

Method of Positioning by GPS

About Positioning by GPS

“Positioning” refers to calculation of your current position from the satellite orbit information and radio propagation time. At least three satellites need to be acquired for successful positioning. If positioning fails, move away from buildings as far as possible and stand in an area with open sky.

● About errors

A positioning error by several hundred meters can occur due to the environmental conditions. Under favorable conditions, positioning can be performed successfully using only three satellites. However, under the following poor conditions, the positioning accuracy can decrease or positioning can fail.

- Between tall buildings
- Narrow paths between buildings
- Indoors or in close vicinity to large buildings
- Beneath bridges or high-voltage lines
- Between trees such as in forests or woods
- Inside tunnel or underground
- Usage behind heat reflective glass
- Areas with strong magnetic fields.

● Searching for satellites when using the GPS function for the first time each day

When you use the GPS function for the first time after purchase or the first time in the day, a few minutes are required to search for satellites. Also, when using the GPS function after turning off the transceiver for several hours, a few minutes may be required to search for satellites.

Method of Positioning by GPS

Saving GPS Information (GPS Log Function)

Position information from the GPS can be saved periodically to the microSD memory card.

Using the saved data and a personal computer, tracks can be displayed with commercially sold map software*.

* Map software, and methods of use are not supported by YAESU.

1 Check that the GPS function is active.

If it is not active, refer to page 68 and enable the GPS function.

2 Press  for over 1 second.

3 Turn  to select [8 CONFIG].

4 Press .

5 Turn  to select [6 GPS LOG].

6 Press .

7 Turn  to select the interval for saving data.

OFF / 1 sec / 2 sec / 5 sec / 10 sec / 30 sec / 60 sec

Position information is not saved if OFF is selected.

8 Press  to enable the GPS log function and exit from the Set mode.

Tip

- Position information will continue to be saved unless "OFF" is selected in step 7, shown above, or the power of the transceiver is turned off.
- If "ON" is selected again in step 7, shown above, or the power for the transceiver is turned on, position information will start being saved to a differently named file.

Checking Tracks on a PC

1 Turn the transceiver off.

2 Remove the microSD.

3 Connect the microSD card to a PC using a commercially sold memory card reader.

4 Open the folder named [FT1D] within the microSD memory card.

5 Open the folder named [GPSLOG].

Data is saved with the name [GPSyymmddhhmmss.log].

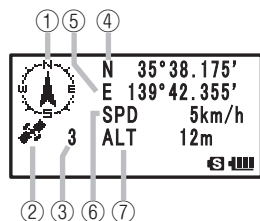
The [yymmddhhmmss] part of the name represents year (yy), month (mm), day (dd), hour (hh), minute (mm), and second (ss).

Tip

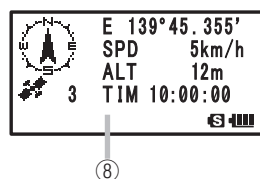
- Tracks can be displayed on a personal computer using commercially sold map software by importing the GPS data.
- For information on importing and using the GPS data, please refer to the operation manual for the map software being used.

Explanation of GPS Screen and Operation

Activating the GPS function displays the following information on the LCD.



Press **MONI/DUAL** (A/B) to scroll the screen until the current time appears.



- ① **Compass:** North-UP (North is always up)
Heading-UP: (When **SCOPE BAND ON** is pressed, the direction in which you are heading is always up. A white arrow icon appears. [H] appears at the lower right of the compass icon.)
- ② **Positioning:** When at least three satellites have been acquired, appears. This icon does not appear on the LCD if the transceiver cannot acquire at least three satellites.
- ③ **Number satellites:** displays the number of acquired satellites.
- ④ **Latitude:** The current position appears using north (N) or south (S) latitude.
Display format: X DD° MM. MMM
X: X=N: North latitude, X=S: South latitude
DD: Degree
MM.MMM: Minute
Example: N 35° 38.250 (35 degrees, 38 minutes, 15 seconds north latitude)
- ⑤ **Longitude:** The current position appears using east (E) or west (S) longitude.
Format: X DDD° MM. DMMM
X: X=E: East longitude, X=W: West longitude
DDD: Degree
MM.MMM: Minute
Example: E 139° 42.500 (139 degrees, 42 minutes, 30 seconds east latitude)
- ⑥ **Speed:** The speed at which you are moving appears.
Format: SPD aaakm/h
Example: SPD 5 km/h
- ⑦ **Altitude:** The altitude of the current position of your radio station appears.
Format: ALT aaaaam
Example: ALT 20m
- ⑧ **Time:** The current time set by GPS appears.
Format: aa (hour): bb (minute): cc (second)
Example: 23:59:59 (23 hours 59 minutes 59 seconds)
* When an external GPS device is connected to the data terminal, the time appears as follows:
aa (hour): bb (minute)

Explanation of GPS Screen and Operation

Tips

- You can change the unit of GPS data by selecting [9 APRS] → [22 GPS UNIT] in the Set mode.
- When the GPS function is used, the accurate time data (date and time) obtained from GPS appears on a 24 hour basis. This time data is reflected in the time data displayed on the GPS and APRS screens.
- You can change the geodetic system of the built-in GPS unit by selecting [9 APRS] → [19 GPS DATUM] in the Set mode. However, since APRS uses the geodetic system of WGS-84, it is recommended not to change it.
- You can set the time zone by units of 30 minutes by selecting [9 APRS] → [28 TIME ZONE] in the Set mode (Default: UTC +0:00).
- When the GPS function is active, the power consumption increases by about 30 mA. As a result, the battery life is reduced by about 20% compared to when the GPS function is deactivated.
- You can obtain position information from a external GPS device by selecting [9 APRS] → [17 COM PORT SETTING] and then setting [INPUT] to [GPS] in the Set mode. In this case, the data obtained from the internal GPS is disabled.
- When using an external GPS device, keep it away from the transceiver.

Smart Navigation Function

Using the Smart Navigation Function

There are 2 methods of navigation with the Smart Navigation function.

- (1) Real-time navigation function
- (2) Backtrack function

•Real-Time Navigation Function

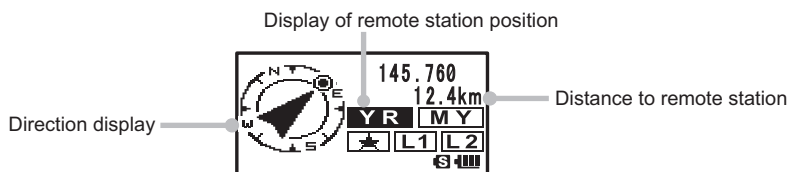
GPS position information and voice signals are simultaneously transmitted in the V/D mode of C4FM digital.

For this reason, the position and direction of the remote station can be displayed in real-time even during communication.

1 Press  to open the GPS screen.

2 Turn  to select [YR].

The distance and direction of the remote station operating on the same frequency in the V/D mode is displayed.



3 Press .

The screen returns from the navigation screen to the normal frequency display.

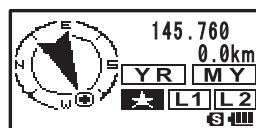
Smart Navigation Function

•Backtrack Function

By registering a point of departure beforehand, the distance and direction to the registered position from your current position can be displayed in real-time.

