KEGEL

BUILT FOR BOWLING

SPECTO

BOWLING

INSTALLATION GUIDE

VERSION 10/17

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What is Specto?

Specto is a Lidar based advanced bowling ball tracking system that provides numerous data and new practice opportunities for users.

One sensor can cover up to 6 lanes according to your center's architecture

Note the limitations of laser coverage in relation to obstacles and architecture of the bowling center and bowling balls.

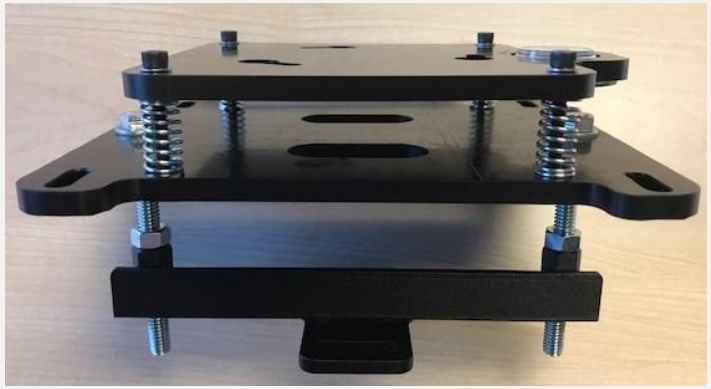
SPECTO LIDAR SENSOR

PACKAGE CONTENTS

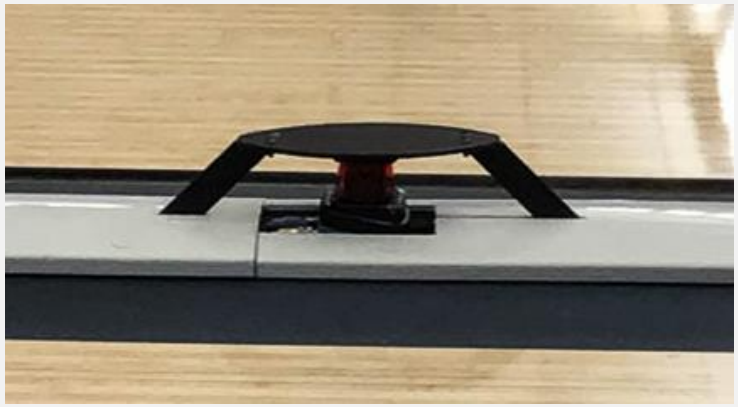
PACKAGE CONTENTS

Specto System Complete – 157-8602

PACKAGE CONTENTS



Sensor Mount Assembly (1)



Sensor Guard Assembly (1)

Calibration Stick (4)
157-1607

PACKAGE CONTENTS

3 Ft. Cat 5 Cable
157-1608

USB to Ethernet adapter
157-1611

60 Ft. Cat 5 Cable
157-1604

Controller
157-8606

Sensor assembly
157-8607

Power Supply
Cable 157-1605

Power Supply
157-1603

RECOMMENDED TOOLS FOR INSTALLATION

RECOMMENDED TOOLS LIST

- Hammer Drill
- Drill Driver (Impact)
- 3/8 Masonry Bit
- 12 inch Extension for Masonry Bit
- Magnet on wand for lost parts under lane
- Phillips Bit for Drill Driver
- 7/16 Wrench
- 1/2 Wrench
- 9/16 Wrench
- 7/16 Deep Socket
- 1/2 Shallow Socket
- 9/16 Deep Well Socket
- 9/64 Tee Allen
- Tape Measure
- Wire cutters
- Black Sharpie
- ¼ Drive Socket Bit
- Hammer
- Flashlight
- Laser level (4 ¼ height)
- Spare AA batteries for Laser
- Cutting Tool – Dremel, Jigsaw, RotoZip etc.

BOWLING CENTER REQUIREMENTS

SPECTO BOWLING	Pre-installation form
Bowling Center Name	
Address	

Contact: _____ Telephone: _____

Bowling Center Tel: _____ Contact email address: _____

Contact email address: _____

IT INFORMATION

Verified internet connection behind lanes where Specto will be installed? Yes/No

Internet Speed up/down (Minimum 2Mbps download / 512Kbps upload):_____

Windows based computer at the front desk to turn Specto on and off? Yes/No

*Email address for Control Desk:_____

BOWLING CENTER EQUIPMENT SPECIFICAIONS

Pinsetter make:_____ Lane Surface:_____

Mfg. and Model of Scoring:_____ Type of Gutter Capping:_____

Type of Ball Return Track:_____ Lanes to be installed:_____

**An email address will need to be given to use as the login address for all control desk personnel. This will not be used for anything but to log in or to remember password.*

