FOREWORD

ICOM's new, multi-function IC-761 all solid state HF transceiver is designed to answer the increasing demand of today's Amateur radio operators for higher precision, sophisticated radio communications. The IC-761 incorporates the latest in ICOM engineering advances in solid state transceiver design such as a higher dynamic range for receiving and greater quality final amplifier circuits.

In the past, ICOM HF transceivers have been used on various DX-peditions in many countries. Their performances on those occasions have helped establish their reputation for excellence among Amateur radio operators all over the world today. An added benefit of these DX-peditions has been the positive response from Amateur users to ICOM's advanced HF automatic antenna tuners which provide comprehensive, uncomplicated antenna tuning operations on the HF bands. Feedback to ICOM from Amateur users everywhere has therefore been very instrumental in the design effort to provide the finest HF equipment available to Amateurs.

The result of this feedback is the IC-761, an all mode, multi-purpose base station HF transceiver with general coverage and advanced HF automatic antenna tuning capability.

To thoroughly understand the capabilities of your new IC-761, please study this instruction manual carefully before attempting operation. If you have additional questions regarding the operation or capabilities of the IC-761, feel free to contact your nearest ICOM Dealer or Service Center.

<table>
<thead>
<tr>
<th>UNPACKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessories included with the IC-761:</td>
</tr>
<tr>
<td>1 AC cord</td>
</tr>
<tr>
<td>2 DC power plug</td>
</tr>
<tr>
<td>3 External speaker plug</td>
</tr>
<tr>
<td>4 CW key plug</td>
</tr>
<tr>
<td>5 Pin plugs (RCA plugs)</td>
</tr>
<tr>
<td>6 Spare fuses for AC line (See below)</td>
</tr>
<tr>
<td>7 Spare fuses for DC line (5A)</td>
</tr>
<tr>
<td>8 Spare fuses for 13.8V DC OUTPUT (2A)</td>
</tr>
</tbody>
</table>

120V AC type : 10A
220 ~ 240V AC type : 5A
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1. PRECAUTIONS AND PREPARATIONS

**INSTALLATION PRECAUTIONS**

1. Avoid using the IC-761 in the following situations:
   a. Where temperatures under $-10^\circ$C or over $+60^\circ$C are encountered. For example, DO NOT use the IC-761 in areas exposed to direct sunlight or near heat-producing devices such as heaters or ranges.
   
   b. In humid or moist places including bathrooms.

2. DO NOT run the antenna feedline near electronic instruments or magnetic compasses.

3. DO NOT place the transceiver within the reach of babies or small children when turning the transceiver ON.

4. DO NOT place any liquids on or near the transceiver as spilling could result in fire risk or electric shocks.

5. An extension cord should not be used unless absolutely necessary. Use of improper extension cords could result in fire risk or electric shocks.

6. DO NOT let metal strips, wire, etc., come into contact with internal components in the transceiver.

**GROUNDING**

To prevent electrical shocks, TVI, BCI and other problems, be sure to ground the transceiver through the GROUND TERMINAL. For best results, use the heaviest gauge wire or strap available and make the connection as short as possible.

ONLY use a city water pipe as a good earth point if the pipe is well grounded and made of metal. NEVER use a gas pipe or electrical conduit pipe for grounding.

![NO](image1)  ![OK](image2)

- **NEVER** use a gas pipe or electrical conduit pipe for grounding.
- **USE** the heaviest gauge wire or strap available and make the connection as short as possible.

**ANTENNA**

Antennas play a very important role in radio communication. If the antenna is inferior, your transceiver cannot give you the best performance. A well-matched $50\Omega$ antenna and feedline will provide the desired performance.
2. FEATURES

COMPLETE HF TRANSCEIVER

- BUILT-IN AUTOMATIC ANTENNA TUNER
  The IC-761 is equipped with an advanced HF antenna tuner system for quick, complete, and well matched antenna performance.

- FULL BREAK-IN FUNCTION
  Full break-in as well as semi break-in operation are provided for smooth, fast, and natural CW conversations.

- BUILT-IN ELECTRONIC KEYER FUNCTION
  Automatic keying is possible in the IC-761 with the simple connection of an iambic paddle. The number of dots and dashes can be controlled by the operator with the result that CW operation is easier and more enjoyable.

- BUILT-IN HIGH STABILITY CRYSTAL UNIT
  The IC-761 has a built-in high stability crystal unit which incorporates a temperature-compensating oven heater, resulting in a frequency stability of less than ±100Hz at −10°C to +60°C.

OUTSTANDING RECEIVER PERFORMANCE

- GENERAL COVERAGE RECEIVER
  The IC-761 features general coverage receive capability with a tuning range from 100kHz to 30MHz. This wide range is accomplished by means of up-conversion using a high side IF and a CPU control system.

- ICOM’S DFM SYSTEM
  The ICOM DFM (Direct Feed Mixer) feeds the incoming signals directly into a high level first mixer developed by ICOM. This advanced system produces a higher spurious response rejection ratio, a higher receiver sensitivity and a wider dynamic range.

- 105dБ DYNAMIC RANGE
  The IC-761 has a 105dB dynamic range. Even with the PREAMP switched ON, the dynamic range is approximately 100dB.

LARGE MEMORY CAPACITY CPU INSTALLED

- 32 MEMORIES
  Thirty-two programmable memories are provided to store mode and frequency, and the CPU is backed up by an internal lithium battery to maintain the memories for up to ten years.

- ADVANCED REMOTE CONTROL SYSTEM
  Full communications using a personal computer equipped with an RS-232C jack are possible by using the serial port mounted on the rear panel of the IC-761. The computer controls frequency, mode, VFO A/B selection, and memories when an appropriate interface is used. The serial port uses a standard 1200bps data rate.

- SCANNING VERSATILITY
  The IC-761 incorporates a total of four separate scanning functions for easy access to a wide range of frequencies.

- 2 -
3. CONTROL FUNCTIONS

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2. WAIT INDICATOR (p. 6)
3. POWER SWITCH (p. 6)
4. TRANSMIT/RECEIVE SWITCH (p. 6)
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6. MONITOR SWITCH (p. 6, 30, 42)
7. TUNER SWITCH (p. 6, 37)
8. FUNCTION INDICATOR (p. 12)
9. DIAL LOCK INDICATOR (p. 12)
10. RECEIVE INDICATOR (p. 12)
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11. NB LEVEL CONTROL (p. 7, 43)
12. METER SWITCH (p. 7, 46)
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RIT/ΔTX TUNING CONTROL (p. 15, 39)
3-1 FRONT PANEL

① TUNER INDICATOR [TUNER]  
Lights up when the built-in antenna tuner is turned ON.

② WAIT INDICATOR [WAIT]  
Lights up while the tuning capacitors in the antenna tuner move to preset positions.

③ POWER SWITCH [POWER]  
This is a push-lock switch which controls the input AC power to the IC-761.

④ TRANSMIT/RECEIVE SWITCH  
This switch is used to manually switch the transceiver from transmit to receive mode and vice versa.

⑤ SPEECH COMPRESSOR SWITCH [COMP]  
This switch turns the built-in speech compressor circuit ON and OFF.  
(p. 30, 43)

⑥ MONITOR SWITCH [MONI]  
This switch turns the monitor circuit ON and OFF.  
(p. 30, 42)

⑦ TUNER SWITCH [TUNER] (p. 37)  
This switch turns the built-in antenna tuner ON and OFF.  
- Output power bypasses the built-in antenna tuner when the [TUNER] SWITCH is in OUT (OFF) position.
9 VOX DELAY CONTROL [VOX DELAY] (p. 44)
This control changes the transmit to receive switching time. Adjust it so transmit to receive switching occurs during pauses in your speech or CW transmission.

9 ELECTRONIC KEYER SPEED CONTROL [ELEC-KEY SPEED] (p. 32)
This control varies the keying speed between 5 and 45wpm when operating in CW mode with the [ELEC-KEY] turned ON. (See item 9)

9 NOISE BLANKER LEVEL CONTROL [NB LEVEL] (p. 43)
This control varies the threshold level of the noise blanker. Adjust to remove the noise without adding distortion to the received signal.

10 METER SWITCH [METER] (p. 46)
In transmit mode, the front panel meter has six functions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vc</td>
<td>Indicates the collector voltage of the final transistors.</td>
</tr>
<tr>
<td>Ic</td>
<td>Indicates the collector current of the final transistors.</td>
</tr>
<tr>
<td>COMP</td>
<td>Indicates the compression level when the speech compressor is in use.</td>
</tr>
<tr>
<td>ALC</td>
<td>Indicates the ALC level. The ALC circuit begins to function when the RF output power reaches a preset level.</td>
</tr>
<tr>
<td>Po</td>
<td>Indicates the approximate output power.</td>
</tr>
<tr>
<td>SWR</td>
<td>Indicates the SWR of the antenna system.</td>
</tr>
</tbody>
</table>

11 AUTOMATIC GAIN CONTROL SWITCH [AGC] (p. 42)
This switch changes the time constant of the AGC circuit.

13 NOISE BLANKER SWITCH [NB] (p. 43)
This switch turns ON the noise blanker circuit to reduce pulse-type noise such as that generated by automobile ignition systems.

Use this switch with the NOISE BLANKER LEVEL CONTROL described in item 9.
The blanking time of the noise blanker circuit may be set for NORMAL or WIDE with this switch. Use this switch with the NOISE BLANKER LEVEL CONTROL described in item 10.

- To activate the [NB WIDE] SWITCH, push IN the [NB] SWITCH.

This key turns the electronic keyer function ON and OFF when operating in CW mode. Manual CW operation only is possible when the switch is OFF.

This switch turns the VOX circuit ON and OFF. The automatic T/R switching VOX circuit functions in the PHONE and CW modes when the switch is IN. In CW mode, semi break-in or full break-in operation is possible.

This switch selects semi or full break-in operation for CW operating purposes when CW mode is selected.

Adjust this control for a suitable modulation level while speaking into the microphone using your normal voice level. Rotate the control clockwise to increase the gain.

This control sets the squelch threshold level. To turn OFF the squelch function, rotate this control completely counterclockwise. To set the threshold level higher, rotate the control clockwise.

Adjust this control clockwise until the green [RECEIVE] INDICATOR just goes out while no signal is being received.

This control varies the audio output level in receive mode. Clockwise rotation increases the level.
This switch selects the RF preamplifier to amplify weak receive signals or the RF attenuator (20dB) to prevent overloading of the receiver.

This jack accepts a standard 1/4 inch plug from headphones with an impedance of 4 ~ 16Ω. Stereo headphones may be used without modification.

This control varies the gain of the RF stage when the transceiver is in receive mode. Rotate the control fully clockwise for maximum gain. When tuning in SSB or CW mode, the S-meter needle rises as the control is rotated counterclockwise and only those signals stronger than the level indicated by the needle are heard.

This control varies the receive audio tone. Adjust the control to provide the clearest, most pleasing audio.

This control varies the RF output power from 10W to maximum.

- **SSB** : 100W PEP
- **CW, RTTY, FM** : 100W
- **AM** : 4W ~ 40W

Rotate the control clockwise to increase the output power. Use the minimum power necessary for reliable communication.

Connect a suitable microphone to this connector. The optional HM-36 HAND MICROPHONE, SM-8 or SM-10 DESK MICROPHONE may be used.

This switch turns the MARKER circuit ON and OFF. A calibration marker is generated every 10kHz when the circuit is activated.
This control varies the marker frequency. Use an accurate standard frequency source such as radio station WWV/WWVH to calibrate the marker generator.

This control changes the audio level of the monitor circuit when the [MONI] SWITCH is turned ON. Adjust the control for the desired monitor volume.

This control increases and decreases the sensitivity of the VOX circuit. When operating in the SSB, AM or FM mode, adjust the control so the VOX circuit activates at a normal speech level.

When using the VOX function, sound from the speaker may cause unwanted switching of the T/R relay. Adjust this control in conjunction with the [VOX GAIN] CONTROL so the T/R relay switches only from the operator's voice and not from the speaker audio.

This switch activates the secondary switch functions on the front panel as indicated by the reverse-image lettering (white letters on a black background).

Rotate this control to change the frequency.

<table>
<thead>
<tr>
<th>TUNING CONTROL</th>
<th>FREQUENCY STEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow rotation</td>
<td>10Hz step</td>
</tr>
<tr>
<td>Rapid rotation</td>
<td>60Hz step</td>
</tr>
<tr>
<td>[TS] SWITCH : ON</td>
<td>1kHz step</td>
</tr>
<tr>
<td></td>
<td>5kHz/rotation</td>
</tr>
<tr>
<td></td>
<td>25kHz/rotation</td>
</tr>
<tr>
<td></td>
<td>500kHz/rotation</td>
</tr>
</tbody>
</table>

This switch electronically locks the IC-761 on the currently displayed frequency and deactivates the TUNING CONTROL.
This switch activates the optional IC-EX310 SPEECH SYNTHESIZER UNIT which announces the displayed frequency in English.

