# UmpAssist

*Last updated: [January 09, 2025]*

# 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. Collect strike zone data
    b. Set strike zone size rules
    c. Calibration
    d. Set up Support Plan
2. Pre-Game
    a. Connect PitchCom device to TM server
    b. Test pitch call relay to home plate Umpire
    c. Confirmation of strike zone sizes/definition
    d. Confirmation of player strike zones
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).

# Preseason

During the preseason, Trackman will gather all player and team information for the new season. This includes new players, transactions, jersey number changes, etc. Most importantly for UmpAssist, Trackman will obtain the strike zone information for each player within the League. This will be done in one of two ways. Either the League will be responsible for providing the player information through the Trackman Roster Template which will then be ingested into the Trackman database and applied to the players listed or the League will provide an API in which Trackman can scrape the player information from automatically. Furthermore, the League will be responsible for providing the Strike Zone definition (Custom Top/Bottom, Height-Based, Static) to Trackman so that it can be applied for the start of the season.

## Obtaining Strike Zone Information

As mentioned above there are a couple of ways that Trackman can gain access to the player information necessary for UmpAssist to work as intended. Below are descriptions and requirements for each method.

### Trackman Roster Template

Trackman has a roster template that we can ingest directly into our database which cuts the time it takes to input rosters greatly. It will be up to the customer to fill out the template (one for each team in the League) with the necessary information for UmpAssist. This includes unit system (centimeters or inches) and player height (in centimeters or inches) for the Height-Based strike zone definition, and unit system, top of SZ (in centimeters or inches), and bottom of SZ (in centimeters or inches). Once filled out and sent back to Trackman it will be ingested into our database and those players will either be created or edited to include the UmpAssist information.

### Roster API

The other method that Trackman can obtain player roster information is through scraping a Data API that contains player metadata. For some Leagues, Trackman is already set up to scrape the Data API to obtain this information, but for Leagues that currently do not have an active Roster API and want to set one up, there are specific requirements for the player profile that must be met. Required player information includes first name, last name, date of birth, hometown, home state/country, batting dexterity, throwing dexterity, and position(s). Trackman will work with any League that wants to set up a Roster API to ensure that all requirements for player profiles are met.

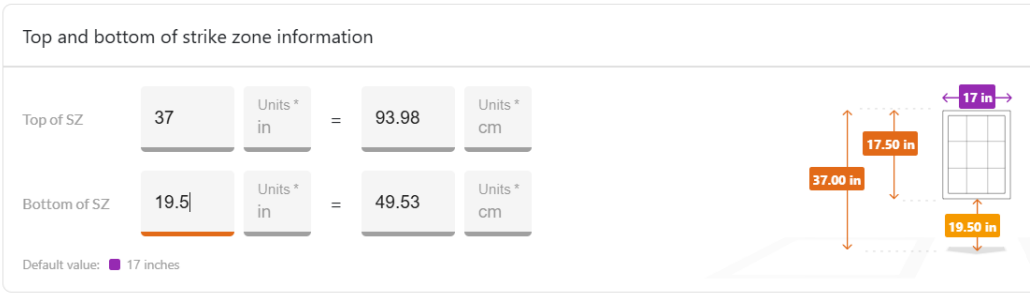
## Setting Strike Zone Definition

Before the season begins, the League utilizing the UmpAssist product will need to decide which kind of strike zone type they would like to use. There are three different strike zone types, and each has a unique definition.

