Radio and Antenna Connection Instructions

2.4 GHz and 5.7 GHz Frequencies

FCC Numbers: ROG466837HO553R24
ROG466837HO553R58

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Voice: 847-686-0800

NOTICES

Important Note on Modifications
Intentional or unintentional changes or modifications to the equipment must not be made unless under the express consent of the party responsible for compliance. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty.

U.S. Federal Communication Commission (FCC) Notifications
This device complies with part 15 of the U.S. FCC Rules and Regulations. 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 undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the U.S. FCC Rules and Regulations. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to correct the interference by one or more of the following measures:

- Increase the separation between the affected equipment and the unit;
- Connect the affected equipment to a power outlet on different circuit from that which the receiver is connected to;
- Consult the dealer and/or experienced radio/TV technician for help

Product Description
The products listed in this manual operate in the ISM 2400-2483.5 MHz and the U-NII 5725-5850 MHz frequency band range. Those products that operate in the 2.4GHz range have a minimum frequency of 2415 MHz and a maximum frequency of 2457.5 MHz. Despite the usage in the same frequency range, the products listed in this manual are not 802.11 devices as they use an access method of TDD/TDMA with a modulation of BFSK. All of the possible frequency options for the 2.4 GHz products are shown in the configuration snapshot in the Radio Configuration section of this manual.

RF Exposure Analysis
The following relates to the guidelines set forth by FCC OET Bulletin 65; which states that the maximum radio frequency power density exposure limit is 10 Watt/m^2 (1 mWatt/cm^2). The corresponding compliance safe distances have been calculated for each frequency range. As a result of the change of gain in each antenna, a table has been complied to show the safe distances for each radio and antenna combination. This table is shown below. The formula used to compute the peak power density (*S*) in the far-field of a radio frequency source that transmits power *P* and linear antenna gain *G* at a distance d is:

$$S = \frac{P * G}{4\pi\ d^2}$$

The table below is the result of the equation above with P = 168mW for 2.4GHz combinations and P = 340mW for 5.7GHz combinations. With this information the safe distance for each radio and antenna combination can be calculated. All the values were calculated using S = 10 W/m2 (1 mWatt/cm2).

Antenna dBi	2.4 GHz Safe Distance *d* (m)	2.4 GHz Safe Distance *d* (cm)	5.7GHz Safe Distance *d* (m)	5.7GHz Safe Distance *d* (cm)
3	0.0516	5.1648	0.0735	7.3474
5	0.0650	6.5020	0.0925	9.2498
12	0.1456	14.5563	0.2071	20.7078
13	0.1633	16.3324	0.2323	23.2346
14	0.1833	18.3252	0.2607	26.0696
17	0.2589	25.8851	0.3682	36.8243
22	0.4603	46.0309	0.6548	65.4839
26	0.7295	72.9541	1.0378	103.7850
29	n/a	n/a	1.4660	146.002

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b):

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (in minutes)
Limits for Occupational / Control Exposure				
300 – 1,500	…	…	F/300	6
1,500 – 100,000	…	…	5	6
Limits For General Population / Uncontrolled Exposure				
300 – 1,500	…	…	F/1500	6
1,500 – 100,000	…	…	1.0	30

