

NEMO21 INFORMATION  
& COMMUNICATIONS  
FCC ID: O7MPRO-301  
JOB # 106AK0  
EXHIBIT # 9A-9W

# MINI HAND HELD TYPE UHF TRANSCEIVER

**user's manual**

**MODEL : EH-465**



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## **INTRODUCTION**

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Congratulations on your purchase of the maycom EH-465 Advanced Family Radio Service (FRS) Portable radio. Your maycom radio is designed to provide trouble-free service and advanced user features to make it the premier choice in radio communications.

## **GENERAL FEATURES**

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Compact size and light weight  
Easy viewing multi-purpose LCD display  
CPU controlled frequency synthesizer for reliable operation  
CTCSS Tone Squelch system to avoid interference  
Advanced user features – Vox, Scan, Call Tones, Melody Call  
and Roger Beep  
Operates on 4 AAA alkaline batteries, Ni-Mh Rechargeable  
Battery Pack or DC Power Supply  
Connections for optional accessories to enhance your  
communication pleasure  
Belt Clip and hand strap for easy carrying

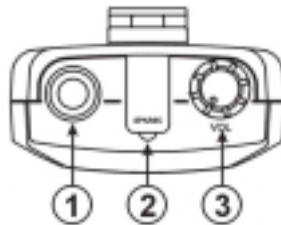
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NEMO21 INFORMATION & COMMUNICATIONS

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.  
OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:  
(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE,  
AND  
(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED,  
INCLUDING INTERFERENCE THAT MAY CAUSE UNDERSIRED  
OPERATION.

## DESCRIPTION OF FEATURES

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### 1. Top Panel Features



#### 1) Power On/Off, Volume Control

Turn the volume control clockwise to switch power on and set volume to desired level. Turn the volume control counter-clockwise to turn power off.

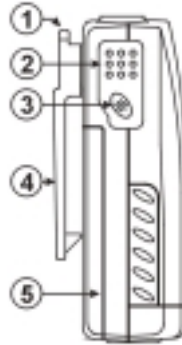
#### 2) Antenna

The antenna is an integral part of FRS radio for maximum performance. Do not modify or connect any external device to antenna to change its characteristics.

#### 3) Microphone and Speaker Jack

Jacks are provided for connection of optional speaker/microphone maycom accessories.

## 2. Side and Back Panel Features



### 1) Flexible Wrist Strap

Placing the strap around the wrist will prevent the radio from falling to the ground(Strap is in accessory pouch).

### 2) PTT(Push-To-Talk) Button

Press the “PTT” button to activate the transmitter. Talk in a normal voice about 2-3 inches from the front panel. When external microphone is connected, the external PTT control is activated. To receive, just release “PTT” button.

### 3) Lamp button


- Press the lamp button. The lamp will stay on during pressing.

#### •Monitor


Press Lamp button for a 2 sec in receiving mode, both carrier and tone squelch circuit will be temporarily disabled. Receiver/audio will sound on the loudspeaker until the “Lamp” button is released.

**Bell Feature**

Function : The user is alerted to incoming calls by bell indicator and an audible tone from the radio.

To Activate : Turn the power off  
α Press the lamp button and then turn the power on  
β The Bell icon “” will appear on the LCD.

Upon receiving an incoming call, the alert function will be activated for about 8 seconds and then stopped for 15 trigger the alert device. The radio will automatically re-armed and ready for another alert after the 15 seconds timer expires.

To De-Activate : Turn the power off and on. The Bell icon “” will disappear from the LCD.

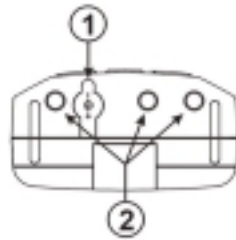
**4) Belt Clip**

Allows for easy of carrying while attached to user's belt.  
(One screw and clip are in accessory pouch).

**5) Battery Case**

See “Battery Installation Instruction” for details.

