SUNSIGHT MICROWAVE PATH

ALIGNMENT SYSTEM

Sunsight Microwave Path Alignment System (models MW and MW Max)

Issue 3

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Table of Contents

Document Change History

Issue	Date	Description
1	**06/01/24**	Update for new product line
2	**08/11/25**	Update for Release 3.0 Firmware

⚠ Safety

The MW unit(s) should be handled with the following considerations:

 Avoid impacting, dropping or rough handling of the MW unit, as it contains sensitive electronic components. Rough handling may result in internal component damage.

 Care should be taken to avoid impact to the black GNSS antennas on the top of the MW unit.

 The MW unit is water resistant, but not waterproof. Do not submerge. All sealing caps and doors must be secured while in use, particularly during inclement weather.

 Use only the Sunsight supplied smart charger to recharge the LiFePO4 battery pack. Use of a non-approved battery charger will void the battery warranty and may damage the battery pack.

 Never attempt to recharge the batteries outdoors in inclement conditions.

 Never short the battery terminals and never attempt to disassemble the battery pack or dispose of the pack in a fire. If disposing of the Sunsight product, any exhausted battery packs must be disposed of properly. CONTACT SUNSIGHT INSTRUMENTS IF YOU ARE UNSURE OF HOW TO PROPERLY DISPOSE OF THE BATTERY.

 All internal repairs must be performed by Sunsight Instruments. Unauthorized disassembly of the MW unit may result in warranty termination.

If you suspect the MW unit is operating incorrectly, contact Sunsight Technical Support via +1-321-244-9443, www.sunsight.com, or an authorized Sunsight Instruments distributor for support.

The Sunsight Microwave Path Alignment System

The Sunsight Microwave Path Alignment System is used to precisely mechanically align devices in azimuth, elevation angle (aka Pitch or tilt) and height. The MW system guides the user to physically align the antennas to a calculated azimuth and elevation based on GNSS location. As such, it is frequency and distance-independent. It is commonly used to align point-to-point communication links. The system consists of a measurement unit mounted on the antenna at each end of the link to be aligned.

Using Sunsight's patented End-to-End Alignment* technology, the two measurement systems communicate with each other to determine the required target alignment parameters of azimuth and elevation. The users at both ends are displayed target data as well as the actual current alignment measurements of the antennas. The user then adjusts the antenna position to match the target data and secures the antenna in the correctly aligned position. The devices (ex. microwave antennas) can be aligned independently once the data is transmitted and the target values are displayed (I.e. technicians at each end can move ahead with antenna adjustment without affecting the opposite end). The system requires no external power or disconnection of the antenna from RF sources (coax, waveguides, or radio/ODU). The alignment results are captured in a comprehensive report.

Once the antennas are physically aligned using the Sunsight MW Tools, they may require slight adjustment to boost signal strength due to refraction and environmental conditions.

Optionally one MW unit can be used in Single Ended Mode to align one end of the link by using the GNSS coordinates and MSL height from the remote end of the link. A complete link can be measured and captured in a single comprehensive report (one alignment report containing both ends of the link).

There are two microwave alignment products currently offered by Sunsight. They are the MW and the MW Max. The MW is the standard microwave alignment tool and is offered as a kit or single unit. It is more than adequate for any typical alignment project for long distance or high frequency microwave links.. The MW Max is a significantly more accurate alignment unit that is used when extreme azimuthal accuracy is required. It is physically larger than the MW and is not to be used for aligning cellular antennas due to its large size. If azimuth accuracy is crucial to a project, the MW Max is the correct product.

Important

Each MW or MW Max included in the Sunsight MW Microwave Path Alignment System may also be used independently to align single microwave antennas. In this way, each Sunsight MW or MW Max Microwave Path Alignment Kit may be employed as an End-to-End alignment system or two individual microwave antenna aligners. The MW system also contains the RF panel alignment capabilities of Sunsight's AAT product which is used typically for cellular antenna alignment. Each MW unit can function as an individual AAT.

This document is a supplement or extension of the AAT product instruction. It describes the microwave functions that are only available in the MW products. Users of this document should review the AAT instruction document also as it contains very detailed descriptions of the many options of the MW/AAT products. Instructions for use as an RF Panel alignment tool can be found on the www.sunsight.com support page at: sunsight.com/aat_mw_support

**End-to-End Alignment technology is a patented design belonging to Sunsight.*

Definitions

- **Azimuth** – compass heading or bearing. All Sunsight products show azimuth referenced to **true north**, not magnetic north
- **Snapshot** – A snapshot is the action of recording measurements to the MW unit. Typically, the tower technician will adjust the antenna to the required alignment values and record the results by performing a snapshot. The snapshot data is then used to generate reports.
- **Elevation (aka Pitch or Tilt)** – Measured in degrees and refers to antenna alignment in the vertical plane. A positive tilt value indicates the MW unit is facing above the horizon.
- **GNSS** is a group of satellite-based positioning systems that is used by the MW unit to determine exact latitude and longitude of the MW unit. Also, and most importantly, the satellites are used to determine the azimuth for the MW unit. GNSS subsystem in the MW unit uses satellites from GPS, GLONASS, Galileo, Beidou and SBAS (correction) in both the L1 and L2 frequency bands.
- **MW or MW MAX kit** - each kit comprises two MW units, along with two sets of microwave antenna mounts, two rugged Android devices and two RF Panel alignment mounts (MW kit only)
- **MW or MW MAX Single Unit** - each Single unit comprises one MW unit, along with one set of microwave antenna mounts, one rugged Android device and one RF Panel alignment

mount (MW only). A Single Unit is used to align each end of a microwave link independently (one at a time). The MW Single Unit can also be used to align a cellular RF panel antenna.

- **Reports** - Reports are formatted alignment results that can be created in PDF or CSV formats. Reports can be created for one individual set of measurements (ex. one antenna) or can be created for an entire site's worth of data (several antennas on one report).
- **Google Earth** - The MW produces a file that can be read by the Google Earth (GE) app. The link information will be shown in the GE app. The GE display can show the line-of-sight view of the link and may provide valuable information in regards to physical obstacle along the transmission path.
- **RF Panel Antenna** - An RF panel antenna is an antenna used for broadcasting cellular signals to handsets. They are typically mounted on towers or rooftops in a tri-sector configuration.
- **Roll** – Sometimes referred to as "plumb" and measured in degrees. Refers to antenna alignment in the horizontal plane. A positive or negative roll value indicates the top of the antenna is not level.
- **Handheld Device (ex. smartphone)** – the MW products come with 5G Android smartphones that use the Sunsight Android app to operate the Sunsight products. Note that any Android device (tablet or Smartphone) with Android Operating System greater than 12.0 can also be used in place of the provided devices. The Sunsight Android app would need to be installed on the Android device. The Sunsight app is available for download from www.sunsight.com under the Support page.

