

ALINCO

OE 8 M7Q
MARTIN FRITZ
9020 Kight., Steingasse 165
Tel. 0463/36 3 92

SER. NR. 30 27 55 43

ALM-203T/E

2m FM HAND HELD TRANSCEIVER

INSTRUCTION MANUAL



ALINCO ELECTRONICS INC.

P.O. Box 20009 Reno, Nevada 89515 U.S.A.
44 Glen Carran Circle Sparks, Nevada 89431 U.S.A.
Phone (702)359-1414 Telex 4993999 EGELECTR
Facsimile (702)359-1424

1-1-1 Mishimae, Takatsuki city, Osaka 569. Japan



ALINCO ELECTRONICS INC.

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INTRODUCTION

Congratulation, now you are the owner of one of our many "ALINCO" products. Your ALM-203T/E has been manufactured and tested very carefully at the factory and will give you satisfactory operation for many years.

ACCESSORIES

Carefully unpack your transceiver and you will find the following accessories included with the transceiver.

- * Rubber Flex Antenna x 1
- * External Speaker Plug x 1
- * External Mic Plug x 1
- * Hand-strap x 1
- * Ni-Cd Battery Pack x 1
- * A.C. Wall Charger x 1
- * Belt Clip x 1

SPECIFICATIONS

1 BATTERY/CHARGE 2 CONTROL FUNCTION

■ GENERAL

Frequency Coverage	144.000 – 147.995MHz (USA) (BAND A) 144.000 – 145.9875MHz (EU) (BAND A) 150 – 160MHz rec, only (BAND B)
Frequency Resolution	5kHz step 800 channels (USA) 12.5kHz step 160 channels (EU)
Antenna Impedance	50 ohms unbalanced
Power Supply Requirement	D.C. 9.6V; with supplied Ni-Cd powerpack negative ground is acceptable
Current Drain at 9.6V	Receiving At max. audio output; Approx. 150mA Squelched ; Approx. 35mA 5mA (Save: ON)
	Transmitting High; 3W (5W) Approx. 900mA (1.2A) Low; 0.1W (0.1W) Approx. 220mA (220mA)
Dimension	200mm(H) x 69mm(W) x 37mm(D) (7-3/4"H x 2-1/2"W x 1-1/2"D) with Ni-Cd powerpack 170mm(H) x 69mm(W) x 37mm(D) (6-1/2"H x 2-1/2"W x 1-1/2"D) with dry cells battery case Approx. 500g – 1.1 lb.

■ TRANSMITTER

Output Power	High; 3W (5W) Low; Approx. 0.1W (0.1W) at 9.6V (13.8V) (when using EDH-25 (option))
Emission Mode	16F3
Modulation System	Variable reactance frequency modulation
Max. frequency deviation	+/-5kHz
Spurious emission	More than 60db below carrier
Microphone	Built-in Electret condenser microphone
Operating mode	Simplex — Duplex +/-600kHz from receive frequency (Memory channel No. 0 accepts any non-standard offsets)

* DTMF encoder included as standard in model ALM-203T

■ RECEIVER

Receiving system	Double-conversion superheterodyne
Modulation acceptance	16F3
Intermediate frequency	1st; 10.7MHz 2nd; 455kHz
Sensitivity	Less than 0.3µV for 20db noise quieting Less than 0.2µV for 12db SINAD Less than -10db (threshold)
Squelch sensitivity	More than 60db
Spurious response rejection ratio	More than +6kHz at -6db point Less than +11kHz at -60db point
Selectivity	More than 350mW
Audio output power	8 ohms
Audio output impedance	

■ Battery Installation/Charge

When using optional battery case:
Depressing the lock button, remove the battery case by sliding the battery case downward.
Remove the plastic panel and install five AA type dry cells batteries into the holder according to the indicated polarity.
To load the battery case, slide the case onto the set with the reverse procedures.
When using supplied Ni-Cd pack EBP-5N:
1. Use the wall charger EDC-4/5/6 or 12V car battery with optional cigarette plug/charger cable EDC-2.
2. The Power switch of the transceiver must be OFF.
3. Connect the output power plug of the wall charger EDC-4/5/6 to the charger socket of Nicad pack EBP-5N.
4. Charge the pack for about 15 hours. (Avoid excess charging).

(1) Antenna Connector

Connect the supplied flexible antenna with the BNC connector.

(2) Free Offset CH switch (for non-standard repeater offsets)

When this switch is set in the locked-in position, the frequency memorized in channel No. 0 is transmitted by pressing the P.T.T. switch.