### 3. Bottom side Features



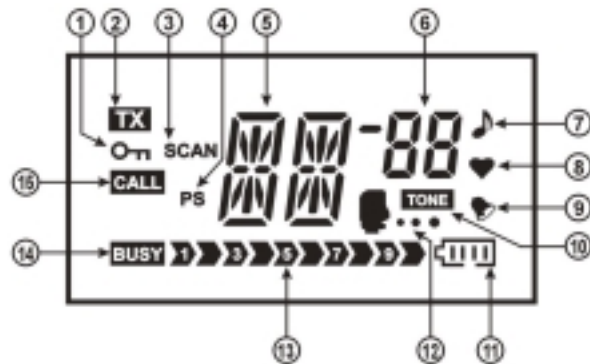
#### 1) DC Jack

For connection to AC Wall Charger, or optional Car Cigarette Lighter DC power Supply Adaptor. Do not connect charger or power supply to the radio if you are using Alkaline Batteries.

#### 2) Bottom Charger contact for Desktop Charger





To charge the rechargeable battery pack with desktop charger , this contact point will be used.

#### 4. Display panel features

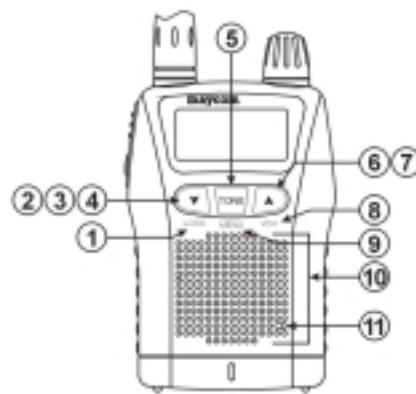


- 1) : Indicates the “Key lock” feature has been activated.
- 2) **TX** : Indicates that radio is the “Transmit” mode.
- 3) **SCAN** : Indicates the “SCAN” feature has been activated.
- 4) **PS** : Indicates that the radio is in the “Battery save” mode.
- 5) : Displays the channel number in which the radio is operating on.
- 6) **88** : Displays the CTCSS tone number in which the radio is operating on.
- 7) : Indicates that “Beep” tone confirmation is on.
- 8) : Indicates that “Roger Beep” tone confirmation is on.
- 9) : Indicates that “Bell” feature has been activated.
- 10) **TONE** : Indicates “TONE” is on.
- 11) : Indicates the amount of battery power left. If the battery level is too low, “” will be flashing.
- 12) : Indicates the “VOX” feature has been activated.





- 13)  : When transmitting, 10 segments will appear on the LCD. “” icon will also appear, at the top left corner of the LCD.
- 14)  : Indicates that RF signal is being received.
- 15)  : Indicates that a correct call is received in the CTCSS option mode.

## 5. Front Panel Features



### 1) Lock

This feature allows the user to lock the operation of each function button on the front panel.

- To Activate : Turn the power off.
  - α Press the Lock button and then turn the power on
  - β The “  icon will appear on the LCD to indicate that this feature is currently activated.
- To De-Activate : Repeat “To Activate” process. The “  icon will disappear on the LCD.

### 2) Channel Down(□)

Press the Down(...) button to change the radio to operate on a lower channel number.

### 3) Down(□) Scan

This feature allows the user to call all 14 FRS channels for activity. To start Down(...) scanning, press channel Down(...) button over 2 seconds.

The radio will stop on any busy channel until the preset Scan delay time expires, then revert to scanning. The user can cancel scanning by pressing the "PTT" while the radio stops at a busy channel, and communicate with other users using that channel. To activate Up(") scanning, press Up(") channel button during down(...) scanning.

#### **4) Melody Call Feature**

The user can transmit two melody tones provided in the radio to indicate its identify test audio performance of the radio.

To operate, simply press "... (or ") button while holding down the "PTT"

NOTE : FCC restrict the transmission of audible tones to less than 15 seconds.

