④ Push **[SET•LOCK]**.
- The first digit blinks.

⑤ Rotate **[DIAL]** to select the desired code.

⑥ Push **[SET•LOCK]** to select the next digit.
- Pushing **[S.MW•MW]** moves the cursor backward.

⑦ Repeat the steps ⑤ and ⑥ to set the desired DTMF tone sequence.
- The S/RF indicator shows the digit group. The indication increases every 6 digits.

⑧ Push any key below the display to exit DTMF memory programming condition.
- Return to the previous indication as in step ①.

### ◇ Programming a DTMF code— via microphone

DTMF

1 Push **[FUNC]** then **[LOW 6(DTMF)]** to turn the DTMF encoder ON.
- "d" appears in place of 100 MHz digit.

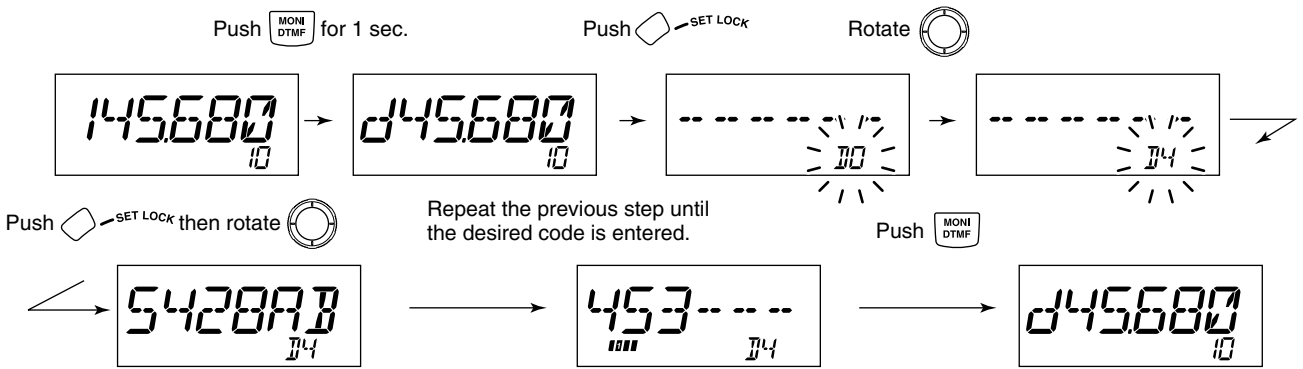
2 Push **[SET B(D-OFF)]** to enter the DTMF memory programming condition.

3 Push **[▲]** or **[▼]** to select the desired DTMF memory channel.

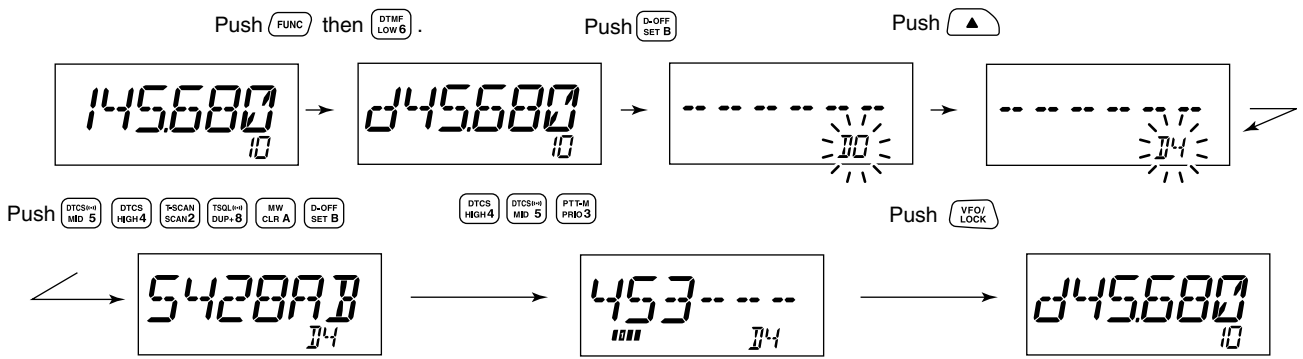
4 Push the desired digit keys.
- When the first digit is input, previous memory contents are cleared automatically.
- "E" stands for "✱" and "F" stands for "# ."
- Push **[▲]**/**[▼]** and repeat this step if you make a mistake.
- The S/RF indicator shows the digit group. The indication increases every 6 digits.

5 Push **[VFO/LOCK]** to exit the programming condition.
- **[CLR A(MW)]** key cannot be used to exit. If pushed, code "A" is input. Reprogram in such a case.

**[EXAMPLE]:** Programming “5428AB453” into DTMF memory channel “D4” via controller.




**[EXAMPLE]:** Programming “5428AB453” into DTMF memory channel “D4” via microphone



# ■ Transmitting a DTMF code

## ◇ Automatic transmission (DTMF memory)

①Push **[MONI•DTMF]** for 1 sec. (or until 1 short and 1 long beeps sound in DV mode; U.S.A. version only) to turn the DTMF memory encoder ON.
- "d" appears in place of 100 MHz digit.

②Push **[SET•LOCK]** to enter DTMF memory programming condition.

③Rotate **[DIAL]** to select the desired DTMF memory channel.

④Push **[PTT]** to transmit the selected DTMF memory content.

⑤Push **[MONI•DTMF]** for 1 sec. to cancel the DTMF encoder.
- When the DTMF encoder is turned ON continuously, each push of the PTT transmits the previously selected DTMF code.


1 Push **[FUNC]** then **[Low 6(DTMF)]** to turn the DTMF memory encoder ON.
- "d" appears in place of 100 MHz digit.

2 Push **[SET B(D-OFF)]** to enter the DTMF memory programming condition.

3 Push **[▲]** or **[▼]** to select the desired channel.

4 Push **[PTT]** to transmit the selected memory.
- Exit the programming condition automatically.
- Each push of **[PTT]** transmits the DTMF code.

5 Push **[FUNC]** then **[SET B(D-OFF)]** to cancel the DTMF memory encoder.
- When the DTMF encoder is turned ON continuously, each push of the PTT transmits the previously selected DTMF code.

## ◇ Transmitting a DTMF memory directly


1 Push **[FUNC]** then **[Low 6(DTMF)]** to turn the DTMF memory encoder ON.
- "d" appears in place of 100 MHz digit.

2 Push **[DTMF-S]** to turn the DTMF memory direct selection ON.
- The function indicator (microphone) lights green.

3 Push the desired DTMF channel.
- "0" to "9" and "A" to "D" are available for DTMF memory channels.
- The selected DTMF code is automatically transmitted without pushing PTT.

**NOTE:** When no DTMF code programmed channel number is pushed, it transmits the relative DTMF code as the manual transmission described in the next page.

4 Push **[DTMF-S]** again to deactivate the DTMF memory direct selection.

5 Push **[FUNC]** then **[SET B(D-OFF)]** to cancel the DTMF memory encoder.

**NOTE for DTMF operation (U.S.A. version only)**

In DV mode, microphone audio is also transmitted simultaneously during DTMF code transmission. Therefore, the DTMF operation cannot be guaranteed.

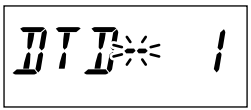
### ◇ Manual transmission


1 Deactivate the DTMF memory encoder by pushing **[FUNC]** then **[SET B(D-OFF)]**.
2 Push **[DTMF-S]** to turn the DTMF direct selection ON.
• The function indicator (microphone) lights green.
3 Push one of "0" to "9" and "A" to "F" keys momentarily, then push the desired DTMF keys, 0–9 and A to F.
• A: **[CLR A(MW)]** B: **[SET B(D-OFF)]**,
C: **[ENT C(T-OFF)]** D: **[SQL▲ D(MUTE)]**,
E: **[∗(TONE-1)]** F: **[SQL▼ #(16KEY-L)]**
• Automatically transmits without pushing PTT.
• The first code, one of "0" to "9" and "A" to "F," is not transmitted. DTMF code transmission starts from the 2nd code.
4 Push **[DTMF-S]** again to deactivate the DTMF direct selection.

## ■ DTMF speed

*USING INITIAL SET MODE*

The rate at which DTMF memories send individual DTMF characters can be set to accommodate operating needs.




The display shows the fastest DTMF speed is selected.

① Push **[PWR]** for 1 sec. to turn power OFF.
② While pushing **[SET•LOCK]**, push **[PWR]** for 1 sec. to turn power ON and enter initial set mode.
③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "DTD" appears as shown above.
④ Rotate **[DIAL]** to select the desired speed as shown in the table below.
⑤ Push **[PWR]** to exit initial set mode.

| DISPLAY | INTERVAL | SPEED |
|---|---|---|
| DTD-- 1 | 100 msec. | 5.0 cps |
| DTD-- 2 | 200 msec. | 2.5 cps |
| DTD-- 3 | 300 msec. | 1.6 cps |
| DTD-- 5 | 500 msec. | 1.0 cps |

cps=characters/sec

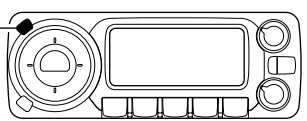
# 10 POCKET BEEP AND TONE SQUELCH

## ■ Pocket beep operation

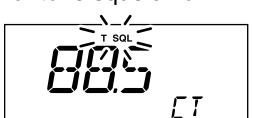
This function listens for subaudible tones and can be used as a “common pager” to inform you that someone has called while you were away from the transceiver.

### ◇ Waiting for a call from a specific station

① Set the operating frequency.
② Push **[SET•LOCK]** to enter set mode.
• Rotate **[DIAL]** to select “SET,” if “CALLS” or “MESSAG” is displayed.



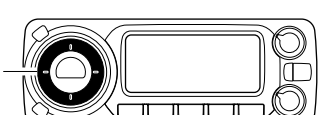

③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until “CT” for tone squelch or “DT” for DTCS squelch appears.



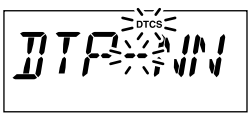

Tone squelch frequency setting


DTCS code setting

④ Rotate **[DIAL]** to select the desired tone squelch frequency.

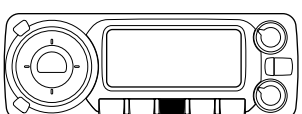



⑤ When operating the pocket beep function with DTCS squelch, push **[SET•LOCK]** once then rotate **[DIAL]** to select the DTCS polarity.

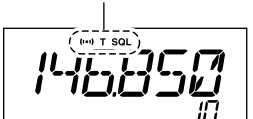



DTCS polarity setting

⑥ Push any key below the display to exit set mode.
⑦ Push **[TONE•T-SCAN]** several times until “T SQL ((•)) ” or “ ((•)) DTCS” are displayed to turn ON the pocket beep with tone squelch or DTCS squelch, respectively.

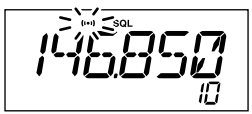



Appears when the pocket beep with tone squelch is activated.




Appears when the pocket beep with DTCS squelch is activated.

⑧ When a signal with the matching tone is received, the transceiver emits beep tones and blinks "((•))."
- Beep tones sound for 30 sec. and "((•))" blinks. To stop the beeps and blinking manually, push any key. When the beep tones are not stopped manually, "((•))" continues blinking until **[PTT]** is pushed (see step ⑨).





⑨ Push **[PTT]** to answer.
- "((•))" disappears and cancels the pocket beep function automatically.

⑩ Push **[TONE•T-SCAN]** several times until "T SQL" or "DTCS" disappears to cancel the tone squelch or DTCS squelch function.

TSQL ((•))
DTCS ((•))

1 Set the operating frequency.
2 Program the CTSS tone frequency or DTCS code in set mode.
➥ Push **[SET B(D-OFF)]** to enter set mode.
- Push **[▲]** or **[▼]** to select "SET," if necessary.

➥ Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "CT" for tone squelch or "DT" for DTCS squelch appears.
- "T SQL" blinks when tone squelch ("CT"), or "DTCS" blinks when DTCS squelch ("DT") is selected.

➥ Push **[▲]**/**[▼]** to select the desired tone frequency or DTCS code.
➥ Push **[SET B(D-OFF)]** to select "DTP" then push **[▲]**/**[▼]** to select the DTCS polarity.
➥ Push **[CLR A(MW)]** to exit set mode.
3 Push **[FUNC]** then push **[DUP+ 8(TSQL ((•)))]** or **[MID 5(DTCS ((•)))]** to turn ON the pocket beep with tone squelch or DTCS squelch, respectively.
4 When a signal with the matching tone is received, the transceiver emits beep tones for 30 sec. and blinks "((•))."
5 Push **[PTT]** to answer or push **[CLR A(MW)]** to stop the beeps and blinking.
- "((•))" disappears and cancels the pocket beep function automatically.

6 To cancel the tone squelch or DTCS squelch function, push **[FUNC]** then **[ENT C(T-OFF)]**.
- "T SQL" or "DTCS" disappears.

## ◇ Available tone frequency list

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

**NOTE:** The transceiver has 50 tone frequencies and consequently their spacing is narrow compared to units having 38 tones. Therefore, some tone frequencies may receive interference from adjacent tone frequencies.
To prevent interference from adjacent tone frequencies, using the frequencies as in the following table, is recommended.

**• Recommended CTCSS frequencies**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 67.0 | 77.0 | 88.5 | 100.0 | 114.8 | 131.8 | 151.4 | 173.8 | 203.5 | 233.6 |
| 69.3 | 79.7 | 91.5 | 103.5 | 118.8 | 136.5 | 156.7 | 179.9 | 210.7 | 241.8 |
| 71.9 | 82.5 | 94.8 | 107.2 | 123.0 | 141.3 | 162.2 | 186.2 | 218.1 | 250.3 |
| 74.4 | 85.4 | 97.4 | 110.9 | 127.3 | 146.2 | 167.9 | 192.8 | 225.7 | |

**• Recommended DTCS codes**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 023 | 065 | 131 | 172 | 261 | 346 | 431 | 532 | 654 | 743 |
| 025 | 071 | 132 | 174 | 263 | 351 | 432 | 546 | 662 | 754 |
| 026 | 072 | 134 | 205 | 265 | 364 | 445 | 565 | 664 | |
| 031 | 073 | 143 | 223 | 271 | 365 | 464 | 606 | 703 | |
| 032 | 074 | 152 | 226 | 306 | 371 | 465 | 612 | 712 | |
| 043 | 114 | 155 | 243 | 311 | 411 | 466 | 624 | 723 | |
| 047 | 115 | 156 | 244 | 315 | 412 | 503 | 627 | 731 | |
| 051 | 116 | 162 | 245 | 331 | 413 | 506 | 631 | 732 | |
| 054 | 125 | 165 | 251 | 343 | 423 | 516 | 632 | 734 | |

## ◇ Calling a waiting station using pocket beep

A subaudible tone matched with the station's CTCSS tone frequency or 3-digit DTCS code with polarity is necessary. Use the tone squelch on the next page or a subaudible tone encoder (pgs. 23–25).

# ■ Tone/DTCS squelch operation

The tone or DTCS squelch opens only when receiving a signal with the same pre-programmed subaudible tone or DTCS code, respectively. You can wait for calls from group members using the same tone or DTCS and not hear other signals.

① Set the operating frequency.
② Program the CTCSS tone frequency or DTCS code in set mode.
• See p. 55 for programming details.
③ Push **[TONE•T-SCAN]** several times until "T SQL" or "DTCS" appears in the function display.
④ When a signal with the matched tone is received, the squelch opens and the signal can be heard.
• When the received signal includes an unmatched tone, the squelch does not open. However, the S/RF indicator shows the received signal strength.
• To open the squelch manually, push **[MONI•DTMF]**.
⑤ Transmit in the normal way (push **[PTT]** to transmit; release **[PTT]** to receive).
⑥ To cancel the tone squelch, push **[TONE•T-SCAN]** several times until "T SQL" or "DTCS" disappears.

TSQL

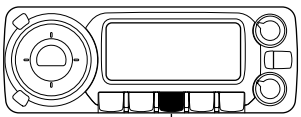
DTCS

1 Set the operating frequency.
2 Program the CTCSS tone frequency or DTCS code in set mode.
• See p. 56 for programming details.
3 Push **[FUNC]** then **[SIMP 9(TSQL)]** or **[HIGH 4(DTCS)]** to turn the tone squelch or DTCS squelch ON.
4 When a signal with the matched tone is received, the squelch opens and the signal can be heard.
• When the received signal includes an unmatched tone, the squelch does not open. However, the S/RF indicator shows the received signal strength.
• To open the squelch manually, push **[MONI 1(BANK)]**.
5 Transmit in the normal way (push **[PTT]** to transmit; release **[PTT]** to receive).
6 To cancel the tone squelch, push **[FUNC]** then **[ENT C(T-OFF)]**.
• "T SQL" or "DTCS" disappears.

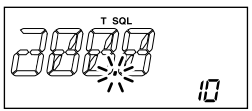
## ■ Tone scan

By monitoring a signal that is being operated with pocket beep, tone or DTCS squelch function, you can determine the tone frequency or DTCS code necessary to open a squelch.

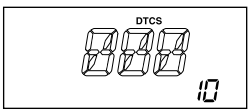
① Set the desired operating frequency or memory channel to be checked for a tone frequency or code.
② Push **[TONE•T-SCAN]** several times to select the type of tone, tone squelch or DTCS, to be scanned.
• Either "T SQL" or "DTCS" appears
③ Push **[TONE•T-SCAN]** for 1 sec. to start the tone scan.
• To change the scanning direction, rotate **[DIAL]**.



[TONE•T-SCAN]




During CTCSS frequency scan




During DTCS code scan

④ When the CTCSS tone frequency or 3-digit DTCS code is matched, the squelch opens and the tone frequency is temporarily programmed into the selected condition such as memory or call channel.
• The tone scan pauses when a CTCSS tone frequency or 3-digit DTCS code is detected.
• The decoded CTCSS tone frequency or 3-digit DTCS code is used for the tone encoder or tone encoder/decoder depending on the selected tone condition or type in step ②.
- "T SQL" : CTCSS tone encoder/decoder
- "DTCS" : DTCS tone encoder/decoder
⑤ Push **[TONE•T-SCAN]** to stop the scan.

T-SCAN

1 Set the frequency or memory channel to be checked for a tone frequency.
2 Selects the tone type to be scanned.
• Push **[FUNC]** then push; **[SIMP 9(TSQL)]** for tone squelch; **[HIGH 4(DTCS)]** for DTCS squelch.
3 Push **[FUNC]** then **[SCAN 2(T-SCAN)]** to start the tone scan.
4 When the tone frequency is matched, the squelch opens and the tone frequency is programmed into the selected mode such as memory or call channel.
5 Push **[CLR A(MW)]** to stop the scan.

**NOTE:** The decoded tone frequency is programmed temporarily when a memory or call channel is selected. However, this will be cleared when the memory/call channel is re-selected.

