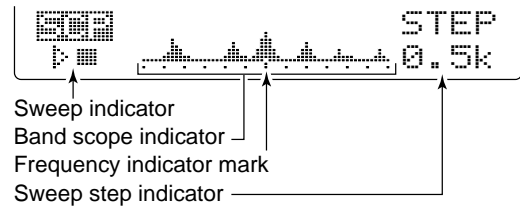









Simple band scope

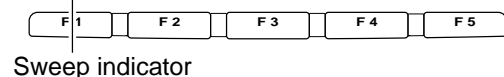
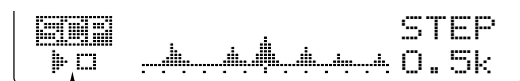
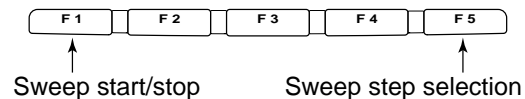
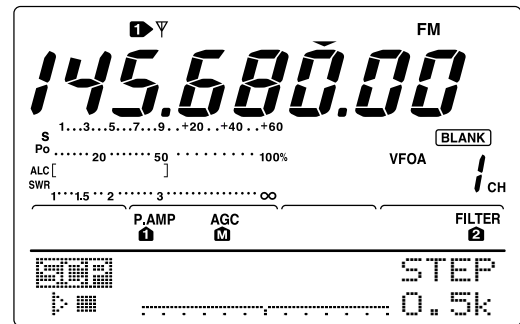
The band scope function allows you to visually check signal condition around a specified frequency. The IC-746PRO's band scope function can be used in any operating mode and frequency band.



INDICATOR	DESCRIPTION
Sweep	While the band scope is “sweeping,” “  ” appears; while stopped “  ” appears. Received audio is not emitted from the speaker while the band scope is “sweeping.”
Band scope indicator	Indicates the relative strength of signals and their location in relation to the center (displayed) frequency. Signal strength is relative to the S-meter level, S1 to S9, with each vertical dot in the band scope indicator equal to one segment of the S-meter. Signal activity is measured ± 30 steps from the center frequency with each step equal to the selected sweep step.
Frequency indicator mark	After a sweep, indicates the relative position of the selected frequency. When the selected frequency is outside of the sweep range, “  ” or “  ” indicator flashes. After changing the frequency, push [F3] for 1 sec. to automatically return to the center frequency.
Sweep step	Indicates the selected sweep step. 0.5, 1, 2, 5, 10, 20 and 25 kHz are selectable. Each dot of the band scope indication is approx. equal to the selected sweep step.

The band scope measures receive signal conditions over a specified range on either side of a selected frequency in either VFO or memory modes.

- ① Rotate the tuning dial to tune a frequency.
- ② While **M1** is selected, push [F5 **SCP**] to select the band scope menu.
 - Starts sweeping automatically with the previously selected sweeping step.
 - During sweep, received signals cannot be heard.
- ③ Push [F5 **STEP**] several times to select the desired sweep step.
- ④ Push [F1] to start sweeping, then stop automatically after sweeping.
 - Push [F1] for 1 sec. to start continuous sweeping. In this case, it is necessary to push [F1] to stop sweeping.
 - During sweep operation “ ” appears and received signals cannot be heard.
 - If there is a lot of signal noise, turn the preamp OFF and the attenuator ON to reduce the signal input level and improve the readability of the band scope.
- ⑤ When rotating the tuning dial and finding a signal you wish to communicate on, simply communicate normally.
 - If you want to return to the previous frequency (before rotating the tuning dial), push [F3] for 1 sec.
 - If the selected frequency is set outside of the swept range, “ ” or “ ” flashes.
- ⑥ While receiving, if you want to update the band conditions, repeat steps ③ and ④ as above.



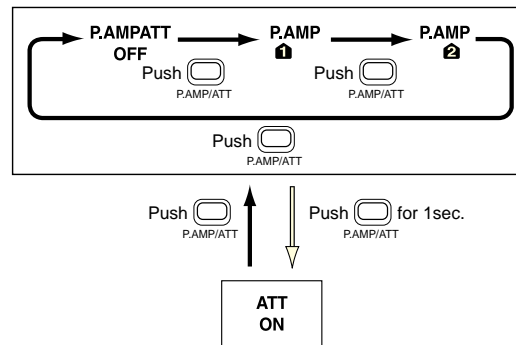
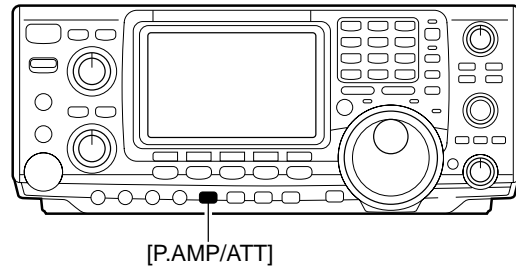
■ Preamp/Attenuator

The preamp amplifies received signals in the front end circuit to improve the S/N ratio and sensitivity. Set this to preamp 1 or preamp 2 when receiving weak signals. The attenuator prevents a desired signal from distortion when very strong signals are near the desired frequency or when very strong electric fields, such as from broadcasting station, are near your location. These can both be set independently for each band.

- ➔ Push [P.AMP/ATT] several times to set the preamp OFF, preamp 1 ON or preamp 2 ON.
 - When the preamp is ON, either “P.AMP 1” or “P.AMP 2” appears in the function display.
 - When operating on the 144 MHz band, the preamp can only be set to ON or OFF only— there is no preamp 1 and preamp 2.

P.AMP 1	Regular preamp, the most effective for 1.8 to 21 MHz bands without IMD corruption.
P.AMP 2	High-gain preamp, the most effective for 24 to 50 MHz bands.
P.AMP	Preamp activates for the VHF band (144 to 146 MHz range; 108 to 174 for the USA version).

- ➔ Push [P.AMP/ATT] for 1 sec. to set the attenuator ON.
 - “ATT” appears in the display when the function is set ON.
 - Push [P.AMP/ATT] momentarily to set the attenuator OFF.



Regarding the use of the “P.AMP 2”

The “P.AMP 2” is a high gain receive amplifier. When the “P.AMP 2” is used during times of strong electric fields, distortion sometimes results. In such cases, use the transceiver with the “P.AMP 1” or “P.AMP OFF” setting.

The “P.AMP 2” is most effective when:

- Used on bands above 24 MHz and when electric fields are weak.
- Receive sensitivity is insufficient during low gain, or while using a narrow band antenna (such as small loop, a Beverage antenna or a short Yagi antenna, etc.) is used.

■ RIT function

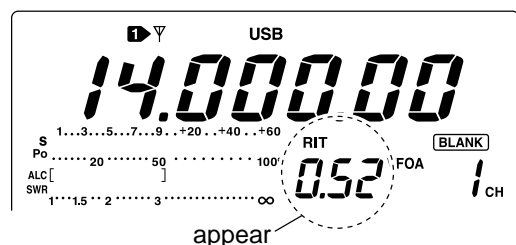
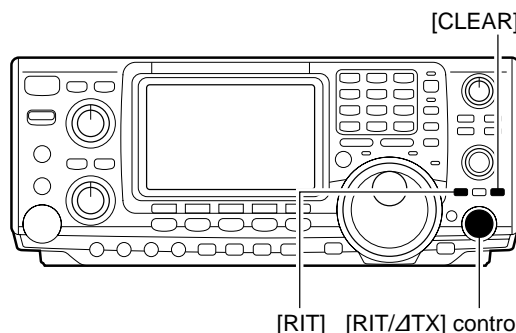
The RIT (Receive Increment Tuning) function compensates for off-frequencies of the communicating station. The function shifts the receive frequency up to ±9.99 kHz in 10 Hz steps without moving the transmit frequency.

•See 30 on p. 4 for function description.

- ① Push [RIT] to turn the RIT function ON and OFF.
 - “RIT” and the shifting frequency appear when the function is ON.
- ② Rotate the [RIT/ΔTX] control.
 - Push [CLEAR] for 1 sec. to reset the RIT frequency.
 - Push [CLEAR] momentarily to reset the RIT frequency when the quick RIT/ΔTX clear function is ON. (p. 85)
 - Push [RIT] for 1 sec. to add the shift frequency to the operating frequency.

◆ RIT monitor function

When the RIT function is ON, pushing and holding [XFC] allows you to monitor the operating frequency directly (RIT is temporarily cancelled).



AGC function

The AGC (auto gain control) controls receiver gain to produce a constant audio output level even when the received signal strength is varied by fading, etc.

The transceiver has 3 AGC characteristics (time constant; fast, mid, slow) for non-FM mode.

The FM mode AGC time constant is fixed as 'FAST' (0.1 sec.) and AGC time constant cannot be selected.

AGC speed selection

- ① Select non-FM mode.
- ② While **M** is selected, push **[F1 AGC]** several times to select AGC **F**, AGC **M**, AGC **S** or AGC OFF.

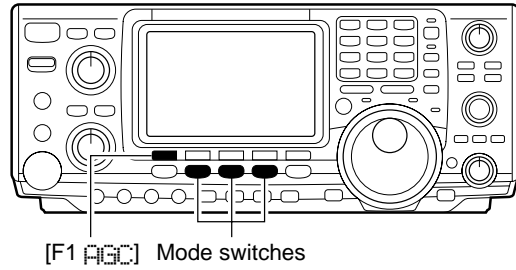
"AGC OFF" appears when AGC time constant OFF is set with one of FAST, MID or SLOW setting in AGC set mode.

Setting the AGC time constant

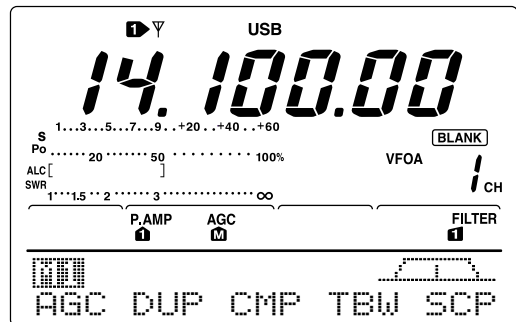
- ① Select the desired mode except FM mode.
- ② While **M** is selected, push **[F1 AGC]** for 1 sec. to enter AGC set mode.
- ③ Push one of **[F2 FAST]**, **[F3 MID]** or **[F4 SLOW]** to select the desired AGC speed to be set.
 - Underline appears below the time constant indication.
- ④ Rotate the tuning dial to set the desired time constant.
 - AGC time constant can be set between 0.1 to 8.0 sec. (depends on mode) or turned OFF.
 - Push **[F2 FAST]**, **[F3 MID]** or **[F4 SLOW]** for 1 sec. to select a default value for each fast, mid, and slow, respectively.
- ⑤ Select another mode except FM. Repeat steps ③ and ④ if desired.
- ⑥ Push **[MENU]** to exit the AGC set mode.

Selectable AGC time constant (unit: sec.)

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



- AGC M** : Medium AGC speed
- AGC S** : Slow AGC speed
- AGC F** : Fast AGC speed
- AGC-OFF** : AGC does not activated

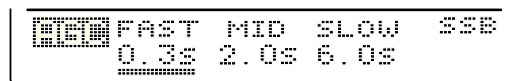


Push **[F1]** for 1 sec.



Appears under the selected AGC Selected mode speed's time constant indication.

When AGC fast is selected



Push **[F2]** for 1 sec. to select the default value in this case.

IF filter selection

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

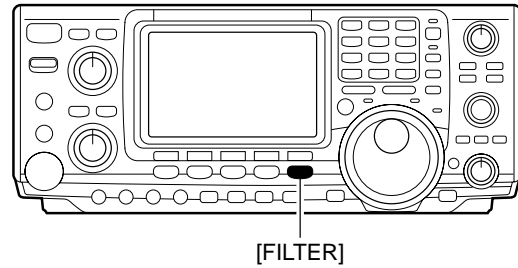
For SSB and CW modes, the passband width can be set within 50 to 3600 Hz in 50 or 100 Hz steps. A total of 41 passband widths are available.

For RTTY mode, the passband width can be set within 50 to 2700 Hz in 50 or 100 Hz steps. A total of 32 passband widths are available.

For AM and FM modes, the passband width is fixed and 3 passband widths are available independently.

▨ The filter selection is automatically memorized in each mode.

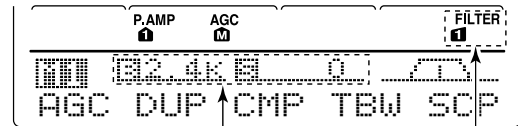
▨ The PBT shift frequencies are automatically memorized in each filter.



IF filter selection

- ① Select the desired mode.
- ② For RTTY mode, turn OFF the RTTY filter.
- ③ Push [FILTER] several times to select the IF filter **1**, **2** or **3**.
 - The selected passband width and filter number is displayed in the LCD.

▨ By pushing [PBTC] indicate the set filter passband width, “**B**,” and shifting value “**S**.”



The selected filter width is indicated for approx. 1 sec. when [FILTER] is pushed. Filter selection

Filter passband width setting (SSB, CW and RTTY mode only)

- ① Select SSB, CW or RTTY mode.
 - Passband widths for AM and FM modes are fixed and cannot be set.
- ② For RTTY mode, turn OFF the RTTY filter.
- ③ Push [FILTER] for 1 sec. to enter filter set mode.
- ④ Push [FILTER] several times to select the desired IF filter number.
- ⑤ While pushing [F1 **B**], rotate the tuning dial to set the desired passband width.
 - In SSB and CW modes, the passband width can be set within the following range.

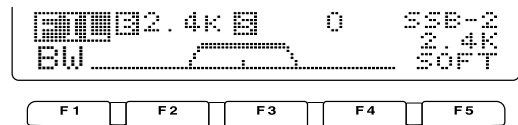
50 to 500 Hz	50 Hz steps
600 to 3600 Hz	100 Hz steps
 - In RTTY mode, the passband width can be set within the following range.

50 to 500 Hz	50 Hz steps
600 to 2700 Hz	100 Hz steps
 - Push [F-3] for 1 sec. to select the default value.
- ⑥ Repeat steps ④ to ⑤ if desired.
- ⑦ Push [MENU] to exit the filter set mode.

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

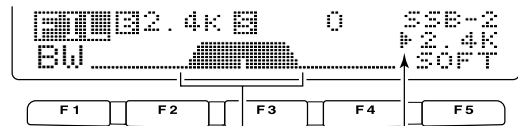
▨ This filter set mode screen graphically displays the PBT shift frequencies and CW pitch operations.

Filter set mode indication



Shows the selected filter and passband width.

Indication while setting

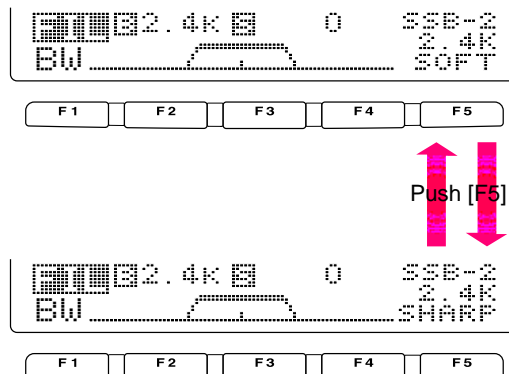


While pushing [F1 **B**], rotate the tuning dial to set passband width. Reverses Appears

IF (DSP) filter shape

The type of IF (DSP) filter shape for each SSB and CW can be selected independently from soft and sharp.

- ① Push [SSB] or [CW/RTTY] to select SSB, CW or RTTY mode.
- ② Select the filter set mode.
 - Push [FILTER] for 1 sec.
 - Operating mode can be selected in this step.
- ③ Push [FILTER] several times to select the desired IF filter.
- ④ Push the [F5] to select the filter shape from “SOFT” and “SHARP.”
- ⑤ Push [MENU] to exit the set mode.

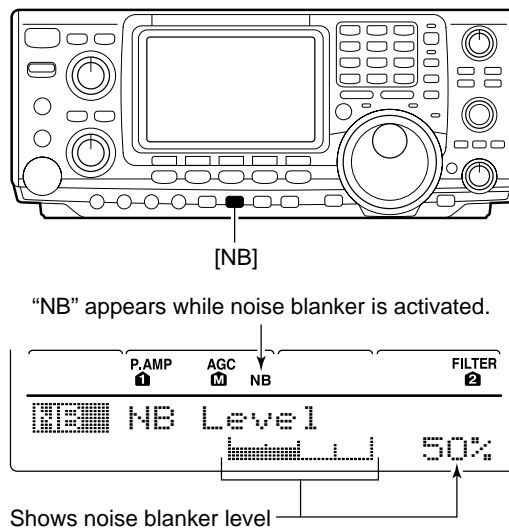


Noise blanker

The noise blanker eliminates pulse-type noise such as from car ignitions. The noise blanker is not available for FM mode.

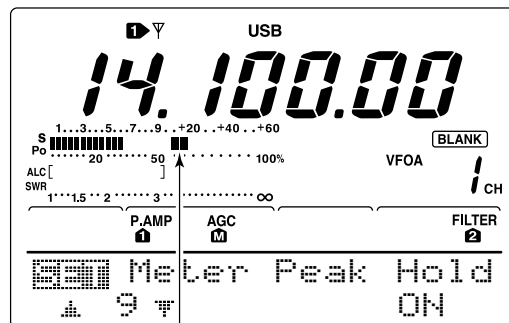
- ① Push [NB] to turn the noise blanker ON.
 - [NB] indicator appears.
- ② Push [NB] for 1 sec. to enter the NB level set mode.
- ③ Rotate the tuning dial to adjust the noise blanker level.
 - Noise blanker level is indicated with bar meter and digit in ‘%.’
- ④ Push [NB] to exit the noise blanker set mode.
- ⑤ Push [NB] to turn the noise blanker OFF.
 - [NB] indicator disappears.

When using the noise blanker, received signals may be distorted if they are excessively strong.



Meter peak hold function

The S-meter shows the peak level holding function. Peak level of receiving signal strength is indicated for 0.5 sec. (approx.). This function can be deactivated in the set mode if desired. (p. 81)



Shows peak level for approx. 0.5 sec.

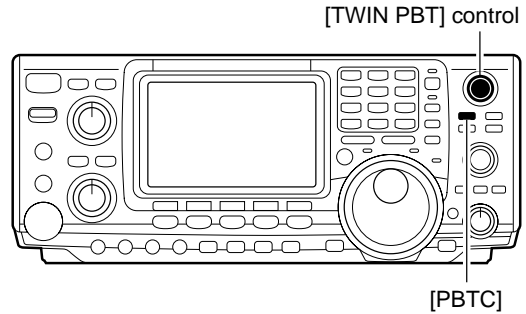
■ Twin PBT operation

General PBT (Passband Tuning) function electronically narrows the IF passband width by shifting the IF frequency to slightly outside of the IF filter passband to reject interference. This transceiver uses the DSP circuit for the PBT function. Moving both [TWIN PBT] controls to the same position shifts the IF.

- The LCD shows the passband width and shift frequency graphically.
- Push [FILTER] for 1 sec. to enter the filter set mode. Current passband width and shift frequency is displayed in the filter set mode screen.
- To set the [TWIN PBT] controls to the center positions, push [PBTC] for 1 sec.

The variable range depends on the passband width and mode. The edge of the variable range is half of the passband width, and PBT is adjustable in 25 or 50 Hz steps. These controls function as an IF shift control while in AM mode and when the RTTY filter is turned ON. Only the inner control may function in this case. IF shift is adjustable in 20/40 Hz steps in RTTY (RTTY filter is turned ON) or 150/300/500 Hz steps in AM.

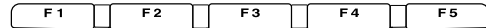
- [TWIN PBT] should normally be set to the center positions (PBT setting is cleared) when there is no interference.
- When PBT is used, the audio tone may be changed.
- Not available for FM mode.
- For AM and RTTY (with RTTY filter ON) modes, [TWIN PBT] inner control can only be activated, and functions as an IF shift function.
- While rotating [TWIN PBT], noise may occur. This comes from the DSP unit and does not indicate an equipment malfunction.
- By pushing [PBTC] momentarily, indicate the using filter passband width, "B," and shifting value, "S."



Passband width and shifting value are indicated while [TWIN PBT] is operated.

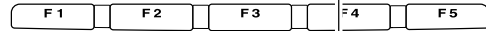
Appears when PBT is used.

• Filter set mode indication



Shows the selected filter and passband width.

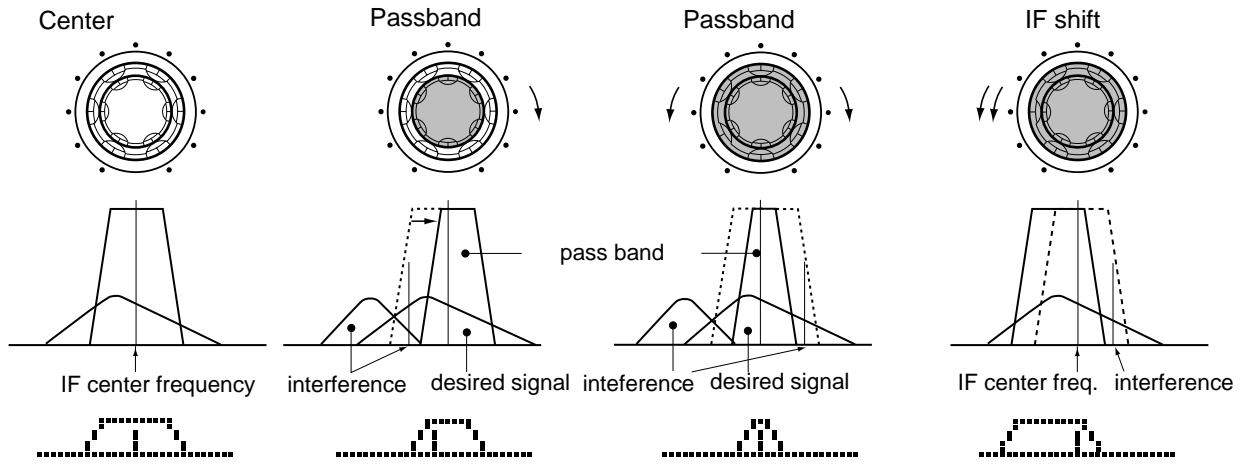
• Indication while PBT setting



Appears when passband is shifted.