### Custom Top/Bottom SZ

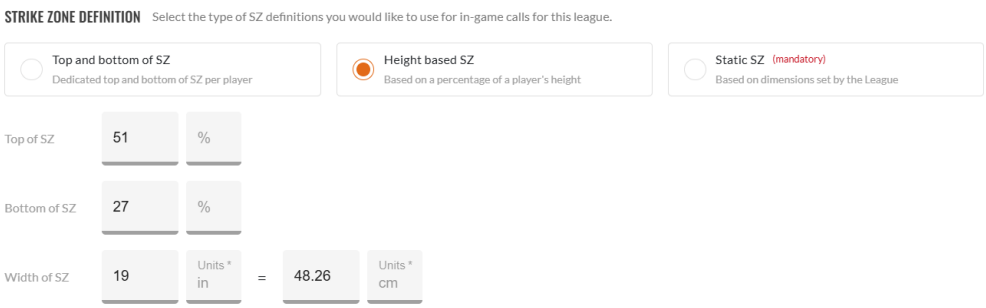
The Custom Top/Bottom SZ definition is the most accurate strike zone definition because each player has a unique strike zone determined by the League. For this strike zone definition, each player will be

given a Top measurement (from the ground to the top of the strike zone) in either inches or centimeters (depending on unit system being used) and a Bottom measurement (from the ground to the bottom of the strike zone). Subsequently, the League will determine the width of the strike zone and that will be applied for any game that is played under that League. If a player does not have the necessary information, then the system will try and find a Height-Based strike zone for that player and if that is unachievable then the strike zone will be determined by the default static strike zone definition.



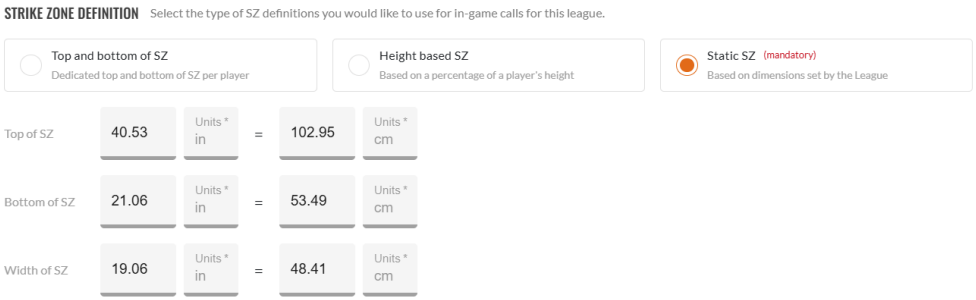

## Height-Based SZ

The Height-Based SZ definition is the most common strike zone definition used across many Leagues. It utilizes percentages of player height to determine the strike zone for each player. The League will determine a Top percentage, a Bottom percentage and a Width for the strike zone. When a game is played under that League, the players involved will have their strike zones determined by these settings. If a player does not have the necessary information, then their strike zone will be determined by the default static strike zone definition.




## Static SZ

The Static SZ definition is a fixed, never changing strike zone. The top, bottom, and width of the strike zone are determined by the League in inches or centimeters. The strike zone will be the same for each batter no matter what their height or batting stance is. This definition will only be used for players that are missing the necessary strike zone information based on the League's preferences.




## Calibration

It is highly recommended to schedule a new calibration for any League wishing to utilize the UmpAssist product. Due to this product requiring the utmost accuracy, the calibration must be updated before the season begins. If, for any reason, the pitch locations appear to be incorrect throughout the season, another pitch bounce calibration will be performed to correct the inaccuracies.