## ■ Digital mode operation

The ID-800H can be operated for digital voice mode and low-speed data operation for both transmit and receive. It can also be connected to a GPS receiver (compatible with an RS-232 output/NMEA format/4800 bps) and transmit/receive position data.

**NOTE:** The DTMF operations (both DTMF memory and using with the HM-133) are not available in digital mode.

## ■ Call sign programming

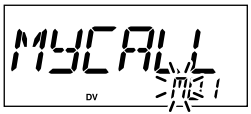
Four types of call sign memories are available for your own call sign “MyCALL,” other station call sign “UrCALL,” repeater call sign “RPT1 C” and “RPT2 C.” “MyCALL” can store up to 6, “UrCALL” can store up to 99 and “RPT1/2 C” can store up to 54 call signs, and each call sign can be programmed with up to 8 characters.

## ◇ Your own call sign programming

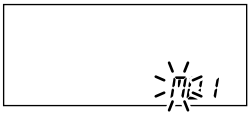
Your own call sign must be programmed for both digital voice and low-speed data communications (including GPS transmission).

① Push **[SET•LOCK]** to enter call sign set mode.
- Rotate **[DIAL]** to select "CALLS," if "SET" or "MESSAG" is displayed.

② Push **[SET•LOCK]** or **[S.MW•MW]** several times to select "MyCALL," then push **[BAND•MODE]**.



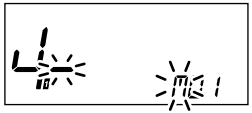

③ Rotate **[DIAL]** to select the desired call sign channel from "M01" to "M06."




④ Push **[BAND•MODE]** for 1 sec. to enter call sign programming mode.
- The 1st digit blinks.

⑤ Rotate **[DIAL]** to select the desired character or code.
- Push **[SET•LOCK]** or **[S.MW•MW]** to move the cursor right or left, respectively.

⑥ Push **[SET•LOCK]** to select 2nd digit, then rotate **[DIAL]** to select the desired character or code.
- 2nd digit blinks (1st digit stops blinking).
- Repeat this step for programming your own call sign.




⑦ Push **[BAND•MODE]** for 1 sec. to save the call sign and enter the note programming mode.
- Up to a 4-digit of note (operating radio type or area) can be set.

⑧ Push **[BAND•MODE]** for 1 sec. to save the note and exit the note programming mode.

⑨ Repeat steps ③ to ⑧ to program other call sign channels.

⑩ Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.

**NOTE:** During the call sign programming mode (④ to ⑦), push **[V/MHz•SCAN**] to clear the entered call sign (the cursor returns to the 1st digit position), push **[V/MHz•SCAN]** again to display the previously saved call sign.

SET B

1 Push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]** or **[▼]** to select "CALLS," if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times to select "MyCALL," then push **[BAND]**.

3 Push **[▲]** or **[▼]** to select the desired call sign channel.

4 Push **[BAND]** for 1 sec. to enter call sign programming mode.
- The 1st digit blinks.

5 Push **[▲]** or **[▼]** to select the desired character or code.
- Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** to move the cursor right or left respectively.

6 Push **[SET B(D-OFF)]** to select 2nd digit, then push **[▲]** or **[▼]** to select the desired character or code.
- The 2nd digit blinks (1st digit stops blinking).
- Repeat this step for programming your own call sign.

7 Push **[BAND]** for 1 sec. to save the call sign and enter the note programming mode.
- Up to a 4-digit of note (operating radio type or area) can be set.

8 Push **[BAND]** for 1 sec. to save the note and exit the note programming mode.

9 Push **[▲]** or **[▼]** to select an another channel from "M01" to "M06."

10 Repeat 3 to 8 to program other call sign channels.

11 Push **[CLR A(MW)]** to exit call sign set mode.

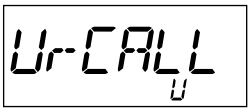
**NOTE:** During the call sign programming mode (4 to 7), push **[VFO/LOCK]** to clear the entered call sign (the cursor returns to the 1st digit position), push **[VFO/LOCK]** again to display the previously saved call sign.

## ◇ Station call sign programming

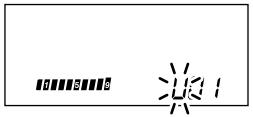
Station call sign must be programmed for the specified station call as well as repeater operation in both digital voice and low-speed data communications.

① Push **[SET•LOCK]** to enter call sign set mode.
- Rotate **[DIAL]** to select "CALLS," if "SET" or "MESSAG" is displayed.

② Push **[SET•LOCK]** or **[S.MW•MW]** several times to select "UrCALL," then push **[BAND•MODE]**.



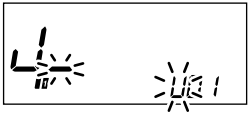

③ Rotate **[DIAL]** to select the desired call sign channel.
- "U" indication blinks.
- "U01" to "U99" are available.
- The call sign "CQCQCQ" is preprogrammed in the channel "U- -."




④ Push **[BAND•MODE]** for 1 sec. to select call sign programming mode.
- The 1st digit blinks.

⑤ Rotate **[DIAL]** to select the desired character or code.
- Push **[SET•LOCK]** or **[S.MW•MW]** to move the cursor right or left, respectively.

⑥ Push **[SET•LOCK]** to select 2nd digit, then rotate **[DIAL]** to select the desired character or code.
- 2nd digit blinks (1st digit stops blinking).
- Repeat this step for programming station call sign.




⑦ Push **[BAND•MODE]** for 1 sec. to save the call sign.

⑧ Rotate **[DIAL]** to select an another channel from "U01" to "U99."

⑨ Repeat steps ③ to ⑦ to program other station call sign channels.

⑩ Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.

**NOTE:** During the call sign programming mode (④ to ⑥), push **[V/MHz•SCAN]** to clear the entered call sign (the cursor returns to the 1st digit position), push **[V/MHz•SCAN]** again to select "CQCQCQ," "/" and the previously saved call sign.


1 Push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]** or **[▼]** to select "CALLS," if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times to select "UrCALL," then push **[BAND]**.

3 Push **[▲]** or **[▼]** to select the desired call sign channel.

4 Push **[BAND]** for 1 sec. to enter call sign programming mode.
- The 1st digit blinks.

5 Push **[▲]** or **[▼]** to select the desired character or code.
- Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** to move the cursor right or left respectively.

6 Push **[SET B(D-OFF)]** to select 2nd digit, then push **[▲]** or **[▼]** to select the desired character or code.
- The 2nd digit blinks (1st digit stops blinking).
- Repeat this step for programming other station call sign.

7 Push **[BAND]** for 1 sec. to save the call sign.

8 Push **[▲]** or **[▼]** to select an another channel from "U01" to "U99."

9 Repeat 3 to 7 to program another station call sign channels.

10 Push **[CLR A(MW)]** to exit call sign set mode.

**NOTE:** During the call sign programming mode (4 to 6), push **[VFO/LOCK]** to clear the entered call sign (the cursor returns to the 1st digit position), push **[VFO/LOCK]** again to select "CQCQCQ," "/" and the previously saved call sign.

**IMPORTANT!** The "M" indicator appears when the selected call sign channel is used for some memory or call channels. The desired call sign can be over-written even the "M" indicator is displayed, however, "MR ✱" is displayed while **[BAND•MOD]** (or **[BAND]**) is pushed and the previously memorized setting in memory or call channels are also changed at the same time.

# ■ Digital voice mode operation

① Set the desired frequency in VFO mode. (pgs. 11, 12)
- Select output power, if desired. (p. 19)

② Select DV mode. (p. 15)

③ Push **[SET•LOCK]** to enter the call sign set mode.
- Rotate **[DIAL]** to select "CALLS," if necessary.

④ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "MyCALL" appears.

⑤ Rotate **[DIAL]** to select the desired your own call sign channel (if you have programmed several call signs) then push **[SET•LOCK]** for 1 sec. to set the call sign and return "MyCALL."
- "M" indication stops blinking.

⑥ Push **[SET•LOCK]** once to select "UrCALL."

⑦ Select the desired call sign as "When sending a CQ (p. 66)" or "When calling the desired station (p. 67)."

⑧ Push and hold **[PTT]** to transmit and speak into the microphone at normal voice level.
- Transmit indicator appears and the RF meter shows the output power.

⑨ Release **[PTT]** to return to receive.
- The other station call sign will be received.
- Received call signs can be stored into the received call record automatically. See page 75 for details.


1 Set the desired frequency in VFO mode. (pgs. 11, 12)

2 Select DV mode. (p. 15)

3 Push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]** or **[▼]** to select "CALLS," if necessary.

4 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "MyCALL" appears.

5 Push **[▲]** or **[▼]** to select the desired own call sign channel, if you have programmed several call signs, then push **[SET B(D-OFF)]** for 1 sec. to set the call sign and return "MyCALL."
- "M" indication stops blinking.

6 Push **[SET B(D-OFF)]** once to select "UrCALL."

7 Select the desired call sign as "When sending a CQ (p. 66)" or "When calling the desired station (p. 67)."

8 Push and hold **[PTT]** to transmit and speak into the microphone at normal voice level.
- Transmit indication appears and the RF meter shows the output power.

9 Release **[PTT]** to return to receive.

***✔ For your information***

See page 75 for the set call sign confirmation.

## ◇ When sending a CQ

**• Select "CQ" as the call sign**

①Push **[SET• LOCK]** to enter call sign set mode.
- Rotate **[DIAL]** to select "CALLS," if "SET" or "MESSAG" is displayed.

②Push **[SET•LOCK]** or **[S.MW•MW]** several times until "UrCALL" appears, then push **[BAND•MODE]**.

③Rotate **[DIAL]** to select the call sign channel, that "CQCQCQ" is programmed.
- "CQCQCQ" is preprogrammed in "U - -" as the default.

④Push **[SET•LOCK]** for 1 sec. to set "CQCQCQ" for operation.
- "U" indication stops blinking.


⑤Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.

⑥Push and hold **[PTT]** to transmit and speak into the microphone at normal voice level.
- Transmit indicator appears and the RF meter shows the output power.

⑦Release **[PTT]** to return to receive.
- The other station call sign will be received.
- Received call signs can be stored into the received call record automatically. See page 75 for details.

SET B

1 Push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]** or **[▼]** to select "CALLS," if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "UrCALL" appears, then push **[BAND]**.

3 Push **[▲]** or **[▼]** to select the call sign channel, that "CQCQCQ" is programmed.
- "CQCQCQ" is programmed in "U - -" as the default.

4 Push **[SET B(D-OFF)]** for 1 sec. to set the "CQCQCQ" for operation.
- "U" indication stops blinking.

5 Push **[CLR A(MW)]** to exit call sign set mode.

6 Push and hold **[PTT]** to transmit and speak into the microphone at normal voice level.
- Transmit indication appears and the RF meter shows the output power.

7 Release **[PTT]** to return to receive.

**NOTE:** In digital mode operation; when the "BUSY" indicator appears but no sound comes out the speaker, it may be because of the analog FM mode interference. In this case, to prevent to interference from analog FM, set the digital monitor setting (p. 100) to "AN (analog)" then listen on the channel before transmitting by pushing **[MONI•DTMF]** on the front panel or **[MONI 1(BANK)]** on the microphone.

## ◇ When calling the desired station

**• Select the desired call sign**

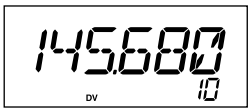
① Push **[SET• LOCK]** to enter call sign set mode.
- Rotate **[DIAL]** to select "CALLS," if "SET" or "MESSAG" is displayed.

② Push **[SET•LOCK]** or **[S.MW•MW]** several times until "UrCALL" appears, then push **[BAND•MODE]**.

③ Rotate **[DIAL]** to select the desired call sign channel.
- See p. 63 for station call sign programming.


④ Push **[SET•LOCK]** for 1 sec. to set the selected call sign for operation.
- "U" indication stops blinking.

⑤ Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.




⑤ Push and hold **[PTT]** to transmit and speak into the microphone at normal voice level.
- Transmit indicator appears and the RF meter shows the output power.

⑥ Release **[PTT]** to return to receive.
- The other station call sign will be received.
- Received call signs are stored into the received call record automatically. See page 75 for details.

**NOTE:** The digital mode operation is vastly different from FM mode. One of the differences is in digital mode the squelch does not function as in FM mode. Changing the squelch setting will not open it to hear the hiss of "White Noise." It only activates for digital squelch functions such as CSQL (Digital code squelch) or DSQL (Digital call sign squelch).

SET B

1 Push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]** or **[▼]** to select "CALLS," if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times until "UrCALL" appears, then push **[BAND]**.

3 Push **[▲]** or **[▼]** to select the desired call sign channel.
- See p. 64 for station call sign programming.

4 Push **[SET B(D-OFF)]** for 1 sec. to set the selected call sign for operation.
- "U" indication stops blinking.

5 Push **[CLR A(MW)]** to exit call sign set mode.

6 Push and hold **[PTT]** to transmit and speak into the microphone at normal voice level.
- Transmit indication appears and the RF meter shows the output power.

7 Release **[PTT]** to return to receive.

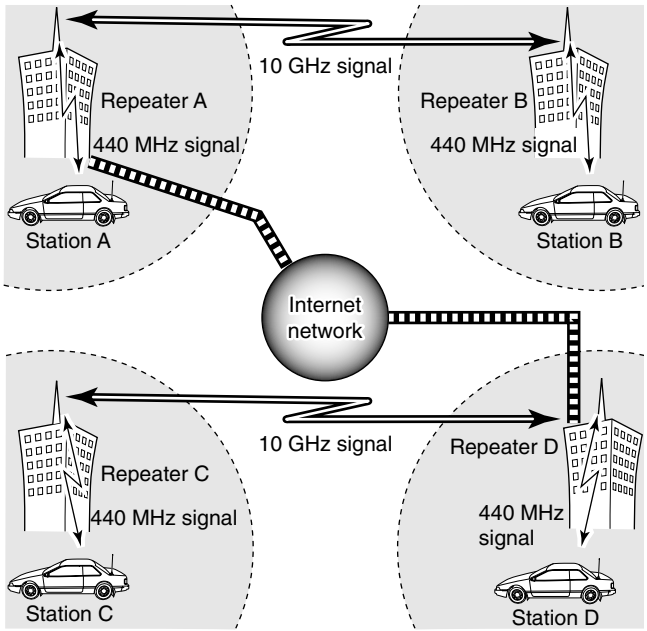
# ■ About D-STAR system

In the D-STAR system, repeater linking via a 10 GHz band backbone and internet network (gateway connection) capabilities are available. This system provides you to with much wider coverage range during digital voice mode operation.

***• D-STAR system outline***



***About time-out timer function***
The ID-800H has a time-out timer function for digital repeater operation. The timer limits a continuous transmission for approx. 10 min. Warning beeps will sound before 30 sec. (approx.) and just before the timer functioning.




For current existing repeater operation, stations that are communicating must be in the same repeater's operating area. However, in the D-STAR system as in the illustration at left, the repeaters can be linked via the system repeaters (with a 10 GHz signal). Thus stations A and B can communicate even though they are in different repeater operating areas.

Also, the D-STAR system repeaters are connectable through the internet network— gateway connection capability.

For example, when station B uses the gateway connection station B can communicate with the station C!
By using the gateway connection, long distance communication like DX operation may be possible with 144 or 440 MHz digital voice!

In the D-STAR system, an independent repeater's operating area is called an Area and a group that linking repeaters via a 10 GHz backbone is called a Zone.

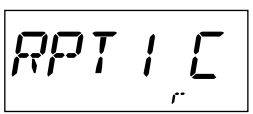
# ■ Digital repeater operation

Repeater call sign must be programmed for repeater operation in both digital voice and low-speed data communications.

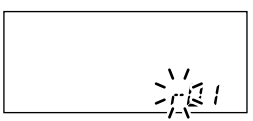
## ◇ Repeater call sign programming

①Push **[SET•LOCK]** to enter call sign set mode.
- Rotate **[DIAL]** to select "CALLS," if "SET" or "MESSAG" is displayed.

②Push **[SET•LOCK]** or **[S.MW•MW]** several times to select either the repeater call sign item, "RPT1 C" or "RPT2 C," then push **[BAND•MODE]**.
- "RPT1 C" or "RPT2 C" appears for repeater call sign.




③Rotate **[DIAL]** to select the desired call sign channel.
- "r01" to "r54" appears.



④Push **[BAND•MODE]** for 1 sec. to enter call sign programming mode.
- The 1st digit blinks.

⑤Rotate **[DIAL]** to select the desired character or code.
- Push **[SET•LOCK]** or **[S.MW•MW]** to move the cursor right or left, respectively.

⑥Push **[SET•LOCK]** to select 2nd digit, then rotate **[DIAL]** to select the desired character or code.
- 2nd digit blinks (1st digit stops blinking).
- Repeat this step for programming repeater call sign.

⑦Push **[M/CALL•PRIO]** to turn the gateway setting ON, if desired.
- "G" indication appears as the 8th digit.
- Add the gateway setting only when programming a gateway repeater call sign with gateway connection usage.

⑧Push **[BAND•MODE]** for 1 sec. to save the call sign.

⑨Rotate **[DIAL]** to select an another channel from "r01" to "r54."

⑩Repeat steps ④ to ⑦ to program other repeater call sign channels.

⑪Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.

**NOTE:** During the call sign programming mode (④ to ⑦), push **[V/MHz•SCAN]** to clear the entered call sign (the cursor returns to the 1st digit position), push **[V/MHz•SCAN]** again to select the previously saved call sign.

SET B

1 Push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]** or **[▼]** to select "CALLS," if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times to select the call sign item, then push **[BAND]**.
- "RPT1 C" or "RPT2 C" appears for repeater call sign.

3 Push **[▲]** or **[▼]** to select the desired call sign channel.
- "r01" to "r54" appears.

4 Push **[BAND]** for 1 sec. to enter call sign programming mode.
- The 1st digit blinks.

5 Push **[▲]** or **[▼]** to select the desired character or code.
- Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** to move the cursor right or left respectively.

6 Push **[SET B(D-OFF)]** to select 2nd digit, then push **[▲]** or **[▼]** to select the desired character or code.
- The 2nd digit blinks (1st digit stops blinking).
- Repeat this step for programming other station call signs.