*Pushing [PBTC] for 1 sec., the shifted value return to default setting and the "dot" disappears.

PBT OPERATION EXAMPLE

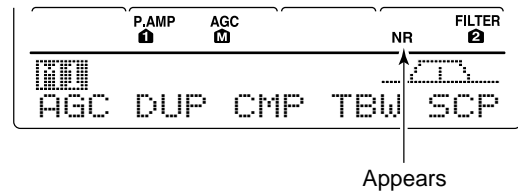
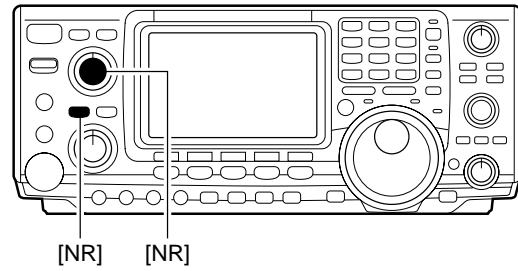


■ Noise reduction

The noise reduction function reduces noise components and picks out desired signals which are buried in noise. The received signals are converted to digital signals and then the desired signals are separated from the noise.

- ① Push the [NR] switch to turn the noise reduction ON.
 - “NR” appears.
- ② Rotate the [NR] control to adjust the noise reduction level.
- ③ Push the [NR] switch to turn the noise reduction OFF.
 - “NR” disappears.

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

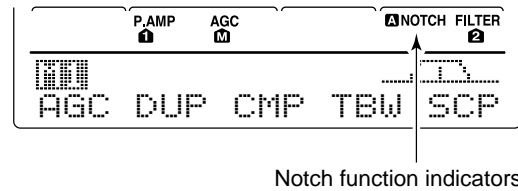
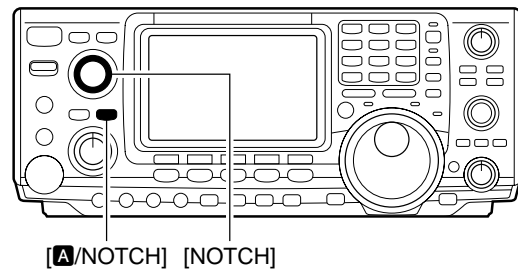


■ Notch function

This transceiver has auto and manual notch functions. The auto notch function automatically attenuates more than 3 beat tones, tuning signals, etc., even if they are moving. The manual notch can be set to attenuate a frequency via the [NOTCH] control.

- ➔ Push [A/NOTCH] to toggle the notch function between auto, manual and OFF in SSB and AM modes.
- ➔ Push [A/NOTCH] to turn the manual notch function ON and OFF in CW mode.
- ➔ Push [A/NOTCH] to turn the auto notch function ON and OFF in FM mode.
 - Set to attenuate a frequency for manual notch via the [NOTCH] control.
 - “A NOTCH” appears when auto notch is in use.
 - “NOTCH” appears when manual notch is in use.

▨ While operating the manual notch, noise may be heard. This comes from the DSP unit and does not indicate an equipment malfunction.

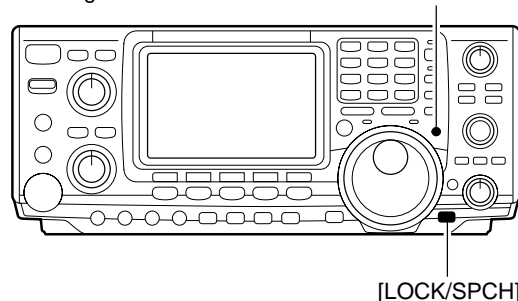


■ Dial lock function

The dial lock function prevents accidental changes caused by the tuning dial.

- ➔ Push [LOCK/SPCH] to turn the dial lock function ON and OFF.
 - “LOCK” indicator lights while the dial lock function is activated.

Lights while the dial lock function is activated.



■ Voice squelch control function

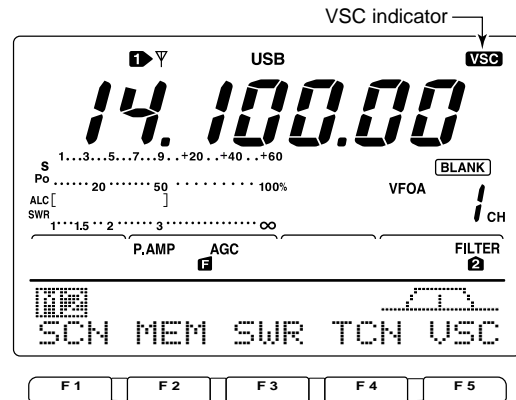
This function is useful when you don't want unmodulated signals. When the voice squelch control function is activated, the receiver checks received signals for voice components.

If a receiver signal includes voice components, and the tone of the voice components changes within 1 sec., squelch opens. If the received signal includes no voice components or the tone of the voice components does not change within 1 sec., squelch closes.

➔ While **M2** is selected with [MENU], push [F5 VSC] to switch the VSC (Voice Squelch Control) function ON and OFF.

- "VSC" appears when the function is activated.

- The VSC function activates for phone modes (SSB, AM and FM).
- The VSC function can also be used for scanning operation in AM or FM mode (p. 00).



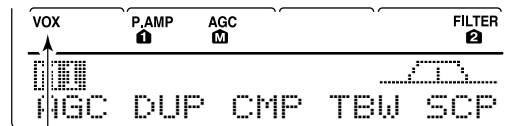
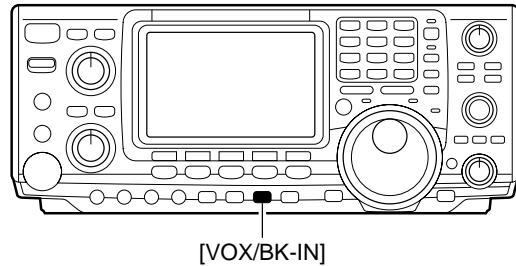
Push [F5] to turn the VSC function ON and OFF.

■ VOX function

The VOX (Voice-Operated Transmission) function switches between transmit and receive with your voice. This function provides an opportunity to input log entries into your computer, etc., while operating.

•Using the VOX function

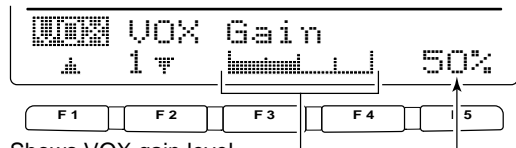
- ① Select a phone mode (SSB, AM, FM).
- ② Push [VOX/BK-IN] to turn the VOX function ON or OFF.



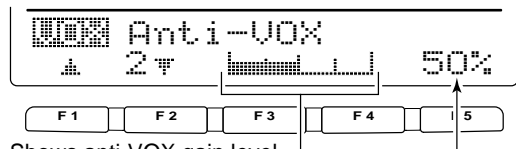
Appears

◆ Adjusting the VOX function

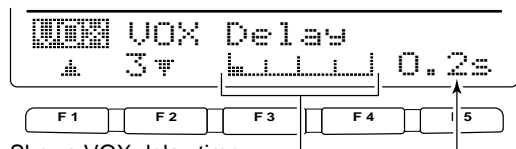
- ① Select a phone mode (SSB, AM, FM).
- ② Push [VOX/BK-IN] to turn VOX function ON.
- ③ Push [VOX/BK-IN] for 1 sec. to enter VOX set mode.
- ④ Select the VOX Gain item using [F1 ▲] or [F2 ▼].
- ⑤ While speaking into the microphone, rotate the tuning dial to the point where the transceiver is continuously transmitting.
 - Pushing [F3] for 1 sec. to select the default value.
- ⑥ Push [F2 ▼] to select Anti-VOX item.
- ⑦ While receiving, rotate the tuning dial to the point where the transceiver does not switch to transmit with the speaker output.
 - Pushing [F3] for 1 sec. to select the default value.
- ⑧ Push [F2 ▼] to select VOX Delay item.
- ⑨ Adjust the VOX delay for a convenient interval before returning to receive.
 - Select the VOX delay item using the tuning dial.
 - Pushing [F3] to select the default value.
- ⑩ Push [MENU] to return to previous indication.



Shows VOX gain level



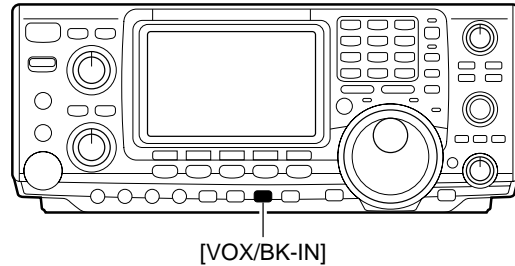
Shows anti-VOX gain level



Shows VOX delay time

■ Break-in function

The break-in function is used in CW mode to automatically toggle the transceiver between transmit and receive when keying. The IC-746PRO is capable for full break-in or semi break-in.

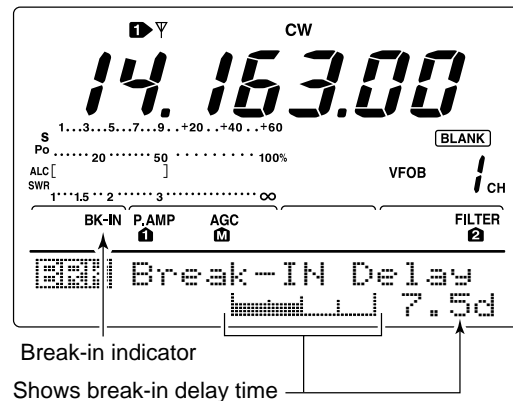


◇ Semi break-in operation

During semi break-in operation, the transceiver selects transceive when keying, then automatically returns to receive after a pre-set time from when you stop keying.

- ① Push [CW/RTTY] to select CW or CW-R mode.
- ② Push [VOX/BK-IN] several times to turn the semi break-in function ON.
 - "BK-IN" appears.
- ③ Set the break-in delay time (the delay from transmit to receive).
 - ➔ Push [VOX/BK-IN] for 1 sec. to select break-in delay program mode.
 - ➔ Rotate the tuning dial to select the desired delay.
 - Push [F3] for 1 sec. to select to the default value.
- ④ Push [MENU] to return to the previous menu.

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

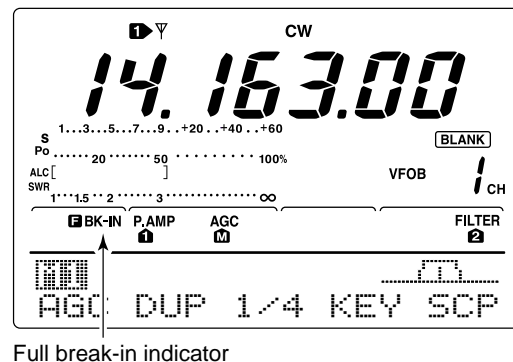


◇ Full break-in operation

During full break-in operation, the transceiver automatically selects receive if a signal is detected while keying.

- ① Push [CW/RTTY] to select CW or CW-R mode.
- ② Push [VOX/BK-IN] several times to turn the full break-in function ON.
 - "BK-IN" appears.

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



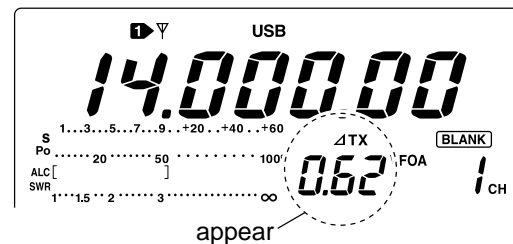
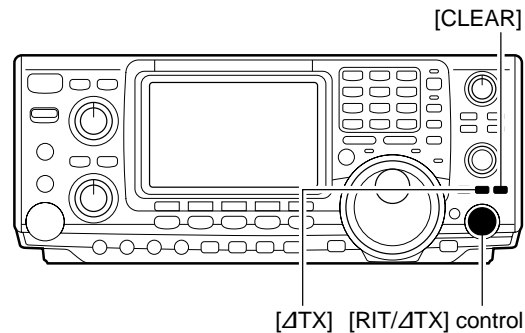
■ ΔTX function

The ΔTX function shifts the transmit frequency up to ±9.99 kHz in 10 Hz steps without moving the receive frequency.

• See ② on p. 4 for function description.

- ① Push the [ΔTX] switch to turn the ΔTX function ON and OFF.
 - “ΔTX” and shift frequency appear when the function is ON.
- ② Rotate the [RIT/ΔTX] control.
 - To reset the ΔTX frequency, push [CLEAR] for 1 sec.
 - Push [CLEAR] momentarily to reset the RIT frequency when the quick RIT/ΔTX clear function is ON. (p. 00)
 - To add or subtract the ΔTX frequency to the displayed frequency, push [ΔTX] for 1 sec.

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



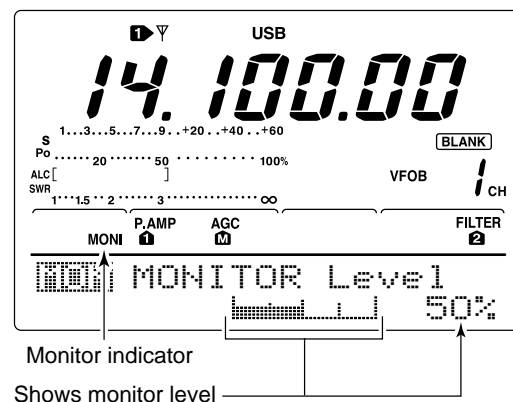
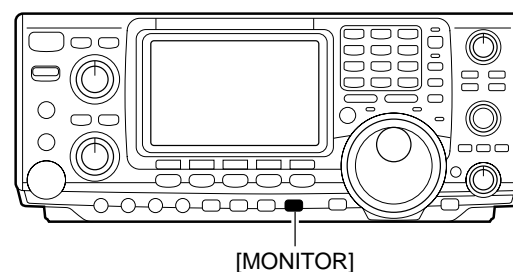
◇ ΔTX monitor function

When the ΔTX function is ON, pushing and holding [XFC] allows you to monitor the operating frequency directly (ΔTX is temporarily cancelled).

■ Monitor function

The monitor function allows you to monitor your transmit IF signals in any mode through the speaker. Use this to check voice characteristics while adjusting SSB transmit tones. (p. 88) The CW sidetone functions regardless of the [MONITOR] switch setting.

- ① Push [MONITOR] to switch the monitor function ON and OFF.
 - “MONI” appears when the monitor function is ON.
- ② Set the monitor level.
 - ➔ Push [MONITOR] for 1 sec. to select monitor program mode.
 - ➔ Rotate the tuning dial for the clearest audio output while pushing [PTT] and speaking into the microphone.
 - Push [F3] for 1 sec. to select the default value.
- ④ Push [MENU] to return to the previous menu.



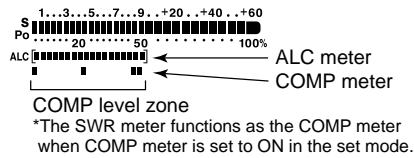
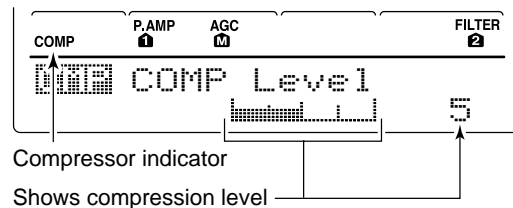
■ Speech compressor

The speech compressor increases average RF output power, improving signal strength and readability in SSB, AM or FM.

When adjusting the compression level, it is necessary to turn the COMP meter ON in the set mode, in advance (p. 81).

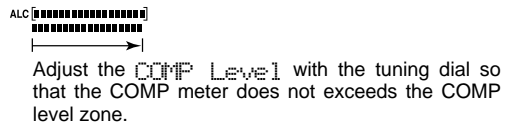
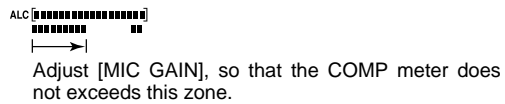
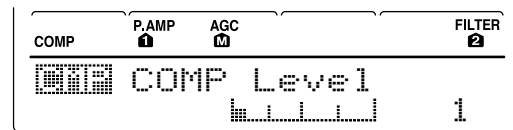
•In SSB mode

- ① Select USB or LSB mode and adjust [MIC GAIN] to a suitable level.
- ② While **M1** is selected, push [F3 COMP] to turn the speech compressor ON.
 - “COMP” appears.
- ③ Push [F3 COMP] for 1 sec. to select compression level set mode.
- ④ While speaking into the microphone, rotate the tuning dial, so that the COMP meter reads within the COMP zone with your normal voice level.
 - Push [F3] for 1 sec. to select the default value.
 - ▨ When the COMP meter peaks above the COMP zone, your transmitted voice may be distorted.
- ⑤ Push [MENU] to return to **M1**.



•In AM/FM mode

- ① While **M1** is selected, push [F3 COMP] to turn the speech compressor ON.
 - “COMP” appears.
- ② Push [F3 COMP] for 1 sec. and set the compression level as “1” in advance.
- ③ While speaking into the microphone, rotate [MIC GAIN], so that the COMP meter does not exceeds the center dot whether you speak softly or loudly.
- ④ While speaking into the microphone, rotate the tuning dial, so that the COMP meter reads within the COMP zone with your normal voice level.
 - Push [F3] for 1 sec. to select the default value.
 - ▨ When the COMP meter peaks above the COMP zone, your transmitted voice may be distorted.
- ⑤ Push [MENU] to return to **M1**.

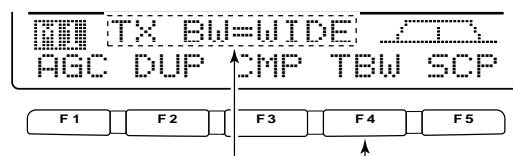
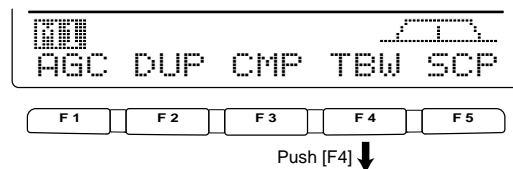


■ Transmit filter width selection (SSB mode only)

The transmit filter width for SSB mode can be selected from wide, middle and narrow.

- ① Select USB or LSB mode.
- ② Push [MENU] to select **M1**, if necessary.
- ③ Push [F4 TBW] for 1 sec. to select the transmission passband width.
 - One of “TX BW=WIDE” “TX BW=MID” or “TX BW=NAR” is displayed for approx. 1 sec.
 - Transmit filter width:

NAR	2.0 kHz
MID	2.6 kHz
WIDE	2.9 kHz



The selected transmit filter width is displayed for approx. 1 sec.
 Push [F4] for 1 sec. to select the transmit filter width.

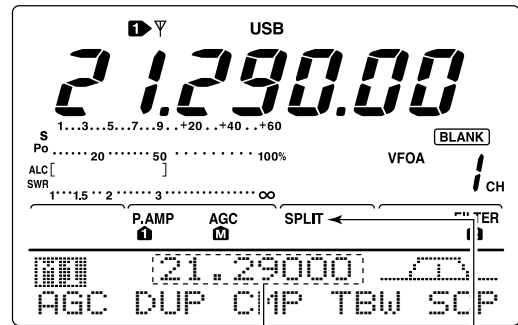
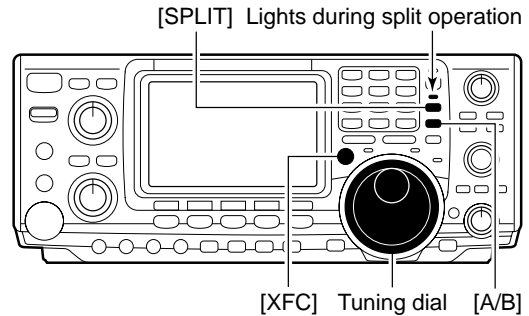
Split frequency operation

Split frequency operation allows you to transmit and receive in the same mode on two different frequencies. The split frequency operation is basically performed using 2 frequencies in VFO A and VFO B.

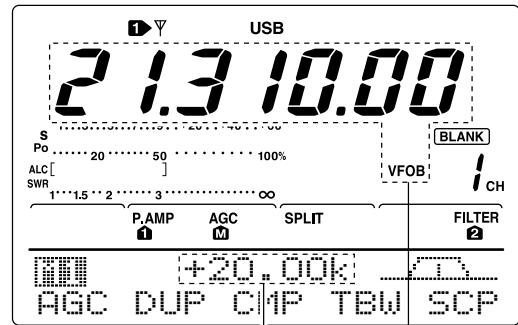
The following is an example of setting 21.290 MHz for receiving and 21.310 MHz for transmitting.

- ① Set 21.290 MHz (USB) in VFO A.
- ② Push [SPLIT] to turn the split function ON, then push [A/B] for 1 sec.
 - The equalized transmit (VFO B) frequency and “SPLIT” appear on the LCD, and the [SPLIT] indicator lights.
- ③ While pushing [XFC] rotate the tuning dial to set the transmit frequency to 21.310 MHz.
 - The transmit frequency can be monitored while pushing [XFC].
- ④ Now you can receive on 21.290 MHz and transmit on 21.310 MHz.

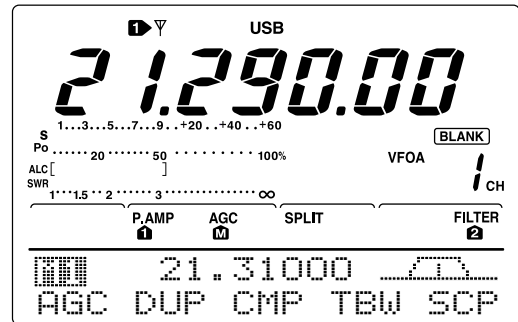
To change the transmit and receive frequencies, push [A/B] to exchange the VFO A and VFO B.



• While pushing [XFC]



• After setting up



CONVENIENT

•Direct shift frequency input

The shift frequency can be entered directly.

- ① Push [F-INP].
- ② Enter the desired shift frequency with the digit keys.
 - 1 kHz to 1 MHz can be set.
 - When you require a minus shift direction, push [GENE •] in advance.
- ③ Push [SPLIT].
 - The shift frequency is input in the sub readout and the split function is turned ON.

[Example]

To transmit on 1 kHz higher frequency:

- Push [F-INP], [1.8 1] then [SPLIT].

