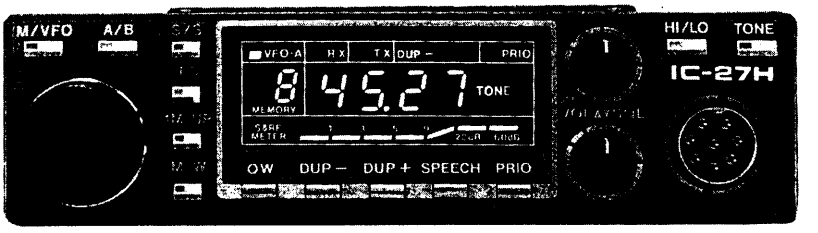
IC-27H

144MHz FM TRANSCEIVER

INSTRUCTION MANUAL



ICOM

TABLE OF CONTENTS

SECTION I SPECIFICATIONS

GENERAL

Numbers of semiconductors	:	Transistor 57 FET 6 IC 24 Diode 110
Frequency coverage	:	144MHz ~ 148MHz (European version: 144MHz ~ 146MHz)
Frequency resolution	:	5KHz/15KHz steps (Australian version: 5KHz/25KHz, European version: 12.5KHz/25KHz steps)
Frequency control	:	Microcomputer based 5KHz step (or 12.5KHz step) Digital PLL synthesizer Independent Dual VFO Capability.
Frequency stability	:	Within ±1.5KHz
Memory channels	:	9 channels with any inband frequency programmable
Usable conditions	:	Temperature: −10°C ~ 60°C (14°F ~ 140°F) Operational time: Continuous
Antenna impedance	:	50 ohms unbalanced
Power supply requirement	:	13.8V DC ±15% (negative ground) 10A Max
Current drain (at 13.8V DC)	:	Transmitting; High (45W) Approx. 9.5A Low (5W) Approx. 3.5A Receiving; At max audio output Approx. 0.6A Squelched Approx. 0.4A
Dimensions	:	38(41)mm(H) x 140mm(W) x 226(238)mm(D) ( ): Shows the dimensions including projections
Weight	:	Approx. 1.4kg

TRANSMITTER

Output power	:	HIGH 45W LOW 5W
Emission mode	:	$16F_3$ (F3E 16K0)
Modulation system	:	Variable reactance frequency modulation
Max. frequency deviation	:	±5KHz
Spurious emission	:	More than 60dB below carrier
Microphone	:	600 ohm electret condenser microphone with push-to-talk and frequency UP/DOWN switches. (U.S.A. version: with 16 key dual-tone pad.) (European version: with 1750Hz tone burst unit.)
Operating mode	:	Simplex, Duplex (Any offset in-band in 100KHz increments programmable)

RECEIVER

Receiving system	:	Double-conversion superheterodyne
Modulation acceptance	:	$16F_3$ (F3E 16K0)
Intermediate frequencies	:	1st: 10.695MHz 2nd: 455KHz
Sensitivity	:	Less than 0.2μV for 12dB SINAD Less than 0.4μV for 20dB Noise quieting
Squelch sensitivity	:	Less than 0.15μV
Spurious response rejection ratio	:	More than 60dB
Selectivity	:	More than 15KHz at −6dB point Less than 30KHz at −60dB point
Audio output power	:	More than 2.0W
Audio output impedance	:	4 ~ 8 ohms

SECTION II DESCRIPTION

THE MOST COMPACT 144MHz MOBILE

The smallest 144MHz mobile available, the IC-27H measures only 38 millimeters high by 140 millimeters wide. As an added bonus, the IC-27H, through ICOM engineering, is able to contain an internal speaker to provide ease of mounting and make the unit one small compact complete package.

HIGH OUTPUT POWER

In such incredibly small package, the IC-27H is able to provide 45 watts of output power. And even though the IC-27H is the smallest available two-meter mobile unit, it has sacrificed none of the features found in fully featured VHF mobiles.

9 MEMORIES

The IC-27H has nine memories available to store receive frequency, transmit offset, offset direction, and subaudible tone.

Memories are backed up by a lithium backup battery, which will store memories for up to seven years.

32 SUBAUDIBLE TONE ENCODER

The IC-27H (U.S.A. version) comes complete with 32 standard subaudible tone encoder ready to go and controlled from the front panel knob. Each subaudible tone may be selected by the main tuning knob and stored into memory for easy access along with the frequency.