These switches select any of the eight operating modes.

<table>
<thead>
<tr>
<th>MODE</th>
<th>SWITCH OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSB</td>
<td>Push SSB SWITCH</td>
</tr>
<tr>
<td>SSB REVERSE</td>
<td>Push FUNC + SSB</td>
</tr>
<tr>
<td>CW</td>
<td>Push CW SWITCH</td>
</tr>
<tr>
<td>CW NARROW (NAR)</td>
<td>Push + CW SWITCH</td>
</tr>
<tr>
<td>RTTY</td>
<td>Push RTTY SWITCH</td>
</tr>
<tr>
<td>RTTY NARROW (NAR)</td>
<td>Push + RTTY SWITCH</td>
</tr>
<tr>
<td>AM</td>
<td>Push AM SWITCH</td>
</tr>
<tr>
<td>FM</td>
<td>Push FUNC + AM</td>
</tr>
</tbody>
</table>

This switch selects VFO A or VFO B for tuning purposes. Each push of this switch selects one of the two VFOs alternately.

Push this switch to increase the tuning rate to 1kHz while in any operating mode. The 100Hz digit on the FREQUENCY DISPLAY clears to “0” simultaneously.

This switch instantly matches the frequency and mode of operation of the two VFOs. The display does not change when this switch is pushed. However, confirmation of the equalizing process is possible by pushing the [VFO A/B] SWITCH to check the frequency and mode of the opposite VFO.
This switch selects the relationship of the two VFO frequencies. In the IN position, one VFO is for receive while the other VFO is for transmit. Each alternate push of this switch chooses the simplex and duplex modes.

This switch selects either the VFO or MEMORY CHANNEL mode for tuning purposes.

The KEYBOARD directly sets the operating frequency in VFO or memory modes.

Each push increases or decreases the operating band. Less significant digits do not change.

In receive mode, the IC-761 front panel meter acts as an S-meter (signal strength meter). In transmit mode, the meter has six different functions as stated in item 11 [METER] SWITCH.

This indicator lights up when the IC-761 is in transmit mode.

This indicator lights up when the IC-761 is in receive mode.

This indicator lights up when the DIAL LOCK function is activated.

This indicator lights up when the FUNCTION SWITCH is pushed.
The IC-761 FREQUENCY DISPLAY gives an easy-to-read, comprehensive display of operating mode, functions, frequencies and memory channels. See items ⑤ to ⑦ for more information.

This switch changes the IC-761 between the HAM BAND and GENERAL COVERAGE modes.

HAM BAND MODE:
The transceiver functions on any of the HF amateur bands from 1.8 to 28MHz.

GENERAL COVERAGE MODE:
The transceiver functions on all frequencies from 0.1 to 30MHz. The IC-761 does not transmit while in the GENERAL COVERAGE mode.

This switch turns the selective mode function ON and OFF. If the switch is IN:

- Only memory channels with the same mode as displayed before the switch was pushed can be selected by the [MEMORY-CH] CONTROL.
- Only memory channels with the same mode as displayed before the switch was pushed can be scanned during MEMORY SCAN operation.

This switch starts and stops all scan functions. When the scan restarts, it begins from the frequency the scan halted on while in programmed scan mode, or from the highest memory channel while in memory mode.

This switch turns the NOTCH FILTER circuit ON and OFF. Adjust the [NOTCH] CONTROL (described in item ⑦) to reduce interference.

This switch selects a different combination of the second IF (9MHz) filter and the third IF (455kHz) filter to vary the overall selectivity.
This switch turns the IF SHIFT function ON and OFF. Adjust the [PBT/IF SHIFT] CONTROL (described in item 4) to reduce interference from adjacent frequency signals.

This control allows continuous tuning of the receive selectivity when using the SSB, CW or RTTY mode. The IF SHIFT function works when the [IF SHIFT] SWITCH is ON. Either the PBT or IF SHIFT function works at the same time.

This control shifts the notch filter frequency when the [NOTCH] SWITCH is ON. Adjust the control to minimize interference.

This switch stores the displayed operating frequency and mode information in the memory channel indicated on the FREQUENCY DISPLAY. Memory writing is possible in either VFO or MEMORY CHANNEL mode.

This switch operates differently depending on which mode the IC-761 is in.

- **In VFO mode**, the frequency and mode stored in the memory channel displayed transfer to the selected VFO.
- **In MEMORY CHANNEL mode**, the displayed frequency and mode transfer to the VFO used immediately prior to changing to MEMORY CHANNEL mode.

**In VFO mode**

```
<table>
<thead>
<tr>
<th>VFO A</th>
<th>14.230.0</th>
<th>01</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEMO CH-01</td>
<td>7.057.0</td>
<td>01</td>
</tr>
</tbody>
</table>
```

**In MEMORY CHANNEL mode**

```
| MEMO CH-01 | 7.057.0 | 01 |
| VFO A | 14.230.0 | 01 |
```
This switch clears the memory which contains the frequency shift information as set with the [RIT/ΔTX] CONTROL and resets the small incremental tuning display to “0.0”.

Push the [FUNC] SWITCH first, then this switch in order to add the shifted frequency to the frequency on the main FREQUENCY DISPLAY.

This switch turns the variable transmit frequency circuit ON and OFF. When the circuit is activated, the “ΔTX” INDICATOR on the front panel lights up and the amount of shift is indicated.

This switch turns the variable receive frequency circuit ON and OFF. When the circuit is activated, the letters “RIT” on the front panel light up and the amount of shift is indicated.

This control is used for selecting memory channels.

This control shifts the receive or transmit frequency by up to 9.9kHz to either side of the frequency indicated on the main FREQUENCY DISPLAY.

3-2 FREQUENCY DISPLAY

This area of the FREQUENCY DISPLAY shows the operating mode currently selected. The modes available are FM, AM, CW, USB, LSB and RTTY.

“SCAN” lights up whenever a scan function is selected.

This readout shows the operating frequency using 6 digits and 100Hz resolution.
“NARROW” lights up when the narrow CW or narrow RTTY filter is selected.

“RIT” or “ΔTX” lights up when the receive or transmit incremental tuning function is activated, respectively. The direction and quantity of the shift is also shown. Both functions may be activated simultaneously if desired.

“MEMO” lights up when the memory mode is selected. A selected memory channel number from 01 to 32 is also shown.

“VFO A” or “VFO B” lights up to indicate which VFO is currently selected.

“SPLIT” lights up when separate VFOs are used for the transmit and receive frequencies. This allows operation with a transmit frequency which is different from the receive frequency.

“GENE” lights up when the IC-761 is in GENERAL COVERAGE mode. When “GENE” does not light up, the transceiver is in HAM BAND mode.

3-3 REAR PANEL

ANTENNA CONNECTOR [ANT] (p. 19, 20)

Connect a 50Ω impedance antenna to this connector. The connector mates with a PL-259 plug.

KEY JACK [KEY] (p. 20, 32)

For CW operation, connect a CW key using the supplied standard 1/4 inch, 3-conductor plug. The terminal voltage from external electronic keyers must be less than 0.4V DC.

When using the built-in electronic keyer function connect an iambic keyer paddle using the supplied 1/4 inch, 3-conductor plug.
1. EXTERNAL SPEAKER JACK [EXT SP] (p. 20)
Connect an external speaker to this jack, if required. Use a speaker with an impedance of 4 ~ 16Ω and remember the built-in speaker does not function when using the EXTERNAL SPEAKER JACK.

2. ACCESSORY SOCKETS (1), (2) [ACC (1)], [ACC (2)] (p. 24)
This connector provides signals such as T/R switching, receiver output, ALC input, etc.

3. EXTERNAL ALC JACk [ALC]
This jack accepts an automatic level control signal from an external amplifier or transverter. The ALC voltage must be in the range of 0 ~ -3V.

4. RECEIVE INPUT JACK [RECEIVE ANT IN]
This is an input jack which connects to the receiver RF stage. An attenuator or preamplifier may be connected between the RECEIVE INPUT JACK and RECEIVE ANTENNA OUTPUT JACK.

5. SPARE JACK [SPARE]
This jack is not used. It may be useful for connecting a personal accessory.

6. GROUND TERMINAL [GND] (p. 19)
To prevent electrical shocks, TVI, BCI and other problems, be sure to ground the equipment through the GROUND TERMINAL. For best results, use the heaviest gauge wire or strap available and make the connection as short as possible.
8 TRANSVERTER JACK [X-VERTER]

Connect a suitable transverter to this jack for operation on VHF/UHF frequencies. The output is approximately 30mV.

10 RECEIVE ANTENNA OUTPUT JACK [RECEIVE ANT OUT]

The receive signals from the ANTENNA CONNECTOR pass through the transmit/receive antenna switching circuit to this jack. Normally, the receiver IN and OUT jacks are connected together with a jumper. The ANTENNA OUTPUT JACK is useful when operating with a separate receiver or an external preamplifier.

11 T/R CONTROL JACK [RELAY] (p. 21)

This jack goes to ground level when the IC-761 is in transmit mode and controls the TX/RX switching of an external amplifier or transverter.

**DO NOT attempt greater than 30V DC, 1A (100V AC, 0.5A).**

12 13.8V DC OUTPUT JACK [DC OUT] (p. 20)

This jack provides 13.8V DC, 2A.

14 FUSE HOLDER [FUSE] (p. 56)

This holder contains the fuses for AC power supply. Use the spare fuses provided to replace an old or damaged fuse.

- 120V AC type : 10A
- 220 ~ 240V AC type : 5A

15 AC POWER SOCKET [AC] (p. 20)

The AC POWER SOCKET connects the IC-761 to AC outlets via the supplied AC cord.

16 REMOTE CONTROL JACK (CI-V) [REMOTE] (p. 26)

This is a communications port designed for use with a personal computer for remote operation of transceiver functions.
4. INSTALLATION

4-1 UNPACKING

Carefully remove your transceiver from the packing carton and examine it for signs of shipping damage. Should any be apparent, notify the delivering carrier or dealer immediately, stating the full extent of the damage. It is recommended you keep the shipping cartons.

See the diagram and description on the FOREWORD page of this manual for accessory equipment included with the IC-761.

4-2 PLANNING

Select a location for your transceiver which allows free access to the front controls, good air circulation and rear clearance for access to the cable connectors.

4-3 ANTENNA

Antennas play a very important role in radio communications. If the antenna is inferior, your transceiver cannot deliver optimum performance. A well-matched 50Ω antenna and feedline will provide the desired effect. The transmission line should be a coaxial cable. The antenna system should show a VSWR of less than 1:1.5 when using a 50Ω coaxial transmission line.

**CAUTION:** Protect your transceiver from LIGHTNING by using a lightning arrester.

- Dipole antenna
- Multi-band Yagi beam antenna

**PL-259 connector installation**

1) Slide the coupling ring over the coaxial cable.

2) Strip the cable as in the figure, and tin about 13mm (1/2") of the shield conductor. Remove the outer plastic casing and strip the center conductor insulation as in the figure. Tin the center conductor.

3) Slide the connector body onto the cable and solder.

4) Screw the coupling ring onto the connector body.

1 inch = 25.4mm

4-4 GROUNDING

To prevent electrical shocks, TVI, BCI and other problems, be sure to ground the transceiver through the GROUND TERMINAL. For best results, use the heaviest gauge wire or strap available and make the connection as short as possible. (See page 1)
4-5 REAR PANEL CONNECTIONS

- Dipole antenna
- Yagi beam antenna

- Straight key connection
- Iambic paddle connection

See page 24.

DC plug connections
Output voltage: 13.8V
Current capacity: Max. 2A

See page 26.

- SP-20 Optional speaker

The SP-20 is equipped with four audio network filters.

See page 1 for detailed grounding information.

For use with an external linear amplifier. See page 21.
5. SYSTEM INTERCONNECTIONS

5-1 EXTERNAL LINEAR AMPLIFIER

The IC-761 is designed to operate into a load with 50Ω impedance. Therefore, any amplifier used must have 50Ω input impedance for best efficiency.

(1) USING THE ICOM IC-2KL LINEAR AMPLIFIER

The optional 500W, solid-state IC-2KL LINEAR AMPLIFIER may be easily connected to the IC-761 with the cables supplied with the amplifier in the same way as other ICOM transceivers. Refer to the IC-2KL instruction manual for details.

(2) USING NON-ICOM EXTERNAL AMPLIFIERS

The [RELAY] JACK on the rear panel of the IC-761 supplies an output from a built-in keying relay for an external amplifier. The [ALC] JACK is an input for the automatic level control signal from an external amplifier.

The specification for the keying relay is 30V DC, 1A (100V AC, 0.5A) maximum. **DO NOT** exceed this limit.