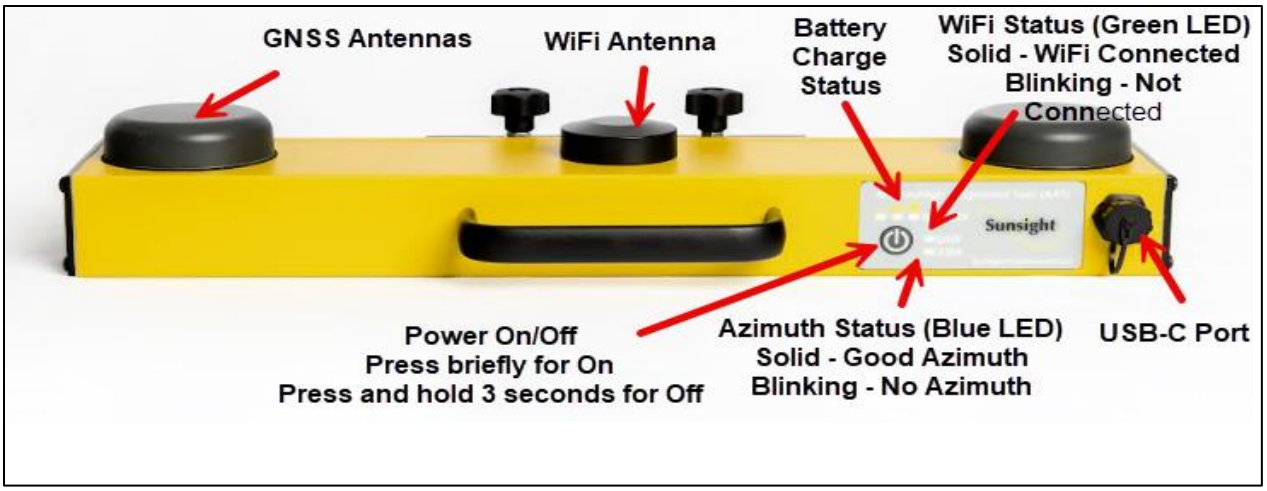
The MW is operated from a handheld device using WiFi or USB-C cable (Android only). For this document, "handheld device" means smartphone, tablet, or laptop.

For the remainder of this document the term Handheld device will mean the Android device supplied with the MW products or any other Android device running the Sunsight Android app.

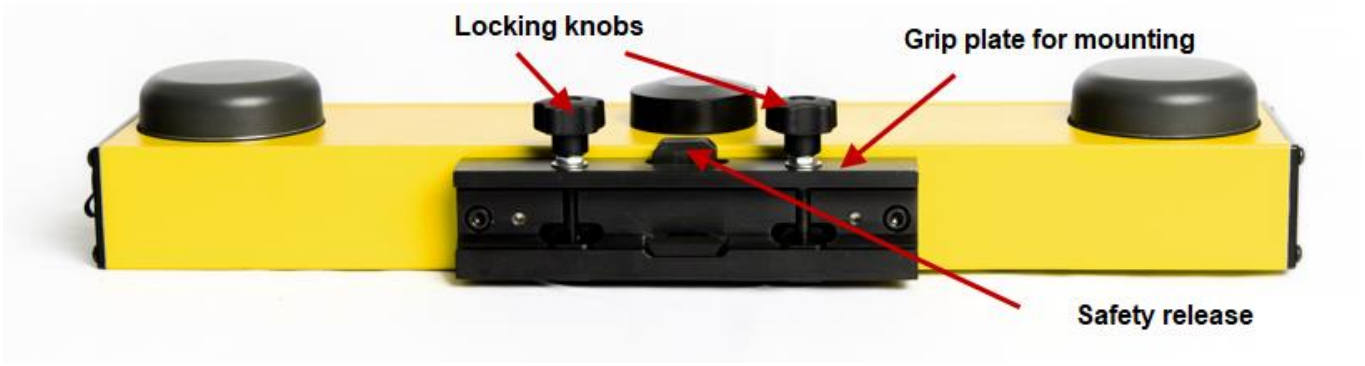
For the purpose of this instruction document the term MW will be used to mean both the MW or MW Max products

Case contents – 2 cases per kit

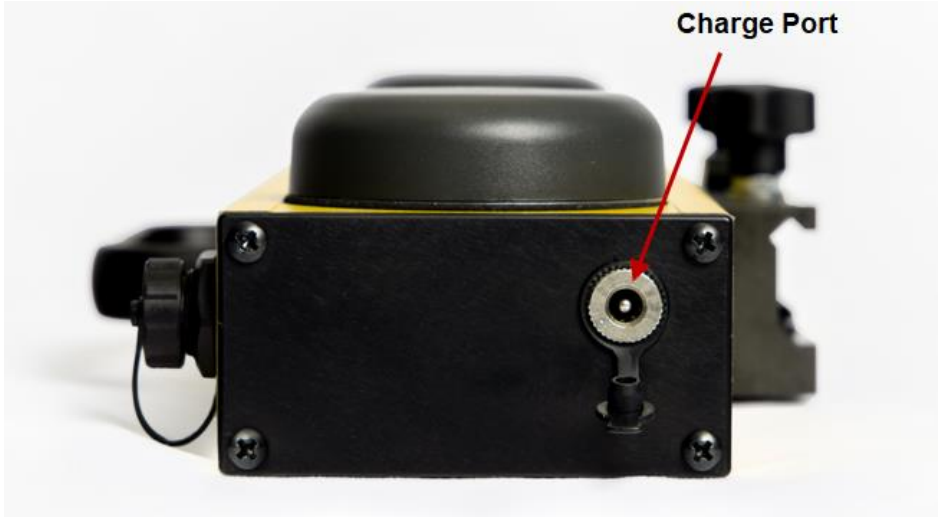
1. MW or MW MAX hard case
2. MW or MW MAX alignment tool
3. Side Mount with strap – for use on standard RF panel antenna (MW only)
4. LiFEPo4 Battery Charger
5. USB-C cable
6. Android 5G smartphone
7. Battery Charger for Smart Phone
8. Electronic digital level w/soft case
9. Adjustable Mount Straps
10. MW Mount Adapter plates (3 pieces)
    a. 1’ – 1.5’ (.3m – .5m) diameter antenna adapter
    b. 1.5’ – 4’ (0.5m – 1.25m) diameter antenna adapter
    c. 4’ – 12’ (1.25m – 4m) diameter antenna adapter
11. MW Mount Baseplate
12. MW Mount Articulated Brace
13. MW Extension Bracket (not pictured)



Front view



Back view



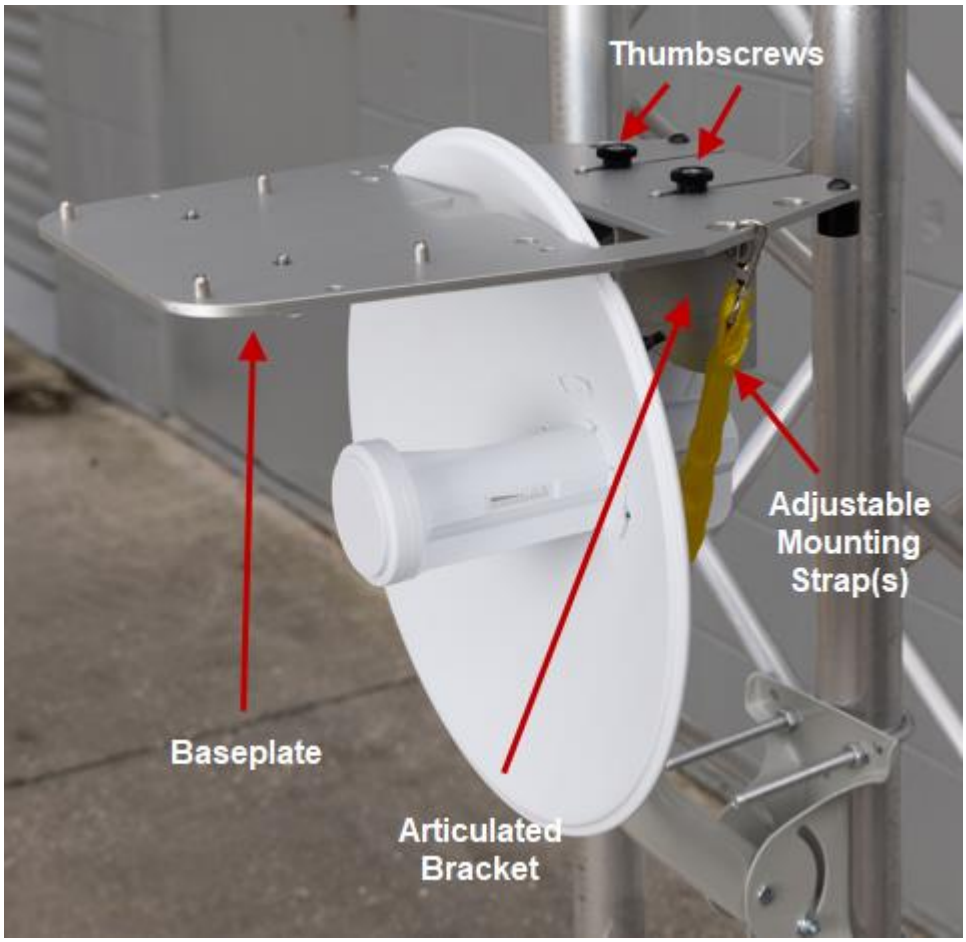
Charge port

Please take time to review the following steps and pictures. It is necessary to understand how to assemble the mount correctly before attempting to use the system in the field.

