



## USING THE AZIMUTH SCOPE KIT


For AAT, AAT Mini, and AAT Max Models


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## Safety


The AAT should be handled using the following considerations:


 There are no user-serviceable parts within the AAT. All internal repairs must be performed by Sunsight Instruments.

 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 can damage the battery pack.

 Never attempt to recharge the batteries outdoors in inclement conditions.

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

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

 Avoid impacting, dropping or rough handling of the AAT. The AAT contains sensitive electronic components. Rough handling may result in internal component damage.

 Care should be taken to avoid impact to the black GPS antennas on the top of the AAT.

**If you suspect the AAT is operating incorrectly, contact Sunsight Instruments or an authorized Sunsight Instruments distributor for support.**

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This document will cover the correct usage of the Azimuth Scope Kit for the AAT, AAT Mini, and AAT Max alignment products.

Before attempting to use the Azimuth Scope Kit or any accessories, please review all training materials and familiarize yourself with the: [AAT/AAT Mini/AAT Max Quick Start Guide](#).

This document assumes that the user has read and understands all AAT training and safety materials.

**For the remainder of this documents, the term "AAT" will mean both the AAT and AAT Mini alignment systems.**

This document assumes that the AAT and Azimuth Scope Kit have been prepared and maintained.

## Overview

The Azimuth Scope Kit is used to obtain quick and easy azimuth solutions on a wide range of elevated antennas including tower and building-mounted installations from ground level. It is suitable for measuring actual azimuth only.



***Azimuth Scope Kit***



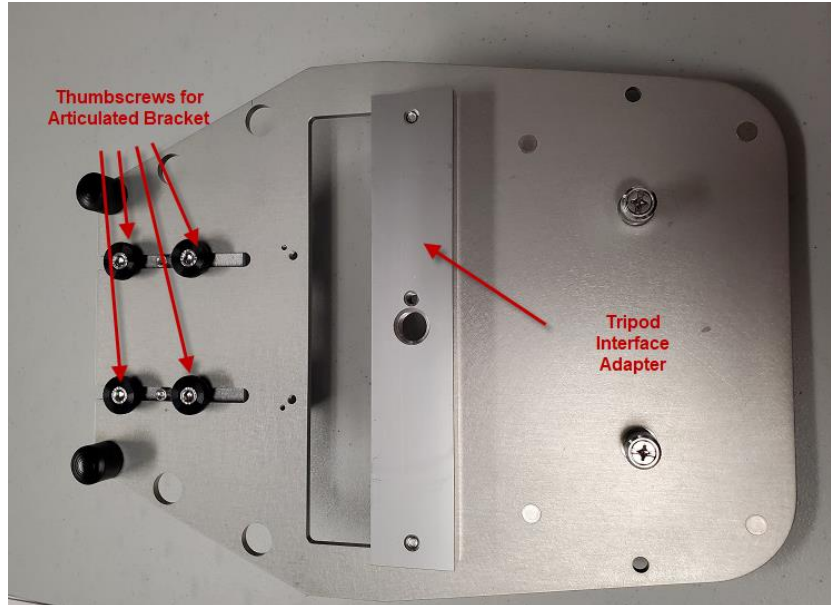
***Azimuth Scope Kit contents***



**Azimuth Scope Kit (with and without AAT)**

## 1. Secure the Azimuth Scope Kit to the Tripod

- 1) Position tripod by extending and locking the legs.
- 2) Attach the Tripod Interface Adapter to the Mount Baseplate using the two thumbscrews