- Using a non-ICOM external amplifier

---

- Using the ICOM IC-2KL

---
5-2 EXTERNAL ANTENNA TUNER

It is recommended that the ICOM IC-AT500 HF AUTOMATIC ANTENNA TUNER be used between the IC-2KL LINEAR AMPLIFIER and the antenna system for maximum transceiver performance.

(1) USING THE IC-AT500

When using the ICOM IC-2KL with the IC-761, it is not necessary to turn the IC-761 built-in antenna tuner ON.

(2) USING THE AH-2

The AH-2 HF ALL BAND ANTENNA TUNER is equipped with a serial bus line and may be connected to the IC-761 and used in conjunction with the ICOM CI-V System.

1) Connect cables as shown in the diagram.

2) Set S-2, S-4 and S-5 on the S2 SWITCH in the OFF position. See page 64 for the exact location of S2 in the IC-761.

3) Turn OFF (OUT) the [TUNER] SWITCH on the IC-761 front panel while operating the AH-2.
5-3 RTTY TERMINAL UNIT

When operating RTTY, connect the ACC(1) SOCKET pin 1 and pin 2 (ground) via a high speed relay or through a level converter for conversion to TTL level to your teletypewriter. The audio tones for your terminal are available from pin 5 and pin 2 (ground). The AF output level is about 300mV for an S9 signal.

- Using a high speed relay
- Using a level converter

5-4 AFSK TERMINAL UNIT

When operating an AFSK such as RTTY, AMTOR or PACKET, connect the ACC(1) as in the diagram below:

- Using the ACC(1) SOCKET
- Using the MIC CONNECTOR
5-5 SSTV UNIT

SSTV (Slow Scan Television) operation is also possible with the IC-761.

- Connect the CAMERA OUTPUT on your SSTV Unit to pin 4 in the ACC(1) SOCKET or pin 1 in the MIC CONNECTOR.
- An audio output signal is available from pin 5 and pin 2 (GROUND). See page 25 for ACC(1) SOCKET information.

5-6 MIC CONNECTOR INFORMATION

<table>
<thead>
<tr>
<th>PIN NO.</th>
<th>FUNCTION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>MIC INPUT</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>+8V DC OUTPUT</td>
<td>Max. 10mA</td>
</tr>
<tr>
<td>③</td>
<td>FREQ UP</td>
<td>Ground</td>
</tr>
<tr>
<td>④</td>
<td>FREQ DOWN</td>
<td>Ground through a 47Ω resistor</td>
</tr>
<tr>
<td>⑤</td>
<td>SQL OPEN</td>
<td>&quot;LOW&quot; level</td>
</tr>
<tr>
<td>⑥</td>
<td>SQL CLOSE</td>
<td>&quot;HIGH&quot; level</td>
</tr>
</tbody>
</table>

CAUTION: DO NOT short pin 2 to GROUND as this can damage the inside 8V regulator.

5-7 ACCESSORY SOCKET INFORMATION

- ACC(1) SOCKET (Rear panel view)
- ACC(2) SOCKET (Rear panel view)

The DIN type ACCESSORY SOCKETS are installed on the rear panel of the IC-761. The function of each socket is as follows:

ACC(1): Connects a phone patch, RTTY, AFSK, and Terminal Units or other equipment. (See page 25)

ACC(2): Connects an ICOM IC-AT500 HF AUTOMATIC ANTENNA TUNER or IC-2KL HF LINEAR AMPLIFIER. (See page 25)
### ACC(1) SOCKET INFORMATION

<table>
<thead>
<tr>
<th>PIN NO.</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATION</th>
</tr>
</thead>
</table>
| 1       | RTYK     | This terminal is for control of RTTY keying. | "H" level: More than 2.4V  
"L" level: Less than 0.6V  
Less than 2mA |
| 2       | GND      | This terminal connects to GROUND. | Connected in parallel with ACC(2) pin 2. |
| 3       | SEND     | The transceiver switches to transmit mode when this terminal is grounded. It is grounded when the [TRANSMIT/RECEIVE] SWITCH is placed in the [TRANSMIT] position. | Bi-directional terminal  
Ground level: -0.5 ~ +0.8V  
Output current: Less than 20mA  
Connected in parallel with ACC(2) pin 3. |
| 4       | MOD      | This is a modulator input terminal, and is connected in the modulator circuit. | Input imp.: 10kΩ  
Input level: Approx. 100mV rms |
| 5       | AF       | Output from the receiver detector stages. | Output imp.: 4.7kΩ  
Output level: 100 ~ 300mV |
| 6       | SQLS     | This terminal goes to ground level when the SQUELCH opens. | SQL open: Less than 0.3V  
SQL closed: More than 6.0V |
| 7       | 13.8V    | 13.8V DC output is switched by the [POWER] SWITCH on the front panel. | Output current: Max. 1A  
Connected in parallel with ACC(2) pin 7. |
| 8       | ALC      | Input for external ALC voltage. | Control voltage: -3 ~ 0V  
Input imp.: More than 10kΩ  
Connected in parallel with ACC(2) pin 5. |

### ACC(2) SOCKET INFORMATION

<table>
<thead>
<tr>
<th>PIN NO.</th>
<th>PIN NAME</th>
<th>DESCRIPTION</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8V</td>
<td>Output reference voltage for band switching.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Ground</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>SEND</td>
<td>Same as ACC(1) pin 3.</td>
<td>Connected in parallel with ACC(1) pin 3.</td>
</tr>
<tr>
<td>4</td>
<td>BAND</td>
<td>Output for external band switching.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>ALC</td>
<td>Same as ACC(1) pin 8.</td>
<td>Connected in parallel with ACC(1) pin 8.</td>
</tr>
</tbody>
</table>
| 6       | TRV      | Input for controlling power amplifier in the transceiver. This terminal is used when operating with a transverter. | Input voltage: 2 ~ 13.8V DC  
Input imp.: More than 10kΩ |
| 7       | 13.8V    | Same as ACC(1) pin 7. | Connected in parallel with ACC(1) pin 7. |
ICOM has introduced a new remote control Local Area Network, the ICOM Communication Interface-V (CI-V) System using the CSMA (Carrier Sense Multiple Access with Collision Detection) standard.

Transmitters and receivers using the ICOM CI-V System exchange serial information in the PACKET format. The contents of a data PACKET can be changed by using the S1 and S2 SWITCHES on the LOGIC (A) UNIT as shown in the diagram.

- A serial data bus carries all control data. Operation is possible using an optional CT-17 LEVEL CONVERTER with a personal computer equipped with an RS-232C serial port.

Up to four ICOM CI-V transceivers can be connected to a personal computer via the CT-17.

The baud rate (data transfer rate) can be changed using s-1 and s-2 on the S1 SWITCH. The baud rate is set for 1200bps of the standard ICOM CI-V baud rate.

<table>
<thead>
<tr>
<th>Baud rate</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>9600</td>
<td>ON</td>
</tr>
<tr>
<td>1200</td>
<td>OFF</td>
</tr>
<tr>
<td>300</td>
<td>ON</td>
</tr>
</tbody>
</table>

**NOTE:**
The standard ICOM CI-V baud rate is 1200bps.

Transceive operation is possible using the IC-761 with another transceiver such as the IC-735 HF TRANSCEIVER. Either transceiver can be used as the transmitter or receiver.

These switches determine the frequency band of the transceiver.

The switches must be set as in the diagram.

The ON position of one of the six switches sets an independent address for your IC-761.
6. GENERAL OPERATION

6-1 INITIAL SETTINGS

After all INSTALLATION instructions have been followed in SECTION 4, including connecting an antenna system, set the controls and switches as shown in the diagram below.

1) Make sure the [POWER] SWITCH is OFF, then plug the AC cord into a domestic AC power outlet.

2) An antenna must be connected to the ANTENNA CONNECTOR.

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

- See page 37 for operating the built-in antenna tuner if needed.

3) A ground connection must be made through the GROUND TERMINAL. See page 1 for detailed information.

![Diagram of initial settings](image)

6-2 FREQUENCY SETTINGS

(1) USING THE TUNING CONTROL

1) **TUNING CONTROL:**
   Rotate the TUNING CONTROL to change the frequency in 10Hz steps while in any operating mode. Turning the TUNING CONTROL faster automatically shifts the tuning increments to 50Hz.

2) **TUNING SPEED SWITCH [TS]:**
   When the [TS] SWITCH is pushed IN, the operating frequency shifts in 1kHz increments while in any operating mode as the TUNING CONTROL is turned.

3) **BAND UP/DOWN SWITCH [UP] [DOWN]:**
   Push these switches to change the operating frequency bands. In HAM BAND mode, the VFO frequencies selected on each band are the initialization frequencies. In GENERAL COVER-AGE mode, only the 10 and 1MHz digits of the FREQUENCY DISPLAY change.

Downloaded by RadioAmateur.EU
(2) Using the KEYBOARD

1) When setting the desired frequency, the displayed frequency already visible disappears.

2) The keyed-in figure for a new frequency is displayed with numbers moving toward the left edge of the FREQUENCY DISPLAY from the right.

3) Zeroes ("0") to the right of the 1MHz digit can be keyed in by pressing the [ENT] KEY.

(EXAMPLE 1) Setting frequency at 14.0000MHz.

Push keys 1 4 ENT

(EXAMPLE 2) Setting frequency at 21.3600MHz

Push keys 2 1 3 6 0 0 ENT

6-3 MODE SELECTION

The various modes are selected by using the MODE SWITCHES and the [FUNC] SWITCH.

(1) SSB

Push the [SSB] SWITCH to automatically select the USB mode on the 10MHz band and above, and LSB mode on the 7MHz band and below. Push the [FUNC] SWITCH, then the [SSB] SWITCH to select the opposite mode.

See page 29 for SSB operation.

(2) CW

Push the [CW] SWITCH to select CW mode, or push the [FUNC] SWITCH then the [CW] SWITCH to select CW NARROW mode.

See page 31 for CW operation.

(3) RTTY

Push the [RTTY] SWITCH to select RTTY mode, or push the [FUNC] SWITCH then the [RTTY] SWITCH to select RTTY NARROW mode.

See page 33 for RTTY operation.

(4) AM

Push the [AM] SWITCH to select AM mode.

See page 34 for AM operation.

(5) FM

Push the [FUNC] SWITCH then the [AM] SWITCH to select FM mode. Push the [AM] SWITCH again to return to AM mode.

See page 35 for FM operation.
(1) SSB RECEIVING

1) Set all controls and switches.

2) Push IN [POWER] SWITCH.

3) Push [UP/DOWN] SWITCHES.

4) Adjust [AF GAIN] CONTROL.

5) Rotate TUNING CONTROL and search for a signal.

6) Use Passband Tuning or IF Shift Tuning.

1) Set all controls and switches as described on page 27.

2) Push IN the [POWER] SWITCH.

3) Push the BAND [UP/DOWN] SWITCHES to select the desired band of operation.

4) Adjust the [AF GAIN] CONTROL for the desired volume.

5) Rotate the TUNING CONTROL and search for a signal. Tune across the signal to peak the meter needle while listening for the most intelligible audio.

6) Passband Tuning or IF Shift Tuning is very useful for improving receiver selectivity, especially when receiving a signal with interference. (See page 45)
(2) SSB TRANSMITTING

1) Select transmit mode.

```
TRANSMIT
RECEIVE
```

OR

```
Push
[PTT] SWITCH
```


```
METER
COMP
ALC
Po
SWR
```

3) [TRANSMIT] INDICATOR lights up.

```
[TRANSMIT] INDICATOR lights up.
```

4) Set [METER] SWITCH to [ALC] position, and adjust [MIC GAIN] CONTROL.

```
METER
COMP
ALC
Po
SWR
```

5) Use the Speech compressor function.

6) Use the Monitor function.

**NOTE:** Listen carefully before transmitting to be sure your transmission will not interfere with any other communications.

1) Select transmit mode using either the [TRANSMIT/RECEIVE] SWITCH or the [PTT] SWITCH.

2) Set the [METER] SWITCH to the [Po] position. Speak into the microphone using your normal voice level. The meter movement indicates that a signal is being transmitted.

3) The [TRANSMIT] INDICATOR lights up whenever the IC-761 is placed in transmit mode. However, an RF signal is only transmitted when the selected operating frequency is within an Amateur band.

4) Set the [METER] SWITCH to the [ALC] position, and adjust the [MIC GAIN] CONTROL for a meter reading within the ALC zone on voice peaks.

5) Use the Speech compressor function for greater talk power. (See page 43.)

6) To monitor your transmission signals, use the Monitor function. (See page 42.)
6-5 CW OPERATION

(1) CW RECEIVING

1) Push IN [POWER] SWITCH.

2) Push [CW] SWITCH.

3) Push [UP/DOWN] SWITCHES.

4) Adjust [AF GAIN] CONTROL.

5) Rotate TUNING CONTROL.

For CW-NARROW receiving, push the [FUNC] SWITCH, then, the [CW] SWITCH.