Subaudible tone unit is activated at the same time. (for ALM-203T only)

(3) External Speaker Jack

Connect an earphone, external speaker (Imp.: 8Ω), or EMS-20 SPEAKER/MIC. If an external speaker is connected, the built-in speaker does not function.

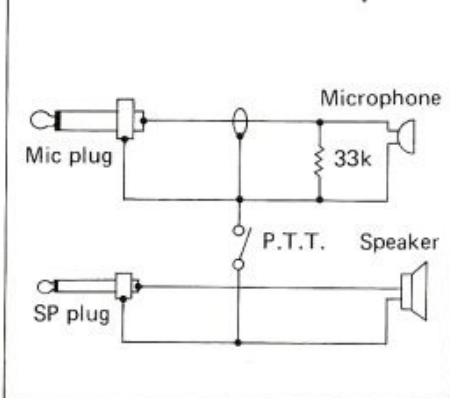
(4) External MIC Jack

Connect an external microphone; Condenser Microphone; Input impedance is 2.2kΩ and supplied D.C. output is 4V.

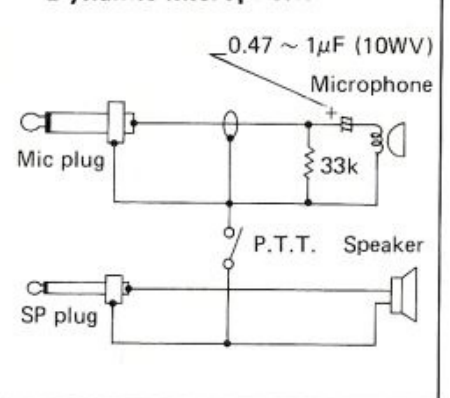
Dynamic Microphone; connect through a 0.47µF – 1µF capacitor to block D.C. voltage.

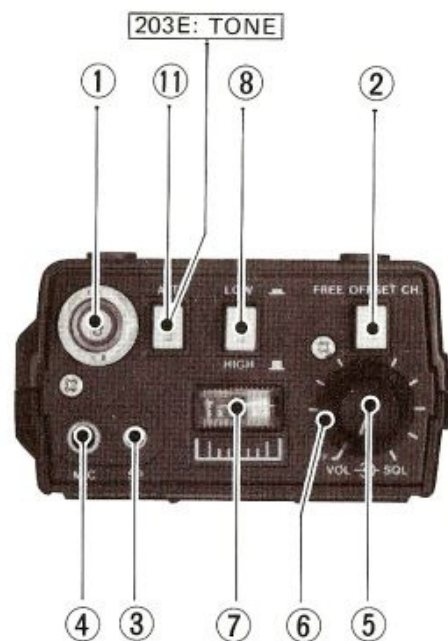
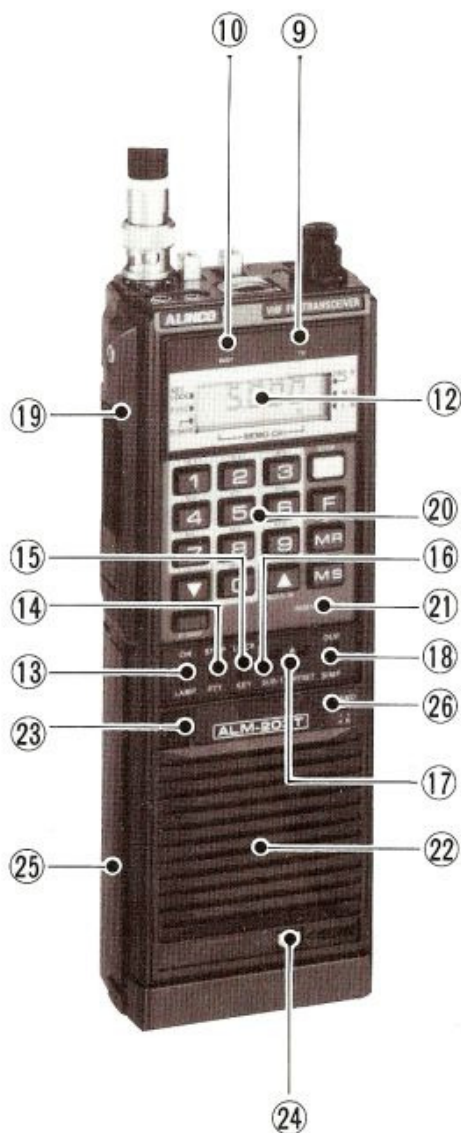
Note: If you use a microphone with P.T.T. switch, connect it between the Mic and Speaker grounds.