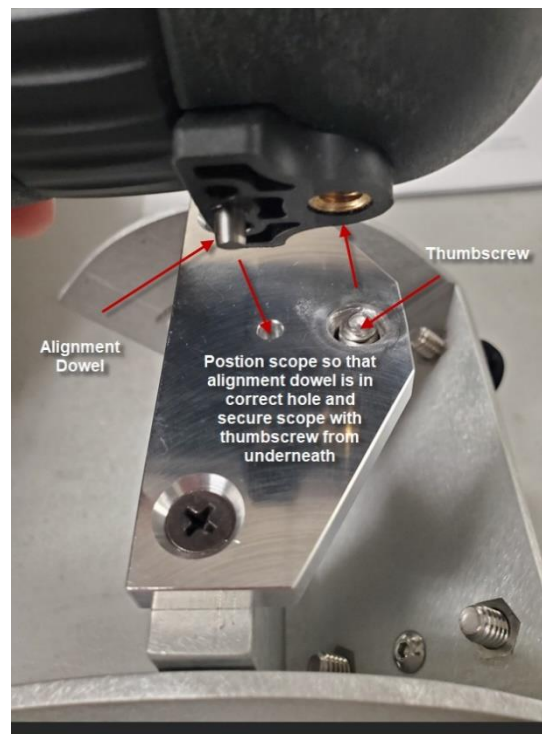
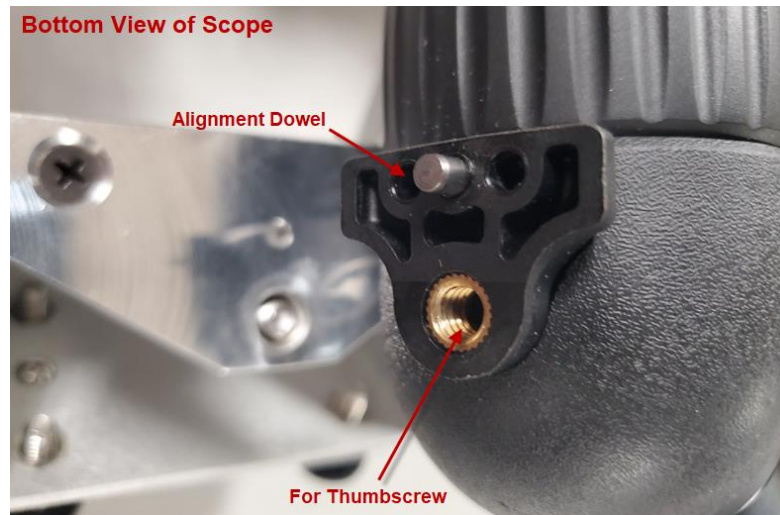


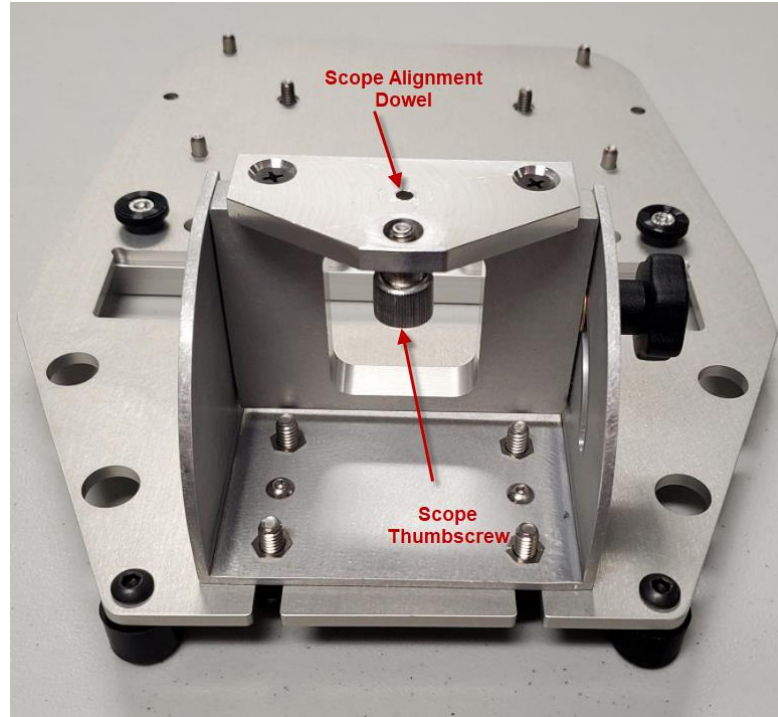
**\*\*\*Do not attempt to disassemble or remove any fasteners from the azimuth scope and mount. Damage caused by failure to follow these instructions is not eligible for warranty coverage\*\*\***

- 3) Screw azimuth scope adapter to the tripod using the attachment knob on the tripod.



- 4) Attach the articulated bracket to the Mount Baseplate by using the threaded knobs from underneath the Mount Baseplate.
- 5) Attach the scope to the Articulated Bracket by aligning the alignment dowel in the bottom of the scope to the correct hole in the mount and then use the thumbscrew to secure scope to bracket.
- 6) Attach AAT to mount with handle facing away from the scope and tighten thumbscrews to secure AAT to mount.
- 7) Remove the protective caps on scope.





