

Instructions for using the AntennAlign Alignment Tool (AAT)

Azimuth Scope Kit – Models AAT-30, AAT-15, AAT-08

Introduction:

Sunsight Instruments is proud to introduce our latest antenna alignment solution, the AntennAlign Azimuth Scope Kit, used to obtain quick and easy azimuth solutions on a wide range of elevated antennas including tower and building-mounted installations. Combining the well-established performance and function of the AntennAlign Alignment Tool (AAT-xx series) with a simple and accurate ground based azimuth scope attachment; **Sunsight Instruments makes it possible to gather critical antenna azimuth information from the ground.** With proper use, the tripod/AAT/scope assembly will provide users with an accurate azimuth measurement. Experienced users can typically come very close to or match measurements made with an AAT mounted directly on the antenna.



Typical azimuth scope usage

Azimuth Scope Kit contents:

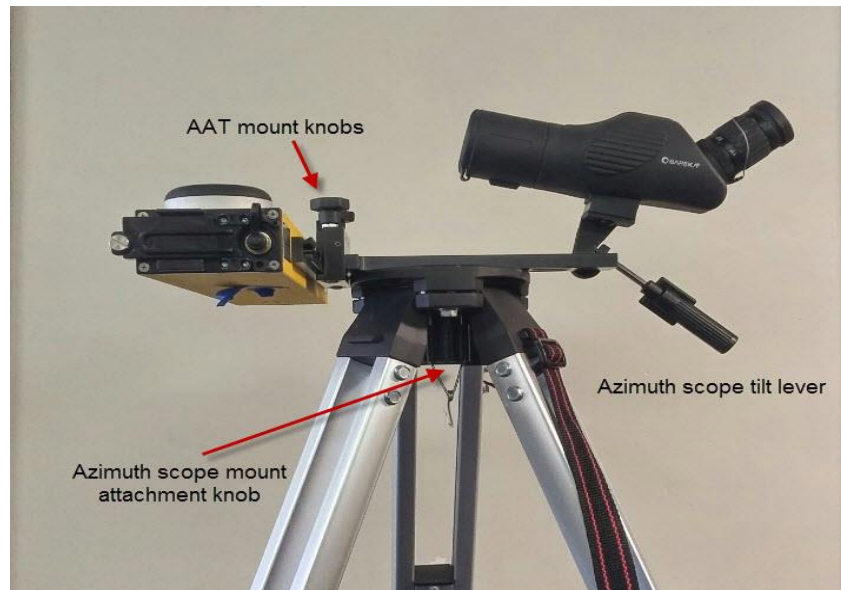


*****Do not attempt to disassemble or remove any fasteners from the azimuth scope and mount, except for the scope tilt lever. Damage caused by failure to follow these instructions is not eligible for warranty coverage*****

PREPARING THE AZM SCOPE KIT FOR USE

Prepare the AAT and Azimuth Scope Kit as follows:

1. Position tripod by extending and locking the legs.
2. Screw azimuth scope adapter to the tripod using the attachment knob.
3. Thread the scope tilt lever into scope bracket. Do not over-tighten.
4. Secure AAT to mount grip and rotate both knobs counter-clockwise to secure AAT to mount.



5. Remove the protective dust caps from both ends of the azimuth scope.

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.

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.

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). 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. MEASUREMENTS WILL NOT BE ACCURATE***** See Figure 2-1