#### **5) Tone On/Off**

Press the "TONE" button while in the receiving mode to toggle the Tone Squelch ON and OFF.

"TONE" icon will appear on the LCD when Tone Squelch is switched ON.

- To De-Activate : Press "TONE" button one more time. The "TONE" icon will disappear on the LCD.

**NOTE :** In Tone Squelch operation, the loudspeaker of the receiver will only become active while the received signal has the same CTCSS code as the one selected in the RX CTCSS Tone setting menu. Although you could not hear interference or transmissions from other users, they could still

exist

and may reduce your communication range. It is a good practice to monitor the channel press the "LAMP" button over 2 seconds, to ensure that it is free of interference before you choose it for

communications.  
Transmission in CTCSS is not private and is  
subject to monitoring by other users.

#### **6) Channel Up(□)**

Press the Up(□) button to move to a higher Channel.

#### **7) Up(□) Scan**

This feature allows the user to call all 14 FRS channels for activity. To start Up(□) scanning, press channel Up(□) button over 2 seconds. The radio will be stop on any busy channel until the preset Scan delay time expires, then revert to scanning. The user can cancel scanning by pressing the “PTT” while the radio stops at a busy channel, and communicate with other users using that channel. To activate Down(...) scanning, press Down(...) channel button during Up(□) scanning.

#### **8) VOX**

This feature allows the user to transmit the voice without pressing PTT button. In VOX mode, the transmitting will be operated automatically when the signal is input to microphone. If there is no signal to be input, the radio will stay in the receiving mode.

- To Activate : Turn the power off  
α Press Channel Up(□) button and then turn the power on  
β VOX “ ● ” will appear on the LCD.
- To De-Activate : Turn the power off and on.

#### **9) Menu**

Will be explained in Option Setting mode

#### **10) Loudspeaker**

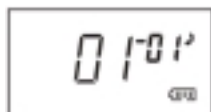
High quality impact resistant output loudspeaker, which provides clear, high volume reception.

### 11) Internal Microphone

The internal microphone is a front mounted, electrostatic condenser microphone which provides clear high quality audio transmission. For best results, hold the radio 2-4 inches from your mouth and speak in a normal voice.

## FRS CHANNEL FREQUENCY TABLE

∂ Display of channel



NO.	Freq.(MHz)	NO.	Freq.(MHz)
1	462.5625	8	467.5625
2	462.5875	9	467.5875
3	462.6125	10	467.6125
4	462.6375	11	467.6375
5	462.6625	12	467.6625
6	462.6875	13	467.6875
7	462.7125	14	467.7125

## CTCSS

The Continuous Tone Code System Squelch System (CTCSS) is a system to avoid interfering signals on the same channel. By selecting and enabling a code (or tone), only the proper received signal will be enabled. The EH-465 can use the same code for transmit and receive (Common Code).

∂ Display of CTCSS RX/TX Common Tone Setting Mode



In the above condition, press the "TONE" button over 2 seconds. CTCSS Tone Code will be blanking.

Press the " " or "..." button to change the TX/RX Tone setting. Press "PTT or TONE" button to store the selected CTCSS code.

NO.	Freq.(Hz)	NO.	Freq.(Hz)	NO.	Freq.(Hz)
1	67.0	14	107.2	27	167.9
2	71.9	15	110.9	28	173.8
3	74.4	16	114.8	29	179.9
4	77.0	17	118.8	30	186.2
5	79.7	18	123.0	31	192.8
6	82.5	19	127.3	32	203.5
7	85.4	20	131.8	33	210.7
8	88.5	21	136.5	34	218.1
9	91.5	22	141.3	35	225.7
10	94.8	23	146.2	36	233.6
11	97.4	24	151.4	37	241.8
12	100.0	25	156.7	38	250.3
13	103.5	26	162.2	39	

When the LCD displays the CTCSS code desired, you can change to display another CTCSS Tone setting by pressing "TONE and " " or "..." buttons. After all the settings are completed, press "PTT or TONE" button to store your selections. The radio will revert to normal operation. You can then activate Tone Squelch operation by pressing "TONE".