Using the Microwave Mount

There are many shapes and sizes of microwave antennas as shown on the following pages. The included microwave antenna mount is designed to be very flexible in this regard, allowing a broad range of fitment. The microwave mount consists of the following:

1. MW Mount Baseplate
2. Curved Adapter brackets – 3 sizes to support various antenna diameters
3. Articulated Brace - Front/Rear support bracket
4. Straps (x3) to secure mount to antenna
5. Thumbscrews (x4) to secure Curved Adapters and Articulated Brace to main body (spare thumbscrews included)
6. MW Extension Bracket



Do not attempt to remove the rubber bumpers secured to the mount main body or adapters. Attempted removal may damage the bumpers or mount

Common Microwave Antenna Styles

Shielded or “Drum Style”

Parabolic with front shield

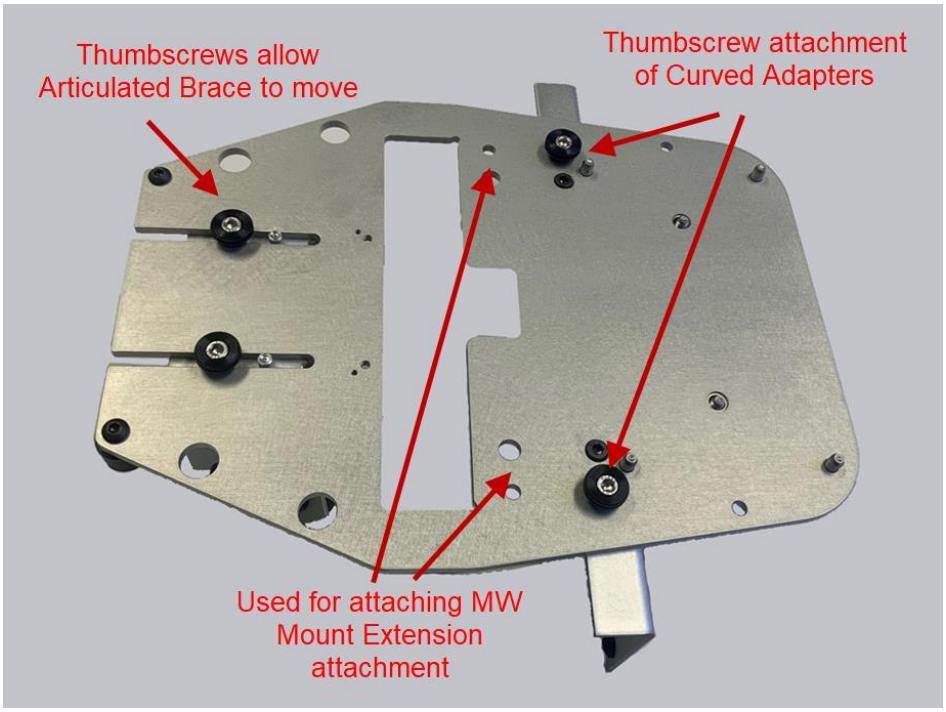
Unshielded Parabolic

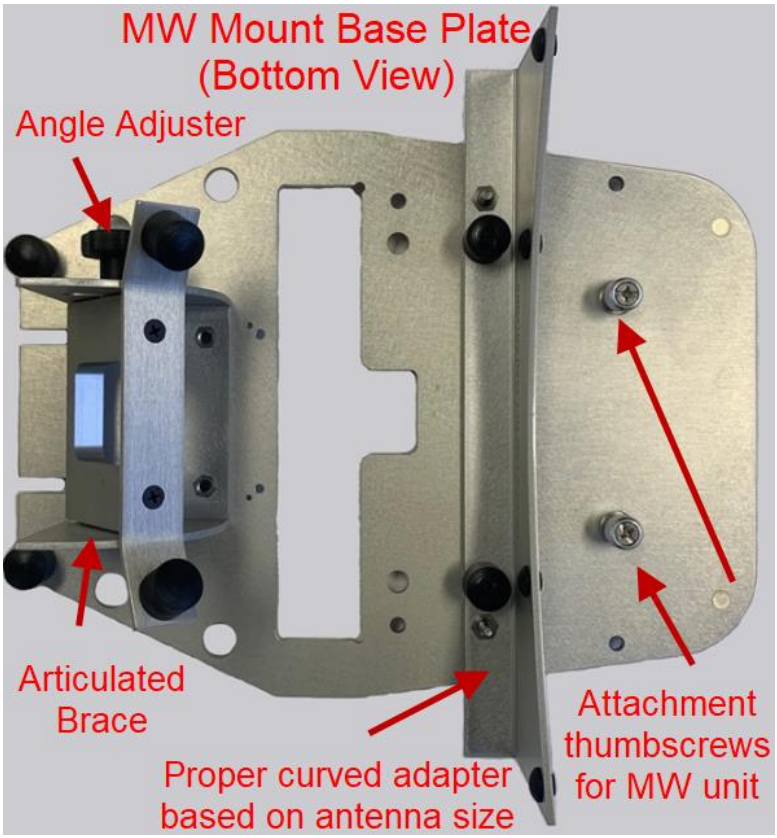
Assembling the Microwave Mount - General Assembly

Note: Curved Adapter brackets may be reversed to accommodate antennas with a better inside lip. Photographs below represent basic assembly procedures. Always use the proper adapter brackets to ensure the mount is sufficiently and safely supported on the antenna. Regardless of the antenna type, always secure the mount to the microwave antenna using the included elastic straps and adjustable end straps.

*****ALWAYS USE THE SAFETY LANYARD TO PROTECT MOUNT AND MW UNIT FROM ACCIDENTAL FALLS Note: The safety lanyard is NOT the same as the yellow/black elastic straps used to the secure the mount to the antenna*****

1. Assemble Articulated Brace to Baseplate using two thumbscrews as shown below
2. Choose the correct curved adapter to match the diameter of the antenna being aligned. The assembled mount should look like this:





3. The elastic mounting straps typically loop under the center of the antenna and back up to the mount. On some shielded "drum" style antennas, the strap can be wrapped around the circumference of the drum. Use the correct straps based on the antenna's diameter. The three mount straps supplied with the microwave alignment kit can be attached end-to-end, allowing a large range of adjustment for various antenna diameters.

Always start with an elastic strap. For very small parabolic antennas use the yellow elastic strap.