To transmit on 3 kHz lower frequency:

- Push [F-INP], [GENE •], [7 3] then [SPLIT].

•Split lock function

Accidentally releasing the [XFC] switch while rotating the tuning dial changes the receive frequency. To prevent this, use both the split lock and dial lock functions to change the transmit frequency only. The split lock function cancels the dial lock function while pushing [XFC] during split frequency operation.

The dial lock's effectiveness during split frequency operation can be selected in the set mode for both receive and transmit frequencies; or only the receive frequency. (p. 82)

■ Quick split function

When you push the [SPLIT] switch for 1 sec., split frequency operation is turned ON, the un-displayed VFO is automatically changed according to the plus/minus shift frequency programmed in set mode (p. 82) or equalized when 0 kHz (default value) is programmed as the split shift frequency. Quick split operation is turned ON by default but can be turned OFF in set mode (p. 82).

- ① Suppose you are operating at 21.290 MHz (USB) in VFO A.
- ② Push [SPLIT] for 1 sec.
 - Split frequency operation is turned ON.
 - The VFO and VFO B are equalized.
- ③ While pushing [XFC], rotate the tuning dial to set the frequency offset between transmit and receive.
 - When [XFC] is released, the receive frequency is indicated.

◇ Split offset frequency setting

By setting an often-used split frequency offset in advance, you can use the quick split function to select split operation at the push of one switch.

Set the split offset frequency in advance in set mode (p. 82, item 12). The example at right shows the split offset is set to +0.020 MHz.

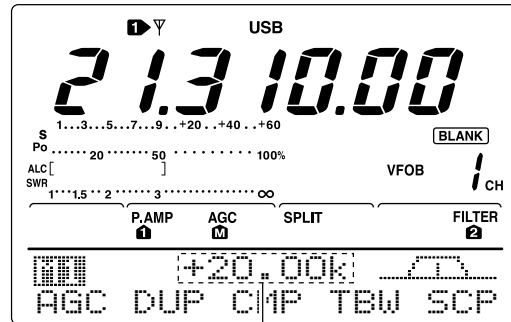
- ➔ Push [SPLIT] for 1 sec. to activate the quick split function.
- The transmit frequency is offset from the receive frequency according to the offset in set mode.

◇ Split lock function

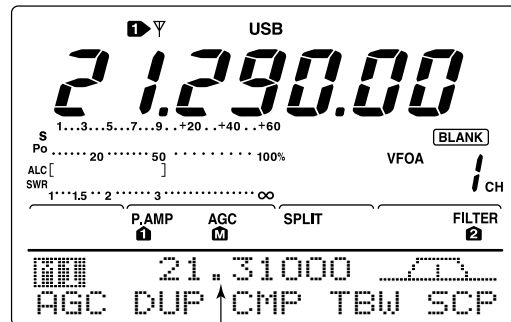
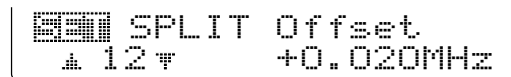
The split lock function is convenient for changing only the transmit frequency. When the split lock function is not used, accidentally releasing [XFC] while rotating the tuning dial, changes the receive frequency. The split lock function is ON by default, but can be turned OFF in set mode.

- ① While split frequency operation is ON, push [LOCK/SPCH] to activate the split lock function.
- ② While pushing [XFC], rotate the tuning dial to change the transmit frequency.
 - If you accidentally release [XFC] while rotating the tuning dial, the receive frequency does NOT change.

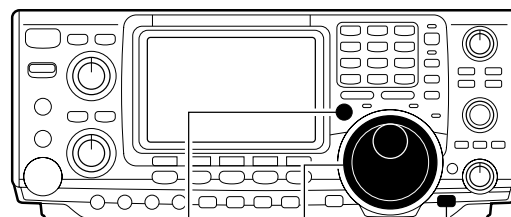
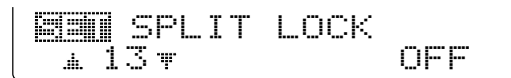
• Setting the frequency while pushing [XFC]



Shows shift frequency and direction



Shows transmit frequency for split operation



[XFC] Tuning dial [LOCK/SPCH]

■ Measuring SWR

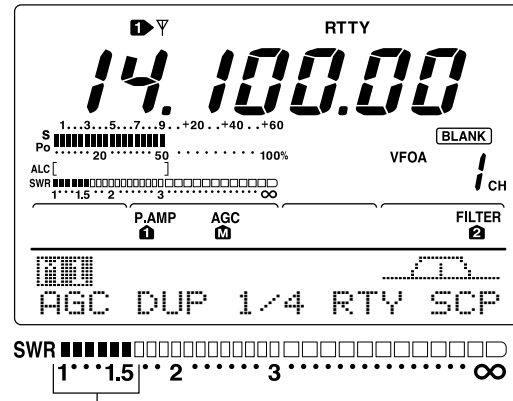
The IC-746PRO has a built-in circuit for measuring antenna SWR— no external equipment or special adjustments are necessary.

The IC-746PRO can measure SWR in 2 ways— spot measurement and plot measurement are available.

◆ Spot measurement

- ① Push [TUNER] to turn the antenna tuner OFF.
- ② Turn the COMP meter OFF.
 - Push [MENU] for 1 sec. to enter set mode.
 - Push [F1] or [F2] several times to select the COMP Meter item.
 - Rotate the tuning dial to set the COMP meter OFF.
 - Push [MENU] to exit set mode.
- ③ Push [CW/RTTY] several times to select RTTY mode.
- ④ Push [TRANSMIT] or [PTT] of the microphone.
- ⑤ Rotate [RF PWR] clockwise past the 12 o'clock position for more than 30 W output power (30%).
- ⑥ Read the SWR on the SWR meter.
- ⑦ Push [TRANSMIT] or release [PTT] to receive.

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

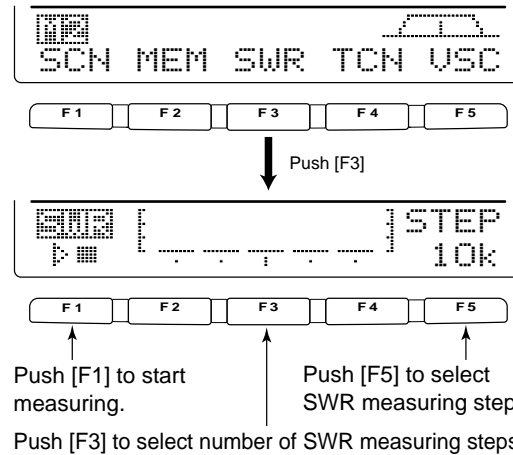


The best match is in this range.

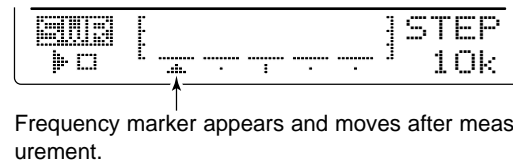
◆ Plot measurement

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

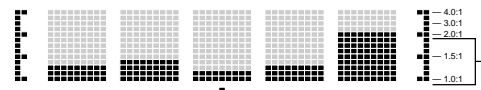
- ① While M2 is selected with [MENU], push [F3 SWR].
 - SWR graph screen appears.
- ② Rotate [RF PWR] clockwise past the 12 o'clock position for more than 30 W output power (30%).
- ③ Set the center frequency for the SWR to be measured.
- ④ Push [F5] for 1 sec. several times to select the desired measuring step from 10, 50, 100 and 500 kHz.
- ⑤ Push [F3] several times to select the desired number of measuring steps from 3, 5, 7, 9, 11 and 13 steps.
- ⑥ Push [F1] to start the measuring.
- ⑦ Push [TRANSMIT] or push and hold [PTT] of the microphone to measure the SWR.
 - Frequency marker, "▲," appears below SWR graph.
 - RTTY mode is automatically selected.
- ⑧ When pushing [TRANSMIT] again or release [PTT], the frequency marker and frequency indication move to the next frequency to be measured.
- ⑨ Repeat steps ⑦ and ⑧ to measure SWR over the entire frequency range.
- ⑩ When the measured SWR is less than 1.5:1, the antenna is well matched with the transceiver in the measured frequency range.



• Measuring (after pushing [F1])



*When measurement point/s is/are set outside of the operable frequency band, frequency marker flashes.



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

Memory channels

The transceiver has 101 memory channels (plus 1 call channel). The memory mode is very useful for quickly changing to often-used frequencies.

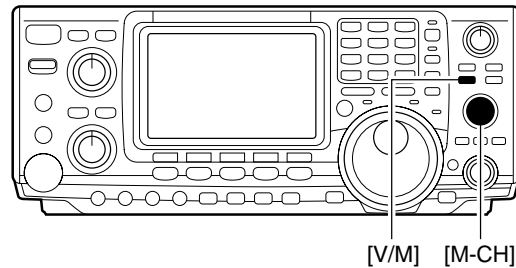
All 101 memory channels are tuneable which means the programmed frequency can be tuned temporarily with the tuning dial, etc. in memory mode.

MEMORY CHANNEL	MEMORY CHANNEL NUMBER	CAPABILITY	TRANSFER TO VFO	OVER-WRITING	CLEAR
Regular memory channels	1–99	One frequency and one mode in each memory channel.	Yes	Yes	Yes
Scan edge memory channels	P1, P2	One frequency and one mode in each memory channel as scan edges for programmed scan.	Yes	Yes	No
Call channel	C	Same as regular.	No	Yes	No

Memory channel selection

In VFO mode

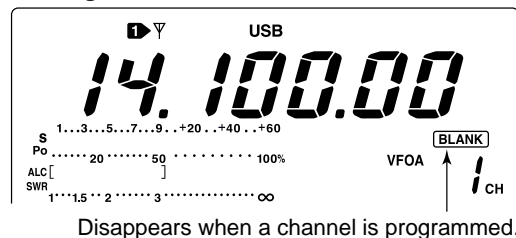
- ① Push [V/M] to select VFO mode, if necessary, then rotate [M-CH] to select a memory channel number.
 - All memory channels including blank channels can be selected.
 - “BLANK” appears when no information has been programmed into a memory channel.
- ② Push [V/M] to select memory mode.
 - “MEMO” and contents of the memory channel appear.



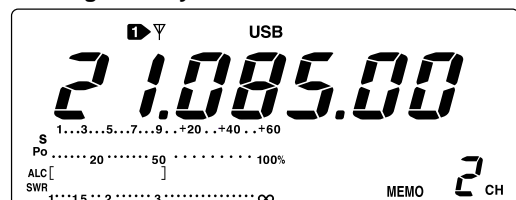
In memory mode

- ① Push [V/M] to select memory mode.
- ② Rotate [M-CH] to select a memory channel.
 - All memory channels including blank channels can be selected.
 - Memory channels can also be selected using the microphone [UP]/[DN] keys.

During VFO mode



During memory mode



■ Programming a memory

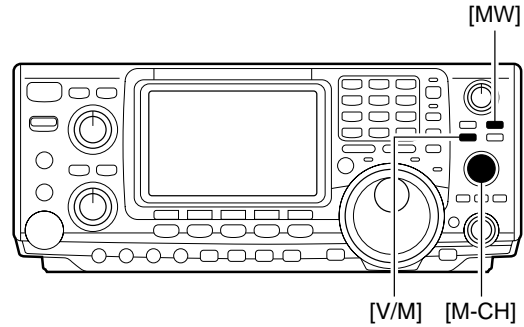
Memory channel programming can be performed either in VFO mode or in memory mode.

◆ Programming in VFO mode

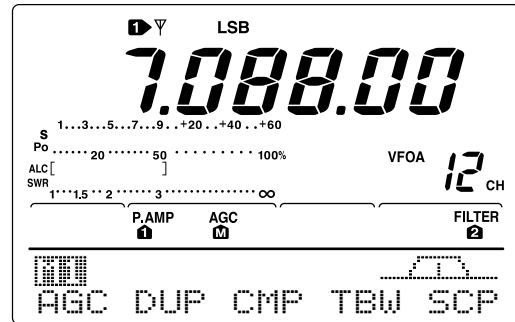
- ① Set the desired frequency and operating mode in VFO mode.
- ② Rotate [M-CH] to select the desired memory channel.
 - “BLANK” appears if the selected memory channel is a blank channel (and does not have contents).
- ③ Push [MW] for 1 sec. to program the displayed frequency and operating mode into the memory channel.
 - 3 beeps are emitted when memory programming is successful.

◆ Programming in VFO mode

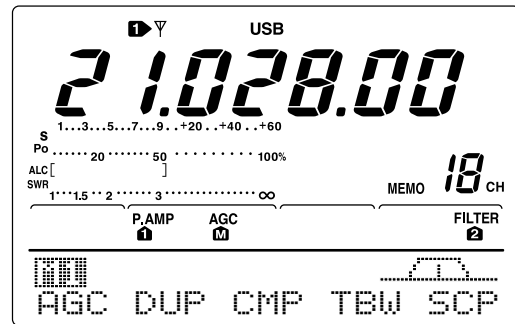
- ① Select the desired memory channel with [M-CH] in memory mode.
 - Memory channel contents appear in the display.
 - “BLANK” appears and no frequency readout is displayed if the selected memory channel is a blank channel (and does not have contents).
- ② Set the desired frequency and operating mode in memory mode.
 - To program a blank channel, use direct frequency entry with the keypad or memo pads, etc.
- ③ Push [MW] for 1 sec. to program the displayed frequency and operating mode into the memory channel.
 - 3 beeps are emitted when memory programming is successful.



• **[EXAMPLE]: Programming 7.088 MHz/LSB into memory channel 12.**



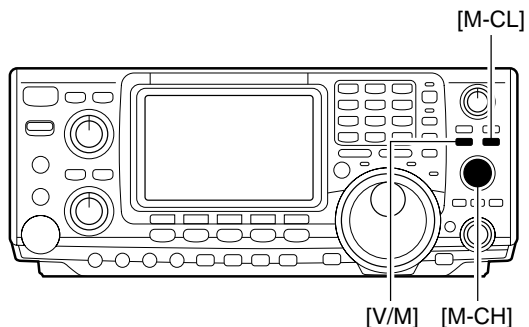
• **[EXAMPLE]: Programming 21.280 MHz/USB into memory channel 18.**



■ Memory clearing

Any unnecessary memory channels can be cleared. The cleared memory channels become blank channels.

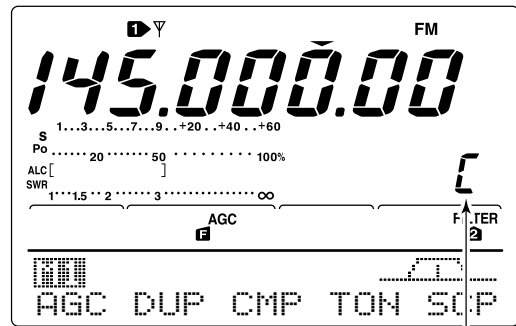
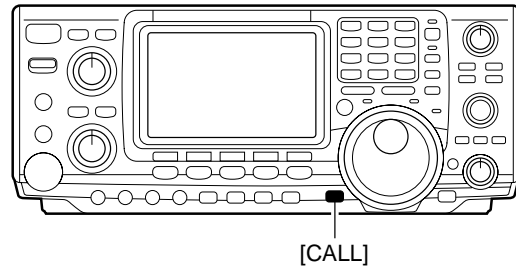
- ① Select memory mode with [V/M].
- ② Select the desired memory channel with [M-CH].
- ③ Push [M-CL] for 1 sec. to clear the contents.
 - The programmed frequency and operating mode disappear.
 - 3 beeps are emitted when memory clearing is successful.
- ④ To clear other memory channels, repeat steps ② and ③.



■ Selecting the call channel

By default 145.00000 MHz/FM is programmed into the call channel. However, this can be changed to suit your operating preference. (see below)

- ① Push [CALL] to select the call channel.
 - “C” appears.
- ② Push [CALL] again to return to the previous mode.



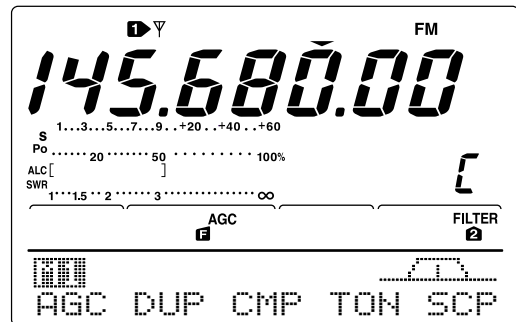
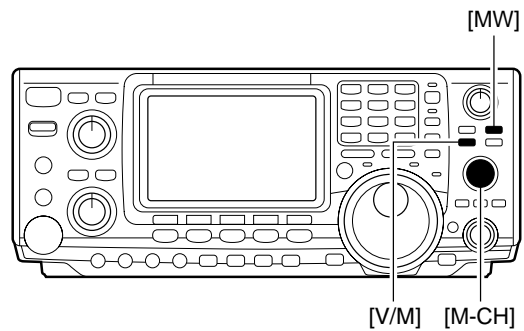
“C” appears

■ Programming the call channel

The call channel is programmed in the same way regular memory channels are. It's convenient to program a most-often-used frequency into the call channel for quick recall. As with memory channels, the call channel can also hold split frequencies.

- ① Rotate [M-CH] to select the call channel.
 - “C” appears.
- ② Select the desired frequency and operating mode to program into the call channel.
- ③ Push [MW] for 1 sec. to program the displayed frequency and operating mode into the call channel.
 - 3 beeps are emitted when memory programming is successful.

IMPORTANT! When the call channel is selected with the [CALL] switch, the frequency CANNOT be changed using the tuning dial, band keys or keypad input. However, when the call channel is selected using [M-CH] in memory mode, the frequency CAN be changed.



Frequency transferring

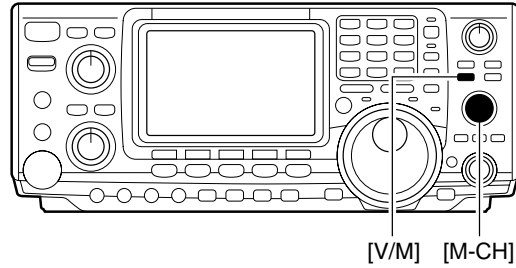
The contents of a memory channel (frequency, operating mode, etc.) can be transferred to the VFO.

Frequency transferring can be performed in either VFO mode or memory mode.

Transferring in VFO mode

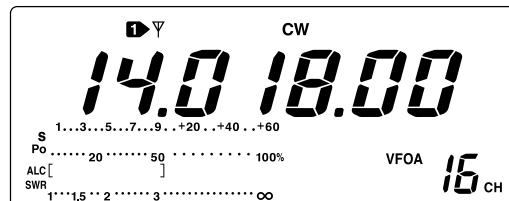
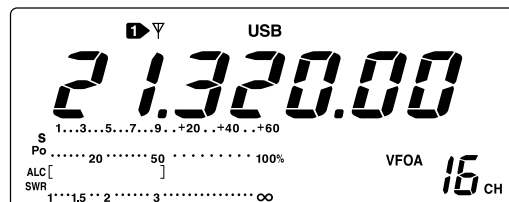
This is useful for transferring programmed contents to VFO.

- ① Select VFO mode with [V/M].
- ② Select the memory channel to be transferred with [M-CH].
 - “BLANK” appears if the selected memory channel is a blank channel. In this case transferring is impossible.
- ③ Push [V/M] for 1 sec. to transfer the frequency and operating mode.
 - 3 beeps are emitted.



TRANSFERRING EXAMPLE IN VFO MODE

Operating frequency : 21.320 MHz/USB (VFO)
 Contents of M-ch 16 : 14.018 MHz/CW



Transferring in memory mode

This is useful for transferring frequency and operating mode while operating in memory mode.

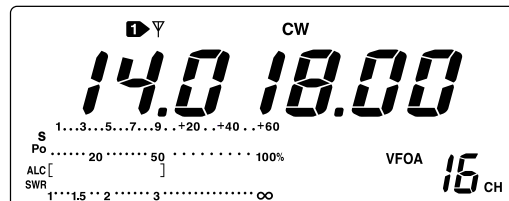
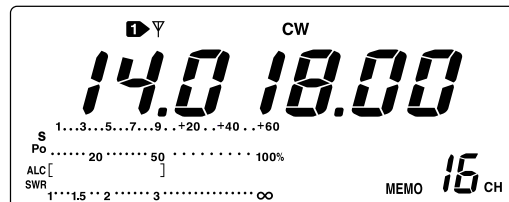
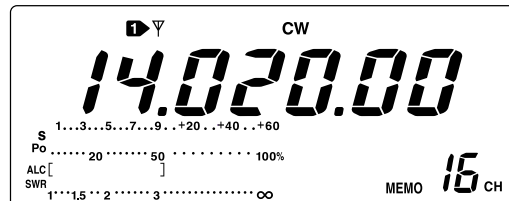
When you have changed the frequency or operating mode in the selected memory channel:

- Displayed** frequency and mode are transferred.
- Programmed** frequency and mode in the memory channel are not transferred, and they remain in the memory channel.

- ① Select the memory channel to be transferred with [M-CH] in memory mode.
 - And, set the frequency or operating mode if required.
- ② Push [V/M] for 1 sec. to transfer the frequency and operating mode.
 - 3 beeps are emitted when the transferring is successful.
 - Displayed frequency and operating mode are transferred to the VFO.
- ③ To return to VFO mode, push [V/M] momentarily.

TRANSFERRING EXAMPLE IN MEMORY MODE

Operating frequency : 14.020 MHz/CW (M-ch 16)
 Contents of M-ch 16 : 14.018 MHz/CW

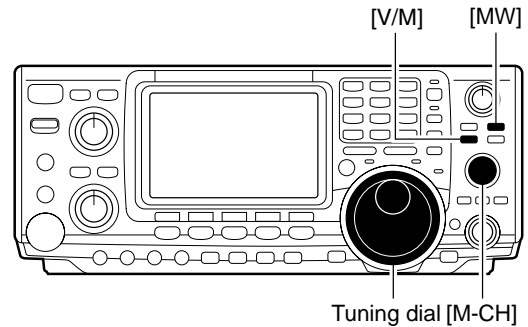


■ Programming scan edges

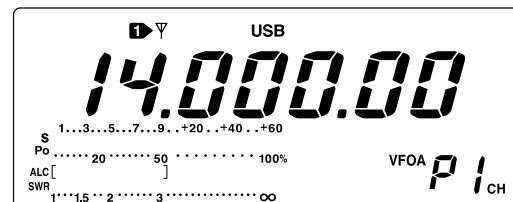
Memory channels P1 and P2 are the program scan edges. They are used to program an upper and lower frequency for programmed scan (p. 71). By default, P1 is programmed with 0.50000 MHz and P2 is programmed with 29.99999 MHz. If P1 and P2 are programmed with the same frequencies, programmed scan will not proceed.

