

IC-551

50MHz ALL MODE TRANSCEIVER

INSTRUCTION MANUAL

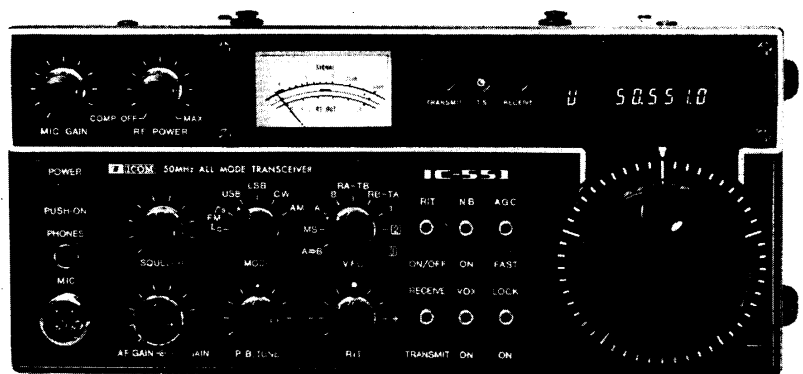


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SECTION I SPECIFICATIONS

GENERAL

Number of Semi-conductors	: Transistors	51
	FET	13
	IC (includes CPU)	30
	Diodes	114
Frequency Coverage	: 50 ~ 54MHz	
Operationable Temperature	: -10°C ~ +60°C (14°F ~ 140°F)	
Frequency Stability	: Less than ±500Hz after switch on 1 min to 60 min, less than 100Hz per 1 hour after 60 min, and less than ±1KHz in the range of -10°C to +60°C	
Antenna Impedance	: 50 ohms unbalanced	
Power Supply Requirements	: 13.8V DC ±15%, negative ground, or 117V/240V AC ±10%	
Power Consumption	: Receive at min. audio level	DC 0.9A AC 35W
	at max. audio level	DC 1.1A AC 41W
	Transmit in SSB/CW modes	DC 3.3A AC 98W
	in AM mode	DC 3.0A AC 92W
in FM mode*	DC 3.3A AC 98W	
Dimensions	: 111mm (H) x 241mm (W) x 311mm (D)	
Weight	: 6.1 kg	

TRANSMITTER

Emission Modes	: A3J SSB (USB/LSB)	
	A1 CW	
	A3H AM	
	F3* FM	
RF Output Power	: SSB 10W PEP (1 ~ 10W adjustable)	
	CW 10W (1 ~ 10W adjustable)	
	AM 4W (0 ~ 4W adjustable)	
	FM* 10W (1 ~ 10W adjustable)	
Modulation System	: SSB/AM Balanced modulation	
	FM* Variable reactance frequency modulation	
Max. Frequency Deviation*	: ±5KHz	
Spurious Emission	: More than 60dB below peak power output	
SSB Carrier Suppression	: More than 40dB below peak power output	
SSB/AM Unwanted Sideband	: More than 40dB down at 1000Hz AF input	
Microphone	: 600 ohm dynamic or electret condenser microphone	

SECTION II DESCRIPTION

50MHz ALL-MODE TRANSCEIVER INCORPORATING A MICROCOMPUTER

CPU control with ICOM's original programs provides various operating capabilities. No-backlash dial controlled by ICOM's unique photo-chopper circuit. Band-edge detector and Endless System provides out-of-band protection. No variable capacitors or dial gear, giving problem-free use. All mode capability: SSB, CW, AM and FM. Operating mode is indicated on the display unit.

MULTI-PURPOSE SCANNING

Memory Scan allows you to monitor three different memory channels. Program Scan provides scanning between two programmed frequencies. Adjustable scanning speed. Auto-stop stops scanning when a signal is received, in all modes. Auto-start restarts scanning after a pre-set interval.

TWO VFO'S BUILT IN

No extra equipment needed for split-frequency operation. Easy writing and reading of the three memory channels. Smooth and easy tuning with a 5KHz-per-turn dial marked in 100Hz increments. Complete 4MHz coverage without a band select switch.

EASIER OPERATION AND LIGHTER WEIGHT

The most compact, lightest weight all-mode 50MHz transceiver. First to use a pulse power supply in communication equipment, for lighter weight. 50mm-diameter large tuning control knob for smooth and easy tuning. Trouble-free controlling knobs for both receiving and transmitting. LED indicator for transmit and receive modes.