MULTI-PURPOSE SCANNING

The Memory Scan allows you to monitor nine different memory channels, the Programmed Scan provides scanning between two programmed frequencies, and Full range Scan scans the entire band. The scanning speed is switchable, and the auto-stop terminates scanning when a signal is received or a channel is free.

PRIORITY SCANNING

Priority may be selected to be either a memory channel or a VFO channel. By using sampling techniques, the operator can determine if a frequency he is interested in using is free or busy.

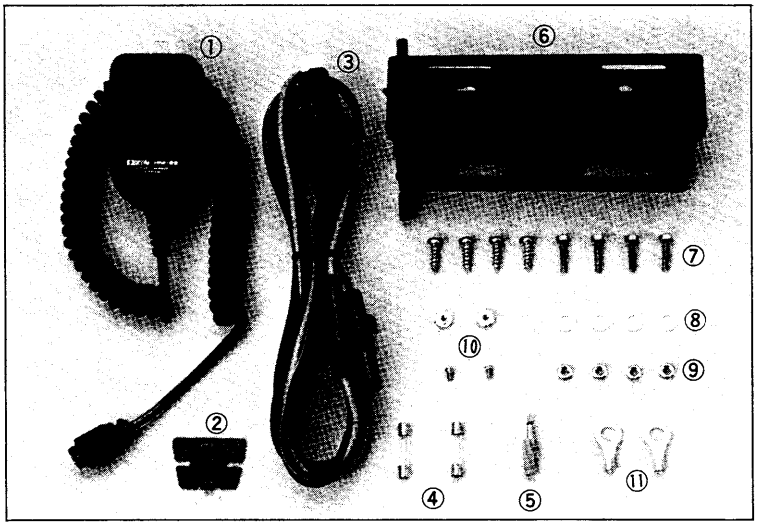
SPEECH SYNTHESIZER

As an added plus, the IC-27H features an optional speech synthesizer to verbally announce the receiver frequency of the transceiver through the simple push of a button. This allows the operator to hear what frequency he is operating on without looking at the frequency display.

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.



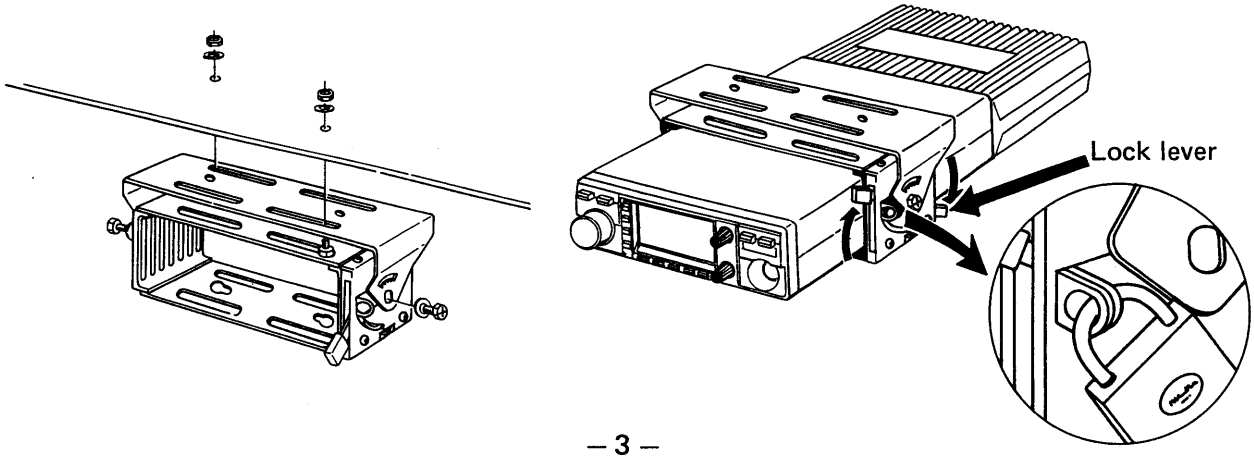
1. Microphone (electret type)* 1
2. Microphone hook 1
3. Power cord. 1
4. Spare fuses (15A) 2
5. Plug for speaker 1
6. Mobile Mounting Bracket 1
7. Mounting screws 8
8. Flat washers 4
9. Mounting screw's nuts 4
10. Screws for additional bracket. 2
11. Battery terminal lugs 2

* U.S.A. version supplies HM-23 (DTMF encoder mic), European version supplies HM-24 (with 1750Hz tone encoder unit) and the other versions supply HM-22.

