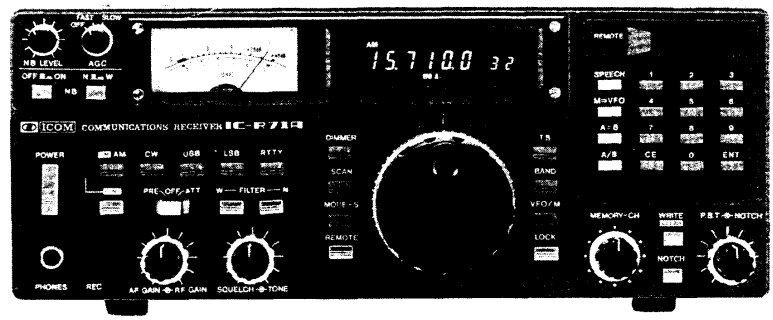
IC-R71A/E/D

COMMUNICATIONS RECEIVER

INSTRUCTION MANUAL



ICOM

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SECTION 1 SPECIFICATIONS

GENERAL

Number of Semiconductors:

Transistors	90
FET	19
IC (Includes CPU)	47
Diodes	237

Frequency Coverage:
0.1MHz ~ 30MHz
(Australian Version: 2.0MHz ~ 30.0MHz)
(German Version: 0.15MHz ~ 26.1MHz)
Thirty 1MHz Segments

Frequency Control:
CPU based 10Hz step Digital PLL synthesizer with dual VFO system

Frequency Readout:
6 digit 100Hz readout.

Frequency Stability:
Less than 200Hz after switch on 1 min to 60 mins, and less than 30Hz after 1 hour. Less than 500Hz in the range of 0°C to +50°C

Power Supply Requirements:
117V or 235V ±10% 50 ~ 60Hz 30VA
(100V/200V/220V use requires internal modification)

Antenna Impedance:
50 ohms Unbalanced
(Single wire can be used on 0.1 ~ 1.6MHz)

Weight:
7.5 kg (16.5 lbs)

Dimensions:
111mm(H) x 286mm(W) x 276mm(D)
(4-3/8 inch x 11-1/4 inch x 10-7/8 inch)

RECEIVER

Receiving System:
Quadruple Conversion Superheterodyne with continuous Bandwidth Control
(F_3*: Triple Conversion Superheterodyne)

Receiving Mode:
A_1, A_3J (USB, LSB), F_1 (Output FSK audio signal), A_3, F_3*

IF Frequencies:

1st	70.4515MHz
2nd	9.0115MHz
3rd	455KHz
4th	9.0115MHz (except F_3*)

with continuous Bandwidth Control (except F_3*)

2nd IF Center Frequency:

SSB (A_3J) AM (A_3)	9.0115MHz
CW (A_1) RTTY (F_1)	9.0106MHz
FM* (F_3)	9.0100MHz

Sensitivity (when preamplifier is ON):

SSB, CW, RTTY	Less than 0.15 microvolts (0.1 ~ 1.6MHz : 1 microvolt) for 10dB S+N/N
AM	Less than 0.5 microvolts (0.1 ~ 1.6MHz : 3 microvolts)
FM*	Less than 0.3 microvolts for 12dB SINAD (1.6 ~ 30MHz)

Selectivity:

SSB, CW, RTTY	2.3KHz at –6dB (Adjustable to 500Hz min) 4.2KHz at –60dB
CW-N, RTTY-N	500Hz at –6dB 1.5KHz at –60dB
AM	6KHz at –6dB (Adjustable to 2.7KHz min) 15KHz at –50dB
FM*	15KHz at –6dB 25KHz at –60dB

Spurious Response Rejection Ratio:
More than 60dB

Audio Output:
More than 3 Watts

Audio Output Impedance:
8 ohms

*When optional FM unit is installed.

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

SECTION 2 FEATURES

GENERAL COVERAGE RECEIVER CAPABILITY

The IC-R71 is a general coverage receiver between 100KHz and 30MHz with thirty 1MHz segments. The Up-conversion system using a high side IF and Microcomputer Control System make these capabilities possible.