## Support Plan

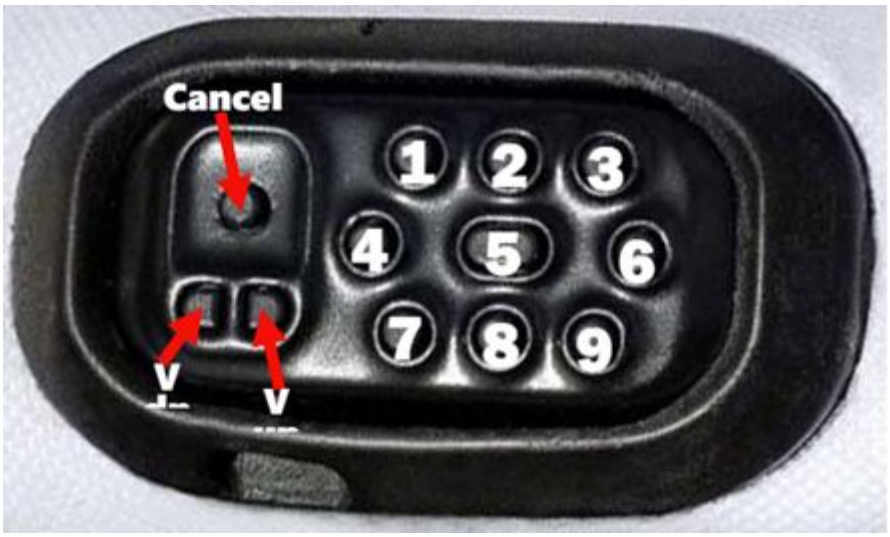
UmpAssist requires a support plan to be put in place prior to the season starting as any issues that could arise will be very time sensitive. It is recommended that the League hire at least 1 on-site support staff to oversee connecting the equipment, testing that equipment before the game, switching out any faulty equipment throughout the game, etc. Additionally, a dedicated Tier 2 team will need to be hired to oversee technical problems and will also oversee troubleshooting any connection errors between the transmitter and the Trackman server.

# Pre-Game

Before the game begins, there will be a couple of things that the on-site operator and support staff will need to check to ensure that the UmpAssist product is ready to be used as intended.

## Connect PitchCom Device to V3 Server

Connecting the PitchCom transmitter to the Trackman server is quick and easy and only requires a few steps to follow to get everything set up.



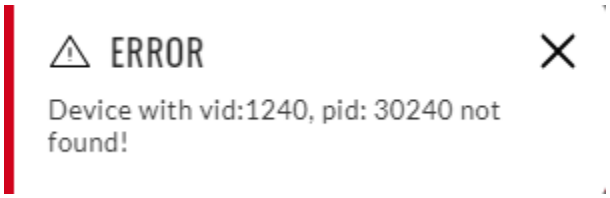

1. Attach the data cable provided to the PitchCom Transmitter device (pictured above),
2. Insert the other end of the cable into the USB port on the V3's stadium server.
    - We recommend using a USB port on the back of the server, but any open USB port would be fine.
    - You should see a red LED light coming from above the Cancel button on the transmitter when you've connected to the correct USB port.
    - If this is the first time connecting the PitchCom transmitter to the server then the PitchCom Service will need to be restarted

To have the service restarted, please follow the Support Plan and contact the Support team in charge and they will have someone restart that service.

## Testing PitchCom Relay

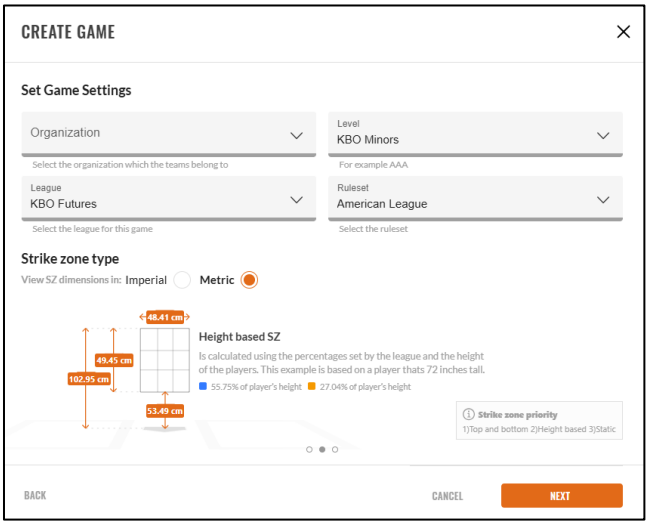

Once the PitchCom transmitter has been successfully connected to the Trackman server, the operator can test the audio output from the transmitter to the PitchCom receivers through the Tagging App. On the home page of the Tagging App there is a selectable button called 'PitchCom Service' which the operator will select. From there the operator will be met with a pop-up window that prompts the operator to select one of the three audio outputs available for the receiver. If the transmitter is connected properly, the receiver(s) is on and paired with the transmitter, then the operator/umpire should hear the audio output selected and a success message in the top right corner of the Tagging App.