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 10 amps for the transceiver.

Mounting bracket installation

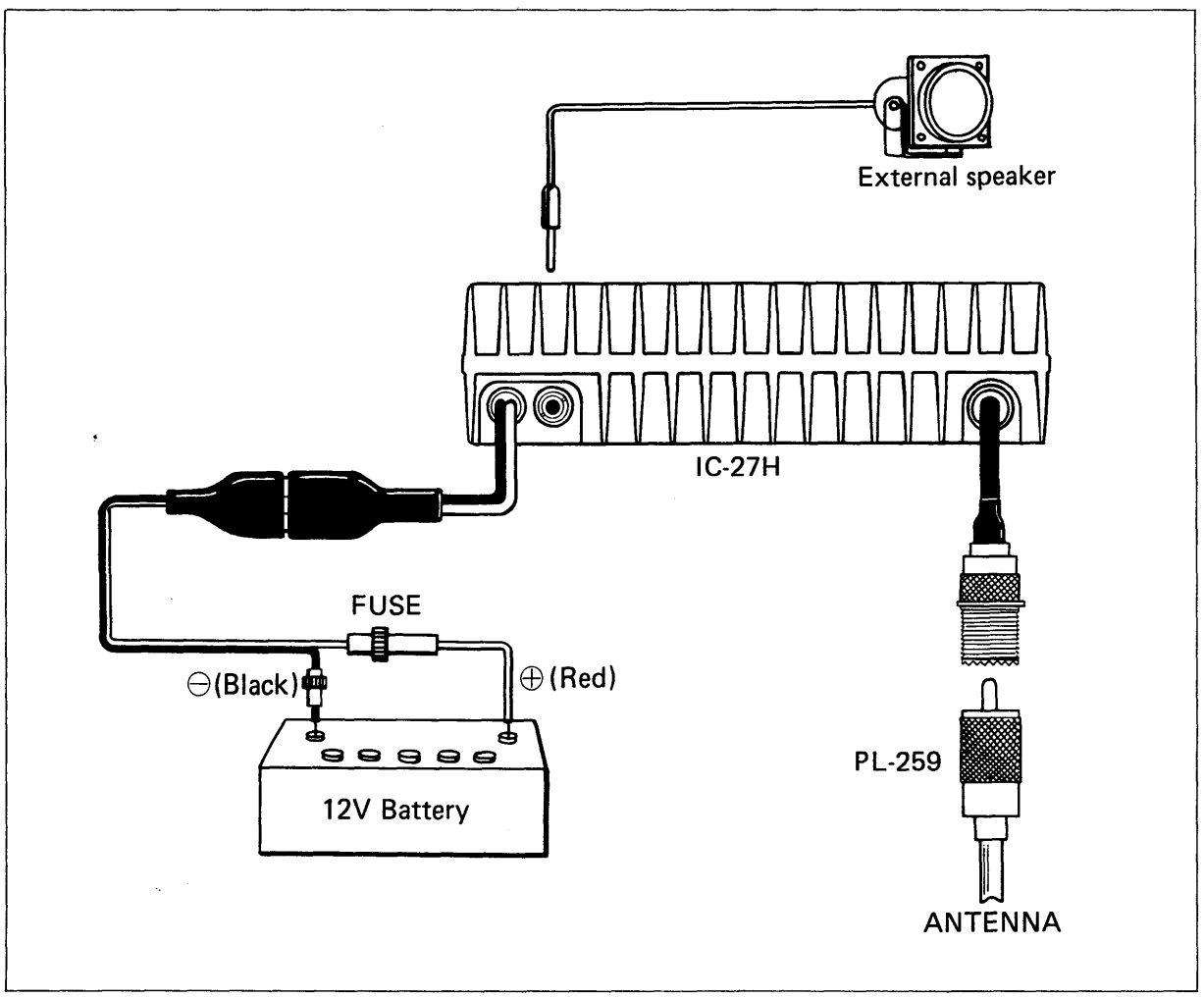


POWER REQUIREMENTS

The transceiver is supplied ready to operate from any regulated 13.8V DC, 10 ampere negative ground source. 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 low battery, worn generator/alternator, poor voltage regulator, etc., will impair operation of your transceiver as well as the vehicle. High noise generation or low voltage delivery can be traced to these deficiencies. If an AC power supply is used with your transceiver, make certain it is adequately regulated for both voltage and current. Low voltage while under load will not produce satisfactory results from your transceiver. Receiver gain and transmitter output will be greatly impaired. Caution against catastrophic failure of the power supply should be observed.