In addition to these, the low-pass filters and the band-pass filters selected by an electronic signal from the BAND UP/DOWN button, make a no tune-up system.

DUAL 10Hz STEP DIGITAL VFO

The dual digital VFO consists of the PLL unit, which has a dual looped Phase-Locked-Loop, and the LOGIC unit used to control the PLL, has the Microcomputer Control System.

Normal tuning rate is in 10Hz increments and increasing the speed of rotation of the main tuning knob shifts the tuning to 50Hz increments automatically. Pushing the tuning speed button gives 1KHz tuning. Digital outputs are available (as an option) for computer control of the receiver frequency and functions, and for a synthesized voice frequency readout.

10-KEY KEY PAD

10-KEY key pad is provided in order to set a desired frequency easily and faster. By pushing digit keys in order of the desired frequency digits, the operating frequency will be changed without changing the band and turning the tuning control.

32 MEMORIES

Thirty two tunable memories are provided to store mode and frequency, and the internal RAM is backed up by an internal lithium memory backup battery to maintain the memories for up to seven years. Scanning of frequencies, memories and bands are possible from the unit. In the Mode-S mode, only those memories with a particular mode are scanned; others are bypassed. Data may be transferred between VFO's, from VFO to memories, or from memories to VFO.

OUTSTANDING RECEIVER PERFORMANCE

Utilizing an ICOM developed J-FET DBM, the IC-R71 has a 105dB dynamic range. The 70.4515MHz first IF virtually eliminates spurious responses, and a high gain 9.0115MHz second IF, with ICOM's PBT selectivity. A deep IF notch filter, adjustable AGC and noise blanker (can be adjusted to eliminate the woodpecker noise), audio tone control, clear reception even in the presence of strong QRM or high noise levels. A low noise receiver preamp provides exceptional reception sensitivity as required.

PASS-BAND TUNING

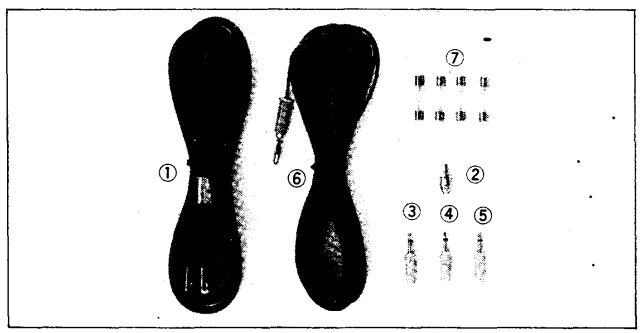
The IC-R71 has a built-in Pass-Band Tuning system developed by ICOM that allows you to continuously adjust the pass band of the IF. By turning the control, you can eliminate interference from a nearby signal, thus providing clear reception.

SECTION 3 INSTALLATION

BE SURE TO READ THE FOLLOWING INSTRUCTIONS BEFORE USE.

3 - 1 UNPACKING

Carefully remove your receiver 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 to keep the shipping cartons. In the event storage, moving, or reshipment becomes necessary they will be handy. Accessory cables, plugs, etc., are packed with the receiver. Make sure you have not overlooked anything.



1. AC Power Cord 1
2. Pin Plug 1
3. External Speaker Plug 1
4. Recorder Plug 1
5. Recorder Remote Control Plug 1
6. Antenna Wire 10m
7. Spare Fuses 4

3 - 2 RECOMMENDATIONS FOR INSTALLATION

1. Avoid placing the IC-R71 in direct sunlight, high temperature, dusty or humid places.
2. Be sure that nothing is on and just behind the rear panel to ensure good ventilation. Also avoid places near outlets of heaters, air conditioners, etc.
3. Place the unit so that the controls and switches can easily be handled and the frequency indication and meter can easily be read.
4. Use the Ground Lug!