•Registering your current position (point of departure) (up to 3 positions can be registered)

- 1 Press  to open the Backtrack screen.
- 2 Turn  to select [MY].
- 3 Press  to display the position information of your station.
- 4 Turn  to select a mark to register from [☆], [L1], and [L2].
- 5 Press  to register the position information to the selected mark and return to the BACK TRACK function screen.
- 6 Press  to return from the backtrack screen to the normal frequency display.



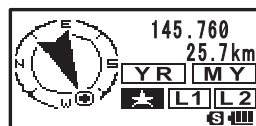
•Using the Backtrack Function

- 1 Press  to open the Backtrack screen.
- 2 Turn  to select [☆], [L1] or [L2].

Select the mark with the registered position you would like to backtrack.

The registered position (departure point) is in the direction of the arrow within the circle. Walk forward so that the arrow stays pointing up on the screen.

- 3 Press  to return from the backtrack screen to the normal frequency display.
To verify the position again, press [DISP] to open the backtrack screen.



Description of the BACK TRACK Function Screen



Dual Reception (DW) Function

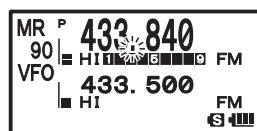
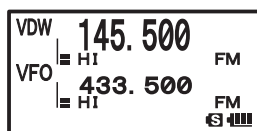
The FT1XDR/DE is equipped with the following 3 types of Dual Reception Functions:

- (1) VFO Dual Reception
- (2) Memory Channel Dual Reception
- (3) Home Channel Dual Reception

The transceiver checks the standby side signal reception over the frequency registered to the selected memory channel (Priority Memory Channel) once approximately every 5 seconds. When the transceiver detects signal reception on the standby side, it starts signal reception over the frequency registered to the selected memory channel.

Even while receiving a signal over the frequency registered to a priority memory channel on the standby side, pressing  disables the Dual Reception function and allows for transmission over the former active side frequency.

Example: Checking signal reception over a frequency registered to the priority memory channel [90] (standby side), while receiving signal over [145.500 MHz] (active side).



Frequency over which a signal is being received.

The transceiver monitors signal reception over the frequency registered to the Priority Memory Channel [90] (standby) and checks it in intervals of approximately 5 seconds.

When the transceiver receives a signal over the frequency registered to the priority memory channel [90], dual reception stops and signal reception switches to [90] (standby).

VFO Dual Reception

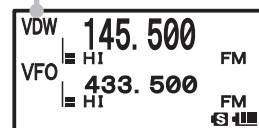
VFO mode → Priority memory channel

- 1 Switch to the Memory mode.
- 2 Press and hold  for over 1 second to enter the Write mode;  and the channel number blink on the LCD.
- 3 Turn  to select a memory channel, then press and hold  for over 1 second.
SCOPE BND ON (BAND)
- Select a memory channel to prioritize for signal reception (Priority Memory Channel). The "P" appears on the LCD.
- 4 Turn  to select a frequency for signal reception.
Select a frequency for continual signal reception in VFO mode (active side).
- 5 Press  and then  to start Dial Dual Reception, and [VDW] appears on the LCD.
- 6 Press  stop the Dial Dual Reception.

"P" is displayed.



"VDW" is displayed.



Dual Reception (DW) Function

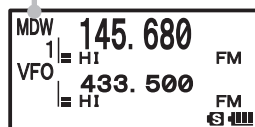
Memory Channel Dual Reception

Memory channel → Priority memory channel

- 1 Switch to the Memory mode.
- 2 Press and hold  over 1 second to enter the Write mode;  and the channel number blink on the LCD.
- 3 Turn  to select a memory channel and press . "P" is displayed.
Select a memory channel to prioritize for signal reception (Priority Memory Channel) (standby side). The "P" appears on the LCD.
- 4 Select a memory channel for signal reception.
Select a memory channel for signal reception at all times (active side).
- 5 Press  and then  to start Memory Channel Dual Reception; and [MDW] appears on the LCD.
- 6 Press  to stop the memory channel dual reception.



"MDW" is displayed.



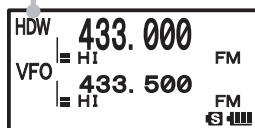
Home Channel Dual Reception

Home channel → Priority memory channel

- 1 Switch to the Memory mode.
- 2 Press and hold  over 1 second to enter the Write mode.  and the channel number blink on the LCD.
- 3 Turn  to select a memory channel and press . "P" is displayed.
Select a memory channel to prioritize for signal reception (Priority Memory Channel) (standby side). The "P" appears on the LCD.
- 4 Press  and then  to recall a HOME channel (active side).
- 5 Press  and then .
HOME Channel Dual Reception starts and [MDW] appears on the LCD.
- 6 Press  to turn home channel dual reception OFF.



"HDW" is displayed.



Dual Reception (DW) Function

Caution

Be sure to set a memory channel as the Priority Memory Channel for standby before using this function.

Tips

- The Priority Memory Channel is set to the Memory Channel number 1 by default.
- Pressing and holding  over 1 second and changing the Set mode option allows you to use this function more conveniently.
[5 SCAN] → [1 DW TIME]: The interval for monitoring the Priority Memory Channel can be changed.
[5 SCAN] → [4 SCAN RESUME]: The resumption conditions for Dual Reception can be changed.
- The combination of the frequency bands and modes of the frequency for the Priority Memory Channel (standby side) and the frequency for continual signal reception (active side) can be freely changed.

AF-DUAL Function for simultaneous signal reception over the other frequency while listening to the radio

The AF-DUAL Reception Function allows reception of a radio broadcast, while standby reception of A-band or B-band frequency (or frequency registered to a memory channel) is active. When standby reception is active, voice received over that frequency cannot be heard, however if a voice signal is detected, the reception of the radio broadcast will be paused and voice will be heard. Although there is a similar function in Dual Reception (See page 76), because a signal reception over the frequency registered to the priority memory channel is checked approximately every 5 seconds in Dual Reception, the reception for radio broadcast is interrupted every time this happens. With the AF-DUAL Reception Function, the reception of radio broadcast is interrupted only when there is a calling signal from another transceiver.

•Listening Radio Broadcast with AF-DUAL Reception Function

- 1 Set the A-band or B-band frequency (or Memory Channel/Home Channel) for standby. Set the standby reception frequency for A-band or B-band (or Memory Channel/Home Channel) to monitor for calls while receiving radio broadcast.

- Tips**
- You can listen to radio broadcast while scanning the standby signal reception frequencies.
 - Radio broadcast can be listened to while monitoring the standby signal reception frequency in the dual reception mode.

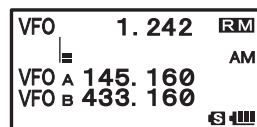
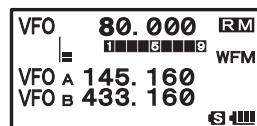
- 2 Press  to set the operating band to A-band.
- 3 Press  and then  to activate the AF-Dual function.
- 4 Press  and select [AM] or [WFM].

The broadcast band is toggled in the following order every time  is pressed:

AM broadcast (middle wave band) ⇔ FM broadcast ⇔ AM broadcast (middle wave band)

On the LCD, AM (AM broadcast) or WFM (FM broadcast) is displayed.

- 5 Turn  to tune in to the frequency of broadcast station.