## OPTION SETTING MODE

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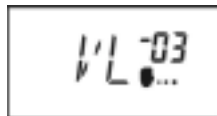
The following procedure allows the user to access optional feature settings. To enter option setting mode, first turn off the radio, then press and hold "TONE" button while turning on the radio.

**NOTE :** While you are in the option setting mode :

- A. If you press "TONE" button, the next option setting mode will appear on the LCD.
- B. If you press "PTT" button, all changed contents will be stored and the radio will return to normal operation mode.

### 1. Setting of VOX Level(1-6 steps)

∂ Display of VOX Level



Press " " or ... button to change the VOX operating level from 1 to 6

### 2. Setting of VOX Delay time

∂ Display of VOX Delay Time



This feature allows the user to limit the maximum VOX delay time for each transmission. If the VOX is depressed for a period exceeding the VOX delay time, the VOX transmitter

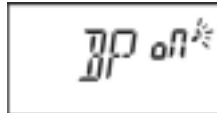
will be cut off and the user has to release and press PTT again to transmit.

Press " or ... button to change the VOX delay time from 1 to 6

### 3. Setting of Beep On/Off

This feature gives the user an audible test tone sequence while turning the radio on, and short confirmation or error tones when the user presses a button on the radio (Except for PTT button).

∂ Display of Beep On/Off



Press " or ... button to switch the "Beep" on and off. When the Beep is on, the beep icon '🔊' is on the LCD. The feature is preset "ON" at the factory. Confirmation tone is a high pitch tone indicating that the button selection is accepted.

### 4. Setting of Roger Beep On/Off

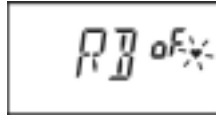
This feature allows the user to finish the transmitting and the

Radio will be in the receiving mode.

When the Roger Beep is on, the Roger Beep icon "🔊" is on the LCD.



#### ∂ Display of Beep On/Off

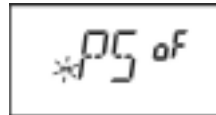


Press " " or ... button to switch the "Roger Beep" on and off. The feature is preset "ON" at the factory.

### 5. Setting of Power Save Mode

This feature enables power save circuit in the radio to reduce power consumption and increase the useful life of your battery significantly in standby mode. The feature is preset "ON" at the factory.

#### ∂ Display of Power Save On/Off Setting Mode

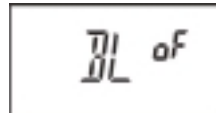


Press " " or ... button to toggle power save On and Off. The "PS" icon on the LCD will appear when power save option is On. The icon will flash when the power save circuit is in operation during standby mode.

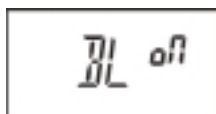
### 6. Setting of Busy Lock On/Off

This allows the user to disable the transmitter while receiving a message from others. This will avoid interference on the radio channel.

#### ∂ Display of Busy Channel Lock Out Setting Mode



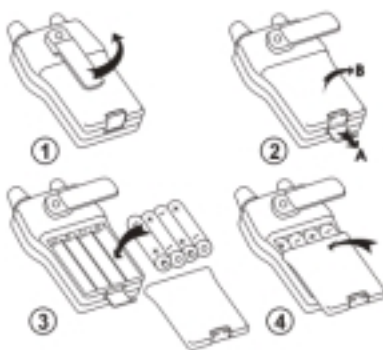
Press " or ... button to toggle Busy Channel Lock Out option between On and Off.