## **MEASURING AZIMUTH FROM THE FRONT FACE AND SIDE OF THE ANTENNA (PREFERRED METHOD)**

There are 3 methods for using the AAT Azimuth Scope Kit. The choice of method will be determined by the situation that is encountered in the field. There are two methods for using the kit when facing the antenna – i.e. viewing the antenna “head-on”. If viewing the face of the antenna is not practical, then the third method - looking across the back of the antenna (90 degrees to the face of the antenna) may be used. Each method will be described in the following paragraphs. Note that the methods are described in order of preference.

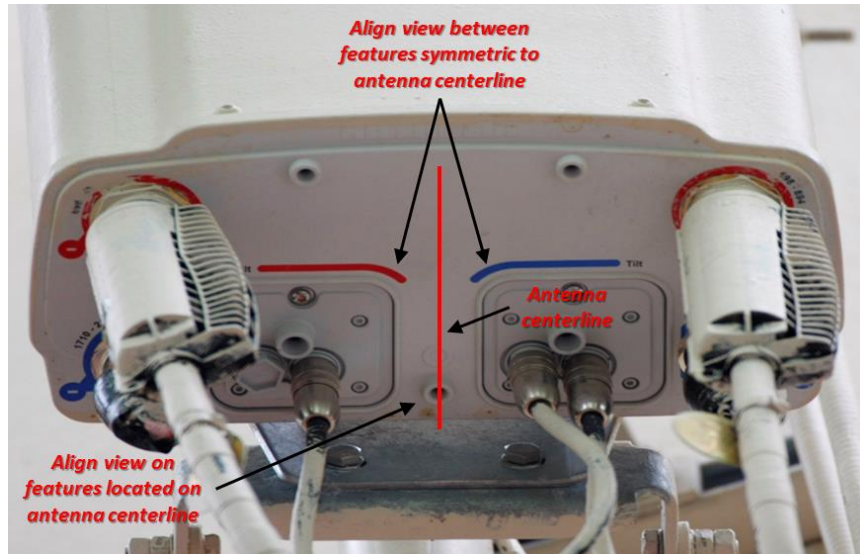
**NOTE: All methods described below require proper training and practice. New users of the AAT with scope and tripod should be trained and closely supervised by a competent user until proficiency is demonstrated.**

**Method 1 – Measuring Azimuth from the face of the antenna using the bottom plate of the antenna and the mast pipe.**

1. Set the tripod with the scope and AAT attached a sufficient distance away from the tower, building or other structure to permit a good view of the antenna and the mounting structure behind it (mast pipe).
2. Using the lowest magnification, locate the antenna to be measured in the viewfinder. The user must be able to see both the bottom plate of the antenna and the mounting pipe where the antenna mounting brackets are attached. **\*\*\*DO NOT PLACE THE AAT UNDER OR NEARLY UNDER THE ANTENNA. FAILURE TO FOLLOW THESE INSTRUCTIONS WILL RESULT IN INACCURATE MEASUREMENT RESULTS\*\*\*** See Figure 2-1

**Figure 2-1**





**Figure 2-2**

3. Once the antenna centerline has been determined, adjust the AAT with scope and tripod to align the antenna centerline with the centerline of the antenna mounting pipe. This will require physically moving the AAT, scope and tripod unit to bring them in line.
4. When the mast pipe, the centerline of the antenna bottom plate and the AAT w/scope are in line with each other connect to the AAT in the standard way by powering on the AAT and connecting using WiFi or USB-C cable (see Quick Start Guide for detailed instructions). The WiFi connection can be made using the Android App (preferred) or by using WiFi and a browser.
5. On the AAT Measure page, set AAT Orientation and click Apply.
6. Confirm the mast pipe, the centerline of the antenna bottom plate and the AAT w/scope are still in line with each other and save results.

**\*\*\* CAUTION:** FOR DOUBLE PIPE MOUNTS, BE SURE TO ALIGN WITH CENTER OF THE PIPE TO WHICH THE MOUNTING BRACKETS ARE ATTACHED. See Figures 2-3, 2-4 and 2-5.

