



## INSTRUCTION MANUAL

# HF/VHF ALL MODE TRANSCEIVER **IC-746PRO**



This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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# FOREWORD

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We understand that you have a choice of many different radios in the market place. We want to take a couple of moments of your time to thank you for making the IC-746PRO your radio of choice, and hope you agree with Icom's philosophy of "technology first". Many hours of research and development went into the design of your IC-746PRO.

Rather than completely redesigning all areas to create a new radio, the engineering team at Icom decided to follow in the footsteps of the IC-746 (one of the best value transceivers in the marketplace) with the new "PRO." Focused on real world improvements compiled over the last few years from letters, phone calls, E-Mails and newsgroup postings, the engineering team at Icom is proud to say "many of these changes were compiled from a list of suggestions from you, the amateur radio operator!"

## FEATURES

- 32-bit Floating point DSP and 24-bit AD/DA converter
- DSP IF Filter creates 102 types of filter
- All mode capability covering 160–2 m
- 100 Watt continuous duty cycle
- All mode digital modulation and demodulation
- RTTY demodulator and decoder
- Twin Pass Band Tuning
- RF speech compression with selectable pass band
- Microphone Equalizer
- SSB/CW synchronous tuning

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# IMPORTANT

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

**SAVE THIS INSTRUCTION MANUAL.** This manual contains important safety and operating instructions for the IC-746PRO.

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# EXPLICIT DEFINITIONS

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

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# PRECAUTIONS

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

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

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

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

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

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

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

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

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

Place unit in a secure place to avoid inadvertent use by children.

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

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

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

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

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

Use Icom microphones only (supplied or optional). Other manufacturer's microphones have different pin assignments, and connection to the IC-746PRO may damage the transceiver.

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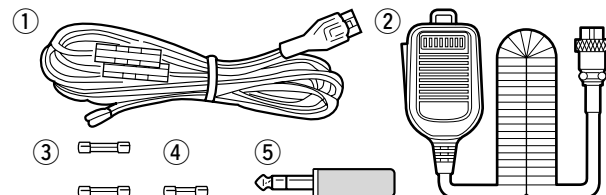
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## SUPPLIED ACCESSORIES

The transceiver comes with the following accessories.

	Qty.
① DC power cable (OPC-025D) .....	1
② Hand microphone (HM-36) .....	1
③ Spare fuses (FGB 30 A) .....	2
④ Spare fuse (FGB 5 A) .....	1
⑤ CW keyer plug (AP-330) .....	1



# QUICK REFERENCE GUIDE

## ■ Installation

1. Install a ground system for DC noise suppression and RFI suppression
2. Install your DC power supply
3. Install lightning protection. This will help protect more than your gear.

4. Install and connect an antenna system for the appropriate bands of operation
5. Connect other peripheral equipment. This includes microphones, headsets, TNC, amplifiers and any other equipment necessary to make your shack complete.

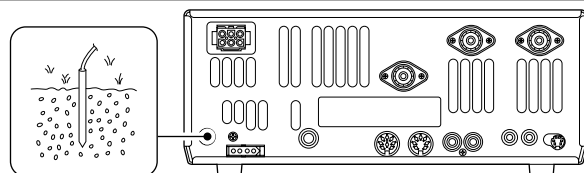
### 1. Grounding your Shack

Although your radio will operate by connecting the DC power supply and antenna, it is necessary to have a good ground system in your shack. A ground connection is the electrical contact between the common point of an electrical or electronic system and the earth.

A good earth ground is necessary to prevent electrical shock, eliminate problems from RFI and DC noise. With more electronic devices being used today, it is also important to reduce RFI and EMI. Although you may not see interference in your shack, without a grounding system, your neighbors may experience interference. Even though many of these devices are Part 15, where they must accept interference from their surrounding environment, it is best to eliminate as much of the possible interference from your shack.

If you do not have a grounding system for your shack, depending on the location of your shack, basement or ground floor, a good ground system can be as simple as a couple of ground rods driven 6 to 8 feet into the soil. When installing your IC-746PRO to your grounding system, the shortest most direct connection is recommended.

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



**WARNING!** NEVER ground station equipment or antennas to house gas lines. NEVER attach ground lines to plastic (pvc) pipe.

#### ◆ Some Symptoms if inadequate grounding

##### a. Poor DC Ground

60 Hz hum on the audio either Rx or Tx without the antenna connected.

If you feel a tingling sensation when you touch a metal surface. Surfaces such as the cover of your radio or power supply.

##### b. Poor RF Ground

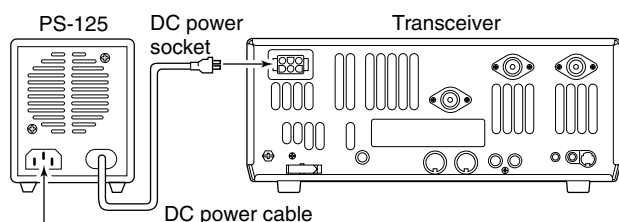
While transmitting and you feel a tingling sensation when you touch a metal surface. Surfaces such as the cover of your radio or power supply.