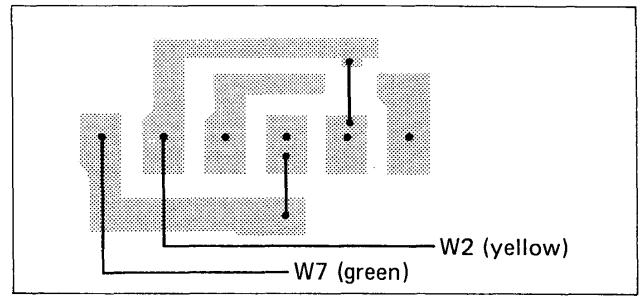
3 - 3 POWER SUPPLY

The receiver has a built-in AC power supply. Connect the supplied AC power cord to the AC power socket on the rear panel of the unit, and the opposite side plug of the power cord into any convenient AC power outlet.

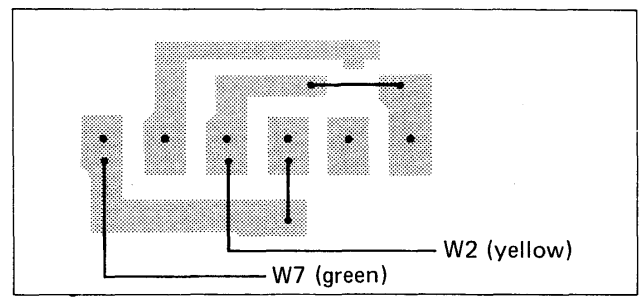
When you wish to use the receiver with an AC power supply voltage other than the original one, you must make internal wiring modifications as per the following drawings.

If you are not familiar with soldering or do not understand the drawings, don't attempt to make any modifications, but contact the nearest ICOM service center or authorized dealer.

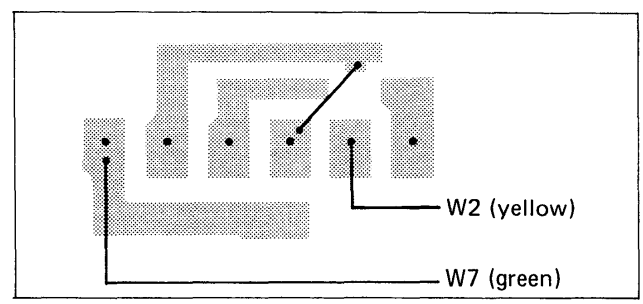
For 100V AC



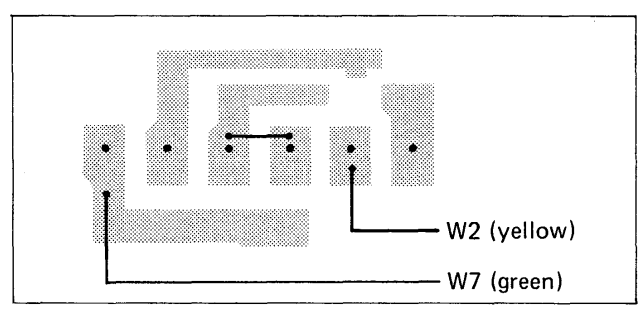
For 117V AC



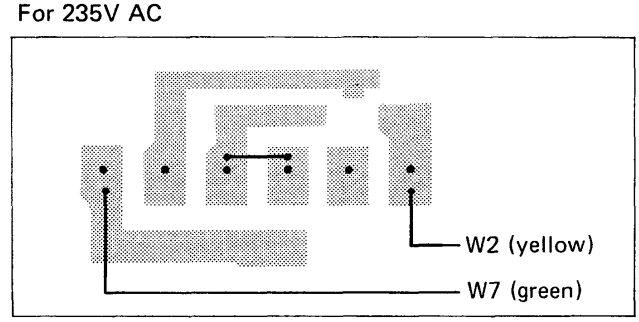
For 200V AC



For 220V AC



For 235V AC



NOTE: For DC operation, contact your nearest ICOM service center or authorized ICOM dealer.