3) Push the BAND [UP/DOWN] SWITCHES to select the desired band of operation.

4) Adjust the [AF GAIN] CONROL for a suitable volume.

5) Rotate the TUNING CONTROL and search for a signal. Tune across the signal to peak the needle while listening for the most intelligible tone.

(2) CW TRANSMITTING

1) Insert CW key.

2) Select transmit mode.

3) Operate CW key. The meter movement indicates that a signal is being transmitted.
1) Set the controls and switches as shown in the table.

<table>
<thead>
<tr>
<th>SWITCH/CONTROL</th>
<th>POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODE</td>
<td>CW OR CW-NARROW</td>
</tr>
<tr>
<td>VOX</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>VOX DELAY</td>
<td>10 O’CLOCK</td>
</tr>
<tr>
<td>TRANSMIT/RECEIVE</td>
<td>RECEIVE</td>
</tr>
</tbody>
</table>

2) Operate the CW key.

3) Set the transmit release delay time to suit your keying speed by adjusting the [VOX DELAY] CONTROL while keying. Rotate the control clockwise to increase the delay.

4) Begin sending with the CW key and the transmitter will switch between transmit and receive automatically.

Automatic keying is possible simply by connecting an iambic paddle. The operator merely controls the number of dots or dashes transmitted without regard to spaces between the elements, or the timing of the elements, within a character. When used correctly, the resulting CW is generally easier and more enjoyable to copy at the receiving end.

1) Set the switches and controls as shown in the table.

<table>
<thead>
<tr>
<th>SWITCH/CONTROL</th>
<th>POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODE</td>
<td>CW OR CW-NARROW</td>
</tr>
<tr>
<td>VOX</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>ELEC-KEY SPEED</td>
<td>12 O’CLOCK</td>
</tr>
<tr>
<td>VOX DELAY</td>
<td>10 O’CLOCK</td>
</tr>
<tr>
<td>ELEC-KEY</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>TRANSMIT/RECEIVE</td>
<td>RECEIVE</td>
</tr>
</tbody>
</table>

2) Operate the CW key.

3) Adjust the [KEY SPEED] CONTROL for a suitable keying speed.

4) Set the transmit release delay time to suit your keying speed by adjusting the [VOX DELAY] CONTROL while keying. Rotate the control clockwise to increase the delay.

5) Transmit/receive switching is automatically performed by the transceiver.

1) Set the switches and controls as shown in the table.

<table>
<thead>
<tr>
<th>SWITCH/CONTROL</th>
<th>POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODE</td>
<td>CW OR CW-NARROW</td>
</tr>
<tr>
<td>VOX</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>ELEC-KEY SPEED</td>
<td>12 O’CLOCK</td>
</tr>
<tr>
<td>VOX DELAY</td>
<td>10 O’CLOCK</td>
</tr>
<tr>
<td>FULL BK-IN</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>ELEC-KEY</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>TRANSMIT/RECEIVE</td>
<td>RECEIVE</td>
</tr>
</tbody>
</table>

2) Operate the CW key.

3) Adjust the [KEY SPEED] CONTROL for a suitable keying speed.

4) Transmit/receive switching is automatically performed by the transceiver.
6-6 RTTY OPERATION

(1) RTTY RECEIVING

1) For RTTY operation, a teletypewriter or keyboard and a demodulator (terminal unit) which is operational with audio input are required. See page 23 for system interconnections.

2) Push the [RTTY] SWITCH to select RTTY operating mode. For RTTY-NARROW receiving, push the [FUNC] SWITCH then the [RTTY] SWITCH.

3) Tune in an RTTY signal using the tuning indicator of the terminal unit or the cross pattern of an oscilloscope to center the receiver on the signal. Mark frequency is 2125Hz and space frequency is 2295Hz.

(2) RTTY TRANSMITTING

Inside MAIN UNIT (See p. 64)

1) Set the [METER] SWITCH to the [Po] position.

2) Set the [TRANSMIT/RECEIVE] SWITCH to the [TRANSMIT] position. The meter indicates the strength of the transmitted carrier wave.

3) Type keys on the RTTY keyboard to transmit RTTY signals.

4) In the AFSK operation, there is a difference between display frequency and the actual operating frequency.

Assuming the demodulator mark frequency is 2125Hz and the space frequency is 2295Hz in receive mode,

\[
\text{Transmit frequency of contacted station} = \frac{\text{Displayed frequency}}{2} - 2125\text{Hz}
\]

Assuming the AFSK generator mark frequency is 2125Hz and the space frequency is 2295Hz in transmit mode,

\[
\text{Transmit frequency of your station} = \frac{\text{Displayed frequency}}{2} - 2125\text{Hz}
\]
6-7 AM OPERATION

(1) AM RECEIVING

1) Push IN the [POWER] SWITCH.

2) Select the desired band of operation.

3) Push the [AM] SWITCH.

4) Adjust the [AF GAIN] CONTROL for a suitable listening level.

5) Tune in an AM signal with the TUNING CONTROL using the meter to peak the signal.

6) Push the [FILTER] SWITCH to select narrow receive selectivity.

<table>
<thead>
<tr>
<th>FILTER SWITCH</th>
<th>BANDWIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON (IN)</td>
<td>2.6kHz</td>
</tr>
<tr>
<td>OFF (OUT)</td>
<td>6kHz</td>
</tr>
</tbody>
</table>

NOTE: The [PBGT] CONTROL (passband tuning) has no effect in AM mode.

(2) AM TRANSMITTING

1) Select transmit mode with either the [TRANSMIT/RECEIVE] SWITCH or the [PTT] SWITCH on the microphone.

2) Turn the [RF PWR] CONTROL maximum clockwise or set it to obtain the desired output power.

3) Set the [METER] SWITCH to the [Po] position.

4) Adjust the [MIC GAIN] CONTROL for a slight indication of the meter needle while speaking into the microphone using your normal voice level.

5) The speech compressor [COMP] SWITCH should be turned OFF to prevent overmodulation or distortion.
6-8 FM OPERATION

(1) FM RECEIVING

1) Push the [FUNC] SWITCH then the [AM] SWITCH.

2) Adjust the [VOLUME] CONTROL for a suitable listening level.

3) Adjust the [SQUELCH] CONTROL to quiet noise from the speaker.

4) When tuning an FM signal, tune for maximum signal strength as indicated on the meter with the clearest audio.

(2) FM TRANSMITTING

1) Set the [MIC GAIN] CONTROL to the center position.

2) Select transmit mode with either the [TRANSMIT/RECEIVE] SWITCH or the [PTT] SWITCH on the microphone.

3) Speak into the microphone using your normal voice level. The meter needle indicates the carrier power when the [METER] SWITCH is in the [Po] position, however the meter does not move in time with your voice modulation in this mode.

• FM REPEATER OPERATION

A tone encoder is often required to access HF FM repeaters. The optional UT-30 PROGRAMMABLE TONE ENCODER is designed for this purpose. See page 60 for UT-30 installation information.

1) When operating through repeaters, program the transmit and receive frequencies in VFO A and VFO B.

See page 47 for information.

2) The encoder tone is transmitted when the [FUNC] SWITCH is pushed while transmitting. In addition, the [FUNCTION] INDICATOR lights up.
1) Set controls and switches.

2) Push IN [POWER] SWITCH.

3) Push [BAND/GENE] SWITCH.

4) Push desired mode switch.

5) Select desired band and frequency.

6) Adjust [AF GAIN] CONTROL.

---

NOTE: In GENERAL COVERAGE mode, it is not possible to transmit on any frequency, including the Amateur band frequencies.

1) Set the controls and switches as stated on page 27. Other controls are unrelated to operation in this mode.

2) Push IN the [POWER] SWITCH.

   • The built-in antenna tuner does not function in GENERAL COVERAGE mode.

3) Select GENERAL COVERAGE mode by pushing the [BAND/GENE] SWITCH.

   • If the transceiver does not display "GENE", push the [BAND/GENE] SWITCH again.

4) Push the desired mode switch.

   • When SSB mode is chosen, USB is automatically selected on the 10MHz band and above, and LSB is selected on the 9MHz band and below.

   • Once either USB or LSB mode is automatically selected, this mode is maintained regardless of frequency or band changes. To change to the opposite sideband, push the [FUNC] SWITCH then the [SSB] SWITCH again.

5) Push the [UP/DOWN] SWITCHES then turn the TUNING CONTROL to select the desired band of operation. Push and release the [UP/DOWN] SWITCHES again, and turn the TUNING CONTROL until a signal is located.

   • The KEYBOARD on the front panel is also useful for setting the desired frequency. (See page 28).

   • The display on the left shows the frequency of a typical standard time station.

6) Adjust the [AF GAIN] CONTROL for a comfortable audio level.

   • The multifunction meter indicates the signal strength of the received signal, therefore tune for the highest reading on the meter with the clearest audio.
7. ANTENNA TUNER OPERATION

NOTE: The built-in antenna tuner does not function in GENERAL COVERAGE mode or during scanning operation.

The built-in automatic antenna tuner allows antenna matching with an impedance of 16.7 ~ 150Ω (VSWR 1:3).

When first using the built-in antenna tuner or when changing the antenna system, observe the following preset procedures.

1) Connect an antenna to the ANTENNA CONNECTOR with SWR set as low as possible.

2) Push IN the [POWER] SWITCH.

3) Push the [RTTY] MODE SWITCH.

4) Verify that the frequency band selected on the transceiver is the same as the area of the band on which you plan to operate.

5) Set the [METER] SWITCH to the [SWR] position.

6) Set the [AUTO/PRESET] SWITCH located under the hatch cover to the [AUTO] position. See the diagram at left.

7) Push IN the [TUNER] SWITCH to turn the tuner ON.

8) Adjust the [RF PWR] CONTROL on the front panel to the 9 o’clock (15W) position.

9) Transmit for a couple seconds. Confirm the auto-tuning function operates correctly resulting in a low SWR. Stop transmitting.

   • If the auto-tuning function does not operate, see SECTION 7-2 AUTO-TUNING FAILS TO OPERATE.

10) Adjust the two PRESET CONTROLS located under the hatch cover corresponding to the selected band until all four red indicators under the hatch cover go out. This completes presetting for this band.

11) Perform the same steps on each frequency band you plan to operate in.
7-2 AUTO-TUNING FAILS TO OPERATE

- The antenna system SWR exceeds 1:3.

The auto-tuning function may not always operate correctly as shown in step 9) above. Reasons for this are listed below.

The antenna needs to be adjusted to bring the SWR below 1:3. The following procedure may allow the tuner to operate correctly:

1) Set the [AUTO/PRESET] SWITCH located under the hatch cover in the [PRESET] position.

2) Adjust the two PRESET CONTROLS alternately to obtain a minimum SWR reading (1:1 if possible) while transmitting a steady carrier using RTTY mode.

3) Stop transmitting. The tuning capacitors are now set at the optimum position for the frequency selected.

4) Reset the [AUTO/RESET] SWITCH in the [AUTO] position.

- Lower transmit output power occurs.

1) Set the [AUTO/PRESET] SWITCH located under the hatch cover in the [PRESET] position.

2) Adjust the two PRESET CONTROLS alternately while transmitting a steady carrier using RTTY mode.

3) Tune for maximum output power while watching the relative power meter on the transceiver.

4) Stop transmitting.


- Additional preset information

(Top view)

Approximate positions of the PRESET CONTROLS for a 50Ω antenna system.

Note (*) the position of the marker when setting each PRESET CONTROL.
8. FUNCTIONS OPERATION

8-1 RIT/ΔTX OPERATION

(1) RIT OPERATION

1) Push [RIT] SWITCH.

```
USB 14.230.0 RIT
VFO A
```
Receive : 14.2300MHz
Transmit : 14.2300MHz

2) Turn [RIT/ΔTX]

```
USB 14.230.0 RIT
VFO A
```
Receive : 14.2300MHz
Transmit : 14.2300MHz

3) Push [RIT] SWITCH again to turn OFF.

```
USB 14.230.0 [ ]
VFO A
```
"RIT" and the shift frequency disappear.

4) Push [RIT] SWITCH again to turn ON.

```
USB 14.230.0 RIT
VFO A
```

5) Push [CLEAR] SWITCH to clear the RIT.

```
USB 14.230.0 [ ]
VFO A
```
The shift frequency resets to "0.0".

6) Push [FUNC] SWITCH and [CLEAR] SWITCH.

```
USB 14.230.0 RIT
VFO A
```
Push [FUNC] and [CLEAR]

```
USB 14.233.0 RIT
VFO A
```
(14.2300MHz + 3.0kHz = 14.2330MHz)

When using the RIT function, it is possible to shift the receive frequency up to 9.9kHz on either side of the transmit frequency without moving the transmit frequency. This is useful for fine tuning stations which call off frequency or for compensating for frequency drift.

1) Push the [RIT] SWITCH to turn the RIT function ON.

