

**ICOM**

**INSTRUCTION MANUAL**

VHF/UHF  
ALL MODE TRANSCEIVER  
**IC-821H**



**Icom Inc.**

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## IMPORTANT

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

**SAVE THIS INSTRUCTION MANUAL.** This instruction manual contains important safety and operating instructions for the IC-821H.

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## PRECAUTIONS

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

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

**⚠ NEVER** apply more than 16 V DC, such as a 24 V battery, to the [DC13.8V] socket on the transceiver rear panel. This could cause a fire or ruin the transceiver.

**⚠ NEVER** let metal, wire or other objects touch any internal part or connectors on the rear panel of the transceiver. This will cause electric shock.

**⚠ NEVER** expose the transceiver to rain, snow or any liquids.

**NEVER** allow children to play with the transceiver.

**AVOID** using or placing the transceiver in areas with temperatures below  $-10^{\circ}\text{C}$  ( $+14^{\circ}\text{F}$ ) or above  $+60^{\circ}\text{C}$  ( $+140^{\circ}\text{F}$ ). Be aware that temperatures on a vehicle's dashboard can exceed  $80^{\circ}\text{C}$  ( $+176^{\circ}\text{F}$ ), resulting in permanent damage to the transceiver if left there for extended periods.

**AVOID** placing the transceiver in excessively dusty environments or in direct sunlight.

**AVOID** placing the transceiver against walls or putting anything on top of the transceiver. This will obstruct heat dissipation.

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

Make sure the transceiver power is OFF before starting the vehicle. This will avoid possible damage to the transceiver by ignition voltage spikes.

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

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

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

Use Icom microphones only (supplied or optional). Other manufacturer's microphones have different pin assignments and connection to the IC-821H may damage the transceiver.

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## EXPLICIT DEFINITIONS

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WORD	DEFINITION
<b>⚠ WARNING</b>	Personal injury, fire hazard or electric shock may occur.
<b>CAUTION</b>	Equipment damage may occur.
<b>NOTE</b>	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

The explicit definitions described at left apply to this instruction manual.

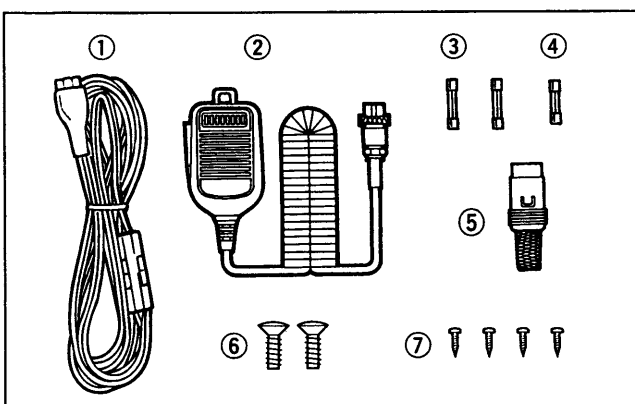


The IC-821H complies with the essential requirements of the 89/336/EEC directive for Electromagnetic Compatibility. This compliance is based on conformity with the ETSI specification prETS300 684 (EMC product standard for Commercially Available Amateur Radio Equipment).