F = Frequency in Megahertz

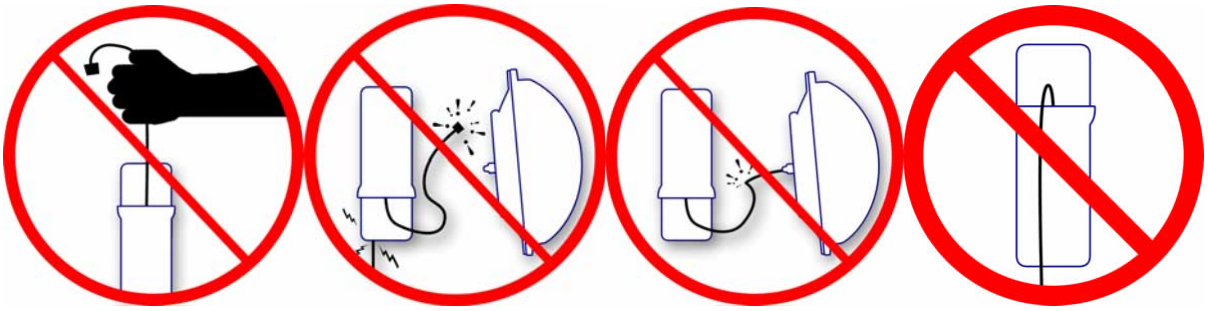
Table of Contents

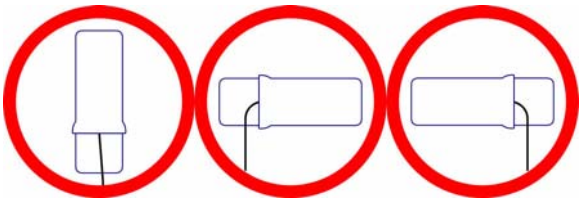
Cautions and Warnings *2*
WARNINGS **2**
2.4 GHz Radios and Antennas *3*
ATE24-1026 and ATE24-2026 ..... **3**
ATE24-10140 and ATE24-20140 ..... **3**
ATE24-101690 and ATE24-201690 ..... **3**
ATE24-103MPOB **4**
ATE24-105MPO **4**
ATE24-1012MPO **4**
ATE24-1012MPBM **5**
ATE24-1017MPBM and ATE24-2017MPBM **5**
ATE24-1022MPT and ATE24-2022MPT **5**
ATE24-1014WSPR120 ..... **6**
5.7 GHz Radios and Antennas *7*
ATE57-1014OMP and ATE57-2014OPP **7**
ATE57-101690 and ATE57-201690 ..... **7**
ATE57-103MPOB **7**
ATE57-105MPO **8**
ATE57-1012MPO **8**
ATE57-1014WSPR120 ..... **8**
ATE57-1012MPBM and ATE57-2012MPBM **9**
ATE57-1029PAC and ATE57-2029PAC **9**
Radio Installation *10*
Securing Radio/Antenna Connection *11*
Radio Configuration *12*
Special Radio Configuration Required For All ATE24-1026, ATE24-2026, ATE24-1022MPT, and ATE24-2022MPT Products **12**

Cautions and Warnings

WARNINGS

1. Do not pull on, or hold the radio by, the N-connector cable.
2. Do not connect, or disconnect, the radio to the antenna feed while the radio is turned on.
3. Do not power on the radio without the antenna connected.
4. Do not crimp the N-connector cable. The cable should be straight or have a large bending radius at all times.
5. Be cautious when installing the bottom radio cover, as the N-connector cable may be caught.
6. Fasten the N-connector with self-adhesive vulcanizing tape as described in the Securing Radio/Antenna Connection section.
7. This radio and antenna must be professionally installed as provided.





2.4 GHz Radios and Antennas

View the Radio Installation, Securing Radio/Antenna Connection, and Radio Configuration sections, starting on Page 10, for more information on radio operation and connection procedures for each of the radio and antenna combinations below.

ATE24-1026 and ATE24-2026

Radio Type: 10mbit and 20mbit Point-to-point respectively
Antenna Model: MaxRad Model MPR24026PTNF
Antenna Rating: 26 dbi
Antenna Type: 3 ft Directional Parabolic Dish

***Note**: Please see the Radio Configuration section on Page 12 for special instructions on the configuring the radio for antennas over 20dB.*

ATE24-10140 and ATE24-20140

Radio Type: 10mbit Multi-point and 20mbit Point-to-point respectively
Antenna Model: Comtelco Model BS2400XL12-0
Antenna Rating: 14 dbi
Antenna Type: 60 inch Omni-directional Antenna

ATE24-101690 and ATE24-201690

Radio Type: 10mbit and 20mbit radios respectively
Antenna Model: Radiowaves, Inc Model SEC-25V-90-16
Antenna Rating: 16 dbi
Antenna Type: 90º Sectored Antenna - 24 inches in height

