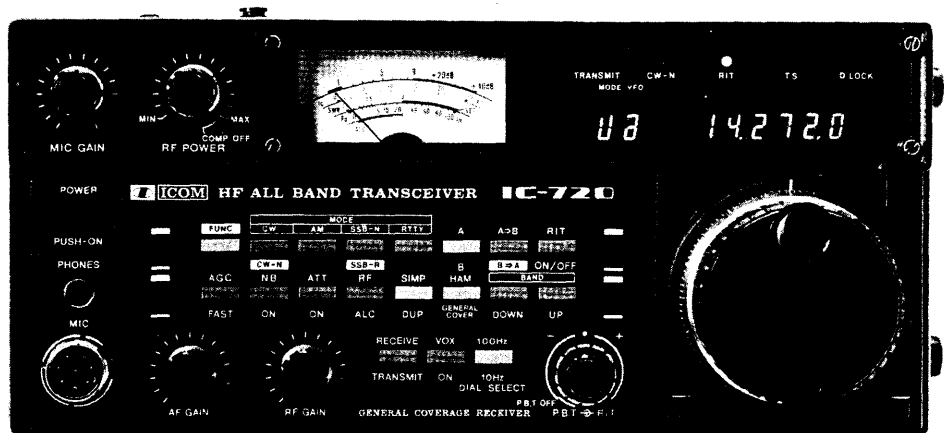


# IC-720

## HF ALLBAND TRANSCEIVER GENERAL COVERAGE RECEIVER

### INSTRUCTION MANUAL





## TABLE OF CONTENTS

I. SPECIFICATIONS .....	1
II. FEATURES .....	2
III. INSTALLATION .....	3
IV. OPERATING CONTROLS.....	6
V. OPERATING INSTRUCTION.....	11
VI. THEORY.....	21
VII. INSIDE VIEW .....	24
VIII. OPTION DESCRIPTION/INSTALLATION.....	27
IX. TRANSVERTER AND SCOPE USE .....	28
X. TROUBLE SHOOTING.....	29

## SECTION I SPECIFICATIONS

### GENERAL

#### Number of Semi-Conductors:

Transistors	104
FET	17
IC (Includes CPU)	55
Diodes	244

#### Frequency Coverage:

Ham Band	1.8MHz ~ 2.0MHz
	3.5MHz ~ 4.1MHz
	6.9MHz ~ 7.5MHz
	9.9MHz ~ 10.5MHz
	13.9MHz ~ 14.5MHz
	17.9MHz ~ 18.5MHz
	20.9MHz ~ 21.5MHz
	24.5MHz ~ 25.1MHz
	28.0MHz ~ 30.0MHz

#### General Cover (Receive Only)

0.1MHz ~ 30.0MHz  
Thirty 1MHz Segments

### TRANSMITTER

#### RF Power:

SSB (A <sub>3</sub> J)	200 Watts PEP input
CW (A <sub>1</sub> ), RTTY (F <sub>1</sub> )	200 Watts input
Continuously Adjustable Output power	10 Watts ~ Max.
AM (A <sub>3</sub> )	40 Watts output

#### Emission Mode:

A <sub>3</sub> J	SSB (Upper sideband and Lower sideband)
A <sub>1</sub>	CW
F <sub>1</sub>	RTTY (Frequency Shift Keying)
A <sub>3</sub>	AM

#### Harmonic Output:

More than 40dB below peak power output

#### Spurious Output:

More than 60dB below peak power output

#### Carrier Suppression:

More than 40dB below peak power output

#### Unwanted Sideband:

More than 40dB down at 1000Hz AF input

#### Microphone:

Impedance 1300 ohms  
Input Level 120 millivolts typical  
Dynamic or Electret Condenser Microphone with  
Preamplifier

#### Frequency Control:

CPU based 10Hz step Digital PLL synthesizer.  
Independent Transmit-Receive Frequency Available  
on same band.