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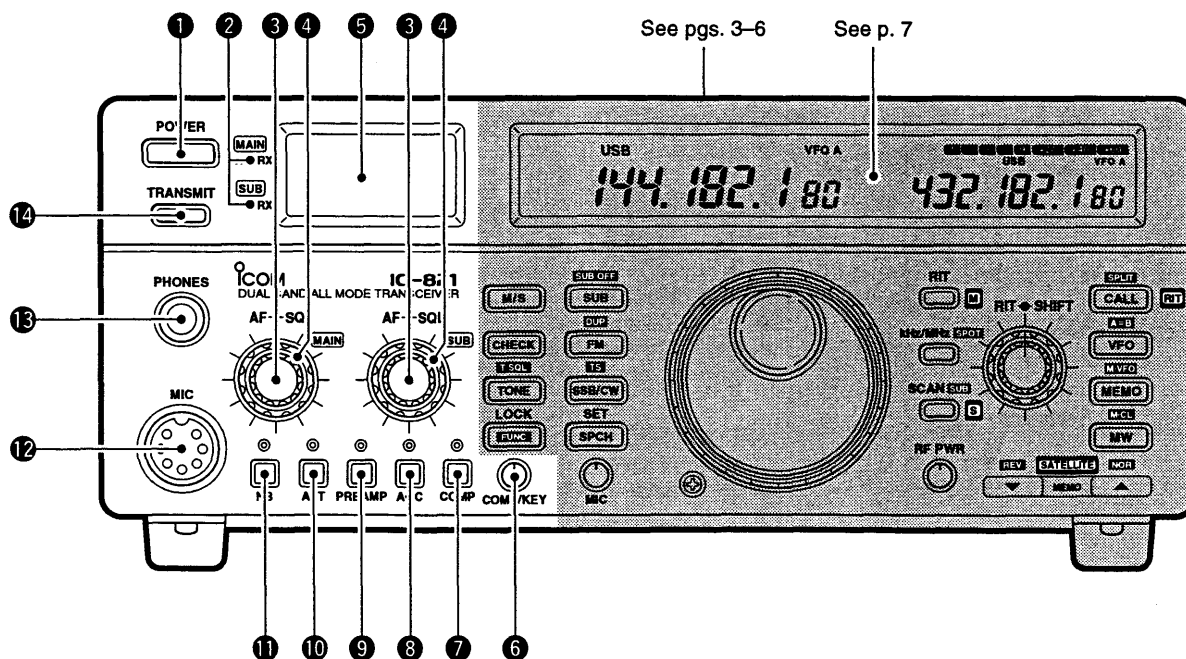
## UNPACKING



Accessories included with the IC-821H:	Qty.
① DC power cable (OPC-657) .....	1
② Hand microphone (HM-12) .....	1
③ Spare fuses (FGB 20 A) .....	2
④ Spare fuse (FGMB 125 V 5 A) .....	1
⑤ DIN plug .....	1
⑥ Screws (M4 × 10, for optional MB-23) .....	2
⑦ Screws (M3 × 6, for optional MB-23) .....	4

# 1 PANEL DESCRIPTION

## ■ Front panel



### 1 POWER SWITCH [POWER] (p. 15)

Turns power ON and OFF.  
- Turn the optional DC power supply ON in advance.



### 2 TX/RX INDICATORS

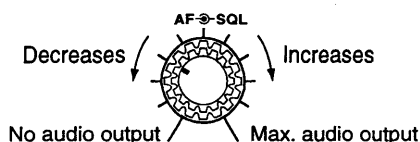
- Light green while receiving a signal (and squelch opens) on the main or sub band. Lights red while transmitting.
- When ALC is activated, the transmit band's indicator brightness increases. (p. 25)
- Flash green when the center indicator is turned ON in set mode with the [FM] switch and an off-center signal is received in FM mode. (p. 23)

#### ✓ What is the ALC function?

The ALC circuit automatically limits RF output power by controlling the input level of the RF power amplifier. This prevents transmission of distorted signals when the input signal level exceeds the allowable level. The ALC activates for SSB and CW modes.

### 3 AF CONTROLS [AF (MAIN)]/[AF (SUB)] (inner control)

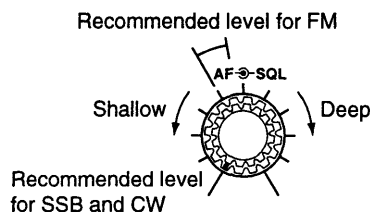
Vary the audio output level from the speaker.



### 4 SQUELCH CONTROLS [SQL (MAIN)]/[SQL (SUB)] (outer control) (p. 21)

Adjust the squelch threshold level. The squelch removes noise output from the speaker (closed condition) when no signal is received.

- The squelch is particularly effective for FM. It is also available for other modes.
- Squelch threshold point for SSB/CW mode can be set to the 9 or 12 o'clock position in set mode with the [CHECK] switch. (p. 45)



#### ✓ How to set the squelch.

When operating in FM, first rotate the control fully counterclockwise. Then, rotate the control clockwise to the point where the noise just disappears. This is the optimum position. The squelch does not open for weak signals when it is set too deep (clockwise).

### 5 S/RF METER

Shows main band's signal strength while receiving. Shows the relative output power while transmitting.

**6 COMPRESSOR/KEY SPEED CONTROL**

[COMP/KEY] (pgs. 25, 27)

- Adjusts the speech compression level in SSB.
- Adjusts the keying speed of the internal electronic keyer in CW.