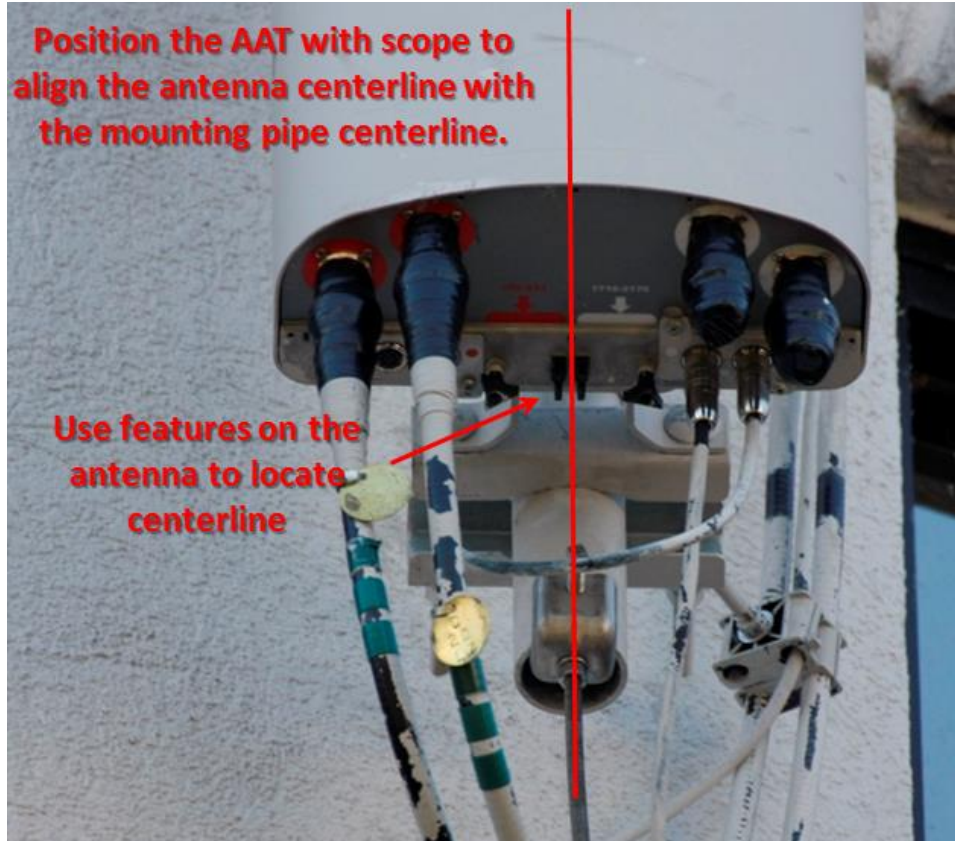


Figure 2-3

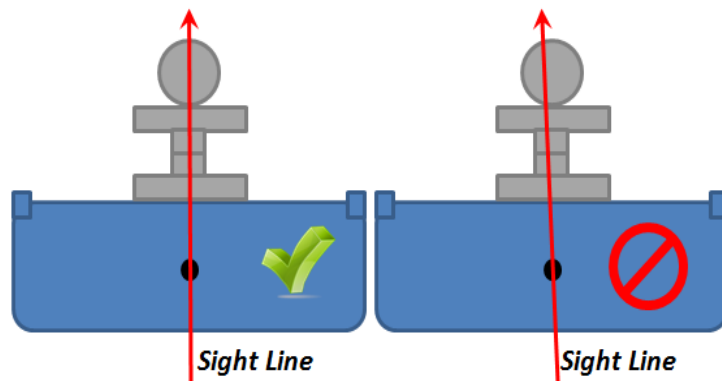
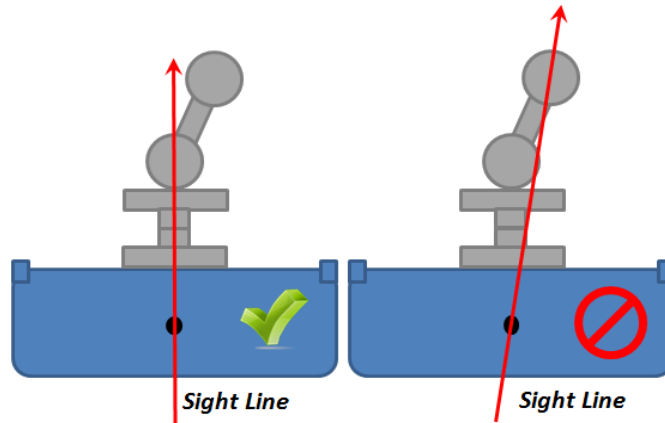


