ICOM

IC-21取扱説明書

TABLE OF CONTENTS

SECTION II – DESCRIPTION

This transceiver is an extremely rugged, completely solid state transceiver. State of the art devices such as Integrated Circuits, Field Effect Transistors, varactors, and Zener diodes, are engineered into its tight-knit, straightforward, electronic design throughout both transmitter and receiver.

Designed for base station use in conjunction with the IC-20(IC 20X). Featuring 24 channel capability, crystal controlled, both transmitting and receiving; plug-in for external VFO in the receive mode; built-in center discriminator meter; built-in S and SWR meter; and RIT circuit for 2nd stage tuning to crystal frequencies above or below standard. Reliability, low current demand, compactness, unexcelled performance, and ease of operation are the net result. The dual conversion receiver with its FET front end and high-Q filter network boasts low noise and sensitivity of 0.4 uV, or less. Signal gain of 90 db, or more, is accomplished from the second mixer back by virtue of numerous IF amplifier stages. The need for additional front end RF amplification is thus eliminated. Zener-regulated crystal-controlled first and second local oscillators produce unmatched stability. Audio reproduction is of an unusually high order of distortion-free clarity.

The transmitter section will produce a minimum of 10 Watts RF out. Again, a Zener regulated crystal oscillator is employed for initial frequency stability. Twenty-four crystal controlled channels are provided for operating convenience and versatility. High-Q LC coupling and shielded stages provide minimum interstage spurious reaction. An encased low-pass filter is placed at the output to further insure undesirable frequency products not being emitted. An ingenious final PA transistor protection device (APC) is incorporated in the final output circuitry. A tiny VSWR bridge and four DC amplifiers constantly monitor the output for high VSWR, a shorted or absent antenna load, or other difficulty that would cause irreparable final transistor damage. Should these difficulties occur, the APC instantaneously disables the driver and final PA, without damage. A two-way power supply, AC or DC, is built in.

All circuitry is constructed in a series of modules which are easily removable for servicing. The modules are housed in a sturdy, anodized brass frame, which is in turn, housed in a rigid metal chassis, providing for an extremely durable and rugged unit. Premium care has been taken to filter and regulate internal DC voltages. A DC input filter is provided to eliminate alternator or generator "whine" generated in the vehicle. Power line inputs are voltage regulated to smooth out power fluctuations to within ± 10%. Test points are brought up from all major circuits to facilitate maintenance checks and trouble shooting, should the need arise.

Each unit comes with built-in speaker, a high-quality dynamic microphone, microphone clip, AC and DC cables, external speaker plug, and operating manual. An optional mobile mounting bracket is available.

A modern styled face plate, easy-to-read meters, and convenient controls, with design that will compliment your ham shack or auto. A welcome addition to any fixed station or dashboard.

SECTION III – INSTALLATION

1. Unpacking:
   Carefully remove your transceiver from the packing carton. It is recommended you keep

the shipping cartons. In the event storage, moving, or re-shipment is necessary, they come in very handy. Accessory hardware, cables, etc., are packed with the transceiver. Make sure you have not overlooked anything.

2. Location:

Where you place the transceiver in your station or automobile is not critical and should be governed by convenience and accessibility entirely. Since the unit is so compact, many mobile possibilities present themselves. If used, the mobile mounting bracket will provide you with some guide as to placement. Anyplace where it can be mounted with metal screws, bolts, or pop-rivets, will work. The IC-21 (IC-21X) is designed for high convenience in fixed-station use; beneath the front of the cabinet is a foldaway stand that can be used to tilt the set up, or folded flat when not in use, or the IC-21 (IC-21X) can be left sitting on its built-on legs. The unit occupies a space of 4 3/8" high x 9 1/16" wide x 10 1/4" deep. Its weight is 14 lbs.

3. Power Requirements:

The IC-21 is supplied ready to operate from any 117 V AC source, or 13.5 VDC, 2.5 ampere negative-ground source. The "IC-21X" transformer can be wired for 100, 117, 200, 220, or 234 Volt. An automobile, 12 volt, negative ground, system is usually more than adequate. Some note must be taken, however, of the condition of the vehicle's electrical system. Items such as a low battery, worn generator-alternator , poor voltage regulator, et cetera, will impair operation of your transceiver, as well as the vehicle. High noise generation, or low voltage delivery can be traced to these deficiencies during DC operation. Receiver gain and transmitter output will be greatly impaired.

CAUTION: Excessive voltage (above 15V DC or 15% AC V) will cause damage to your transceiver. Be sure to check the source voltage before plugging in the power cord.