While in SSB mode



While in CW mode



**7 SPEECH COMPRESSOR SWITCH [COMP]**

(p. 25)

Turns the speech compressor ON and OFF. The speech compressor compresses the transmitter audio input to increase the average audio output level. Therefore, talk power is increased. This function is effective for long distance communication or when propagation conditions are poor.

- The compression level can be adjusted with the [COMP/KEY] control as above.



**8 AGC SWITCH [AGC]** (p. 23)

Changes the time constant of the main band AGC circuit. The AGC controls receiver gain to produce a constant audio output level even when the received signal strength is varied by fading, etc. Use AGC slow for normal operation and select AGC fast depending on the receiving condition.

- AGC does not function in FM mode.
- Sub band AGC is fixed depending on mode.



**9 PREAMP SWITCH [PREAMP]** (p. 23)

Turns an optional preamplifier, AG-25 or AG-35, ON and OFF.

- The transceiver applies DC voltage to the antennas when this switch is turned ON. Therefore, this switch should be set to OFF when no preamplifier is connected.
- The preamplifier can be used on one band, both bands or neither according to the selection in set mode with the [PREAMP] switch. (p. 49)



**10 ATTENUATOR SWITCH [ATT]** (p. 23)

Turns the 15 dB attenuator ON and OFF. The attenuator prevents a desired signal from distorting when very strong signals are near the desired frequency or when very strong electric fields, such as from a broadcasting station are near your location.

- The attenuator can be used on one band only or both bands according to the selection in set mode with the [ATT] switch. (p. 49)



**11 NOISE BLANKER SWITCH [NB]** (p. 22)

Turns both band's noise blankers ON and OFF. The noise blanker reduces pulse-type noise such as that generated by automobile ignition systems. This function cannot be used for FM, or non-pulse-type noise.

- The noise blanker functions for both bands simultaneously.



**12 MICROPHONE CONNECTOR [MIC]**

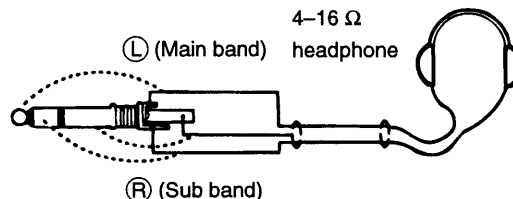
Accepts the supplied or optional microphone.

- See p. 56 for appropriate microphones.
- See p. 9 for microphone connector information.

**13 HEADPHONE JACK [PHONES]**

Accepts headphones.

- The main and sub band audio can be mixed or separated when using stereo headphones using set mode with the [M/S] switch. (p. 44)
- When headphones are connected, the internal speaker or connected external speaker does not function.