Figure 2-1

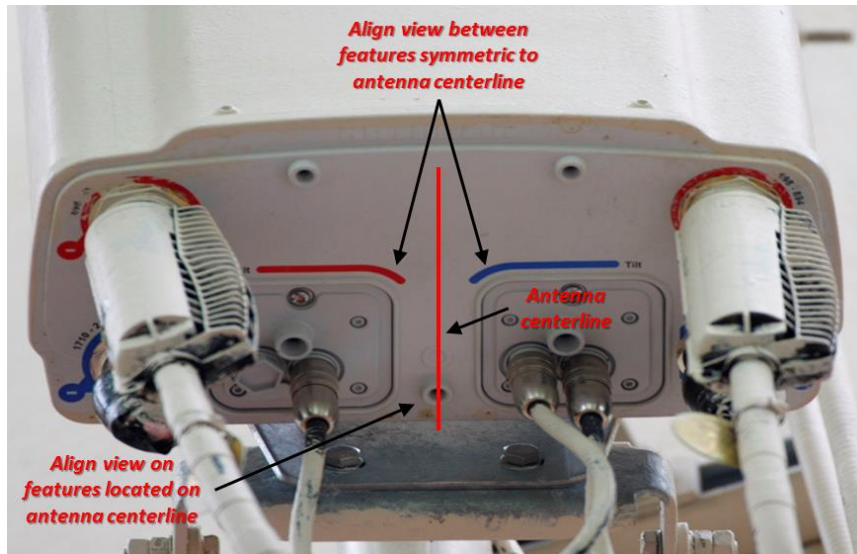


Figure 2-2

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. Now the mast pipe, the centerline of the antenna bottom plate and the AAT w/scope are in line with each other and the azimuth measurement can be made using the AAT's Measure Only feature. Be sure to set the AAT orientation to "Back" and use the Scope Capture option on the Measure Only page to record your azimuth measurements. Please see SunSight's free training videos at <https://www.sunSight.com/index.php/training> for more information.