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

Included with your transceiver is a DC power cable with plug attached. The Red Wire is positive (+), the Black, 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 automotive accessory wiring. If such an arrangement is not possible, then any convenient B+ lead in the interior of the vehicle and the negative frame can be utilized. 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.



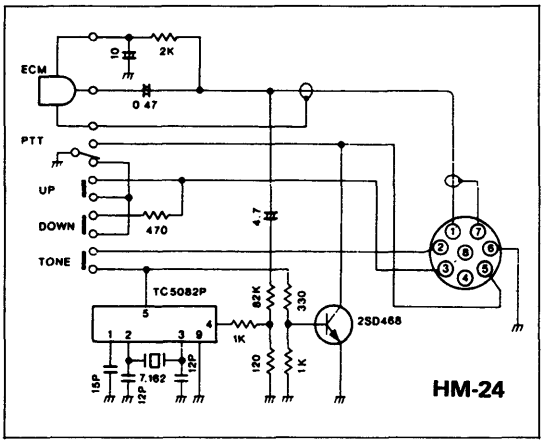
ANTENNA

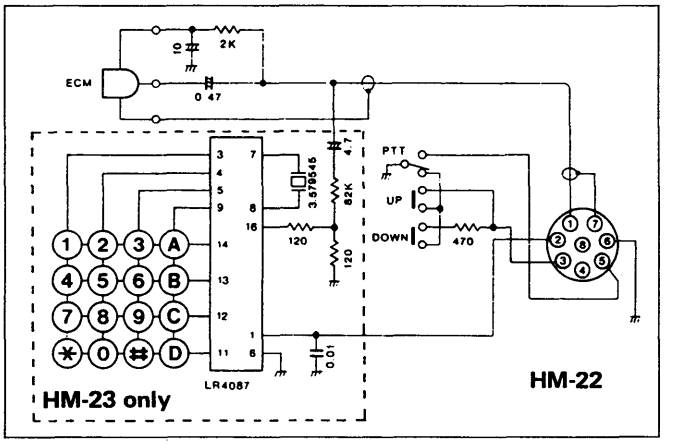
The most important single item that will influence the performance of any communication system is the antenna. For that reason, a good, high-quality, gain antenna of 50 ohms impedance is recommended, fixed or mobile. In VHF as well as the low bands, every watt of ERP makes some difference. Therefore, 45 watts average output plus 3dB of gain antenna equals 90 watts ERP, presuming low VSWR of course. The few extra 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 panel 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.

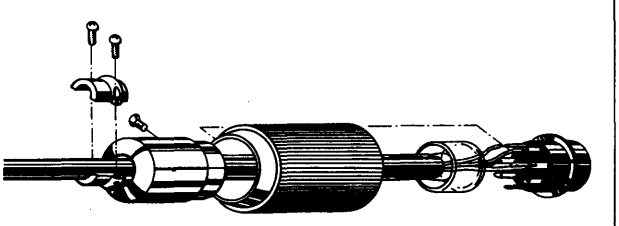
MICROPHONE

A high quality electret condenser 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 has a proper output level. Particular care should be exercised in wiring also, as the internal electric switching system is dependent upon it. See the schematic for the proper hookup.