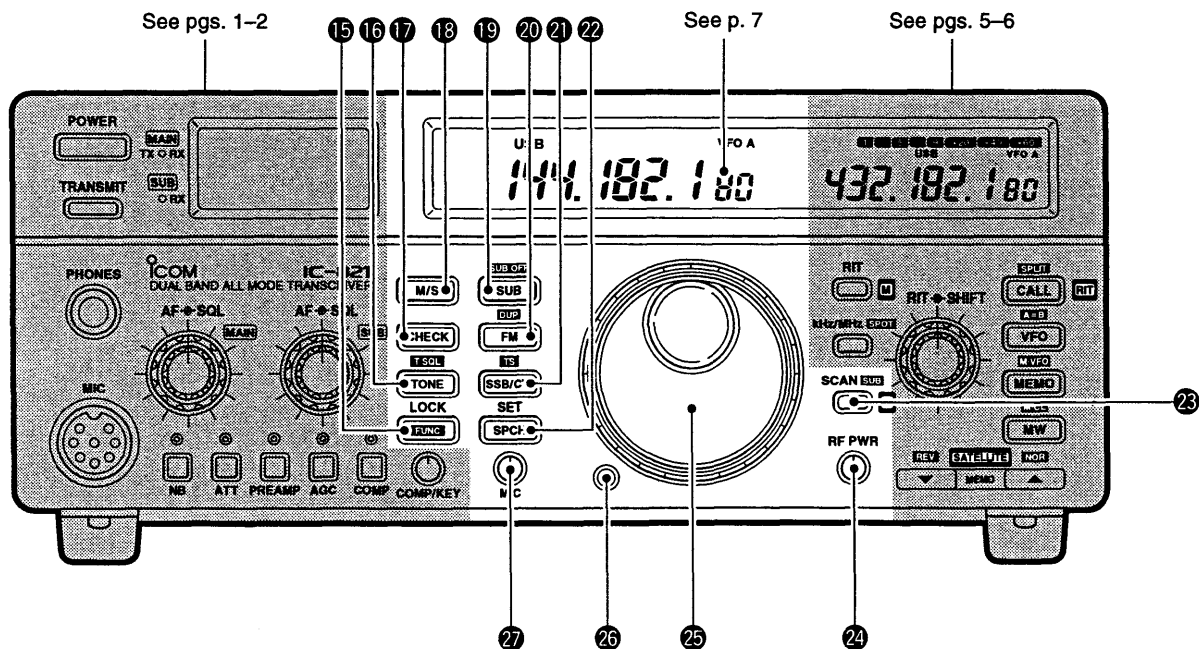


**14 TRANSMIT SWITCH [TRANSMIT]**

Selects transmitting or receiving.



# 1 PANEL DESCRIPTION



## 15 FUNCTION/LOCK SWITCH [FUNC•LOCK]

**[FUNC]**

- Activates the secondary function of some switches.
- Turns the dial lock function ON and OFF when pushed for 2 sec. (p. 19)
  - The dial lock function electronically locks the tuning dial.

**LOCK**  
**[FUNC]**

Push and hold

## 16 TONE SWITCH [TONE•T SQL] (p. 31)

**[TONE]**

- Turns the subaudible tone encoder ON and OFF in FM mode. (U.S.A. and Australia versions)
- Transmits a 1750 Hz tone call signal when pushed in FM mode. (Europe and Sweden versions)

**[TONE]**

**[FUNC]**

then

**[TSQL]**

**[TONE]**

- Activates an optional tone squelch function after pushing [FUNC] for rejecting undesired signal reception. (p. 24)
  - The tone squelch can be used on both the main and sub bands simultaneously with an optional UT-84 TONE SQUELCH UNIT.

## 17 FREQUENCY CHECK SWITCH [CHECK]

(pgs. 21, 24, 31)

Opens the squelch manually to check the operating frequency condition.

- Checks the transmit frequency simultaneously when selecting duplex or split operation.

## 18 MAIN/SUB EXCHANGE SWITCH [M/S]

- Replaces the main band's frequency and mode with the sub band's. (p. 16)
- Displays the 10 Hz digits when pushed and held.

## 19 SUB BAND SWITCH [SUB•SUB OFF] (p. 16)

**[SUB]**

- Activates the sub band access function to control the sub band's frequency/mode while standing by on the main band.
  - "SUB" appears in the function display while the function is in use.
- Toggles the sub band activation ON or OFF after pushing [FUNC]. (p. 19)

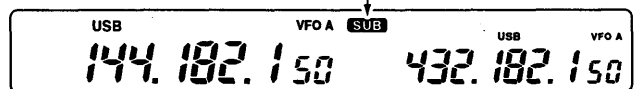
**[FUNC]**

then

**[SUB OFF]**

**[SUB]**

"SUB" appears.



## 20 FM MODE SWITCH [FM•DUP]

**[FM]**

- Selects an FM mode. (p. 19)
  - FM mode with a duplex/subaudible tone encoder setting is selected when pushing twice on the main band. (U.S.A. and Australia versions)
- Selects -duplex, +duplex or cancels duplex (simplex) on the main band in sequence after pushing [FUNC]. (p. 31)
  - An auto-repeater function is available to activate duplex and the subaudible tone encoder automatically when in a repeater frequency range. (U.S.A. and Australia versions)
- Enters the repeater range programming mode for the auto-repeater function when pushed with [FM] and [TONE] at power ON. (p. 32) (U.S.A. and Australia versions)

**[FUNC]**

then

**[DUP]**

**[FM]**

**[FM]**

and

**[TONE]**

+

**POWER**

**[ON]**

**21 SSB/CW MODE SWITCH [SSB/CW•TS]**



•Selects USB, LSB, CW or CW-Narrow\* mode in sequence. (p. 19)

\*When optional CW narrow filter is not installed, no audio is output in CW-N mode.

•Indicates accessed band's tuning step increments after pushing [FUNC]; use the tuning dial to change the tuning steps. (p. 18)



- Tuning steps can be separately selected for FM and SSB/CW.