7 Push **[BAND]** for 1 sec. to save the call sign.

8 Push **[▲]** or **[▼]** to select an another channel from "r01" to "r54."

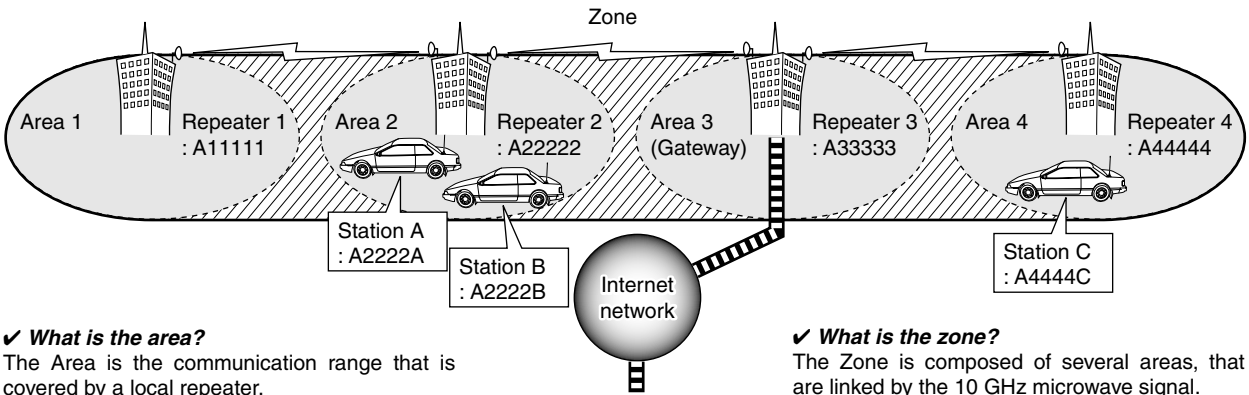
9 Repeat 4 to 7 to program other station call sign channels.

10 Push **[CLR A(MW)]** to exit call sign set mode.

**NOTE:** During the call sign programming mode (4 to 6), push **[VFO/LOCK]** to clear the entered call sign (the cursor returns to the 1st digit position), push **[VFO/LOCK]** again to select the previously saved call sign.

**IMPORTANT!** The "M" indicator appears when the selected call sign channel is used for some memory or call channels. The desired call sign can be over-written even the "M" indicator is displayed, however, "MR ✱" is displayed while **[BAND•MOD]** (or **[BAND]**) is pushed and the previously memorized setting in memory or call channels are also changed at the same time.

**• Setting example 1**




***✔ What is the area?***
The Area is the communication range that is covered by a local repeater.
The Local repeater is called as an area repeater in the D-STAR system.

***✔ What is the zone?***
The Zone is composed of several areas, that are linked by the 10 GHz microwave signal.
The areas 1 to 4 make up a zone in the example above.

**❑ The setting when the Station A is calling the Station B**

MyCALL : A2222A
UrCALL : A2222B
RPT1 C : A22222
RPT2 C : NOTUSE

**❑ The setting when the Station A is making a CQ call in area 1**

MyCALL : A2222A
UrCALL : CQCQCQ
RPT1 C : A22222
RPT2 C : A11111

**❑ The setting when the Station A is calling the Station C**

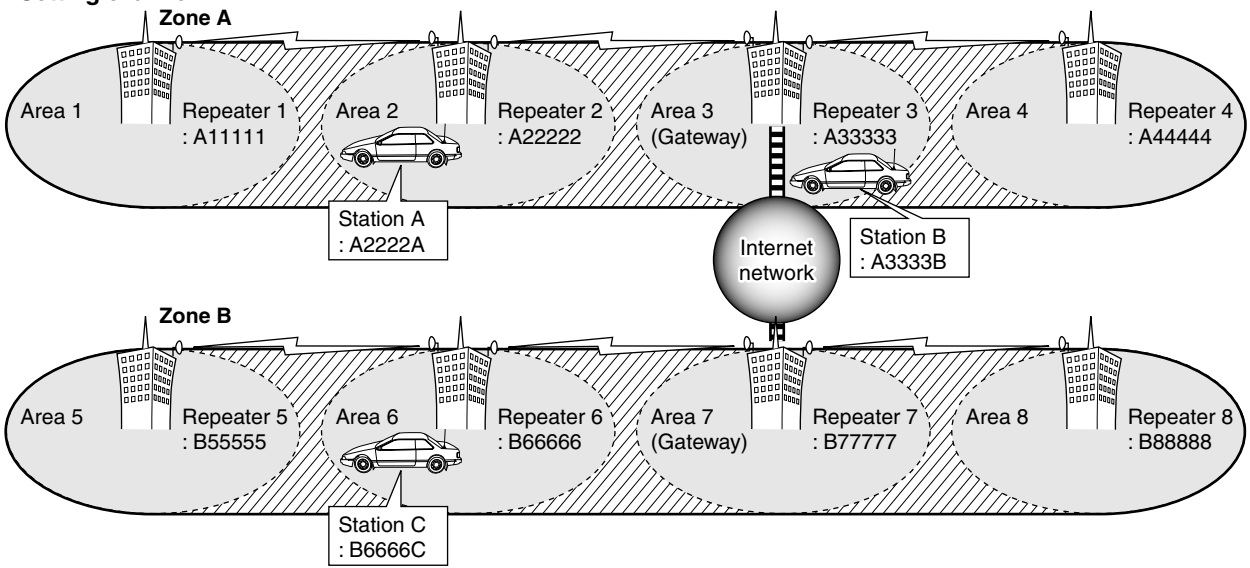
MyCALL : A2222A
UrCALL : A4444C
RPT1 C : A22222
RPT2 C : A44444

## ◇ Repeater operation in the same zone

① Set the desired repeater's frequency, offset and shift direction in VFO mode. (p. 21)
• Select "DV" mode in advance. (p. 15)
② Set your own call sign. (p. 65)
• See p. 61 for your own call sign programming.
③ Set the desired station call sign. (pgs. 66, 67)
• See p. 63 for station call sign programming.
④ Set the repeater's call sign as follows;
(1) Push **[SET•LOCK]** to enter call sign set mode.
• Rotate **[DIAL]** to select "CALL" if necessary.
(2) Push **[SET•LOCK]** or **[S.MW•MW]** several times to select "RPT1 C."
(3) Rotate **[DIAL]** to select the nearest repeater's call sign.
(4) Push **[SET•LOCK]** for 1 sec. to set the call sign for "RPT1 C."
(5) Push **[SET•LOCK]** to select "RPT2 C."
(6) Rotate **[DIAL]** to select the desired repeater's (in the same zone) call sign.
• Select "r - - (NOTUSE)" when not operating RPT2.
(7) Push **[SET•LOCK]** for 1 sec. to set the call sign for "RPT2 C."
(8) Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.
⑤ Push **[PTT]** to transmit; release to receive.


1 Set the desired repeater's frequency, offset and shift direction in VFO mode. (p. 22)
• Select "DV" mode in advance. (p. 15)
2 Set your own call sign. (p. 65)
• See p. 62 for your own call sign programming.
3 Set the desired station call sign. (pgs. 66, 67)
• See p. 64 for station call sign programming.
4 Set the repeater's call sign as follows;
(1) Push **[SET B(D-OFF)]** to enter call sign set mode.
• Push **[▲]** or **[▼]** to select "CALL" if "SET" or "MESSAG" is displayed.
(2) Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times to select "RPT1 C."
(3) Push **[▲]** or **[▼]** to select the nearest repeater's call sign.
(4) Push **[SET B(D-OFF)]** for 1 sec. to set the call sign for "RPT1 C."
(5) Push **[SET B(D-OFF)]** to select "RPT2 C," then push **[BAND]**.
(6) Push **[▲]** or **[▼]** to select the desired repeater's (in the same zone) call sign.
• Select "r - - (NOTUSE)" when not operating RPT2.
(7) Push **[SET B(D-OFF)]** for 1 sec. to set the call sign for "RPT2 C."
(8) Push **[CLR A(MW)]** to exit call sign set mode.
5 Push **[PTT]** to transmit; release to receive.

**• Setting examle 2**




**❑ The setting when the Station A is calling the Station C**

MyCALL : A2222A
UrCALL : B6666C
RPT1 C : A22222
RPT2 C : A33333 G

**❑ The setting when the Station A is making a CQ call in area 8**

MyCALL : A2222A
UrCALL : /B88888
RPT1 C : A22222
RPT2 C : A33333 G

**❑ The setting when the Station B is calling the Station C**

MyCALL : A3333B
UrCALL : B6666C
RPT1 C : A33333
RPT2 C : A33333 G

## ◇ Repeater operation into another zone

①Set the desired repeater's frequency, offset and shift direction in VFO mode. (p. 21)
- Select "DV" mode in advance.

②Set your own call sign. (p. 65)
- See p. 61 for your own call sign programming.

③Set the desired station call sign. (pgs. 66, 67)

***• When making a CQ call***

Set the desired repeater's (in a different zone) call sign, for the area you want to make a CQ call, into "UrCALL."
- "/," stands for "CQCQCQ," is added at the 1st digit automatically.

- See p. 63 for station call sign programming.

④Set the repeater's call sign as follows;

(1) Push **[SET•LOCK]** to enter call sign set mode.
- Rotate **[DIAL]** to select "CALL" if necessary.

(2) Push **[SET•LOCK]** or **[S.MW•MW]** several times to select "RPT1 C."

(3) Rotate **[DIAL]** to select the nearest repeater's call sign.

(4) Push **[SET•LOCK]** for 1 sec. to set the call sign for "RPT1 C."

(5) Push **[SET•LOCK]** to select "RPT2 C."

(6) Rotate **[DIAL]** to select the gateway repeater's (in the same zone) call sign.
- The call sign should have "G" setting as the 8th digit.
- Push **[SET•LOCK]** or **[S.MW•MW]** to display last 6-digit or first 6-digit of the call sign, respectively.

(7) Push **[SET•LOCK]** for 1 sec. to set the call sign for "RPT2 C."

(8) Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.

⑤Push **[PTT]** to transmit; release to receive.

SET B

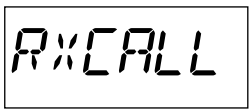
1 Set the desired repeater's frequency, offset and shift direction in VFO mode. (p. 22)
• Select "DV" mode in advance. (p. 15)
2 Set your own call sign. (p. 65)
• See p. 62 for your own call sign programming.
3 Set the desired station call sign. (pgs. 66, 67)
***• When making a CQ call***
Set the desired repeater's (in a different zone) call sign, for the area you want to make a CQ call, into "UrCALL."
• See p. 64 for station call sign programming.
4 Set the repeater's call sign as follows;
(1) Push **[SET B(D-OFF)]** to enter call sign set mode.
• Push **[▲]** or **[▼]** to select "CALL" if necessary.
(2) Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times to select "RPT1 C."
(3) Push **[▲]** or **[▼]** to select the nearest repeater's call sign.
(4) Push **[SET B(D-OFF)]** for 1 sec. to set the call sign for "RPT1 C."
(5) Push **[SET B(D-OFF)]** to select "RPT2 C."
(6) Push **[▲]** or **[▼]** to select the gateway repeater's (in the same zone) call sign.
• The call sign should have "G" setting as the 8th digit.
• Push **[SET•LOCK]** or **[S.MW•MW]** to display last 6-digit or first 6-digit of the call sign, respectively.
(7) Push **[SET B(D-OFF)]** for 1 sec. to set the call sign for "RPT2 C."
(8) Push **[CLR A(MW)]** to exit call sign set mode.
5 Push **[PTT]** to transmit; release to receive.

# ■ Received call sign

When a call in digital voice mode is received, the calling station and using repeater call signs being used can be stored into the received call record. The stored call signs are viewable in the following manner.

## ◇ Desired call record indication

① Push **[SET•LOCK]** to enter call sign set mode.
• Rotate **[DIAL]** to select "CALLS" if necessary.
② Push **[SET•LOCK]** or **[S.MW•MW]** several times to select the received call indication.
• "RXCALL," "RXRPT1," and "RXRPT2" are available for the received station, repeater 1 and repeater 2 call signs, respectively.




③ To confirm the received call, push **[BAND•MODE]** to enter the received call sign indication mode.
• When "RXCALL" is selected in step ②, the additional note can be displayed by pushing **[BAND•MODE]**.
• Push **[SET•LOCK]** or **[S.MW•MW]** to display last 6-digit or first 6-digit of the received call sign, respectively.
• Push **[BAND•MODE]** once or twice to exit the indication mode.
④ Push one of **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit call sign set mode.

SET B

1 Push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]** or **[▼]** to select "CALLS," if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times to select the received call indication.
- "RXCALL," "RXRPT1" and "RXRPT2" are available for the received station call sign, repeater 1 and repeater 2 call sign, respectively.

3 To confirm the received call, push **[BAND]** to enter the received call sign indication mode.
- When "RXCALL" is selected in step 2, the additional note can be displayed by pushing **[BAND]**.
- Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** to display last 6-digit or first 6-digit of the received call sign.
- Push **[BAND]** once or twice to exit the indication mode.

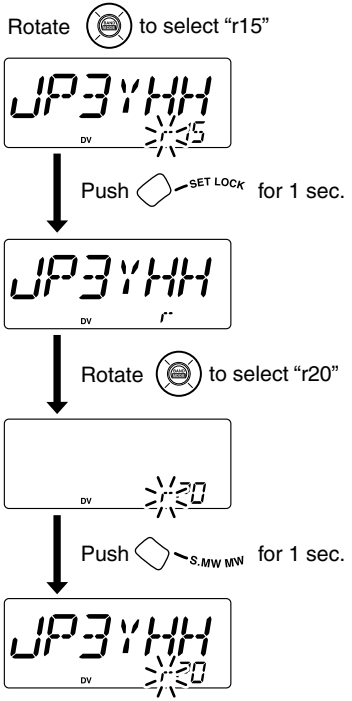
4 Push **[CLR A(MW)]** to exit call sign set mode.

**NOTE:** The record is cleared once turning power OFF, or overwritten when another call is received.

***For your information***

By selecting "MyCALL," "UrCALL," "RPT1 C" or "RPT2 C" at step ② as at above left and step 2 as above, the programmed call sign can also be displayed for confirmation.
**[DIAL]** rotation is necessary to select the desired call sign channel in this case.

**• Example— Copying the call sign memory "r15" into "r20"**



## ◇ Received station call sign indication

➥ Push and hold **[TONE•T-SCAN•BK]**, until 2 beeps sound, to display the received station call sign.

- The first 6-digit of the stored call sign in "RXCALL" are displayed.
- While continuing to hold **[TONE•T-SCAN•BK]** even if 2 beeps sound, a long beep will sound and the stored call signs (in "RXCALL," "RXRPT1" and "RXRPT2") are set for operation (see "One-touch reply using the call record" as below). While continuing to hold **[TONE•T-SCAN•BK]** even if a long beep sounds, a long beep will sound again and the break-in function will be set (see p. 84)
- When a call sign has not been received correctly, "NoCALL" is displayed.

## ◇ One-touch reply using the call record

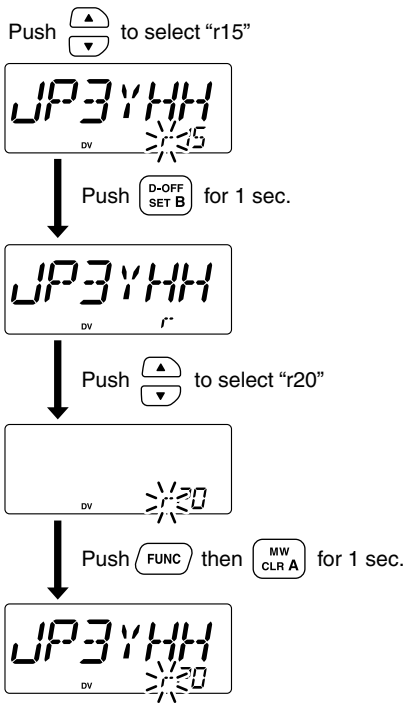
The stored call signs in the call record can be set for operation to reply to the call.

① After receiving a call, push and hold **[TONE•T-SCAN•BK]** until 2 regular and 1 long beeps sound.
Or, during the received call sign indication as described in "Desired call record indication" at left, push **[SET•LOCK]** for 1 sec.

- Set your own call sign (MyCALL) in advance.
- The call sign stored in "RXCALL" is set to "UrCALL," "RXRPT1" is set to "RPT2 C" and "RXRPT2" is set to "RPT1 C."

② Push **[PTT]** to transmit; release to receive.

**• Example— Copying the call sign memory "r15" into "r20"**



***Important!***
The set call signs with the "One-touch reply using the call record" operation as at below left are for temporary operation only. Therefore, the set call signs will be erased when another call sign is set.
- Never saved into a call sign memory.
- When "NoCALL" is displayed, the "One-touch reply using the call record" operation won't be performed.

If you want to save the set call signs, see "Copying the set call sign contents for temporary operation" (p. 79) for details.

***For your information***
When the call that is specifying your own call sign is received, the station and the using repeater call signs being used can be set for operation automatically.

- When "Auto Received Call sign Set" (p. 99) is set to ON, the stored station call sign in "RXCALL" is set to "UrCALL" automatically.

- When "Auto Received Repeater Call sign Set" (p. 100) is set to ON, the stored station call sign in "RXRPT1" is set to "RPT2 C" and "RXRPT2" is set to "RPT1 C" automatically.

**NOTE:**
When call sign memories are full (no blank channel is available), the call sign is unable to be saved and the function display shows the following indication.

**• When no blank channel is available in "UrCALL"**


**• When no blank channel is available in "RPT1/2 C"**


**• When no blank channel is available in both "UrCALL" and "RPT1/2 C"**


# ■ Copying the call sign

## ◇ Copying the call sign memory contents

This function is convenient when saving additional notes for areas (for mobile operation) or unit number/initials (if several transceivers are available), or modifying a part of the current call sign.

① During VFO mode, push **[SET•LOCK]** to enter call sign set mode.
- Rotate **[DIAL]** to select "CALL" if necessary.

② Push **[SET•LOCK]** or **[S.MW•MW]** several times to select

"MyCALL," "UrCALL," "RPT1 C" or "RPT2 C" as desired.

③ Push **[BAND•MODE]** then rotate **[DIAL]** to select the desired call sign channel to be copied.
- M01 to M06, U01 to U99 and r01 to r54 are available.

④ Push **[SET•LOCK]** for 1 sec. to set the selected call sign for operation.

⑤ Rotate **[DIAL]** to select the desired call sign channel to copy to.

⑥ Push **[S.MW•MW]** for 1 sec. to copy the selected call sign into the selected call sign memory.

⑦ Modify the copied call sign as described in "Call sign programming" (pgs. 61–64) or "Repeater call sign programming" (pgs. 69, 70).


1 During VFO mode, push **[SET B(D-OFF)]** to enter call sign set mode.
- Push **[▲]/[▼]** to select "CALL" if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** several times to select "MyCALL," "UrCALL," "RPT1 C" or "RPT2 C" as desired.

3 Push **[BAND]** then push **[▲]/[▼]** to select the desired call sign channel to be copied.
- M01 to M06, U01 to U99 and r01 to r54 are available.

4 Push **[SET B(D-OFF)]** for 1 sec. to set the selected call sign for operation.

5 Push **[▲]/[▼]** to select the desired call sign channel to copy to.

6 Push **[FUNC]**, then push and hold **[CLR A(MW)]** for 1 sec. to copy the selected call sign into the selected call sign memory.

7 Modify the copied call sign as described in "Call sign programming" (pgs. 61–64) or "Repeater call sign programming" (pgs. 69, 70).