Dual Reception (DW) Function

Tips

- For broadcast station frequencies, refer to "Preset Broadcast Station Frequencies List (See page 54)" or a commercially sold frequencies list.
- AF-DUAL reception function can be used for the radio frequency registered to the memory bank.
- Pressing  while a signal is being received, will switch to receiving the standby reception frequency.
- With the AF-DUAL Function, an A Band or B Band registered with a AM broadcast (middle wave frequency) or a FM broadcast frequency, set for standby reception, cannot be simultaneously received while listening to the radio.
- To disable the AF-DUAL Function, press  and then  .
The frequency registered to the standby (memory channel) appears on the LCD.

•Setting the resumption time of radio reception

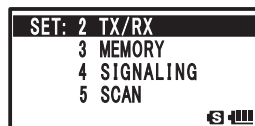
While receiving radio broadcast (active side) and ham radio band (A-band or B-band) on standby side, the transceiver may be set to resume receiving the broadcast audio [After loss of receive signal] or [After transmission].

- Press and hold  for over 1 second to enter the Set mode.
- Turn  to select [2 TX/RX].
- Press .
- Turn  to select [3 AUDIO].
- Press .
- Turn  to select [3 RX AF DUAL].
- Press .
- Turn  to select reception time.

Set transmission time as well.

Transmission and reception for 1 second to 10 seconds, HOLD (Fixed), or transmission for 1 second to 10 seconds.

Remarks Default setting: transmission and reception for 2 seconds



Display	Operation
Transmission and reception: 1 second to 10 seconds	While receiving radio broadcast and ham radio band frequencies (A-band and B-band) on standby simultaneously with [AF-DUAL Reception Function], resumption of receiving radio broadcast can be set to [After loss of receive signal] or [After transmission]. For example, if 5 seconds is selected, radio reception resumes after 5 seconds after reception (or transmission) ends.
Fixed	While receiving radio broadcast and ham radio band frequencies (A-band and B-band) on standby simultaneously with [AF-DUAL Reception Function], the transceiver will continue to receive a signal over that frequency after signal detection without switching back to radio broadcast.

Dual Reception (DW) Function

Display	Operation
Transmission: 1 sec- ond to 10 seconds	While receiving radio broadcast and ham radio band frequencies (A-band and B-band) on standby simultaneously with [AF-DUAL Reception Function], the transceiver switches signal reception to the standby upon detecting it. After the user transmits signal for response and transmission ends, the transceiver switches signal reception back to radio broadcast after the specified time from the end of transmission. If a signal is received before transmitting it, [AF-DUAL Reception Function] is disabled and the transceiver continually receives a signal over that frequency.

- 9 Press  to set the radio broadcast resumption time for reception and Transmission, and exit the Set mode.



Using the DTMF Function

DTMF (Dual Tone Multi Frequencies) is the tone signal sent for making a call through DTMF telephone line. The maximum of 16 digit DTMF code can be registered (up to 10 channels) for telephone numbers to make a call through the public telephone line from a phone patch.

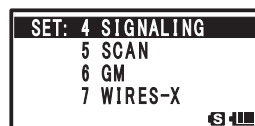
- Press and hold  for over 1 second to enter the Set mode.
- Turn  to select [4 SIGNALING].
- Press .
- Turn  to select [5 DTMF SELECT].
- Press .
- Turn  to select a memory channel to register the DTMF code (1 to 10).
- Press .
- Input the DTMF code with .

Tips

- DTMF code can also be entered with the numeric keys.
- To delete a code, press . When  is pressed, a code is deleted and the cursor moves to left.

- Press  to move the cursor.
- Repeat steps 8 and 9 to enter the DTMF code.

Tips The maximum of 16 digits for DTMF code can be entered.



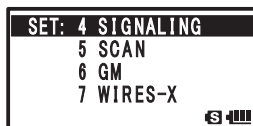
Using the DTMF Function

- 11 Press  to set the DTMF code and exit from the Set mode.



Confirming the entered DTMF code by the sound

- 1 Press and hold  for over 1 second to enter the Set mode.
- 2 Turn  to select [4 APRS].
- 3 Press .
- 4 Turn  to select [5 SCAN].
- 5 Press .
- 6 Turn  to select the memory channel to which the DTMF code was registered.
- 7 Press  to confirm the registered DTMF code by the audio tones.
- 8 Press  to exit from the Set mode.



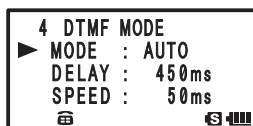
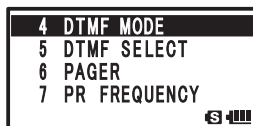
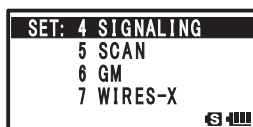
Sending the Registered DTMF Code

- 1 Press and hold  over 1 second to enter the Set mode.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [4 DTMF MODE].
- 5 Press .
- 6 Turn  to select [MODE].
- 7 Press .
- 8 Turn  to select [AUTO].
- 9 Press .
- 10 Press  to set the auto dialer.
- 11 While pressing  key, press  to  to select the DTMF memory channel to transmit with the numeric keys.

- Tips**
- The registered DTMF code is transmitted.
 - The transmitted DTMF tone can be heard from the speaker.

- 12 Release .

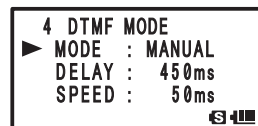
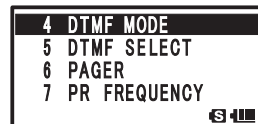
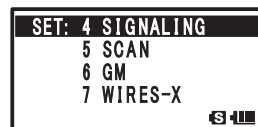
Even if  is released, the DTMF tone signal will continue to be transmitted until transmission of the signal is complete.



Using the DTMF Function

Sending a DTMF Code Manually

- 1 Press and hold  for over 1 second to enter the Set mode.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [4 DTMF MODE].
- 5 Press .
- 6 Turn  to select [MODE].
- 7 Press .
- 8 Turn  to select [MANUAL].
- 9 Press .
- 10 Press  to set [MANUAL].
- 11 While pressing , select the DTMF code to transmit by pressing  to , A, B, C, *, and # on the numeric keys.



- Tips**
- The DTMF code selected by pressing the keys is transmitted (refer to chart below).
 - The transmitted DTMF tone can be heard from the speaker.

- 12 Release .

Even if  is released, the DTMF tone signal will continue to be transmitted until transmission of the signal is complete.

Tips

- The DTMF code is a combination of 2 frequencies.

	1209Hz	1336Hz	1477Hz	1633Hz
697Hz	1	2	3	A
770Hz	4	5	6	B
852Hz	7	8	9	C
941Hz	*	0	#	D

Searching for signals with the signal strength graph. Band Scope Function

While in VFO mode, the Band Scope Function is available that will graphically display the strength of the signals on up to ± 50 channels, centered on the current main band frequency.

1 Turn  to tune in to your desired center frequency.

2 Press and hold  for over 1 second.

With the current frequency as the center, the strengths of any signals of each of the higher and lower 16 channels are shown on a graph.

3 Turn  to adjust the  to point to any of the displayed channels, and the signal on the indicated frequency can be received.

4 Press  to exit the band scope function.



Tips

- You can change the number of band scope channels setting by selecting [1 DISPLAY] → [4 BAND SCOPE] in the Set mode. The band scope channel setting can be changed to ± 5 channels, ± 9 channels, ± 16 channels, ± 24 channels, and ± 50 channels, instead of ± 16 channels.
- The band scope channel interval is the same as the VFO frequency step.
- When band scope is active, the numeric keys will not function.
- The audio of A/B common frequency band can be heard simultaneously while scanning.
- FULL: Continually scans(scoops).
 1Time: Scans(scoops) only once.
 If the frequency is changed with , scan will resume.
- * FULL is only selected in the analog mode.
- * 1Time is only selected in the digital mode.