4. Place the mount on the antenna and secure it using the elastic straps. Be sure the Curved Adapter is in good contact with the front of the antenna

1. Adjust the Articulated Brace to make the baseplate sit as flat as possible on top of the antenna. **Note that shielded antennas typically do not use the Articulated Brace.**
2. **Ensure the mount is secure and mounted as flat as possible on top of the antenna. The mount should be very stable on the antenna.**

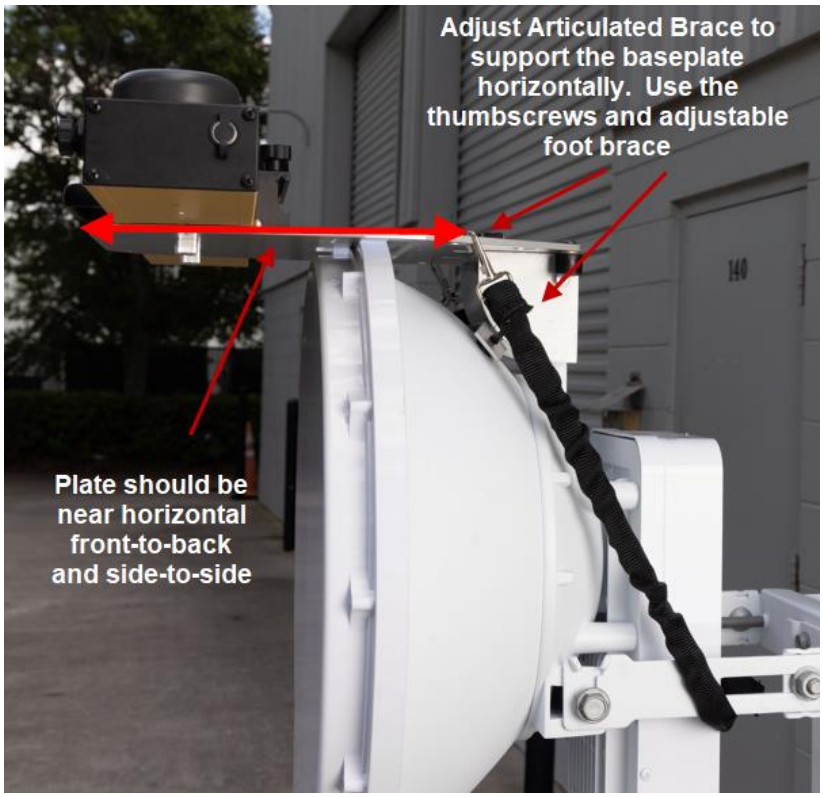


Figure 1

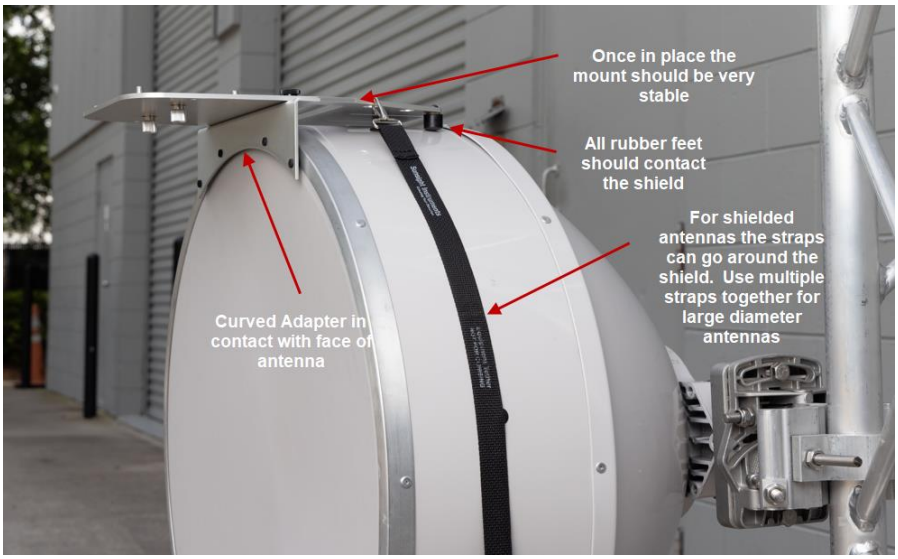


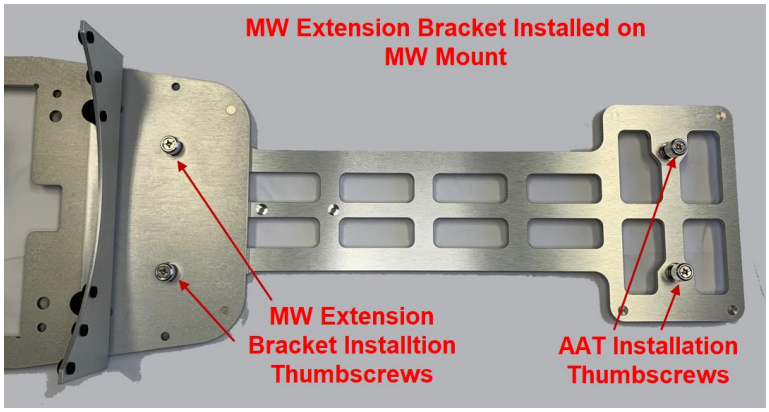
Figure 2

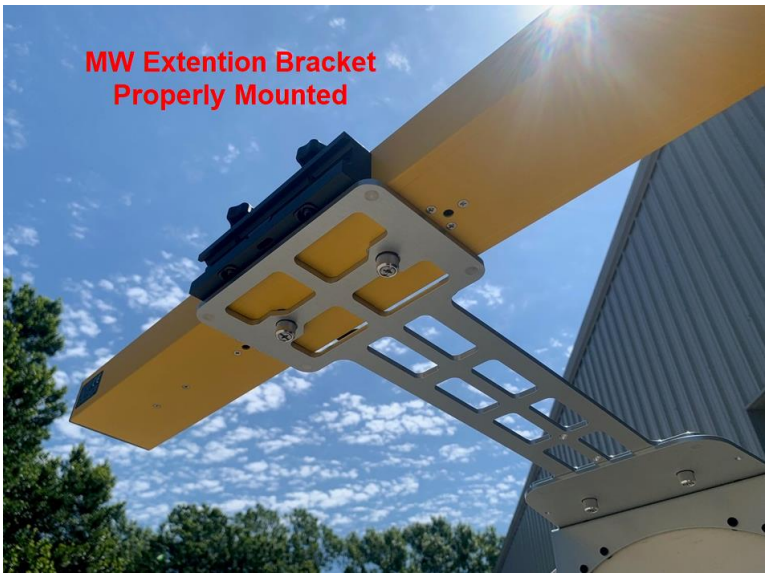
ALWAYS USE THE SAFETY LANYARD TO PROTECT MOUNT AND MW UNIT FROM ACCIDENTAL FALLS Note: The safety lanyard is NOT the same as the yellow/black elastic straps used to the secure the mount to the antenna

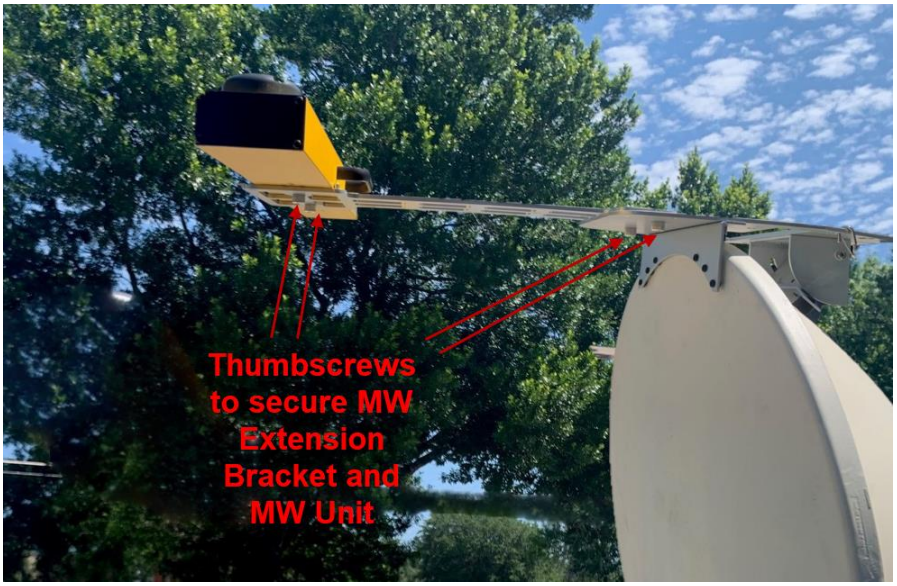
The MW Kit(s) also include the **MW Extension Bracket**. This bracket is used to extend the MW unit further out in front of the antenna to allow the GNSS antennas a clear view of the sky. The typical application for the MW Extension bracket is to extend the MW past an overhead ice shield or other overhead structure blocking the GNSS antennas of the MW unit.