ATE24-103MPOB

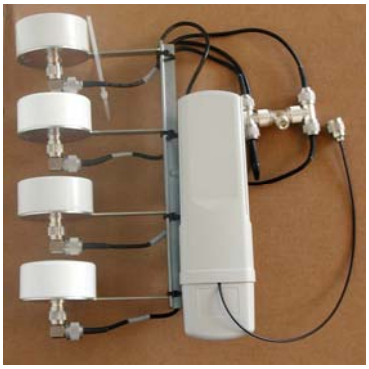
Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model MP-Bullet 2.4GHz
Antenna Rating: 3 dbi
Antenna Type: Omni-directional - 3 inches in height

ATE24-105MPO

Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model MP-5 Omni
Antenna Rating: 5 dbi
Antenna Type: Omni-directional Antenna – 3 inches in height

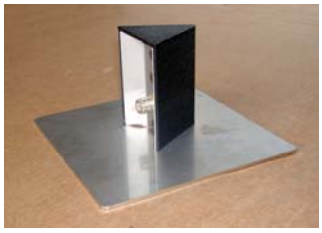
ATE24-1012MPO

Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model MP-5 Omni
Antenna Rating: 12 dbi
Antenna Type: Omni-directional Antenna



ATE24-1012MPBM

Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus 4in Beam 2.4GHz
Antenna Rating: 12 dbi
Antenna Type: Point-to-multipoint Antenna – 4 inches in height



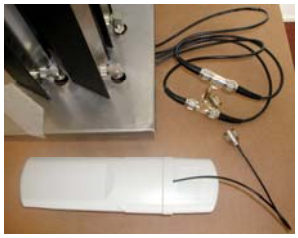
ATE24-1017MPBM and ATE24-2017MPBM

Radio Type: 10mbit and 20mbit Point-to-point radios respectively
Antenna Model: WIFI-Plus Model MP18in Beam
Antenna Rating: 17 dbi
Antenna Type: Directional Point-to-point Antenna – 17 inches in height

ATE24-1022MPT and ATE24-2022MPT

Radio Type: 10mbit and 20mbit Point-to-point radios respectively
Antenna Model: WIFI-Plus Model Tetrad-M 2.4 GHz
Antenna Rating: 22 dbi
Antenna Type: Directional Point-to-point Array Antenna – 17 inches in height

***Note**: Please see the Radio Configuration section on Page 12 for special instructions on the configuring the radio for antennas over 20dB.*



ATE24-1014WSPR120

Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model WISPer Dual Band
Antenna Rating: 14 dbi
Antenna Type: 120 º Sectored Antenna

5.7 GHz Radios and Antennas

View the Radio Installation, Securing Radio/Antenna Connection, and Radio Configuration sections, starting on Page 10, for more information on radio operation and connection procedures for each of the radio and antenna combinations below.

ATE57-1014OMP and ATE57-2014OPP

Radio Type: 10mbit Access Point and 20mbit Point-to-point respectively
Antenna Model: Comtelco Model BS5800XL12
Antenna Rating: 14 dbi
Antenna Type: Omni-directional Antenna – 30 inches in height

ATE57-101690 and ATE57-201690

Radio Type: 10mbit Access Point and 20mbit Point-to-point
Antenna Model: Radiowaves, Inc Model SEC-5.5V-90-10
Antenna Rating: 16 dbi
Antenna Type: 90º Sectored Antenna - 40 inches in height

ATE57-103MPOB

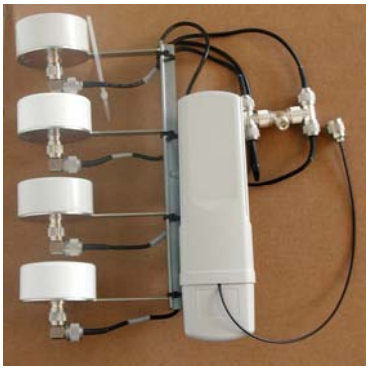
Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model MP-Bullet 5.7GHz
Antenna Rating: 3 dbi
Antenna Type: Omni-directional - 3 inches in height