### ◇ Copying the set call sign contents for temporary operation

This is a way to program the set operating frequency with other settings into a memory channel and the set call sign ("UrCALL," "RPT1 C" and "RPT2 C"), from the call record, at the same time.

① After a call is received, perform "One-touch reply using the call record" (p. 76) to set the call signs.
- When the call that is specifying your own call sign is received, during "Auto Received Call sign Set" (p. 99) and/or "Auto Received Repeater Call sign Set" (p. 100) is/are ON, the received station and/or repeater call signs are set automatically.

② When the call is received in memory mode, perform "Copying memory contents—Memory/call➪VFO" (p. 31) to copy the memory contents into VFO.

③ During VFO mode, push **[S.MW•MW]** momentarily.
- "M" indicator and the memory channel number blink.

④ Rotate **[DIAL]** to select the desired memory channel to be programmed.

⑤ Push **[S.MW•MW]** for 1 sec. to program the operating frequency with other settings into the selected memory channel. The set call signs in "UrCALL," "RPT1 C" and "RPT2 C" are saved into their respective blank channels (U01–U99 and r01–r54) at the same time.

***For your information***

If **[S.MW•MW]** is pushed for 1 sec. at step ③ as at left, the operating frequency and another settings can be stored into the displayed memory channel. (steps ④ and ⑤ can be skipped)

However, the memory channel is over-written, and the currently programmed frequency and settings will be lost.
- The saved contents in the call sign memories are kept.

## ■ Message items

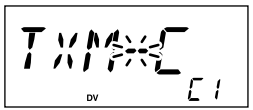
### ◇ TX message programming

TX messages are available for up to 6 channels and each channel can be programmed with a message of up to 20 characters. Available characters are **0** to **9**, **A** to **Z** (capital letters only), some symbols and space.

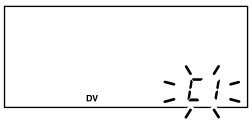
A TX message channel C1 must be programmed, if you want to use the GPS message. The GPS message is transmitted from channel C1 only.

① Push **[SET•LOCK]** to enter message set mode.
- Rotate **[DIAL]** to select "MESSAG," if "CALLS" or "SET" is displayed.

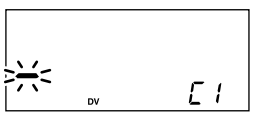
② Push **[SET•LOCK]** or **[S.MW•MW]** several times until "TXM-C" appears, then push **[BAND•MODE]**.




③ Rotate **[DIAL]** to select the message channel.
• One of either “C1” to “C6” blinks.

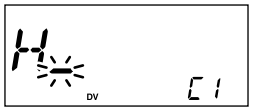



④ Push **[BAND•MODE]** for 1 sec. to select message programming mode.
• The 1st digit blinks and the channel indication stops blinking.




⑤ Rotate **[DIAL]** to select the desired character.
• Push **[SET•LOCK]** or **[S.MW•MW]** to move the cursor right or left, respectively.

⑥ Push **[SET•LOCK]** to select the 2nd digit, then rotate **[DIAL]** to select the desired character.
• 2nd digit blinks (1st digit stops blinking).
• Repeat this step for programming.




⑦ Push **[BAND•MODE]** for 1 sec. to save the message.
⑧ Repeat steps ② to ⑦ to set other message channels.
⑨ Push **[M/CALL•PRIO]**, **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit message set mode.

SET B

1 Push **[SET B (D-OFF)]** to enter message set mode.
- Push **[▲]** or **[▼]** to select "MESSAG" if necessary.

2 Push **[SET B(D-OFF)]** or **[ENT C (T-OFF)]** several times to select "TXM-C."

3 Push **[BAND]** then push **[▲]** or **[▼]** to select the message channel.
- One of either "C1" to "C6" blinks.

4 Push **[BAND]** for 1 sec. to enter message programming mode.
- The 1st digit blinks and channel indicator stops blinking.

5 Push **[▲]** or **[▼]** to select the desired character.
- Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** to move the cursor right or left, respectively.

6 Push **[SET B(D-OFF)]** to select the 2nd digit, then push **[▲]** or **[▼]** to select the desired character.
- 2nd digit blinks and 1st digit stops blinking.
- Repeat this step for programming.

7 Push **[BAND]** for 1 sec. to save the message.

8 Repeat steps 2 to 7 to set another message channels.

9 Push **[CLR A(MW)]** to exit the message set mode.

## • Available characters

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| (space) | (!) | (") | (#) | ($) | (%) | (&) | (') | (() | ()) | (*) |
| (+) | (,) | (–) | (.) | (/) | (0) | (1) | (2) | (3) | (4) | (5) |
| (6) | (7) | (8) | (9) | (:) | (;) | (<) | (=) | (>) | (?) | (@) |
| (A) | (B) | (C) | (D) | (E) | (F) | (G) | (H) | (I) | (J) | (K) |
| (L) | (M) | (N) | (O) | (P) | (Q) | (R) | (S) | (T) | (U) | (V) |
| (W) | (X) | (Y) | (Z) | ([) | (\) | (]) | (^) | | | |

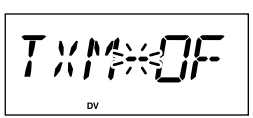
## ◇ Message Transmission

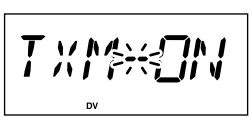
Select the message transmission function ON and OFF. When ON is selected, the transceiver transmits a text message (pre-programmed). (default: OFF)

① Set the operating frequency, call signs and other settings, such as repeater, as desired.
② Push **[SET•LOCK]** to enter message set mode.
- Rotate **[DIAL]** to select "MESSAG," if "CALLS" or "SET" is displayed.

③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "TXM-C" appears.
④ Rotate **[DIAL]** to select the desired message channel.
- "C1" to "C6" available.
- See pgs. 80 and 81 for message programming.

⑤ Push **[S.MW•MW]** to select the message transmission setting, then rotate **[DIAL]** to select "TXM-ON."



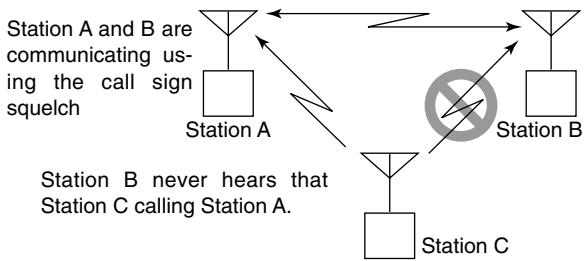




⑥ Push **[M/CALL•PRIO]**, **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit message set mode.
⑦ Push **[PTT]** to transmit and send the selected message simultaneously.

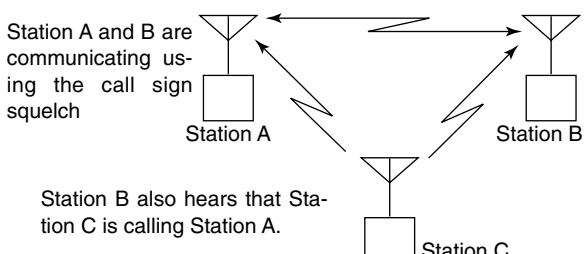
***• How to use the break-in?***

While operating with the call sign squelch, the squelch never opens (no audio sounds) even if a call is received, unless your own call sign ("MyCALL") is specified.
However, when the call including the "BK ON" signal (break-in call) is received, the squelch will open and audio sounds even if the call is specified for another station.

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




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



SET B

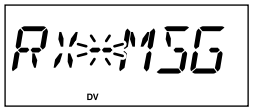
1 Set the operating frequency, call signs and other settings, such as repeater, as desired.
2 Push **[SET B (D-OFF)]** to enter message set mode.
  • Push **[▲]** or **[▼]** to select "MESSAG" if necessary.
3 Push **[SET B(D-OFF)]** or **[ENT C (T-OFF)]** several times until "TXM-C" appears.
4 Push **[▲]** or **[▼]** to select the desired message channel.
5 Push **[ENT C(T-OFF)]** then **[▲]** to select "TXM-ON."
6 Push **[CLR A(MW)]** to exit message set mode.
7 Push **[PTT]** to transmit and send the selected message simultaneously.

## ◇ RX message indication

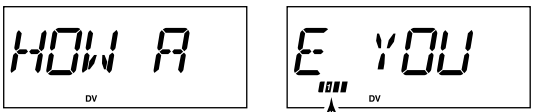
When a call with a message is received, the message can be stored into the RX message record.
The message is cleared once turning power OFF, or over-written when another message is received.

① When the call with a message is received, the digital message indicator blinks.


② Push **[SET•LOCK]** to enter message set mode.
  • Rotate **[DIAL]** to select "MESSAG," if necessary.
③ Push **[SET•LOCK]** or **[S.MW•MW]** several times until "RX-MSG" or "RX-CAL" appears.
  • When "RX-CAL" is displayed, rotate **[DIAL]** to select "RX-MSG."
  • When "RX-CAL" is selected, the station call sign, that the message is send, is displayed at the next step.
  Push **[SET•LOCK]** or **[S.MW•MW]** to display last 6-digit or first 6-digit of the call sign, respectively, in this case.



④ Push **[BAND•MODE]** to display the message, then push **[SET•LOCK]** or **[S.MW•MW]** several times to scroll the message.




Scroll indicator appears

⑤ Push **[M/CALL•PRIO]**, **[TONE•T-SCAN•BK]**, **[LOW•DUP]** or **[MONI•DTMF•EMR]** to exit the message set mode.

SET B

1 When the call with a message is received, the digital message indicator blinks.
2 Push **[SET B (D-OFF)]** to enter message set mode.
- Push **[▲]** or **[▼]** to select "MESSAG" if necessary.

3 Push **[SET B(D-OFF)]** or **[ENT C (T-OFF)]** several times to select "RX-MSG" or "RX-CAL."
- When "RX-CAL" is displayed, push **[▲]** or **[▼]** to select "RX-MSG,"

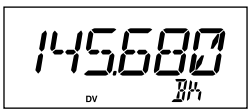
4 Push **[BAND]** to display the message.
5 Push **[SET B(D-OFF)]** or **[ENT C (T-OFF)]** to scroll the message.
6 Push **[CLR A(MW)]** to exit the message set mode.

***For your information***
When "Auto RX message Display (RMD)" (p. 101) is set to ON, the received message will be displayed and scrolls automatically.

# ■ Break-in communication

The break-in function allows you to break into an another station's communications in both digital voice and low-speed data operation.

① While receiving an another station's communication, push and hold **[TONE•T-SCAN•BK]** until 2 regular and 2 long beeps sound to turn the break-in setting ON.
- "BK" appears.
- When a call sign has not been received correctly, "NoCALL" is displayed and "BK" won't be appears. Receive the call sign included in a communicating signal again, or set the call sign manually in this case.




②When both stations are in standby, transmit to send a break-in call.
- Programmed call sign station receives the break-in call as well as your call sign.

③Wait for the reply call from the station who receives the break-in call.
④After receiving the reply call, communicate normally.
⑤To cancel the break-in, push and hold **[TONE•T-SCAN•BK]** for 1 sec. to turn OFF.

# ■ Pocket beep operation

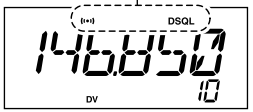
This function uses a digital code/call sign for calling and can be used as a “common pager” to inform you that someone has called while you were away from the transceiver. The digital code or digital call sign squelch does not function while in a low-speed data communication.

## ◇ Waiting for a call from a specific station

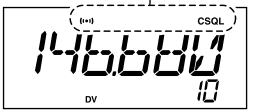
①Set the operating frequency.
②Program the digital code or call sign.
- See p. 99, “Digital code setting,” or pgs. 61, 62, “Call sign programming” and p. 65, call sign setting.

③Push **[TONE•T-SCAN•BK]** several times until “((•)) CSQL” or “((•)) DSQL” is displayed to turn ON the pocket beep with digital code squelch or digital call sign squelch, respectively.

Appears when the pocket beep with digital call sign squelch is activated.




Appears when the pocket beep with digital code squelch is activated.



④When a signal with the matched digital code/call sign is received, the transceiver emits beep tones and blinks "((•))."
- Beep tones sound for 30 sec. and "((•))" blinks. To stop the beeps and blinking manually, push any key. When the beep tones are not stopped manually, "((•))" continues blinking until **[PTT]** is pushed (see step ⑤).

⑤Push **[PTT]** to answer.
- "((•))" disappears and cancels the pocket beep function automatically.

⑥Push **[TONE•T-SCAN•BK]** several times until "CSQL" or "DSQL" disappears to cancel the digital code squelch or digital call sign squelch function.

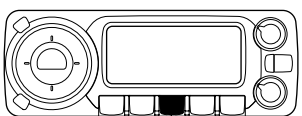
## ■ Digital squelch function

The digital code (CSQL) or digital call sign (DSQL) squelch opens only when receiving a voice signal with the same preprogrammed digital code or call sign, respectively.

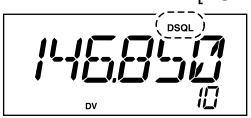
①Set the operating frequency.

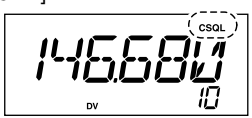
②Program the digital code or call sign.
- See p. 99, "Digital code setting," or pgs. 61, 62, "Call sign programming" and p. 65, call sign setting.

③Push **[TONE•T-SCAN•BK]** several times until "CSQL" or "DSQL" appears in the function display.
- "CSQL" for digital code squelch; "DSQL" for digital call sign squelch operation.



[TONE•T-SCAN]



④When a signal with the matched digital code/call sign is received, the squelch opens and the signal can be heard.
- When the received signal includes an unmatched digital code/call sign, the squelch does not open. However, the S/RF indicator shows the received signal strength.
- To open the squelch manually, push **[MONI•DTMF•EMR]** momentarily.

⑤Operate the transceiver in the normal way (push **[PTT]** to transmit; release **[PTT]** to receive).

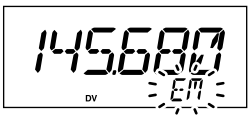
⑥To cancel the digital code/digital call sign squelch, push **[TONE•T-SCAN•BK]** several times until "CSQL" or "DSQL" disappears.

***✔ While scanning in digital mode:***
- The digital call sign squelch function deactivate, then after cancelling the scan it will activate again.
- Scan stops near channel in a 5 kHz tuning steps, and then no sound comes out.

## ■ EMR communication

The EMR communication mode is available for digital mode operation. In the EMR communication mode, no call sign setting is necessary. When an EMR communication mode signal is received, the audio (voice) will be sound in the specified level even the volume setting level is set to minimum level.

①Set the desired frequency then push and hold **[MONI•DTMF•EMR]** until 4 beeps sound to turn the EMR setting ON.
- "EM" blinks.

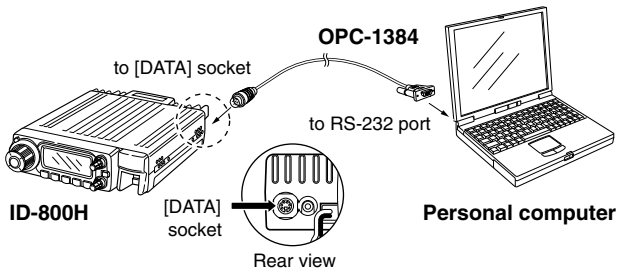



②Operate the transceiver normal way.

③To cancel the EMR communication mode, push and hold **[MONI•DTMF•EMR]** for 1 sec. to turn OFF.

# ■ Low-speed data communication

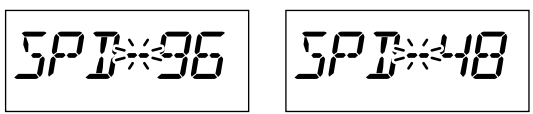
In addition to the digital voice communication, a low-speed data communication is available.




①Turns OFF the transceiver

②While pushing **[SET•LOCK]**, push and hold **[PWR]** for 1 sec. to enter initial set mode. (see p. 104)

③Push **[SET•LOCK]** or **[S.MW•MW]** several times to select the data communication speed setting. (see p. 110)
- "SPD" appears.
- Rotate **[DIAL]** to select suitable data speed for your PC or application.

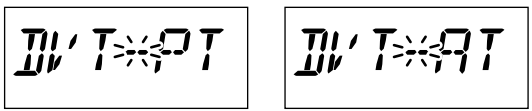



④Push **[PWR]** to exit initial set mode, then set the desired frequency.

⑤Set repeater call signs, transmit output power and other conditions.

⑥Push **[SET•LOCK]** to enter set mode.
- Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.

⑦Push **[SET•LOCK]** or **[S.MW•MW]** several times to select the automatic data transmission setting. (see p. 99)
- "DVT" appears.
- Skip this setting, if you want to transmit manually.



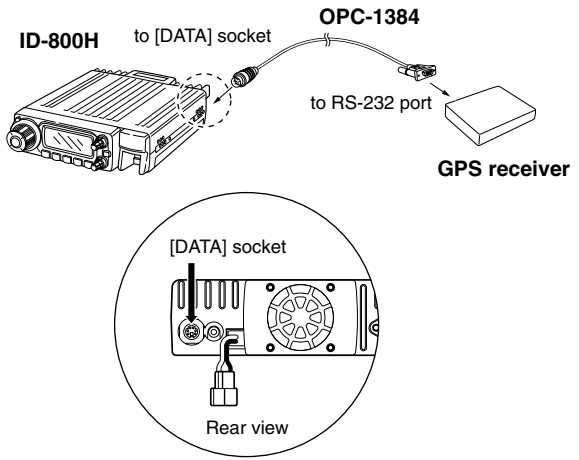

⑧Start up the low-speed data communication application.

⑨Set the application as follows.
- Port : The same COM port number as ID-800H's
- Baud rate : 4800 bps or 9600 bps (same as step ③)
- Data : 8 bit
- Parity : None
- Stop : 1 bit
- Flow control : Xon/Xoff

⑩Transceiver automatically transmits or receives the data while the computer is sending data to transceiver. Or push and hold **[PTT]** to transmit, release to receive the data manually.
- Refer to the instructions of the application that how to send or receive data.

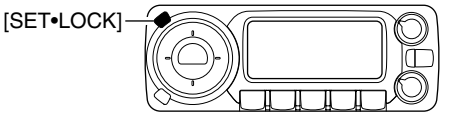
# ■ GPS operation

A GPS receiver (RS-232 output/NMEA format/4800 bps) can be connected to **[DATA]** socket of the ID-800H to indicate the current position (Latitude and Longitude). The position data can also be transmitted with a message to another station.

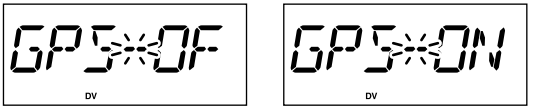



## ◇ Position indication

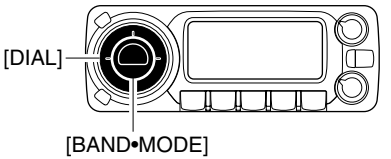
①While connected to a GPS receiver and operating digital (DV) mode, push **[SET•LOCK]** to enter set mode.
- Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.