Taking picture with the optional camera mounted on speaker microphone

Pictures can be taken by connecting the speaker microphone with optional camera (MH-85A11U).

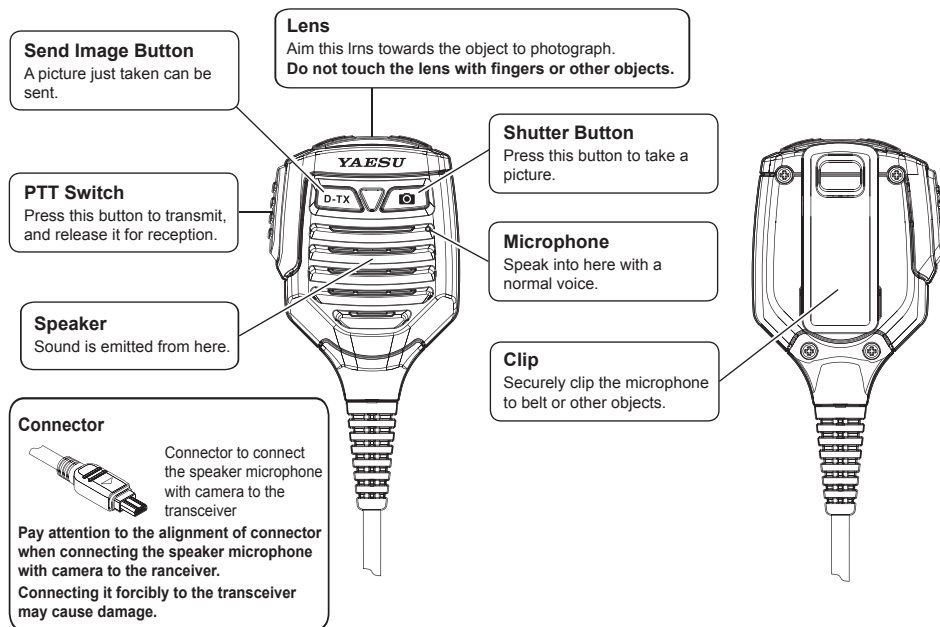
Captured image data can be saved to a microSD memory card placed in the transceiver. Saved image data can be sent to another transceiver in the digital mode or using the GM function.

In addition, image data can be transmitted to other transceivers* by pressing the  (Send Image Button) on the camera mounted on speaker microphone.

* Refer to the Yaesu homepage or catalog for the models of transceiver to which images can be transferred.

* Only the picture just taken can be sent to another transceiver. For methods to send other image data, refer to the GM Function instruction manual.

Taking picture with the optional camera mounted on speaker microphone.



- 1 Connect the speaker microphone with camera (MH-85A11U) to the DATA terminal of the transceiver.
- 2 Press  to turn the transceiver on.
- 3 Press .

Point the lens towards the object to shoot and press .

Make sure to have at least 50cm between the lens and the object. If the object is too close, the picture will be out of focus, resulting in a blurred picture.

- Tips**
- You can set the picture size (resolution) and image quality (compression rate) of the image, by selecting [11 OPTION] → [1 USB CAMERA] in the Set mode.
 - Captured images are saved to the microSD memory card installed in the transceiver.
 - If your transceiver and another compatible transceiver are both in digital mode, a picture just taken may be sent to the other transceiver by pressing .

Caution

- Do not directly photograph objects with strong light, such as the sun or other bright objects. Such operation can lead to malfunction.
- If the lens or the microphone gets dirty, use a dry, soft cloth to wipe off the contaminants.
- Do not place the MH-85A11U near heat emitting equipment or where it is exposed to direct sunlight. Doing so can lead to fire or a malfunction.
- Do not drop the MH-85A11U. Applying a strong shock to the MH-85A11U may result in damages or failure.

Using the Tone Squelch Function

The tone squelch opens the squelch only when a signal containing the specified frequency tone is received. Use of the digital code squelch (DCS) opens the squelch only when a signal containing the specified DCS code is received. The tone squelch function mutes monitoring the communications between other stations, even when listening for a call by a specific station for a long time.

1 Press and hold  over 1 second.

2 Turn  to select [4 SIGNALING].

3 Press .

4 Turn  to select [11 SQL TYPE].

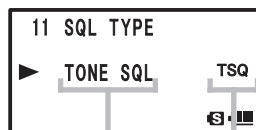
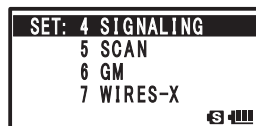
5 Press .

The Set mode option [11 SQL TYPE] is selected.

6 Turn  to select a squelch type.

Select a squelch type with reference to the table shown below.

7 Press  to set the squelch type and exit the Set mode.



Displays squelch type

Displays logo

Tips

- The tone squelch and DCS setting are also active during scanning. If scanning is performed with the tone squelch or the DCS function turned on, it stops only when a signal containing a tone of the specified frequency or a signal containing the specified DCS code is received.
- Pressing the Monitor switch allows you to hear signals that do not contain a tone or DCS code, and signals with different tones or DCS code.
- Pressing and holding  for 1 second, and then changing the Set mode option allows you to use this function more conveniently.
[4 SIGNALING] → [3 DCS INVERSION]: Allows you to receive the DCS code of the inverted phase.
[4 SIGNALING] → [10 SQL EXPANTION]: Allows you to specify different squelch types for transmission and reception respectively.

Display	Operation
OFF	Turns off the tone sending function, tone squelch function, etc.
TONE	Just sends tones ([TN] appears).
TONE SQL	Turns on the tone squelch function ([TSQ] appears).
DCS	Turns on the digital code squelch ([DCS] appears).
REV TONE	Turns on the reverse tone ([RTN] appears). Used to monitor communications based on the squelch control system in which a tone signal is contained when communication is not performed and the tone signal disappears when communication starts.

Using the Tone Squelch Function

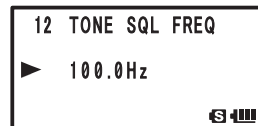
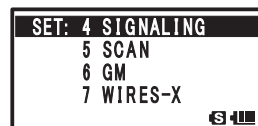
Display	Operation
PR FREQ	Turns on the no-communication squelch function for radios ([PR] appears.). You can specify no-communication signal tone frequencies within the range from 300 Hz to 3000 Hz in steps of 100 Hz.
PAGER (See page 90)	Turns on a new pager function ([PAG] appears). When using transceivers with your friends, specifying personal codes (each code is composed of two tones) allows only a specific station to be called.
D CD*	Sends a DCS code only in case of transmission ([DC] appears).
TONE-DCS*	Sends a tone signal in case of transmission, and waits for a DCS code in case of reception ([T-D] appears).
D CD-TONE SQL*	Sends a DCS code in case of transmission, and waits for a tone signal in case of reception ([D-T] appears).

* Pressing and holding  over 1 second and selecting [4 SIGNALING] → [10 SQL EXPANTION] and then [ON] will add the setting items of D CD, ONE-DCS, and D CD TONESQ to [10 SQL TYPE] of the Set mode option [4 SIGNALING], allowing you to select different types of squelches for transmission and reception.