ATE57-105MPO

Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model MP-5 Omni
Antenna Rating: 5 dbi
Antenna Type: Omni-directional - 3 inches in height

ATE57-1012MPO

Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model MP-5 4-way Omni-array
Antenna Rating: 12 dbi
Antenna Type: Omni-directional Antenna



ATE57-1014WSPR120

Radio Type: 10mbit Access Point
Antenna Model: WIFI-Plus Model WISPer Dual Band
Antenna Rating: 14 dbi
Antenna Type: 120 º Sectored Antenna

ATE57-1012MPBM and ATE57-2012MPBM

Radio Type: 10mbit and 20mbit Point-to-point radios respectively
Antenna Model: WIFI-Plus Model 8.5 inch 5.7 GHz Beam Antenna
Antenna Rating: 17 dbi
Antenna Type: Directional Point-to-point Antenna – 8.5 inches in height

ATE57-1029PAC and ATE57-2029PAC

Radio Type: 10mbit and 20mbit Point-to-point radios respectively
Antenna Model: Pacific Wireless PAWDA58-29
Antenna Rating: 29 dbi
Antenna Type: Directional Point-to-point two foot dish

Radio Installation

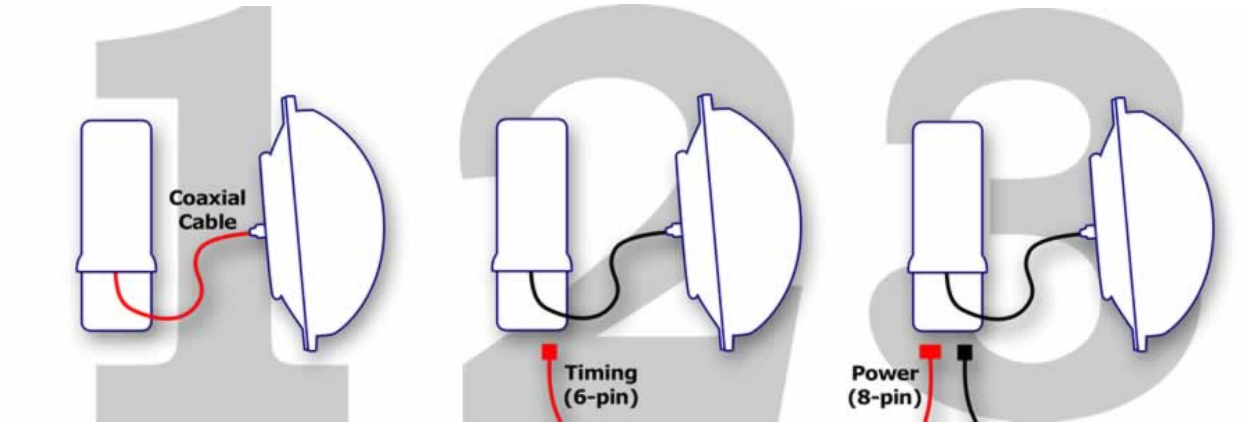
READ AND UNDERSTAND ALL WARNINGS BEFORE INSTALLATION

Step 1: The radio should be mounted with hose clamps in close proximity to the antenna considering the N-Connector cable is only twenty-four inches in length. Note that the hose clamps should only encase the pole and the radio, not the mount of the antenna. If the mount is included, then the antenna will not rotate easily for horizontal alignment.

Step 2: **A**ttach the N-Connector from the radio to the signal feed connection on the antenna. The feed connection of each antenna is shown in its corresponding description as listed above. It is important that the N-connector cable from the radio is free of kinks, crimps, and sharp bends. This could damage the cable. Prior to operation, place self-vulcanizing rubber tape on the N-connector after it has been securely fastened to the antenna feed as described in the *Securing Radio/Antenna Connection* section found on Page 11.