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

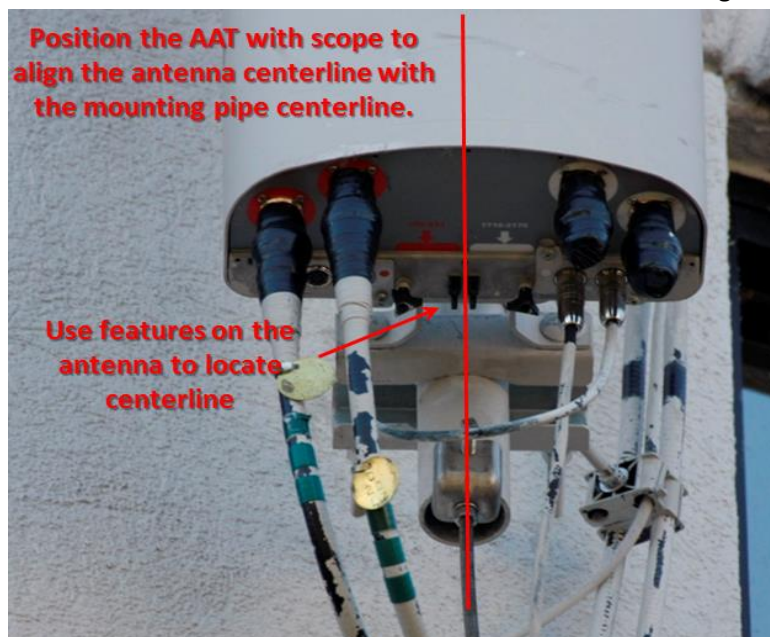


Figure 2-3

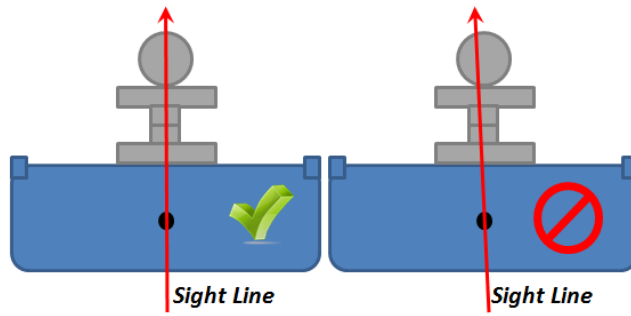


Figure 2-4

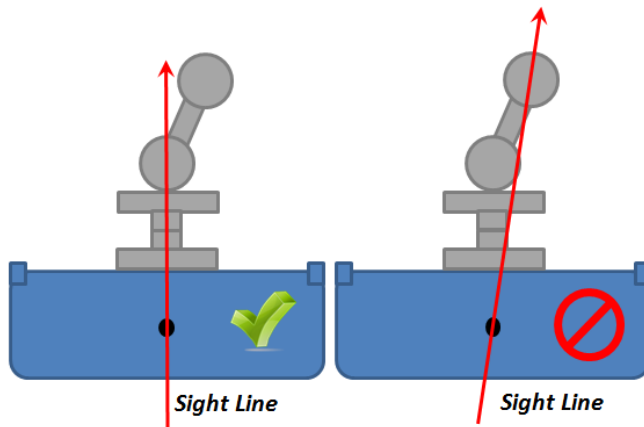
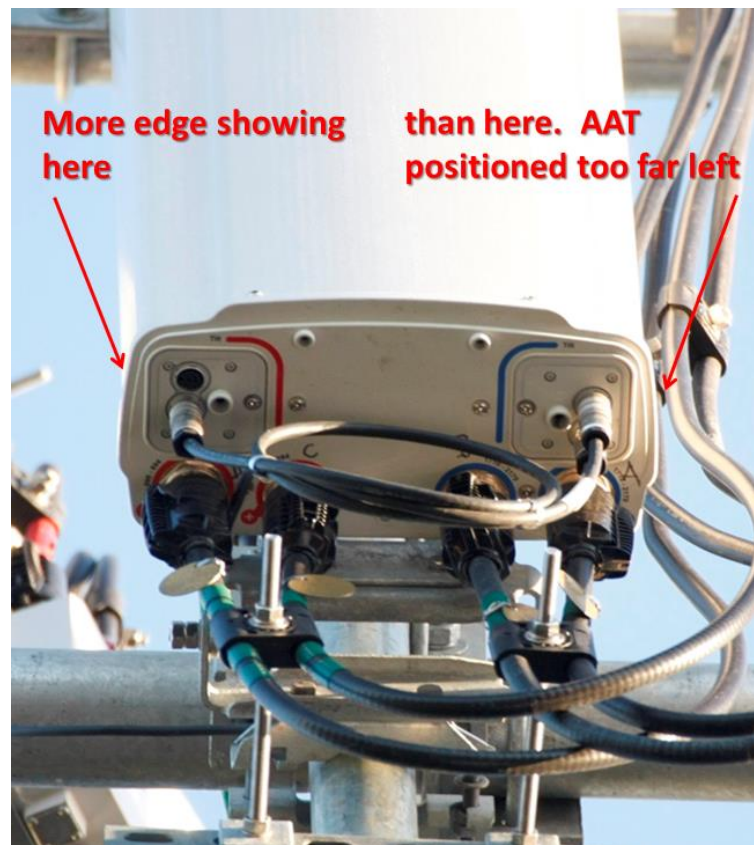


Figure 2-5

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

- 2) 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. 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. 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

Method 3 - Measuring Antenna Azimuth from the Side

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.

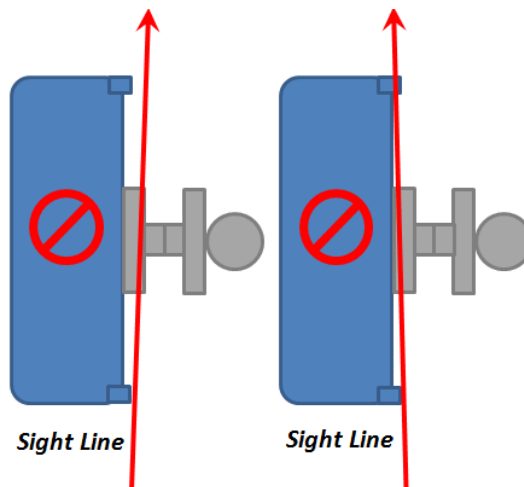


Figure 3-1

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.

