

# Height Photo Best Practices

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## Purpose

Katapult Pro calculates attachment heights based on geometric algorithms that leverage data from height photos as variables. The below practices will ensure the platform's algorithms receive the most accurate data. Neglecting these practices may introduce parallax and distortion, which will result in less accurate data collection and, in turn, less accurate measurements.

The document is divided into two sections: Pole Height Photos and Midspan Height Photos. Some practices are applicable to both categories, but they are noted in both sections to highlight nuances for each case.

## Pole Height Photos

### Height Stick Operator Duties

***The bottom of the height stick must touch the ground.***

Heights should be calculated relative to the ground. Katapult Pro always calculates heights relative to the bottom of the height stick. If the height stick is raised from the ground, the heights will not represent positioning relative to the ground.

***The height stick must be straight and flat against the pole.***

If the height stick is not flat against the pole, depth is introduced. When capturing the three-dimensional pole in a two-dimensional photograph, any depth introduced will create an angle between the height stick and the pole, and the algorithm cannot account for this.

*Back-Office Tip: If the fielder's hand is between the pole and the height stick, there is at least a hand's-depth of space, maybe more. If the fielder's hand is on the outside of the height stick pressing it against the pole, it is more likely there is no space between the height stick and the pole. See Example 1 for an example of proper height stick placement.*

***The red and white side of the height stick must face the camera.***

First, this is the side the target stickers which data processors will use to calibrate the photo are on. Second, the red and white sections can be used to manually measure heights if part of the height stick is obstructed.

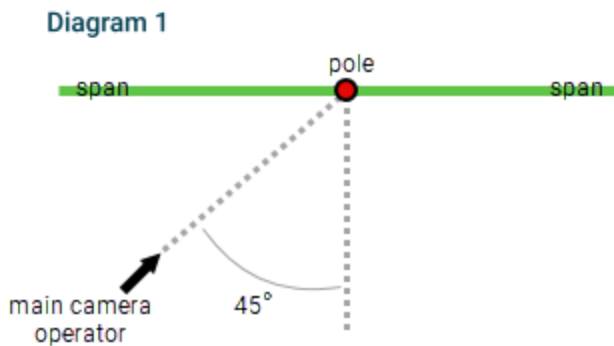
Example 1



**All target stickers should be clearly visible.**

Data processors need to be able to see the whole stick. There will be times where obstacles block part of the height stick from view. The most common cause is vegetation. In these cases, ensure 4 known heights are visible. Data Processors can manually calibrate a photo if they have 4 known heights. See Example 1 for an example of an unobstructed height stick. Though there is vegetation, it is not obstructing the bottom target sticker. Do not

raise the stick to avoid an obstruction, prioritize contact with the ground.



## Main Camera Operator Duties

**Stand at approximately a 45 degree angle from the pole.**

This angle is best to capture any bisecting down guys (as well as any equipment that may otherwise be obstructed by any crossarms) to provide the most visibility of the pole's attachments for those working in the back office. See Diagram 1.

**Stand at least a pole's length away when taking the photo.**

Standing too close to the pole will introduce parallax, which will make taking an inaccurate photo more likely.

*Fielder Tip: If the pole were to fall over, would it hit the main camera operator? The answer should be "no." If "yes," the main camera operator is too close to the pole. In situations where the main camera operator cannot safely stand a pole's length away, they should use the maximum focal length possible to properly frame the photo (see the last point in this section).*

**Photo warnings may indicate that camera clips could be helpful.**

Our software can approximate the distance between the main camera operator and the pole based on the height stick calibration and may give [photo warnings](#) if the main camera operator stands too close to the pole. Standing too close to the pole will introduce parallax, which will make taking an inaccurate photo more likely. To help coach your main camera operator to stand at a healthy distance from the pole, you can use a camera clip. We have camera clips available (free of charge), and you can reach out to [support@katapultengineering.com](mailto:support@katapultengineering.com) if you are interested in acquiring some for your team. We will ship them to your team, free of charge.

*Fielder Tip: Precise height stick placement is always critical, regardless of whether camera clips are used. The camera clip only assists with maintaining proper distance - it does not compensate for improper height stick placement.*

**Take the photo in portrait orientation.**

While the software allows landscape height photos, taking the photo in portrait orientation ensures more pixels are delegated to the subject of interest in the photo.

**Frame the photo so there is sky above and ground below the pole.**

Ensuring proper framing around the pole not only reduces parallax, but it also provides additional environmental context for the back office to understand what is surrounding the pole. If the photo is framed too tightly, the main camera operator is too close to the pole. Standing too close to the pole will introduce parallax, which will make taking an inaccurate photo more likely. Well-framed poles will also provide a more polished deliverable. See Example 1 as a case of proper framing.