Selecting a Tone Frequency

You can select a tone frequency from among 50 frequencies (67.0 Hz to 254.1 Hz).

- 1 Specify the operating frequency.
- 2 Press and hold  over 1 second.
Enters the Set mode.
- 3 Turn  to select [4 SIGNALING].
- 4 Press .
- 5 Turn  to select [12 TONE SQL FREQ].
- 6 Press .
- 7 Turn  to select a tone frequency.
- 8 Quickly press  3 times to save the tone frequency setting and exit the Set mode.



Tips

- The tone frequency selected using the above-described procedure is also effective when only the tone is sent out.
- By default, the tone frequency is set to 88.5 Hz.

Using the Tone Squelch Function

Searching for the Frequency of the Tone Squelch Used by the Remote Station

The frequency of the tone squelch used by the remote station can be searched for and displayed.

Enter the Set mode:

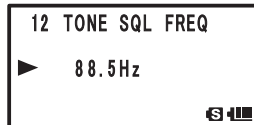
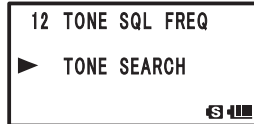
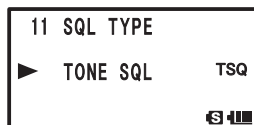
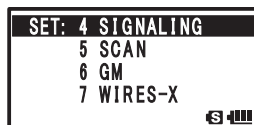
- 1 Press and hold  for over 1 second.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [11 SQL TYPE].
- 5 Press .
- 6 Turn  to select [TONE SQL].
- 7 Press .
- 8 Turn  to select [12 TONE SQL FREQ].
- 9 Press .
- 10 Receive the signal from the remote station.
- 11 Press and hold  over 1 second.
[TONE SEARCH] appears.
- 12 Release .

Search for the tone frequency starts.

When a corresponding tone frequency is detected, a beep is emitted and search stops temporarily. The detected tone frequency blinks.

Tip To set the searched tone frequency and exit from the Set mode:

Press  → a beep is emitted. → Quickly press  3 times.



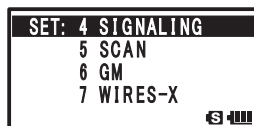
Tip

For the operation to perform when scan stops, refer to "Selecting a Reception Method When Scanning Stops" on page 59.

Selecting a DCS Code

You can select a DCS code from among 104 DCS codes (023 to 754).

- 1 Specify the operating frequency.
- 2 Press and hold  over 1 second to enter the Set mode.
- 3 Turn  to select [4 SIGNALING].
- 4 Press .
- 5 Turn  to select [2 DCS CODE].
- 6 Press .



Using the Tone Squelch Function

- 7 Turn  to select a DCS code.
- 8 Quickly press  3 times to set the DCS code and exit from the Set mode.



Tip

By default, the DCS code is set to [023].

Searching for the Frequency of the DCS Used by the Remote Station

The DCS code used by the remote station can be searched for and displayed.

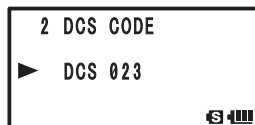
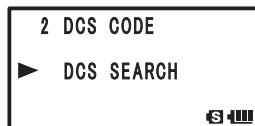
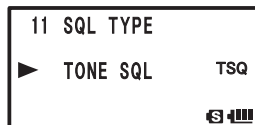
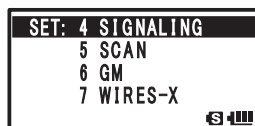
Enter the Set mode:

- 1 Press and hold  over 1 second.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [11 SQL TYPE].
- 5 Press .
- 6 Turn  to select [DCS].
Sets the DCS.
- 7 Press .
- 8 Turn  to select [2 DCS CODE].
- 9 Press .
- 10 Receive the signal from the remote station.
- 11 Press and hold  over 1 second.
[DCS SEARCH] appears.
- 12 Release .

Searching for the DCS code begins. When a corresponding DCS code is heard, a beep is emitted and search stops temporarily. The found DCS code blinks.

Tip To set the searched DCS code:

Press  → a beep is emitted. → Quickly press  3 times to set the DCS code and exit from the Set mode.



Tip

To perform the operation when scan stops, refer to "Selecting a Reception Method When Scanning Stops" on page 59.

Using the Tone Squelch Function

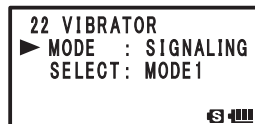
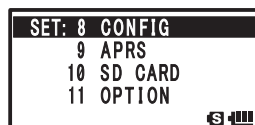
Notification of Call from the Remote Station by Vibration of the Vibrator

Set the vibrator to alert you of a call from a remote station containing a corresponding CTCSS tone or DCS code.

Enter the Set mode:

- 1 Press and hold  over 1 second.
- 2 Turn  to select [8 CONFIG].
- 3 Press .
- 4 Turn  to select [22 VIBRATOR].
- 5 Press .
- 6 Turn  to select [MODE].
- 7 Press .
- 8 Turn  to select [SIGNALING].
- 9 Press  to set the Vibrator mode and exit the Set mode.

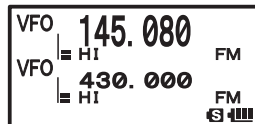
Tip To turn off the Vibrator function, select [OFF] in step 7.



Tips

- The vibrator function can be set for all frequency bands belonging to A-band (Main) and B-band (Sub).
- Selecting [8 CONFIG] → [22 VIBRATOR] → [MODE] and then [BUSY] for [MODE] in the Set mode will cause the vibrator to start vibrating when the BUSY LED lights upon reception of a signal.
- If the BUSY state is not held continuously over 5 seconds, the suspended state is canceled.

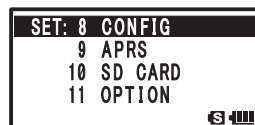
If the  switch is operated to change the communication mode from transmission to reception when the vibrator is turned ON, the vibrator function is turned off for 5 seconds.



Selecting Vibrator Operation Mode

Enter the Set mode:

- 1 Press and hold  over 1 second.
- 2 Turn  to select [8 CONFIG].
- 3 Press .
- 4 Turn  to select [22 VIBRATOR].
- 5 Press .



Using the Tone Squelch Function

- 6 Turn  to select [SELECT].
- 7 Press .
- 8 Turn  to select a vibrator operation mode.

Remark Default: MODE1

MODE1	The vibrator vibrates continuously.
MODE2	The vibrator operates at long intervals.
MODE3	The vibrator operates at short intervals.



- 9 Press .

Sets the Vibrator mode and exits from the Set mode.

Notification of a Call from a Remote Station by the Bell

Set the Bell sound and the blinking  icon on the LCD, to alert you of a call from a remote station containing a corresponding CTCSS tone or DCS code.

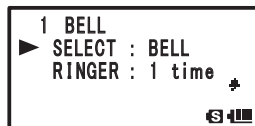
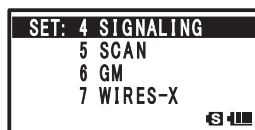
Enter the Set mode:

- 1 Press and hold  over 1 second.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [1 BELL].
- 5 Press .
- 6 Turn  to select [SELECT].
- 7 Press .
- 8 Turn  to select [BELL].

When the tone squelch or DCS function is turned on, the  icon appears.