- "RIT" and the amount of the shift frequency appear on the FREQUENCY DISPLAY.

2) Turn the [RIT/ΔTX] to change the receive frequency.

3) Push the [RIT] SWITCH again to turn OFF the RIT function.

- "RIT" and the amount of shift frequency disappear.
- When the RIT function is OFF, RIT shift frequency is stored in a memory for later use.

4) Push the [RIT] SWITCH again to turn ON the RIT function.

- "RIT" and the stored shift frequency appear.

5) Push the [CLEAR] SWITCH to clear the RIT shift frequency.

- The shift frequency resets to "0.0" and the receive and transmit frequencies become the same.

6) Push the [FUNC] SWITCH then the [CLEAR] SWITCH to add the RIT shift frequency to the displayed frequency.
(2) ΔTX OPERATION

1) Push [ΔTX] SWITCH.

```
    USB 14.230.0 0.0 0.1
    Transmit: 14.2300MHz
```

2) Turn [RIT/ΔTX] CONTROL.

```
    USB 14.230.0 -1.0 0.1
    Transmit: 14.2290MHz
```

3) Push [ΔTX] SWITCH again to turn OFF.

```
    USB 14.230.0 0.0 0.1
```

"ΔTX" and the shift frequency disappear.

4) Push [ΔTX] SWITCH again to turn ON.

```
    USB 14.230.0 -1.0 0.1
```

5) Push [CLEAR] SWITCH.

```
    USB 14.230.0 0.0 0.1
```

The shift frequency resets to "0.0".

6) Push [FUNC] SWITCH and [CLEAR] SWITCH.

```
    USB 14.230.0 -1.0 0.1
```

Push [FUNC] and [CLEAR].

```
    USB 14.229.0 0.0 0.1
```

(14.2300MHz − 1.0kHz = 14.2290MHz)

7) Same receive and transmit frequencies when RIT and ΔTX are turned ON.

```
    USB 14.230.0 3.0 0.1
```

"RIT" and "ΔTX" appear.

The ΔTX function allows the transmit frequency to be shifted up to 9.9kHz on either side of the receive frequency without moving the receive frequency. This is similar in operation to the RIT function.

1) Push the [ΔTX] SWITCH to turn ON the ΔTX function.

* "ΔTX" and the amount of shift frequency appear on the FREQUENCY DISPLAY.

2) Turn the [RIT/ΔTX] CONTROL to change the transmit frequency.

3) Push the [ΔTX] SWITCH again to turn OFF the ΔTX function.

* "ΔTX" and the amount of shift frequency are no longer displayed.

* When the ΔTX function is OFF, ΔTX shift frequency is stored in a memory for later use.

4) Push the [ΔTX] SWITCH again to turn ON the ΔTX function.

* "ΔTX" and the stored shift frequency appear.

5) Push the [CLEAR] SWITCH to clear the ΔTX shift frequency.

* The shift frequency resets to "0.0" and the receive and transmit frequencies become the same.

6) Push the [FUNC] SWITCH and then the [CLEAR] SWITCH to add the ΔTX shift frequency to the displayed frequency.

7) If the RIT and ΔTX functions are both activated, the receive and transmit frequencies will be equal but shifted from the displayed frequency by the shift value.

* Varying the [RIT/ΔTX] CONTROL changes the receive and transmit frequencies simultaneously.
8-2 FILTER SWITCH OPERATION

(1) FILTER COMBINATIONS

This switch selects the different combinations of the internal 2nd IF (9MHz) and 3rd IF (455kHz) receive filters.

<table>
<thead>
<tr>
<th>MODE</th>
<th>FILTER SWITCH</th>
<th>9MHz FILTER</th>
<th>455kHz FILTER</th>
<th>STANDARD BANDWIDTH</th>
<th>PASS/BAND TUNING</th>
<th>IF SHIFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSB</td>
<td>OUT FL-80</td>
<td>CFJ455K5</td>
<td>2.6kHz</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IN FL-80</td>
<td>FL-44A</td>
<td>2.4kHz</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>CW</td>
<td>OUT FL-80</td>
<td>FL-44A</td>
<td>2.6kHz</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IN FL-80</td>
<td>FL-52A</td>
<td>500Hz</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>RTTY</td>
<td>OUT FL-32A</td>
<td>FL-52A</td>
<td>500Hz</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IN FL-32A</td>
<td>FL-52A</td>
<td>500Hz</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>(NARROW)</td>
<td>(FL-101)</td>
<td>(FL-101)</td>
<td>(250Hz)</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td>OUT THROUGH</td>
<td>CFW455HT</td>
<td>6kHz</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(FL-102)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IN THROUGH</td>
<td>CFW455K5</td>
<td>2.6kHz</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(FL-102)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM</td>
<td>OUT THROUGH</td>
<td>CFW455E</td>
<td>15kHz</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IN THROUGH</td>
<td>CFW455E</td>
<td>15kHz</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
</tbody>
</table>

1) Bracketed filters are optional.
2) Standard bandwidth is shown at −6dB point.

(2) FILTER REVERSE SWITCHES

The [FILTER] SWITCH on the front panel selects between two receive filter systems for SSB, CW, RTTY or AM mode when it is switched between the IN and OUT positions. The IN/OUT relationship of the [FILTER] SWITCH may be reversed by using the internal FILTER REVERSE SWITCHES. (See page 64)

In SSB mode:
Internal preset switch S5 reverses these normal and narrow filters.

<table>
<thead>
<tr>
<th>FILTER SWITCH POSITION</th>
<th>REVERSE SWITCH (S5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NORMAL [NOR]</td>
</tr>
<tr>
<td>OUT</td>
<td>2.6kHz</td>
</tr>
<tr>
<td>IN</td>
<td>2.4kHz</td>
</tr>
</tbody>
</table>

In CW and RTTY modes:
Internal preset switch S4 reverses these wide and narrow filters.

<table>
<thead>
<tr>
<th>FILTER SWITCH POSITION</th>
<th>REVERSE SWITCH (S4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NORMAL [NOR]</td>
</tr>
<tr>
<td>OUT</td>
<td>2.4kHz</td>
</tr>
<tr>
<td>IN</td>
<td>500Hz</td>
</tr>
</tbody>
</table>

In CW-NARROW and RTTY-NARROW modes:
Internal preset switch S4 reverses these narrow and super-narrow filters.

<table>
<thead>
<tr>
<th>FILTER SWITCH POSITION</th>
<th>REVERSE SWITCH (S4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NORMAL [NOR]</td>
</tr>
<tr>
<td>OUT</td>
<td>500Hz</td>
</tr>
<tr>
<td>IN</td>
<td>500Hz (250Hz)</td>
</tr>
</tbody>
</table>

( ) : Optional super-narrow filter bandwidth.

In AM mode:
Internal preset switch S3 reverses these wide and narrow filters.

<table>
<thead>
<tr>
<th>FILTER SWITCH POSITION</th>
<th>REVERSE SWITCH (S3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NORMAL [NOR]</td>
</tr>
<tr>
<td>OUT</td>
<td>6kHz</td>
</tr>
<tr>
<td>IN</td>
<td>2.6kHz</td>
</tr>
</tbody>
</table>
8-3 MONITOR OPERATION
The transmit IF signal may be monitored while operating in SSB, CW, RTTY or AM mode if desired. This circuit is included to allow checking of the quality of the transmitted signal, especially useful when using the RF speech compressor.

1) Push IN the [MONI] SWITCH.

2) Adjust the [MONITOR GAIN] CONTROL on the front panel for a comfortable audio level.

3) Wear headphones while using the monitor function to prevent howling sounds caused by feedback.

8-4 PREAMP/ATT SWITCH OPERATION

● PREAMP

Place the [ATT] SWITCH on the top panel to the [PRE] position when receiving weak signals. An RF preamplifier is inserted in the receive path which increases receiver sensitivity.

● ATTENUATOR

Place the [ATT] SWITCH in the [20dB] position when receiving very strong signals. In the [ATT] position, the RF preamplifier is removed from the receive path and a 20dB attenuator is inserted. This helps to reduce interference.

● FOR NORMAL OPERATION

Leave the [ATT] SWITCH in the [OFF] position for normal operation.

8-5 AGC SWITCH OPERATION

The IC-761 has a fast attack/slow release AGC system which maintains the peak voltage of the rectified IF signal from the IF amplifier circuit for a brief period of time. This circuit keeps irritating background noise from being heard during the short pauses in speech. The damping effect of the AGC therefore allows accurate S-meter readings to be taken of peak IF signal strength.

1) For normal SSB or AM reception, select the [SLOW] position.

2) For CW reception, or for SSB reception with short interval fading, select the [FAST] position. In the [FAST] position, the time constant of the circuit is shortened.

3) In the [OFF] position, the AGC circuit is deactivated and the S-meter gives no signal strength readings. In this case, the [RF GAIN] CONTROL is useful to reduce the receiver gain when strong signals are received.
8-6 SPEECH COMPRESSOR OPERATION

1) Set the switches and controls.

2) Switch to transmit and speak into mic.

3) Adjust [MIC GAIN] CONTROL.

The IC-761 has a low distortion, RF speech compressor circuit which provides greater talk power by improving the intelligibility of the transmitted signal over long distances.

1) Set the switches and controls as shown in the table.

<table>
<thead>
<tr>
<th>SWITCH/CONTROL</th>
<th>POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIC GAIN</td>
<td>CENTER</td>
</tr>
<tr>
<td>RF POWER</td>
<td>MAX. CCW</td>
</tr>
<tr>
<td>COMP</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>METER</td>
<td>COMP</td>
</tr>
</tbody>
</table>

2) Switch to transmit and turn the [RF PWR] CONTROL clockwise while speaking into the microphone until the desired RF peak output of approximately 10 ~ 100W is obtained.

3) Adjust the [MIC GAIN] CONTROL for a meter reading between 10dB and 20dB on the COMPRESSOR [COMP] scale.

4) For the best transmit audio, leave the compressor OFF, or use a low mic gain setting with the compressor ON. However, when in contact with DX stations, or under weak signal conditions, the compressor will improve the readability of your signal when it is turned ON and adjusted correctly.

NOTE: Misadjustment of the speech compressor may cause interference to other stations.

8-7 NOISE BLANKER (NB) OPERATION

The IC-761 noise blanker function effectively reduces interference when pulse-type noise (such as ignition noise from vehicles) makes receiving difficult.

1) Push the [NB] SWITCH IN.

2) Rotate the [NB LEVEL] CONTROL clockwise. Noise is suppressed and weak signals can be received.

3) The noise blanker function removes long duration pulse-type noise such as “woodpecker noise” when the [NB WIDE] SWITCH is set in the WIDE (IN) position.

NOTE: The noise blanker function may not work as well when strong signals are on nearby frequencies, or when noise is continuous rather than pulse-type.

If the desired receive signal becomes distorted by the action of the noise blanker, set the [NB WIDE] SWITCH in the OUT position, or reduce the [NB LEVEL] CONTROL (turn counterclockwise) until the signal is clear.
8-8 VOX OPERATION

(1) IN SSB, AM AND FM MODES

1) Set the switch and controls.

2) Set the [TRANSMIT/RECEIVE] SWITCH in the [RECEIVE] position.

3) Adjust [VOX GAIN] CONTROL.

4) Adjust [VOX DELAY] CONTROL.

5) Adjust [ANTI-VOX] CONTROL.

The IC-761 has a built-in VOX (voice-operated relay) circuit which allows automatic transmit/receive switching by using the operator's speech modulation.

1) Set the switch and controls as shown in the table.

<table>
<thead>
<tr>
<th>SWITCH/CONTROL</th>
<th>POSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOX</td>
<td>ON (IN)</td>
</tr>
<tr>
<td>VOX GAIN</td>
<td>MAX, CCW</td>
</tr>
<tr>
<td>VOX DELAY</td>
<td>CENTER</td>
</tr>
<tr>
<td>MIC GAIN</td>
<td>CENTER</td>
</tr>
</tbody>
</table>

2) Set the [TRANSMIT/RECEIVE] SWITCH in the [RECEIVE] position. It is not necessary to push the [PTT] SWITCH on the microphone.

3) Rotate the [VOX GAIN] CONTROL clockwise while speaking into the microphone until the transmit/receive switching circuit is activated.

4) Rotate the [VOX DELAY] CONTROL counterclockwise to reduce the time delay after you stop speaking and before the transceiver changes back to receive mode. Set the control to allow for short pauses in normal speech without having the IC-761 change to receive mode.

5) Rotate the [ANTI-VOX] CONTROL clockwise while receiving a signal until the audio from the speaker no longer activates the VOX circuit.

In CW mode, break-in operation is possible using the VOX function.

See page 32 for CW break-in operation information.
8-9 PASSBAND/IF SHIFT OPERATION

(1) PASSBAND OPERATION

Passband Tuning is a system designed to electronically narrow the bandwidth (selectivity) of frequencies that pass through the receive crystal filter.