[EXAMPLE]: Programming 14.00000 MHz into P1 and 14.35000 MHz into P2.

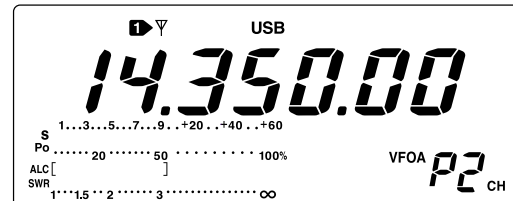
- ① Push [V/M] to select VFO mode, if necessary.
- ② Rotate [M-CH] to select scan edge P1.
- ③ Rotate the tuning dial to set 14.00000 MHz as the lower frequency.
- ④ Push [MW] for 1 sec. to program 14.00000 MHz into scan edge P1.
 - 3 beeps are emitted.
- ⑤ Rotate [M-CH] to select scan edge P2.
- ⑥ Rotate the tuning dial to set 14.35000 MHz as the upper frequency.
- ⑦ Push [MW] for 1 sec. to program 14.35000 MHz into scan edge P2.
 - 3 beeps are emitted.
 - When programmed scan is activated (p. 71) scanning will search the frequencies between 14.00000 MHz and 14.35000 MHz for signals.



• After steps ② to ④



• After steps ⑤ to ⑦

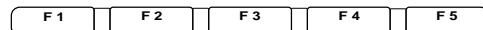
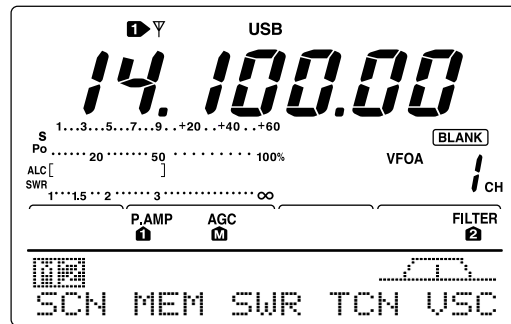
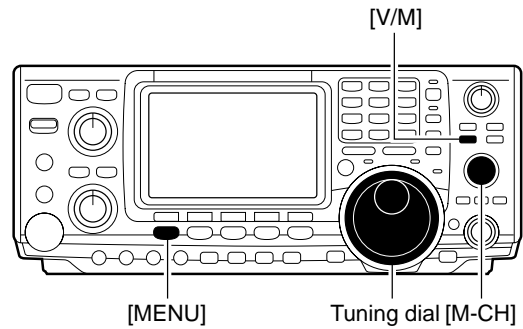


■ Assigning memory names

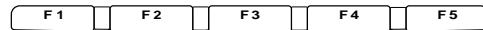
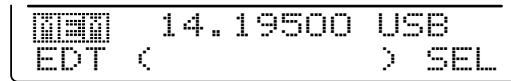
All memory channels (including scan edges) can be tagged with alphanumeric names of up to 9 characters each.

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

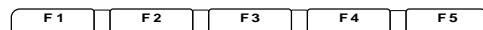
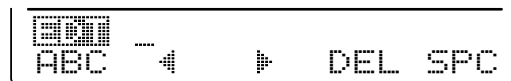
- ① Push [V/M] to select memory mode, if necessary.
- ② Rotate [M-CH] to select memory channel 99.
- ③ Push [MENU] several times to select $\mathcal{M}2$.
- ④ Push [F2 MEM] to select the memory name screen.
- ⑤ Push [F1 EDT] to edit memory channel name.
 - A cursor appears and blinks.
 - Memory channel names of blank channels cannot be edited.
- ⑥ Push [F1] several times to select the type of characters for input.
 - “ABC” inputs capital letters A to Z.
 - “abc” inputs small letters a to z.
 - “etc” is used to input other characters—! # \$ % & ¥ ? “ ’ ^ + - * / . , ; = < > () [] { } | _ - are available.
 - Use the keypad to directly input numerals, “0” to “9,” including a decimal point.
- ⑦ Rotate the tuning dial to select the first character for input.
- ⑧ Push [F2 ←] or [F3 →] to move the cursor forwards or backwards, respectively.
 - Push [F5 SPC] to input a space and [F4 DEL] to delete the selected character.
- ⑨ Repeat steps ② to ⑧ to program another memory channel’s name, if desired.
- ⑩ Push [MENU] to set the memory channel name and return to the memory name menu.
 - Push [MENU] 1 more times to return to $\mathcal{M}2$.



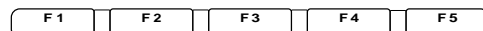
Push [F2 MEM]



Push [F2 MEM]

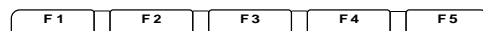


• During assigning a memory names



- Input space
- Delete a character
- Move cursor forwards
- Move cursor backwards
- Selects character type

• After assigning a memory names



■ Memo pads

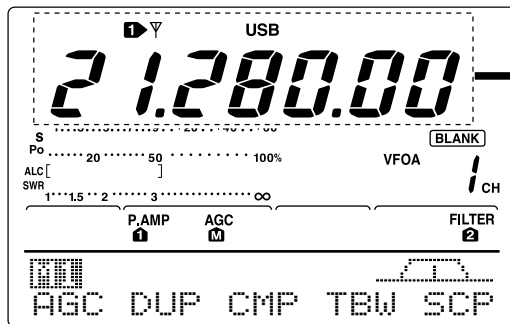
The transceiver has a memo pad function to store frequency and operating mode for easy write and recall. The memo pads are separate from memory channels. The default number of memo pads is 5, however, this can be increased to 10 in set mode if desired. (p. 84)

◇ Writing frequencies and operating modes into memo pads

- Push [MP-W] to store the displayed frequency and operating mode into a memo pad.
 - Each push of [MP-W] stores a frequency and mode into the next available memo pad; when you write a 6th (or 11th) frequency and operating mode, the oldest written frequency and operating mode are automatically erased to make room for the new settings.

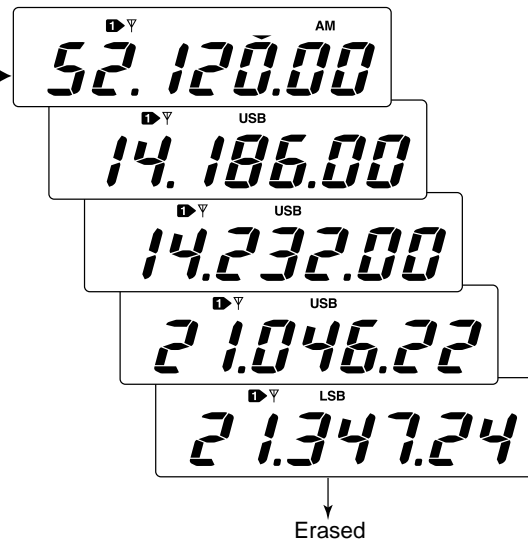
NOTE: Each memo pad must have its own unique combination of frequency and operating mode; memo pads having identical settings cannot be written.

• Displayed frequency and mode



In this example, pushing [MP-W] enters 21.28000 MHz USB into the top memo pad and erases the oldest memo pad (21.34724 MHz LSB).

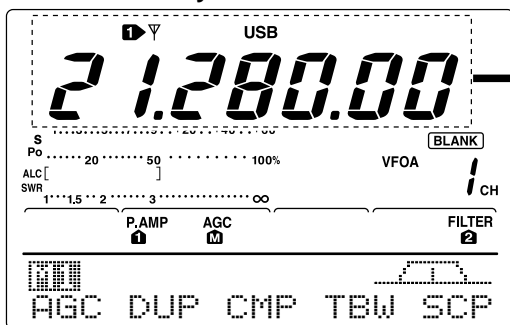
• Stored in next available memo pad



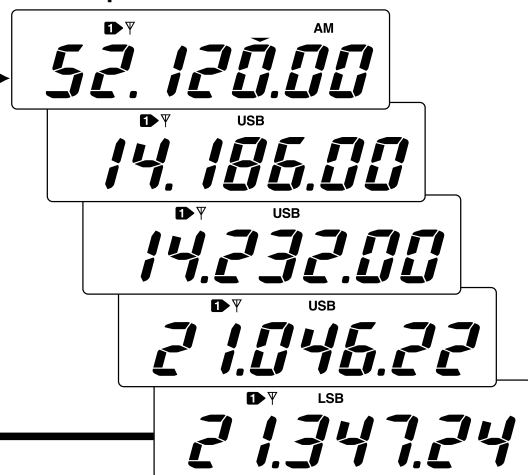
◇ Recalling a memo pad

- Push [MP-R] to recall a memo pad.
 - Each push of [MP-R] recalls a memo pad, starting from the most recently written.

• VFO or memory mode



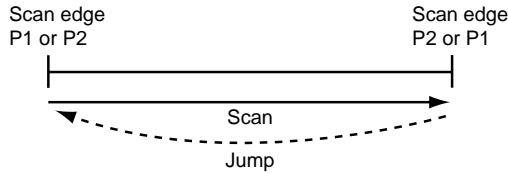
• Memo pads



Scan types

PROGRAMMED SCAN

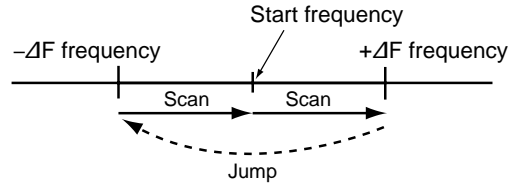
Repeatedly scans between two scan edge frequencies (scan edge memory channels P1 and P2).



This scan operates in VFO mode.

ΔF SCAN

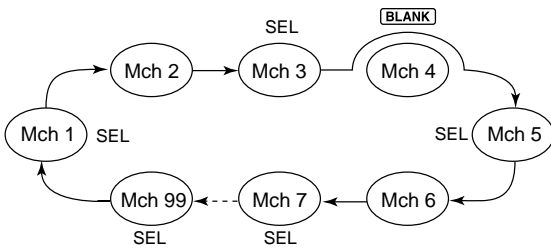
Repeatedly scans within ΔF span area.



This scan operates in both VFO and memory modes.

MEMORY SCAN

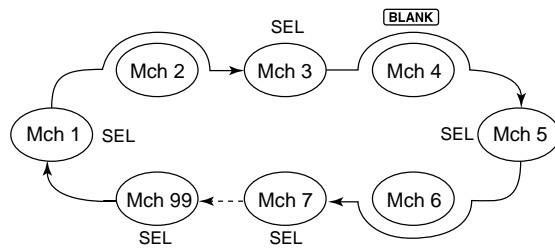
Repeatedly scans all programmed memory channels.



This scan operates in memory mode.

SELECT MEMORY SCAN

Repeatedly scans all select memory channels.



This scan operates in memory mode.

Preparation

Channels

For programmed scan:

Program scan edge frequencies into scan edge memory channels P1 and P2.

For ΔF scan:

Set the ΔF span (ΔF scan range) in the scan screen.

For memory scan:

Program 2 or more memory channels except scan edge memory channels.

For select memory scan:

Designate 2 or more memory channels as select memory channels. To designate the channel as a select memory channel, choose a memory channel, then push [F3 SEL] in the scan screen, or push [F5 SEL] in the memory name screen.

Scan resume ON/OFF

You can select the scan to resume or cancel when detecting a signal, in set mode. Scan resume ON/OFF must be set before operating a scan. See p. 70 for ON/OFF setting and scan resume condition details.

Scan speed

Scan speed can be selected from 2 levels, high or low, in set mode. See p. 70 for details.

Squelch condition

SCAN STARTS WITH	PROGRAMMED SCAN	MEMORY SCAN
SQUELCH OPEN	The scan continues until it is stopped manually, and does not pause even if it detects signals.	Scan pauses on each channel when the scan resume is ON; not applicable when OFF.
SQUELCH CLOSED	Scan stops when detecting a signal. If you set scan resume ON in scan set mode, the scan pauses for 10 sec. when detecting a signal, then resumes. When a signal disappears while scan is paused, scan resumes 2 sec. later.	

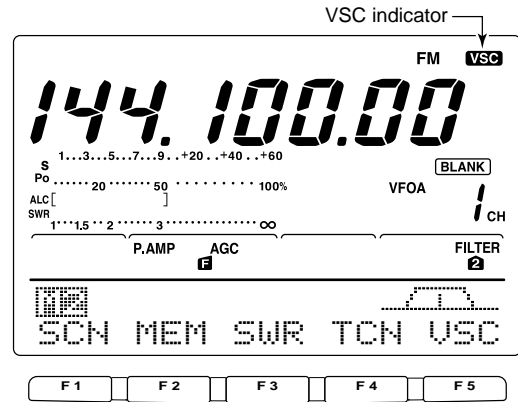
■ Voice squelch control function

This function is useful when you don't want unmodulated signals pausing or cancelling a scan. When the voice squelch control function is activated, the receiver checks received signals for voice components.

If a receiver signal includes voice components, and the tone of the voice components changes within 1 sec., scan pauses (or stops). If the received signal includes no voice components or the tone of the voice components does not change within 1 sec., scan resumes.

- ➔ While M2 is selected with [MENU], push [F5 VSC] to switch the VSC (Voice Squelch Control) function ON and OFF.
 - "VSC" appears when the function is activated.

- ▨ • The VSC function activates for any scan.
- ▨ • The VSC function resumes the scan on unmodulated signals, regardless of the scan resume condition is set to ON or OFF.

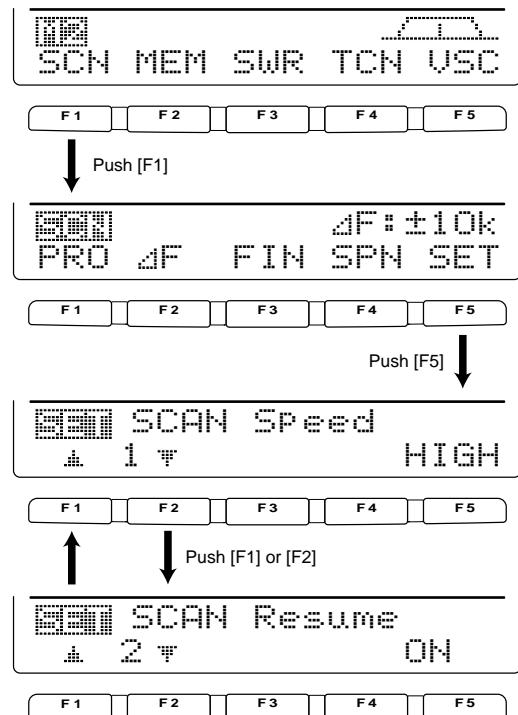


Push [F5] to turn the VSC function ON and OFF.

■ Scan set mode

When the squelch is open, scan continues until it is stopped manually—it does not pause on detected signals. When squelch is closed, scan stops when detecting a signal, then resumes according to the scan resume condition. Scan speed and the scan resume condition can be set using the scan set mode.

- ① Push [MENU] to select M2.
- ② Push [F1 SCN] to select scan menu.
- ③ Push [F5 SET] to select scan set mode.
- ④ Push [F1 ▲] or [F2 ▼] to select SCAN Speed item.
- ⑤ Rotate the tuning dial to select scan speed from high and low.
 - "HIGH" : scan is faster
 - "LOW" : scan is slower
- ⑥ Push [F2 ▼] to select SCAN Resume item.
- ⑦ Rotate the tuning dial to select scan resume function from ON and OFF.
 - "ON" : when detecting a signal, scan pauses for 10 sec., then resumes. When a signal disappears, scan resumes 2 sec. later.
 - "OFF" : when detecting a signal, cancels scanning.
- ⑧ Push [MENU] to return to scan menu.

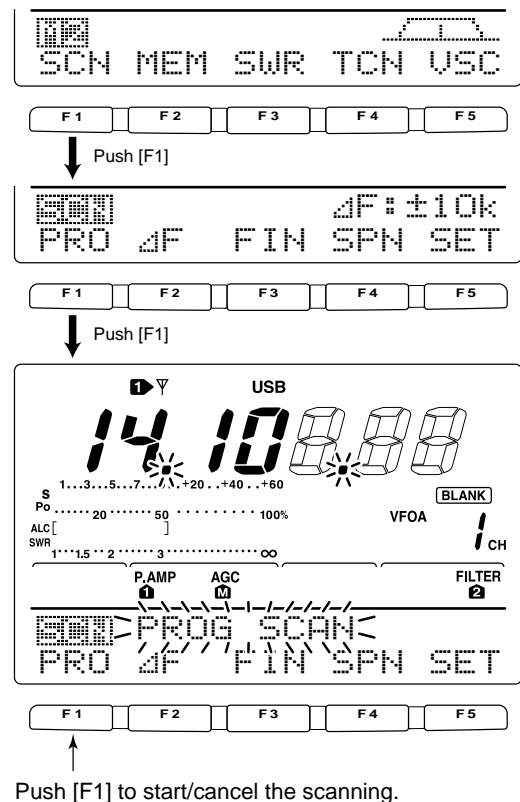
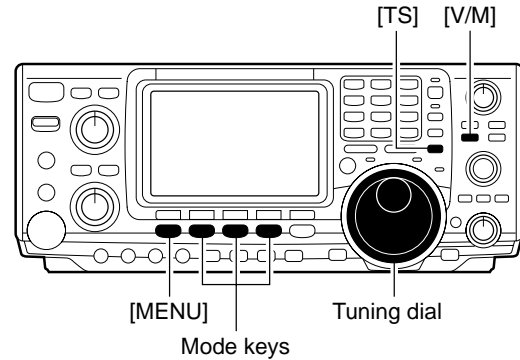


■ Programmed scan/Fine programmed scan (VFO mode)

Programmed scan searches for signals between scan edge memory channels P1 and P2. The default frequencies for these memories are 0.500000 MHz and 29.99999 MHz, respectively. See p. 66 for scan edges programming.

- ① Push [V/M] to select VFO mode, if necessary.
- ② Select the desired operating mode.
 - The operating mode can also be changed while scanning.
- ③ Push [TS] to select a tuning step.
 - The tuning step can also be changed while scanning.
- ④ Push [MENU] to select M2.
- ⑤ Push [F1 SCN] to select the scan menu.
 - See p. 69 for scan condition.
 - If the [RF/SQL] control function is set as "AUTO," the squelch is always open in SSB, CW and RTTY modes.
- ⑥ Push [F1 PRO] to start the programmed scan.
 - The MHz and kHz decimal points blink while scanning.
- ⑦ When the scan detects a signal, the scan stops, pauses or ignores it depending on the resume, VSC setting and the squelch condition.
- ⑧ To cancel the scan, push [F1 PRO].
 - Rotating the tuning dial during scan also cancels scan operation.

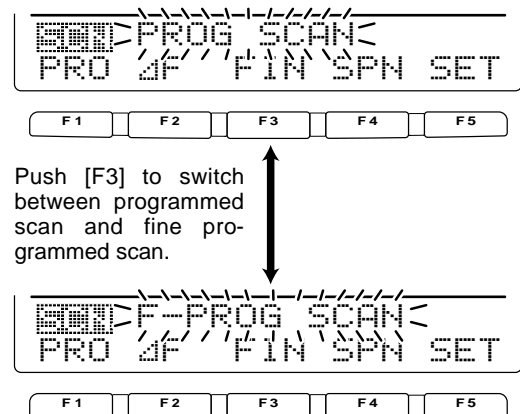
▨ If the same frequencies are programmed into the scan edge memory channel P1 and P2, programmed scan does not start.



◆ About the Fine programmed scan

During programmed scan, when a signal is received, scan continues, but the tuning step is temporarily set to 10 Hz.

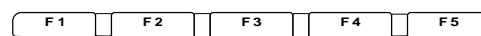
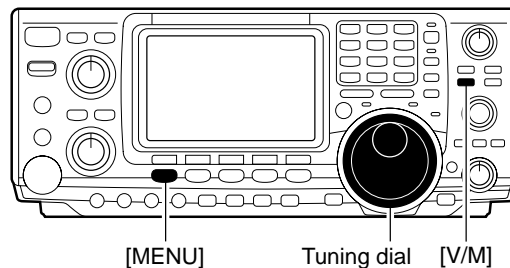
- ① Follow steps ① to ⑥ above to start programmed scan.
- ② During programmed scan, push [F3 FIN] to switch between programmed scan and fine programmed scan operation.
- ③ Push [F1 PRO] to cancel the scan.
 - Rotating the tuning dial during scan also cancels scan operation.



Memory scan operation (Memory mode)

Memory scan searches through memory channel 1 to 99 for signals. Blank (un-programmed) memory channels are skipped.

- ① Push [V/M] to select memory mode, if necessary.
- ② Push [MENU] to select M2.
- ③ Push [F1 SCAN].
 - See p. 69 for scan condition.
 - If the [RF/SQL] control function is set as "AUTO," the squelch is always open in SSB, CW and RTTY modes.
- ④ Push [F1 MEM] to start the memory scan.
 - The MHz and kHz decimal points blink while scanning.
 - At least 2 memory channels must be programmed for memory scan to proceed.
- ⑤ To cancel the scan, push [F1 MEM].
 - Rotating the tuning dial during scan also cancels scan operation.

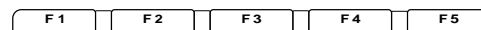


Push [F1] to start/cancel the scanning.

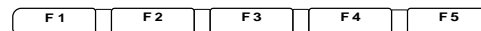
Select memory scan

Select memory scan searches through memory channel set as "select" for signals. See below for setting and deleting select memory channels.

- ① Follow the steps ① to ④ above to start memory scan.
- ② During memory scan, push [F3 SEL] to switch between memory scan and select memory scan.
 - At least 2 memory channels must be set as the select channel.
- ③ Push [F1 MEM] to cancel the scan.
 - Rotating the tuning dial during scan also cancels scan operation.