MOST SUITABLE FOR BOTH FIXED AND PORTABLE STATIONS

Built-in 117V/240V AC and DC power supplies. Convenient Dial Lock switch for mobile operation. Easy-carry handle. Effective Noise Blanker to reduce outcoming pulse noise. IC-SM2 high quality stand microphone is suitable for fixed station operation. Powerful audio output, 2 watts at 8 ohm, for easy listening even in noisy surroundings.

EXCELLENT SPURIOUS AND INTERMODULATION CHARACTERISTICS

ICOM's specially designed helical cavities at both the input and output of the RF amplifier provide excellent intermodulation characteristics. Newly developed high quality FET's for improved S/N ratio. Dual-gate MOS FET's for IF amplifiers. Newly developed compact high quality crystal filter for better selectivity. Variable RF output power.

ACCESSORY CIRCUITS AND VARIOUS OPTIONAL UNITS TO UPGRADE YOUR OPERATION

ICOM's original effective Noise Blanker to reduce pulse noise. AGC selection to reduce QSB effect. RIT circuit to shift the receiving frequency without effecting the transmitting frequency. Optional voice control unit for smooth VOX operation. Optional FM unit for ICOM's traditional high quality FM operation. Optional Pass Band Tuning unit to improve selectivity in the receive mode and for RF speech processing in the transmit mode.

RECEIVER

Receiving Mode	:	A1 (CW), A3J (USB, LSB), A3H (AM), F3 (FM)*
Receiving System	:	SSB/CW/AM Single Superheterodyne (Triple Superheterodyne when Pass Band Tuning unit is installed)
Intermediate Frequency	:	FM* Double Superheterodyne
	:	SSB/CW/AM 9.0115MHz (When Pass Band Tuning Unit is installed: 2nd IF: 10.75MHz, 3rd IF: 9.0115MHz)
Sensitivity	:	FM* 1st IF: 9.0115MHz, 2nd IF: 455KHz
	:	SSB/CW/AM Less than 0.5 μ V for 10dB S+N/N FM* More than 30dB S+N+D/N+D at 1 μ V
Spurious Response Rejection Ratio	:	More than 60dB
Selectivity	:	SSB/CW/AM More than \pm 1.1KHz at -6dB Less than \pm 2.2KHz at -6dB (When Pass Band Tuning Unit is installed: less than 1KHz at -6dB)
	:	FM* More than \pm 7.5KHz at -6dB Less than \pm 15KHz at -60dB
Squelch Sensitivity	:	SSB/CW/AM 1 μ V
	:	FM* 0.4 μ V
Audio Output Power	:	More than 2 watts
Audio Output Impedance	:	8 ohms

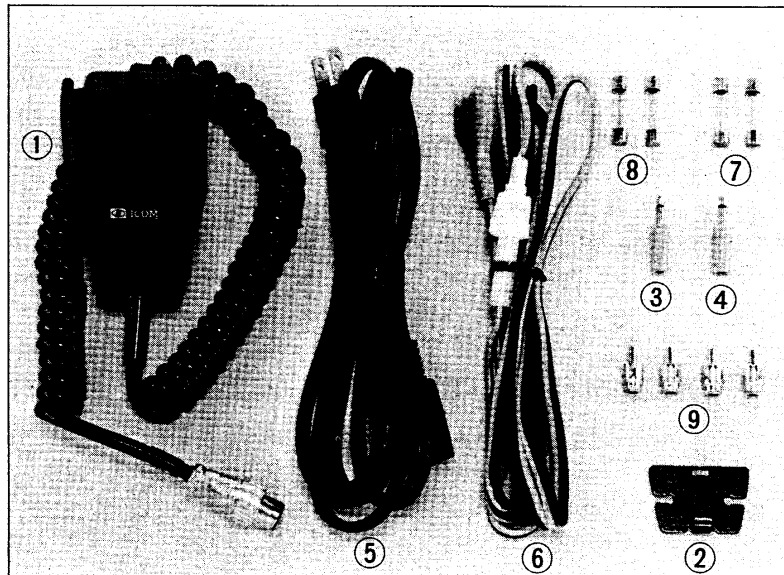
*Only when FM Unit is installed.



SECTION III INSTALLATION

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. In the event storage, moving, or reshipment becomes necessary, they come in handy. Accessory hardware, cables, etc., are packed with the transceiver. Make sure you have not overlooked anything.