■ Electret condenser Microphone



■ Dynamic Microphone





(5) Volume Control and Power ON/OFF switch

When this control is turned completely counterclockwise, the power is OFF.

(6) SQUELCH CONTROL

When no signal is present in the receive mode, adjust this control clockwise until the noise threshold is reached.

In scan operation this control must be set to the threshold point.

(7) S/R/F Meter

This Meter indicates Signal Strength and RF output level.

(8) HI/LOW Switch

This switch is used to set output power to HIGH and LOW.

In the HIGH (Out) position, the output power is 3.0W at 9.6V (and 5.0W at 13.8V when using EDH-25.)

In the LOW (locked-in) position, the output power is approx. 0.1W.

(9) ON AIR Indicator

This LED will indicate transmit mode.

(10) Busy Indicator

This LED is lit when the signal is received or whenever the squelch is open.

(11) RF ATT (RF attenuator) switch (for ALM-203T only)

When this switch is in the locked-in position, the receiving gain will be less by 20db than that in the normal out position.

Use this switch to avoid interference from a strong in-coming signal.

(11) Tone-Burst Button (for ALM-203E only)

This switch activates a 1750Hz tone-burst generator for initial access of the repeater.

Depress this switch for a required period and carrier with a 1750Hz tone will be transmitted.

(12) LCD (liquid crystal display) Panel

Operating frequency, for example, 145.385 is displayed in four digits as 5.385.

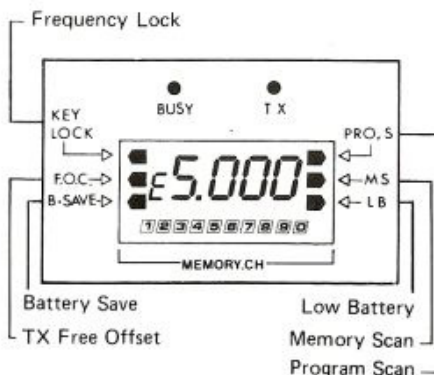
By setting LAMP Switch "ON", the display is lit up, "■" or "■" indicate "FREQUENCY LOCK", "PROGRAM AND MEMORY SCAN", "TX FREE OFFSET", "BATTERY SAVE" and "LOW BATTERY" are functioning as

the drawing shows.

"LB" Indicator shows, in the transmit mode, the battery is about to be exhausted.

When the "■LB" is indicated stop using the set and recharge the Ni-Cd pack or replace the batteries with new ones.

Also memory channel address numbers and; in the case of incorrect key entering, "E" (Error) are displayed.



(13) LAMP Switch

When this switch is set in the "ON" position, the frequency display and S-Meter are lit up.

To save power, do not keep this switch in the "ON" position unnecessarily.

(14) P.T.T. OFF Switch

When this switch is set in the "STOP" position, the P.T.T. switch will not function.

Use this anti-transmitting switch when carrying the transceiver.

(15) KEY LOCK Switch

When this switch is set at the "LOCK" position, the 17 keys on the keyboard will not function and the "■" is displayed on the LCD panel.

(16) Subaudible Tone A/B switch (for ALM-203T only)

This switch is used for selecting two desired sub-tones, which can be programmed with two DIP-switches, A & B.

Tones are activated by the P.T.T. switch.



**Subaudible
Tone Chart
(ON = 1)**

Freq. (Hz)	P1	P2	P3	P4	P5	P6
67.0	1					
71.9		1				
74.4	1	1				
77.0			1			
79.7	1		1			
82.5		1	1			
85.4	1	1	1			
88.5				1		
91.5	1			1		
94.8		1		1		
97.4	1	1		1		
100.0			1	1		
103.5	1		1	1		
107.2		1	1	1		
110.9	1	1	1	1		
114.8					1	
118.8	1				1	
123.0		1			1	
127.3	1	1			1	
131.8			1		1	

Freq. (Hz)	P1	P2	P3	P4	P5	P6
136.5	1		1		1	
141.3		1	1		1	
146.2	1	1	1		1	
151.4				1	1	
156.7	1			1	1	
162.2		1		1	1	
167.9	1	1		1	1	
173.8			1	1	1	
179.9	1		1	1	1	
186.2		1	1	1	1	
192.8	1	1	1	1	1	
203.5						1
210.7	1					1
218.1		1				1
225.7	1	1				1
233.6			1			1
241.8	1		1			1
250.3		1	1			1

(17) TX OFFSET Switch

This switch is used for selecting whether the transmitting frequency is to be 600kHz. above (+) or below (-) the receive frequency.