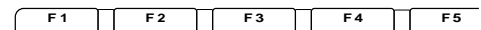
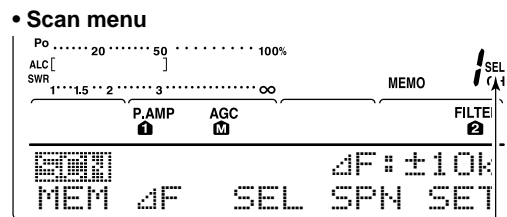
Push [F3] to switch between memory scan and select memory scan.



Setting/Cancelling select memory channels

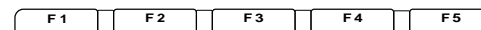
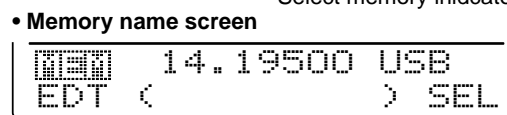
All memory channels, except scan edges (P1 and P2), can be set as a select memory channels.

- ➔ While the scan menu is selected, push [F3 SEL] to set/cancel the displayed memory channel as a select channel; or while memory name screen is indicated, push [F5 SEL] to set/cancel the displayed memory channel as a select memory channel.
 - "SEL" appears when the channel set as a select memory channel.
 - "SEL" disappears when cancelled.
 - Push [F3 SEL]/[F5 SEL] for 1 sec to cancels all select memory settings.



Push [F3] to set/cancel as a select channel.

Select memory indicator

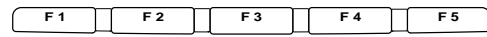
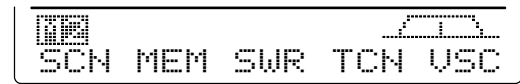
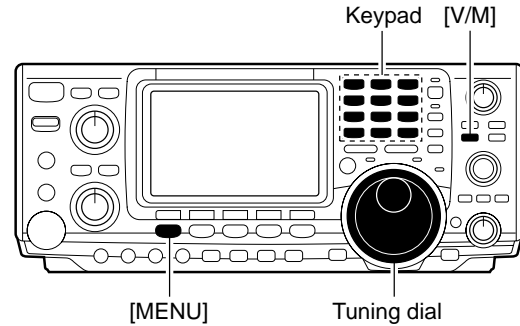


Push [F3] to set/cancel as a select channel.

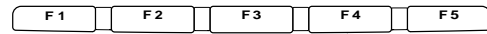
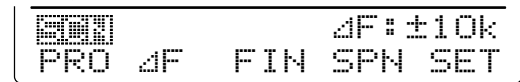
■ ΔF scan operation and Fine ΔF scan

ΔF scan searches for signals within the specified range with the displayed VFO or memory channel frequency as for center frequency. The frequency range is specified by the span.

- ① Push [V/M] to select VFO mode or memory mode, as desired.
- ② Set center frequency of the ΔF scan.
- ③ Push [MENU] to select M2.
- ④ Push [F1 **SCN**] to select the scan menu.
 - See p. 69 for scan condition.
 - If the [RF/SQ] control function is set as "AUTO," the squelch is always open in SSB, CW and RTTY modes.
- ⑤ Set the ΔF span by pushing [F4 **SPN**].
 - ± 5 kHz, ± 10 kHz, ± 20 kHz, ± 50 kHz, ± 100 kHz, ± 500 kHz and ± 1 MHz are selectable.
- ⑥ Push [F2 ΔF] to start the ΔF scan.
 - Decimal points blink while scanning.
- ⑦ When the scan detects a signal, the scan stops, pauses or ignores it depending on the VSC, resume setting and the squelch condition.
- ⑧ Push [F2 ΔF] to cancel the ΔF scan.
 - Rotating the tuning dial during scan also cancels scan operation.

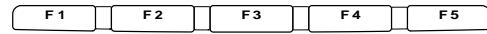
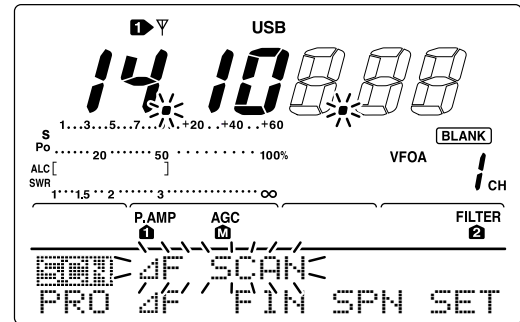


Push [F1]



Push [F2]

Push [F4] to select the span.

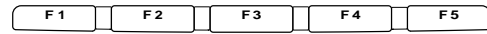
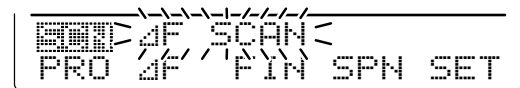


Push [F2] to start/cancel the scanning.

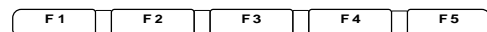
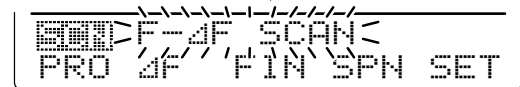
◆ About the Fine ΔF scan

During ΔF scan, when a signal is received, scan continues, but the tuning step is temporarily set to 10 Hz.

- ① Follow steps ① to ⑥ above to start programmed scan.
- ② During ΔF scan, push [F3 **FIN**] to switch between ΔF scan and fine ΔF scan operation.
- ③ Push [F2 ΔF] to cancel the scan.
 - Rotating the tuning dial during scan also cancels scan operation.



Push [F3] to switch between programmed scan and fine programmed scan.



■ Tone scan/DTCS code scan operation

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

- ① Push [AM/FM] to select FM mode.
- ② Push [MENU] several times to select [M1].
- ③ Push [F4 TONE] for 1 sec. to enter tone set mode.
- ④ Push [F1 TON] to select the tone type to be scanned.

- "Rptr Tone" for repeater tone, "TSQL Tone" for tone squelch and "DTCS Code" for DTCS code can be selected.

- When selecting DTCS code to be scanned, push [F5] several times to select the DTCS code polarity.

"NN": Normal polarity for both transmit and receive.

"NR": Normal polarity for transmit and reverse polarity for receive.

"RN": Reverse polarity for transmit and normal polarity for receive.

"RR": Reverse polarity for both transmit and receive.

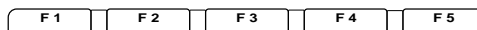
- ⑤ Push [F2 SCN] to start the tone scan function.
 - "Rptr Tone SCAN," "TSQL Tone SCAN" or "DTCS Code SCAN" blinks when repeater tone scan, tone squelch scan or DTCS code scan is operated, respectively.

- ⑥ When matched tone or code is found, the scan pauses and the tone frequency or code is set for the selected tone as in step ④.

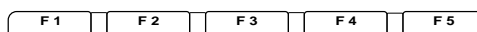
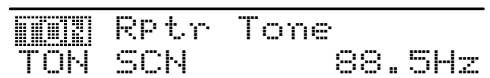
When the tone scan or DTCS code scan is operated in memory or call channel, the detected tone frequency or code can be used for temporarily.

To keep the detected tone frequency or code setting for memory contents, you must over-written the memory or call channel.

- ⑦ Push [F2 SCN] to cancel the tone scan function.
 - Rotating the tuning dial during scan also cancels scan operation.

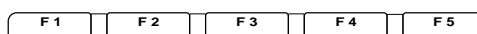
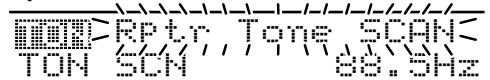


Push [F4] for 1 sec. ↓



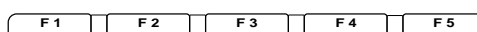
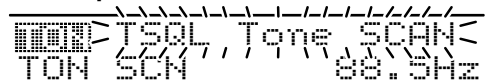
↑ Push [F1] several times to select tone type.

• Repeater tone scan



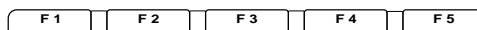
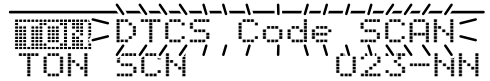
↑ Push [F2] to start/cancel the scan.

• Tone squelch tone scan



↑ Push [F2] to start/cancel the scan.

• DTCS code scan

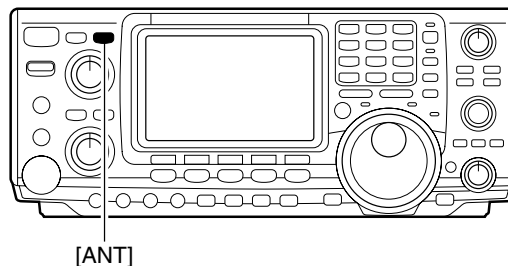


↑ Push [F2] to start/cancel the scan. ↑ Push [F1] several times to select polarity.

■ Antenna connection and selection

The IC-746PRO has 2 antenna connectors for the HF/50 MHz bands, [ANT1] and [ANT2], and 1 antenna connector for the 144 MHz band; a total of 3 antenna connectors.

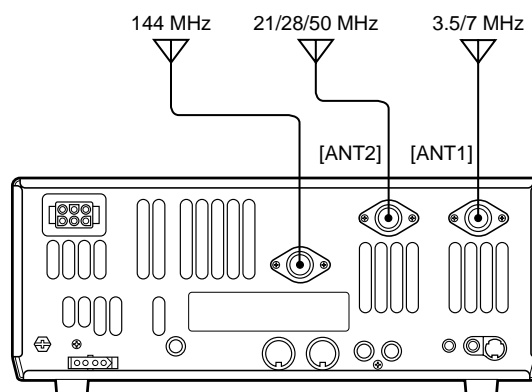
For each operating band the IC-746PRO covers, there is a band memory which can memorize a selected antenna. When you change the operating frequency beyond a band, the previously used antenna is automatically selected (see below) for the new band. This function is convenient when you use 2 antennas for HF and 50 MHz bands operation.



• Antenna select function: “Auto”

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

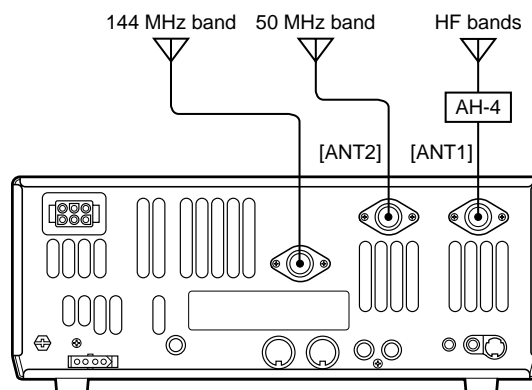
[EXAMPLE]: a 3.5/7 MHz antenna is connected to [ANT1], a 21/28/50 MHz antenna is connected to [ANT2]. When the antenna selector function is set to “Auto,” an antenna is automatically selected when changing bands.



• Antenna select function: “Manual”

When “Manual” is selected, you can use the [ANT1] and [ANT2], however, band memory does not function. In this case you must select an antenna manually. However, the 144 MHz antenna will still be selected automatically.

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



• Antenna select function: “OFF”

In this case, only [ANT1] and the 144 MHz antenna connector can be used. [ANT] switch does not function.

■ Antenna tuner operation

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

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

◇ TUNER OPERATION

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

• MANUAL TUNING

During SSB operation at low voice levels, the internal tuner may not be tuned correctly. In such cases, manual tuning is helpful.

- ➔ Push [TUNER] for 1 sec., to start manual tuning.
 - A side tone is emitted and [TUNER] blinks while tuning.
 - If the tuner cannot reduce the SWR to less than 1.5:1 after 20 sec. of tuning, the [TUNER] switch indicator goes out.

• AUTOMATIC TUNER START (HF bands only)

If you want to deactivate the tuner under conditions of VSWR 1.5:1 or less, use the auto tuner start function and turn the tuner OFF. This function activates the tuner automatically when the SWR exceeds 1.5:1.

This function is turned ON in set mode. (p. 83).

• PTT TUNER START

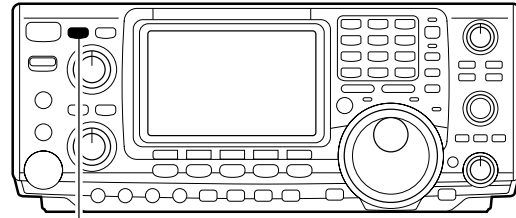
The tuner is always tuned when the PTT is pushed after the frequency is changed (more than 1% from last-tuned frequency). This function removes the "push and hold [TUNER]" operation and activates for the first transmission on a new frequency.

This function is turned ON in set mode. (p. 83).

• Antenna tuner of the IC-PW1

When using an external antenna tuner such as the IC-PW1's tuner, tune with the external antenna tuner, while the internal tuner is turned OFF. After tuning is completed, turn the internal tuner ON. Otherwise, both tuners tune simultaneously and correct tuning may not be obtained.

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



[TUNER]

NOTES:

- The internal antenna tuner can only tune the HF and 50 MHz bands— the 144 MHz band cannot be tuned.
- DO NOT transmit if no antenna is connected to [ANT1] and [ANT2].
- When 2 antennas are connected, select the antenna to be used with [ANT].
- If the SWR is higher than about 1.5:1 when tuning above 100 kHz on an antenna's preset point, push [TUNER] for 1 sec. to start manual tuning.
- The internal tuner may not be able to tune in AM mode. In such cases, push [TUNER] for 1 sec. to manually tune.

◇ If the tuner cannot tune the antenna

Check the following and try again:

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

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

- repeat manual tuning several times.
- tune with a 50 Ω dummy load and re-tune the antenna.
- turn power OFF and ON.
- adjust the antenna cable length. (This is effective for higher frequencies in some cases.)
- Some antennas, especially for low bands, have a narrow bandwidth. These antennas may not be tuned at the edge of their bandwidth, therefore, tune such an antenna as follows:

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

- ① Push [TUNER] to turn the antenna tuner ON.
- ② Select CW mode.
- ③ Turn OFF the break-in function. (p. 56)
- ④ Push [TRANSMIT] to set to the transmit condition.
- ⑤ Set 3.55 MHz and key down.
- ⑥ Set 3.80 MHz and key down.
- ⑦ Push [TRANSMIT] to return to the receive condition.

■ Optional external tuner operation

◆ AH-4 HF/50 MHz AUTOMATIC ANTENNA TUNER

The AH-4 matches the IC-746PRO to a long wire antenna more than 7 m/23 ft long (3.5 MHz and above).

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

NEVER operate the AH-4 without an antenna wire. The tuner and transceiver will be damaged.

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

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

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

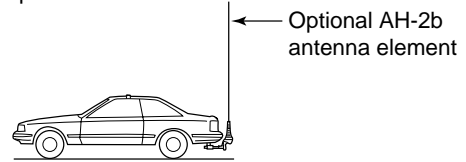
◆ AH-4 operation

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

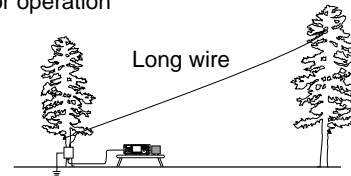
- ① Set the desired frequency in an HF or 50 MHz band.
 - The AH-4 may not operate on frequencies outside of ham bands.
- ② Push [TUNER] for 1 sec.
 - "TUNER" blinks while tuning.
- ③ "TUNE" appears constantly when tuning is complete.
 - When the connected wire cannot be tuned, the "TUNE" indicator goes out, and the AH-4 is bypassed. At that point the antenna wire connection root is to the transceiver directly, and not via AH-4 antenna tuner.
- ④ To bypass the AH-4 manually, push [TUNER].

AH-4 setting example:

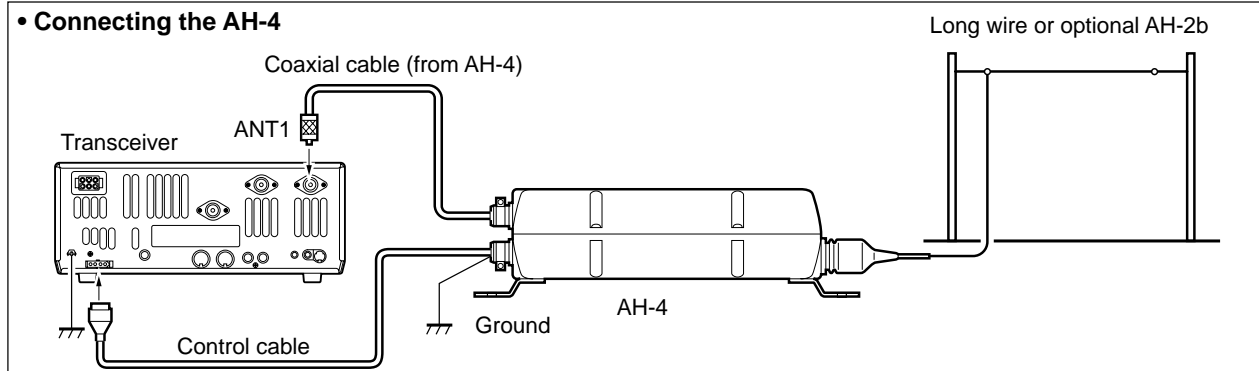
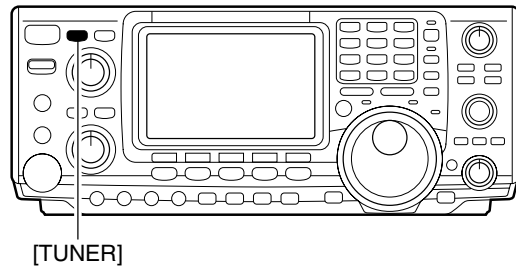
For mobile operation



For outdoor operation



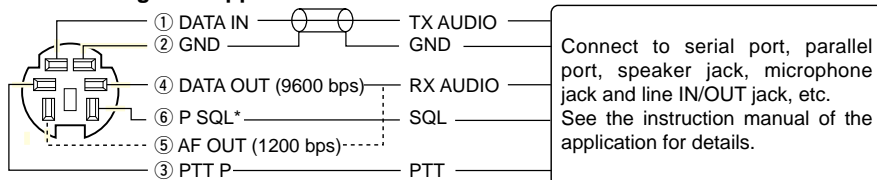
WARNING: HIGH VOLTAGE!
NEVER touch the antenna element while tuning or transmitting.



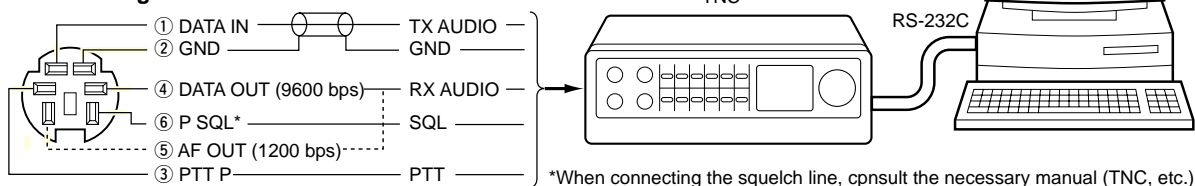
■ Connections

■ When connecting to [DATA]

• When using a PC application

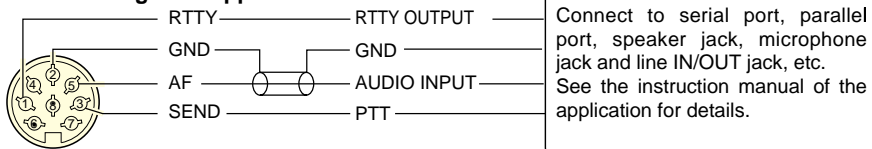


• When using a TNC

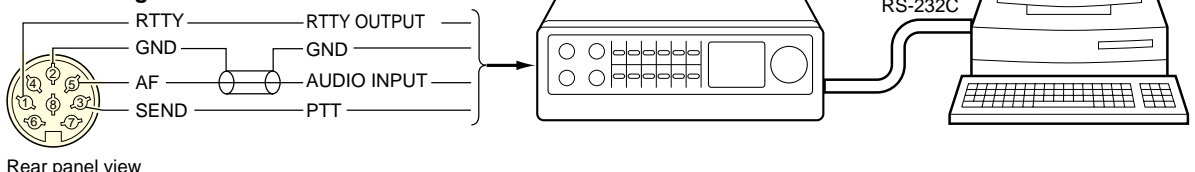


■ When connecting to [ACC(1)]

• When using a PC application



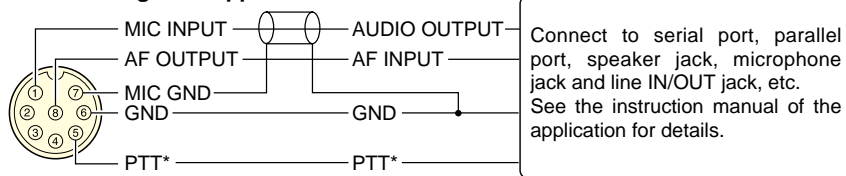
• When using a TNC



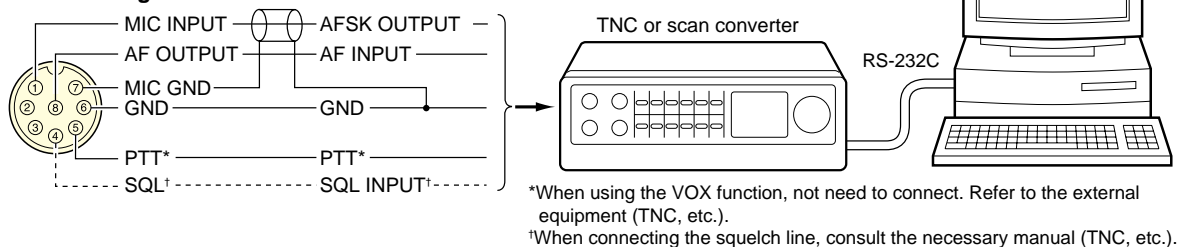
Rear panel view

■ When connecting to [MIC]

• When using a PC application



• When using a TNC



■ Packet (AFSK) operation

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

- ① Connect a TNC and PC. (p. 77)
- ② Push a band key to select an operating band.
- ③ Push [SSB] or [AM/FM] to select the desired operating mode.
 - After LSB or USB is selected, push [SSB] for 1 sec. to select LSB data or USB data mode, or after AM or FM is selected, push [AM/FM] for 1 sec. to select AM data or FM data mode.
 - Generally, LSB is used on HF bands and FM is used for packet operation on the VHF band.
- ④ Rotate the tuning dial to tune the desired signal.
- ⑤ Transmit your AFSK signals using your computer's keyboard.
 - Rotate [RF PWR] to set the output power.
 - Relative strength of the transmitted signal is indicated in the Po meter while operating the TNC.
 - When operating in SSB (data) mode, adjust output power so that the ALC reading in the ALC meter stays in the ALC zone.