If the transmitter is not connected properly then the operator will see an error message displayed in the top right corner of the Tagging App indicating that there was an error when trying to transmit the call to the receiver.



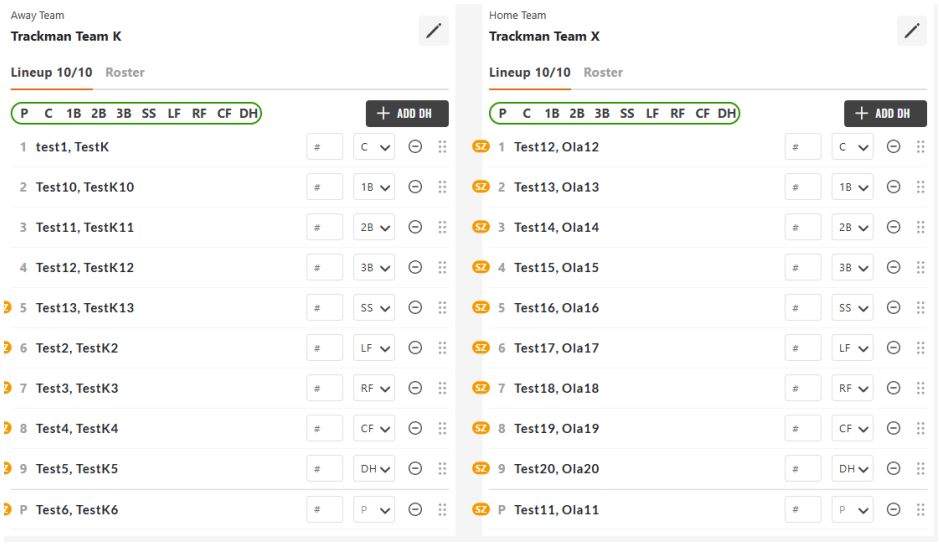

## Confirmation of Strike Zone Size and Definition

During the game setup, the on-site operator will create an official game for that session. When the operator creates an official game, it will be up to the operator to select the correct League during the Game Settings step. If the operator selects the wrong League, then there's a very good chance that the strike zone definition being used will be incorrect. The Level and League that should be selected for the KBO Minors games is **Level = KBO Minors** and **League = KBO Futures**. Once the League has been selected, an example will be displayed showing a strike zone using the definition assigned to that League. The examples will slightly differ based on the definition that the League is using. For Custom Top/Bottom, the example will display default measurements for the top and bottom of the strike zone and will show the width based on the Leagues' preferences. For Height-Based, the example will show the strike zone based on a 72 inch (182.88 cm) tall player, using the percentages decided on by the League. For Static, the example will show the exact measurements for the top and bottom of the strike zone determined by the League. Once the operator has confirmed that the League is correct and the examples are correct, then they can move on to the next step of setting the lineup.



## Confirmation of Player Strike Zones

Once the operator has confirmed that the League and the League strike zone size/definition is correct, the operator will then move on to the Lineup screen where they will be required to select teams and players for the game. If a scheduled game has been selected, then the teams are automatically selected for the operator, and they will only have to select the players to fill the lineup. If an official game has been created, then the operator will need to search and select the teams and then fill in the lineup with the players. If a player is missing strike zone information that coincides with the strike zone definition that that game is being played under, then a yellow “SZ” warning marker will appear next to their name when they’ve been selected in the lineup. To check all players that are missing strike zone information, there is a button in the bottom left corner of the lineup page that will show the operator all players that are missing the necessary information. If there is time before the game begins, it is recommended to contact the Trackman Data Desk with the correct strike zone information (custom or height), and they can update that player’s profile. If there is not enough time before the game begins then each of these players will be using the default static strike zone based on the League selected.




# In-Game

During the game, the operator will oversee tagging the game like normal but remember that having the correct batter up at bat is crucial for the correct strike zone to be used during that at-bat.