(18) Duplex/Simplex Switch

For repeater operation, set this switch at the Dup (Duplex) position (Subaudible tone unit is activated at the same time. (for ALM-203T only)) and for simplex operation set this switch at the Simp (Simplex) position, making (17): TX OFFSET Switch nonfunctional.

(19) P.T.T. Switch (Press-to talk switch)

For transmission, press this switch and speak into the microphone.

(20) Key Board Switches (Also refer to Key Board Operation)

① - ⑩: Numerical keys

Used to set operation frequencies and channel numbers to be memorized.

ⓐ: Clear/Stop key

Press this key and the entered digits are canceled and the lowest band edge frequency is recalled.

When this key is pressed during Memory or Program scan, operating frequency or memory channel stops on the displayed one.

ⓑ: Function key

Used to store and erase the memory with the **ⓂⓇ** key, to preset the scan

width and scan step for program scan with the **ⓐ** key, and to Operate program scan with the **ⓓ** key.

ⓂⓇ: (Memory/Memory Recall) key

Used to 1. STORE and 2. ERASE the memory with the **ⓑ** key and desired set key **① - ⑩** and to 3. RECALL memory with desired set key **① - ⑩**.

- 1: Please refer to: Memorizing Frequency
- 2: " : Erasing Memory
- 3: " : Recalling Memorized Frequency

ⓂⓈ: Memory Scan key

By pressing this key, scan starts and memorized channel numbers and frequencies are displayed (Scan speed is fixed: 1/2 second per channel) and the scan stops at a channel where signal is present and resumes 2 seconds later after the signal goes away. To resume the scan while stopped on a signal, press the **ⓂⓈ** key.

ⓐ (Up/Scan. W) key

By pressing this key, the operating frequency shifts up with 5kHz. step. (ALM-203E: 12.5kHz step)

When this key is kept depressed for more than 1 second, the frequency is manually scanned.

This key is also used with the **ⓑ** key to set the scan width and scan step for program scanning.

The scan step must be 5kHz. (12.5kHz) or its multiples. (5.10 . . . 20.25kHz.) (12.5, 25, 37.5, 50kHz)

ⓓ (Down/Prog. S) key

By pressing this key, the operating frequency shifts down with 5kHz. step. (12.5kHz) When this key is kept depressed for more than 1 second, the frequency is manually scanned.

This key is also used with the **ⓑ** key for program scan operation.

Scan width and Scan step must be preset.

Ⓟ (Battery Save Key)

By Pressing this key, "Battery Save" function starts and battery consumption will be greatly reduced during

reception. (The squelch control must be set to the threshold point.) In this function, the receiver monitors the selected frequency for about 500ms. at 5s intervals.

If a signal appears between the "Save" intervals, the receiver will function normally and when it disappears, the "Save" function will resume about 2 seconds later.

To clear this function, press **ⓐ** key, P.T.T. button, or set Power Switch to OFF.

(21) Reset Switch

Used to erase all memories or data of program scan.

Also in the case of malfunction of built-in computer, set the Power switch to OFF and push this switch.

(22) Speaker

(23) Microphone

An electret condenser microphone.

(24) Release Button

Used to release the battery pack for removal.

Depress this button and slide the battery pack down.

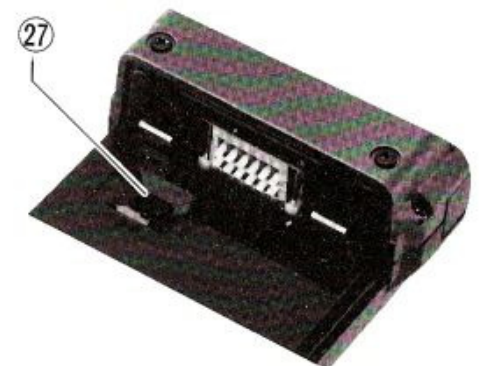
**(25) Nickel Cadmium Battery Pack
EBP-5N (9.6V, 450mAh)**

(26) Band Indicator (B-Band: 150 - 160MHz receive only)

When using Memory or Scan functions, be sure to set the Band selection switch to the "A" position.

Otherwise, these functions may not be fulfilled completely.

(27) Band selection switch



3 KEYBOARD OPERATION

The ALM-203T/E employs a 16 key channel selection system. These instructions cover the basic operation of the keyboard. It is also advisable to refer Section 4 "Operation".