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

When SSB data mode is selected, the audio input from the [MIC] connector is automatically cut, and use the audio input from the [ACC(1)].

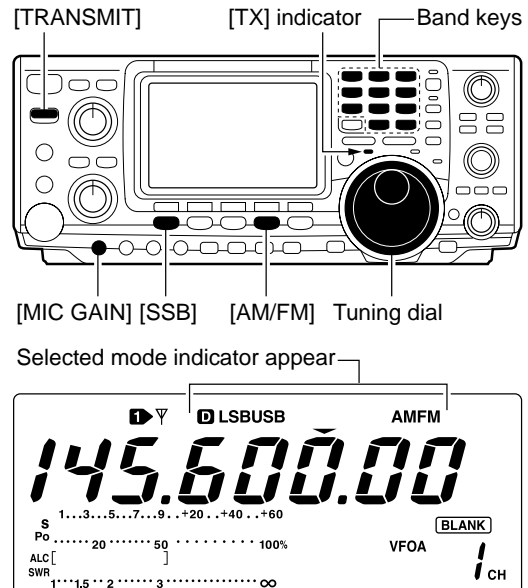
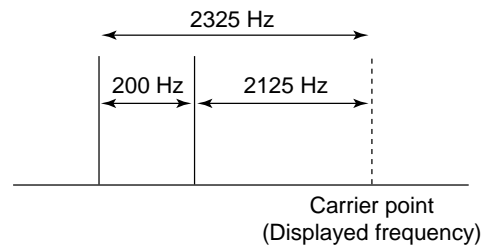
And, when the SSB data mode is selected, signals are transmitted with the fixed conditions as follow;

- Speech compressor : OFF
- Transmit bandwidth : MID
- Tx tone (Bass) : 0
- Tx tone (Trebles) : 0

◆ Frequency indication during AFSK operation

When operating AFSK in SSB mode, the indicated frequency is the signals carrier point.

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



■ Adjusting the TNC output level

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 0.6 V p-p, otherwise the transceiver will not be able to maintain the band width and may possibly interfere with other station.

◇ Using with a level meter or synchroscope

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

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

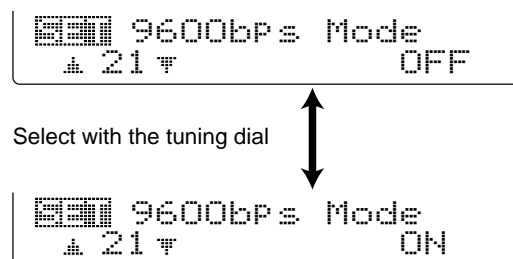
◇ Not using a measuring device

- ① Connect transceiver to a TNC. (p. 00)
- 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 lights 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.

■ Data transmission speed

For data communication, the transceiver can be set to one of two data speeds: 9600 bps or less speed.

- ① Push [MENU] for 1 sec. to enter set mode.
- ② Push [F1 ▲] or [F2 ▼] to select the 9600bps Mode item.
- ③ Rotate the tuning dial to turn ON and OFF the 9600 bps mode.
 - ON : 9600 bps of data speed
 - OFF : less than 9600 bps of data speed (default)
- ④ Push [MENU] to return to previous indication.



11 SET MODE

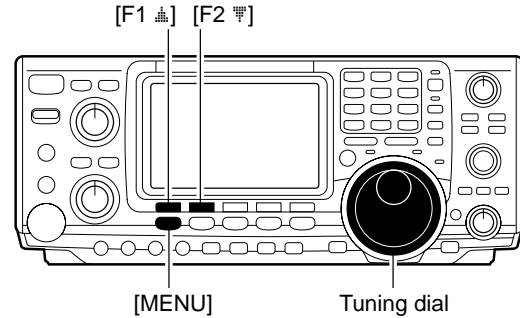
■ General set mode

◇ Entering set mode

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

•Set mode operation

- ① Push [MENU] several times to function menu indication, if necessary.
- ② Push [MENU] for 1 sec. to enter the set mode.
- ③ Push [F1] or [F2] to select the desired item.
- ④ Set the desired condition using the tuning dial.
 - Push [F3] for 1 sec. to select a default condition or value.
- ⑦ Push [MENU] to exit the set mode.



◇ Set mode items

1. LCD Contrast

This item adjusts the contrast of the LCD from 0% to 100% in 1% steps.
(default: 50%)



2. LCD Backlight

This item adjusts the brightness of the LCD from 0% to 100% in 1% steps.
(default: 50%)



3. Beep Level

This item adjusts the volume level for confirmation beep tones from 0% to 100% in 1% steps. When beep tones, the item 6. Beep (p. 81), are turned OFF, this setting has no effect.
(default: 50%)



4. Beep Level-Int

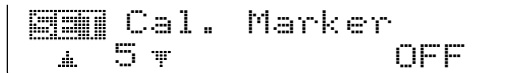
This item allows you to set a maximum volume level for confirmation beep tones. Confirmation beep tones are linked to the [AF] control until a specified volume level is reached—further rotation of the [AF] control will not increase the volume of the beep tones.



- ON Confirmation beep ON (default)
- OFF Confirmation beep OFF

5. CAL. Marker

This item is used for a simple frequency check of the transceiver.



- ON Calibration marker ON
- OFF Calibration marker OFF (default)

▨ Turn the calibration marker OFF after checking the frequency of the transceiver.

See p. 93 for calibration procedure.

■ General set mode (continued)

6. Beep

A beep sounds each time a switch is pushed to confirm it. This function can be turned OFF for silent operation.

ON Confirmation beep ON (default)
OFF Confirmation beep OFF

The volume level can be set in 3. Beep Level.
(p. 80)

```

[RF] Beep
  6  ON
  
```

7. Band Edge Beep

A beep sounds when an operating frequency enters or exits an amateur band. This functions independent of the confirmation beep setting (above).

ON Band edge beep ON (default)
OFF Band edge beep OFF

The volume level can be set in 3. Beep Level.
(p. 80)

```

[RF] Band Edge Beep
  7  ON
  
```

8. RF/SQL Control

The [RF/SQL] control can be set as the RF/squelch control (default), the squelch control only (RF gain is fixed at maximum) or 'Auto' (RF gain control in SSB, CW and RTTY; squelch control in AM and FM).

RF+SQL [RF/SQL] control as RF/squelch control (default)
SQL [RF/SQL] control as squelch control
AUTO [RF/SQL] control as RF gain control in SSB, CW and RTTY; squelch control in AM and FM

```

[RF] RF/SQL Control
  8  RF+SQL
  
```

9. Meter Peak Hold

This item turns the meter peak hold function ON and OFF. When set to ON (default), peak meter reading are displayed for about 0.5 sec.

```

[RF] Meter Peak Hold
  9  ON
  
```

10. COMP Meter

This item turns the COMP meter indication ON and OFF during transmit. When set to ON, the COMP meter is displayed instead of the SWR meter. (default: OFF)

```

[RF] COMP Meter
 10  OFF
  
```

■ General set mode (continued)

11. Quick SPLIT

When this item is set to ON, pushing [SPLIT] for 1 sec. sets transmit frequency using the displayed frequency and the split offset, set in SPLIT Offset item below, and activate split function automatically.

ON Quick split ON (default)
OFF Quick split OFF

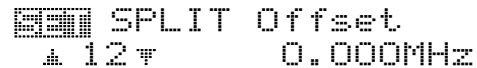


Quick SPLIT
▲ 11 ▼ ON

12. SPLIT Offset

This item sets the offset (difference between transmit and receive frequencies) for the quick split function.

The offset frequency can be set from -9.999 MHz to +9.999 MHz in 1 kHz steps.



SPLIT Offset
▲ 12 ▼ 0.000MHz

13. SPLIT LOCK

When this item is ON, the tuning dial can be used to adjust the transmit frequency while pushing [XFC] even while the dial lock function is activated.

ON Split lock function ON
OFF Split lock function OFF (default)

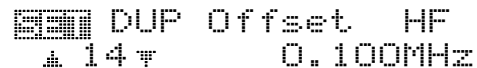


SPLIT LOCK
▲ 13 ▼ OFF

14. DUP Offset HF

This item sets the offset (difference between transmit and receive frequencies) for the duplex operation. However, this setting is used to input the repeater offset for an HF band only.

The offset frequency can be set from 0.000 MHz to 9.999 MHz in 1 kHz steps.

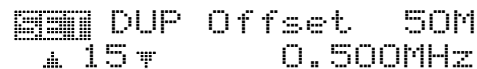


DUP Offset HF
▲ 14 ▼ 0.100MHz

15. DUP Offset 50M

This item sets the offset (difference between transmit and receive frequencies) for the duplex operation. However, this setting is used to input the repeater offset for a 50 MHz band only.

The offset frequency can be set from 0.000 MHz to 9.999 MHz in 1 kHz steps.

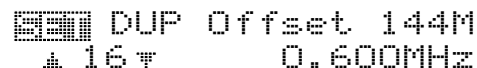


DUP Offset 50M
▲ 15 ▼ 0.500MHz

16. DUP Offset 144M

This item sets the offset (difference between transmit and receive frequencies) for the duplex operation. However, this setting is used to input the repeater offset for a 144 MHz band only.

The offset frequency can be set from 0.000 MHz to 9.999 MHz in 1 kHz steps.



DUP Offset 144M
▲ 16 ▼ 0.600MHz

17. One Touch Rptr

This item turns the one touch repeater function to ON (DUP- or DUP+) and OFF.

When [F2 DUF] is pushed for 1 sec. during M1, the selected offset direction and the programmed duplex offset frequency (depending on the operating frequency band) is set with the displayed frequency.



```
One Touch Rptr
↑ 17 ↓
DUP-
```

■ General set mode (continued)

22. [ANT] Switch

You can set the antenna connector selection to automatic, manual or non-selection (when using 1 antenna only for the HF/50 MHz bands).

- Auto** : The antenna switch is activated and the band memory memorizes the selected antenna. (default)
- Manual**: The antenna switch is activated and selects an antenna manually.
- OFF** : The antenna switch is not activated and does not function. The [ANT1] connector is always selected in this case.



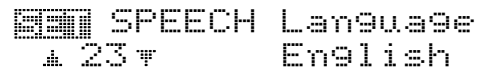
The LCD display shows the menu item [ANT] Switch with a cursor on the left. Below it, the value 'Auto' is displayed. The number '22' is shown at the bottom left of the display area.

23. SPEECH Language

When the optional UT-102 VOICE SYNTHESIZER UNIT is installed, you can select between English and Japanese as the language.

- English** : Announces in English (default)
- Japanese** : Announces in Japanese

See p. 89 for unit installation.



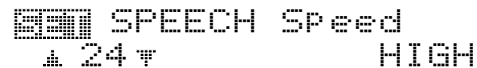
The LCD display shows the menu item SPEECH Language with a cursor on the left. Below it, the value 'English' is displayed. The number '23' is shown at the bottom left of the display area.

24. SPEECH Speed

When the optional UT-102 VOICE SYNTHESIZER UNIT is installed, you can select between faster or slower synthesizer output.

- HIGH** : Announces faster (default)
- LOW** : Announces slower

See p. 89 for unit installation.



The LCD display shows the menu item SPEECH Speed with a cursor on the left. Below it, the value 'HIGH' is displayed. The number '24' is shown at the bottom left of the display area.

25. SPEECH S-Level

When the optional UT-102 VOICE SYNTHESIZER UNIT is installed, you can have frequency, mode and signal level announcement. Signal level announcement can be deactivated if desired.

- ON** : Announces operating frequency, mode and receiving signal level. (default)
- OFF** : Announces operating frequency and mode only.

See p. 89 for unit installation.

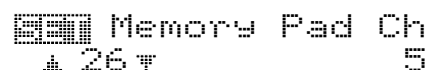


The LCD display shows the menu item SPEECH S-Level with a cursor on the left. Below it, the value 'ON' is displayed. The number '25' is shown at the bottom left of the display area.

26. Memory Pad Ch

This item sets the number of memo pad channels available. 5 or 10 memo pads can be set.

- 5** : 5 memo pads (default)
- 10**: 10 memo pads



The LCD display shows the menu item Memory Pad Ch with a cursor on the left. Below it, the value '5' is displayed. The number '26' is shown at the bottom left of the display area.

■ General set mode (continued)

27. DIAL Auto TS

This item sets the auto tuning step function. When rotating the tuning dial rapidly, the tuning step automatically changes several times as selected.

There are 2 type of auto tuning steps: HIGH (Fastest) and LOW (Faster).

- HIGH** : Auto tuning step is turned ON.
Approx. 5 times fastest tuning step during rapid rotation (default)
- LOW** : Auto tuning step is turned ON.
Approx. 2 times faster tuning step during rapid rotation
- OFF** : Auto tuning step is turned OFF.

```

DIAL Auto TS
  27  HIGH
```

28. MIC U/D Speed

This item sets the rate at which frequencies are scanned when the microphone [UP]/[DN] switches are pushed and held. High or low can be selected.

- HIGH** : High speed (default, 50 tuning steps/sec.)
- LOW** : Low speed (25 tuning steps/sec.)

```

MIC U/D Speed
  28  HIGH
```

29. Quick RIT Clear

This item selects the RIT/ Δ TX frequency clearing instruction with [PBTC].

- ON** : Clears the RIT/ Δ TX frequency when [PBTC] is pushed momentarily.
- OFF** : Clears the RIT/ Δ TX frequency when [PBTC] is pushed for 1 sec. (default)

```

Quick RIT Clear
  29  OFF
```

30. BW PopUp (PBT)

This item turns the PBT shifting value indication ON and OFF during [TWIN PBT] control operation. When set to ON, the shifting value is displayed above the multi-function switches.
(default: ON)

```

BW PopUp (PBT)
  30  ON
```

31. BW PopUp (FIL)

This item turns the IF filter width indication ON and OFF when selecting with [FILTER]. When set to ON, the filter width is displayed above the multi function switches.
(default: ON)

```

BW PopUp (FIL)
  31  ON
```


■ General set mode (continued)

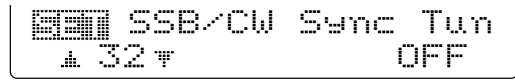
32. SSB/CW Synchronous Tuning

This item selects the displayed frequency shift function from ON and OFF.

When this function is activated, the receiving signal can be kept to receive even when the operating mode is changed between SSB and CW.

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

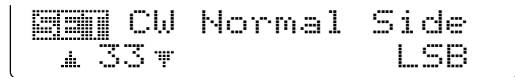
/// The frequency shifting value may differ according to the CW pitch setting.



33. CW Normal Side

Selects the carrier point of CW mode from LSB and USB.

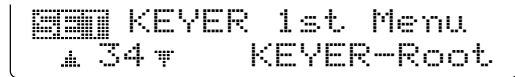
- LSB : The carrier point is set to LSB side. (default)
- USB : The carrier point is set to USB side.



34. KEYER 1st Menu

This item selects the appearing menu when [F4 KEY] is pushed in M1 at first, from KEYER-Root and KEYER-SEND.

- KEYER-Root : Selects memory keyer menu at first (default)
- KEYER-SEND : Selects keyer SEND menu at first



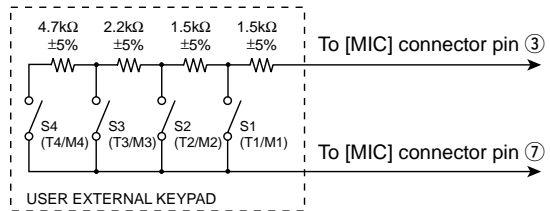
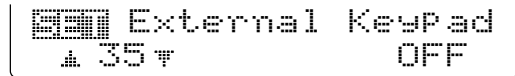
35. External Keypad

This item sets the external keypad capability.

- OFF : External keypad does not function. (default)
- KEYER SEND: Pushing one of external keypad switches, transmits the desired keyer memory contents during CW mode operation.

For your information

The diagram as at right shows the equivalent circuit of an external keypad and connects to the pin 3 and pin 7 of the [MIC] connector (p. 12)



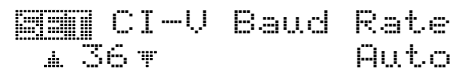
■ General set mode (continued)

36. CI-V Baud Rate

This item sets the data transfer rate. 300, 1200, 4800, 9600, 19200 bps and "Auto" are available.

Auto : Auto baud rate (default)
 300 : 300 bps
 1200 : 1200 bps
 4800 : 4800 bps
 9600 : 9600 bps
 19200 : 19200 bps

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

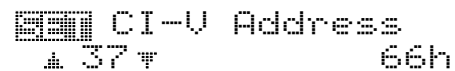


IC-746PRO CI-V Baud Rate
 ▲ 36 ▼ Auto

37. CI-V Address

To distinguish equipment, each CI-V transceiver has its own Icom standard address in hexadecimal code. The IC-746PRO's address is 66h.

When 2 or more IC-746PRO's are connected to an optional CT-17 CI-V LEVEL CONVERTER, rotate the tuning dial to select a different address for each IC-746PRO in the range 01h to 7Fh.



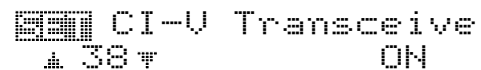
IC-746PRO CI-V Address
 ▲ 37 ▼ 66h

38. CI-V Transceive

Transceive operation is possible with the IC-746PRO connected to other Icom HF transceivers or receivers.

ON : Transceive ON (default)
 OFF : Transceive OFF

When "ON" is selected, changing the frequency, operating mode, etc. on the IC-746PRO automatically changes those of connected transceivers (or receivers) and vice versa.



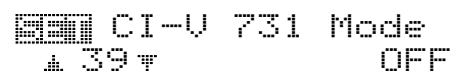
IC-746PRO CI-V Transceive
 ▲ 38 ▼ ON

39. CI-V 731 Mode

When connecting the IC-746PRO to the IC-735 for transceive operation, you must change the operating frequency data length to 4 bytes.

• This item must be set to "ON" only when operating the transceiver with the IC-735.

ON : 4 bytes of frequency data
 OFF : 5 bytes of frequency data (default)



IC-746PRO CI-V 731 Mode
 ▲ 39 ▼ OFF

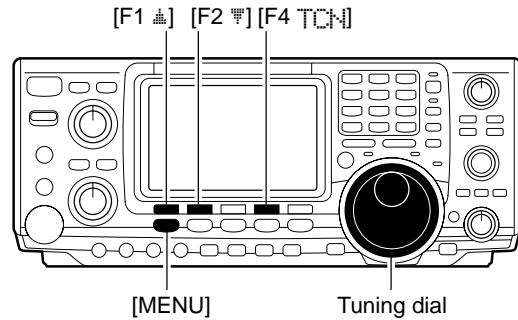
■ Tone control set mode

◇ Entering tone control set mode

Tone levels (bass and treble) for each transmit and receive audio can be set for each phone mode independently.

• Set mode operation

- ① Push [MENU] several times to select $\overline{M2}$.
- ② Push [F4 TON] to select the tone control set mode.
- ③ Push [F1 \blacktriangle] or [F2 \blacktriangledown] to select the desired item.
- ④ Push [SSB] or [AM/FM] to select the desired operating mode.
- ⑤ Set the desired condition using the tuning dial.
 - Push [F3] for 1 sec. to select a default value.
- ⑥ Push [MENU] to exit the set mode.



◇ Tone control set mode items

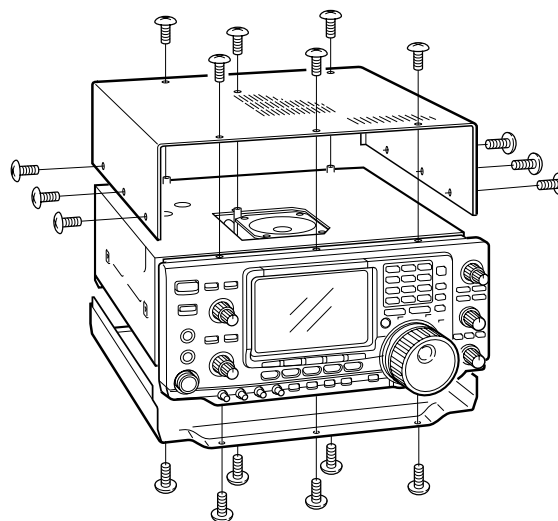
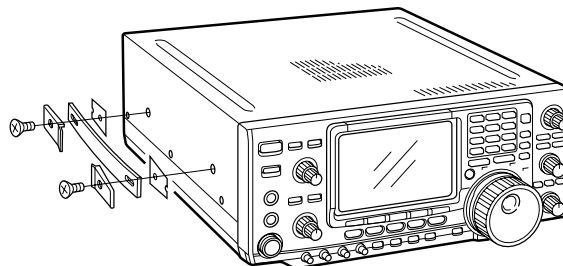
<p>1. TX Bass This item adjusts the bass level of the transmit audio tone from -5 dB to +5 dB in 1 dB steps.</p>	<p>The LCD display shows a signal strength indicator on the left, followed by 'TX Bass' and 'SSB'. Below 'TX Bass' is a left arrow, the number '1', and a right arrow. To the right of the signal strength indicator is a bar graph. The 'SSB' mode is indicated on the right side of the display, with a '0' below it.</p>
<p>2. TX Treble This item adjusts the treble level of the transmit audio tone from -5 dB to +5 dB in 1 dB steps.</p>	<p>The LCD display shows a signal strength indicator on the left, followed by 'TX Treble' and 'SSB'. Below 'TX Treble' is a left arrow, the number '2', and a right arrow. To the right of the signal strength indicator is a bar graph. The 'SSB' mode is indicated on the right side of the display, with a '0' below it.</p>
<p>3. RX Bass This item adjusts the bass level of the receive audio tone from -5 dB to +5 dB in 1 dB steps.</p>	<p>The LCD display shows a signal strength indicator on the left, followed by 'RX Bass' and 'SSB'. Below 'RX Bass' is a left arrow, the number '3', and a right arrow. To the right of the signal strength indicator is a bar graph. The 'SSB' mode is indicated on the right side of the display, with a '0' below it.</p>
<p>4. RX Treble This item adjusts the treble level of the receive audio tone from -5 dB to +5 dB in 1 dB steps.</p>	<p>The LCD display shows a signal strength indicator on the left, followed by 'RX Treble' and 'SSB'. Below 'RX Treble' is a left arrow, the number '4', and a right arrow. To the right of the signal strength indicator is a bar graph. The 'SSB' mode is indicated on the right side of the display, with a '0' below it.</p>

■ Opening the transceiver's case

Follow the case and cover opening procedures shown here when you want to install an optional unit or adjust the internal units, etc.