## **BATTERY INSTALLATION INSTRUCTIONS**

1. Turn belt clip to right(or left) direction. (1)
2. Slide open the battery cover on the back of the radio towards the indicated direction. (2)
3. Install 4 AAA Alkaline batteries (or rechargeable battery pack). If using individual batteries, place into the tray in the indicated arrangement. Place tray inside battery well (3). Please note the polarity of the batteries.
4. Put the battery cover back on the radio. Press and slide to close. (4)
5. Press the battery open button upward to lock battery case.

If you have installed rechargeable "AAA" size batteries, or used the Ni-Mh rechargeable pack, you can use the optional DC wall charge adapter, or optional desktop charger to charge the batteries.



NOTE : Alkaline RENEWABLE batteries are NOT regular rechargeable batteries. They require a special battery charger to recharge.

WARNING : DO NOT CHANGE ANY BATTERIES OTHER THAN Ni-Mh RECHARGEABLE TYPE IN THE RADIO. CHARGING BATTERIES INCORRECTLY CAN CAUSE SERIOUS DAMAGE TO THE RADIO AND ITS OPERATOR.

## **TO RECEIVE**

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If you have just transmitted, release the “PTT” button. If you have not transmitted, leave the radio on to receive selected channel.

The radio will unmute upon receiving a signal. The BUSY icon will appear on the LCD and the S-RF meter will show received signal strength.

When the radio is operated with CTCSS Tone Squelch, and the radio receives a signal with correct CTCSS code, the CALL icon will appear on the LCD display.

## **TO TRANSMIT**

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Press and Hold the “PTT” button to transmit.

If Busy Channel Lock Out Option is on and the radio is in receiving mode, “**BUSY**” will be blinking on the LCD and the audible alarm (error beep tone) is telling you the radio will stay in receiving mode and you will not be able to transmit. Press “TONE” to cancel privacy codes on that channel.

**NOTE :** Please refer to the different sections in this manual for detailed operational procedures.

## **INITIALIZATION**

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Pressing and holding the “PTT” while turning the power on will put the radio into initialization mode. The radio will be reset to original factory settings. This feature is useful when you have mis-programmed the radio and the radio is not operating normally.

## **RANGE**

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The maycom EH-465 has an effective range of about two miles in open terrain. Buildings, hills, trees and other objects can reduce the effective range of transmission.

## **EASY AND SAFE COMMUNICATIONS**

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The EH-465 can make communications with family and friends easy and safe when :  
You communicate with fellow hikers and bikers.  
You keep track of children in a shopping mall or at a concert.  
Communicate between floors or rooms in your own home.

Talk to neighbors or friends.  
Talk to traveling friends in another car.

## **SPECIFICATION**

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### **1. General**

Channels ----- 14  
Frequency Range ----- 462.5625 to 462.7125 MHz  
467.5625 to 467.7125 MHz  
Frequency Control ----- Phase Lock Loop (PLL)  
Synthesizer  
Frequency Stability ----- +/- 2.5 ppm  
Operating Temperature ----- -20 to +60  
(-22 to +140 )  
Power Source ----- DC 6.0V  
Impedance ----- 50 ohm  
Dimensions ----- 55(W) x 26(H) x 82.5(D)  
(mm)  
Weight ----- 115g (with out battery)

### **2. Transmit**

Power Output ----- 500mW  
Frequency Modulation ----- Narrow Band FM @ 2.5 KHz  
deviation  
Current Drain ----- 600mA @ full power  
Distortion ----- 5 % maximum  
S/N Ratio ----- 40 dB

### 3. Receive

Circuit Type -----	Super Heterodyne-Dual Conversion
IF Frequency -----	First IF : 21.7 MHz Second IF : 450 KHz
Audio output -----	120mW
Sensitivity -----	0.25 $\mu$ V for 12 dB SND
Selectivity -----	50 dB Min

## **TROUBLESHOOTING**

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### **1. The radio won't receive :**

If "TONE" is lighted on the display, press "TONE" to cancel privacy codes on that channel.

### **2. "PS" is flashing :**

Power save mode is turned on to save battery power.

### **3. The radio is locked up :**

Turn the radio off and turn back on.





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