Step 3: If required, install the 6-pin timing cable; depending on radio configuration

Step 4: Connect the 8-pin power/data cable.



Securing Radio/Antenna Connection

The N-connector terminal is shown for each of the antennas (2.4GHz and 5.7 GHz) listed in this manual. In order to make the antenna connection weather-resistant, it is important to fasten the N-connector. After the radio is attached to the antenna, wrap the entire N-connector in self-adhesive vulcanizing tape. This not only protects the connector from the weather elements, but decreases the odds of the connection becoming loose. Pictures below show the process for wrapping the WIFI-Plus Model MP-Bullet antenna.

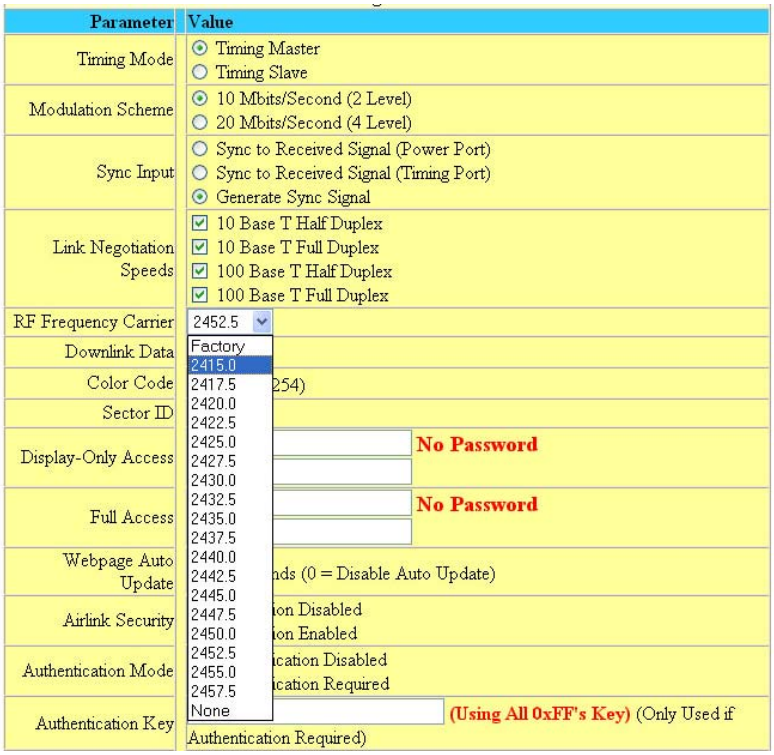
Tape Recommendations:

- Cover the entire N-connector up to the antenna.
- Cut the tape with an angled cut (shown in the middle picture).
- It may be necessary to tape the connection before mounting the antenna.

Radio Configuration

DO NOT POWER THE RADIO UNLESS AN ANTENNA IS ATTACHED TO THE N-CONNECTOR CABLE.

The radio is configured from a web browser using the IP address as the URL. The default IP address is 169.254.1.1. The initial page has the firmware version installed on the radio. For technical operation of the radio transmitter, please refer to the Motorola Canopy Reference Notes corresponding to the version of the firmware for a complete operational guide. The reference notes can be found on the Internet in the library section at http://www.canopywireless.com. In the Motorola Canopy Manual, please disregard all references to any FCC certification numbers.



Special Radio Configuration Required For All ATE24-1026, ATE24-2026, ATE24-1022MPT, and ATE24-2022MPT Products

For the ATE24-1026, ATE24-2026, ATE24-1022MPT, and ATE24-2022MPT products, the radios must be set to low power in order to comply with the rules and regulations of FCC Part 15.247. This adjustment can be easily made in the configuration of the radio via the web interface. Simply access the ***Configuration*** page via a web browser and locate the ***Power Control*** setting located halfway down the page. Select ***Low*** as the power setting, then click ***Save Changes*** on the bottom of the page. To complete the process, reboot the radio. These products come shipped on the low power setting.