## Tagging

There are no changes or extra requirements for the operator to tag the game. Their job will be to tag the game as accurately as possible making sure that the correct batters are selected when they are up at bat.

## PitchCom Relay

During the game the Trackman system will automatically push transmissions through to the receiver which will, in turn, output audio to the umpire. If for any reason the umpire does not hear the audio for a given pitch, then they should make the call to the best of their ability and then ask for time to switch out their receiver or receive technical support.

# Appendix

## PitchCom Devices

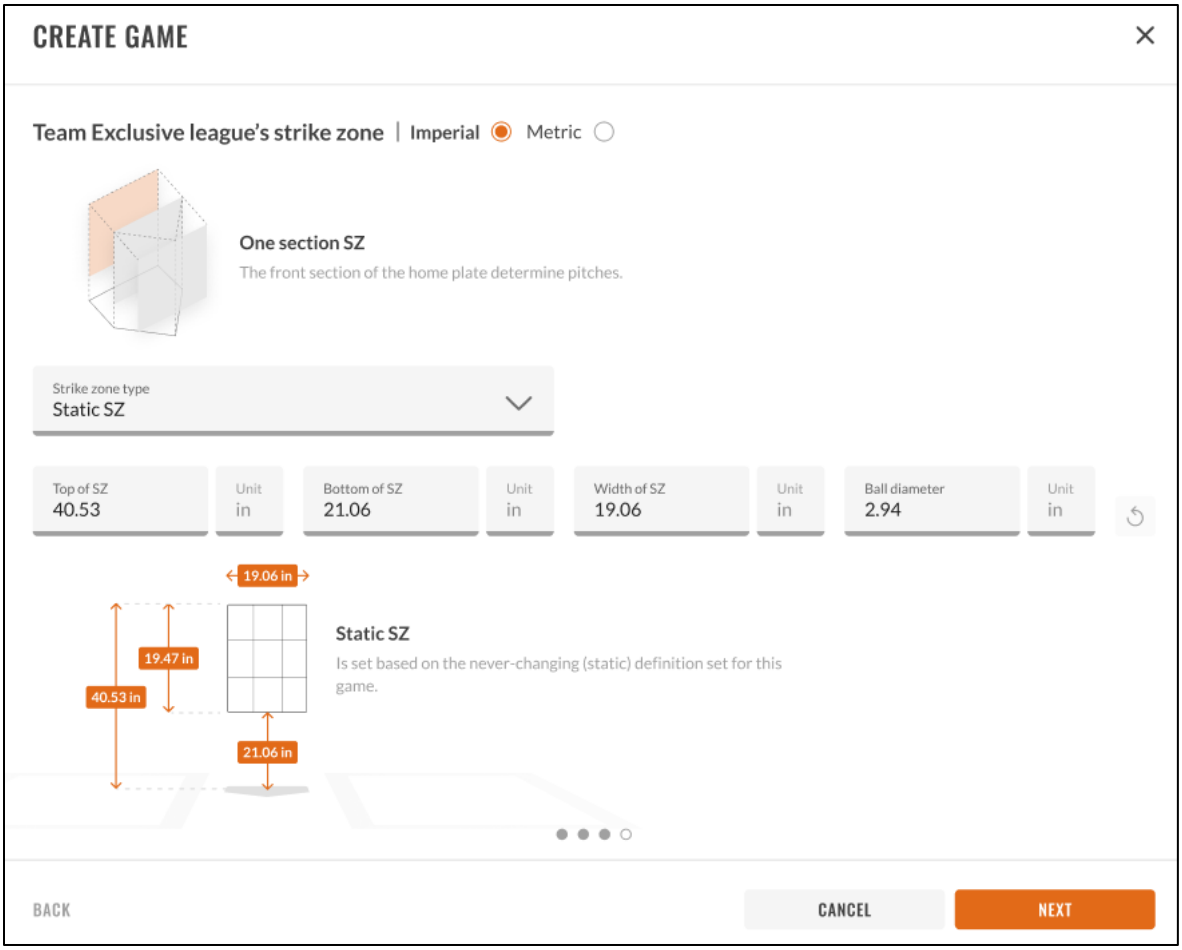
There are two ways that the PitchCom devices can be distributed. Either by umpiring team or by location. We prefer to distribute the devices by location to limit user errors and to limit the need to restart the system services when a new transmitter is connected. The standard number of devices per location/umpire team will be 2 transmitters and 3 receivers and can be used in any way that the League sees fit. If there is an issue with the equipment, then please contact Trackman and a replacement will be sent overnight.