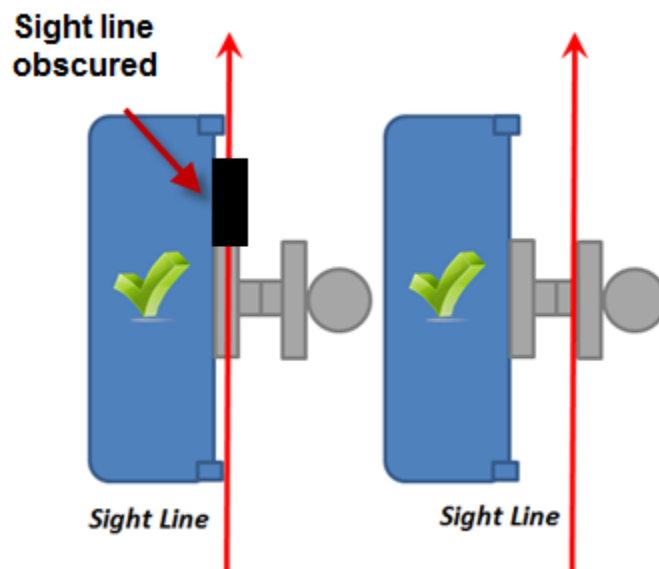


Figure 3-2

MEASURING AND CAPTURING AZIMUTH FROM THE GROUND

Capturing to a previously created profile -

- 1) With the antenna properly located in the scope viewfinder using one of the three methods above, adjust the magnification by rotating the eyepiece (clockwise increases magnification) such that the side and antenna lower edge are easily viewed. The adjustment knob on the right side of the scope housing sets the focus. Adjust the position of the AAT/scope/tripod assembly as necessary.
- 2) Power the AAT on. Wait for GPS/AZM signal acquisition – Blue LED on AAT will be solid once azimuth has been calculated.
- 3) Log in to the AAT with a Wi-Fi enabled device as described in *Quick Start Guide for Operating the AntennAlign Alignment Tool* originally supplied with every new AAT, or visit <https://www.sunsight.com/index.php/training> to view Sunsight's free training videos.
- 4) Click the **Profiles/Capture/Report** link at the top of the webpage.
 - a. Select the profile to be captured by clicking the jobsite name button. See Figure 4-1.
 - b. Use the Next or Previous buttons to select the antenna position to be measured.
 - c. Once the correct antenna has been chosen, click **Scope Capture**. See Figure 4-2.

- d. On the following page, set the orientation and 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. See Figure 4-3.
 - i. ***Set orientation with the understanding that the Orientation selected *must* be opposite of the user's position relative to the antenna being measured!***
 - ii. "AAT Faces Left" if measuring from the right of the antenna.
 - iii. "AAT Faces Right" if measuring from the left side of the antenna.
 - iv. "AAT Faces Back" if measuring from in front of the antenna.
 - v. If the measured azimuth is 180 degrees opposite of expected, the orientation is likely incorrectly set.
- 5) Verify the antenna position through the viewfinder, ensuring that the antenna is still aligned with the viewfinder reticle (crosshairs).
- 6) Select capture delay time. Delay timer will be displayed, and then the results of the capture will be reviewable.
 - a. After initial capture, user should review results and then save or reject alignment results. See Figure 4-4.