Microphone plug exploded view

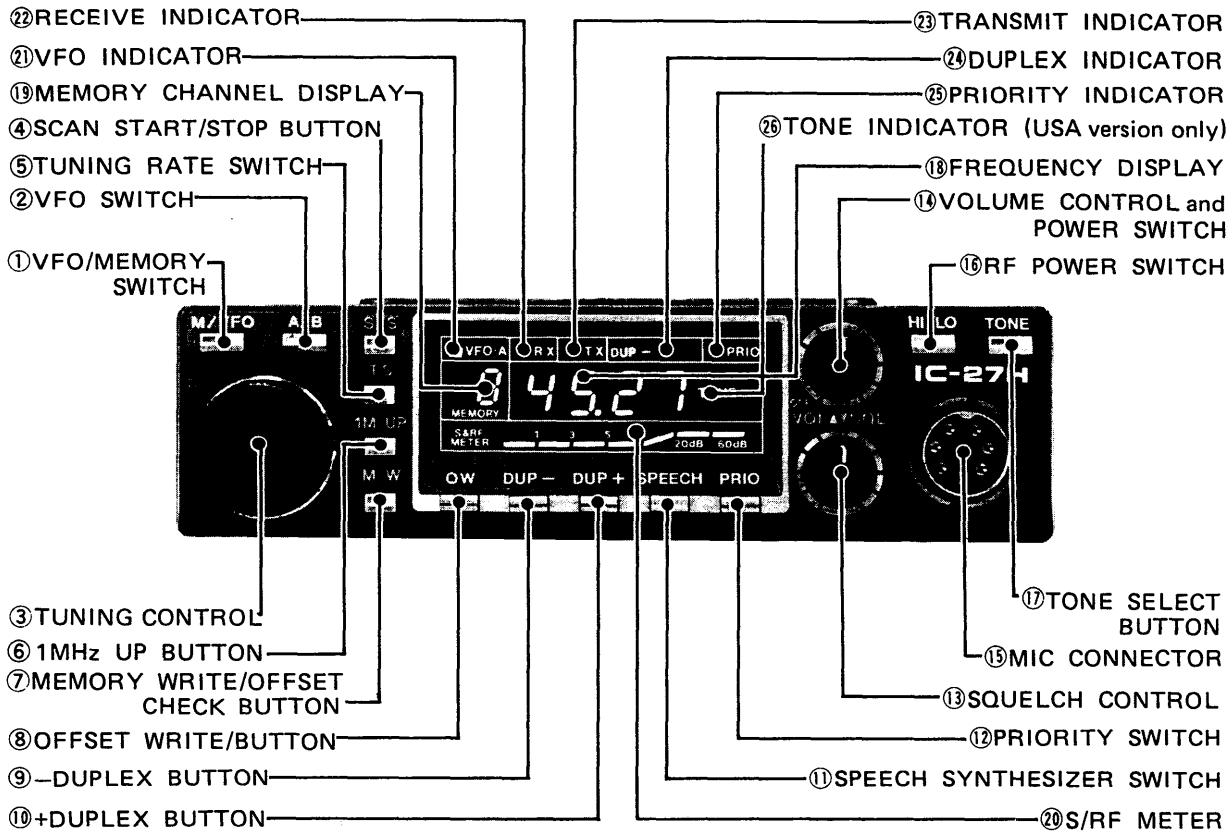


EXTERNAL SPEAKER

An external speaker plug is supplied with your unit in the event another speaker is desirable. The external speaker impedance should be 4 ~ 8 ohms, and when used, will disable the internal speaker. A 4 ~ 16 ohm headset can be utilized as well.

SECTION IV CONTROL FUNCTIONS

FRONT PANEL



1. VFO/MEMORY SWITCH

Each push switches from MEMORY CHANNEL operation to VFO operation alternately. When the set is in the MEMORY CHANNEL operation, the letter "M" is displayed at the MEMORY CHANNEL DISPLAY. The selected memory channel number is also displayed at the MEMORY CHANNEL DISPLAY, however this number remains even if the VFO operation is selected.

2. VFO SWITCH

Selects either VFO, "A" or "B", for tuning. When the switch is in the out position, VFO A is selected and the VFO INDICATOR is illuminated. When the switch is pushed in, VFO B is selected and the VFO INDICATOR goes off.

3. TUNING CONTROL

In the VFO operation mode, rotating the TUNING CONTROL clockwise increases the frequency, while rotating it counterclockwise decreases the frequency. The frequency is changed in 5KHz steps (European version: 12.5KHz steps) when the TUNING RATE switch is pushed in, and in 15KHz steps (European and Australian versions: 25KHz) when the TUNING RATE switch is in the out position.

When tuning up past the upper limit of the operation band, the frequency will automatically revert to the lower limit. Likewise, when tuning down past the lower limit, the frequency will automatically revert to the upper limit.

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