FM : 0.1, 5, 10, 12.5, 20, 25, 100 kHz

SSB/CW : 1, 10, 50, 100 Hz

**22 SPEECH/SET MODE SWITCH [SPCH•SET]**



•Announces the accessed band's frequency, mode, etc. when an optional UT-102 VOICE SYNTHESIZER UNIT is installed. (pgs. 46, 52)



•Enters set mode when pushed for 2 sec. Push the following switch to access set mode contents. (p. 43)

Push and hold

- The [M/S], [CHECK], [TONE], [FUNC], [SUB], [FM], [SSB/CW], [RIT], [kHz/MHz], [SCAN], [ATT] and [PREAMP] switches have set mode content(s).

**23 SCAN SWITCH [SCAN•SUB•S]**



•Starts and stops the accessed band programmed scan, memory scan or mode select memory scan. (p. 38)



•Starts and stops the sub band programmed scan, memory scan or mode select memory scan after pushing [FUNC]. (p. 38)



Push in satellite mode

•Cancels the tracking function when pushed; the tuning dial changes the sub band only, for Doppler shift compensation, in satellite mode. (p. 40)



Push and hold

•Starts the optional tone scan when the tone squelch is in use and pushed for 2 sec. (p. 32)

- An optional UT-84 TONE SQUELCH UNIT is required.

**24 RF POWER CONTROL [RF PWR] (p. 25)**

Adjusts the RF output power continuously.

- VHF FM/CW 45-6 W
- SSB 35-6 W
- UHF FM/CW 40-6 W
- SSB 30-6 W



**25 TUNING DIAL (p. 18)**

Changes the displayed frequency, etc.

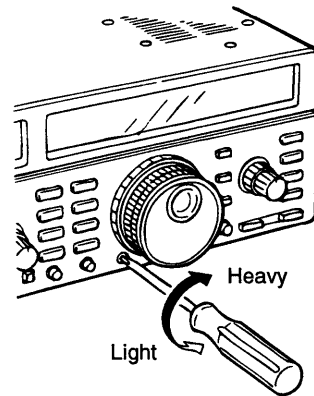
- While rotating the tuning dial in SSB/CW mode and in 1, 10 or 50 Hz tuning steps, the memory channel read-out shows below the 10 Hz-digit. This returns to channel number indication 1 sec. after tuning.

**Tuning rates** (frequency change/rotation of tuning dial)

MODE	Selected tuning step	Normal rotation	Rapid rotation
SSB, CW	1 Hz	400 Hz	4 kHz
	10 Hz	4 kHz	20 kHz
	50 Hz	10 kHz	20 kHz
	100 Hz	20 kHz	20 kHz
FM	5 kHz	250 kHz	250 kHz

**26 BRAKE ADJUSTMENT SCREW**

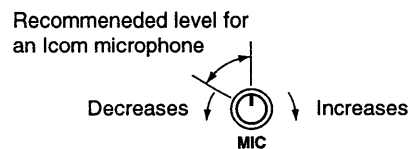
Adjusts the tuning dial tension.