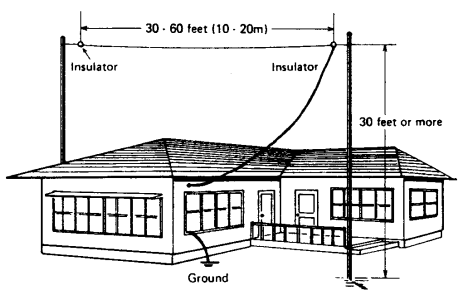
3 - 4 ANTENNA

The antenna plays a very important role in radio communication. If the antenna is inferior, your receiver cannot give you the best performance. With a good antenna and feeder cable having 50 ohms impedance, you should easily get the desired matching and performance. Carefully install a high performance antenna that suits the frequency band(s) you wish to operate on and place it as high as possible. Be especially careful of the condition of the connectors as loose connections will deteriorate the performance.

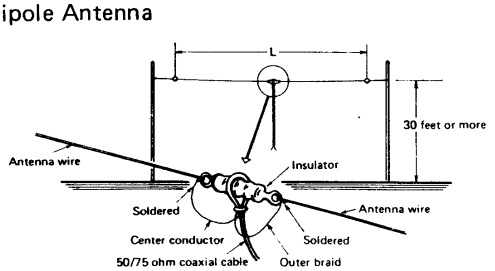
Since the IC-R71 is a general coverage receiver it is recommended that a long-wire general coverage antenna and an antenna coupler be used. To attempt to use a Ham band antenna for general coverage reception could result in mismatching, and attendant poor reception. However, it is good enough for strong broadcasting stations. Also, the supplied antenna wire can be used as a temporary antenna.

Example of various antennas:

- Long Wire Antenna

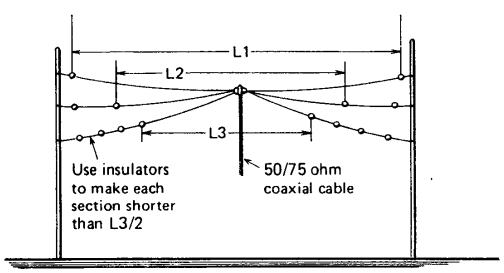


- Dipole Antenna



$$L(m) = \frac{143}{\text{Frequency (MHz)}} \quad \text{or} \quad L(\text{feet}) = \frac{468}{\text{Frequency (MHz)}}$$

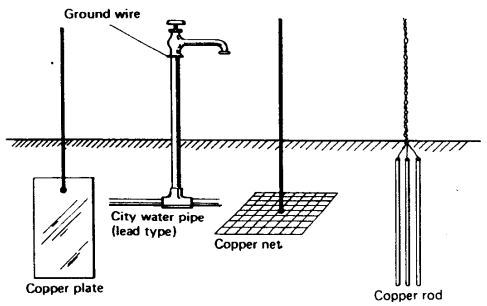
- Multiband Antenna
  L1, L2 and L3 can be calculated by the same formula as for dipole antenna.



3 - 5 GROUND

In order to prevent electrical shocks, and other problems, be sure to connect a heavy wire ground, as short as possible, from a good earth point to the ground terminal on the rear panel.

Example of various ground systems:



3 - 6 EXTERNAL SPEAKER

The IC-R71 contains an internal speaker, and is also designed so that it can drive an external speaker from the external (EXT) speaker jack on the rear panel. Be sure the impedance of the external speaker is 8 ohms, and remember that with the external speaker connected, the internal speaker is disabled.

3 - 7 HEADPHONES

Any good headphone set, including stereo type, that have 4-16 ohms impedance can be used. With the plug inserted halfway into the PHONES jack, both the headphone and speaker will operate. This is convenient when others wish to listen in on the station.

With a stereo headphone set inserted this way, however, the headphone will lose the sound on one side. With the plug inserted completely, only the headphone works.

