

UmpAssist

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Overview

Since the widespread use of pitch-tracking technology, the global baseball community has pushed for its use in improving the controversial job of calling balls and strikes. While Trackman pitch-tracking data has been used in many pitch call automation experiments, we will now provide an end-to-end solution – UmpAssist.

Trackman UmpAssist gives baseball leagues and organizers the ability to accurately track pitches, instantly make a ball/strike decision based on pre-defined strike zone rules, and relay audio pitch calls to home plate umpires without obstructing their ability to hear other important cues – all in under 1 second.

UmpAssist works in three phases:

1. Pre-Season
 - a. Set strike zone size rules
 - b. Collect strike zone data
2. Pre-Game
 - a. Confirmation of strike zone sizes
 - b. Test pitch call relay to home plate Umpire
3. In-game
 - a. Standard tagging via Tagging App, to ensure correct strike zone sizes are being used for each player
 - b. Real-time pitch calls relay to home plate Umpire

To provide the live relay component of UmpAssist, Trackman is excited to partner with PitchCom – creator of the most innovative baseball communication hardware available.

PitchCom products:

- Are used today in Major League Baseball to relay pitch clock information to umpires
- Are used today in MLB and in countless other leagues to relay pitch types between coaches, catchers and pitchers
- Use sophisticated encryption techniques to ensure information security
- Include a compact receiver/speaker that attaches to umpires' helmets, enabling home plate umpires to hear pitch calls without a headphone/ear plug obstructing their ears (which can prevent them from missing important audio cues, like foul tips, hit by pitches, and catcher's interference)

How the Strike Zone is Set

Pioneer League will utilize the Height-Based Dynamic Strike Zone

- Top and Bottom: Trackman UmpAssist sets a unique top and bottom of the strike zone based on a percentage of each player's height that is provided by the league.
- Sides of Strike Zone: The sides of the strike zone do not change. These are based on the rule book definition.

How the Pitch Call is Displayed and Relayed

- Tagging Application & Local Live Dashboard
 - Trackman's Tagging App and Local Live Dashboard will display the word "IN" or "OUT" under the strike zone graphic and/or in its own tile (if selected in preferences), based on the location of the pitch at home plate relative to the player's unique strike zone.
 - This will stay on the screen until the next pitch is thrown.
- Audio relay via PitchCom
 - The word "BALL" or "STRIKE" will be communicated through a PitchCom earpiece immediately after the pitch crosses the front of home plate.

Graphic Representation of the Strike Zone

Please note: We are actively investigating and fixing two bugs relating to Strike Zone visualization:

- Live Dashboard: The dynamic strike zone stored in our database is not being displayed, instead showing a static Strike Zone.
- Tagging App: The representation of the ball relative to the strike zone is not scaling correctly. This can make balls that are just outside of the strike zone look like strikes.

These issues are Trackman's current top priority. We will notify the league office as soon as the tools can be used with confidence.

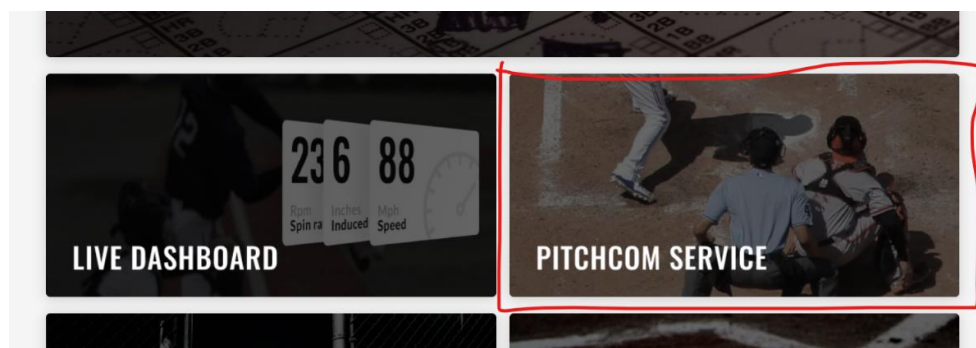
General Manager: Responsibilities & Experience

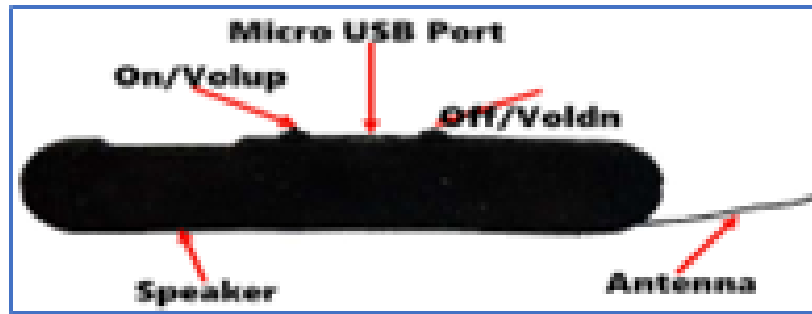
Initial Set-up

- Setting up the PitchCom device only requires a couple of steps:

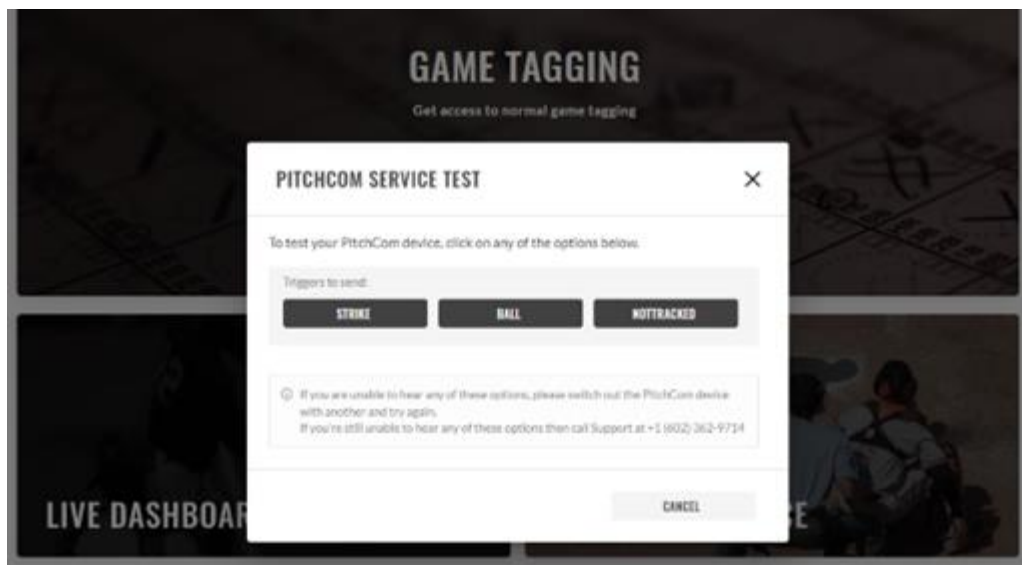


- Attach the provided data cable to the PitchCom Transmitter device (pictured above),
 - DO NOT connect the other end of the cable to the V3 server yet! That will come in Step 3.
- Insert the other end of the cable into the USB port on the V3's stadium server.
- Then, press and hold down the 4 & 6 buttons [for 2 seconds]
 - A white LED light above the 'Cancel' button should turn on and start shimmering/blinking very fast
 - This puts the PitchCom Transmitter into pairing mode.
 - If this is the first time connecting the PitchCom device then Support will need to be contacted to restart the PitchCom Service.
 - Currently, there is no on-screen confirmation of pairing (this will be added soon), but Step 4 shows how to confirm successful pairing.
- Test the Transmitter pairing by clicking 'PitchCom Service' on the home page of the Tagging App:

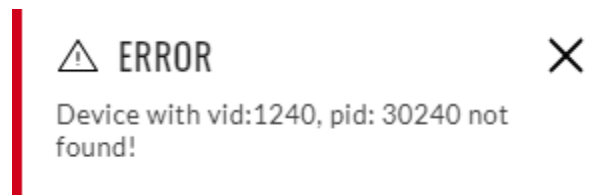




- Have the Receiver turned on and be ready to listen for an audio message. Then, click any of the options shown below. (*Receiver shown above*)



- If the Transmitter was successfully paired, you will hear the corresponding audio output.
- If the Transmitter was not successfully paired, you will see a failure message in the top right corner of the Tagging App.



- If the PitchCom Transmitter test fails, please call Trackman Support. A restart of the 'PitchCom Service' may be necessary.
- If the PitchCom Transmitter test passes, you're ready to place the Transmitter in its day-to-day location.

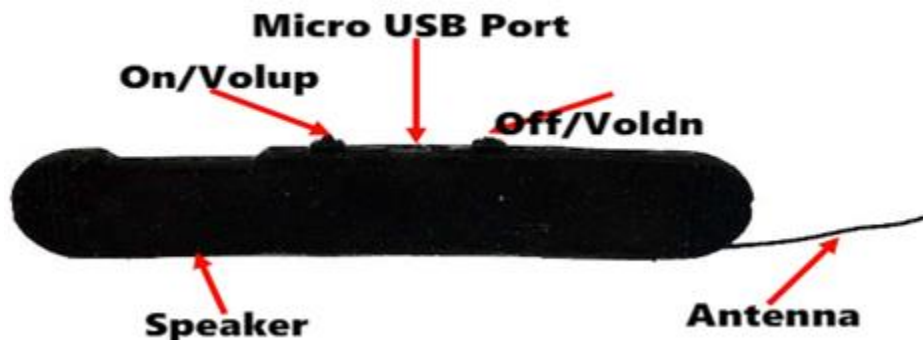
- **Important:** Although we use the word ‘pairing’, the PitchCom Transmitter does NOT communicate with the V3 server wirelessly, like via Bluetooth. The Transmitter must remain connected to the server via the provided cable for pitch calls to relay to the Receiver.