②Push **[SET•LOCK]** or **[S.MW•MW]** several times to select the GPS setting.
- "GPS" appears.



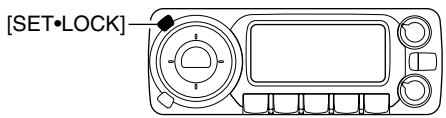

③Rotate **[DIAL]** to select the GPS setting ON, then push **[BAND•MODE]** to enter the sentence formatter set mode.



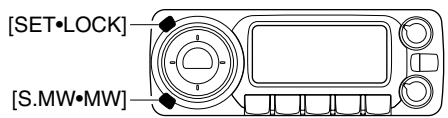
# ■ Set mode

## ◇ Set mode operation

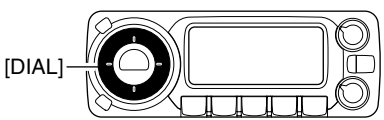
①Push **[SET•LOCK]** to enter set mode.
- Rotate **[DIAL]** to select "SET," if "CALLS" or "MESSAG" is displayed.




②Push **[SET•LOCK]** or **[S.MW•MW]** to select the desired item.




③Rotate **[DIAL]** to select the condition or value.



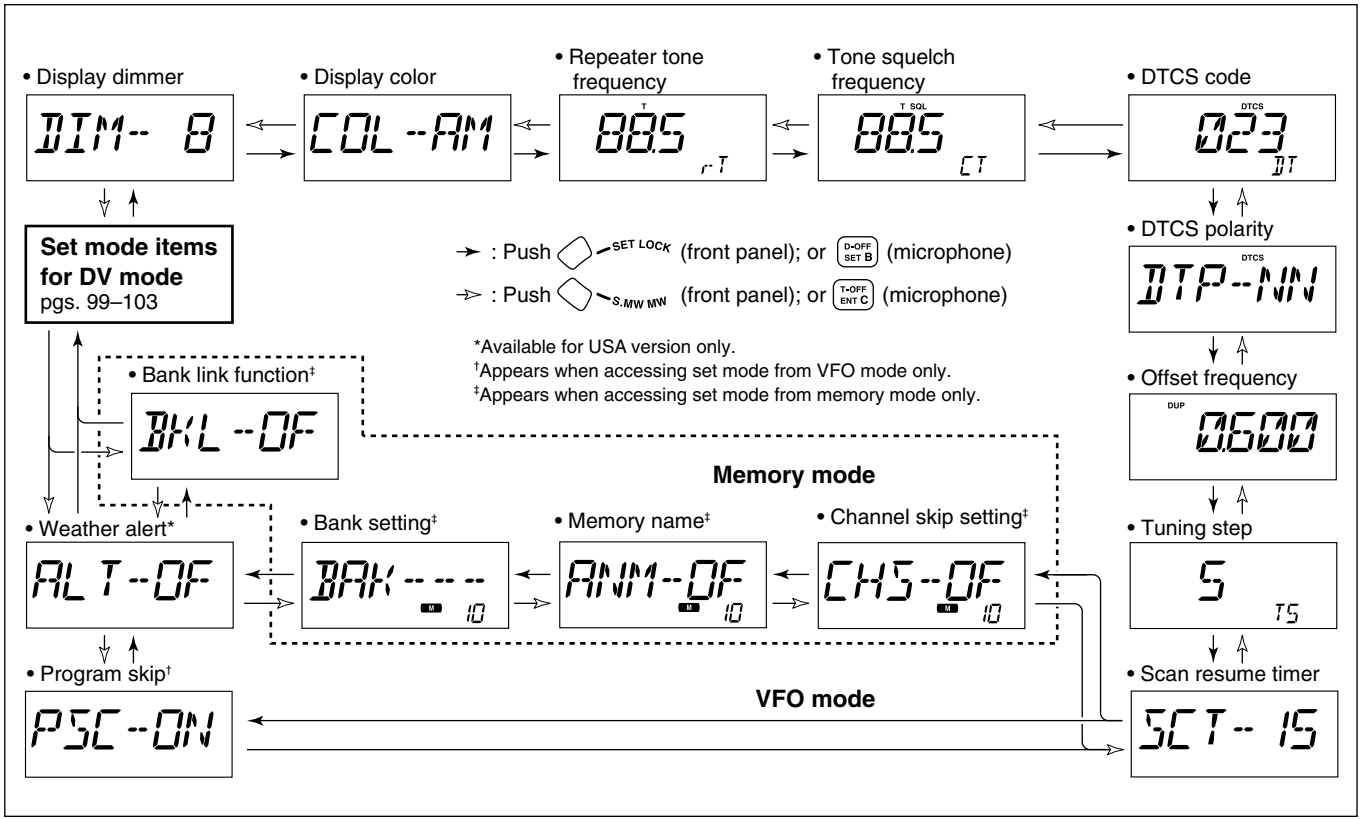

④Push any key below the display to exit set mode.

SET B

1 Push **[SET B(D-OFF)]** to enter set mode.
- Push **[▲]** or **[▼]** to select "SET," if necessary.

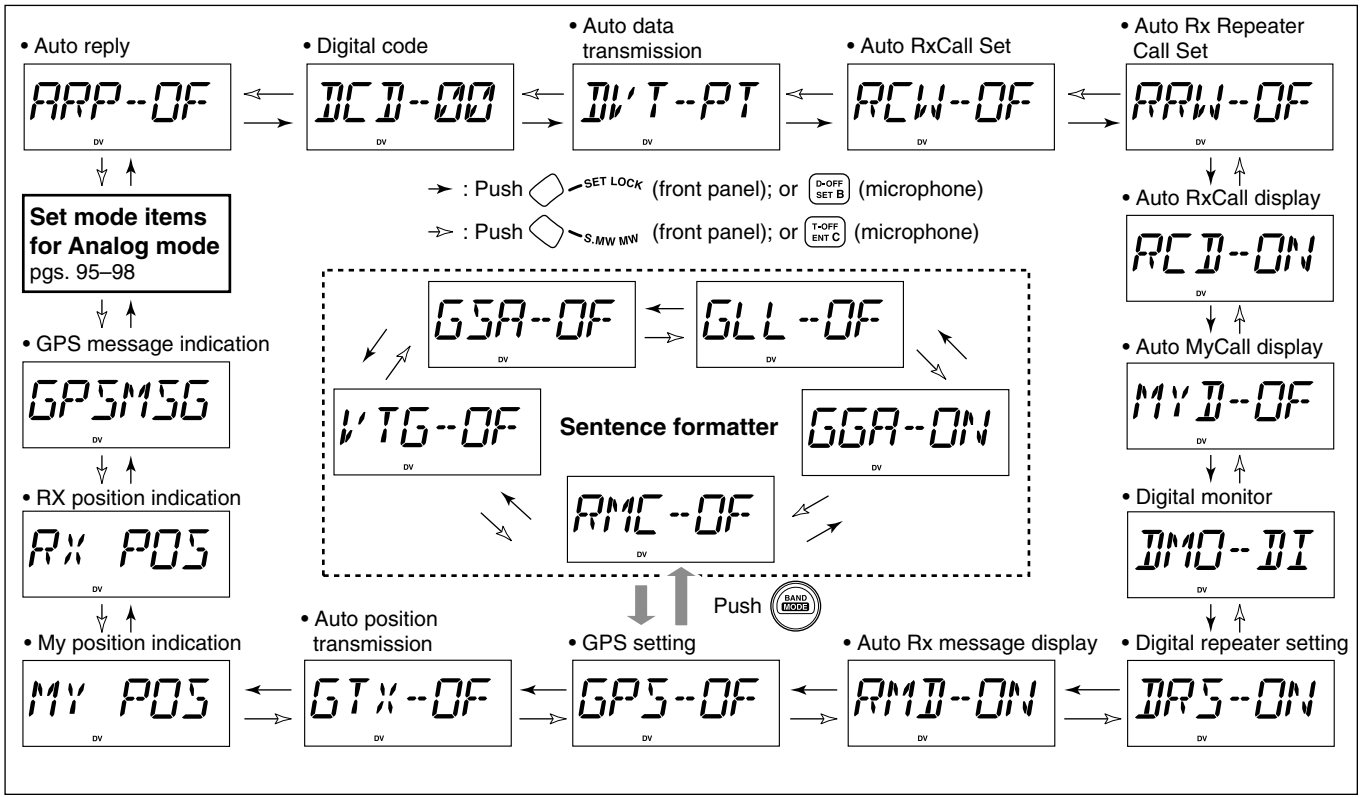
2 Push **[SET B(D-OFF)]** or **[ENT C(T-OFF)]** to select the desired item.
3 Push **[▲]** or **[▼]** to select the condition or value.
4 Push **[CLR A(MW)]** to exit set mode.

## ◇ Set mode items (VFO/Memory mode)



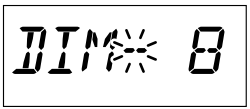
## ◇ Set mode items (DV mode)

These items appear when set mode is accessed from the digital (DV) mode only.



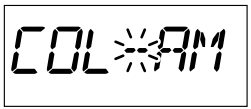
### ◇ Display dimmer

Adjust to suit lighting conditions.
The levels 1 (dark) to 8 (bright: default) are available.

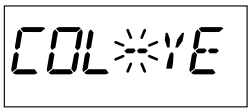



### ◇ Display color

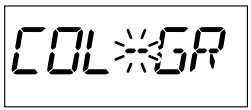
The display color can be set to amber (default), yellow or green.




• Amber setting (default)




• Yellow setting




• Green setting

### ◇ Repeater tone

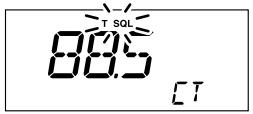
Sets subaudible tone frequency (encoder only) for repeater operation. Total of 50 tone frequencies (67.0–254.1 Hz) are available. (default: 88.5 Hz)


**• Available subaudible tone frequencies**

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

### ◇ Tone squelch tone

Sets subaudible tone frequency (both encoder and decoder) for tone squelch operation. Total of 50 tone frequencies (67.0–254.1 Hz) are available. (default: 88.5 Hz)



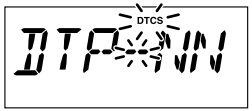
### ◇ DTCS code

Sets DTCS code (both encoder and decoder) for DTCS squelch operation. Total of 104 codes are available.

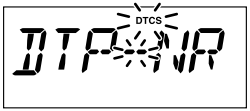
(default: 023)


### ◇ DTCS polarity

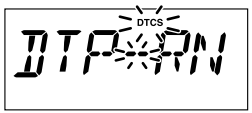
Sets DTCS polarities for transmission and reception from "NN," "NR," "RN" and "RR." (default: NN)



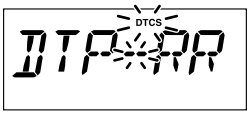

• Transmit : normal
Receive : normal
(default)




• Transmit : normal
Receive : reverse




• Transmit : reverse
Receive : normal

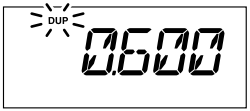



• Transmit : reverse
Receive : reverse

### ◇ Offset frequency

Sets the duplex offset frequency within 0 to 20 MHz range. During duplex (repeater) operation, transmit frequency shifts the set frequency.

**(Default value may differ depending on operating frequency band and versions.)**

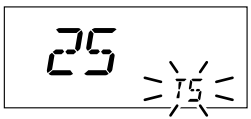



### ◇ Tuning step

Selects tuning step from 5,* 6.25,* 10, 12.5, 15, 20, 25, 30, 50, 100 and 200 kHz for **[DIAL]** or **[▲]/[▼]** operation.

**(Default value may differ depending on operating frequency band and versions.)**

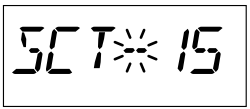
*Not selectable in 900 MHz band.

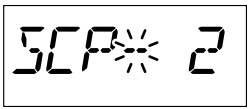


## ◇ Scan resume timer

Selects scan resume timer from SCT-15 (default), SCT-10, SCT-5 and SCP-2.

- SCT-15/10/5 : Scan pauses for 15/10/5 sec., then resumes.
- SCP-2 : Pause on a signal until signal disappears, then resumes 2 sec. after the signal disappears.

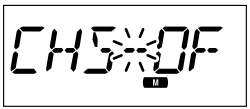


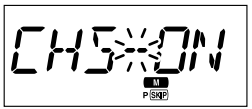

## ◇ Channel skip setting

☞ **This item appears when set mode is accessed from memory mode only.**

Sets channel skip setting from ON and OFF for memory skip scan operation.




• Default setting

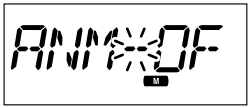



• "SKIP" or "P SKIP" appears when set to "ON."

## ◇ Memory name setting

☞ **This item appears when set mode is accessed from memory mode only.**

Sets memory name setting from ON (appear) and OFF (not appear; default) for memory name appearance.

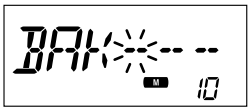


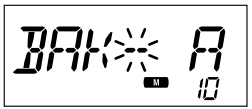


## ◇ Memory bank setting

☞ **This item appears when set mode is accessed from memory mode only.**

Sets the desired memory bank (A to J and OFF) to assign the regular memory channels.

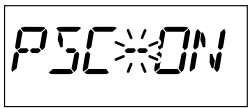


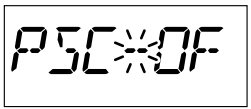



## ◇ Program scan skip setting

☞ **This item appears when set mode is accessed from VFO mode only.**

Sets the program scan skip setting from ON (default) and OFF for VFO scan operation, such as programmed scan.

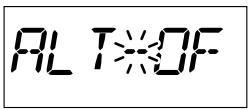


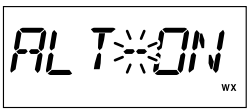




## ◇ Weather alert function

***U.S.A. version only***

Turns weather alert function ON and OFF (default).

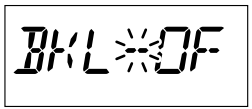


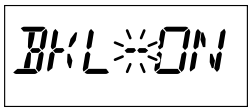




## ◇ Memory bank link function

☞ **This item appears when set mode is accessed from memory mode only.**

Sets the memory bank link function ON and OFF (default). The link function provides continuous banks scan, scanning all contents in the selected banks during bank scan.




### • Bank link setting

① Rotate **[DIAL]** to select the memory bank link function ON.
② Push **[SET•LOCK]** or **[S.MW•MW]** to select the desired bank to be linked.

- BLA: Bank A, BLB: Bank B, BLC: Bank C, BLD: Bank D, BLE: Bank E, BLF: Bank F, BLG: Bank G, BLH: Bank H, BLI: Bank I, BLJ: Bank J



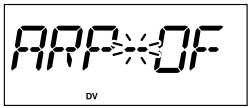
③ Rotate **[DIAL]** to select “ON” to link the bank.
④ Repeat steps ② and ③ to link other banks.

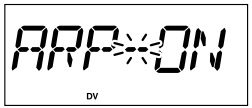
## ◇ Auto Reply

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

During digital mode operation, auto reply function is available. This function replies to an individual station call even you are away from the transceiver. (default: OFF)

After the manual transmission (pushing **[PTT]**), the Auto Reply setting returns to OFF automatically.

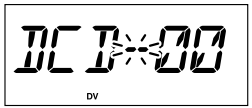


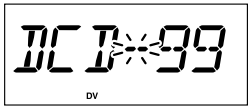




## ◇ Digital Code

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

Sets the desired digital code for digital code squelch operation. Total of 100 codes (00–99) are available. (default: 00)

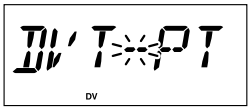


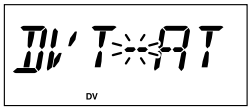




## ◇ Auto data Transmission

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

During low-speed data operation, auto data transmission function is available. This function transmits when data has been input from PC via the **[DATA]** socket. (default: PTT)



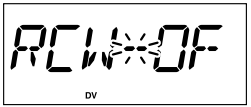

## ◇ Auto Received Call sign Set

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

When an individual station call is received, the calling station call sign can be set for operation automatically.

(default: OFF)

The set call sign cannot be re-called when another station call sign is set, if the call sign has not been saved.

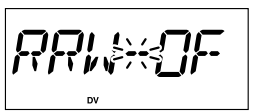


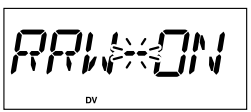

## ◇ Auto Received Repeater Call sign Set

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

When an individual station call via the repeater is received, the repeater call sign can be stored automatically.
(default: OFF)

The set call sign cannot be re-called when another repeater call sign is set, if the call sign has not been saved.

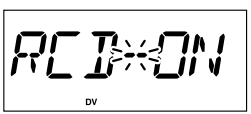


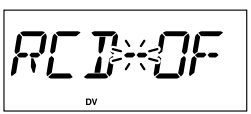




## ◇ Auto Received Call sign Display

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

When an individual station call is received, the calling station call sign can be indicated automatically. (default: ON)

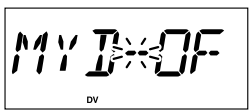


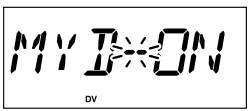




## ◇ Auto MyCALL Display

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

Sets auto MyCALL display function ON and OFF. When this setting is set to ON, the transceiver automatically indicates your programmed call sign at turning power ON or digital mode transmission. (default: OFF)

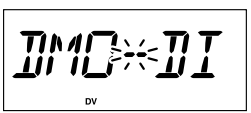


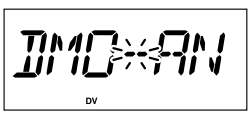




## ◇ Digital Monitor

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

Sets the desired monitoring mode during digital mode operation from “DI (Digital)” and “AN (Analog).” (default: DI)
Select “ANALOG” when using FM mode for monitoring.

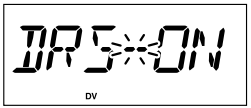


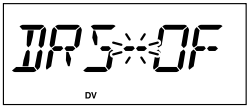



## ◇ Digital Repeater setting

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

When accessing the repeater's call sign is different as your programmed, the repeater call sign can be stored into "RPT1 C" automatically by reading the repeater's transmission. The stored repeater's call sign can be re-called when selecting the repeater call sign. (default: ON)




## ◇ Auto RX message Display

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

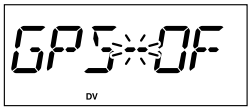
Sets auto received message display function ON and OFF. When this setting is set to ON, the transceiver automatically indicates the received message. (default: ON)

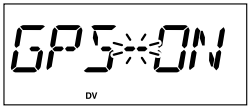


## ◇ GPS setting

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

Sets the current position indication ON and OFF. When a GPS receiver (compatible with an RS-232 output/NMEA format/4800 bps) is connected to **[DATA]** socket and this setting is set to ON, the transceiver can indicate the current position (Latitude and Longitude). (default: OFF)



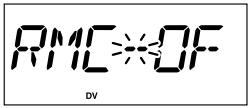



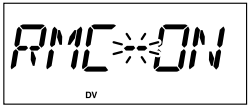

### • Sentence formatter setting

① While selecting "GPS" setting item, push **[BAND•MODE]** to enter the sentence formatter setting condition.