1) The [PBT/IF SHIFT] CONTROL has a detent at the center (12 o’clock) position. This position provides the widest bandwidth, and the control should normally be left here.

2) Rotate the [PBT/IF SHIFT] CONTROL either clockwise or counterclockwise to eliminate interference.

NOTE: The Passband Tuning does not function when the transceiver is in AM or FM mode.

(2) IF SHIFT OPERATION

IF Shift Tuning is a system designed to electronically shift the passband of frequencies that pass through the receive crystal filter.

1) Push the [IF SHIFT] SWITCH IN to turn ON the IF Shift Tuning circuit.

2) Rotate the [PBT/IF SHIFT] CONTROL either clockwise or counterclockwise to eliminate interference.

NOTE: IF Shift Tuning does not function when the transceiver is in AM or FM mode.

Passband Tuning and IF Shift Tuning do not function simultaneously.
8-10 NOTCH FILTER OPERATION

1) Push [NOTCH] FILTER SWITCH.

2) Adjust [NOTCH] FILTER CONTROL.

NOTCH FILTER CHARACTERISTICS

CENTER: 9.0115MHz
SPAN : 10kHz
SWP : 500ms
RBW : 300Hz
VBW : 3kHz
REF : 10dB/div

8-11 SWR READING

The built-in, highly advanced SWR meter in the IC-761 is designed to operate in any mode, even during SSB operation when transceiver output power does not remain at a steady and constant level.

NOTE: The [TUNER] SWITCH must be turned OFF when measuring SWR.

1) Turn the [RF PWR] CONTROL clockwise past the center position to output 30W of power or more.

2) Set the [METER] SWITCH in the [SWR] position.

3) Set the [TRANSMIT/RECEIVE] SWITCH in the [TRANSMIT] position.

- When operating in SSB mode, whistle for a couple seconds into the mic to measure the SWR.

4) Read the SWR on the SWR scale.

- Antenna matching is fine if the reading is 1.5 or less. Check your antenna system if the reading is more than 1.5.
8-12 SPLIT (DUPLEX) OPERATION

1) Set VFO A mode and program.
   VFO A : 7.0570MHz/CW
   [Image of VFO A display]

2) Set VFO B mode and program.
   VFO B : 7.2550MHz/LSB
   [Image of VFO B display]

3) Return to VFO A mode.
   [Image of VFO A/B switch]

4) Push [SPLIT] SWITCH.
   "SPLIT" appears.
   [Image of VFO A display with "SPLIT" text]

5) Transmit.

6) Receiving : 7.0570MHz in CW mode
   Transmitting : 7.2550MHz in LSB mode

The purpose of the split function is to allow an operator the option of transmitting on a frequency different than the receive frequency.

Duplex operation is possible using the contents of VFO A and VFO B. Following is an example for 7.0570MHz/CW for receiving and 7.2550MHz/LSB for transmitting on split (duplex) operation.

1) Push the [VFO A/B] SWITCH to set the transceiver in VFO A mode and set a receive frequency of 7.0570MHz with the TUNING CONTROL.

2) Push the [VFO A/B] SWITCH to set the transceiver in VFO B mode and set a transmit frequency of 7.2550MHz with the TUNING CONTROL.

3) Push the [VFO A/B] SWITCH again to return to VFO A mode.

4) Push the [SPLIT] SWITCH to enter split frequency operation.
   "SPLIT" appears on the FREQUENCY DISPLAY.

5) Push either the [TRANSMIT/RECEIVE] or [PTT] SWITCH to transmit.

6) You are now receiving on 7.0570MHz/CW and transmitting on 7.2550MHz/LSB. Push the [VFO A/B] SWITCH once again to receive on 7.2550MHz/LSB and transmit on 7.0570MHz/CW.

Each VFO stores the operating mode in addition to the operating frequency. This allows crossmode contacts to be easily made.

When operating in FM mode using the SPLIT operation, a tone encoder is often required to access FM repeaters. See pages 35 and 60 for more information.

**NOTE:** Most countries only allow FM operation on 28MHz or higher.
9. MEMORY AND SCANNING OPERATION

The IC-761 has thirty-two memory channels. One frequency, the operating mode, HAM BAND/GENERAL COVERAGE mode VFO A/B, and the split condition may be assigned to each memory channel whether the transceiver is in VFO mode or MEMORY CHANNEL mode.

Remember the following when storing frequencies in memories:

**MEMO 01, 02:** These channels are used as band limits for the PROGRAMMED SCAN function.

9-1 MEMORY CHANNEL AND VFO SELECTION

1) Push [VFO/MEMO] SWITCH.

![VFO/MEMO SWITCH]

"MEMO" appears

<table>
<thead>
<tr>
<th>USB</th>
<th>MEMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.230.0</td>
<td>10</td>
</tr>
</tbody>
</table>

2) Rotate [MEMO-CH] SELECTOR CONTROL

![MEMO-CH SELECTOR CONTROL]

<table>
<thead>
<tr>
<th>CH</th>
<th>MEMO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>03</td>
</tr>
</tbody>
</table>


![VFO/MEMO SWITCH]

<table>
<thead>
<tr>
<th>USB</th>
<th>VFO A</th>
</tr>
</thead>
<tbody>
<tr>
<td>21360.0</td>
<td>01</td>
</tr>
</tbody>
</table>

4) Push [VFO A/B] SWITCH to select VFO A or VFO B mode.

![VFO A/B SWITCH]

<table>
<thead>
<tr>
<th>USB</th>
<th>VFO B</th>
</tr>
</thead>
<tbody>
<tr>
<td>70990.0</td>
<td>01</td>
</tr>
</tbody>
</table>

1) Push the [VFO/MEMO] SWITCH to select MEMORY CHANNEL mode.

- "MEMO" appears on the FREQUENCY DISPLAY.

2) Rotate the [MEMO-CH] SELECTOR CONTROL to select any of the memory channels.

- When memory channels not yet programmed are selected, only the decimal points appear on the FREQUENCY DISPLAY.

**NOTE:** If the [MODE-S] SWITCH is pushed IN, only memory channels with the same operating mode as displayed just prior to pushing the switch are selected when the [MEMO-CH] CONTROL is used.

3) Push the [VFO/MEMO] SWITCH again to return to VFO A or VFO B mode selection.

4) Push the [VFO A/B] SWITCH to select VFO A or VFO B mode.
9-2 PROGRAMMING MEMORY CHANNELS

(1) IN VFO MODE

1) Select VFO mode.

2) Select GENERAL COVERAGE mode.

3) Push [RTTY] SWITCH.

4) Set the frequency for 15.7250MHz.

5) Select Memory Channel 20.

6) Push [WRITE] SWITCH.


Any frequency, operating mode, HAM BAND/GENERAL COVERAGE mode, VFO A/B, or split condition may be memorized in any memory channel.

Following are instructions for programming 15.7250MHz and RTTY mode into MEMO 20 in GENERAL COVERAGE mode.

1) Select VFO A or VFO B mode.

   • If the FREQUENCY DISPLAY shows “MEMO”, push the [VFO/MEMO] SWITCH to select VFO mode.

2) Select GENERAL COVERAGE mode using the [BAND/GENE] SWITCH.

   • “GENE” appears on the FREQUENCY DISPLAY.

3) Push the [RTTY] SWITCH to select RTTY mode.

4) Set the frequency for 15.7250MHz using the [UP/DOWN] SWITCHES and TUNING CONTROL.

5) Select Memory Channel 20 by rotating the [MEMORY-CH] SELECTOR CONTROL.

6) Push the [WRITE] SWITCH to program all the above information into Memory Channel 20.

7) To check the memory channel contents, push the [VFO/MEMO] SWITCH.

   • The contents of the selected memory channel are displayed.
(2) IN MEMORY CHANNEL MODE

1) Push [VFO/MEMO] SWITCH.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>15.7250</th>
<th>20</th>
</tr>
</thead>
</table>

2) Select MEMO 10.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>14.2300</th>
<th>10</th>
</tr>
</thead>
</table>

3) Select GENERAL COVERAGE mode.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>14.2300</th>
<th>10</th>
</tr>
</thead>
</table>

4) Push [AM] SWITCH.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>14.2330</th>
<th>10</th>
</tr>
</thead>
</table>

5) Set the frequency for 15.3500MHz.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>15.3500</th>
<th>10</th>
</tr>
</thead>
</table>

6) Push [WRITE] SWITCH.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>15.3500</th>
<th>10</th>
</tr>
</thead>
</table>

9-3 MEMORY CLEARING

1) Push [VFO/MEMO] SWITCH.

2) Select a memory channel.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>15.7250</th>
<th>20</th>
</tr>
</thead>
</table>

3) Push [FUNC] SWITCH, then push [M→VFO] or [WRITE] SWITCH.

<table>
<thead>
<tr>
<th>VFO/MEMO</th>
<th>MEMO</th>
<th>RTTY</th>
<th>20</th>
</tr>
</thead>
</table>

Following are instructions for programming 15.3500MHz and AM mode into memory channel 10 (MEMO 10) GENERAL COVERAGE mode.

1) Push the [VFO/MEMO] SWITCH to select MEMORY CHANNEL mode.

- "MEMO" appears on the FREQUENCY DISPLAY.

2) Select MEMO 10 by rotating the [MEMORY-CH] SELECTOR CONTROL.

- Previously memorized frequency and the other information appear on the FREQUENCY DISPLAY.

3) Select GENERAL COVERAGE mode using the [BAND/GENE] SWITCH.

- "GENE" appears on the FREQUENCY DISPLAY.

4) Push the [AM] SWITCH to select AM mode.

5) Set the frequency for 15.3500MHz using the [UP/DOWN] SWITCHES and TUNING CONTROL.

6) Push the [WRITE] SWITCH to program the above information into MEMO 10.

This function clears the information in each memory channel.

1) Push the [VFO/MEMO] SWITCH to select MEMORY CHANNEL mode.

- "MEMO" appears on the FREQUENCY DISPLAY.

2) Select a memory channel to be cleared (erased).

3) Push the [FUNC] SWITCH, then push the [M→VFO] or [WRITE] SWITCH.

- The memory channel is now vacant.

- 50 -
The IC-761 is equipped with four scan functions, providing tremendous scanning versatility at the touch of just a few switches.

<table>
<thead>
<tr>
<th>SCAN TYPE</th>
<th>OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGRAMMED SCAN</td>
<td>Repeatedly scans between two user-PROGRAMMED frequencies in the scan range using MEMO 01 and MEMO 02 for storing frequency data.</td>
</tr>
<tr>
<td>MEMORY CHANNEL SCAN</td>
<td>Scans all MEMORY CHANNELS containing information while skipping memories in blank status.</td>
</tr>
<tr>
<td>SELECTED MODE MEMORY SCAN</td>
<td>Repeatedly scans all memory channels containing frequencies in the same MODE as the displayed frequency.</td>
</tr>
</tbody>
</table>

(1) PROGRAMMED SCAN

1) Store the HIGH and LOW frequency limits.

![Image of frequency limits](image)

2) Push [VFO/MEMO] SWITCH.

3) Select a desired mode.

4) Adjust [SQUELCH] CONTROL.

   ![Image of squelch control](image)

   [RECEIVE] INDICATOR goes OFF.

5) Push [SCAN] SWITCH.

6) The scan stops when the transceiver receives a signal.

7) Push [SCAN] SWITCH or turn TUNING CONTROL.

---

1) Store the HIGH and LOW frequency limits of the desired scanning range in MEMO 01 and 02. Refer to page 49 for memory channel programming information.

- The scan begins from the LOW limit of the range regardless of which channel has the lower frequency stored.

**NOTE:** Store both scanning limits in MEMO 01 and MEMO 02 using HAM BAND or GENERAL COVERAGE mode. The programming MUST be used in the same band when using HAM BAND mode.

2) Push the [VFO/MEMO] SWITCH to select VFO mode.

3) Select a desired mode such as SSB or AM mode.

4) Adjust the [SQUELCH] CONTROL to quiet noise output from the speaker.

- The green [RECEIVE] INDICATOR goes OFF.

5) Push the [SCAN] SWITCH to start the scan.

- "SCAN" appears on the FREQUENCY DISPLAY.

6) The scan stops for approximately 10 seconds after a receive signal opens the squelch, then resumes scanning.

- See page 52 for scan resumption information.

7) Push the [SCAN] SWITCH or turn the TUNING CONTROL to stop the scan.

- "SCAN" disappears.
(2) MEMORY CHANNEL SCAN

1) Program the desired frequencies.

2) Push [VFO/MEMO] SWITCH.

3) Adjust [SQUELCH] CONTROL.

4) Push [SCAN] SWITCH.

- Program the desired frequencies into memory channels. Refer to page 49 for programming memory channels.

- Push the [VFO/MEMO] SWITCH to select MEMORY CHANNEL mode if the transceiver is in VFO mode.

- "MEMO" appears on the FREQUENCY DISPLAY.