## Midspan Height Photos

### Height Stick Operator Duties

***The bottom of the height stick must touch the ground.***

Heights should be relative to the ground, and heights are always calculated relative to the bottom of the height stick. Lifting the height stick will cause calculated heights to be higher than the attachment's position in reality.

***Hold the height stick vertically.***

Heights are calculated in-line with the height stick. For midspan height photos, best practice is to measure heights relative to the ground as this is the data clearance rules are concerned with. Holding the stick completely vertical will yield the most accurate data. (Hold it straight such that, if there was no wind, the stick would balance itself.)

***Place the height stick directly beneath the wires.***

Best practice is to measure heights relative to the ground. Because clearance rules are concerned with the point directly beneath the wires, these are the heights the fielder should collect. If your wires are far enough out of line, you may need to capture additional height shots.

***All target stickers should be clearly visible.***

Data processors need to be able to see the whole stick. There will be times where obstacles block part of the height stick from view. Vegetation is the most common cause. In these cases, ensure 4 known heights are visible. Data Processors can manually calibrate a photo if they have 4 known heights. See Example 3 for a case of proper stick placement. Do not raise the stick to avoid an obstruction, prioritize contact with the ground.

***The red and white side of the height stick must face the camera.***

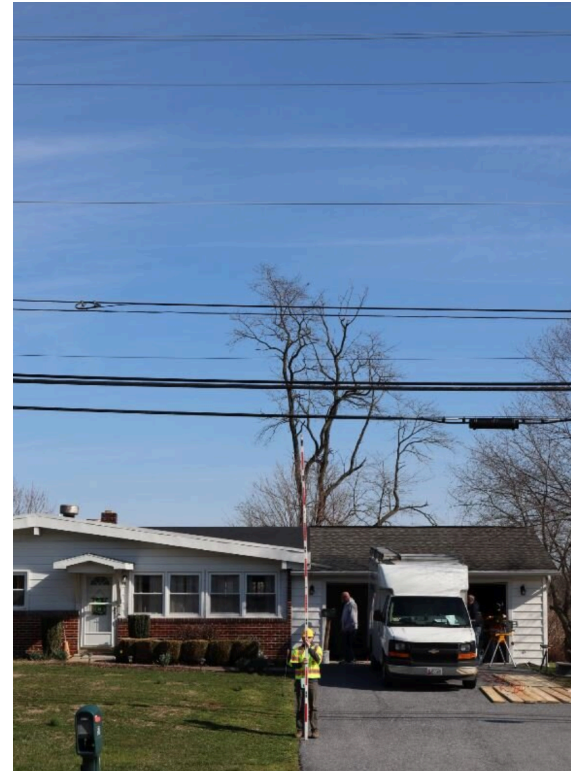
First, this is the side the target stickers which data processors use to calibrate the photo are on. Second, the red and white sections can be used to manually measure heights if part of the height stick is obstructed.

### Main Camera Operator Duties

***Take the shot perpendicular to the midspan.***

It is imperative that the main camera operator is perpendicular to the midspan. Other angles may introduce a "lean" to the wires, which could drastically amplify any errors. Do your best not to compromise taking the picture perpendicular to the midspan. Prioritize this angle to avoid a drastically increased likelihood of introducing error.

Example 3



***Stand at a healthy distance from the midspan.***

Using a camera clip can help prevent the main camera operator from zooming out too far because they're standing too close to the midspan. Standing too close to the midspan will introduce parallax, which will make taking an inaccurate photo more likely.

*Fielder Tip: Precise height stick placement is always critical, regardless of whether camera clips are used. When working without a camera clip, take multiple shots of the midspan in a perpendicular position. In each photo, ensure at least 6 feet of the height stick is visible. Data processors can manually calibrate the upper photo with 4 known heights.*

***Frame the photo in portrait orientation.***

While Katapult Pro works on landscape photos, taking the photo in portrait orientation ensures more pixels are delegated to the subject of interest in the photo. Landscape orientation creates “wasted space” and less resolution dedicated to the midspan.

***Leave room on the top and bottom of the photo.***

Giving the wires and the bottom of the height stick margin ensures the main camera operator is standing far enough away to prevent parallax. Standing too close to the midspan will introduce parallax, which will make taking an inaccurate photo more likely. See Example 3 for a properly framed photo.

If you have questions or would like to schedule a training session, please email [training@katapultengineering.com](mailto:training@katapultengineering.com).