② Push **[SET•LOCK]** or **[S.MW•MW]** to select the desired sentence formatter to be activated.

• RMC, GGA, GLL, GSA and VTG are selectable.




③ Rotate **[DIAL]** to select "ON" to activate the sentence formatter.

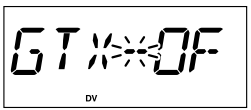
④ Repeat steps ② and ③ to set the link condition.

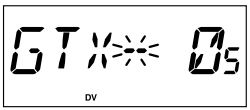
• Only three sentence formatters are activated at same time.

## ◇ GPS Automatic transmission

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

Sets automatic position transmission function ON (0.5, 1, 3, 5, 10, 30 min.) and OFF. When the position information is received from a connected GPS receiver and this setting is set to a specific time, the transceiver automatically transmits with the current position and message at every setting interval. (default: OFF)



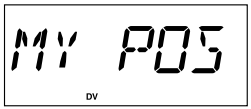

## ◇ GPS position indication

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

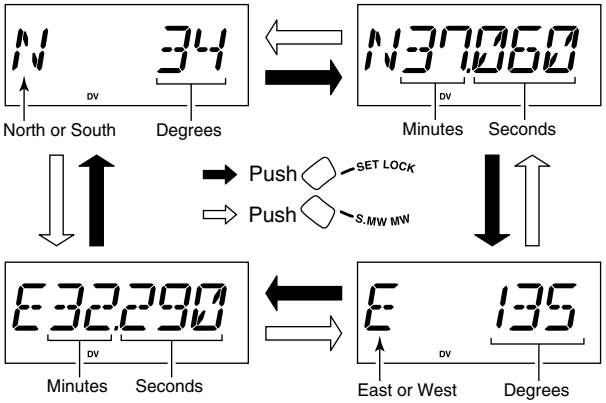
Indicates a current position, when the position information is received from a connected GPS receiver.

➥ Select “My POS,” then push **[BAND•MODE]** to enter the position indication.

• The GPS setting item, “GPS,” must be set ON in advance.




• Latitude data and longitude date appear alternately by pushing **[SET•LOCK]** or **[S.MW•MW]**. (see below)

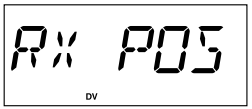


## ◇ GPS received position indication

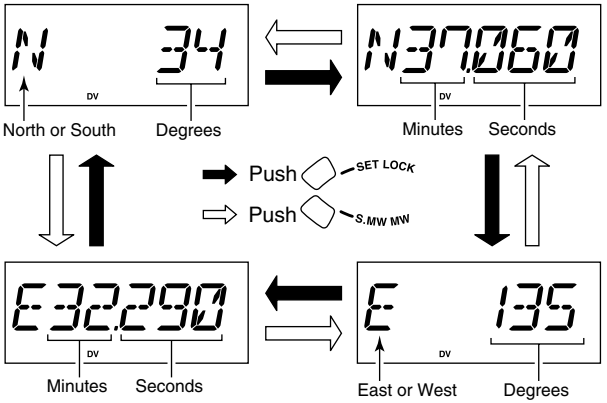
☞ **This item appears when set mode is accessed from digital (DV) mode only.**

Indicates a received position information from the other transceiver.

➥ Select “Rx POS,” then push **[BAND•MODE]** to enter the received position indication.




• Latitude and longitude data appear alternately by pushing **[SET•LOCK]** or **[S.MW•MW]**. (see below)

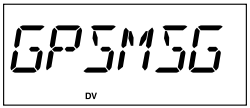



## ◇ GPS received message indication

☞ **This item appears when set mode is accessed from digital (DV) mode only.**

Indicates a received message with the GPS transmission from the other transceiver.

➥ Select “GPSMSG,” then push **[BAND•MODE]** to enter the received message indication when the message is attached.



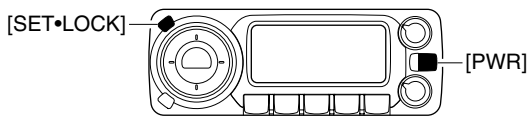

# ■ Initial set mode

***AT POWER ON***

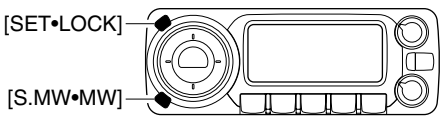
The initial set mode is accessed at power ON and allows you to set seldom-changed settings. In this way, you can "customize" transceiver operations to suit your preference and operating style.

### ◇ Initial set mode operation

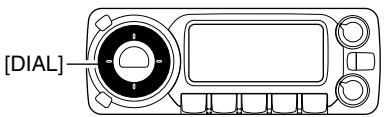
① While pushing **[SET•LOCK]**, push and hold **[PWR]** for 1 sec. to enter initial set mode.



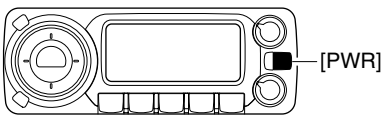

② Push **[SET•LOCK]** or **[S.MW•MW]** to select the desired item.



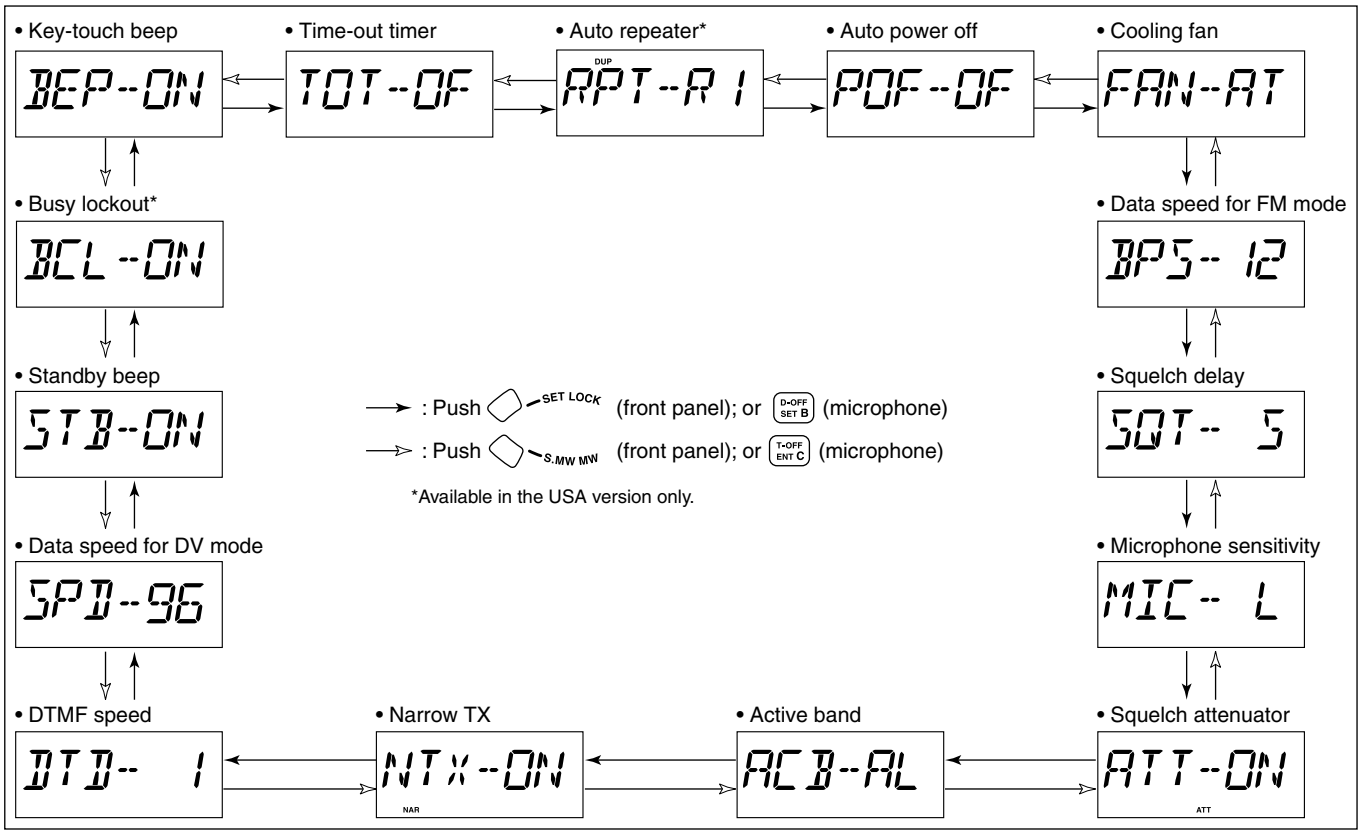

③ Rotate **[DIAL]** to select the condition or value.




④ Push **[PWR]** momentarily to exit initial set mode.

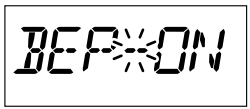


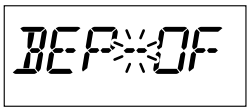
## ◇ Initial set mode items



### ◇ Key-touch beep

The key-touch beep can be turned OFF for silent operation. (default: ON)

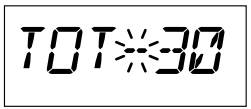



### ◇ Time-out timer

To prevent accidental prolonged transmission, etc., the transceiver has a time-out timer. This function cuts a transmission OFF after 3–30 min. of continuous transmission. This timer can be cancelled. (default: OFF)

- TOT-OF : The time-out timer is turned OFF.
- TOT-3/5/15/30 : The transmission is cut OFF after the set period elapses. Warning beeps sound when the time-out timer is activated before 10 sec.

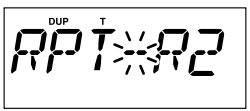

### ◇ Auto repeater

***U.S.A. version only***

The auto repeater function automatically turns ON or OFF the duplex operation with a specified shift direction and tone encoder, when the operating frequency falls within or outside of 145.200–145.495, 146.610–146.995, 147.000–147.395, 442.000–444.995, and 447.000–449.995 MHz range. The offset and repeater tone frequencies are not changed by the auto repeater function, reset these frequencies, if necessary.

- OF : The auto repeater function is turned OFF.
- R1 : Activates for duplex only. (default)
- R2 : Activates for duplex and tone.

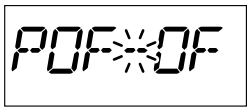


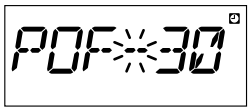


## ◇ Auto power OFF

The transceiver can be set to automatically turn OFF after a specified period with a beep when no key operations are performed.

30 min., 1 hour, 2 hours and OFF can be specified. The specified period is retained even when the transceiver is turned OFF by the auto power OFF function. To cancel the function, select “OF” in this set mode. (default: OFF)




**NOTE:** While GPS automatic transmit function is activated, this function does not work.

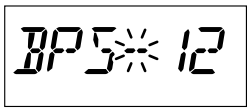
## ◇ Cooling fan control

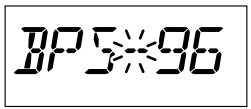
Selects the cooling fan control condition from Auto (default) and ON.

- Auto (AT) : The fan rotates during transmit and for 2 min. after transmission, or when the internal temperature of the transceiver exceeds the preset value until the temperature drops.
- ON (ON) : The fan continuously rotates.


### ◇ Data transmission speed

Selects the data transmission speed for packet operation from 1200 bps and 9600 bps. (default: 1200 bps)




### ◇ Squelch delay

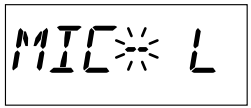
Selects squelch delay from short and long to prevent repeated opening and closing of the squelch during reception of the same signal.

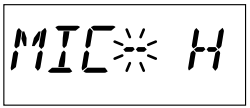
- S : Short squelch delay. (default)
- L : Long squelch delay.



### ◇ Microphone sensitivity

Selects the microphone sensitivity from high (H) and low (L) to suits your preference. (default: Low)

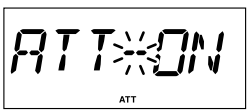



### ◇ Squelch attenuator

Turns the squelch attenuator function ON (default) and OFF.

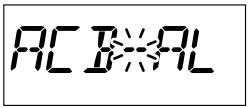
- ON : The squelch attenuator activates when **[SQL]** control is set between 12 o'clock and fully clockwise position.
- OF : The squelch attenuator does not function.

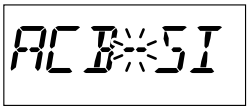



### ◇ Active band

Selects the frequency selecting condition via **[DIAL]** or **[▲]/[▼]** on the microphone from all (AL) and single (SI).

- All (AL) : The operating frequency can be selected continuously. (default)
- Single (SI) : The operating frequency can be selected within the current band. Pushing **[BAND•MODE]** then **[DIAL]** rotation is necessary for frequency band selection.




### ◇ Narrow TX function

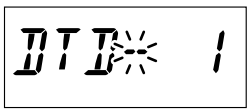
Select the narrow TX function ON and OFF.

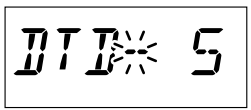
- ON : Enables the FM narrow mode transmission. The deviation (modulation level) becomes half from the regular FM transmission can be performed. (default)
- OFF : Inhibits the FM narrow mode transmission. The regular FM deviation transmission is performed (“NAR” indication disappears while transmission) even when FM narrow is selected.


### ◇ DTMF speed

The rate at which DTMF memories send individual DTMF characters can be set to accommodate operating needs.

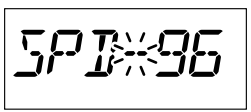
- 1 : 100 msec. interval; 5.0 cps rate (default)
- 2 : 200 msec. interval; 2.5 cps rate
- 3 : 300 msec. interval; 1.6 cps rate
- 5 : 500 msec. interval; 1.0 cps rate

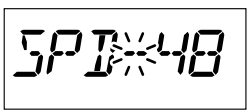





### ◇ Data Speed

Select the communication speed between the transceiver and PC for low-speed data communication from 4800 bps or 9600 bps. (default: 9600 bps)

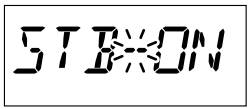


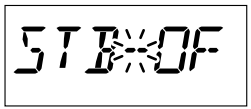



### ◇ Standby Beep

Turns the beep emission capability ON and OFF when the communicating station finishes transmitting or the receive signal disappears. while in the digital mode operation.

(default: ON)





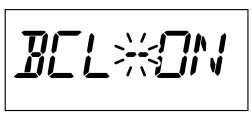

### ◇ Busy lockout

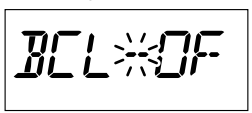
***U.S.A. version only***

The busy lockout function inhibits the transmission while receiving a signal on the selected frequency to prevent interference to another stations.

ON : The transmission with [PTT] is inhibited and beeps sound while the selected frequency is in busy. (default)

OFF : The transmission with [PTT] is possible even the selected frequency is in busy.

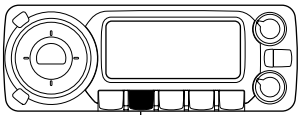


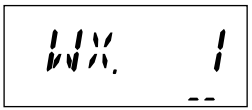


# ■ Weather channel operation (USA version only)

## ◇ Weather channel selection

① Push **[M/CALL•PRIO]** several times to select weather channel group.



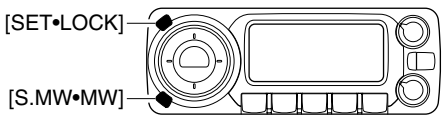

Weather channel group indication

② Rotate **[DIAL]** to select the desired weather channel.
③ Push **[M/CALL•PRIO]** to select memory mode, or push **[V/MHz•SCAN]** to select VFO mode.

## ◇ Weather alert function

NOAA broadcast stations transmit weather alert tones before important weather announcements. When the weather alert function is turned ON, the selected weather channel is monitored each 5 sec. for the announcement. When the alert signal is detected, the “AL.T” and the WX channel are displayed alternately and sounds a beep tone until the transceiver is operated. The previously selected (used) weather channel is checked periodically during standby or while scanning.

① Select the desired weather channel.
② Turn the weather alert function ON in set mode.
➥ Push **[SET•LOCK]** to enter set mode.
• Rotate **[DIAL]** to select “SET,” if “CALLS” or “MESSAG” is displayed.



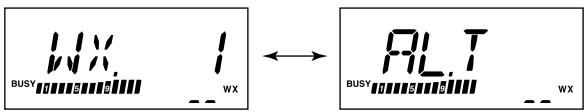

➥ Push **[SET•LOCK]** or **[S.MW•MW]** to select the weather alert item, then rotate **[DIAL]** to set ON.



➥ Push any key below the display to exit set mode.

③ Sets the desired stand-by condition.
- Selects VFO, memory or call channel.
- Scan or priority watch operation can also be selected.

④ When the alert is detected, a beep sounds and the following indication will be displayed.




Shows above indications alternately.

⑤ Turn the weather alert function OFF in set mode.

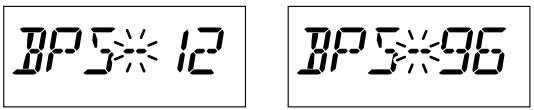
**NOTE:** While receiving a signal (on a frequency other than the weather alert ON frequency), the receiving signal or audio will be interrupted momentarily every 5 sec. (approx.) in case the alert function is turned ON. This symptom is caused by the WX alert function. To cancel these symptoms, set the weather alert item OFF in set mode.

# ■ Packet operation

## ◇ Data speed

For packet operation, the transceiver can be set to one of two data speeds: 1200 bps or 9600 bps.

① While pushing **[SET•LOCK]**, push and hold **[PWR]** for 1 sec. to enter initial set mode.
② Push **[SET•LOCK]** or **[S.MW•MW]** to select 'BPS.'
③ Rotate **[DIAL]** to select the desired data speed.



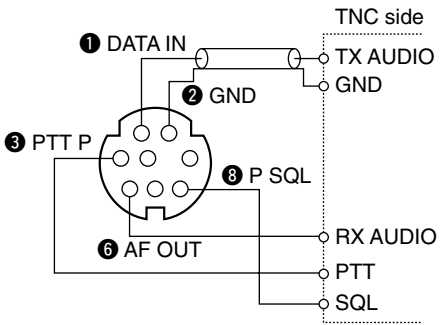

④ Push **[PWR]** to exit initial set mode.

*For 1200 bps operation—*
- Disconnect the microphone plug from the microphone connector during data transmission, otherwise the data signal and voice signal are simultaneously transmitted.