- Adjust the [SQUELCH] CONTROL to quiet noise output from the speaker.

- The green [RECEIVE] INDICATOR goes OFF.

- Push the [SCAN] SWITCH to start the scan.

- "SCAN" appears on the FREQUENCY DISPLAY.

- Push the [SCAN] SWITCH or turn the TUNING CONTROL to stop the scan.

- See item (4) SCAN RESUMPTION below.

(3) SELECTED MODE MEMORY SCAN

1) Program the desired frequencies.

2) Push [VFO/MEMO] SWITCH.

3) Select a desired mode.

4) Adjust [SQUELCH] CONTROL.

5) Push [MODE-S] SWITCH.

6) Push [SCAN] SWITCH.

- Program the desired frequencies into memory channels. Refer to page 49 for memory channel programming information.

- Push the [VFO/MEMO] SWITCH to select MEMORY CHANNEL mode if the transceiver is in VFO mode.

- "MEMO" appears on the FREQUENCY DISPLAY.

- Select a desired mode such as SSB or AM mode.

- Adjust the [SQUELCH] CONTROL to quiet noise output from the speaker.

- The green [RECEIVE] INDICATOR goes OFF.

- Push the [MODE-S] SWITCH IN to select SELECTED MODE MEMORY SCAN.

- Push the [SCAN] SWITCH to start the scan.

- "SCAN" appears on the FREQUENCY DISPLAY.

- Push the [SCAN] SWITCH or turn the TUNING CONTROL to stop the scan.

- See item (4) SCAN RESUMPTION below.

(4) SCAN RESUMPTION

Scanning resumes after approximately 10 seconds after the scan stops on a receive signal. However, the switch shown in the diagram may be used to override this feature. (See page 64)"
10. CIRCUIT DESCRIPTION

10-1 RECEIVER CIRCUITS

(1) RF CIRCUIT

Incoming signals to the RF UNIT are switched by RL1 and applied to an L-type 20dB attenuator (R92, R93) or bypass the attenuator. Signals are then fed to one of the bandpass filters or low-pass filters depending on the frequency of the signal that is controlled by IC1 and IC2.

Signals from the bandpass filters are fed to an L-type attenuator which consists of R28 and PIN diodes D10 and D11 which are controlled by AGC voltage. Signals are then fed to the preamp (Q6, Q7) or bypass the preamp and enter the 1st mixer. Signals from low-pass filters are fed to the 1st mixer directly.

(2) IF CIRCUIT

Q9 and Q10 create a double-balanced mixer which uses low-noise FETs (2SK125) and is driven by 13.8V to provide an excellent noise figure. Multi-signal receiving characteristics are determined by the 1st mixer circuit. The double-balanced mixer has a high interception point and reduces spurious characteristics in signals. The IC-761 has a very high dynamic range (100dB in SSB mode and 104 ~ 105dB in CW mode).

1st IF signals are filtered (F11), amplified (Q8) and mixed at IC3 with 2nd LO signals from the PLL UNIT for conversion into 2nd IF signals (9.0115MHz) and are then applied to the MAIN UNIT.

(3) PASSBAND TUNING

High quality 9MHz and 455kHz filters are necessary to operate Passband Tuning. The IC-761 therefore has high shape filters in this circuit. The PBT oscillator circuit oscillates local frequency signals for mixers IC10 and IC11 which are located at both the input and output terminals of the 455kHz filter. The center frequency of the 455kHz filter appears to change when the local oscillator frequency is changed ±1.7kHz by the [PBT] CONTROL.

(4) NOISE BLANKER

The noise components of 2nd IF signals to the MAIN UNIT are amplified with wide dynamic range at Q8, Q9, and Q10, are detected at D17 and D18, and control the noise blanker gate by using the NB switching circuit (Q15).

Q12 controls the blanking time for setting 10msec. when the [NB WIDE] SWITCH is pushed IN and for 1 ~ 2msec. when the [NB WIDE] SWITCH is OUT. This results in a distortion-free audio signal. The limits of blanking time are determined by D16, R56, R57, C39 and C40.

(5) NOTCH CIRCUIT

The notch circuit uses a bridge-type notch filter and achieves very sharp attenuation and stability using a crystal unit. Notch frequency can be altered by a capacitance change of varicap D110 which is installed in series with crystal X2. Monolithic filter F17 is connected to the next stage of the notch circuit and eliminates spurious signals emitted from mixer IC11.

(6) AF CIRCUIT

Audio signals from IC20 or Q76 are amplified at IC19(b), are tone controlled by R394, C258 and the [TONE] CONTROL, and pass through the [AF GAIN] CONTROL and are then power amplified at IC18 to more than 3W.
10-2 TRANSMITTER CIRCUITS

(1) AF CIRCUIT

An audio signal from the MIC CONNECTOR is amplified at Q2 in the AF VR UNIT, passes through the [MIC GAIN] CONTROL, and is then amplified again at Q34 and Q35. The tone control circuit is installed between Q34 and Q35, and varies the frequency response of the mic amplifier.

(2) IF CIRCUIT

IC9 is a double-balanced mixer which generates DSB or AM signals using BFO signals. A DSB signal is applied to F12, a 9MHz filter, creating the SSB signal. An AM signal bypasses the filter. Signals are buffer-amplified at Q84 and then converted into 2nd IF frequency signals of 455kHz at IC10.

A 2nd IF signal is fed into the compressor circuit or bypasses it and then is applied to Q38 depending on the [COMP] SWITCH position. A 455kHz filter, buffer-amplifier Q42, and mixer IC11 are commonly used with the receive circuit, so 455kHz 2nd IF signals are reconverted to 9MHz 3rd IF signals, are amplified at Q1, and are then applied to the RF UNIT.

3rd IF signals to the RF UNIT are converted to 70.4515MHz at IC3, amplified at Q11, and are then fed to the mixer circuit (Q12, Q13) for conversion to the desired frequency (same as on the FREQUENCY DISPLAY).

(3) MONITOR CIRCUIT

The transmitter monitor circuit is not simply a modulation monitor: it also receives signals at the point where the transmit signals are amplified by Q49 and detected by IC15 and fed to IC19(a). The monitor circuit is turned ON and OFF by the power source of Q49.

(4) RF CIRCUIT

Converted signals pass through one of nine bandpass filters and are then applied to the PA UNIT.

Signals from the RF UNIT are amplified at Q1 (a class A amplifier), are amplified at Q2 and Q3 (class AB push-pull amplifiers), and are then amplified at final transistors Q4 and Q5 (class AB push-pull amplifiers) to provide 100W of output power.

10-3 ANTENNA TUNER

(1) MATCHING CIRCUIT

Variable capacitors C3 and C4 are connected to their respective motors and additional condensers are parallel connected to C3 and C4 when the transceiver operates in the 1.8 ~ 3.5MHz range. The taps of the coils on L1 and L2 are automatically selected by the bands designated by relays RL7 ~ RL12. By using two separate motors, the IC-761 obtains a faster overall tuning speed.

(2) DETECTOR CIRCUIT

Resistance components are detected by L1, D1, and D2 on the DET UNIT. If an antenna impedance is higher than 50Ω, positive detected voltage appears; if lower than 50Ω, negative voltage appears.

Reaction components are detected from the RF current and RF voltage using phase detection. RF current is detected by L1 and R5, and RF voltage is detected by C3 ~ C5. Both detector voltages are buffer amplified and are then applied to phase comparators IC1 ~ IC3.
The PLL UNIT in the IC-761 is equipped with a reversed heterodyne 1st mixer and a normal heterodyne 2nd mixer, so PLL output has very accurate oscillation.

The PLL loop generates a 1st LO frequency (Fv) that is given as:

\[ F_v = F_{Lo} + N \times F_{Ref} \]

- \( F_{Lo} \): Fsub (generated by the sub loop) + Fref
- \( N \): Driven by N-data
- \( F_{Ref} \): Reference frequency

The reference frequency (Fref) is 10kHz, and the VCO is controlled in 10kHz steps by changing the dividing ratio N of the programmable divider. A frequency between this step (less than 10kHz) is obtained by \( F_{Lo} \), which controls the VCO output frequency. Note that \( F_{Lo} \) can be changed in 10Hz steps over the 9.99kHz range, and in this way the entire 30MHz range of the PLL can be varied in 10Hz steps.

1) MAIN LOOP

The output of the VCO is separated into two parts after passing through the Q22 buffer-amplifier. One part is amplified by Q23, and, after being impedance matched by Q25, is output to the RF UNIT as 1st LO frequency (output level is 0dBm/50Ω). The other part of the VCO is fed back to the PLL loop through Q26, a buffer amplifier.

The VCO signal is mixed with the in-loop LO (Fv) by IC3 and is down mixed. The output is then amplified by Q16 and Q17 (a cascade amplifier), and is input to IC2 to divide the phase detector with Fref.

2) SUB LOOP

The reference frequency is 5kHz and the VCO can be locked within a frequency range of 115.00 ~ 119.995MHz. The output signal of the 4.995MHz bandwidth with a 5kHz resolution is divided in a 1/500 ratio by IC204 and IC203, providing output ranging from 230.00 to 239.99kHz in 10Hz steps. This output is fed to the main loop.

[MAIN LOOP]

![Diagram of PLL Circuit: MAIN LOOP](image)

[MARKER GENERATOR]

![Diagram of PLL Circuit: MARKER GENERATOR](image)
11-1 MAINTENANCE

(1) RESETTING THE INTERNAL CPU

The FREQUENCY DISPLAY may occasionally display erroneous information during operation or when first applying power. This may be due to an external cause such as static electricity.

If this sort of problem occurs, turn OFF power to the IC-761, wait for a few seconds and turn ON power again. If the problem continues, perform the following procedure.

**NOTE:** All information programmed in memory channels will be cleared if the transceiver is reset.

1) Push the [POWER] SWITCH OFF (OUT).

2) Push and hold the [WRITE] SWITCH and push the [POWER] SWITCH ON (IN).

3) The IC-761 is now reset, and displays the following information:

- Frequency : 7.100.0MHz
- Mode : LSB
- VFO : VFO A

(2) FUSE REPLACEMENT

If the fuse blows or the transceiver stops functioning, track down the source of the problem if possible, and replace the damaged fuse with a new, rated fuse.

**WARNING:** DISCONNECT THE AC CORD FROM THE AC OUTLET (RECEPTACLE) TO PREVENT ELECTRIC SHOCKS WHEN CHANGING THE FUSE.

Rear panel AC line fuse : 10A for 120V AC
5A for 220 ~ 240V AC

Inside DC line fuses : 5A for inside units
2A for external 13.8V DC

The AC line fuse is located on the rear panel and the DC line fuses are located in the transceiver.

1) Remove the top cover.

2) The fuse holders are located near the POWER SUPPLY UNIT. See the diagrams below.
(3) BACKUP BATTERY

The IC-761 uses an advanced, highly reliable microprocessor chip. The purpose of the battery is to provide power to the microprocessor so it retains all memory information during power failures, or when the unit is unplugged or turned OFF.

• The usual life of the lithium backup battery should be five years. It is advisable to monitor the battery carefully and replace it if there are repeated cases of display malfunction.

• The transceiver transmits and receives normally if the backup battery is exhausted but the transceiver cannot memorize frequencies.

NOTE: Battery replacement should be done by an authorized ICOM Dealer or ICOM Service Center.

(4) CLEANING

If the transceiver becomes dusty or dirty, wipe it clean with a dry, soft cloth. Avoid the use of strong cleaning agents such as benzine or alcohol as they may damage the surfaces.

11-2 ADJUSTMENTS

(1) BRAKE ADJUSTMENT

TUNING CONTROL tension may be adjusted to suit the operator’s preference.

1) The screw adjustment is located on the bottom side of the transceiver cabinet below the TUNING CONTROL.

2) Turn the brake adjustment screw either CW or CCW to comfortable tension level while turning the TUNING CONTROL continuously and smoothly in one direction.

(2) SIMPLE FREQUENCY ADJUSTMENT

A very accurate frequency counter is required to align the frequency of the IC-761. However, a simple check may be performed by receiving radio station WWV, WWVH or other standard frequency signals.

1) Push the [BAND/GAIN] SELECTOR SWITCH to select GENERAL COVERAGE mode.

2) Push the [USB] SWITCH to select USB mode.

3) Set the FREQUENCY DISPLAY to the exact frequency of the standard frequency station minus 1kHz.

• EXAMPLE: When using WWV (10.000.00MHz), adjust the operating frequency 9.999.00MHz.
  10.000.00MHz - 0.001.00MHz (1kHz) = 9.999.00MHz

4) Push the [MARKER] SWITCH IN (ON).

5) Push and pop up the [CALIBRATOR] CONTROL then adjust the control for zero beat.

• Zero beat means that two signals are on exactly the same frequency, resulting in a single audio tone being emitted.

