

Zoom 9X FAQ Series

Field Calibration

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Filename: Zoom95_FieldCal_Vertical_r002.docx

Thesis

The 2nd step of a field calibration requires that you aim at a target between 27 to 63 degrees, or 117 to 153 degrees from zenith = 0 (straight up).

There is a struggle to find a target that is high or low enough for the vertical shot. Some clues:

- you don't need a prism at the vertical target, just something to accurately aim at
- for the vertical shot, you don't need 100 m, shorter is fine

Notes

Pointing Up:



Notice that there is no way to see through the telescope at 27 degrees.

Pointing Down:

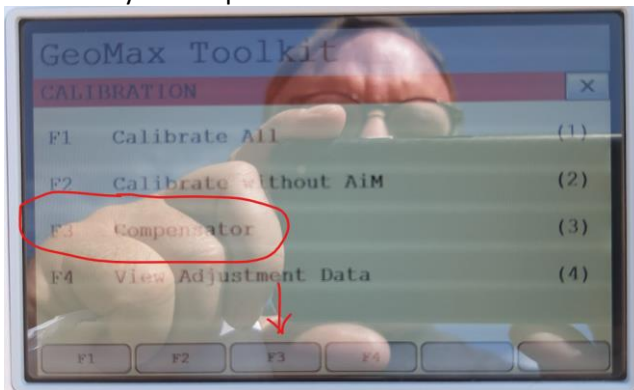


2

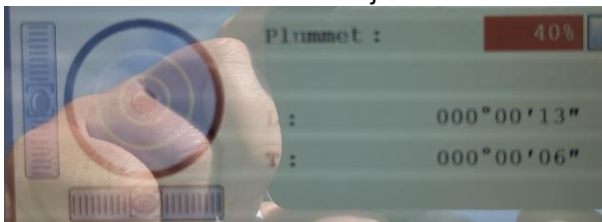
Hints

Use the Compensator adjustment tool to check the vertical angle

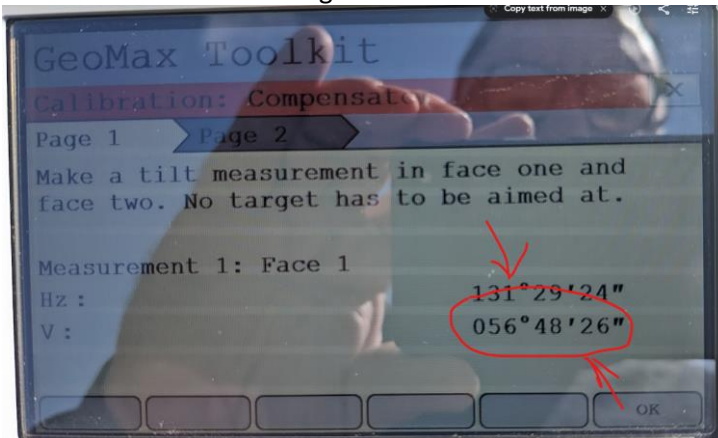
Typically, you will use a high shot for the vertical calibration. Use the “F3 Compensator” calibration tool after you setup and level the robot to do a test shot on whatever you will use for the high shot:



This tool will show a bubble adjustment:



Then the vertical zenith angle will be shown:

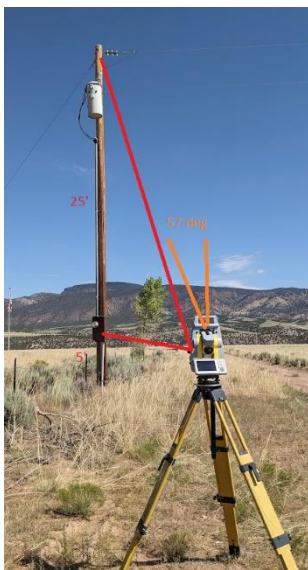


3

Make sure the vertical angle is between 27 and 63 degrees (or 117 and 153 degrees.)

If your high shot is in range, then click ESC (button on keyboard), then Yes to exit the F3 function.

Using a telephone pole as the high target



If the pole sticks out of the ground 30 feet, the telescope is 5 feet above the ground, then you will be set up between 12' (27 deg) and 49' (63 deg) from the base of the pole.

In the picture to the left, the robot is 14 paces (42 feet) from the pole and the vertical angle is 57 degrees to the corner of a plate below the top of the pole:



The top left corner of the steel plate, nearest the robot will be used as the target point. Notice how the double cross hair lines move from left to right when the scope inverts.



It is important to use a round prism with a target for the horizontal shot. It is best if the round prism is nearly 300 feet distant. Stepping off 100 paces is close enough.

Make sure the target is level so that the side arrows are at the same height.



The prism target will appear to be slightly tilted when you look at the crosshairs, no matter how careful you level it, you should use the arrow on the same side of the prism for each measurement.



In this case I will use the top and right-hand black arrows to adjust the crosshairs to be EXACTLY (this is a 1" robot) at the center of the arrows.

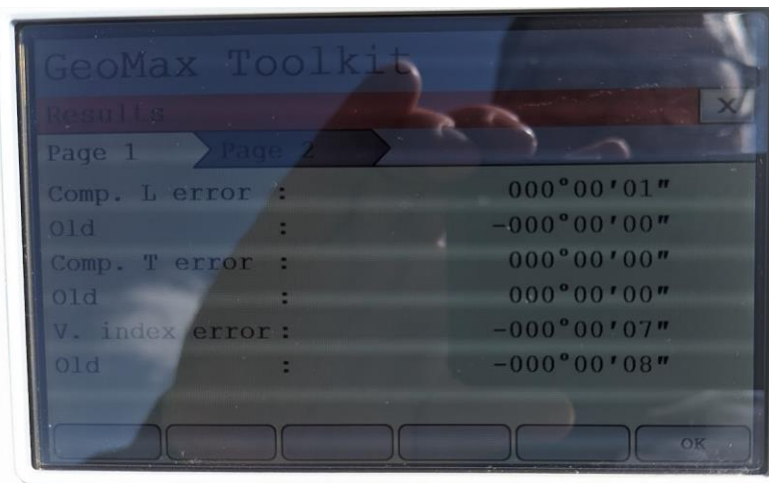
Aligning the center crosshair to the center of the prism is nearly impossible.



When the scope inverts for the reverse shot, there will be double lines on the right, instead of a single line. Carefully center the double lines over the black arrow.

4

When you complete the calibration process, look at the old vs. new calibration constants. Assuming same temperature, robot not dropped or handled roughly the values should not change much:



Vertical shot: high or low?

The instructions and the screen instructions request a high or low target 100 meters distant from the robot. The sites where this would be possible are few. At many undeveloped sites, it will be impossible to find a suitable vertical target higher than 35 feet.

It will usually be possible to target a point on the ground 10 feet in front of the robot. This will get you past the angle requirement. The distance will be totally short, however if you have a suitable hard edge to align with, it should be good enough.



Some YouTube videos

<https://youtu.be/bb8u1HKZACM?t=209>

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