#### Frequency Readout:

6 digit 100Hz readout.

#### Frequency Stability:

Less than 500Hz after switch on 1 min to 60 mins,  
and less than 100Hz after 1 hour. Less than 1KHz  
in the range of -10°C to +60°C.

#### Power Supply Requirements:

DC 13.8V ±15% Negative ground Current drain  
20A max. (at 200W input)

AC power supply is available for AC operation.

#### Antenna Impedance:

50 ohms Unbalanced

#### Weight:

7.5Kg

#### Dimensions:

111mm(H) x 241mm(W) x 311mm(L)

### RECEIVER

#### Receiving System:

Quadruple Conversion Superheterodyne with con-  
tinuous Bandwidth Control.

#### Receiving Mode:

A<sub>1</sub>, A<sub>3</sub>J (USB, LSB) F<sub>1</sub> (Output FSK audio signal),  
A<sub>3</sub>

#### IF Frequencies:

1st	39.7315MHz
2nd	9.0115MHz
3rd	10.75MHz
4th	9.0115MHz

with continuous Bandwidth Control

#### Sensitivity:

Less than 0.25 microvolts for 10dB S+N/N

#### Selectivity:

SSB, CW, RTTY	±1.15KHz at -6dB (Adjustable to ±0.4KHz Min)
	±2.1KHz at -60dB
CW-N (when optional filter Installed)	±250Hz at -6dB ±750Hz at -60dB
AM (when optional filter installed)	±3.0KHz at -6dB ±9.0KHz at -60dB ±2.6KHz at -6dB ±6.0KHz at -60dB

#### Spurious Response Rejection Ratio:

More than 60dB

#### Audio Output:

More than 2 Watts

#### Audio Output Impedance:

8 ohms

Specifications are approximate and are subject to change without notice or obligation.

## SECTION II FEATURES

### FEATURES:

Congratulations on the purchase of ICOM's IC-720. This fine piece of equipment represents ICOM's advanced digital technology and knowledge in the field that have produced an HF transceiver with a general coverage receiver, from 100KHz to 30MHz in 1MHz steps. This, combined with features ICOM has found, are most wanted by Amateurs, serves to make this the finest in the HF field. The all solid state circuits, driver and final power stages provide about 100 Watts output with all the attendant convenience and long life. The IC-720 is an all mode, 30 band transceiver offering SSB, CW, and RTTY.

With the Band Up/Down control the frequency can be changed in 1MHz steps in the General Coverage mode, and will change the Ham bands from one band to the next when pushed. The band change will continue up to 28MHz, then revert to the lowest band if pushed continuously.

### DUAL 10Hz STEP DIGITAL VFO

The dual digital VFO consists of the PLL Unit which has a triple looped Phase Locked Loop and the LOGIC Unit to control the PLL which has a Microcomputer Control System.

Three tuning frequency resolutions of 10Hz, 100Hz and 1KHz steps are selectable with the TS button and the DIAL SELECT switch.

Two separate VFO's can be used independently in the SIMPLEX operation, and any desired frequency split transmit/receive in the DUPLEX operation.

### OUTSTANDING RECEIVER PERFORMANCE

The IC-720 employs a dual conversion superheterodyne system which has the first IF 39.7315MHz and a second IF 9.0115 MHz.

The RF amplifier circuit is a wide band push-pull amplifier using low-noise and wide dynamic range junction FET's, and the mixer is a high level Double Balanced Mixer developed by ICOM.

These advanced devices and systems give higher spurious response rejection ratio, higher sensitivity, and wider dynamic range.

### PASS BAND TUNING AND SPEECH PROCESSOR

The IC-720 has a built-in Pass Band Tuning system developed by ICOM that allows you to continuously adjust the pass band of the IF. By turning the control, you can eliminate interference from a nearby signal, thus providing clear reception. It can also be used as a tone control. During transmit, the Pass Band Tuning circuit can be used as a Speech Processor providing increased "talk power" for outstanding DXing.