6) Push the [CALIBRATION] CONTROL IN and push the [MARKER] SWITCH to turn OFF the marker function.
1) Connect a CW iambic paddle to the [KEY] JACK on the rear panel.

2) Push the [CW] and [ELEC-KEY] SWITCHES.

3) Close the CW key and adjust R8 to suit your weight length.
   
   • The R8 WEIGHT CONTROL is set at the factory for the DOT: SPACE: DASH ratio at 1:1:3. DOTS and DASHES increase in length if R8 is turned clockwise.

4) CW SIDETONE FREQUENCY ADJUSTMENT

   1) This control is factory set for a 700Hz tone.

   2) Connect a CW key to the [KEY] JACK on the rear panel.

   3) Push the [CW] SWITCH to select CW mode.

   4) Close the CW key and adjust R374 on the MAIN UNIT for a suitable tone. Refer to page 64 for the adjustment location.

5) BFO ADJUSTMENT

   Connect a frequency counter to CP1 on the MAIN UNIT. Refer to page 64 for the CP1 location.

<table>
<thead>
<tr>
<th>MODE</th>
<th>FREQUENCY (MHz)</th>
<th>ADJUSTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB</td>
<td>9.01300</td>
<td>9.01300</td>
</tr>
<tr>
<td>LSB</td>
<td>9.01000</td>
<td>9.01000</td>
</tr>
<tr>
<td>CW</td>
<td>9.00990</td>
<td>NO SIGNAL</td>
</tr>
<tr>
<td>RTTY</td>
<td>9.008475</td>
<td>9.008475</td>
</tr>
<tr>
<td>AM</td>
<td>NO SIGNAL</td>
<td>9.01000</td>
</tr>
<tr>
<td>FM</td>
<td>NO SIGNAL</td>
<td>NO SIGNAL</td>
</tr>
</tbody>
</table>

6) TRANSMIT AUDIO ADJUSTMENT

   The bass and treble response of your transmitted signal may be altered with the R155 adjustment on the MAIN UNIT. Refer to page 64 for the R155 location.

7) OTHER ADJUSTMENTS

   See page 64 for information regarding other adjustments.
12. OPTIONS INSTALLATIONS

12-1 IC-EX310 VOICE SYNTHESIZER UNIT

(1) INSTALLATION

After being installed, the voice synthesizer announces the displayed frequency when the [SPEECH] SWITCH on the front panel is pushed.

1) Remove the top and bottom covers.

2) Disconnect the 6-pin and 2-pin connectors as shown in the diagram.

3) Unscrew the two side panel screws and two inside screws as shown in the diagram and remove the power supply unit installed with a metal plate.

4) Connect the 2-pin plug into J2 of the IC-EX310 and connect the 8-pin plug from the IC-EX310 into J12 on the LOGIC UNIT.

5) Install the unit correctly using the supplied screws as shown in the diagram.

6) Re-assemble the power supply unit and connectors correctly.

7) Adjusting the volume and speech speed is necessary before the covers are replaced. The procedure is described below.

(2) ADJUSTMENT

1) Connect an AC cord between the transceiver and the AC outlet (receptacle).

2) Push the [POWER] SWITCH IN to turn power ON and push the [SPEECH] SWITCH on the front panel.

   • The speaker announces the displayed frequency in English.

3) The speech volume and speech speed can be adjusted as follows:

   • Volume of the announcement: Turn R30
   • Faster speech speed: Cut W1 jumper wire

4) Replace the top and bottom covers after finishing the adjustments.
12-2 UT-30 PROGRAMMABLE TONE ENCODER UNIT

The tone encoder allows access to repeater stations that require subaudible tones superimposed on the transmit signal. The optional UT-30 has 38 kinds of tones available, and is programmable.

1) Remove the top and bottom covers.

2) Install the unit where IC3 is located on the MAIN UNIT using the double-sided tape. See page 64 for the location.

3) Plug the 3-pin connector from the UT-30 into J6 on the MAIN UNIT.

4) Program the unit for the frequency required using the programming chart. The UT-30 is factory programmed for 88.5Hz.

5) Replace the top and bottom covers.

6) Refer to page 35 for instructions regarding operation.

12-3 FILTERS

(1) FILTER CHARACTERISTICS

<table>
<thead>
<tr>
<th>FILTER</th>
<th>MODE</th>
<th>CENTER FREQ.</th>
<th>-6dB POINT</th>
<th>-60dB POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL-53A</td>
<td>CW/RTTY</td>
<td>455kHz</td>
<td>250Hz</td>
<td>480Hz</td>
</tr>
<tr>
<td>FL-101</td>
<td>CW/RTTY</td>
<td>9.0106MHz</td>
<td>250Hz</td>
<td>800Hz</td>
</tr>
<tr>
<td>FL-102</td>
<td>AM</td>
<td>9.0100MHz</td>
<td>6kHz</td>
<td>20kHz</td>
</tr>
</tbody>
</table>

(2) INSTALLATIONS

- **FL-53A installation**
  - CW 455kHz (S9)

  This is a 455kHz filter for use with the CW-Narrow or RTTY-Narrow mode.

  1) Insert the optional FL-53A into the position shown in the diagram on page 61.
     - No soldering is required for the installation.

  2) Set S9 on the MAIN UNIT in the vertical position as shown in the diagram at left.

- **FL-101 installation**
  - CW 9MHz (S7)

  This is a 9MHz narrow filter for CW and RTTY mode.

  1) Insert the optional FL-101 into the position shown in the diagram on page 61.
     - No soldering is required for the installation.

  2) Set S7 on the MAIN UNIT in the vertical position as shown in the diagram at left.

- **FL-102 installation**
  - AM 9MHz (S6)

  This is a 9MHz filter for AM mode.

  1) Insert the optional FL-102 into the position shown in the diagram on page 61.
     - No soldering is required for the installation.

  2) Set S6 on the MAIN UNIT in the vertical position as shown in the diagram at left.
(3) INSTALLATION LOCATIONS

MAIN UNIT

(4) FILTER SYSTEM

THROUGH
AM
FM
AM
L
2nd IF AMP
CW
RTTY
SSB
CW
RTTY
SSB
CW
RTTY
CH-N
RTTY-N

OPTION
[A]
[B]
[C]
D
3RD MIXER

CFW455HT
AM
[|E|
[|F|
[|G|
[|H|
[|I|
[|J|

4TH MIXER

CFW455K5
AM
9MHz
S7
CW 9MHz
S9
CW 455kHz

[|A|] : FL-102
[|D|] : FL-101
[|I|] : FL-53A

NOTE: 9MHz filters, [|A|] [|D|] are bypassed when the [IF SHIFT] SWITCH is pushed IN.

- 61 -
12-4 OPTIONS

IC-2KL  
500W LINEAR AMPLIFIER

IC-AT500  
500W AUTOMATIC ANTENNA TUNER

SP-20  
EXTERNAL SPEAKER WITH AUDIO FILTERS

SM-10  
COMPRRESSOR/GRAPHIC EQUALIZER DESK TOP MICROPHONE

SM-8  
DESK MICROPHONE

CT-17  
CI-V LEVEL CONVERTER

IC-EX310  
VOICE SYNTHESIZER UNIT

UT-30  
PROGRAMMABLE TONE ENCODER UNIT

MB-19  
RACK MOUNTING HANDLES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL-53A</td>
<td>455kHz CW and RTTY Super-narrow Filter (250Hz/-6dB)</td>
</tr>
<tr>
<td>FL-101</td>
<td>9MHz CW and RTTY Super-narrow Filter (250Hz/-6dB)</td>
</tr>
<tr>
<td>FL-102</td>
<td>9MHz AM Filter (6kHz/-6dB)</td>
</tr>
<tr>
<td>CT-16</td>
<td>Satellite Interface Unit</td>
</tr>
<tr>
<td>HP-2</td>
<td>Communication Headphones</td>
</tr>
</tbody>
</table>
13. INSIDE VIEWS

13-1 TOP VIEW
(REGULATOR AND TUNER UNITS)

- Internal Speaker Connector
- TUNER UNIT
  - R8 (Weight Control Adj)
  - AUTO/PRESET SWITCH
  - PRESET CONTROLS
  - PRESET INDICATORS
  - TUNER PRESET SWITCH

- DC Fuse Holder (For 13.8V DC OUTPUT JACK)
- DC Fuse Holder (For Internal Units)
- R14 (Scan Speed Adj)
- CPU Backup Battery
- LOGIC UNIT

- Space for IC-EX310
- P31 (Plug for IC-EX310)
- J12 (Connector for IC-EX310)
- L2 (PLL Freq Adj)

PLL UNIT
15. SPECIFICATIONS

**GENERAL**

- Frequency coverage
  - Receive: 0.1MHz ~ 30.0MHz
  - Transmit: 160m band 1.8MHz ~ 2.0MHz
  - 80m band 3.45MHz ~ 4.1MHz
  - 40m band 6.95MHz ~ 7.5MHz
  - 30m band 9.95MHz ~ 10.5MHz
  - 20m band 13.95MHz ~ 14.5MHz
  - 17m band 17.95MHz ~ 18.5MHz
  - 15m band 20.95MHz ~ 21.5MHz
  - 12m band 24.45MHz ~ 25.1MHz
  - 10m band 27.95MHz ~ 30.0MHz

- Modes
  - SSB (A3J), CW (A1), FM (F3), RTTY (F1), AM (A3)

- Frequency control
  - CPU-based 10Hz step digital PLL synthesizer

- Frequency stability
  - ±100Hz in the range of −10°C ~ +60°C
    (+14°F ~ +140°F)

- Antenna impedance
  - 50Ω (when TUNER SWITCH is OFF)
  - 16.7 ~ 150Ω (with TUNER SWITCH ON)

- Power supply requirement
  - U.S.A, version: AC 100 ~ 120V
  - Australia, Europe, France versions: AC 200 ~ 240V

- Power consumption
  - Max. 650VA transmitting
  - Max. 80VA receiving

- Dimensions
  - 424mm(W) x 150mm(H) x 390mm(D)
  - (Projections not included)

- Weight
  - 17.5kg

**TRANSMITTER**

- Output power
  - SSB: Max. 100W PEP
  - CW, RTTY, FM: Max. 100W
  - AM: Max. 40W

- Modulation
  - SSB: Balanced modulation
  - FM: Reactance modulation
  - AM: Low level modulation

- Max. frequency deviation
  - ±5kHz

- RTTY shift width
  - 170Hz, 850Hz

- Spurious emissions
  - Less than −60dB

- Carrier suppression
  - Less than −40dB

- Unwanted sideband
  - Less than −55dB with 1000Hz modulation

- Microphone impedance
  - 600Ω
■ RECEIVER

* Receive system
  - SSB, CW, RTTY, AM
  - Quadruple-conversion
  - FM
  - Triple-conversion

* Intermediate frequencies
  - 1st All modes 70.4515MHz
  - 2nd SSB 9.0115MHz
    - CW, RTTY 9.0106MHz
    - FM, AM 9.0100MHz
  - 3rd All modes 455kHz
  - 4th SSB 9.0115MHz
    - CW, RTTY 9.0106MHz
    - AM 9.0100MHz

* Sensitivity (PREAMP SWITCH ON)
  - SSB, CW, RTTY
    - 0.1 ~ 0.5MHz Less than 0.5μV for 10dB S/N
    - 0.5 ~ 1.6MHz Less than 1μV for 10dB S/N
    - 1.6 ~ 30MHz Less than 0.15μV for 10dB S/N
  - AM (NARROW FILTER selected)
    - 0.1 ~ 0.5MHz Less than 3μV for 10dB S/N
    - 0.5 ~ 1.6MHz Less than 6μV for 10dB S/N
    - 1.6 ~ 30MHz Less than 1μV for 10dB S/N
  - FM
    - 28 ~ 30MHz Less than 0.3μV for 12dB SINAD

* Squelch sensitivity
  - Less than 0.3μV

* Selectivity
  - SSB (FILTER SWITCH ON) 2.4kHz/−6dB
    - 3.8kHz/−60dB
  - CW, RTTY (FILTER SWITCH ON) 500Hz/−6dB
    - 1kHz/−60dB
  - AM
    - 6kHz/−6dB
    - 18kHz/−50dB
  - FM
    - 15kHz/−6dB
    - 30kHz/−50dB

* Audio output power
  - More than 2.6W at 10% distortion with 8Ω load

* Notch filter attenuation
  - More than 45dB

* RIT variable range
  - ±9.9kHz

■ ANTENNA TUNER

* Output matching range
  - 16.7 ~ 150Ω unbalanced (when TUNER SWITCH is ON)

* Minimum input power
  - 8W

* Band switching time
  - 3 seconds or less

* Auto tuning time
  - 3 seconds or less

* Auto tuning accuracy
  - VSWR 1.2:1 or less

* Insertion loss
  - 0.5dB or less (after tuning)

* All stated specifications are subject to change without notice or obligation.
Count on us!