Figure 2-4

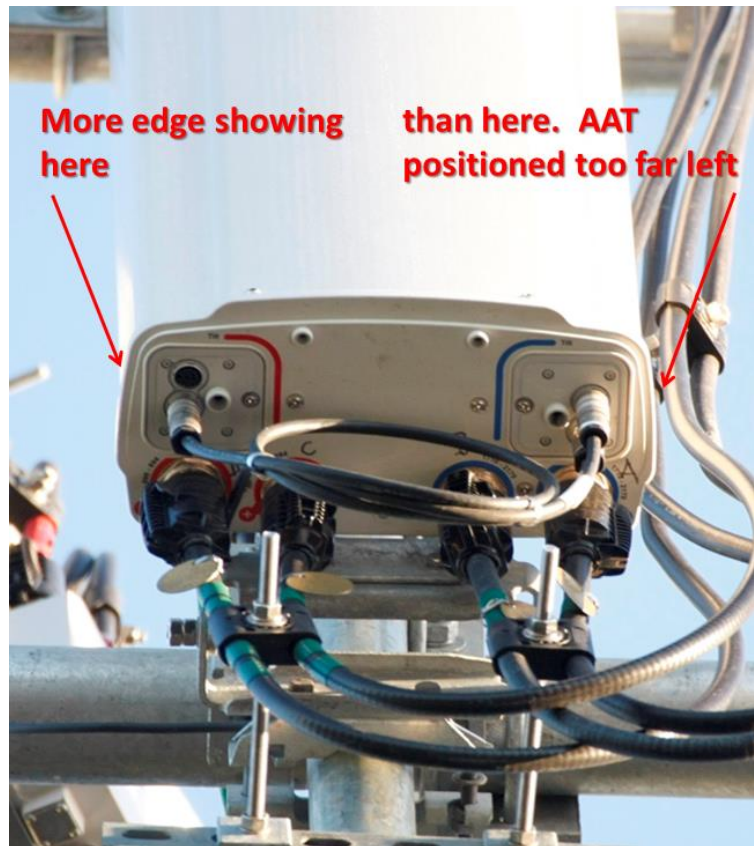


**Figure 2-5**

**Method 2 – Measuring Azimuth from the face of the antenna using the antenna profile**

1. Set the AAT with the scope and tripod attached a sufficient distance away from the tower, building or other structure to permit a good view of the antenna and the mounting structure behind it (mast pipe). A good rule of thumb is 150 feet minimum, or 1 foot away for every 1 foot of height of the antenna. Note that these distances are guidelines and good results may be obtained at lesser distances by experienced crews.
2. Once the AAT, azimuth scope and tripod are set up at this distance, set the scope to the lowest magnification and locate the antenna to be measured in the viewfinder.
3. View the antenna face and move the AAT, azimuth scope, tripod assembly until sides of the antenna look the same when viewed through the scope. The idea is that if the sides or edges of the antenna look the same, the user is directly in front of the antenna. This approach is similar to how magnetic compasses have traditionally been used to measure azimuth, but much more precise and repeatable.

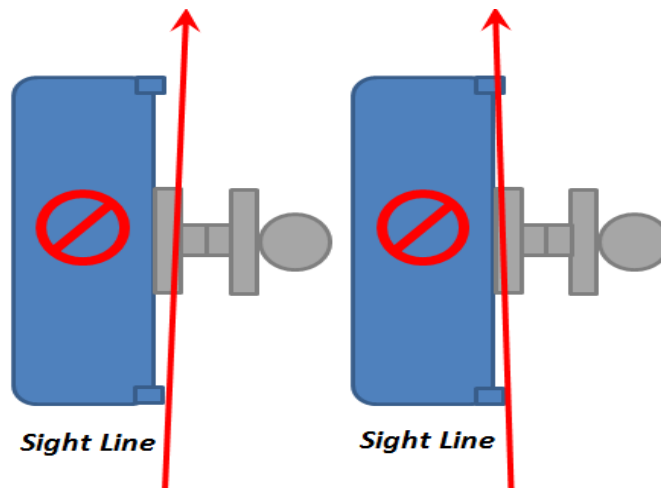
In the picture below, the two sides of the antenna are unequal in size, showing that the AAT, scope and tripod are too far to the left of the antenna. Note that more of the left edge of the antenna is visible when compared to the right edge. The AAT, scope and tripod should be moved to the right to make the two sides of the antenna appear the same in the viewfinder.