- | | | | |
|--|---|-------------------------------------|---|
| 1. Microphone (dynamic type) | 1 | 7. Spare Fuse (2A) for AC | 2 |
| 2. Microphone hook | 1 | 8. Spare Fuse (5A) for DC | 2 |
| 3. External Speaker Plug | 1 | 9. Pin Plug. | 4 |
| 4. Key Plug | 1 | 10. Jumper Plug. | 1 |
| 5. AC Power Cord. | 1 | (inserted in the DC power socket) | |
| 6. DC Power Cord. | 1 | | |

RECOMMENDATIONS FOR INSTALLATION

1. Avoid placing the IC-551 in direct sunlight, high temperature, dusty or humid places.
2. Both sides of the unit, function also as heatsinks. The temperature there will usually become relatively warm. Any equipment should be at least 1 inch (3cm) away from the unit so as to provide 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.
For mobile installation, an optional mounting bracket is available. Select the best location that can stand the weight of the unit and that does not interfere with your driving in any way.
5. Use the Ground Lug!

POWER SUPPLY

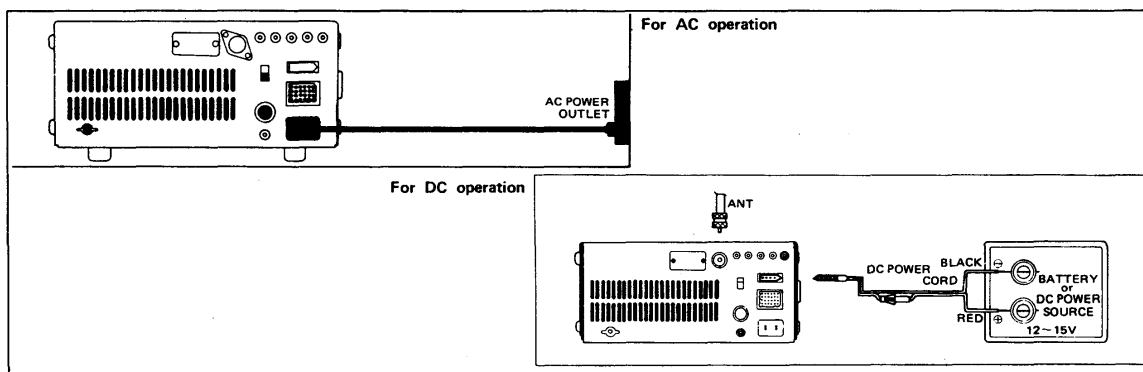
For AC operation:

The IC-551 has a built-in AC power supply. Connect the supplied AC power cord to the AC power socket on the rear panel of the IC-551, and the opposite side plug of the power cord into any convenient AC power outlet. Be sure that the jumper plug is inserted to the DC power socket on the rear panel.

For DC operation:

If you would like to use your car battery or any other DC power supply, be sure that its output voltage is 12~15 Volts and the current capacity is at least 3.5 Amps. The maximum power consumption of the set during transmission runs from 3~3.5 Amps, so keep that in mind if the unit is installed in your automobile. Attention should also be paid to the condition of the battery and electrical system.

The connection of the DC power cord supplied with the IC-551 is done in the following way: First make sure that the power switch of the unit is in the OFF position and the T/R switch is in the receive position. Connect the cord to the DC power supply with the RED lead to the positive terminal and the BLACK lead to the negative terminal. (Reverse connection will cause the protection circuit to operate and blow the fuse.) Connect the DC plug to the socket on the rear panel of the IC-551. Refer to the drawing below.



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, 10 watts average output plus 3dB of gain antenna equals 20 watts ERP, presuming low VSWR of course. The few more dollars invested in a gain type antenna is well worth it. When adjusting your antenna, whether mobile or fixed, by all means follow the manufacturer's instructions. There are some pitfalls to be aware of. For example, do not attempt to adjust an antenna for lowest VSWR when using a diode VSWR meter not engineered for VHF applications. Such readings will invariably have an error of 40% or more. Instead, use an in-line watt meter similar to the Drake WV-4, Bird Model 43 or Sierra Model 164B 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.

The RF coaxial connector on the rear chassis mates with a standard PL-259 connector. Some models may have metric threads. In any event, the RF connector will mate with almost any PL-259 connector if care is taken to seat them properly.