*For 9600 bps operation—*
- When the transceiver is set for 9600 bps data transmission in set mode, the microphone signal is automatically cut. Therefore, it is not necessary to disconnect the microphone plug from the connector in this case.
- When pushing **[PTT]** during data transmission, data transmission is interrupted and voice signals have priority.

## ◇ 1200 bps packet operation

① Connect the transceiver and a TNC as illustrated below.




② Set the TNC for transmit.
③ Set transmit delay on the TNC.
④ Adjust the TNC frequency deviation if necessary.

- ***When using a deviation meter:***
  Adjust the output of the TNC so that frequency deviation is in the range ± 3 to ±4 kHz.

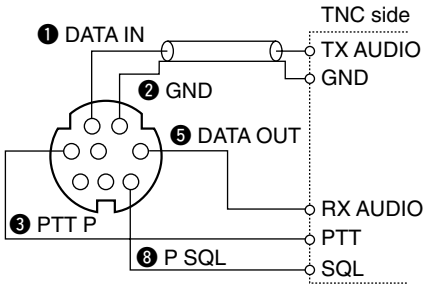
- ***When NOT using a deviation meter:***
  A receiver or transceiver is needed to monitor the transmission—compare the received audio output level when receiving a TNC modulated signal with high level voice signals using the microphone. Then adjust the TNC modulated signal to a lower level than the voice modulated signal.

- Read the instructions supplied with your TNC carefully before attempting packet operation with the transceiver.
- Pin ❻ AF OUT is for 1200 bps operation only. This pin cannot be used for 9600 bps operation.
- Over modulation may degrade signal quality. If you find that many transmissions are failing, re-adjust the modulation level.

## ◇ 9600 bps high speed packet operation

The transceiver supports 2 modes of 9600 bps packet operation: G3RUH and GMSK.

① Connect the transceiver and a TNC as illustrated below.




② G3RUH mode can handle 16 kinds of modulated wave forms in order to maintain a communication link.
③ Set transmit delay on the TNC.
④ Adjust the TNC frequency deviation if necessary (see right content for details).

- When using the PTT P terminal for packet operation, no voice signals are transmitted from the microphone.
- When pushing **[PTT]** during data transmission, data transmission is interrupted and the voice signal takes priority.
- Read the instructions supplied with your TNC carefully before attempting packet operation with the transceiver.
- Pin ❺ DATA OUT is for 9600 bps operation only. This pin cannot be used for 1200 bps operation.

## ◇ Adjusting the transmit signal output from the TNC

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

**NEVER** apply data levels from the TNC of over the acceptable level below, otherwise the transceiver will not be able to maintain the band width and may possibly interfere with other stations.

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

| | |
|---|---|
| 2 Vp-p (1 Vrms) | : recommended level |
| 1 Vp-p–3 Vp-p (0.5–1.5 Vrms) | : acceptable level |

**2. When NOT using a measuring device.**

① Connect the transceiver to a TNC.
② Enter a test mode (“CAL,” etc.) on the TNC, then transmit some test data.
③ *When the transceiver fails to transmit the test data or transmits sporadically (TX indicator doesn’t appear or flashes):*
- Decrease the TNC output level until the transmit indicator lights continuously.

*When transmission is not successful even though the TX indicator lights continuously:*
- Increase the TNC output level.

# ■ Microphone keys

The supplied HM-133's (optional for some versions) **[F-1]** and **[F-2]** keys memorize the transceiver conditions.
The **[UP]**/**[DN]** keys of the standard or an optional microphone (other than the HM-133) can be assigned functions like the function keys on the transceiver's front panel.

## ◇ [UP]/[DN] keys on a microphones

(other than HM-133) *AT POWER ON*

The following functions are assigned to **[UP]**/**[DN]** keys on the other microphones (HM-118N, etc.) when first applying power.

**• Default setting**

**[UP]** : channel up; push and hold to start scan, push again to stop scan.

**[DN]** : channel down; push and hold to start scan, push again to stop scan.

➥ ***Assigning a function***

① Turn the power OFF.
② While pushing the desired switch on the transceiver and one of either **[UP]**/**[DN]** keys on the microphone, turn the power ON.
• The function is programmed into the key.

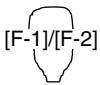
➥ ***Clearing an assignment***

① Turn the power OFF.
② While pushing the desired **[UP]** or **[DN]** key on the microphone, turn the power ON.

## ◇ [F-1]/[F-2] keys on HM-133

The following conditions can be memorized into **[F-1]** and **[F-2]** keys, independently.

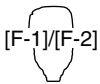
- Operating frequency
- Repeater setting (offset direction and frequency, tone ON/OFF and frequency)
- Tone/DTCS squelch (ON/OFF, frequency/code and polarity)
- Transmit output power selection
- Tuning step
- Operating mode selection




➥ ***Programming the band condition***
Push and hold for **[F-1]**/**[F-2]** for 1 sec.
• 3 beeps sound.

➥ ***Recalling the band condition***
Push **[F-1]**/**[F-2]** momentarily.

And, the set call signs ("UrCALL," "RPT1 C" and "RPT2 C"), set mode and initial set mode setting conditions can additionally be memorized with **[FUNC]** and **[F-1]**/**[F-2]** keys operation, independently.




➥ ***Programming the band condition***
Push **[FUNC]** then push and hold **[F-1]**/**[F-2]** for 1 sec.

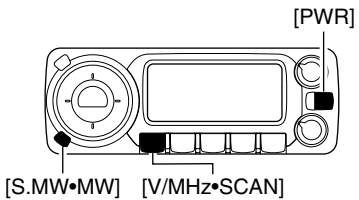
➥ ***Recalling the band condition***
Push **[FUNC]** then push **[F-1]**/**[F-2]**.

## ■ Partial reset

*AT POWER ON*

If you want to initialize the operating conditions (VFO frequency, VFO settings, set mode contents) without clearing the memory contents.

➥ While pushing **[V/MHz•SCAN]** and **[S.MW•MW]**, push and hold **[PWR]** for 1 sec. to partially reset.




## ■ All reset

*AT POWER ON*

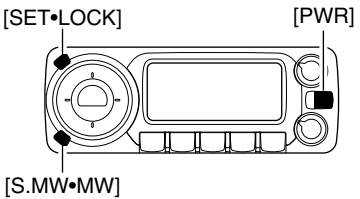
The function display may occasionally display erroneous information (e.g. when first applying power). This may be caused externally by static electricity or by other factors.

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

• Partial resetting is also available. See left for details.

**IMPORTANT!:**
Resetting the transceiver **CLEARS** all memory information and initializes all values in the transceiver.

➥ While pushing **[S.MW•MW]** and **[SET•LOCK]**, push and hold **[PWR]** for 1 sec. to reset the CPU.



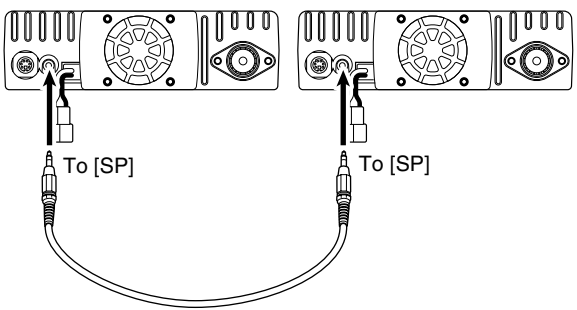
# ■ Data cloning

*AT POWER ON*

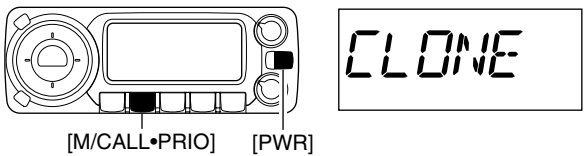
Cloning allows you to quickly and easily transfer the programmed contents from one transceiver to another; or data from a personal computer to a transceiver using the optional CS-D800 CLONING SOFTWARE.

## ◇ Cloning between transceivers

① Connect the OPC-474 cloning cable to **[SP]** jack of the master and sub-transceivers.
- The master transceiver is used to send data to the sub-transceiver.

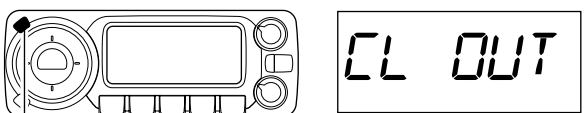



② While pushing **[M/CALL•PRIO]**, turn power ON to enter cloning mode (master transceiver only— power on only for sub-transceiver).
- "CLONE" appears and the transceivers enter the clone standby condition.




While pushing [M/CALL•PRIO], turn power ON.

③ Push **[SET•LOCK]** on the master transceiver.
- "CL OUT" appears in the master transceiver's display and the S/RF indicators show that data is being transferred to the sub-transceiver.
- "CL IN" appears automatically in the sub-transceiver's display and the S/RF indicators show that data is being received from the master transceiver.



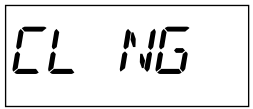

Pushing [SET•LOCK] start cloning.

④ When cloning is finished, turn power OFF, then ON to exit cloning mode.

### ◇ Cloning error

**NOTE: DO NOT** push any key on the sub-transceiver during cloning. This will cause a cloning error.

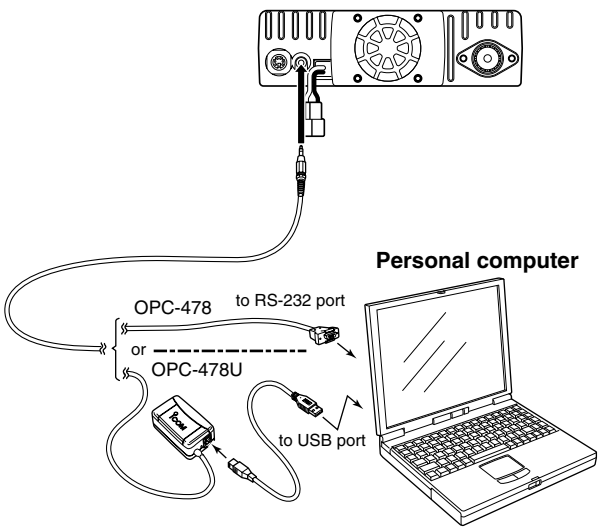
When the display as below appears, a cloning error has occurred.




In such a case, both transceivers automatically return to the clone standby condition and cloning must be repeated.

### ◇ Cloning using a personal computer

Data can be cloned to and from a personal computer (Microsoft® Windows® 98/2000/Me/XP) using the optional CS-D800 CLONING SOFTWARE and the optional cloning cable OPC-478U (USB type) or OPC-478 (RS-232 type). Consult the CS-D800 CLONING SOFTWARE HELP file for details.



## ■ Troubleshooting

If your transceiver seems to be malfunctioning, please check the following points before sending it to a service center.

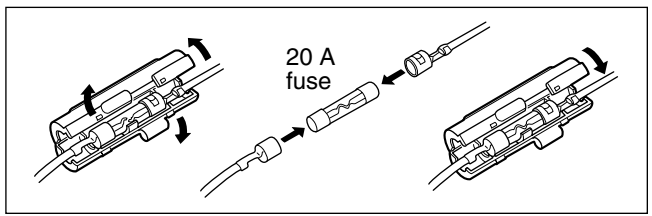
| PROBLEM | POSSIBLE CAUSE | SOLUTION | REF. |
|---|---|---|---|
| Does not turn on. | • Power connector has a poor contact.<br>• Polarity of the power connection is reversed.<br>• Blown fuse. | • Check the connector pins.<br>• Re-connect the power cable observing the proper polarity. Replace the fuse if damaged.<br>• Check the cause, then replace the fuse. | —<br>pgs. V, 120<br>p. 120 |
| No sound comes from the speaker. | • Volume is too low.<br>• The audio mute function is activated.<br>• Squelch is set too high.<br>• A selective call or squelch function is activated such as pocket beep or tone squelch. | • Rotate **[VOL]** clockwise.<br>• Push any switch or key to deactivate it.<br>• Set the squelch level to the threshold.<br>• Turn the appropriate function OFF. | p. 16<br>p. 18<br>p. 16<br>pgs. 55–58 |
| Sensitivity is low and only strong signals are audible. | • Antenna feedline or the antenna connector has a poor contact or is short circuited.<br>• Squelch attenuator function is activated. | • Check, and if necessary, replace the feedline or solder the antenna connector again.<br>• Set **[SQL]** between 10–12 o'clock position. | p. VI<br>p. 17 |
| No contact possible with another station. | • The other station is using tone squelch.<br>• The transceiver is set to duplex. | • Turn the tone squelch function ON.<br>• Set to simplex. | p. 58<br>p. 21 |
| Repeater cannot be accessed. | • Wrong offset frequency is programmed.<br>• Wrong subaudible tone frequency is programmed. | • Correct the offset frequency.<br>• Correct the subaudible tone frequency. | p. 26<br>p. 23 |
| Frequency cannot be set. | • The frequency lock function is activated.<br>• Priority watch is paused on the watching frequency. | • Turn the function OFF.<br>• Push and hold **[M/CALL•PRIO]** for 1 sec. to cancel the watch. | p. 14<br>p. 50 |
| Frequency cannot be set via the microphone. | • The frequency lock function is activated.<br>• The microphone keypad lock function is activated.<br>• Priority watch is paused on the watching frequency. | • Turn the function OFF<br>• Push **[FUNC]** then **[SQL▼ #(16KEY-L)]** to deactivate the microphone keypad lock function.<br>• Push and hold **[M/CALL•PRIO]** for 1 sec. to cancel the watch. | p. 14<br>p. 14<br>p. 50 |

| PROBLEM | POSSIBLE CAUSE | SOLUTION | REF. |
|---|---|---|---|
| Some memory channels cannot be selected via **[DIAL]**. | • The memory channel number has not yet been programmed. | • Select the channel via the microphone keypad to check whether the channel has been programmed or not. | — |
| Scan does not operate. | • The squelch is open.<br>• Only 1 memory channel is programmed or other channels are set as skip channels.<br>• Priority watch is activated. | • Set the squelch to the threshold point.<br>• Program other memory channels or cancel the memory skip function in the desired channels.<br>• Cancel the watch. | p. 16<br>pgs. 29, 30, 47<br>p. 50 |
| Transmission is automatically cut off. | • Time-out timer is activated. | • Set the timer to OFF. | p. 106 |
| Transmission continues even when the PTT is released. | • One-touch PTT function is activated. | • Turn the function OFF. | p. 19 |
| The function display shows erroneous information. | • The CPU is malfunctioning. | • Reset the CPU. | p. 116 |



## ■ Fuse replacement

If the fuse blows or the transceiver stops functioning, find the source of the problem if possible, and replace the damaged fuse with a new, rated one (FGB 20 A) as shown at right.



# 14 SPECIFICATIONS AND OPTIONS

## ■ Specifications

### ◇ GENERAL

- Frequency coverage :

| | | |
|---|---|---|
| USA | Rx | 118.000–173.995 MHz*1, |
| | | 230.000–549.995 MHz*2, |
| | | 810.000–999.990 MHz*3 |
| | Tx | 144–148 MHz, 440–450 MHz |
| EXP | Rx | 118.000–173.995 MHz*1, |
| | | 230.000–549.995 MHz*2, |
| | | 810.000–999.990 MHz |
| | Tx | 144–148 MHz, 430–440 MHz |

*1Guaranteed: 144–148 MHz range only.; *2Guaranteed: 440–450 MHz range for the USA, 430–440 MHz for the EXP version; *3824.005 to 848.995 and 869.005 to 893.995 MHz ranges are inhibited for USA version and not guaranteed.

- Type of emission : FM, GMSK (digital), AM (Receive only)
- Number of memory channels : 512 (incl. 10 scan edges and 2 calls)
- Frequency resolution : 5, 10, 12.5, 15, 20, 25, 30, 50, 100, 200 kHz
- Digital transmission speed : 4.8 kbps
- Voice coding speed : 2.4 kbps
- Operating temperature range : –10°C to +60°C; +14˚F to +140˚F
- Frequency stability : ±2.5 ppm (–10°C to +60°C)
- Power supply requirement : 13.8 V DC ±15%
- Current drain (at 13.8 V DC: approx.):

| | | |
|---|---|---|
| Transmit | at 55 W (VHF) | 12.0 A |
| | at 50 W (UHF) | 12.5 A |
| Receive | standby | 0.9 A |
| | max. audio | 1.1 A |

- Antenna connector : SO-239 (50 Ω)
- Dimensions (proj. not included) : 141(W) × 40(H) × 185.4(D) mm
  5 9/16(W)×1 9/16(H)×7 5/16(D) in
- Weight (approx.) : 1.2 kg; 2 lb 10 oz

### ◇ TRANSMITTER

- Modulation system :

| | |
|---|---|
| FM | Variable reactance frequency modulation |
| DV (Digital) | GMSK reactance frequency modulation |

- Output power : VHF 55/15/5 W (approx.)
  UHF 50/15/5 W (approx.)
- Max. frequency deviation : ±5.0 kHz (FM wide: approx.))
  ±2.5 kHz (FM narrow: approx.)
- Spurious emissions : Less than –60 dB
- Microphone connector : 8-pin modular jack (600 Ω)

### ◇ RECEIVER

- Receive system : Double-conversion superheterodyne
- Intermediate frequencies : 1st: 46.05 MHz, 2nd: 450 kHz
- Sensitivity :

FM: at 12 dB SINAD/AM: at 10 dB S/N

| | |
|---|---|
| 118.000–173.995 MHz | Less than 0.18 µV/0.45 µV |
| 230.000–299.995 MHz | Less than 0.32 µV/0.79 µV |
| 300.000–499.995 MHz | Less than 0.22 µV/0.63 µV |
| 500.000–549.995 MHz | Less than 0.32 µV/Not specified |
| 810.000–999.990 MHz | Less than 0.45 µV/Not specified |

DV (digital) BER 1%

| | |
|---|---|
| VHF/UHF band | Less than 0.35 µV |

- Squelch sensitivity (FM mode only) : Less than 0.13 µV (threshold)
- Selectivity :

| | |
|---|---|
| Wide | More than 12 kHz/6 dB |
| | Less than 30 kHz/60 dB |
| Narrow | More than 6 kHz/6 dB |
| | Less than 20 kHz/60 dB |

- Spurious and image rejection : More than 60 dB
- AF output power (at 13.8 V DC) : More than 2.0 W at 10% distortion with an 8 Ω load
- Ext. speaker connectors : 3-conductor 3.5 (d) mm (1/8″)/8 Ω

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

# ■ Options

**HM-133** REMOTE-CONTROL MICROPHONE
Wired remote control microphone with key backlight. Same as that supplied with the transceiver.

**HM-118N** HAND MICROPHONE
For all-round mobile operation.

**OPC-600/600R*, OPC-601/601R*** SEPARATION CABLES
OPC-600/600R: Same as that supplied with the transceiver. 3.5 m (11.5 ft)
OPC-601/601R: For extended separate installation. 7.0 m (23.0 ft)
* A ferrite core is supplied with the OPC-600R or OPC-601R for the USA version.