3 - 8 CAUTIONS

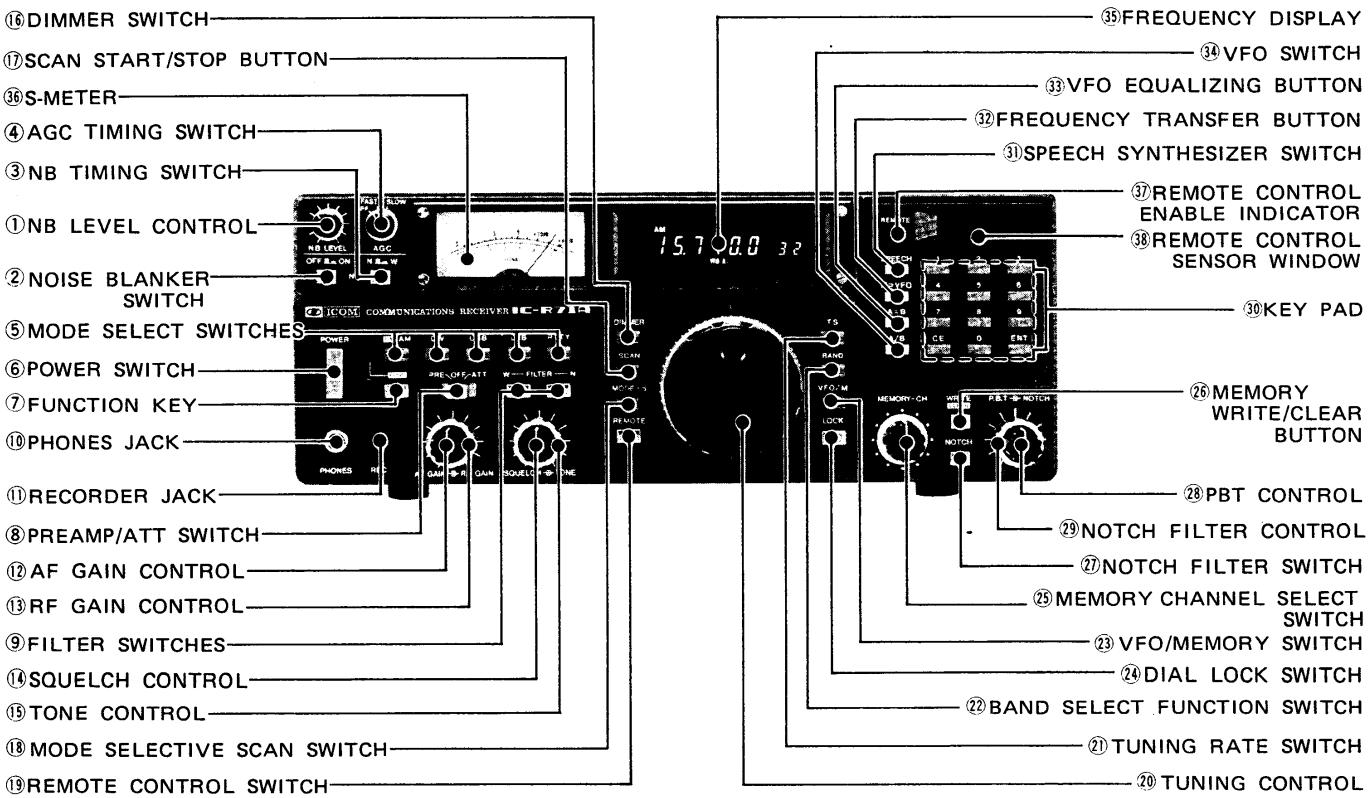
As the unit has already been closely adjusted with highly sophisticated measuring instruments, never tamper with the turnable resistors, coils, trimmers, etc.

C-MOS is used in the Logic unit as well as the PLL. C-MOS ICs are very susceptible to excessive static charges and overcurrent and care must be used when handling them. Therefore, avoid touching the Logic unit and the nearby circuitry unless absolutely necessary. When it is necessary to check the circuitry, observe the following points.

Ground all measuring instruments, the soldering iron, and other tools. Do not connect or disconnect the C-MOS IC from its socket, or solder it when the power is on. Do not apply voltage of less than −0.5 or more than +5 Volts to the input terminals of the IC. DO NOT MEASURE WITH AN OHMMETER.

SECTION 4 OPERATING CONTROLS

4 - 1 FRONT PANEL



1. NB LEVEL CONTROL

Controls the threshold level of the noise blanker. Adjust the controls so that incoming noises will be disappeared.