### ADDITIONAL CIRCUITS

The IC-720 has a built-in Noise Blanker, VOX, CW Monitor, APC, SWR detector, and many other circuits for your convenience.

The IC-720 has everything you need to really enjoy HF operation, in an extremely compact, rugged transceiver.

### WARC '79 FREQUENCIES

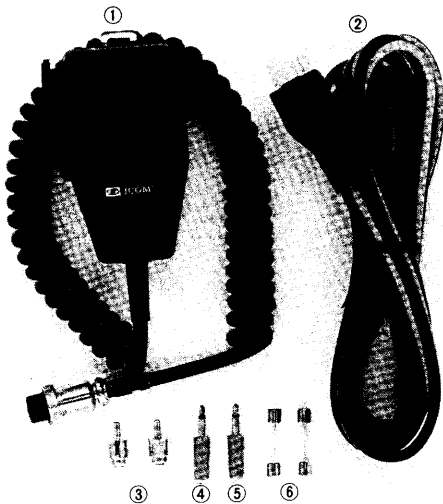
All the frequencies approved during the conference are in! Keeping up with the future ICOM again leads the field. No need for plug-ins, the frequencies are there.

## SECTION III INSTALLATION

BE SURE TO READ THE FOLLOWING INSTRUCTIONS BEFORE USE

### 3 - 1 UNPACKING

Carefully remove the transceiver and accessories from the shipping carton and examine them for damage incurred during shipping. If damage is found, notify the shipping agents or dealer immediately stating the full extent of the damage. It is recommended that you retain the shipping cartons for storage, re-shipping, or moving. Make sure that you have not overlooked any of the accessories packed. The photo below shows all the items that are packed in the carton.



1. Microphone (IC-HM7) . . . . .	1
2. DC Power Cord. . . . .	1
3. Pin Plugs (Scope Terminal Plug, Transverter Terminal Plug). . . . .	2
4. External Speaker Plug . . . . .	1
5. Key Plug . . . . .	1
6. Spare Fuses (20 Amp) . . . . .	2

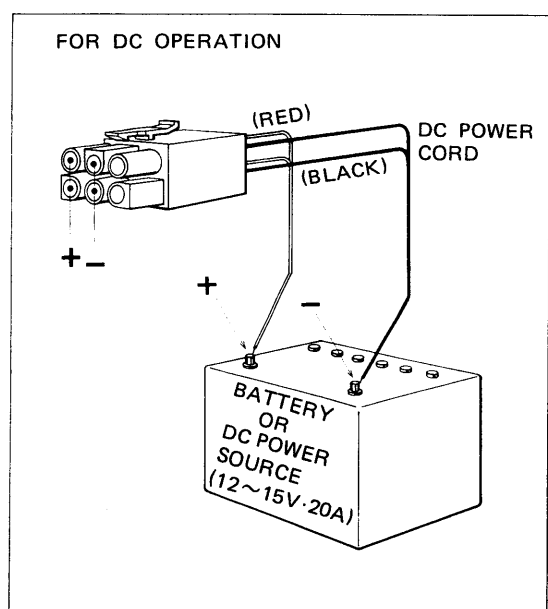
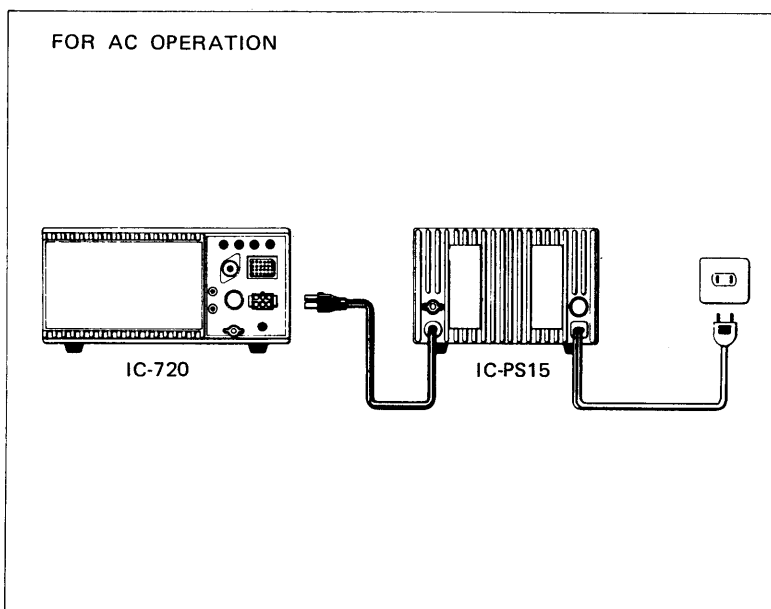
### 3 - 2 INSTALLATION RECOMMENDATIONS