To use the MW Extension Bracket:

1. Install the MW Extension Bracket onto the MW Mount Baseplate securing it with the thumbscrews
2. Mount the entire MW Extension Bracket onto the antenna making sure it is very secure and stable
3. Install the MW at the end of the MW Extension Bracket securing it with the thumbscrews







ALWAYS USE THE SAFETY LANYARD TO PROTECT MOUNT AND MW UNIT FROM ACCIDENTAL FALLS Note: The safety lanyard is NOT the same as the yellow/black elastic straps used to the secure the mount to the antenna

Using the Microwave Alignment System in the Field

Single-Ended Microwave Alignment	End-to-End Microwave Alignment
MW unit and Handheld device (smartphone) are charged	Both MW units and Handheld devices (smartphone) are charged
One crew at one end of a microwave link	Crews at both ends of a microwave link
One microwave alignment kit case and contents	Both microwave alignment kit cases and contents
No SIM cards required	SIM cards must be installed and activated in handheld devices
Targets determined by manual input	Targets determined by location of MW units
Remote (other) antenna latitude, longitude and MSL height required for targeting	No remote (other) antenna location information required
See Page 12 for Single-Ended Alignment	See Page 16 for End-to-End Alignment

Preparation before going to field

1. Ensure that the main MW unit(s) and handheld device(s) batteries are charged. If using optional LASER rangefinder, ensure that the LASER rangefinder is charged or has new batteries.
2. If performing a ***Single-Ended*** alignment (aligning only one end of link at a time), proceed to the **Single-Ended Alignment** section. Be sure to have the latitude, longitude and height of the remote antenna's location.
3. If performing an ***End-to-End*** alignment (teams at both ends of the link and using paired MW units simultaneously), proceed to **End-to-End Alignment** section on page 16.

Single-ended Alignment

Aligning only one end of the link - i.e. no team member at remote site, or no cellular service to support end to end alignment

NOTE:** The latitude, longitude and MSL height of the remote antenna must be available in order to calculate accurate target alignment data

Two items are required for performing a single ended alignment

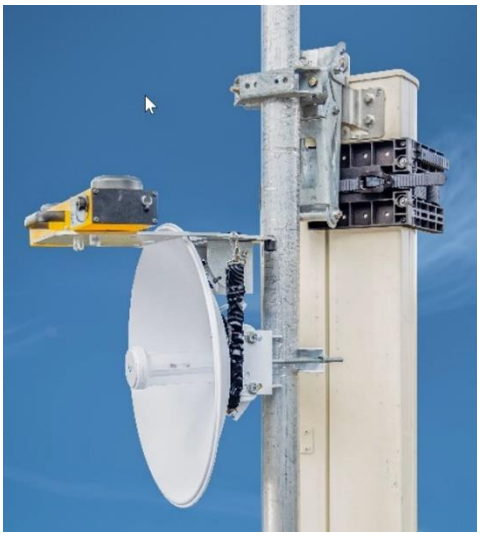
1. **Latitude, longitude and MSL height of the remote antenna site**
2. **Calibrate the MW mount on antenna using the included digital level**

At the site

1. Ensure that the main MW unit(s) and handheld device(s) batteries are charged. If using optional LASER rangefinder, ensure that the LASER rangefinder is charged or has new batteries.
2. Configure and attach the MW mount to the antenna

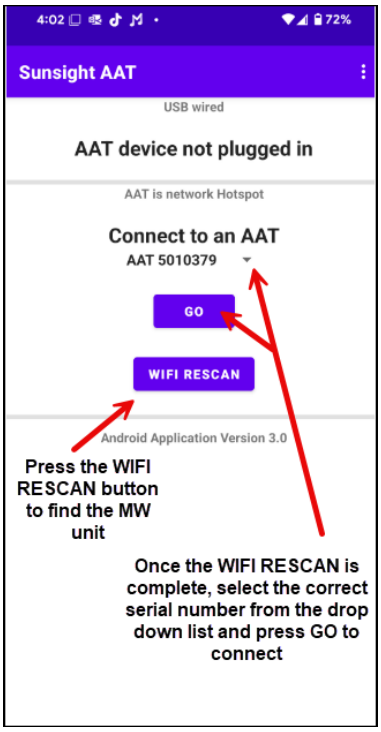
ALWAYS USE A SAFETY LANYARD TO PROTECT MOUNT AND MW UNIT FROM ACCIDENTAL FALLS Note: The safety lanyard is NOT the same as the black elastic straps used to the secure the mount to the antenna

3. Attach the MW unit to the mount using the captured thumbscrews



***** Azimuth accuracy improves dramatically with time. Wait 7-10 minutes after powering on MW unit for best results *****

4. Power on the handheld device and MW unit .
5. Use the Sunsight app on the handheld device to connect to the MW unit via WiFi or USB-C cable



6. From the Main Menu, choose **Single Ended Microwave**

At this point, the user can start a Snapshot/Measurement session where the user enters the remote antenna data directly and can begin alignment. Alternatively, the user can pre-program the remote alignment data using the Add Target function. After adding a target, the user can choose to start a Snapshot session by selecting a pre-programmed target(s).

The following steps apply directly to the Snapshot/Measurement screen (no pre-programmed target)

7. Select the orientation of the MW unit (front/back/left/right). Typically, this would be "back" with handle facing the back of the antenna (towards the tower.)
8. Next, the Elevation Offset must be set to remove any discrepancy between the MW mount (tilted up or down) as attached and the actual antenna. There are two methods for this. These methods are 1) "Set antenna to boresight" or 2) "Use Digital level to measure current angle.

   Option 1) Set Antenna to Boresight
   The boresight level method requires the antenna be leveled to horizontal and then pressing the calibrate button to tell the MW unit that the antenna is now level
   a. Place the included digital level on a reference surface of the antenna and adjust the antenna so that the antenna boresight is exactly horizontal
   a. Press the "Calibrate" button. MW unit and mount are calibrated for elevation

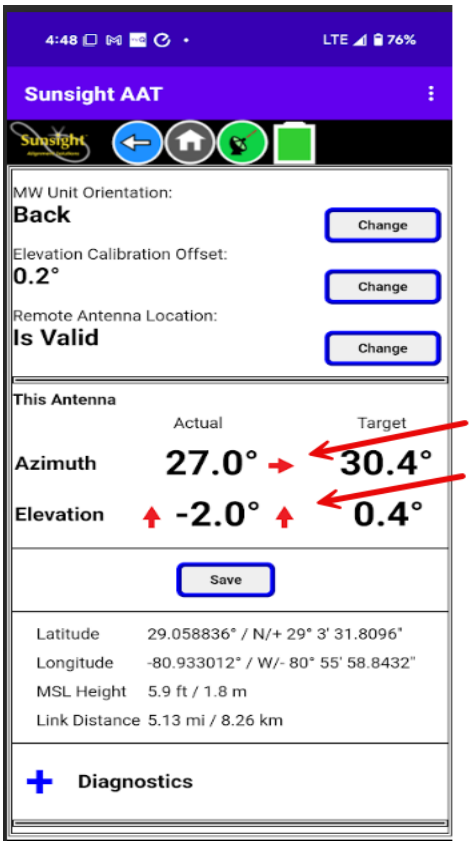
Option 2) Use Digital Level to Measure Current Angle

Leaves the antenna where it is currently located and the digital level is used to determine the actual angle of the mounted antenna and tell the MW unit that angle so that the MW unit corrects the displayed angles.

a. Place digital level on back of antenna and enter angle from digital level in the app
b. In the app, choose whether the antenna is pointed above or below the horizon and click the appropriate button and press "Calibrate" the MW unit and mount are now calibrated for elevation

Tilt calibration can be reset at any time if the MW mount/unit are disturbed in such a way that would affect elevation measurements

9. Make sure the blue Azimuth LED is solid and not flashing. A solid blue LED indicates that the MW unit has calculated azimuth.
10. Adjust the antenna to closely match the actual target azimuth and tilt displayed on the app.
    a. Note that one or two tenths of a degree in azimuth is not critical.
    b. Be sure to give the MW unit adequate time - up to a minute - to "settle" on an azimuth after making minor adjustments.