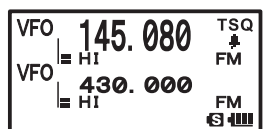
- 9 Press  to set the bell function and exit Set mode.

Tip To turn off the bell function, select [OFF] in step 6.



Tips

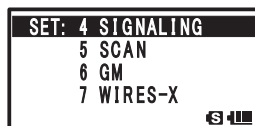
- To use the bell function, turn on the tone squelch or DCS function.
- The bell function cannot be used via the repeater.
- The  icon appears when the bell function is turned on. Upon receipt of a signal from a remote station, the  icon blinks.



Changing the Number of Times the Bell Rings

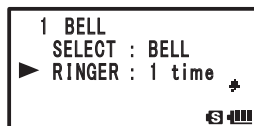
Enter the Set mode:

- 1 Press and hold  over 1 second.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .



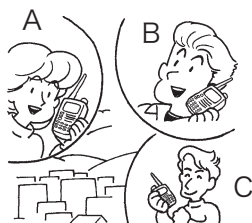
Using the Tone Squelch Function

- 4 Turn  to select [1 BELL].
- 5 Press .
- 6 Turn  to select [RINGER].
- 7 Press .
- 8 Turn  to select the number of times the bell rings.
Remark Default: Once
Tip You can select the number of times the bell rings from among 1 to 20 times, or continuous.
- 9 Press  to set the selected number of times the bell rings and exit from the Set mode.

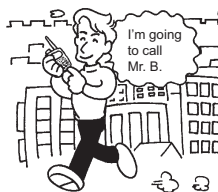


Calling Only a Specific Station — New Pager Function

When using the transceivers with your friends, specifying personal codes (each code composed of two CTCSS tones) allows you to call only a specific station. Even if the called person is not near his or her transceiver, the information on the LCD indicates that he or she has been called.



Three persons A, B, and C are using the transceiver.

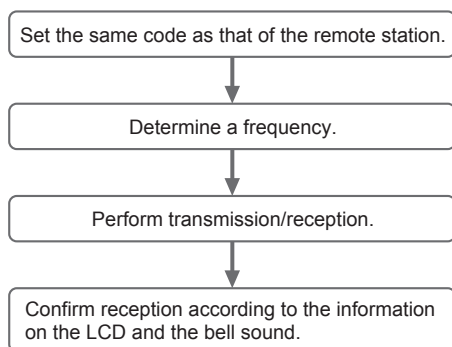


Mr. C sends the personal code of Mr. B.



Only Mr. B is called.

Flow of Operation to Use the Pager Function



Using the Tone Squelch Function

Setting the Code of Your Station

Set the personal code (your code) to be called by other stations.

Enter the Set mode:

- 1 Press and hold  over 1 second.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [6 PAGER].
- 5 Press .
- 6 Turn  to select [CODE-RX].
- 7 Press .
- 8 Turn  to select a code.

Select the first code from among 1 to 50.

- 9 Press .

The cursor [*] moves.

- 10 Turn  to select a code.

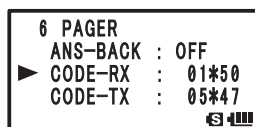
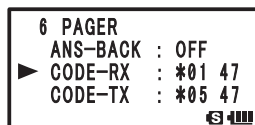
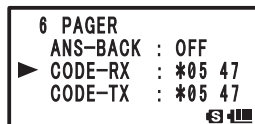
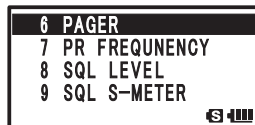
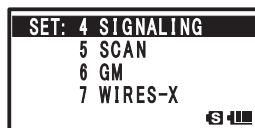
Select the second code from among 1 to 50.

Caution The second code must be different from the first code.

- 11 Press  to set your station code and exit from the Set mode.

Tips • Default: 05 47

- The first and second codes contained in your personal code may be reversed, i.e., [47 05] from [05 47] but recognized as the same code.
- If the same personal code (group code) is specified for all persons, all persons can be called at the same time.

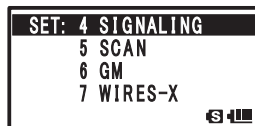


Turning on the New Pager Function

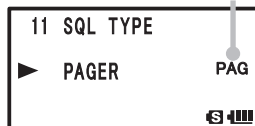
Enter the Set mode:

- 1 Press and hold  over 1 second.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [11 SQL TYPE].
- 5 Press .
- 6 Turn  to select [PAGER].
- 7 Press  to set the new pager function and exit from the Set mode.

You can make a call, or wait for a call from a remote station, using the new pager function.



PAG appears.



Using the Tone Squelch Function

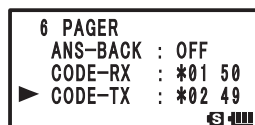
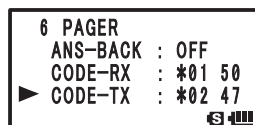
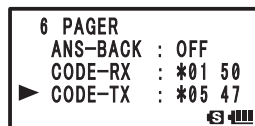
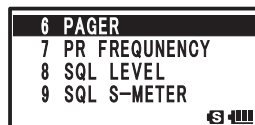
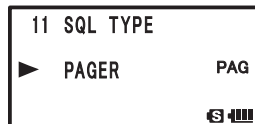
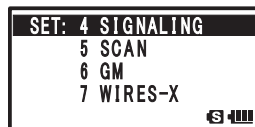
Calling a Specific Station

Enter the Set mode:

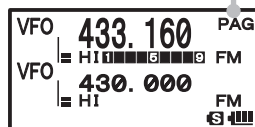
- 1 Press and hold  over 1 second.
- 2 Turn  to select [4 SIGNALING].
- 3 Press .
- 4 Turn  to select [11 SQL TYPE].
- 5 Press .
- 6 Turn  to select [PAGER].
Set the new pager function:
- 7 Press .
- 8 Turn  to select [6 PAGER].
- 9 Press .
- 10 Turn  to select [CODE-TX].
- 11 Press .
- 12 Turn  to select the code of the remote station.
Select the first code of the remote station.

Caution Register the pager code of the remote station in advance.

- 13 Press .
The cursor [*] moves.
- 14 Turn  to select the code of the remote station.
Select the second code of the remote station.
- 15 Press  to set the code of the remote station and exit from the Set mode.
- 16 Press  to call the remote station.



PAG appears.



Using the Tone Squelch Function

Being Called by the Remote Station (Standby Operation)

If you use the new pager function on the same frequency as the remote station, the [PAG] icon displayed on the LCD changes to [PIN], alerting that you have been called by the remote station. In addition, if you turn on the “bell function” (See page 89), you can confirm a call from the remote station by the [PAG] display, the blinking [PIN] icon, and the bell sound. Also, if you turn on the “vibrator function” (See page 88), the vibrator will confirm a call from the remote station.



Tip

Selecting [4 SIGNALING] → [9 PAGER ANS-BACK] → [ON] in the Set mode automatically places the transceiver in the transmission mode (for about 2.5 seconds) when called by the remote party, and notifies the remote party to get ready for communication.

Set Mode

Using the Set Mode

The Set mode allows you to select various functions from a list so you can use your transceiver more conveniently.

Enter the Set mode:

- 1 Press and hold  for over 1 second.
- 2 Turn  to select a Set mode option.
- 3 Press .
- 4 Turn  to choose a setting item.