## Data Delivery

Trackman will include player strike zone information (top, bottom, left of the middle of home plate, and right of the middle of home plate) in the post-game CSV and the post-game Data API which can be used to compare to the pitch location measurements also available in both delivery methods. Trackman will also include a Strike Zone Decision which will display as either ‘In’ or ‘Out’ indicating whether the pitch was deemed inside or outside of the given strike zone.

## Private Sessions

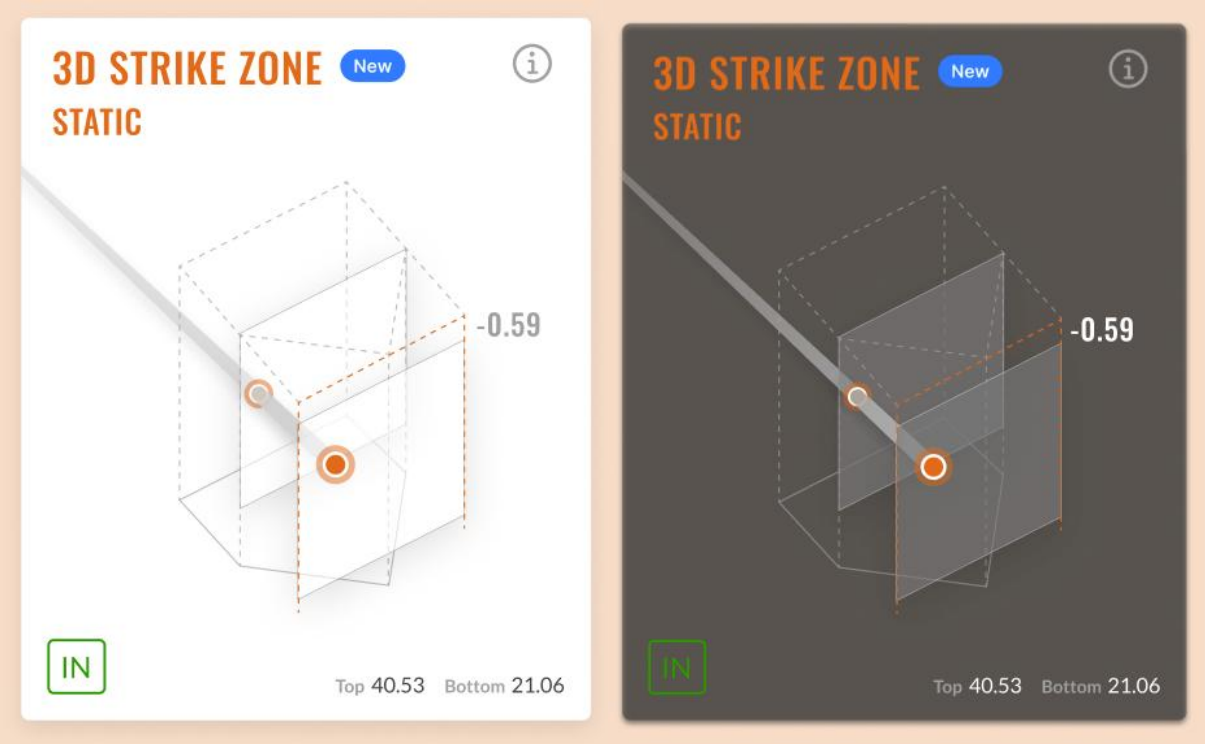
UmpAssist can be used in Private sessions despite ‘Team Exclusive’ always being the League used for those sessions. The strike zone selection feature will be part of the game set up instead of part of the pre-season tasks. During game set up, the operator will be able to select the strike zone definition (Custom, Height-Based, or Static) and set the preferences/measurements for whichever definition is chosen.