CAUTION: DISCONNECT the DC power cable from the transceiver before performing any work on the transceiver. Otherwise, there is danger of electric shock and/or equipment damage.

- ① Remove 2 screws from the left side of the transceiver to remove the carrying handle as shown at right.
- ② Remove 6 screws from the top of the transceiver and 6 screws from the sides, then lift up the top cover.
- ③ Turn the transceiver upside down.
- ④ Remove 6 screws from the bottom of the transceiver, then lift up the bottom cover.

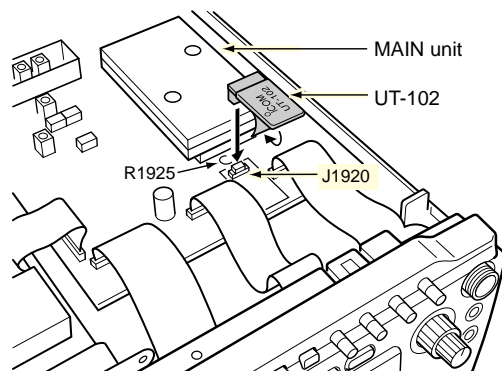


■ UT-102 VOICE SYNTHESIZER UNIT

The UT-102 announces the accessed readout's frequency, mode, etc. (S-meter level can also be announced— p. 84) in a clear, electronically-generated voice, in English (or Japanese).

➔ Push [LOCK/SPCH] for 1 sec. to announce the frequency, etc.

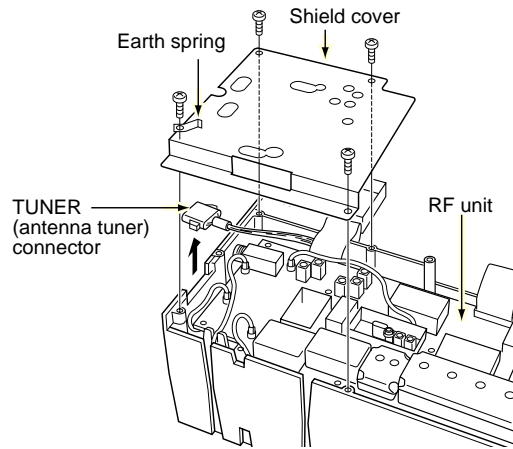
- ① Remove the top and bottom covers as shown above.
- ② Remove the protective paper attached to the bottom of the UT-102 to expose the adhesive strip.
- ③ Plug UT-102 into J1920 on the MAIN unit as shown in the diagram at right.
- ④ Adjust the trimmer, SPCH LVL: R1925 on the MAIN unit, to set the speech level if desired. Refer the illustration at right.
- ⑤ Return the top and bottom covers to their original positions.



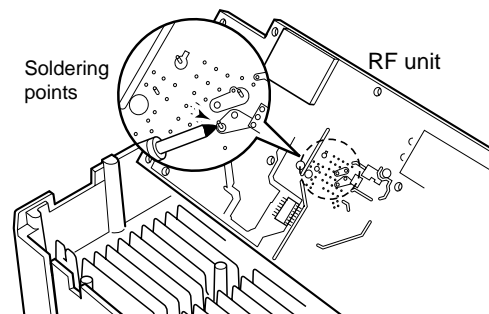
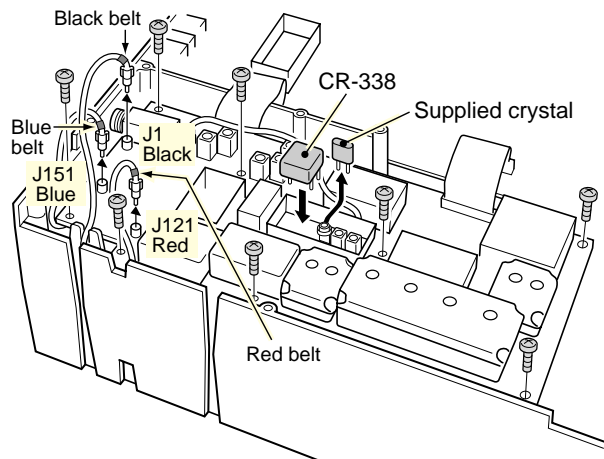
■ CR-338 HIGH STABILITY CRYSTAL UNIT

By installing the CR-338, the total frequency stability of the transceiver will be improved.

- ① Remove the bottom covers as shown in the previous page.
- ② Remove 4 screws from the shield cover of the RF unit, then lift up the shield cover.
 - There is an earth spring with the shield cover, so be careful for lost it when removing the cover.

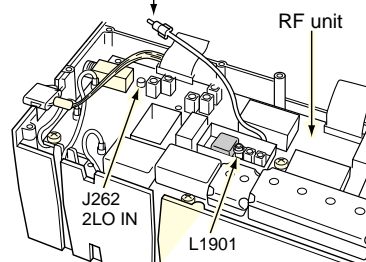


- ③ Remove 8 screws from the RF unit, disconnect J1, J121 and J151, then remove the RF unit.
- ④ Remove the supplied internal crystal and replace with the CR-338.
- ⑤ Return the RF unit, J1, J121 and J151 to their original positions.



- ⑥ Connect a frequency counter to the J262, 2LO IN, then adjust the reference frequency to be 64.00000 MHz with the L1901 on the RF unit.
- ⑦ Return the J262, shield cover, earth spring and bottom covers to their original positions.

Connect a frequency counter, then adjust the frequency to be 64.00000 MHz.



■ Troubleshooting

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

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

	PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
POWER	Power does not come on when the [POWER] switch is pushed.	<ul style="list-style-type: none"> • Power cable is improperly connected. • Fuse is blown. 	<ul style="list-style-type: none"> • Re-connect the DC power cable correctly. • Check for the cause, then replace the fuse with the spare one. (Fuses are installed in the DC power cable and the internal PA unit.) 	p. 16 p. 92
	RECEIVE	No sounds come out from the speaker.	<ul style="list-style-type: none"> • Volume level is too low. • The squelch is closed. • The transceiver is in transmitting condition. 	<ul style="list-style-type: none"> • Rotate [AF] clockwise to obtain a suitable listening level. • Turn [RF/SQL] to 10 o'clock position to open the squelch. • Push [TRANSMIT] to receive or check the SEND line of an external unit, if desired.
Sensitivity is too low, and only strong signals are audible.		<ul style="list-style-type: none"> • The antenna is not connected properly. • The antenna for another band is selected. • The antenna is not properly tuned. • The attenuator is activated. 	<ul style="list-style-type: none"> • Re-connect to the antenna connector. • Select an antenna suitable for the operating frequency. • Push [TUNER] for 1 sec. to manually tune the antenna. • Push [P.AMP/ATT] for 1 sec. to select "ATT OFF." 	— p. 75 pgs. 76, 77 p. 48
Received audio is unclear or distorted.		<ul style="list-style-type: none"> • Wrong operating mode is selected. • PBT function is activated. • Noise blanker is turned ON when receiving a strong signal. • Preamp is activated. • The noise reduction is activated and the [NR] control is too far clockwise. 	<ul style="list-style-type: none"> • Select a suitable operating mode. • Push [PBTC] for 1 sec. to reset the function • Push [NB] to turn the noise blanker OFF. • Push [P.AMP/ATT] once or twice to turn the function OFF. • Set the [NR] control for maximum readability. 	p. 23 p. 52 p. 51 p. 48 p. 53
The [ANT] switch does not function		<ul style="list-style-type: none"> • The antenna switch has not been activated. 	<ul style="list-style-type: none"> • Set the antenna switch in set mode to "Auto" or "Manual." 	p. 84
Transmitting is impossible.		<ul style="list-style-type: none"> • The operating frequency is not set to a ham band. 	<ul style="list-style-type: none"> • Set the frequency to a ham band. 	p. 19
TRANSMIT	Output power is too low.	<ul style="list-style-type: none"> • [RF PWR] is set too far counterclockwise • [MIC GAIN] is set too far counterclockwise • The antenna for another band is selected. • The antenna is not properly tuned. 	<ul style="list-style-type: none"> • Rotate [RF PWR] clockwise. • Set [MIC GAIN] to a suitable position. • Select an antenna suitable for the operating frequency. • Push [TUNER] for 1 sec. to manually tune the antenna. 	p. 25 p. 25 p. 75 pgs. 76, 77
	No contact possible with another station.	<ul style="list-style-type: none"> • RIT or ΔTX function is activated. • Split frequency and/or duplex function are activated. 	<ul style="list-style-type: none"> • Push [RIT] or [ΔTX] to turn the function OFF. • Push [SPLIT] and/or [F2 DUF] (in M1) to turn the function OFF. 	pgs. 48, 56 pgs. 58, 44
	Transmit signal is unclear or distorted.	<ul style="list-style-type: none"> • [MIC GAIN] is set too far clockwise 	<ul style="list-style-type: none"> • Set [MIC GAIN] to a suitable position. 	p. 25
	Repeater cannot be accessed.	<ul style="list-style-type: none"> • Split frequency or duplex function is not activated. • Programmed subaudible tone frequency is wrong. 	<ul style="list-style-type: none"> • Push [SPLIT] and/or [F2 DUF] (in M1) to turn the function ON • Reset the frequency using set mode. 	pgs. 44, 58 p. 45
	Programmed scan does not stop.	<ul style="list-style-type: none"> • Squelch is open. • [RF/SQL] is assigned to RF gain control and squelch is open. 	<ul style="list-style-type: none"> • Set [RF/SQL] to the threshold point. • Reset [RF/SQL] control assignment and set it to the threshold point. 	p. 24 pgs. 24, 81
SCAN	Programmed scan does not start.	<ul style="list-style-type: none"> • The same frequencies have been programmed in scan edge memory channels P1 and P2. 	<ul style="list-style-type: none"> • Program different frequencies in scan edge memory channel P1 and P2. 	p. 66
	Memory scan does not start	<ul style="list-style-type: none"> • 2 or more memory channels have not been programmed. 	<ul style="list-style-type: none"> • Program more than 2 memory channels. 	p. 63
	Select memory scan does not start	<ul style="list-style-type: none"> • 2 or more memory channels have not been designated as select channels. 	<ul style="list-style-type: none"> • Designate more than 2 memory channels as select channels for the scan. 	p. 72

	PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
DISPLAY	The displayed frequency does not change properly.	<ul style="list-style-type: none"> The dial lock function is activated. A set mode screen is selected. 	<ul style="list-style-type: none"> Push [LOCK/SPCH] to turn the function OFF. Push [MENU] several times to exit the set mode. Reset the CPU. 	p. 53 —
		<ul style="list-style-type: none"> The internal CPU has malfunctioned. 		p. 93

■ Fuse replacement

If a fuse blows or the transceiver stops functioning, try to find the source of the problem, and replace the damaged fuse with a new, rated fuse.

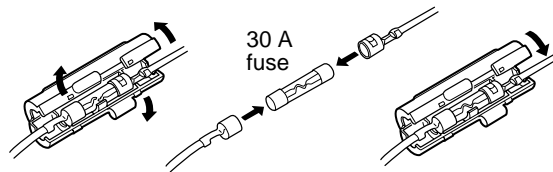
The IC-746PRO has 2 types of fuses installed for transceiver protection.

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

◇ DC power cable fuse replacement

Refer the figure illustrated at right for the DC power cable fuse replacement.

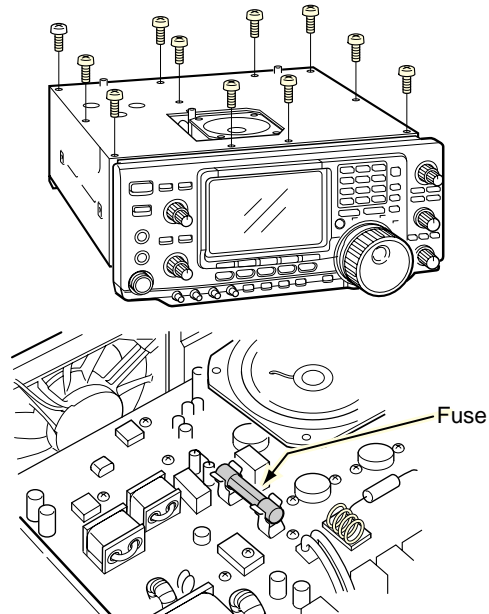
CAUTION: DISCONNECT the DC power cable from the transceiver when changing a fuse.



◇ Circuitry fuse replacement

The 13.8 V DC from the DC power cable is applied to all units in the IC-746PRO, except for the power amplifier, through the circuitry fuse. This fuse is installed in the PA unit.

- ① Remove the top cover as shown on p. 89.
- ② Remove 11 screws from the PA shielding plate, then remove the plate.
- ③ Replace the circuitry fuse as shown in the diagram at right.
- ④ Replace the PA shielding plate and top cover.

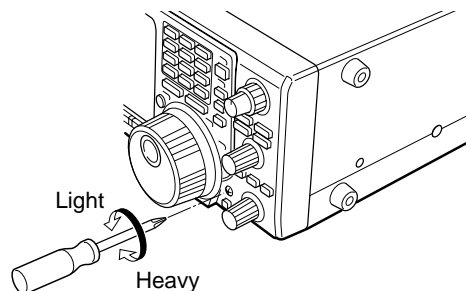


■ Tuning dial brake adjustment

The tension of the tuning dial may be adjusted to suit your preference.

The brake adjustment screw is located on the right side of the tuning dial. See the figure at right.

Turn the brake adjustment screw clockwise or counterclockwise to obtain a comfortable tension level while turning the dial continuously and evenly in one direction.

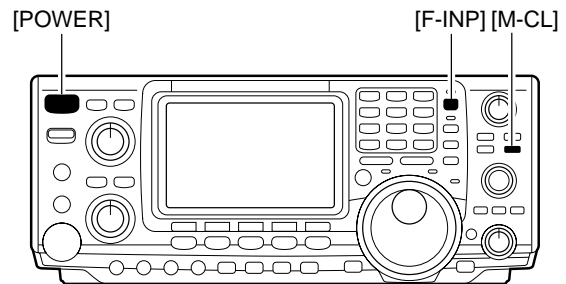


Resetting the CPU

When first applying power or when the function seems to be displaying erroneous information, reset the CPU as follow:

- ① Make sure the transceiver power is OFF.
- ② While pushing [M-CL] and [F-INP], push [POWER] for 1 sec. to turn power ON.
 - The internal CPU is reset.
 - The transceiver displays its initial VFO frequency when resetting is complete.
- ③ Correct the set mode settings after resetting, if desired.

NOTE: Resetting **CLEARs** all programmed contents in memory channels and returns programmed values in set mode to default values.

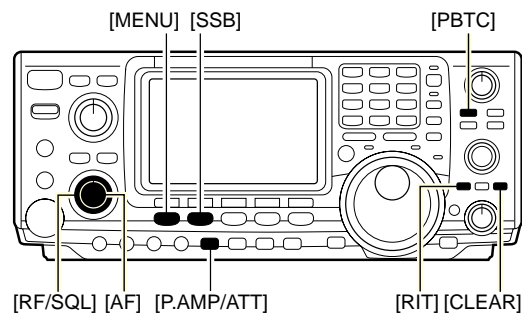


Frequency calibration (approximate)

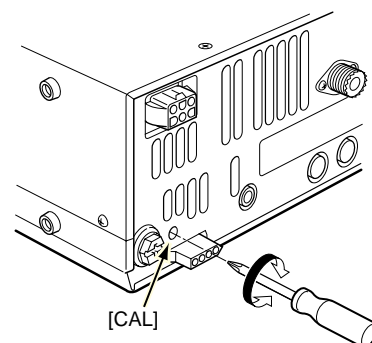
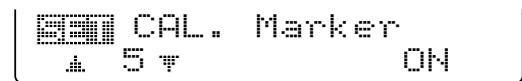
A very accurate frequency counter is required to calibrate the frequency of the transceiver. However, a rough check may be performed by receiving radio station WWV, or other standard frequency signals.

CAUTION: Your transceiver has been thoroughly adjusted and checked at the factory before being shipped. You should not calibrate frequencies, except for special reasons.

- ① Push [SSB] to select USB mode.
- ② Push [PBTC] for 1 sec. to clear the PBT settings and make sure that the RIT/ΔTX function is not activated.
- ③ Set the frequency to the standard frequency station minus 1 kHz.
 - When receiving WWV (10.000.00 MHz) as a standard frequency, set the operating frequency for 9.999.00 MHz.
 - Other standard frequencies can also be used.
- ④ Push [MENU] several times to select M1 or M2, if necessary.
- ⑤ Push [MENU] for 1 sec. to select the set mode screen.
- ⑥ Push [F1] or [F2] several times to select the CAL. Marker item.
- ⑦ Rotate the tuning dial clockwise to turn the calibration marker ON.
 - Side tone may be heard.
- ⑧ Adjust [CAL] pot on the rear side of the transceiver for a zero beat with the received standard signal.
 - Zero beat means that two signals are exactly the same frequency, resulting in a single tone being emitted.
- ⑨ Rotate the tuning dial counterclockwise to turn the calibration marker OFF.
- ⑩ Push [MENU] to exit set mode.



• Calibration marker item



14 CONTROL COMMAND

Remote jack (CI-V) information

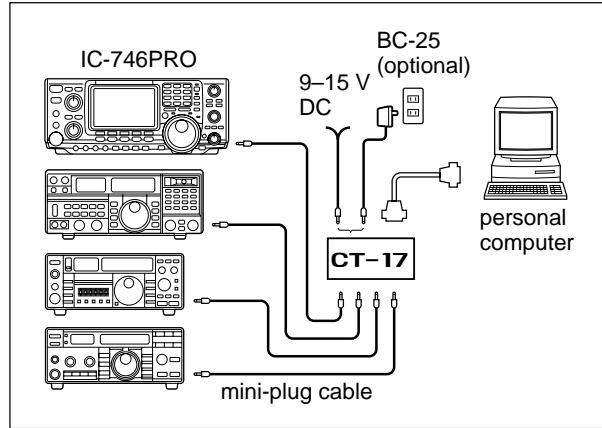
CI-V connection example

The transceiver can be connected through an optional CT-17 CI-V LEVEL CONVERTER to a personal computer equipped with an RS-232C port. The Icom Communications Interface-V (CI-V) controls the following functions of the transceiver.

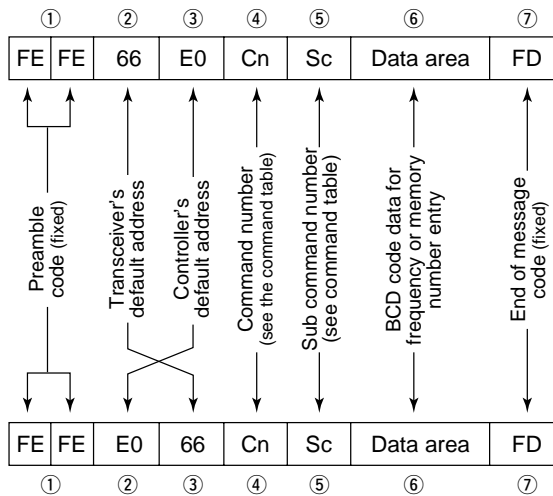
Up to 4 Icom CI-V transceivers or transceivers can be connected to a personal computer equipped with an RS-232C port. See p. 87 for setting the CI-V condition using set mode.