11. Once the antenna is aligned as desired, secure the antenna in position.
12. With alignment complete, press the "Save" button and follow the instructions to complete saving and viewing results

    Reports can be viewed and downloaded by pressing the PDF symbol on the Measuring page or navigating to the Microwave Single End -> Reports page or navigating to the Microwave Single End -> Existing Targets page.

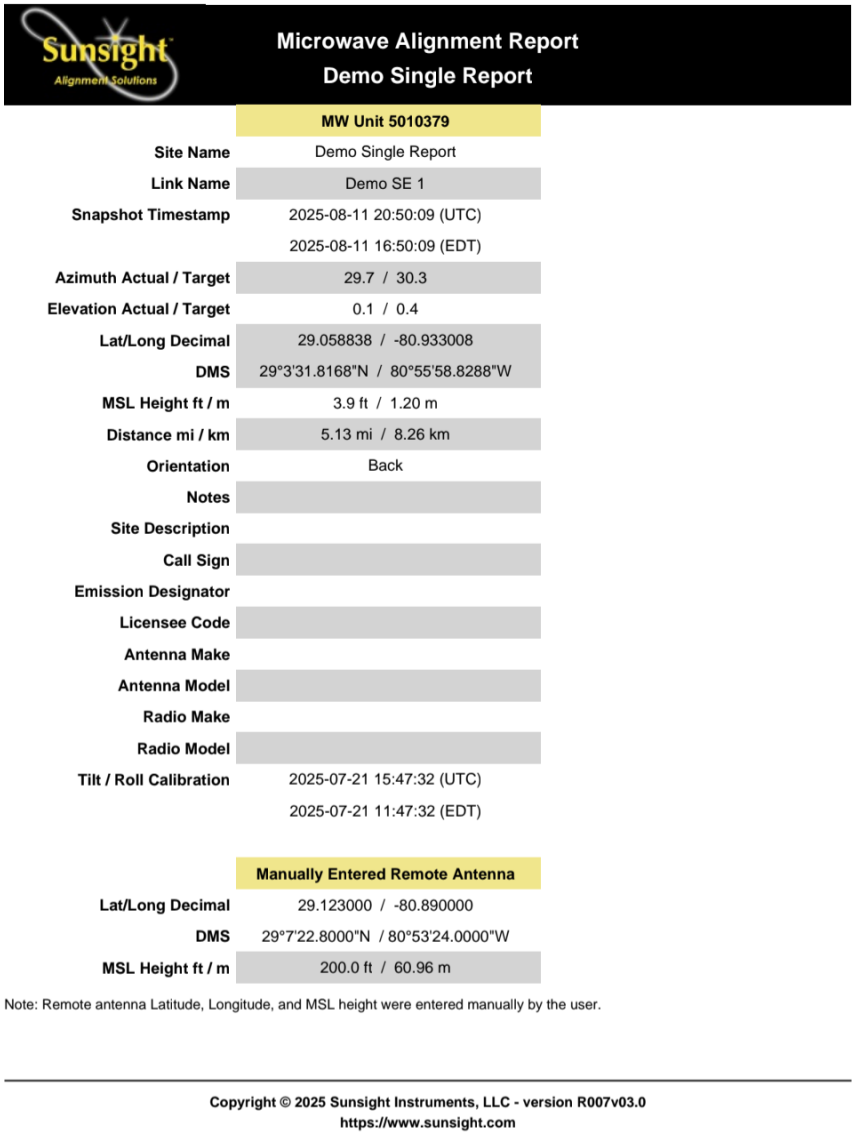
    The Single-Ended alignment is now complete. The antenna housings are physically aligned but may require additional adjustment for signal strength due to refraction and environmental conditions.

13. Power down MW unit and Handheld device and secure for transport.

After returning from the field

1. Retrieve reports from handheld device/MW unit.
2. Charge the MW unit and handheld device prior to long term storage.
3. Be sure to turn off data/phone plan to conserve costs. This can also be accomplished by turning off the handheld device(s).

END OF SINGLE-ENDED ALIGNMENT PROCEDURE



Microwave Alignment Report
Demo Single Report

	MW Unit 5010379
Site Name	Demo Single Report
Link Name	Demo SE 1
Snapshot Timestamp	2025-08-11 20:50:09 (UTC) 2025-08-11 16:50:09 (EDT)
Azimuth Actual / Target	29.7 / 30.3
Elevation Actual / Target	0.1 / 0.4
Lat/Long Decimal	29.058838 / -80.933008
DMS	29°3'31.8168"N / 80°55'58.8288"W
MSL Height ft / m	3.9 ft / 1.20 m
Distance mi / km	5.13 mi / 8.26 km
Orientation	Back
Notes	
Site Description	
Call Sign	
Emission Designator	
Licensee Code	
Antenna Make	
Antenna Model	
Radio Make	
Radio Model	
Tilt / Roll Calibration	2025-07-21 15:47:32 (UTC) 2025-07-21 11:47:32 (EDT)

	Manually Entered Remote Antenna
Lat/Long Decimal	29.123000 / -80.890000
DMS	29°7'22.8000"N / 80°53'24.0000"W
MSL Height ft / m	200.0 ft / 60.96 m

Note: Remote antenna Latitude, Longitude, and MSL height were entered manually by the user.

Example Single-Ended Microwave Alignment report

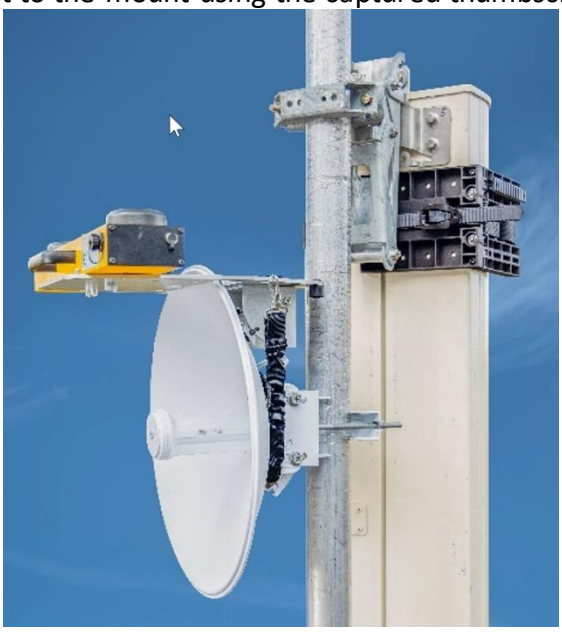
End-to-End Alignment

End-to-End - Aligning both ends of the link simultaneously – crews at each end of the link with paired MW units. **Only available through Sunsight (patented)**

NOTE: End-to-End Alignment requires both Android handheld devices to have network access. SIM cards must be installed and activated in both devices. Cellular network coverage is required.