While transmitting, you experience interference to other electronic devices, such as the telephone, television or stereo audio systems.

### 2. Installing your DC Power Supply

The DC power supply is a device used to convert 110/220 V AC, also known as Household current, to a steady source of 13.8 V DC.

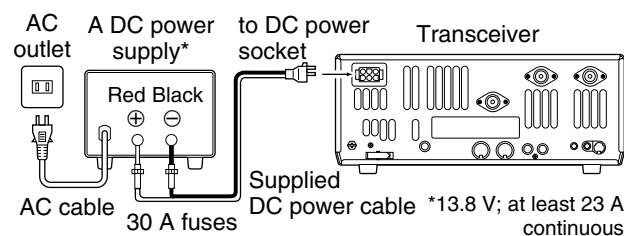
The perfect match to your IC-746PRO is the PS-125. This compact switching power supply is the matching power supply for your IC-746PRO with a current rating of 25 A continuous duty. This plug and play unit plugs into the DC jack located on the rear of the radio.



Connect to an AC outlet using the supplied AC cable.

•If you are not using the PS-125:

Connect the supplied DC power cable (OPC-025D) to the appropriate color coded terminals, then insert the DC connector into the DC jack located on the rear of the radio.



**NOTE:** Although the power supply current requirement is quite low during receiving, this is not the case when you transmit. With many electrical devices in the shack, it is very important to verify the electrical circuit is not overloaded.

### 3. Installing lightning protection

Although you may not live in an area with high occurrence for lightning storms, it is always wise to take precautions for lightning or static discharges. Proper lightning protection not only offers protection to the ham gear, but the shack and most importantly the operator.

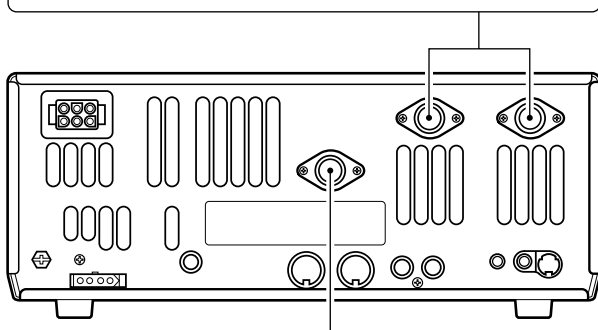
**NOTE:** There are many publications covering proper lightning protection, check with your local dealer for more information and recommendations.

### 4. Installing your antenna system

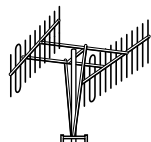
Whether your IC-746PRO is your first radio or one of many, one of your key elements in a great shack is the antenna system. There are three connections on the back of your IC-746PRO, two for HF and 6 m and one for 2 m. If you are using one antenna for HF and 6 m, for simplicity, connect the antenna coax to ANT 1.

#### ANTENNA 1, 2

[Example]: ANT1 for 1.8–18 MHz bands  
ANT2 for 21–50 MHz bands



#### 144 MHz ANTENNA



Connect a VHF (60–144 MHz) antenna; impedance: 50  $\Omega$ .

Your IC-746PRO is equipped with an internal antenna tuner (ATU) for operation on 160–6 m. This ATU is designed to work with an unbalanced 50  $\Omega$  feedline. The purpose of the internal antenna tuner is to match the impedance of your antenna system to as close to a 50  $\Omega$  load as possible. This ATU will not operate with a long wire or ladder line (450  $\Omega$  or other balanced feedlines). An external ATU such as the AH-4 would be necessary for this kind of operation.

#### Antenna SWR

Each antenna is tuned for a specified frequency range and SWR may be increased out-of-range. When the SWR is higher than approx. 2.0:1, the transceiver's power drops to protect the final transistors. In this case, an antenna tuner is useful to match the transceiver and antenna. Low SWR allows full power for transmitting even when using the antenna tuner. The IC-746PRO has an SWR meter to monitor the antenna SWR continuously.

#### PL-259 CONNECTOR INSTALLATION EXAMPLE

- ① Slide the coupling ring down. Strip the cable jacket and soft solder.  
Coupling ring      30 mm      10 mm (soft solder)
- ② Strip the cable as shown at left. Soft solder the center conductor.  
10 mm      Soft solder      1–2 mm
- ③ Slide the connector body on and solder it.  
solder      solder
- ④ Screw the coupling ring onto the connector body.  
30 mm  $\approx$  9/16 in    10 mm  $\approx$  3/8 in    1–2 mm  $\approx$  1/16 in

**⚠ WARNING:** Although a mag mount antenna works great on a vehicle, **DO NOT** use the IC-746PRO with this type of antenna.

**CAUTION:** Although your IC-746PRO has protection to drop down power with a high SWR, this does not completely protect the transceiver from transmission without an antenna. Make sure you have an antenna connected whenever you transmit with your radio.

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

Count on us!



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