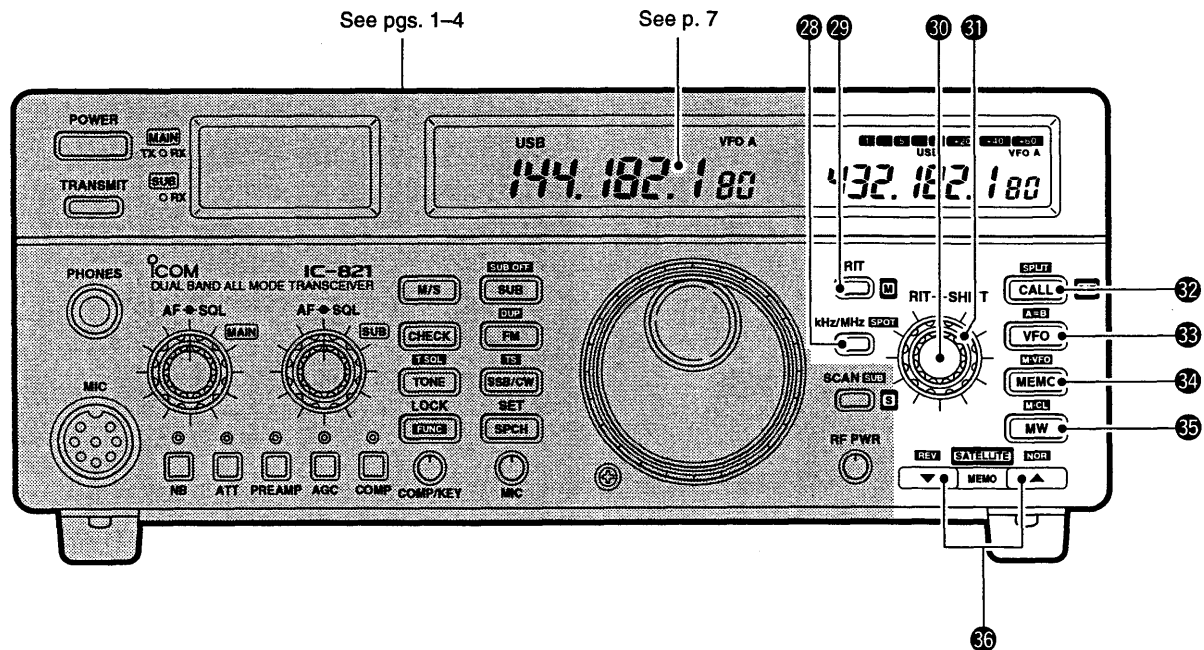
**27 MIC GAIN CONTROL [MIC] (p. 25)**

Adjusts microphone input gain.

- For SSB mode, adjust the [MIC] control so the [TX] indicator brightly illuminates (ALC activates) periodically during normal voice transmission.



# 1 PANEL DESCRIPTION



## 28 QUICK TUNING/SPOT FREQUENCY SWITCH [kHz/MHz•SPOT]

kHz/MHz SPOT



- Selects the 1 kHz or a pre-selected normal tuning step when pushed. (p. 18)

kHz/MHz SPOT



Push and hold

- Selects the 1 MHz tuning step when pushed for 2 sec. (p. 18)

FUNC



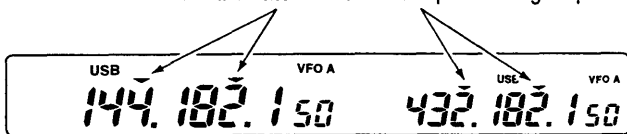
then

kHz/MHz SPOT



- Programs displayed frequency as a spot frequency for future reference after pushing [FUNC]. (p. 24)

"▼" indicates the selected quick tuning step.



## 29 RIT SWITCH [RIT•M]



- Turns the RIT function ON and OFF when pushed. (p. 21)

- Use the [RIT] control to vary the RIT frequency.



Push and hold

- Activates the sub tuning dial function according to the selection in set mode with the [RIT] switch when pushed for 2 sec. (p. 20)



Push in satellite mode

- Cancels the tracking function when pushed; the tuning dial changes the main band only in satellite mode. (p. 40)

## ✓ What is the RIT function?

The RIT (Receiver Incremental Tuning) shifts the receive frequency without shifting the transmit frequency.

This is useful for fine tuning stations calling you on an off-frequency or when you prefer to listen to slightly different sounding voice characteristics, etc.

## 30 RIT CONTROL [RIT]

- Shifts the main band receive frequency without changing the transmit frequency while the RIT function is ON. (p. 21)

- Rotate the control clockwise to increase the receive frequency, or rotate the control counterclockwise to decrease the receive frequency.

- The shift frequency range depends on mode:

SSB/CW : ±1.0 kHz in 10 Hz steps

FM : ±5.0 kHz in 50 Hz steps

- Can be used as the sub tuning dial, sub band RIT control or sub band IF shift control according to the selection in set mode with the [RIT] switch. (p. 20)

## ✓ What is the sub tuning dial?

The sub tuning dial allows you to change the frequency without using the tuning dial. Tuning speed varies according to the control rotation. However, this is not a scan function, therefore, tuning does not stop, even when detecting a signal. The control is convenient when you want to search both the main and sub bands.