At the site

1. Ensure that the main MW unit(s) and handheld device(s) batteries are charged. If using optional LASER rangefinder, ensure that the LASER rangefinder is charged or has new batteries.
2. Configure and mount the MW mount to the antenna
   ALWAYS USE THE SAFETY LANYARD TO PROTECT MOUNT AND MW UNIT FROM ACCIDENTAL FALLS Note: The safety lanyard is NOT the same as the black elastic straps used to the secure the mount to the antenna
3. Attach the MW unit to the mount using the captured thumbscrews



4. Power on the handheld device and MW unit

***** Azimuth accuracy improves dramatically with time.**
Wait 7-10 minutes after powering on MW unit for best results ***

5. Use the Sunsight app to connect to the MW unit via WiFi or USB-C cable
6. From the Main Menu, choose **Microwave End-to-End**
7. At this point, the user can start a Snapshot/Measurement session. Alternatively, the user can pre-program the remote alignment data using the Add Target function. After adding a target, the user can choose to start a Snapshot session by selecting the pre-programmed target(s).

The following steps are for going directly to the Snapshot/Measurement screen (no pre-programmed target)

8. Select the orientation of the MW unit (front/back/left/right).
9. Enter/Select the MW unit serial number for the remote end of the link. This decides what MW unit will send and receive alignment data from the remote antenna. The MW unit serial number decal is located on the back of the unit and is formatted 501xxxx. The AAT remembers the last serial number entered
10. Next, the Elevation Offset must be set to remove any discrepancy between the MW mount (tilted up or down) as attached and the actual antenna. There are two methods for this. These methods are 1) "Set antenna to boresight" or 2) "Use Digital level to measure current angle.

Option 1) Set Antenna to Boresight

The boresight level method requires the antenna be leveled to horizontal and then pressing the calibrate button to tell the MW unit that the antenna is now level

a. Place the included digital level on a reference surface of the antenna and adjust the antenna so that the antenna boresight is exactly horizontal
b. Press the "Calibrate" button. MW unit and mount are calibrated for elevation

Option 2) Use Digital Level to Measure Current Angle

Leaves the antenna where it is currently located and the digital level is used to determine the actual angle of the mounted antenna and tell the MW unit that angle so that the MW unit corrects the displayed angles.

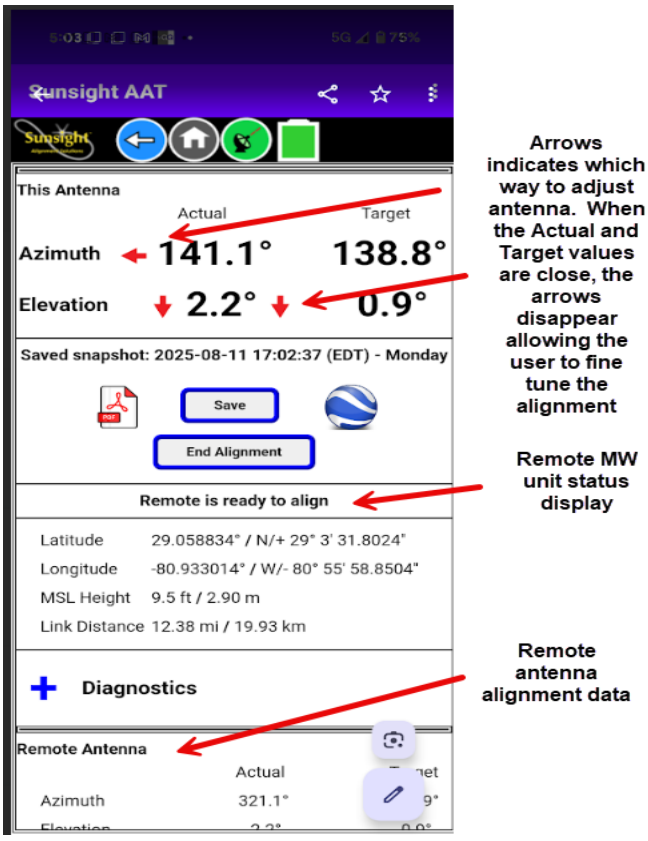
a. Place digital level on back of antenna and enter angle on screen.
b. Choose whether the antenna is pointed above or below the horizon and click the appropriate button and press "Calibrate" the MW unit and mount are now calibrated for elevation

Tilt calibration can be reset at any time if the MW mount/unit are disturbed in such a way that would affect elevation measurements

12. Make sure the blue Azimuth LED is solid and not flashing. A solid blue LED indicates that the MW unit has calculated azimuth.
13. The MW unit is now sending alignment data toward the MW unit at the remote end of the link.
14. Steps 1-13 must be completed at the remote antenna to allow the end-to-end MW alignment process to begin

Once the remote end technician has setup their unit following the steps above, both users should see their respective targets (azimuth and elevation) as well as lat/long and msl from the opposite end. This may take a few seconds for the data to be transferred from the respective ends.

15. Adjust the antennas to closely match the targets for azimuth and tilt.
    a. Note that one or two tenths of a degree in azimuth is not critical.
    b. Be sure to give the MW unit adequate time - up to a minute - to "settle" on an azimuth after making minor adjustments.



16. Once the antennas are aligned at the local and remote ends of the link, secure the antennas in position.
    a. Press the "Save" button and follow the instructions to complete saving and viewing results. This should be performed at both ends of the link. Note that each report will have the local alignment data as well as the remote data, but it is still best practice to capture reports at both ends.

Reports can be viewed and downloaded by pressing the PDF symbol on the Measuring page or navigating to the Microwave End-to-End –> Reports page or navigating to the Microwave End-to-End -> Existing Targets page.

The End-to-End alignment is now complete. The antenna housings are physically aligned but may require additional adjustment for signal strength due to refraction and environmental conditions.

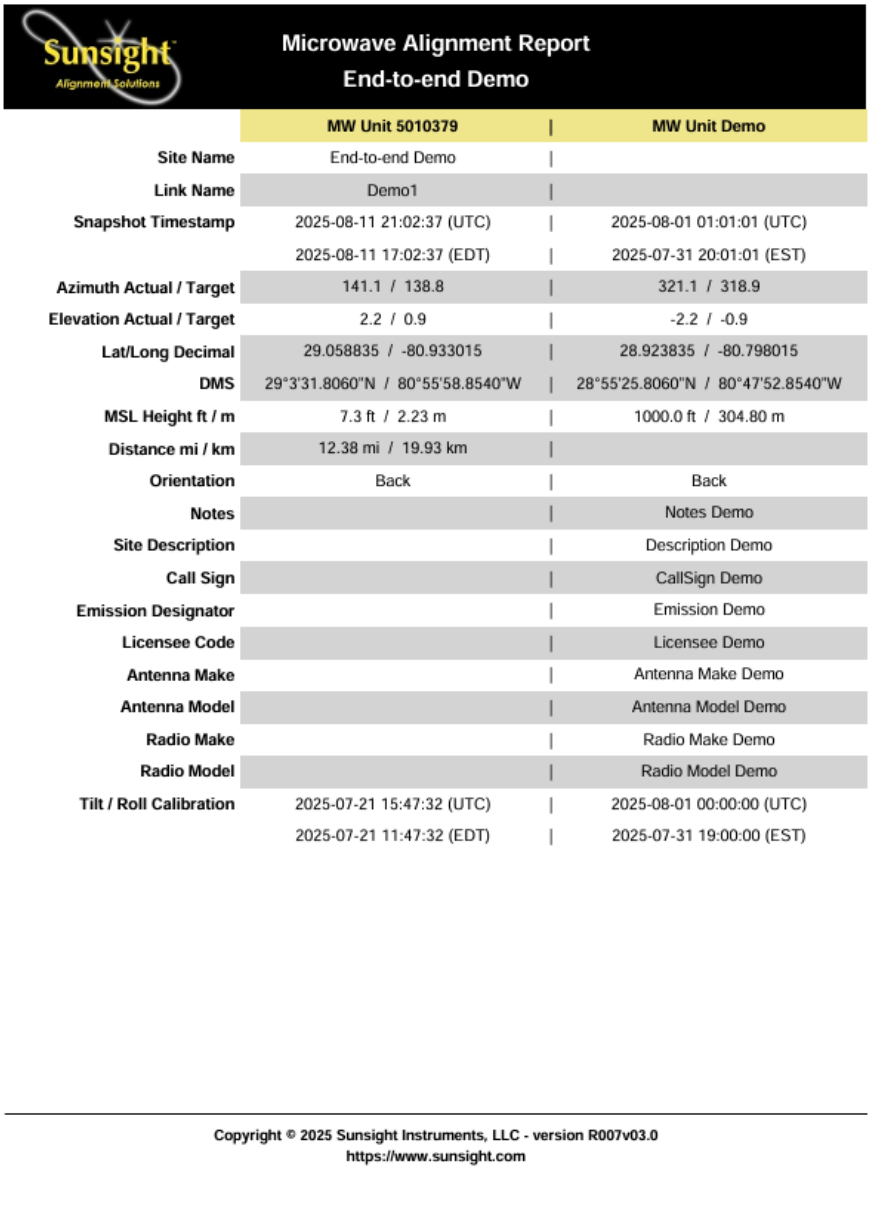
17. Power down MW units and Handheld devices and secure for transport.