Included with your transceiver is an AC power cable and a DC power cable, with plugs attached, great care should be taken to not interchange them. On the DC cable the Red Wire is positive (+) and the Black Wire is negative (–). If your mobile installation permits, it is best to connect these directly to the battery terminals. This arrangement eliminates random noise and transient spikes sometimes found springing from the automotive accessory wiring. If such an arrangement is not practicable, than any convenient B+ lead in the interior of the vehicle, and the negative frame, can be utilized. Your transceiver provides an internal DC filter that will take out the large amount of transient difficulties, anyway. Remember, the unit operates on a negative ground system, only - it cannot be used in a positive ground automobile. After making your connections, simply insert the plug into your transceiver (see Fig. 2).

4. Antenna:

The most important single item that will influence the performance of any communication system is the antenna. For that reason, a good, high-quality, gain antenna of 50 ohms impedance is recommended, fixed or mobile. In VHF as well as the low bands, every watt of ERP makes some difference. Therefore, 12 watts average output plus 3 db of gain antenna equals 24 watts ERP, presuming low VSWR, of course. The little more invested in a gain type antenna is well worth it.

When adjusting your antenna, whether fixed or mobile, by all means follow the manufacturer's instructions. There are some pitfalls to be aware of. If a SWR meter is used remotely that is a diode VSWR meter, and not engineered for VHF applications, readings will invariably have errors of 40% or more. Rather than this, use an in-line Watt Meter similiar to the Drake WV-4, or Bird Model 23, with VHF cartridge. Further, when adjusting a mobile antenna, do so with the motor running, preferably above normal idling speed. This will insure proper voltage level to the transceiver.

Do not become alarmed if your transceiver fails to transmit at times during the antenna tune-up procedure. Remember, your transceiver has a built-in Automatic Protection Circuit (APC) that will disable the transmitter if VSWR, a shorted coaxial line or connector, or other antenna deficiency is present. A quick check on a good 50 ohm dummy load will show the transceiver to be working. The difficulty will lie with the antenna, or its transmission line. The RF coaxial connector on the rear chassis mates with a standard PL-259 connector. Some models may have metric thread, if this is the case, a matching metric PL-259 is provided. In any event, the RF connector will mate with almost any PL-259 connector, if care is taken to seat them properly.

5. Microphone:

A high-quality dynamic microphone is supplied with your transceiver. Merely plug it into the proper receptacle on the front panel. Should you wish to use a different microphone, make certain it is of the high impedance type; at least 10K, or better. Particular care should be exercised in wiring, also, as the internal electronic switching system is dependent on it. See the schematic for the proper hook-up. Under no circumstances use a "gain pre-amp" type microphone. The audio system in your transceiver is more than adequate and additional pre-amplification is unnecessary. To use this class microphone is to invite distortion and possible damage to the transceiver.

6. Crystals:

Your transceiver has twenty-four channels, both transmit and receive, or a total of forty-eight crystal positions. The channel selector switch selects in each position one transmit and one receive channel of its twenty-four positions. It also has a plug-in, external VFO accessory socket. Merely plug in the remote VFO to the remote VFO accessory plug (see Fig. 3), then plug in the interior plug, located at the top of the crystal board (see Fig. 3). To order additional crystals from a manufacturer, the following correlation data is provided. Remember to specify high activity as a prerequisite to your acceptance:

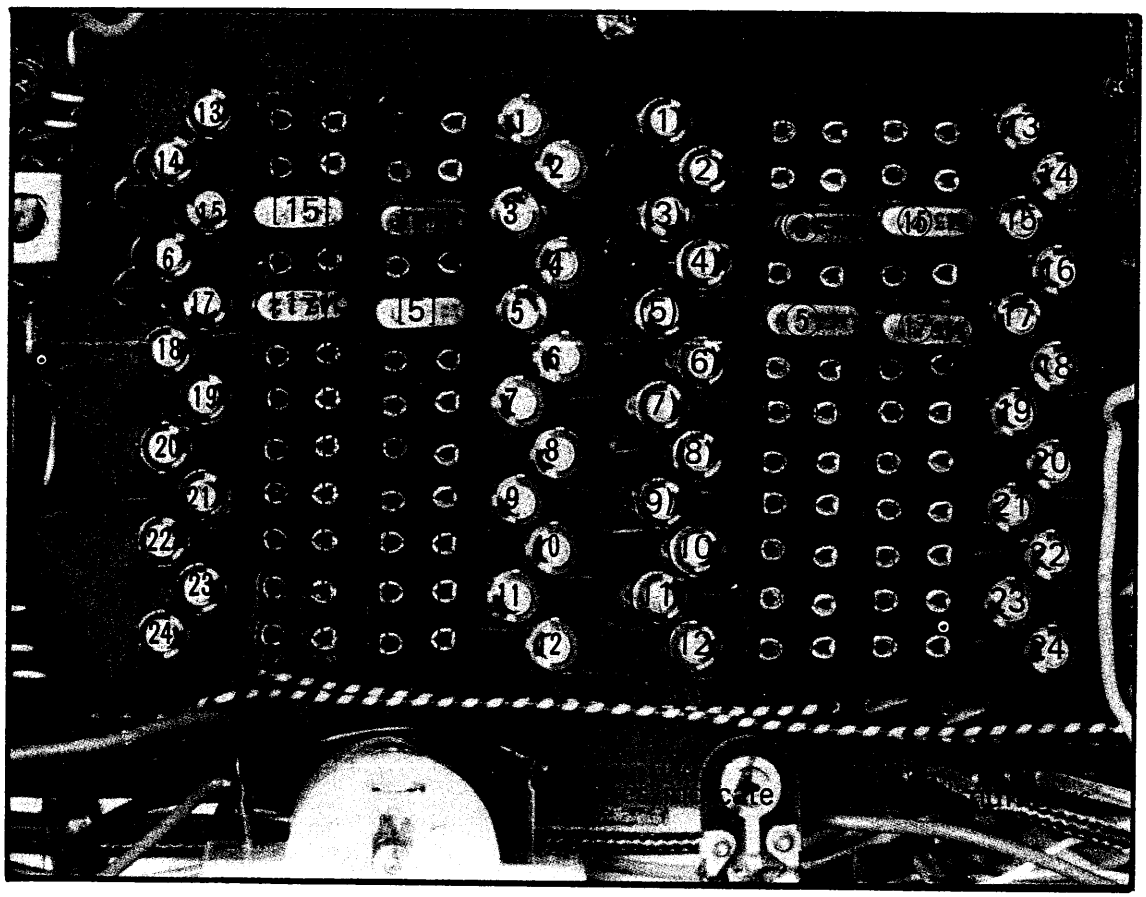
	Crystal Data
Holder type:	HC–25/u
Calibration Tolerance:	0.0025%
Load Capacitance:	20 pf
Effective Resistance:	15 ohms, or less
Transmit Crystals:	$\frac{\text{Crystal Frequency}}{\text{Desired Operation Frequency}}{8}$
Receive Crystals:	$\frac{\text{Crystal Frequency}}{\text{Desired Operating Frequency} - 10.7\ \text{MHz}}{9}$

Trimmers have been placed on the crystal board to assist you in "tweaking" new crystals on frequency. Consult the trimmer location chart (see Fig. 1) for their positions.

The amount of frequency spread between any two receiving or any two transmitting frequencies should not exceed 2 MHz. Since the receiver and transmitter are independent of each other, you may have any practical amount of frequency separation you wish here. Only two or more widely spaced frequencies for the receiver alone, or for the transmitter alone, need be considered under the 2 MHz limitation. For accurate crystal alignment it is best to use a frequency counter, however, an easy method of tuning to crystals is as follows:

1. Receiving:
   a. Use a calibrated IC-20(IC-20X) or IC-21(IC-21X) signal source.
   b. Set RIT Control (#5) to 0, or off.
   c. Next adjust trimmer for that particular channel to a '0' reading on the Discriminator Meter (#9).

2. Transmitting:
   a. Turn the Squelch Control (#3) full counter-clockwise, past the "click."
   b. Adjust trimmer for that particular channel for a '0' reading on the Discriminator Meter (#9).
   c. By turning the Mic Gain Control (#16) the deviation can be set for the best transmit tone.

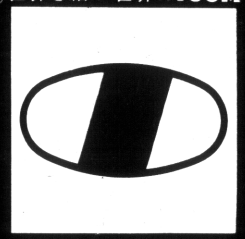


* Front Panel

(Fig. 1)

[1] ~ [24]	Crystal unit sockets for transmission
1 ~ 24	Transmitting frequency adjust trimmers
①~㉔	Crystal unit sockets for reception
(1) ~ (24)	Receiving frequency adjust trimmers

世界を結ぶ世界のICOM



株式会社 井上電機製作所

本　社　大阪市東住吉区加美鞍作町３番地の８　☎(06)792-6843(代)
営業所　東京都渋谷区恵比寿南2丁目13番9号フオックスビル2階　☎(03)715-3350

 Printed by AD COLOR 5.45.110