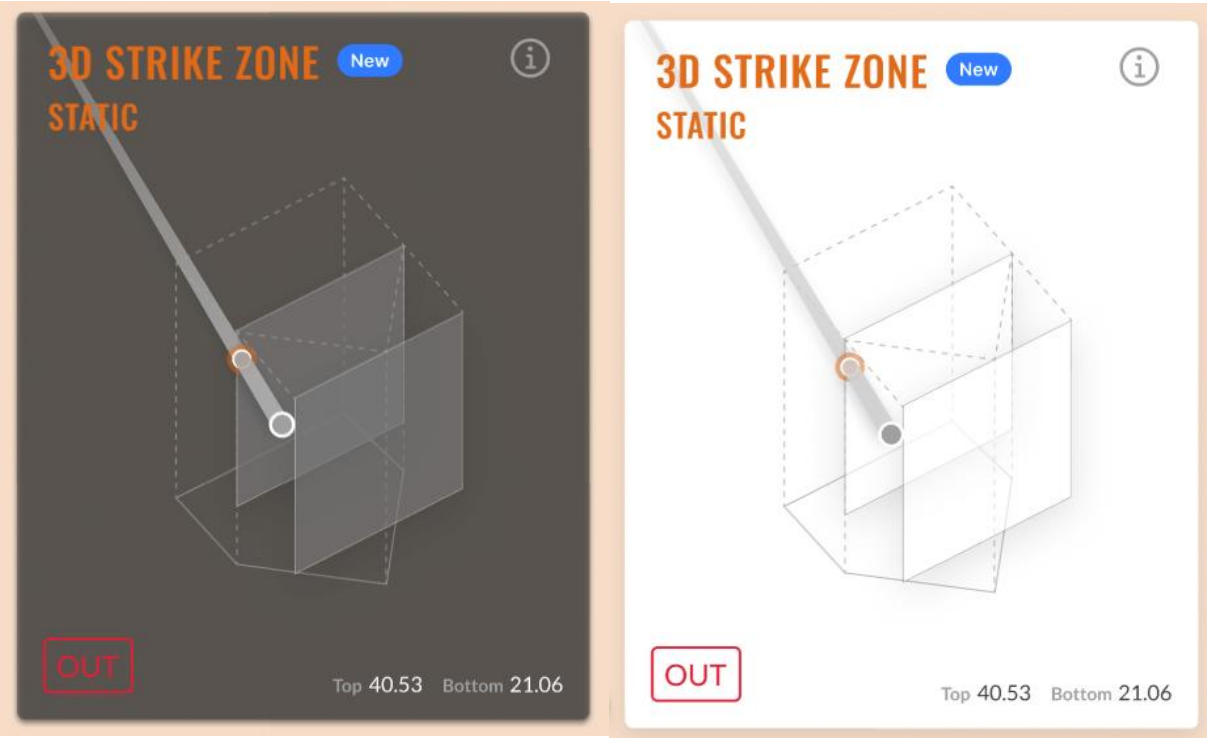

These preferences will be used to determine the Ball/Strike calls output by the PitchCom devices and will be displayed as “In” or “Out” on the Live Dashboards.

## Live Dashboards

On both, the Local and Cloud Live Dashboards, there will be a strike zone tile that displays a ball marker upon a dynamic strike zone based on the player that is batting within the Tagging App. The strike zone type will be determined by the League that is selected during the game set up steps. The strike zone type that is being used will be displayed in the title of the tile and there will be a small info blurb that when hovered over will explain that specific strike zone definition.




If a pitch is considered “In” then the user will see an orange ball marker where the ball crosses each plane that is in use. If the ball misses the entire area of any of the planes it will be considered “Out”, and the user will see a gray ball marker on any plane that the ball misses.



# Change Log