EXTERNAL SPEAKER

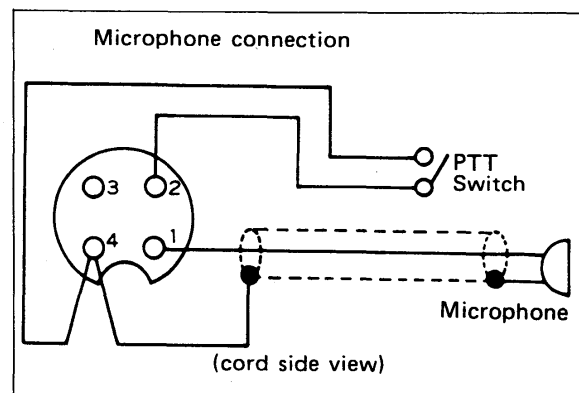
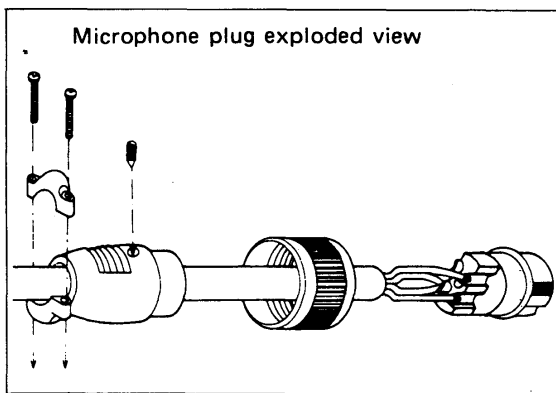
The IC-551 contains an internal speaker, and is also designed so that it can drive an external speaker from the external (EXT) speaker jack on the rear panel. Be sure the impedance of the external speaker is 8 ohms, and remember that with the external speaker connected, the internal speaker is disabled.

HEADPHONES

Any good headphone set, including stereo type, that has 4 ~ 16 ohms impedance can be used. With the plug inserted halfway into the PHONES jack, both the headphones and speaker will operate. This is convenient when others wish to listen in on the station, or you wish to record contacts using a tape recorder connected to the headphones jack. With a stereo headphone set inserted this way, however, the headphones will lose the sound on one side. With the plug inserted completely, only the headphones work.

MICROPHONE

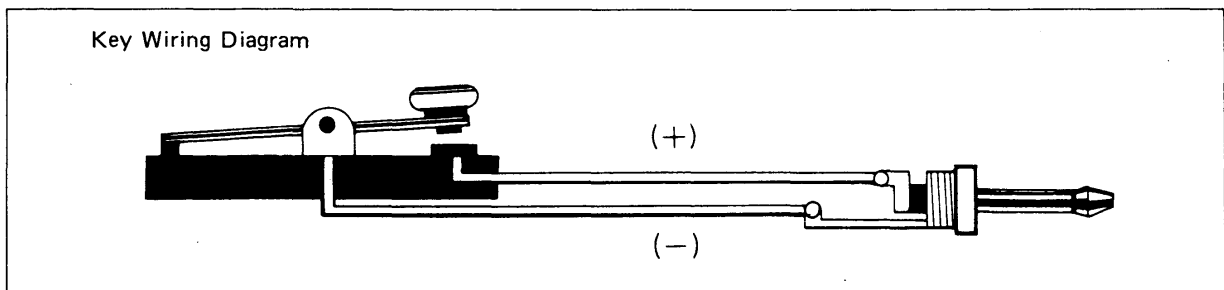
A high quality dynamic microphone is supplied with your transceiver. Merely plug it into the proper receptacle on the front panel. Should you wish to use a different microphone, make certain it is approximately 600 ohms. Particular care should be exercised in wiring also, as the internal electronic switching system is dependent upon it. See the schematic for the proper hook up.



CW KEY

When operating CW, connect the Key to the Key Jack with the plug supplied. The connection of the plug is shown below.

If the terminals have polarity, be sure to make the correct connection. Note that the keyed voltage when switching with semiconductors or relays with resistors in the circuit, should be adjusted to be below 0.4 Volts!