■ Channel Selection

Frequencies are entered in 4 digits so, when entering 145.445, press keys **5** **4** **4** and **5** in that order. (ALM-203E: When entering 145.4375MHz, Press **5** **4** **3** in 3 digits. In this case, last 0.5kHz digit is not displayed on LCD panel.)

(When entering frequencies, please confirm that the frequencies are within the coverage of the Transceiver, otherwise,

E (ERROR) Symbol is displayed on LCD.)

If the key setting is found to be incorrect after pressing 4 keys, press the correct keys once again.

To correct the setting before all the 4 keys are pressed, press the **C** key and then press the correct set keys.

■ To Shift frequency, proceed

Press the keys as outlined above, or press the **▲** or **▼** key.

The frequency shifts up or down by 5kHz. (ALM-203E: 12.5kHz) at each press of the **▲** or **▼** key; frequency is scanned when either key is kept depressed for more than one second.

(for ALM-203T)

For example

(for ALM-203E)

Entering 145.445MHz

Press **M5** **M4** **M4** **M5**

Display 5.445

Entering 145.4375MHz

Press **M5** **M4** **M3**

Display 5.437

Shifting Frequency

Press **SCAN W** **▲**

Display 5.450

Press **PRO S** **▼**

Display 5.440

Press **SCAN W** **▲**

Display 5.450

Press **PRO S** **▼**

Display 5.425

■ Memorizing Frequency

First display the frequency to be memorized by pressing Set keys then press the **F** **MR** keys.

All memorized channel numbers are displayed on LCD.

Next, press a Set key **1** - **0** to select a storage channel.

A lower-key beep sound is heard to confirm the frequency has been memorized in that channel.

For example:

To memorize 145.805MHz. into channel No. 4.

(1) With the frequency 5.805 displayed, press the **F** **MR** keys.

Only memorized channel addresses are displayed on the LCD.

(2) Press the **4** key

A lower-key beep is heard confirming 145.805MHz. has been memorized into channel **4**.

Memorizing Frequency

Press **M5** **M8** **M0** **M5**

Display 5.805

Press **F** **MR**

Display 5.805

Press **M4** **4**

Display 5.805

Recalling Memorized Frequency

Press **MR**

Display 5.240

Press **M4** **4**

Display 5.805

■ Recalling Memorized Frequency

Press the **MR** key and all memorized channel addresses are displayed then press a Set key (**1** - **0**) for the desired channel.

The channel number and the frequency, memorized in that channel are displayed on LCD.

For example:

To recall the frequency memorized in 4 channel.

(1) Press the **MR** key
 (2) Among the displayed channel numbers, press the **4** key.
 (3) The channel number **4** and the memorized frequency 145.805 in that channel are displayed on LCD.

4 OPERATION

5 OPTIONS

■ Reception

1. Turn the power switch clockwise to click on.
2. A frequency will be displayed on LCD panel.
3. Turn the SQL (Squelch Control) completely counterclockwise and VOL (Volume Control) clockwise slowly to a comfortable level.
4. Select the desired frequency by pushing keys. (1) - (0) or (▲) and (▼) keys) (Please refer to Section 3 "KEYBOARD OPERATION")
5. If no signal can be heard but only noise, turn the SQL clockwise until the noise from the speaker stops and set it just below this threshold.

■ Transmission

1. For SIMPLEX operation, set the DUP/SIMP (Duplex/Simplex) switch to the "SIMP" position.
2. For DUPLEX (repeater) operation, set the DUP/SIMP switch to the "DUP" position and select the TX-OFFSET frequency by the +/- (+: +600kHz., -: -600kHz. from the receive frequency).
3. Select either LOW POWER or HIGH POWER.
4. Depress the P.T.T. (Press-To-Talk) switch and speak into the microphone with your normal speech level for the proper microphone level.
The ON-AIR indicator LED will be lit.

1. **EDH-25**
DC/DC Converter (for max. 5W output)
2. **EBP-5N**
Ni-Cd Battery Pack
3. **EDC-4/5/6**
Wall Charger for EBP-5N
EDC-4 (A.C. 120V)
EDC-5 (A.C. 220V)
EDC-6 (A.C. 240V)
4. **EDC-2**
Cigarette Plug/Charger Cable
5. **ESC-3**
Leatherette Case
6. **EMS-20**
Speaker/Microphone
7. **Battery case for five "AA" type dry cells**

Caution: Interference from a radio receiver.

The operator of a radio receiver, regardless of tuning range, date of manufacture, or of certification, which causes harmful interference shall promptly take steps to eliminate the harmful interference. (FCC Part 15.82)