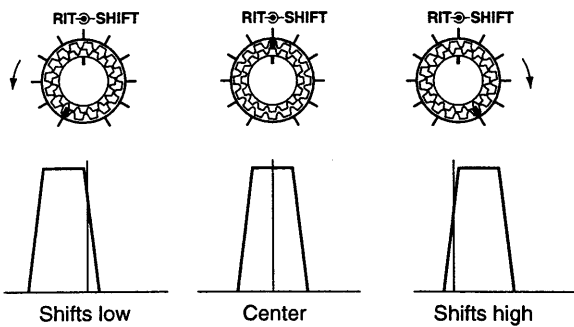


**31 IF SHIFT CONTROL [SHIFT]**

- Shifts the center frequency of the main band IF in SSB and CW modes. (p. 22)
  - The shift frequency range:  $\pm 1.2$  kHz in 100 Hz steps.
- Can be used as the sub tuning dial, sub band RIT control or sub band IF shift control according to the selection in set mode with the [RIT] switch. (p. 20)
  - See the description on the previous page for details.

**✓ What is the IF shift control?**

The IF shift electronically changes the IF passband frequency to reject interference. The IF shift is especially effective in SSB operation and is not available in FM operation.



**32 CALL SWITCH [CALL•SPLIT•RIT]**

- [CALL] [RIT] • Calls up the call channel. (p. 36)
- [CALL] [RIT] • Turns the RIT function ON and OFF while in satellite mode. (p. 39)
- [FUNC] then [SPLIT] [CALL] [RIT] • Turns the split function ON and OFF after pushing [FUNC]. (p. 26)
  - This function is available in VFO mode only.

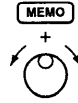
**33 VFO SWITCH [VFO•A=B]** (p. 17)

- [VFO] • Selects VFO mode and toggles VFO A and B.
- [FUNC] then [A=B] [VFO] • When pushed for 2 sec. after pushing [FUNC], equalizes the contents (frequency, operating mode, etc.) of the two VFOs.
  - The rear (undisplayed) VFO contents are equalized to the front (displayed) VFO contents.

Push and hold

**34 MEMORY SWITCH [MEMO•M▶VFO]** (p. 33)

- [MEMO] • Selects memory mode.
  - When the selected channel is not programmed, a selected band name (140 or 400) appears 2 sec. after the selection.
- [MEMO] with a dial icon • While pushed and held, the tuning dial changes the memory channel.
- [FUNC] then [MEMO] [MEMO] • When pushed for 2 sec. after pushing [FUNC], transfers the programmed contents in the selected memory channel to a VFO.
  - This function is available both in VFO and memory modes.



Push and hold

**35 MEMORY WRITE SWITCH [MW•M-CL]** (p. 33)

- [MW] • Stores displayed frequency and mode into the displayed memory channel when pushed for 2 sec.
  - This function is available both in VFO and memory modes.
- [FUNC] then [M-CL] [MW] • Clears memory channel contents when pushed for 2 sec. after pushing [FUNC].
  - This switch does not function in VFO mode.

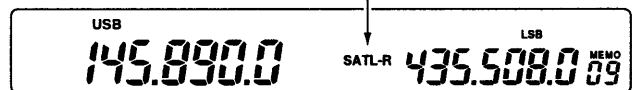


Push and hold

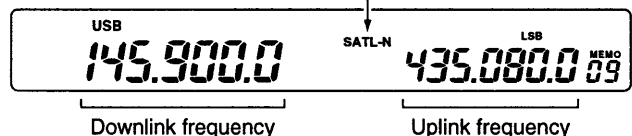
**36 MEMORY UP/DOWN SWITCHES [MEMO UP/DOWN-SATELLITE NOR/REV]** (pgs. 33, 39)

- [▲] or [▼] • Select the memory channel number.
  - Memory channel can be selected both in VFO and memory modes.
- [FUNC] then [NOR] [▲] or [REV] [▼] • Enter satellite mode after pushing [FUNC] to track the main and sub bands frequencies.
  - When selecting satellite mode, the [VFO] switch selects satellite VFO mode and the [MEMO] switch selects satellite memory mode.
- [FUNC] then [NOR] [▲] or [REV] [▼] • Exit satellite mode after pushing [FUNC].
- [FUNC] then [NOR] [▲] or [REV] [▼] • Enter and exit satellite mode using the current operating frequencies when pushing one of these for 2 sec. after pushing [FUNC].

[FUNC] then [REV] [▼] Indicates reverse tracking for the uplink and downlink frequencies.



[FUNC] then [NOR] [▲] Indicates normal tracking for the uplink and downlink frequencies.



**Count on us!**

