

IC-255A

144MHz FM TRANSCEIVER

INSTRUCTION MANUAL



TABLE OF CONTENTS

I. SPECIFICATIONS	2
II. DESCRIPTION	3
III. INSTALLATION	4
IV. CONTROL FUNCTIONS.....	7
V. OPERATION	12
VI. INSIDE VIEW	21
VII. TROUBLE SHOOTING.....	23
IX. VOLTAGE CHARTS.....	25
X. BLOCK DIAGRAM.....	28
XI. P.C. BOARD LAYOUT.....	SEPARATE
XII. SCHEMATIC DIAGRAM.....	SEPARATE

SECTION I SPECIFICATIONS

GENERAL

Numbers of semi-conductors	:	Transistors	49
		FET	4
		IC	29
		Diode	80
Frequency coverage	:	143.800 ~ 148.195MHz	
Frequency resolution	:	15KHz steps 5KHz steps with TS switch depressed	
Frequency Control	:	Microcomputer based Digital PLL synthesizer. Independent Transmit-Receive Frequency Capability	
Memory channels	:	5 channels, any inband frequency programmable	
Usable conditions	:	Temperature: $-10^{\circ}\text{C} \sim 60^{\circ}\text{C}$ ($14^{\circ}\text{F} \sim 140^{\circ}\text{F}$) Operationable time: continuous	
Frequency stability	:	Within $\pm 1.5\text{KHz}$	
Antenna impedance	:	50 ohms unbalanced	
Power supply requirement	:	13.8V DC $\pm 15\%$ (negative ground) 5.5A Max.	
Current drain	:	Transmitting	
		HIGH (25W)	Approx. 5.5A
		LOW (1W)	Approx. 1.5A
		Receiving	
		At max audio output	Approx. 0.7A
		Squelched	Approx. 0.5A
Dimensions	:	185mm (W) x 64mm (H) x 223mm (D)	
Weight	:	Approx. 2.5kg	

TRANSMITTER

Output power	:	25W (HIGH), 1W (LOW)	
Emission mode	:	16F ₃	
Modulation system	:	Variable reactance frequency modulation	
Max. frequency deviation	:	$\pm 5\text{KHz}$	
Spurious emission	:	More than 60dB below carrier	
Microphone	:	1.3K ohm dynamic microphone with built-in preamplifier and push-to-talk switch	
Operating mode	:	Simplex, Duplex ($\pm 600\text{KHz}$ from receive frequency and any inband frequency separation programmable)	

RECEIVER

Receiving system	:	Double-conversion superheterodyne	
Modulation acceptance	:	16F ₃	
Intermediate frequency	:	1st:	10.75MHz
		2nd:	455KHz
Sensitivity	:	More than 30dB S+N+D/N+D at $1\mu\text{V}$ Less than $0.6\mu\text{V}$ for 20dB Noise quieting	
Squelch sensitivity	:	Less than $0.4\mu\text{V}$	
Spurious response rejection ratio	:	More than 60dB	
Selectivity	:	More than $\pm 7.5\text{KHz}$ at -6dB point Less than $\pm 15\text{KHz}$ at -60dB point	
Audio output power	:	More than 2.0W	
Audio output impedance	:	8 ohms	

SECTION II DESCRIPTION

144MHz FM TRANSCEIVER INCORPORATING A MICROCOMPUTER

CPU control with ICOM's original programs provides various operating capabilities. Frequency control, band-edge detection, and the display are accomplished by the microcomputer. The 5-channel memory is controlled electrically by the use of a 256-bit RAM area. The circuits for these IC-255A functions are equivalent in capability to conventional circuits having a large number of C-MOS MSI's.

TWO VFO'S BUILT-IN

No extra equipment needed for split-frequency operation. Easy writing and reading of the five memory channels. Smooth and easy tuning with 15KHz and 5KHz steps.

MULTI-PURPOSE SCANNING

Memory Scan allows you to monitor five different memory channels. Program Scan provides scanning between two programmed frequencies. Adjustable scanning speed. Auto-stop stops scanning when a signal is received, or a frequency is not being used.

SUPERIOR RECEIVING CHARACTERISTICS

The use of newly developed low-noise and large dynamic range junction FET's (for the RF amplifier and the first mixer) and of helical cavity filters (for the antenna and RF circuits) provides excellent sensitivity and intermodulation distortion characteristics. A pair of high quality monolithic crystal filters and ceramic filters facilitates very stable receiving and excellent durability.