PitchCom Transmitter Placement

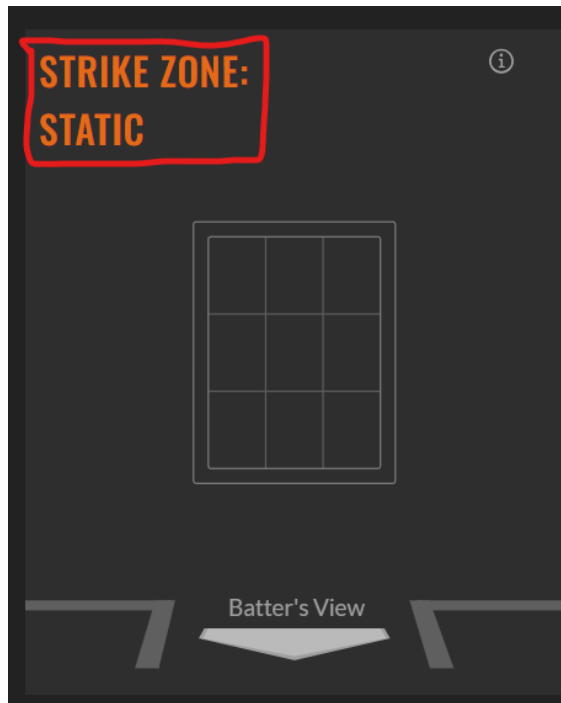
- Once paired with the V3 server, the Transmitter can be placed in its location for in-game use.
- For optimal message transmission performance, PitchCom strongly recommends giving the Transmitter a clear line of sight to the field, such as in a press box (behind a glass window is OK). The Transmitter’s signal can pass through some walls, but performance is less certain than when given a clear line of sight to the Receiver’s location.
- The Transmitter/Receiver connection has a range of ~500-600 feet, so ensure you locate the Transmitter below or within this range from Home Plate (the shorter the distance, the better).

PitchCom Receiver & Placement

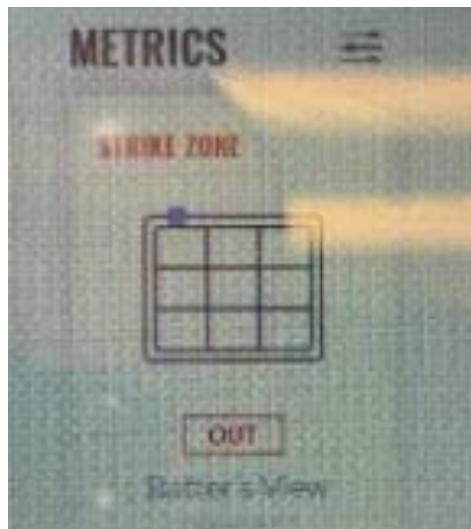
- The PitchCom Receiver (*pictured below*) is designed to fit comfortably within the umpire’s hat or helmet, above their ear. The Receiver will output audio automatically within 300-500 ms of pitches being tracked.



- To ensure that the player’s heights are being used, the system operator must choose “Pioneer League” as the League when setting up a game. This will trigger the strike zone definition to select the height-based strike zone and then use the player heights provided by the Pioneer League to determine each player’s strike zone.
- **Regarding bugs mentioned in beginning of document.**
 - The Cloud Live Dashboard is stuck displaying the static strike zone and is not changing dimensions based on the player’s selected.



- When fixed it will read **“Strike Zone: Height Based”**
- The Strike Zone graphic in the Tagging App is currently misrepresenting where the ball is in relation to the strike zone and some close pitches may look like they’re touching the inner or outer frame of the strike zone when they should not.



- The ball marker in the picture above should have been higher than it is displayed. The “Out” decision is correct based on the measurement data but where the ball marker is incorrect.

System Operator: Responsibilities & Experience

With UmpAssist in use, the system operator's doesn't have to perform additional tasks, but it is imperative that they take notice of a few settings and notifications:

- The "League" in "Game Settings" must be set to "Pioneer League"
 - This makes sure that the strike zone definition correctly uses the the settings that have been applied for Pioneer League, in this case – Height-based.
- In the Lineup screen, if a player has an orange "SZ" next to their name when entered into the lineup, this means that they don't have a height entered into our database and therefore will be using a static strike zone when the game is started.
 - The system operator can email datadesksupervisors@Trackman.com with the player's name, team, and the player's height and we will add the information as quickly as possible.

Umpire: Responsibilities & Experience

With these features turned on, the strike zone will be going from a static strike zone (never changing) to a dynamic strike zone that changes based on the player's height. Any challenges will be based on the "Strike" or "Ball" audio from the PitchCom or the "In" or "Out" message on the Live Dashboard / Tagging App.

If the Field Umpire wears the PC device, this provides the opportunity for Challenges to be decided by him, using the audio output from the PC device. However, leagues can announce decisions using any preferred method.

If Field Umpire wears the PC device, Trackman very much appreciates any and all feedback about the experience. We're mostly interested in knowing if the PC audio doesn't work for a given pitch, a series of pitches, or is too late after crossing the plate. Of course, feedback on all other aspects of the experience is welcomed.