After returning from the field

1. Retrieve reports from handheld device/MW unit.
2. Charge the MW unit and handheld device prior to long term storage.
3. Be sure to turn off data/phone plan to conserve costs. This can also be accomplished by turning off the handheld device(s).

END OF END-TO-END ALIGNMENT PROCEDURE

End-to-End Alignment technology is a patented design belonging to Sunsight.



Microwave Alignment Report
End-to-end Demo

	MW Unit 5010379	MW Unit Demo
Site Name	End-to-end Demo	
Link Name	Demo1	
Snapshot Timestamp	2025-08-11 21:02:37 (UTC)	2025-08-01 01:01:01 (UTC)
	2025-08-11 17:02:37 (EDT)	2025-07-31 20:01:01 (EST)
Azimuth Actual / Target	141.1 / 138.8	321.1 / 318.9
Elevation Actual / Target	2.2 / 0.9	-2.2 / -0.9
Lat/Long Decimal	29.058835 / -80.933015	28.923835 / -80.798015
DMS	29°3'31.8060"N / 80°55'58.8540"W	28°55'25.8060"N / 80°47'52.8540"W
MSL Height ft / m	7.3 ft / 2.23 m	1000.0 ft / 304.80 m
Distance mi / km	12.38 mi / 19.93 km	
Orientation	Back	Back
Notes		Notes Demo
Site Description		Description Demo
Call Sign		CallSign Demo
Emission Designator		Emission Demo
Licensee Code		Licensee Demo
Antenna Make		Antenna Make Demo
Antenna Model		Antenna Model Demo
Radio Make		Radio Make Demo
Radio Model		Radio Model Demo
Tilt / Roll Calibration	2025-07-21 15:47:32 (UTC)	2025-08-01 00:00:00 (UTC)
	2025-07-21 11:47:32 (EDT)	2025-07-31 19:00:00 (EST)

Example End-to-End Microwave Alignment report

End-to-End Demonstration Mode

The MW is equipped with a demonstration mode for practicing end-to-end alignments. Using the demo mode requires only one MW unit be used. The remote antenna is simulated as being about 12.9 miles (20.7 km) away.

The MW unit must be outside so it can receive an GNSS signal and the handheld device being used to operate the MW must have a sim card with active cellular service to allow data to be sent from the cloud.

Once in the demo mode, the MW will receive the simulated remote MW data from the cloud and the user will see this information displayed on their handheld just as they would if a real MW unit was being used at the remote antenna. The results can be saved, photos added and reports made.

Aligning RF Cellular Panel Antennas

Using the Microwave Path Alignment Kit to align RF cellular panel antennas
Each half of the MW Microwave Path Alignment Kit (MW only, not the MW Max) may also be used independently for RF Cellular Panel Alignment with the included RF panel antenna mount. In this mode, the MW acts as a standard AAT. Instructions for use as an RF Panel alignment tool can be found on the www.sunsight.com support page at:
sunsight.com/aat_mw_support

Checking Tilt and Roll Calibration

Sunsight recommends that users periodically check the tilt and roll calibration of the MW unit's internal sensors. The frequency with which these checks should be performed will depend on how often the MW unit is used and how it is cared for, but calibration checks should be performed monthly at a minimum. ***The MW unit does not require return to Sunsight for calibration***.

To check tilt and roll

1. Place the MW unit on a flat surface and record the tilt and roll values displayed on the cellular alignment page – Main Menu-> Cellular Alignment->Snapshot/Measure. Be sure to let the unit settle for about 20 seconds before recording the values for tilt and roll.
2. Turn the MW unit 180 degrees and place it back in the location. Let the unit settle again and compare the tilt and roll values recorded in step 1. If the values are the same except with opposite signs, then the no calibration is required. They can vary +/- .1 degrees and still be in calibration.

If calibration is required

1. From the Main Menu select Tools -> Tilt Roll Calibration and follow the instructions

Troubleshooting

- Checking current firmware version
  - Log in to the MW unit. Scroll to the bottom of any MW unit webpage, where the user can find the MW unit serial number and firmware version currently installed.
- The MW unit will not power on
  - Ensure that the onboard LiFePO4 battery is charged using only the approved charger. Use of any other charger or power supply may cause insufficient charge, overcharge, or electrical damage to the unit.
- Webpages not available

- Ensure Wi-Fi is enabled on your Android device. Power on the MW. Use the Sunsight app to connect to your MW. Note that the app indicates the connection is made successfully and the MW unit can be operated normally.

- The MW unit will not display azimuth
  - GNSS is line-of-sight technology and, as such, both GNSS antennas at the top of the MW unit must have as clear a view of the sky as possible.
  - The MW unit should always be mounted as high on the antenna to be measured as possible.
  - Use the indicators on the MW unit's **Diagnostic** page to help determine optimal placement.

Use and care of the Sunsight MW unit

- The MW unit utilizes state-of-the-art GNSS technology in order to provide highly accurate azimuth calculations. GNSS is a line-of-sight technology, for optimal results, the black, round antennas at the top of the MW unit should be offered the best "view" of the sky as possible. Physical obstructions over either antenna may result in difficult or no-azimuth conditions. Position the MW unit so as to eliminate or minimize physical obstructions.

- The MW unit and its accessories are weather resistant, not water-proof! Do not immerse or submerge the MW unit in liquid of any type. All caps must be in good working order and secured while the MW unit and its accessories are in use, especially in inclement weather.

- Do not store the MW unit or its accessories in a wet case. Allow the case(s) to air dry prior to storing the MW unit and its accessories.

- The MW unit housing is fabricated of aluminum for durability, but still contains highly sensitive electronic components. Avoid sharp impacts and drops.

- The MW unit and its accessories contain no user-serviceable components. Do not attempt to disassemble the MW unit for any reason. Unauthorized disassembly may result in component damage and warranty termination.

- Sunsight strives to provide the best user experience possible with our products. To that end, we continue to develop hardware and software solutions to meet the needs of our customers. Sunsight will periodically issue firmware updates to enhance performance and function of our products. To receive update notifications, please register your MW unit at: https://www.sunsight.com/index.php/register-AAT. Your information is never shared or sold and is used only by Sunsight to notify users of product updates.

For questions regarding use or care of the MW unit and its accessories, please contact Sunsight Instruments Technical Support. Live technical support is available Monday – Friday from 9:00am to 5:30pm Eastern via support@sunsight.com or 1-321-244-9443 x2