HIGHLY STABLE TRANSMITTING CHARACTERISTICS

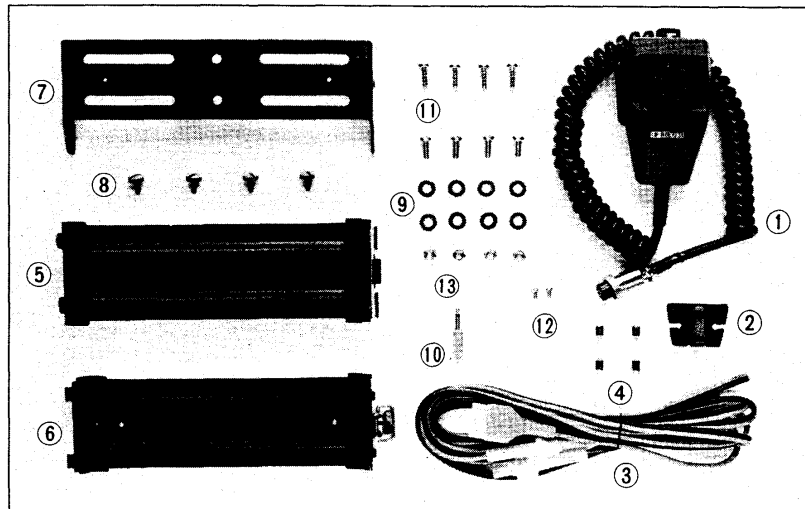
Both the directly amplified VCO output without the use of multipliers or mixers and the use of a power module in the PA unit produce very clean transmitting signals without spurious radiation. RF power is selectable 25W (HIGH) and 1W (LOW). 25W HIGH output power will increase your QSO range.



SECTION III INSTALLATION

UNPACKING

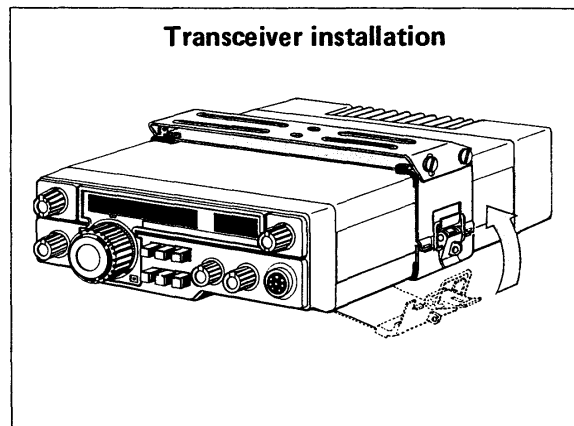
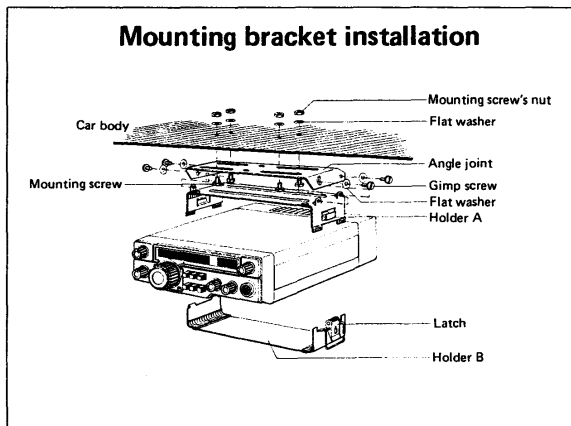
Carefully remove your transceiver from the packing carton and examine it for signs of shipping damage. Should any be apparent, notify the delivering carrier or dealer immediately, stating the full extent of the damage. It is recommended you keep the shipping cartons. In the event storage, moving, or 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	8. Gimp screws	4
2. Microphone hook	1	9. Flat washers	12
3. Power cord	1	10. Plug for speaker	1
4. Spare fuses (10A)	2	11. Mounting screws	8
5. Installing holder A	1	12. Screws for additional bracket.	2
6. Installing holder B	1	13. Mounting screw's nuts	4
7. Installing angle joint.	1		

LOCATION

Where you place the transceiver in your automobile is not critical and should be governed by convenience and accessibility. Since the unit is so compact, many mobile possibilities present themselves. In general, the mobile mounting bracket will provide you with some guide as to placement. Any place where it can be mounted with metal screws, bolts, or pop-rivets will work. For fixed station use, a power supply should be designed to produce 6 amps for the transceiver.





ICOM INCORPORATED

1-6-19, KAMI KURATSUKURI, HIRANO-KU,
OSAKA JAPAN