1. It is recommended that the transceiver be placed in a location away from direct sunlight, high temperatures dust, and high humidity.
2. During transmission the right side of the unit, as you face the set, will usually become relatively warm since it is used as a heatsink. Allow at least one inch (3cm) clearance from other equipment to provide good air circulation. The rear PA heatsink should also have good ventilation; avoid heater or air conditioner ducts.
3. Locate the set so that controls are readily accessible, and so the meter can be easily read.
4. An optional bracket is available for mobile operation. Select the best location for mounting that will accommodate the weight of the set, and not interfere with driving.
5. Be sure to hook up to the ground lug!

### 3 - 3 POWER SUPPLY

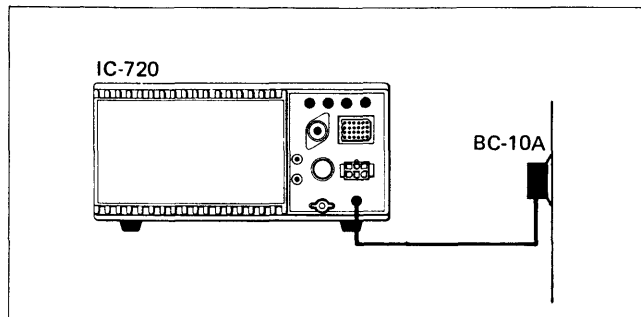
For AC operation, the IC-PS15 is recommended. For mobile operation, or if another power supply is used, be certain that it provides 12 - 15 volts and at least 20 Amps. The maximum power consumption of the transceiver is 16 - 20 Amps, so keep in mind that if the unit is installed in an automobile it is turned on after the engine is started. Pay close attention to the battery and wiring conditions.

To connect the DC power cord supplied with the set, do the following: First make sure the Power Switch is Off, and the set is in the Receive mode. Connect the cord to the power supply using the red wire for the positive (+) side, and the black wire for the negative (-) side (Reversing the connections will cause the protection circuit to blow the fuse.) Connect the DC plug to the IC-720 as shown in the drawing below.



### 3 - 4 MEMORY BACK-UP

To retain the memory in the CPU, keeping the operating frequencies of the VFOs even when the main Power Switch is turned off, hook up a power source of 9 to 12 Volts DC to the Memory Back-Up terminal on the rear panel. For mobile installation this can be accomplished by direct connection to the car battery, since the current drain is low. For AC operation it is recommended that the optional BC-10A be used.



### 3 - 5 ANTENNA

The antenna is the single most important piece of equipment, other than the transceiver. An inferior antenna will result in reduced performance. With a quality antenna and a feed of 50 ohms impedance matching the excellent performance are easily attained.

Install a high performance antenna for the band(s) on which you wish to operate, placing it as high as possible, and insuring that all connections are securely made. Loose connections, poor soldering, or faulty connectors will greatly effect performance. In the case of mobile antennas make sure they are connected to a good ground on the body of the car.

The output of the transceiver is quite high so make sure you do not connect the antenna connector to open lines or transmit under mis-matched conditions. To do either can result in overload of the final stage and damage or malfunction of the set.