Data format

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

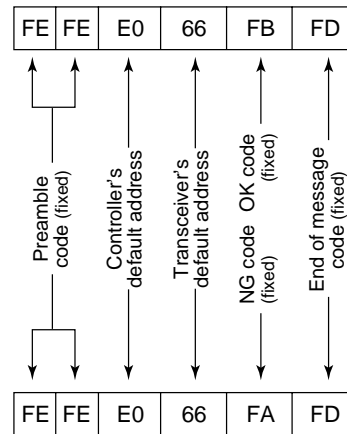


Controller to IC-746PRO



IC-746PRO to controller

OK message to controller



NG message to controller

Command table

Command	Sub command	Description
00	—	Send frequency data
01	Same as command 06	Send mode data
02	—	Read band edge frequencies
03	—	Read operating frequency
04	—	Read operating mode
05	—	Set operating frequency
06	00	Select LSB
	01	Select USB
	02	Select AM
	03	Select CW
	04	Select RTTY
	05	Select FM
	07	Select CW-R
	08	Select RTTY-R
07	—	Select VFO mode
	00	Select VFO A
	01	Select VFO B
	A0	Equalize VFO A and VFO B

Command	Sub command	Description
07	B0	Exchange VFO A and VFO B
08	—	Select memory mode
	0001–0101*	Select memory channel *P1=0100, P2=0101
	0102	Select the call channel
09	—	Memory write
0A	—	Memory to VFO
0B	—	Memory clear
0C	—	Read offset frequency
0D	—	Set offset frequency
0E	00	Scan stop
	01	Programmed/memory scan start
	02	Programmed scan start
	03	ΔF scan start
	12	Fine programmed scan start
	13	Fine ΔF scan start
	22	Memory scan start
	23	Select memory scan start

•Command table (continued)

Command	Sub command	Description
0E	A1–A7	Set ΔF scan span (A1= ± 5 kHz, A2= ± 10 kHz, A3= ± 20 kHz, A4= ± 50 kHz, A5= ± 100 kHz, A6= ± 500 kHz, A7= ± 1 MHz)
	B0	Set as non-select channel
	B1	Set as select channel
	D0	Set scan resume OFF
	D3	Set scan resume ON
0F	00	Turn the split function OFF
	01	Turn the split function ON
	10	Select simplex operation
	11	Select –DUP operation
	12	Select +DUP operation
10	00	Select 10 Hz (1 Hz) tuning step
	01	Select 100 Hz tuning step
	02	Select 1 kHz tuning step
	03	Select 5 kHz tuning step
	04	Select 9 kHz tuning step
	05	Select 10 kHz tuning step
	06	Select 12.5 kHz tuning step
	07	Select 20 kHz tuning step
	08	Select 25 kHz tuning step
11	—	Select/read attenuator (0=OFF, 1=ON)
12	—	Select/read antenna selection (0=ANT1, 1=ANT2)
13	00	Announce with voice synthesizer (00=all data; 01=frequency and S-meter level; 02=receive mode)
	01	
	02	
14	01 + Level data	[AF] level setting (0=max. CCW to 255=max. CW)
	02 + Level data	[RF] level setting (0=max. CCW to 255=11 o'clock)
	03 + Level data	[SQL] level setting (0=11 o'clock to 255=max. CW)
	06 + Level data	[NR] level setting (0=min. to 255=max.)
	07 + Level data	Inside [TWIN PBT] setting or IF shift setting (0=max. CCW, 128=center, 255=max. CW)
	08 + Level data	Outside [TWIN PBT] setting (0=max. CCW, 128=center, 255=max. CW)
	09 + Level data	[CW PITCH] setting (0=300 Hz, 128=600 Hz, 255=900 Hz)
	0A + Level data	[RF PWR] setting (0=min. to 255=max.)
	0B + Level data	[MIC GAIN] setting (0=min. to 255=max.)
	0C + Level data	[KEY SPEED] setting (0=slow to 255=fast)
	0D + Level data	[NOTCH] setting (0=low freq. to 255=high freq.)
	0E + Level data	COMP Level Delay setting (0=0 to 10=10)
	0F + Level data	Break-IN DELAY setting (20=2.0d to 130=13.0d)
15	01	Read squelch condition
	02	Read S-meter level
	11	Read RF power meter
	12	Read SWR meter
	13	Read ALC meter
16	02	Preamp (0=OFF; 1=preamp 1; 2=preamp 2)

Command	Sub command	Description
16	12	AGC selection (0=OFF; 1=Slow; 2=Mid; 3=Fast)
	22	Noise blanker (0=OFF; 1=ON)
	40	Noise reduction (0=OFF; 1=ON)
	41	Auto notch (0=OFF; 1=ON)
	42	Repeater tone (0=OFF; 1=ON)
	43	Tone squelch (0=OFF; 1=ON)
	44	Speech compressor (0=OFF; 1=ON)
	45	Monitor (0=OFF; 1=ON)
	46	VOX function (0=OFF; 1=ON)
	47	Break-in (0=OFF; 1=semi break-in; 2=full break-in)
	48	Manual notch (0=OFF; 1=ON)
	49	RTTY filter (0=OFF; 1=ON)
	4B	DTCS (0=OFF; 1=ON)
	4C	VSC (0=OFF; 1=ON)
	19	00
1A	00	Send/read memory contents (see p. 97 for details)
	01	Send/read band stacking register contents (see p. 97 for details)
	02	Send/read memory keyer contents (see p. 97 for details)
	03	Send/read the selected filter width (0=50 Hz to 40/31=3600/2700 Hz)
	04	Send/read the selected AGC time constant (0=OFF, 1=0.1/0.3 sec. to 13=6.0/8.0 sec.)
	0501	Send/read LCD contrast (0=0% to 255=100%)
	0502	Send/read LCD backlight (0=0% to 255=100%)
	0503	Send/read beep gain (0=min. to 255=max.)
	0504	Send/read beep gain limit (0=OFF, 1=ON)
	0505	Send/read calibration marker (0=OFF, 1=ON)
	0506	Send/read confirmation beep (0=OFF, 1=ON)
	0507	Send/read band edge beep (0=OFF, 1=ON)
	0508	Send/read RF/SQL control set (0=Auto, 1=SQL, 2=RF+SQL)
	0509	Send/read meter peak hold set (0=OFF, 1=ON)
	0510	Send/read COMP meter set (0=OFF, 1=ON)
	0511	Send/read quick split set (0=OFF, 1=ON)
0512	Send/read split offset –9.999 to +9.999 MHz (see p. 98 for details)	
0513	Send/read split lock set (0=OFF, 1=ON)	
0514	Send/read duplex offset 0.000 to 9.999 MHz for HF (see p. 98 for details)	
0515	Send/read duplex offset 0.000 to 9.999 MHz for 50 MHz band (see p. 98 for details)	
0516	Send/read duplex offset 0.000 to 9.999 MHz for 144 MHz band (see p. 98 for details)	

•Command table (continued)

Command	Sub command	Description
1A	0517	Send/read one touch repeater set (0=DUP-, 1=DUP+)
	0518	Send/read auto repeater set (0=OFF, 1=ON-1, 2=ON-2)
	0519	Send/read tuner auto start set (0=OFF, 1=ON)
	0520	Send/read PTT tune set (0=OFF, 1=ON)
	0521	Send/read 9600 bps mode set (0=OFF, 1=ON)
	0522	Send/read antenna selection (0=OFF, 1=Manual, 2=Auto)
	0523	Send/read speech language (0=English, 1=Japanese)
	0524	Send/read speech speed (0=Slow, 1=Fast)
	0525	Send/read S-level speech (0=OFF, 1=ON)
	0526	Send/read memo pad numbers (0=5 ch, 1=10 ch)
	0527	Send/read main dial auto TS (0=OFF, 1=Low, 2=High)
	0528	Send/read mic. up/down speed (0=Low, 1=High)
	0529	Send/read quick RIT/ Δ TX clear function (0=OFF, 1=ON)
	0530	Send/read PBT shifting value popup set (0=OFF, 1=ON)
	0531	Send/read IF filter width popup set (0=OFF, 1=ON)
	0532	Send/read SSB/CW synchronous tuning function (0=OFF, 1=ON)
	0533	Send/read CW normal side set (0=LSB, 1=USB)
	0534	Send/read keyer 1st menu set (0=Keyer-root, 1=Keyer-send)
	0535	Send/read external keypad set (0=OFF, 1=Keyer send)
	0536	Send/read CI-V transceive set (0=OFF, 1=ON)
	0537	Send/read CI-V 731 mode set (0=OFF, 1=ON)
	0538	Send/read speech compressor level set (0=0 to 10=10)
	0539	Send/read SSB TX Tone (Bass) level (0=-5 to 10=+5)
	0540	Send/read SSB TX Tone (Treble) level (0=-5 to 10=+5)
	0541	Send/read SSB RX Tone (Bass) level (0=-5 to 10=+5)
	0542	Send/read SSB RX Tone (Treble) level (0=-5 to 10=+5)
	0543	Send/read AM TX Tone (Bass) level (0=-5 to 10=+5)
	0544	Send/read AM TX Tone (Treble) level (0=-5 to 10=+5)
	0545	Send/read AM RX Tone (Bass) level (0=-5 to 10=+5)
	0546	Send/read AM RX Tone (Treble) level (0=-5 to 10=+5)
0547	Send/read FM TX Tone (Bass) level (0=-5 to 10=+5)	

Command	Sub command	Description
1A	0548	Send/read FM TX Tone (Treble) level (0=-5 to 10=+5)
	0549	Send/read FM RX Tone (Bass) level (0=-5 to 10=+5)
	0550	Send/read FM RX Tone (Treble) level (0=-5 to 10=+5)
	0551	Send/read contact number style (0=Normal, 1=190→ANO, 2=190→ANT, 3=90→NO, 4=90→NT)
	0552	Send/read count up trigger channel (1=M1, 2=M2, 3=M3, 4=M4)
	0553	Send/read present number (1-9999)
	0554	Send/read CW side tone gain (0=min. to 255=max.)
	0555	Send/read CW side tone gain limit (0=OFF, 1=ON)
	0556	Send/read CW keyer repeat time (1=1 sec. to 60=60 sec.)
	0557	Send/read CW keyer dot/dash ratio (28=1:1:2.8 to 45=1:1:4.5)
	0558	Send/read rise time (0=2 msec., 1=4 msec., 2=6 msec., 3=8 msec.)
	0559	Send/read paddle polarity (0=Normal, 1=Reverse)
	0560	Send/read keyer type (0=Straight, 1=Bug-key, 2=ELEC-Key)
	0561	Send/read mic. up/down keyer set (0=OFF, 1=ON)
	0562	Send/read RTTY filter bandwidth (0=250 Hz, 1=300 Hz, 2=350 Hz, 3=500 Hz, 4=1 kHz)
	0563	Send/read twin peak filter (0=OFF, 1=ON)
	0564	Send/read RTTY mark frequency (0=1275 Hz, 1=1615 Hz, 2=2125 Hz)
	0565	Send/read RTTY shift width (0=170 Hz, 1=200 Hz, 2=425 Hz)
	0566	Send/read RTTY keying polarity (0=Normal, 1=Reverse)
	0567	Send/read RTTY decode USOS (0=OFF, 1=ON)
	0568	Send/read RTTY decode new line code (0=CR,LF,CR+LF, 1=CR+LF)
	0569	Send/read number of RTTY decoder line (0=2 lines, 1=3 lines)
	0570	Send/read scan speed (0=Low, 1=High)
	0571	Send/read scan resume (0=OFF, 1=ON)
	0572	Send/read NB level (0=0% to 255=100%)
	0573	Send/read VOX gain (0=0% to 255=100%)
	0574	Send/read anti VOX gain (0=0% to 255=100%)
	0575	Send/read VOX delay (0=0.0 sec. to 20=2.0 sec.)
	0576	Send/read Break-IN delay set (20=2.0d to 130=13.0d)

• Command table (continued)

Command	Sub command	Description
1A	0577	Send/read MONITOR level (0=0% to 255=100%)
	06	Send/read DATA mode (0=OFF, 1=ON)
	07	Send/read SSB transmit bandwidth (0=WIDE, 1=MID, 2=NAR)
	08	Send/read DSP filter shape (0= sharp, 1= soft)
1B	00	Set/read repeater tone frequency (see p. 98 for details)
	01	Set/read TSQL tone frequency (see p. 98 for details)
	02	Set/read DTCS code and polarity (see p. 98 for details)
1C	00	Set/read the transceiver's condition (0=Rx; 1=Tx)
	01	Set/read antenna tuner condition (0=OFF, 1=ON, 2=Start tuning or while tuning)

◇ To send/read memory contents

When sending or reading memory contents, additional code as follows must be added to appoint the memory channel.

➔ Additional code: 0000–0102 (0100=P1, 0101=P2, 0102=Call)

◇ Band stacking register

To send or read the desired band stacking register's contents, combined code of the frequency band and register codes as follows are used.

For example, when sending/reading the oldest contents in the 21 MHz band, the code "0703" is used.

• Frequency band code

Code	Frequency band	Frequency range (unit: MHz)
01	1.8	1.800000– 1.999999
02	3.5	3.400000– 4.099999
03	7	6.900000– 7.499999
04	10	9.900000–10.499999
05	14	13.900000–14.499999
06	18	17.900000–18.499999
07	21	20.900000–21.499999
08	24	24.400000–25.099999
09	28	28.000000–29.999999
10	50	50.000000–54.000000
11	144	144.000000–148.000000
12	GENE	Other than above

• Register code

Code	Registered number
01	1 (latest)
02	2
03	3 (oldest)

◇ Codes for memory keyer contents

To send or read the desired memory keyer contents, the channel and character codes as follows are used.

• Channel code

Code	Channel number
01	M1
02	M2
03	M3
04	M4

• Character's code

Character	ASCII code	Description
0–9	30–39	Numerals
A–Z	41–5A	Alphabetical characters
space	20	Word space
/	2F	Symbol
?	3F	Symbol
,	2C	Symbol
.	2E	Symbol
^	5E	e.g., to send \bar{B} , enter ^4254
*	2A	Inserts contact number (can be used for 1 channel only)

◇ Codes for memory name contents

To send or read the desired memory name settings, the character codes, instructed codes for memory keyer contents as above, and follows are additionally used.

• Character's code— Alphabetical characters

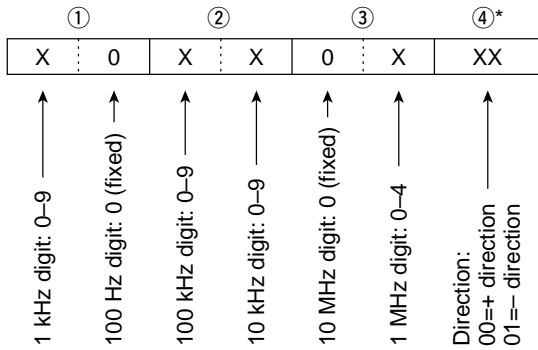
Character	ASCII code	Character	ASCII code
a–z	61–7A	—	—

• Character's code— Symbols

Character	ASCII code	Character	ASCII code
!	21	#	23
\$	24	%	25
&	26	¥	5C
?	3F	"	22
'	27	`	60
+	2B	–	2D
:	3A	;	3B
=	3D	<	3C
>	3E	(28
)	29	[5B
]	5D	{	7B
}	7D		7C
_	5F	–	7E

◆ Split/Duplex frequency setting

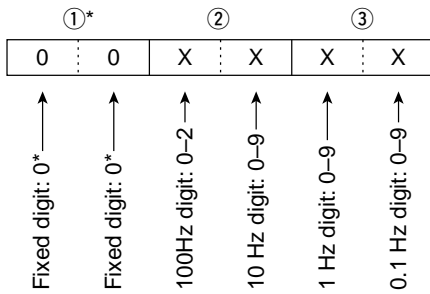
The following data sequence is used when sending/reading the split or duplex frequency setting.



*Not need to enter for duplex frequency setting.

◆ Repeater tone/tone squelch frequency setting

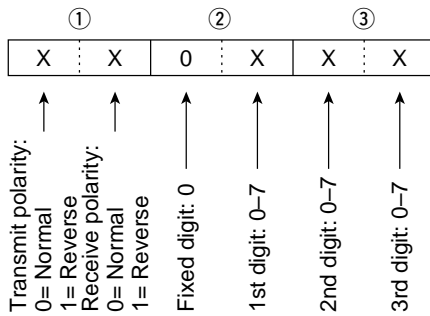
The following data sequence is used when sending/reading the DTCS code and polarity setting.



*Not necessary when setting a frequency.

◆ DTCS code and polarity setting

The following data sequence is used when sending/reading the DTCS code and polarity setting.



•General

•Frequency coverage	:	(Unit: MHz)
Receive	:	0.030– 60.000000*
Transmit	:	108.000– 174.000000*
	:	1.800– 2.000000
	:	3.500– 3.999999
	:	7.000– 7.300000
	:	10.100– 10.150000
	:	14.000– 14.350000
	:	18.068– 18.168000
	:	21.000– 21.450000
	:	24.890– 24.990000
	:	28.000– 29.700000
	:	50.000– 54.000000
	:	144.000– 148.000000

*Some frequency ranges are not guaranteed.

•Mode	:	USB, LSB, CW, RTTY, AM, FM
•No. of memory ch.	:	102 (99 regular, 2 scan edges and 1 call)
•Antenna connector	:	SO-239×3 (2 for HF/50 MHz and 1 for 144 MHz; 50 Ω)
•Usable temp. range	:	–10°C to +60°C ; +14°F to +140°F
•Frequency stability	:	Less than ±7 ppm from 1 min. to 60 min. after power ON. After that, rate of stability is less than ±1 ppm/hr. at 25°C (+77°F). Temperature fluctuations 0°C to +50°C (+20°F to +122°F) less than ±5 ppm.
•Frequency resolution	:	1 Hz
•Power supply	:	13.8 V DC ±15% (negative ground)
•Power consumption	:	
Transmit	:	Max. power 23.0 A
Receive	:	Standby 2.2 A Max. audio 3.0 A
•Dimensions	:	287(W)×120(H)×316.5(D) mm (projections not incl.) 13 ⁹ / ₁₆ (W)×4 ²³ / ₃₂ (H)×12 ¹⁵ / ₃₂ (D) in
•Weight (approx.)	:	9.0 kg; 19 lb 13 oz
•ACC 1 connector	:	8-pin DIN connector
•ACC 2 connector	:	7-pin DIN connector
•DATA connector	:	Mini DIN 6-pin
•CI-V connector	:	2-conductor 3.5 (d) mm (1/8")

•Transmitter

•Output power (continuously adjustable):	
SSB/CW/RTTY/FM	Less than 5 to 100 W
AM	Less than 5 to 40 W
•Modulation system	:
SSB	<i>Digital PSN modulation</i>
AM	<i>Digital low power modulation</i>
FM	<i>Digital phase modulation</i>
•Spurious emission	:
	50 dB (HF bands)
	60 dB (50/144 MHz)
•Carrier suppression	:
	40 dB
•Unwanted sideband suppression	:
	55dB
•ΔTX variable range	:
	±9.99 kHz
•Mic. connector	:
	8-pin connector (600 Ω)
•ELEC-KEY connector	:
	3-conductor 6.35(d) mm (1/4")
•KEY connector	:
	3-conductor 6.35(d) mm (1/4")
•SEND connector	:
	Phono (RCA)
•ALC connector	:
	Phono (RCA)

•Receiver

•Receive system	:	Triple conversion superheterodyne system
•Intermediate frequencies:		
1st	:	64.455 MHz
2nd	:	455 kHz
3rd	:	36 kHz
•Sensitivity (typical)	:	
SSB, CW, RTTY	:	0.16 μV* ¹ (1.80–29.99 MHz)
(10 dB S/N)	:	0.13 μV* ² (50 MHz)
	:	0.11 μV* ³ (144 MHz)
AM (10 dB S/N)	:	13 μV (0.5–1.799 MHz)
	:	2 μV* ¹ (1.80–29.99 MHz)
	:	1 μV (50* ² /144* ³ MHz)
FM (12 dB SINAD)	:	0.5 μV* ¹ (28.0–29.99 MHz)
	:	0.25 μV* ² (50 MHz)
	:	0.18 μV* ³ (144 MHz)
		* ¹ Pre-amp 1 is ON, * ² Pre-amp 2 is ON, * ³ Pre-amp is ON
•Squelch sensitivity (Pre-amp: OFF):		
SSB, CW, RTTY	:	Less than 5.6 μV
FM	:	Less than 1.0 μV
•Selectivity	:	
SSB (BW: 2.4 kHz)	:	More than 2.4 kHz/–6 dB Less than 3.6 kHz/–60 dB
CW (BW: 500 Hz)	:	More than 500 Hz/–6 dB Less than 700 Hz/–60 dB
RTTY (BW: 350 Hz)	:	More than 360 Hz/–6 dB Less than 650 Hz/–60 dB
AM (BW: 6 kHz)	:	More than 6.0 kHz/–6 dB Less than 15.0 kHz/–60 dB
FM (BW: 15 kHz)	:	More than 12.0 kHz/–6 dB Less than 20.0 kHz/–60 dB
•Spurious and image rejection ratio:		
HF/50 MHz	:	More than 70 dB (except IF through on 50 MHz band)
144 MHz	:	More than 60 dB
•AF output power	:	More than 2.0 W at 10% distortion with an 8 Ω load
(at 13.8 V DC)		
•RIT variable range	:	±9.99 kHz
•PHONES connector	:	3-conductor 6.35 (d) mm (1/4")
•Ext. SP connector	:	2-conductor 3.5 (d) mm (1/8")/8Ω

•Antenna tuner

•Matching impedance range:	
HF bands	16.7 to 150 Ω unbalanced (Less than VSWR 3:1)
50 MHz band	20 to 125 Ω unbalanced (Less than VSWR 2.5:1)
•Minimum operating input power	:
	8 W (HF bands)
	15 W (50 MHz band)
•Tuning accuracy	:
	VSWR 1.5:1 or less
•Insertion loss	:
	Less than 1.0 dB (after tuning)

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

16 OPTIONS

IC-PW1 HF/50 MHz ALL BAND 1 kW LINEAR AMPLIFIER



Full-duty 1 kW linear amplifier including an automatic antenna tuner. Has automatic tuning and band selection capability. Full break-in (QSK) operation is possible. The amplifier/power supply unit and the remote control unit are separated.

PS-125 DC POWER SUPPLY



Light weight switching regulator system power supply.
•Output voltage: 13.8 V DC
•Max. current drain: 25 A

AH-4 HF/50 MHz AUTOMATIC ANTENNA TUNER



Specially designed to tune a long wire antenna for portable or mobile HF operation. The PTT tuner start function provides simple operation.
•Input power rating: 120 W

AH-2b ANTENNA ELEMENT



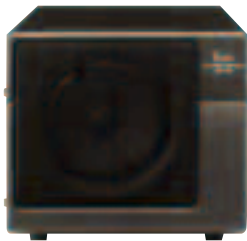
A 2.5 m long antenna element for mobile operation with the AH-4.
•Frequency coverage: 7–54 MHz bands with the AH-4

SM-20 DESKTOP MICROPHONE



Unidirectional, electret microphone for base station operation. Includes [UP]/[DOWN] switches and a low cut function.

SP-21 EXTERNAL SPEAKER



Designed for base station operation.
•Input impedance: 8 Ω
•Max. input power: 5 W

CT-17 CI-V LEVEL CONVERTER



For remote transceiver control using a personal computer. You can change frequencies, operating mode, memory channels, etc.

UT-102 VOICE SYNTHESIZER UNIT
Announces the receive frequency, mode and S-meter level in a clear, electronically-generated voice, in English (or Japanese).

SP-20 EXTERNAL SPEAKER
4 audio filters; headphone jack; can connect to 2 transceivers.
•Input impedance: 8 Ω
•Max. input power: 5 W

CR-338 HIGH STABILITY CRYSTAL UNIT
Contains a temperature-compensating oven heater and crystal unit for improved frequency stability.
•Frequency stability: ± 0.5 ppm

HM-36 HAND MICROPHONE
Hand microphone equipped with [UP]/[DOWN] switches.

Count on us!