### Method 3 – Measuring Antenna Azimuth from the Side of the Antenna

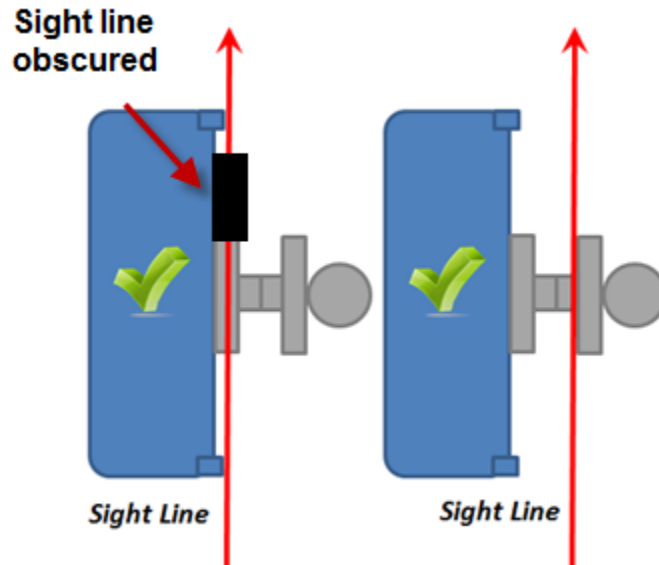
Antenna azimuth can be accurately measured from the side of the antenna using the AAT with scope and tripod on the ground. As with the direct frontal measurements, the AAT must not be positioned under or nearly under the antenna.

Using the scope, align the AAT so it is measuring directly across the back of the antenna. Positioning the AAT too far towards the front of the antenna will block the view of the far edge of the antenna. Positioning the AAT too far in the opposite direction will expose some of the back side of the antenna in the view which is an indicator of incorrect alignment. See Figure 3-1.



**Figure 3-1**

Some antennas have a curved backs or obstructions that block the view of the far edge. In these situations, accurate alignment can sometimes be achieved using the surface of the antenna mounting bracket. See Figure 3-2.



**Figure 3-2**

## MEASURING AND CAPTURING AZIMUTH FROM THE GROUND

- 1) With the antenna properly located in the scope viewfinder using one of the three methods above, adjust the magnification such that the side and antenna lower edge are easily viewed. Adjust the position of the AAT/scope/tripod assembly as necessary.
- 2) Connect to the AAT in the standard way by powering on the AAT and connecting using WiFi or USB-C cable (see Quick Start Guide for detailed instructions). The WiFi connection can be made using the Android App (preferred) or by using WiFi and a browser.
- 3) On the AAT Measure page, set AAT Orientation and click Apply.
- 4) Confirm AAT w/scope is still in line and save results.

**\*\* Be sure to set the AAT Orientation as necessary\*\***

**Set orientation with the understanding that the Orientation selected *must* be opposite of the user's position relative to the antenna being measured!**

- i. "AAT Faces Left" if measuring from the right of the antenna.
- ii. "AAT Faces Right" if measuring from the left side of the antenna.

- iii. **"AAT Faces Back" if measuring from in front of the antenna.**
  - iv. If the measured azimuth is 180 degrees opposite of expected, the orientation is likely incorrectly set.
- 5) Ensure that the AAT is within +/- 1 degree of level in both tilt and roll. Adjust the tripod leg height as necessary to obtain acceptable tilt and roll values.
  - 6) Verify the antenna position through the viewfinder, ensuring that the scope is still aligned to the antenna as required
  - 7) Capture Alignments in the standard way using the AAT
  - 8) After initial capture, user should review results and then save or reject.

**Notes:**

The azimuth solution acquired utilizing this procedure is only as accurate as the preparation. The closer the AAT/scope is to the base of the tower, the more likely it becomes that the measurements will be incorrect. Take the time to ensure you are properly aligned with the antenna being measured before recording any data.

\*\*\* For optimal results, keep the tripod/AAT/scope as level as possible. Check the attitude of the equipment using the AAT's **Measure** page.

The spotting scope included with this kit is designed to be rugged and reliable; however, it utilizes glass optics. Avoid dropping or jarring the unit. Keep protective dust caps secured when not in use.