2. NB (NOISE BLANKER) SWITCH

When pulse type noise such as automobile ignition noise is present, push this switch in. The noise will be reduced to provide comfortable reception.

3. NB TIMING SWITCH

The noise blanker blanking time can be selected NORMAL and WIDE by this switch. It will be effective against any types of noises.

4. AGC TIMING SWITCH

For changing the time-constant of the AGC (Automatic Gain Control) circuit. By setting the switch to slow position, the AGC voltage is released more slowly. Set the switch to provide comfortable reception.

When the switch is in the OFF position, the AGC function is turned OFF and the S-meter does not swing even if a signal has being received. (The AGC does not actuate on the FM mode.)

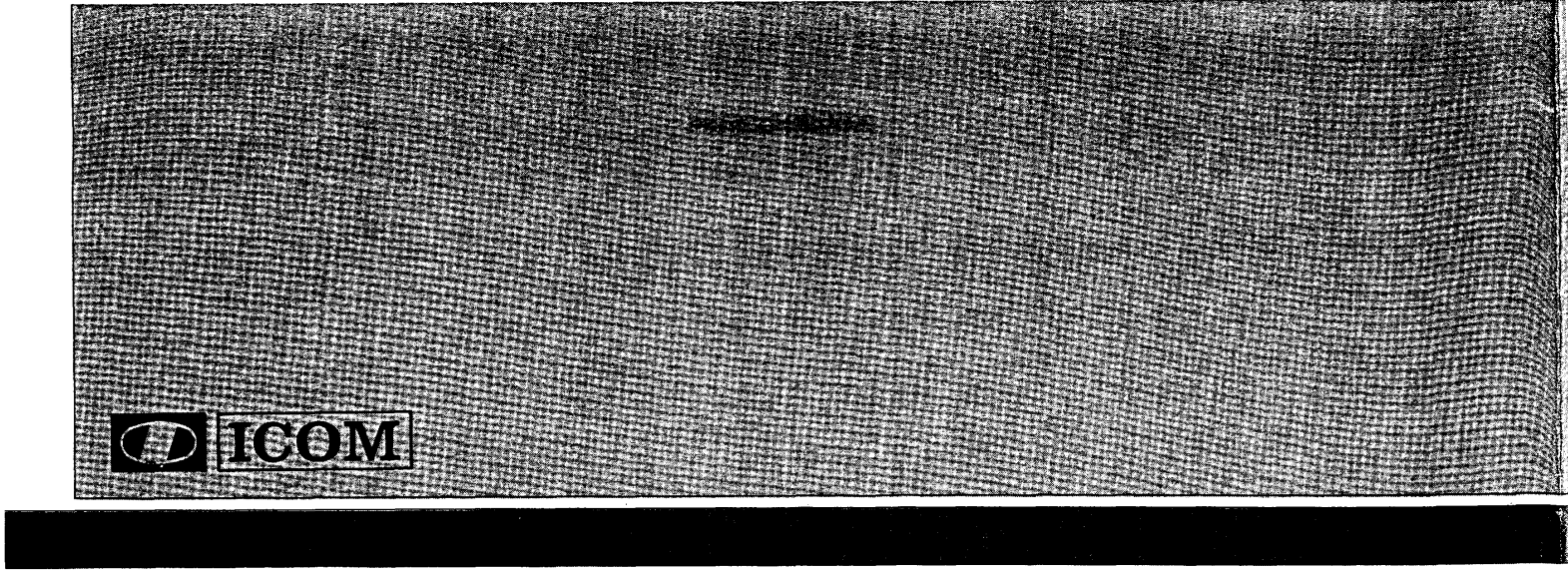
5. MODE SELECT SWITCHES

Selects any one of five operating modes by simply pushing the desired switch. Additionally, the AM switch has dual function as follows.

1. AM — For AM operation.
2. FM — Pushing the FUNCTION KEY first, then the AM switch, the FM mode is selected.

6. POWER SWITCH

This switch is a push-lock type switch which controls the input AC power to the set. When the switch is pushed in and locked, power is supplied to the set. The switch is pushed again and released, the power to all circuits is cut.



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