#### WARNING:

DO NOT OPERATE THE SET WITHOUT A WELL-GROUNDED ANTENNA TO PROTECT THE TRANSCIVER AGAINST MIS-MATCH. USE OF A BALUN FOR MATCH IS HIGHLY RECOMMENDED. FAILURE TO DO SO CAN RESULT IN DESTRUCTION OF FINALS.

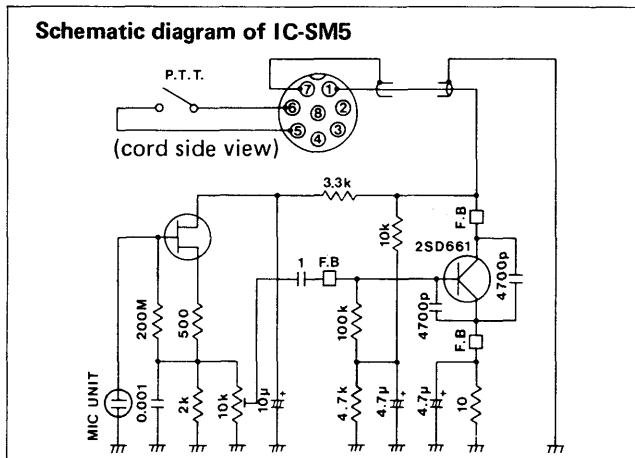
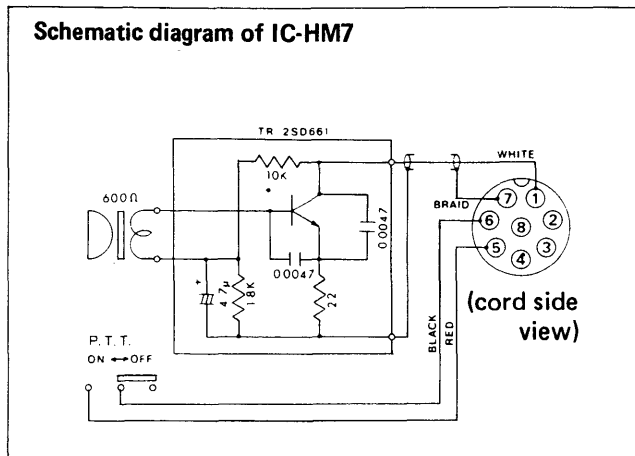
### 3 - 6 GROUND

To eliminate the danger of electrical shocks, TVI, BCI, and other problems be sure to connect a heavy ground wire, as short as possible, to the ground lug on the rear panel.

### 3 - 7 MICROPHONE

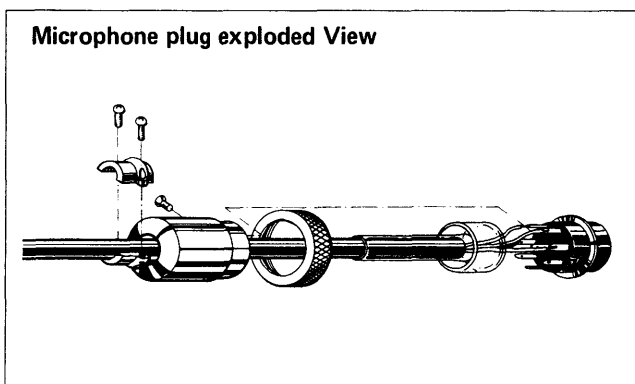
The microphone supplied with the IC-720 is the IC-HM7 which contains a pre-amplifier. The optional electret condenser type stand microphone IC-SM5 can be used. (The optional IC-SM5, a desk top type microphone also contains also a pre-amplifier.)

Their circuit diagrams are shown below.



Should you wish to use a different microphone make certain it has a proper pre-amplifier.

Particular care should be exercised in wiring, as the internal electrical switching system is dependent upon it. See the schematic for the proper hook up.





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