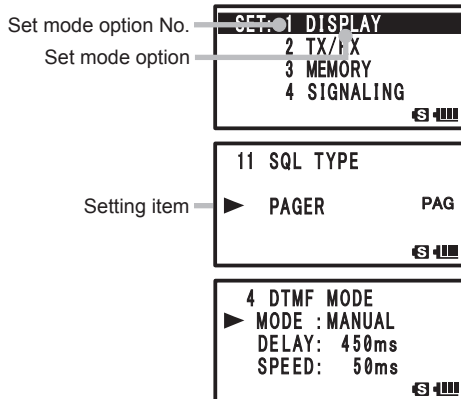
Select a setting item:

- 5 Press .

[If there is no lower layer of setting items
Proceed to step 8.]

[If there is lower layer of setting items
continue with step 6.]

- 6 Turn  to select a setting item.
- 7 Press  to exit the Set mode.



Resetting the Set Mode Options

The Set mode options you have set can be restored to the defaults by following the procedure described below. However, to restore the following setting items to the defaults, "ALL RESET" (See page 39) is required.

2-1-2 ANTENNA ATT

2-1-4 RX MODE

3-3 MEMORY NAME

4-2 DCS CODE

4-6 PAGER (CODE-RX/CODE-TX)

4-9 SQL S-METER

4-12 TONE SQL FREQ

8-5 CLOCK TYPE

8-15 RPT SHIFT

9-7 APRS MSG TXT

9-18 DIGI PATH

9-24 MY POSITION

12 CALLSIGN

2-1-3 HALF DEVIATION

3-2 BANK NAME

3-5 MEMORY SKIP

4-3 DCS INVERSION

4-7 PR FREQUENCY

4-11 SQL TYPE

7-4 EDIT CATEGORY TAG

8-12 PASSWORD

8-16 RPT SHIFT FREQ

9-15 BEACON STATS TXT

9-23 CALLSIGN (APRS)

9-25 MY SYMBOL (4:User)

Set Mode

- 1 Press  while pressing , and .
Then turn the transceiver on. When a beep is heard, release the keys.
 - 2 When [SET MODE RESET PUSH F KEY] appears, press .
A beep is emitted.
- Tip** To cancel resetting, press any key other than .

Set Mode Option List

Set mode option No./ setting item	Description of function	Setting Item (Bold letters: Default)	Reference page
1 DISPLAY			
1-1 GPS INFO	Press  to open the GPS screen.	—	103
1-2 TARGET LOCATION	Set the display method for the BACKTRACK screen that appears when using the GM Function.	COMPASS / NUMERIC	104
1-3 COMPASS	Set the display method for BACKTRACK Compass.	HEADING UP / NORTH UP	104
1-4 BAND SCOPE	Switch the Search Channel for the BAND SCOPE operation mode.	11ch / 19ch / 33ch / 49ch / 101ch	105
1-5 LAMP	Set the duration time of backlight and keys to be lit.	OFF / 2 to 10 SEC (KEY) / CONTINUOUS KEY 5sec	105
1-6 LANGUAGE	Select Japanese or English as the display language for Set mode options, setting items, etc.	JAPANESE / ENGLISH	106
1-7 LCD CONTRAST	Set the LCD contrast level.	LEVEL 1 to LEVEL 15 Level 7	106
1-8 LCD DIMMER	Set the brightness level of the LCD backlight and keypad key light.	LEVEL 1 to LEVEL 6 Level 6	107
1-9 OPENING MESSAGE	Select an opening message type.	NORMAL / OFF / DC / MESSAGE / CALLSIGN	107
1-10 SENSOR INFO	Display function for electrical voltage and temperature.	Voltage & Temperature	108
1-11 S-METER SYMBOL	Select a S/PO meter symbol display type.	4 types	109
2 TX / RX			
2-1 MODE			
2-1-1 ANTENNA AM	Select an AM radio antenna type.	BAR & EXT / Bar Antenna	33
2-1-2 ANTENNA ATT	Set the attenuator to ON or OFF.	OFF / ON	109
2-1-3 HALF DEVIATION	Set the transmission modulation level.	OFF / ON	110
2-1-4 RX MODE	Select a reception mode.	AUTO / FM / AM	38
2-2 DIGITAL			
2-2-1 DIGITAL MODE	Select DIGITAL to switch to DIGITAL mode	MODE: DIGITAL / AMS / ANALOG DIG TX: DN / VW AMS MODE: TX M / TX FM / TX DN / TX VW / AUTO	111

Set Mode

Set mode option No./ setting Item	Description of function	Setting Item (Bold letters: Default)	Reference page
2-2-2 SQL TYPE	Select SQL Type in the DIGITAL mode.	SQL TYPE: OFF / CODE / BREAK CODE: 001 to 126	113
2-2-3 DIGI POP UP	Set the POP UP time.	OFF BND2s / BND4s / BND6s / BND8s / BND10s / BND20s / BND30s / BND60s / BND CNT	113
2-2-4 LOCATION SERVICE	Set whether or not to display the current location of your own station in the digital mode.	ON / OFF * For more details of this function, refer to the GM Function Instruction Manual.	
2-2-5 STANDBY BEEP	STANDBY BEEP setting	ON / OFF	114
2-2-6 DSP Ver	DSP version display	Version display	115
2-3 AUDIO			
2-3-1 MIC GAIN	Adjust the microphone gain level.	LEVEL 1 to LEVEL 9 LEVEL 5	115
2-3-2 MUTE	Set the muting level on the non-operating side when a signal is received on the operating band side.	OFF / MUTE30% / MUTE50% / MUTE 100%	35
2-3-3 RX AF DUAL	Set the resumption time of radio reception in the AF Dual mode.	Transmission and reception 1 second to 10 seconds, Fixed, or transmission 1 second to 10 seconds. Transmission 2 seconds	78
2-3-4 VOL MODE	Set [VOL] key.	NORMAL / AUTO BACK	116
3 MEMORY			
3-1 BANK LINK	Set memory bank link.	BANK 1 to BANK 24, BANK LINK ON / OFF	117
3-2 BANK NAME	Assign a name to a memory bank.	BANK1 to BANK24	49
3-3 MEMORY NAME	Enter a memory channel tag.	Up to 16 characters	47
3-4 MEMORY PROTECT	Allow or prohibit memory channel registration.	OFF / ON	118
3-5 MEMORY SKIP	Set memory channels or selected memory channels to skip.	OFF / SKIP / SELECT	60
3-6 MEMORY WRITE	Set the automatic increment to display memory channel to be registered.	NEXT / LOWER	118
4 SIGNALING			
4-1 BELL	Set the number of bell ring.	SELECT: OFF / BELL RINGER: 1 time to 20 times / Continuous	89
4-2 DCS CODE	Set the DCS code.	DCS 023 to DCS 754	86