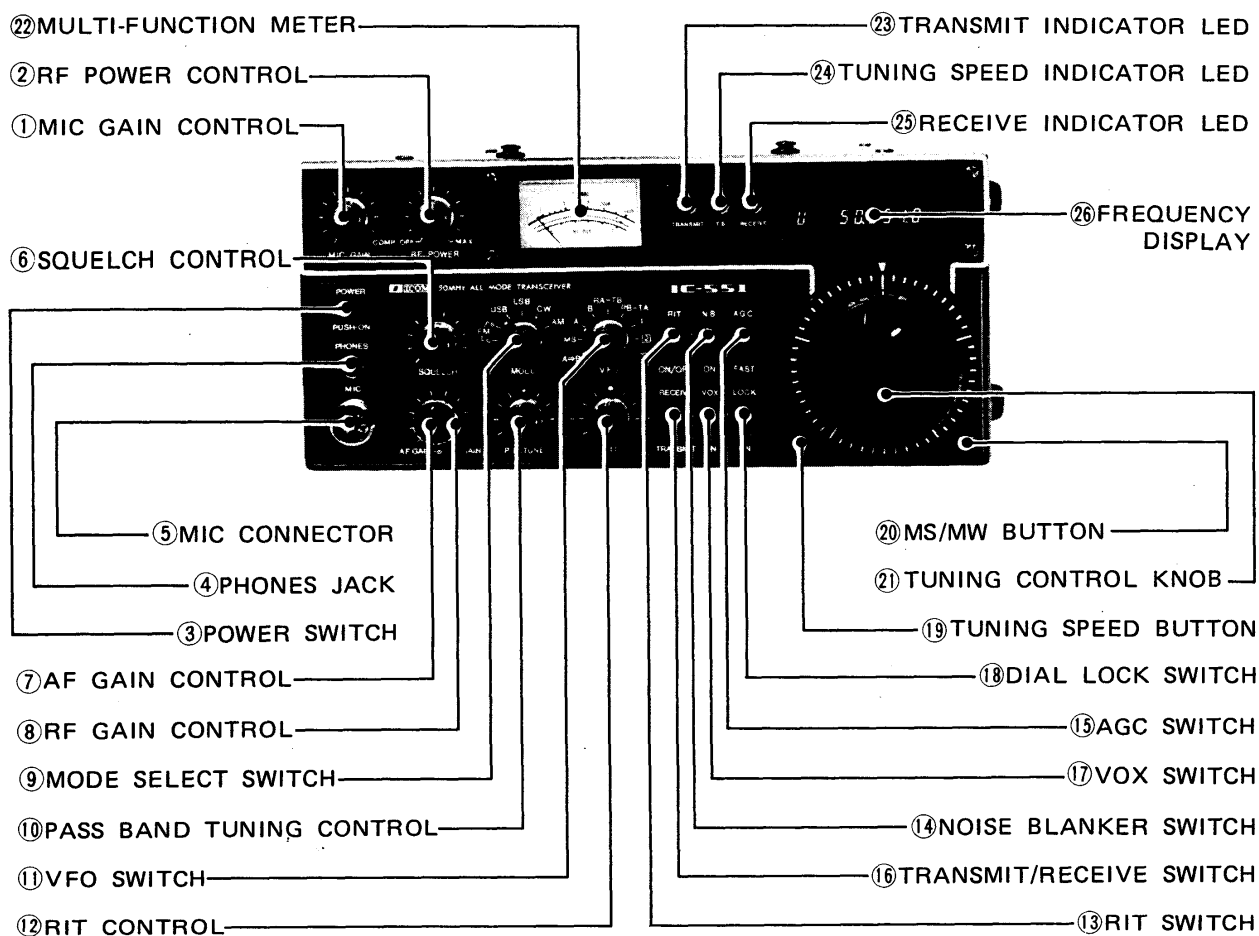


GROUND

In order to prevent electrical shocks, TVI, BCI 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.

SECTION IV CONTROL FUNCTIONS

FRONT PANEL



1. MIC GAIN CONTROL

Adjusts the level of modulation according to the input of the microphone. Clockwise rotation increases microphone gain. With the optional Pass Band Tuning unit installed in the IC-551, when the speech processor is turned ON, the MIC Gain Control adjusts the clipping level.

2. RF POWER CONTROL

Adjusts the RF output power to between 1 and 10 watts in FM, SSB and CW modes, and from 0 to 4 watts in the AM mode. In the OFF position, it sets the RF output power to the maximum for each mode. With the optional Pass Band Tuning unit installed in the IC-551, the speech processor is turned ON by turning the RF POWER Control clockwise from the OFF position (a click will be heard).



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