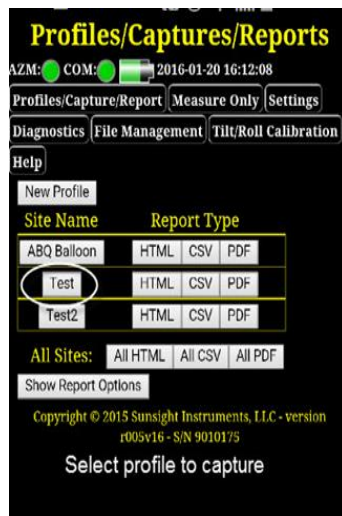


Figure 4-1

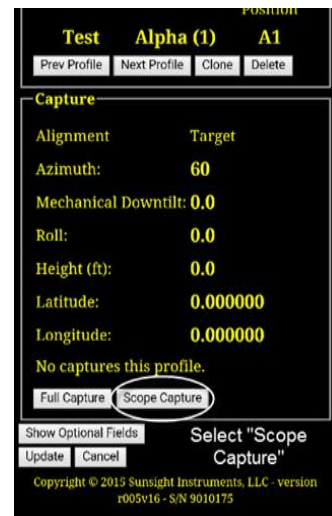


Figure 4-2

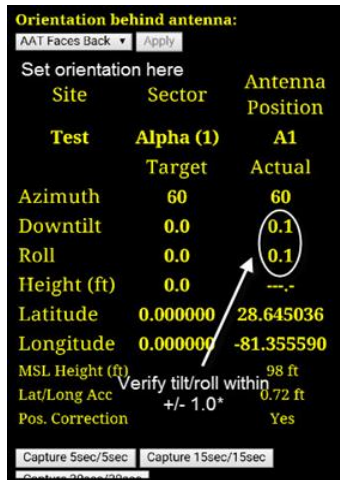


Figure 4-3

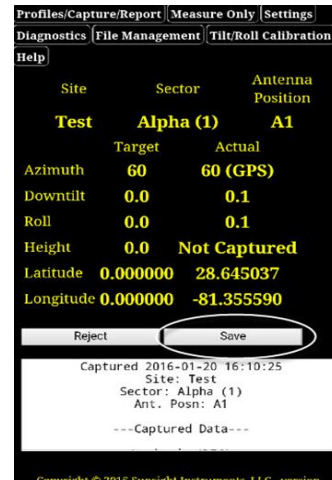


Figure 4-4

Capturing using the Quick Capture feature –

- 1) Complete Steps 1 – 3 as described under **Capturing to a previously created profile**.
- 2) Using the **Measure Only** page, set the orientation and 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. See Figure 5-1.
 - i. ***Set orientation with the understanding that the Orientation selected *must* be opposite of the user's position relative to the antenna being measured!***
 - ii. "AAT Faces Left" if measuring from the right of the antenna.
 - iii. "AAT Faces Right" if measuring from the left side of the antenna.
 - iv. "AAT Faces Back" if measuring from in front of the antenna.
 - v. If the measured azimuth is 180 degrees opposite of expected, the orientation is likely incorrectly set.
- 3) Click the **Quick Capture** or **Scope Capture** (if available)* button at the bottom of the page.
- 4) Review the captured data, then click **Reject** to return to the Measure Only page or click **Next** to enter and save site data.
- 5) To save the captured information, the user must include Site, Sector and Antenna Position.
- 6) To generate an azimuth-only report from a Quick Capture:
 - a. Click the **Profiles/Capture/Report** link.
 - b. NOTE: if Scope Capture was selected to save the data, an azimuth-only report will be generated. Steps b – d do not need to be performed for data saved under Scope Capture.
 - c. Click **Show Report Options**. See Figure 5-3.
 - d. Deselect all options **except** Azimuth.
 - e. Click the PDF or HTML report button next to the appropriate jobsite.
 - i. PDF reports will automatically download to the user's Wi-Fi device if the PDF option is selected.

- ii. HTML reports must be converted to PDF and manually saved to the user's device.
- iii. All captured information remains available on the AAT for future use until the SD card erase feature found under the File Management tab is used **OR** the profile is manually deleted.

* Scope Capture option available on the Measure Only screen with firmware version r005v19 and higher. Visit <https://sunsight.com/index.php/support> to download the most recent firmware release.



Figure 5-1

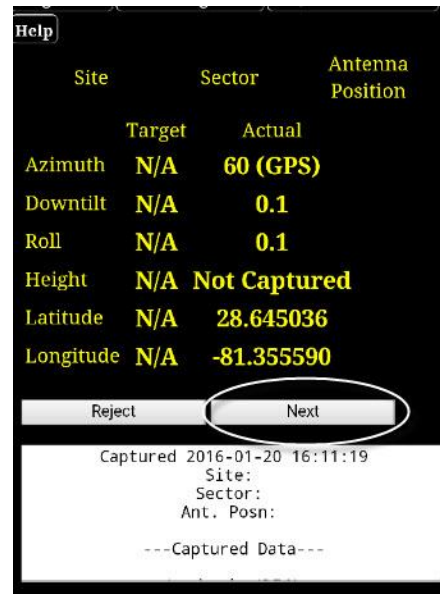


Figure 5-2

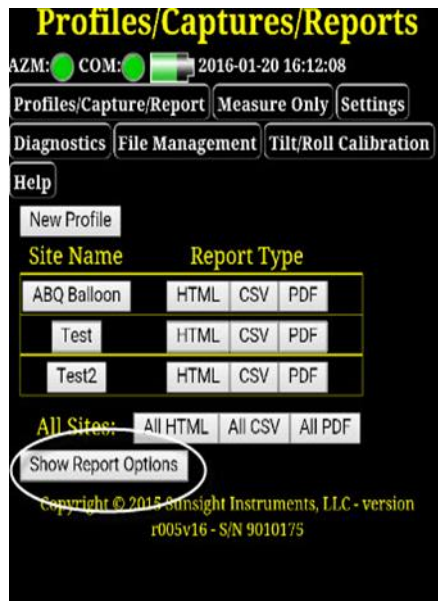


Figure 5-3

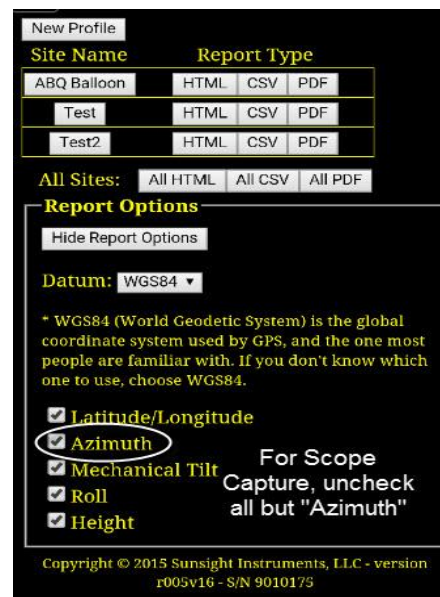


Figure 5-4

**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 Only** 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.