Set Mode

Set mode option No./ setting Item	Description of function	Setting Item (Bold letters: Default)	Reference page
4-3 DCS INVERSION	Select a combination of DCS inversion codes in terms of communication direction.	RX (Reception): -NORMAL (Homeomorphic) / INVERT (Inversion) / BOTH (Both Phase) / NORMAL (Homeomorphic) TX (Transmission): -NORMAL (Homeomorphic) / NORMAL (Homeomorphic) NORMAL (Homeomorphic) INVERT (Inversion)	119
4-4 DTMF MODE	Set the transmission of DTMF code registered to a DTMF memory channel, DTMF code transmission delay time, and DTMF code transmission speed.	MODE: MANUAL / AUTO DELAY: 50ms / 250ms / 450ms / 750ms / 1000ms SPEED: 50ms / 100ms	81
4-5 DTMF SELECT	Set a DTMF auto dialer channel and code (16 characters).	1 to 10	79
4-6 PAGER	Turn on/off the pager answerback function and specify a personal code (transmission/reception).	ANS-BACK: OFF / ON CODE-RX: 01 02 to 50 49 05 47 CODE-TX: 01 02 to 50 49 05 47	90
4-7 PR FREQUENCY	Set a non-communication squelch.	300 Hz to 3000 Hz 1600 Hz	120
4-8 SQL LEVEL	Select a squelch level.	Level 0 to Level 15 Level 1	121
4-9 SQL S-METER	Select an S-meter squelch level.	OFF / LEVEL 1 to LEVEL 9	121
4-10 SQL EXPLANATION	Set a separate squelch type for reception and transmission.	OFF / ON	122
4-11 SQL TYPE	Select a squelch type.	OFF / TONE / TONE SQL / DCS / REV TONE / PR FREQ / PAGER	84
4-12 TONE SQL FREQ	Set a tone frequency.	67.0 Hz to 254.1 Hz 100 Hz	85
4-13 TONE-SRCH	Set the audio output during tone search. Turn the muting function on/off and select a tone search speed.	MUTE: ON / OFF SPEED: FAST / SLOW	123
4-14 WX ALERT	Enables/Disables the Weather Alert Feature.	OFF / ON	124
5 SCAN			
5-1 DW TIME	Set the priority memory channel monitoring interval.	0.1 SEC to 10 SEC 5 SEC	124
5-2 SCAN LAMP	Set the scan lamp to light or not when scanning stops.	ON / OFF	125
5-3 SCAN RE-START	Set the scanning restart time.	0.1 SEC to 10 SEC 2 SEC	125
5-4 SCAN RESUME	Set the scan stop mode.	SCAN: BUSY / HOLD / 2sec to 10sec 5sec DW: BUSY / HOLD / 2sec to 10sec	59
5-5 SCAN WIDTH	Set the scan mode.	VFO: ALL / BAND MEMORY: ALL CH / BAND	126

Set Mode

Set mode option No./ setting Item	Description of function	Setting Item (Bold letters: Default)	Reference page
6 GM			
6-1 LANGUAGE	Select the language to use for writing a message, etc.	JAPANESE ENGLISH	–
6-2 DELETE GROUP	Delete a registered group.	–	–
6-3 DELETE MEMBER	Delete a registered member.	–	–
6-4 RADIO ID	Transceiver specific number(ID) appears. (This cannot be edited)	–	–
* For more details of this function, refer to the GM Function Instruction Manual.			
7 WIRES-X			
7-1 LANGUAGE	Select the language to use for writing a message, etc.	JAPANESE ENGLISH	–
7-2 RPT/WIRES FREQ	Set a frequency to be used for Repeater/WIRES.	MANUAL / PRESET	–
7-3 SERCH SETUP	Set the WIRES ROOM selection method.	HISTORY / ACTIVITY	–
7-4 EDT CATEGORY TAG	Edit a category tag.	C1 to C5	–
7-5 REMOVE ROOM/ NODE	Delete a registered Category ROOM.	C1 to C5	–
* For more details of this function, refer to the WIRES-X Function Instruction Manual.			
8 CONFIG			
8-1 APO	Set the APO operating time.	OFF / 0.5 HOUR / 1 HOUR to 12 HOURS	127
8-2 BCLO	Turn on/off the busy channel lock-out function.	OFF / ON	128
8-3 BEEP	Set the beep output function and the function of emitting a beep when a band edge/CH1 is encountered.	SELECT: KEY&SCAN / KEY / OFF EDGE: OFF / ON	128
8-4 BUSY LED	Turn on/off the BUSY LED.	A BAND: ON / OFF B BAND: ON / OFF RADIO: ON / OFF	129
8-5 CLOCK TYPE	Set the clock shift function.	A / B	129
8-6 GPS LOG	Set the GPS access time.	OFF / 1 SEC / 2 SEC / 5 SEC / 10 SEC / 30 SEC / 60 SEC	130
8-7 HOME VFO	ENABLE/DISABLE of VFO transmission in Home Channel.	ENABLE / DISABLE	130
8-8 LED LIGHT	Turn on/off the white LED flash-light.	–	131
8-9 LOCK	Select a lock mode.	KEY&DIAL / PTT / KEY&PTT / DIAL&PTT / ALL / KEY / DIAL	131
8-10 MONI/T-CALL	Select a monitor switch or T-CALL switch.	MONI / T-CALL *1	132
8-11 TIMER	Set the power ON/OFF timer.	ON: 00:00 to 23:59 ON / OFF OFF: 00:00 to 23:59 ON / OFF	132
8-12 PASSWORD	Turn on/off the password function.	ON / OFF [– – – –]	133

*1: Depends on the transceiver version.

Set Mode

Set mode option No./ setting Item	Description of function	Setting Item (Bold letters: Default)	Reference page
8-13 PTT DELAY	Set the PTT delay time.	OFF / 20ms / 50ms / 100ms / 200ms	134
8-14 RPT ARS	Turn the ARS function on/off.	ON / OFF	134
8-15 RPT SHIFT	Select a repeater shift direction.	Differs depending on frequency	135
8-16 RPT SHIFT FREQ	Select a repeater shift width.	Differs depending on frequency	135
8-17 SAVE RX	Set the reception save time.	OFF / 0.2 SEC (1:1) to 60.0 SEC (1:300)	136
8-18 STEP	Select a channel step.	AUTO / 5.0 kHz to 100 kHz	37
8-19 DATE & TIME ADJ	Set up the built-in clock function.	—	34
8-20 TOT	Set the timeout timer.	OFF / 30 SEC to 10 MIN 3.0min	136
8-21 VFO MODE	Select the frequency selection range in the VFO mode.	ALL / BAND	137
8-22 VIBRATOR	Select a vibrator mode and set up the vibrator function.	MODE: OFF / BUSY / SIGNALING SELECT: MODE1 / MODE2 / MODE3	88
9 APRS			
9-1 APRS AF DUAL	Turn on/off the muting function when both the APRS function and AF dual function are active.	ON / OFF	—
9-2 APRS DESTINATION	Displaying Model Code	APY01D (Cannot be edited.)	—
9-3 APRS FILTER	Select filter function	Mic-E: ON / OFF POSITION: ON / OFF WEATHER: ON / OFF OBJECT: ON / OFF ITEM: ON / OFF STATUS: ON / OFF OTHER: OFF / ON ALTNET: OFF / ON	—
9-4 APRS MODEM	Set the APRS baud rate	OFF / 1200bps / 9600bps	—
9-5 APRS MSG FLASH	Set the strobe to flash when there is an incoming message.	MSG: OFF / 2-4-10 (2sec interval) / 20sec / 30sec / 60sec / CONTINUOUS / EVERY 2s-10s (1sec interval) / EVERY 10s-EVERY 50s (10sec interval) / EVERY 1m-EVERY 10m (1min interval) GRP: OFF / 2-4-10 (2sec interval) / 20sec / 30sec / 60sec / CONTINUOUS BLN: OFF / 2-4-10 (2sec interval) / 20sec / 30sec / 60sec / CONTINUOUS	—