**MB-58** REMOTE CONTROLLER BRACKET
Mounts the remote controller in a convenient location for operation with the front panel detached from the main body.

**MB-65** MOUNTING BASE
Mounts the remote controller on to variety of place in vehicle. MB-84 is required for mounting.

**MB-17A** MOBILE MOUNTING BRACKET
One-touch bracket. Transceiver main unit easily attached or removed.

**OPC-440/OPC-647** MIC EXTENSION CABLES
OPC-440: 5.0 m (16.4 ft); OPC-647: 2.5 m (8.2 ft)

**OPC-441** SPEAKER EXTENSION CABLE
5.0 m (16.4 ft)

**SP-7/SP-10** EXTERNAL SPEAKERS
SP-7: For base station use. Cable length: 1.0 m; 3.3 ft
SP-10: For all-round mobile operation. Cable length: 1.5 m; 4.9 ft

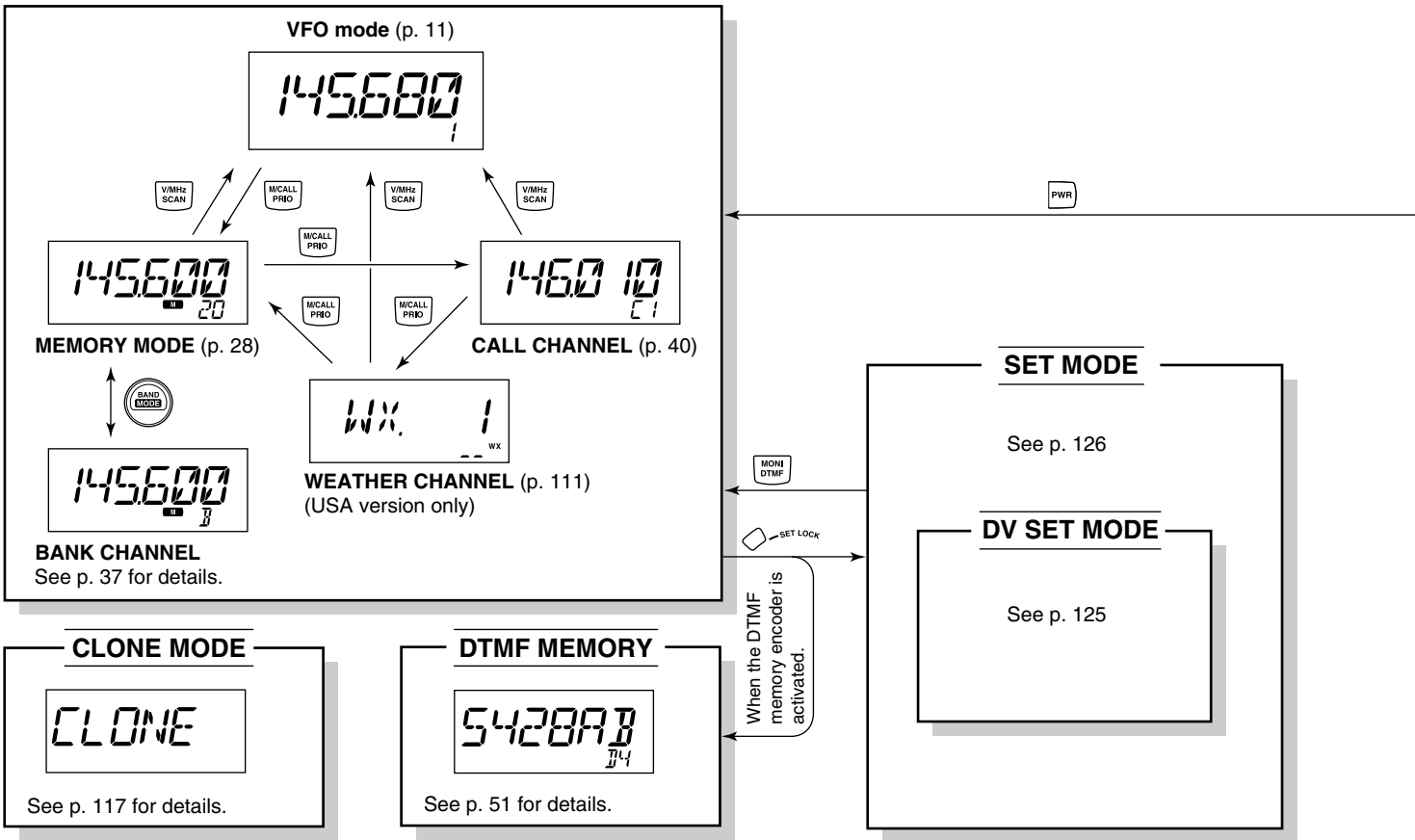
**OPC-347/OPC-1132** DC POWER CABLES
OPC-347: 7.0 m (23 ft)
OPC-1132: 3.0 m (9.8 ft) Same as that supplied with the transceiver.

**CS-D800** CLONING SOFTWARE + **OPC-478U** CLONING CABLE
Provides quick and easy programming items, such as memory channels, set mode contents for local repeater frequencies, via PC's USB terminal. RS-232 type cloning cable, OPC-478, also available.

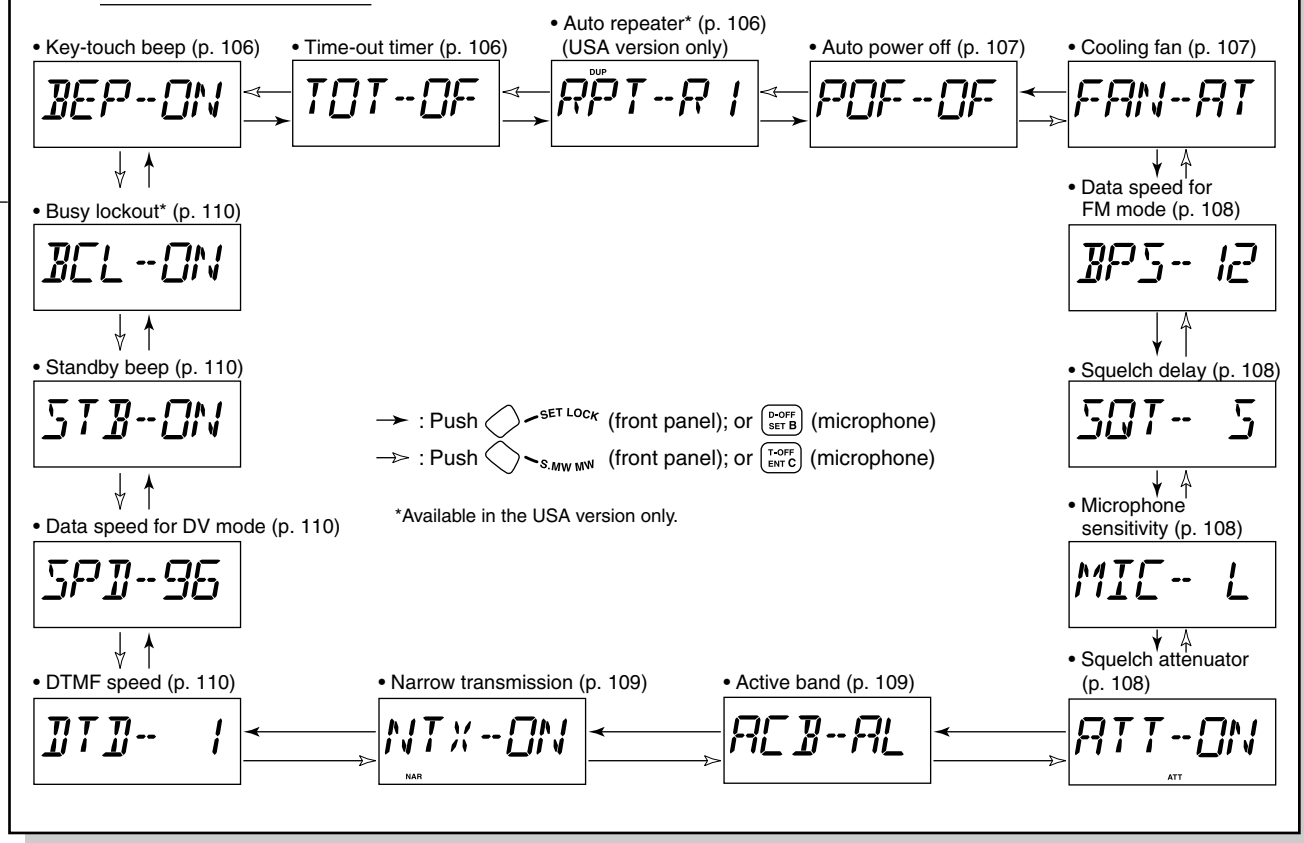
**OPC-474** CLONING CABLE
Used for data cloning between transceivers.

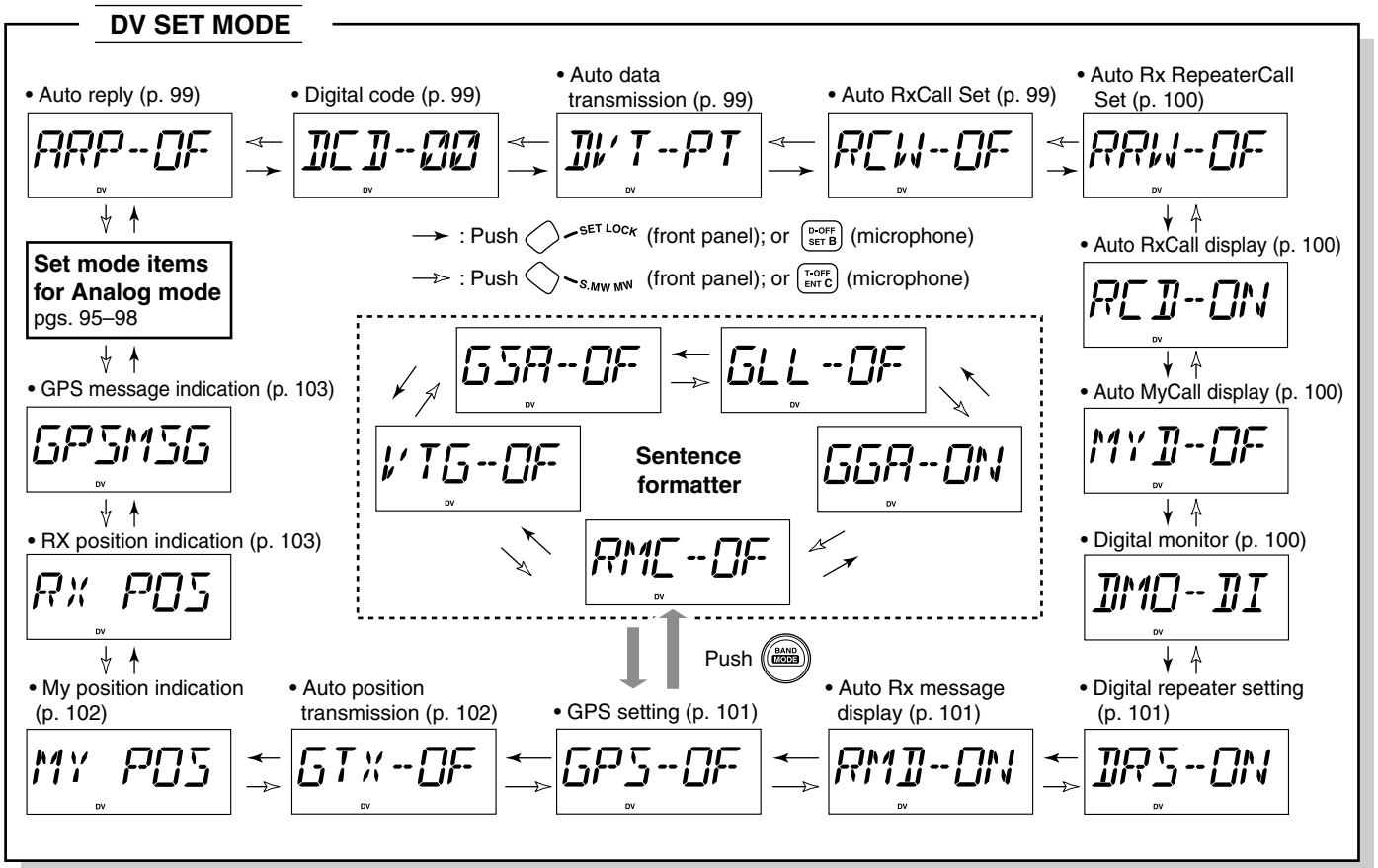
**OPC-1384** DATA COMMUNICATION CABLE
Used for data communication between transceiver and PC (or GPS receiver). (Mini DIN 8 pin ⇔ RS-232 D-sub 9 pin)

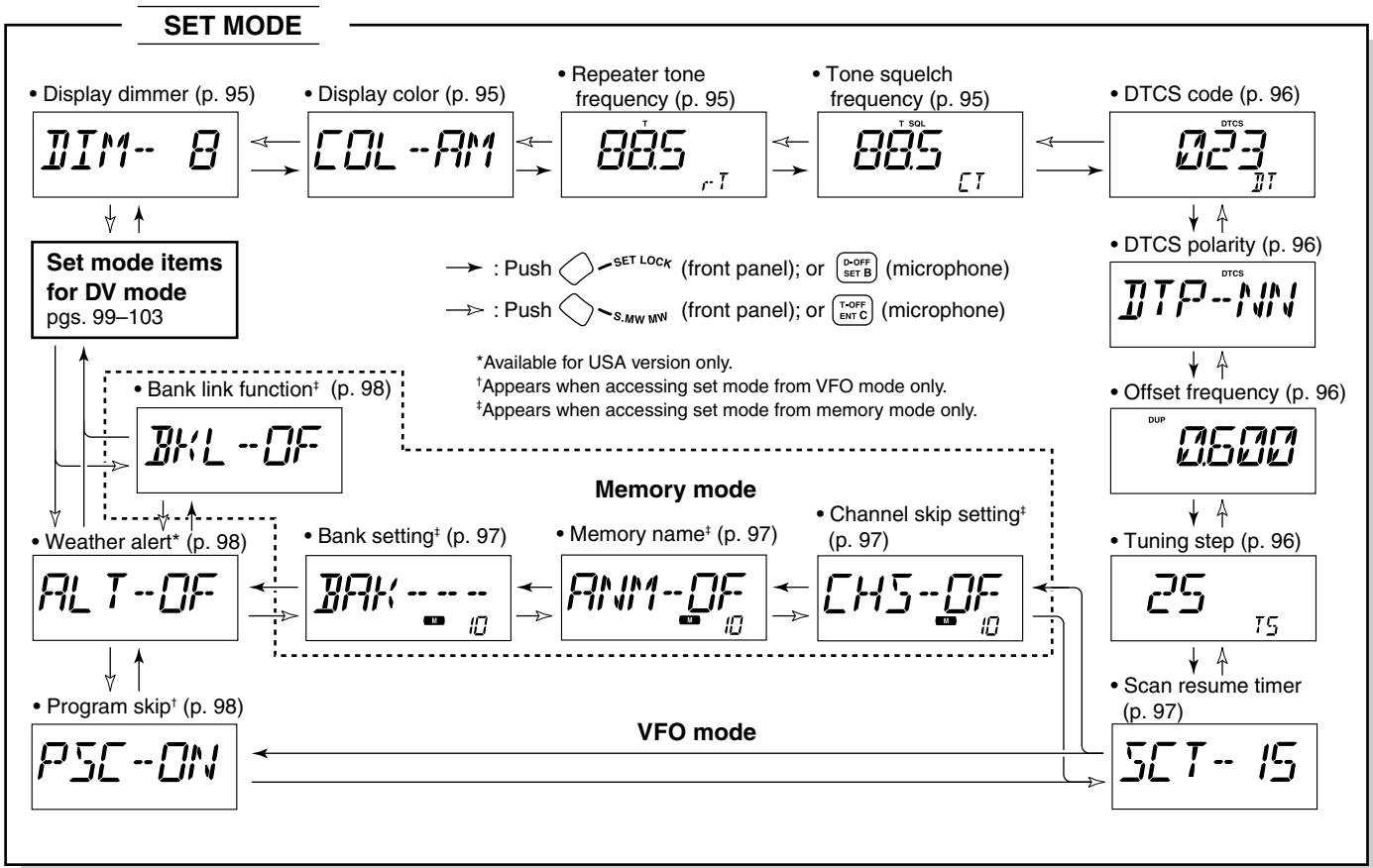
# 15 MODE ARRANGEMENT



## INITIAL SET MODE




DV SET MODE
• Auto reply (p. 99)
ARP--OF
• Digital code (p. 99)
DCD--00
• Auto data transmission (p. 99)
DVT--PT
• Auto RxCall Set (p. 99)
RCW--OF
• Auto Rx RepeaterCall Set (p. 100)
RRW--OF
Set mode items for Analog mode
pgs. 95–98
: Push SET LOCK (front panel); or D-OFF SET B (microphone)
: Push S.MW MW (front panel); or T-OFF ENT C (microphone)
• Auto RxCall display (p. 100)
RCD--ON
• Auto MyCall display (p. 100)
MYD--OF
• Digital monitor (p. 100)
DMD--DI
• Digital repeater setting (p. 101)
DRS--ON
• Auto Rx message display (p. 101)
RMD--ON
• GPS setting (p. 101)
GPS--OF
• Auto position transmission (p. 102)
GTX--OF
• My position indication (p. 102)
MY POS
• RX position indication (p. 103)
RX POS
• GPS message indication (p. 103)
GPSMSG
Sentence formatter
GSA--OF
GLL--OF
VTG--OF
GGA--ON
RMC--OF
Push BAND MODE


SET MODE
• Display dimmer (p. 95)
DIM-- 8
• Display color (p. 95)
COL--AM
• Repeater tone frequency (p. 95)
88.5 rT
• Tone squelch frequency (p. 95)
T SQL
88.5 CT
• DTCS code (p. 96)
DTCS
023 DT
• DTCS polarity (p. 96)
DTCS
DTP--NN
• Offset frequency (p. 96)
DUP
0.600
• Tuning step (p. 96)
25 TS
• Scan resume timer (p. 97)
SCT-- 15
Set mode items for DV mode
pgs. 99–103
→ : Push SET LOCK (front panel); or D-OFF SET B (microphone)
⇒ : Push S.MW MW (front panel); or T-OFF ENT C (microphone)
*Available for USA version only.
†Appears when accessing set mode from VFO mode only.
‡Appears when accessing set mode from memory mode only.
• Bank link function‡ (p. 98)
BKL--OF
Memory mode
• Weather alert* (p. 98)
ALT--OF
• Bank setting‡ (p. 97)
BAK----
M 10
• Memory name‡ (p. 97)
ANM--OF
M 10
• Channel skip setting‡ (p. 97)
CHS--OF
M 10
• Program skip† (p. 98)
PSC--ON
VFO mode

**Count on us!**

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