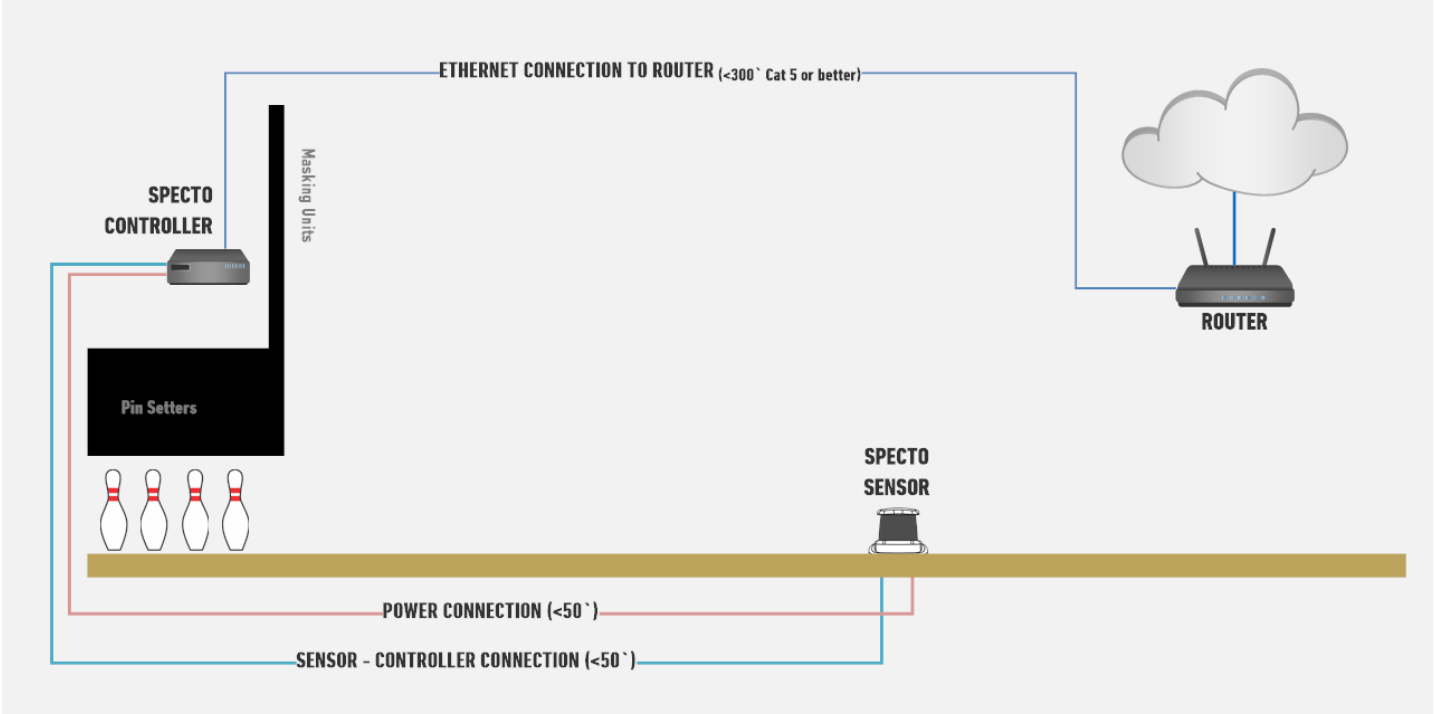
REQUIREMENT CHECKLIST

IT REQUIREMENTS

- ROUTER LOCATION: Must be less than 300 feet from the pair the sensor will be installed, preferably where league play will be at its most
- NETWORK CABLE TYPE: CAT5e or greater
- NETWORK CABLE LOCATION: Between router and Specto Controller (behind the pair the sensor is installed)
- INTERNET SPEED: Minimum 2Mbps download / 512Kbps upload
- IN HOUSE NETWORK SPEED: Minimum 100Mbps
- IP ADDRESS: Static or DHCP

REQUIREMENT CHECKLIST

General configuration



SENSOR LOCATION

SENSOR LOCATION

Keep in mind that every obstacle that blocks the sensor view can prevent Specto from reading the ball motion data correctly. It is very important that the Specto sensor can clearly view the bowling ball in the last 5-6 feet before the pins.

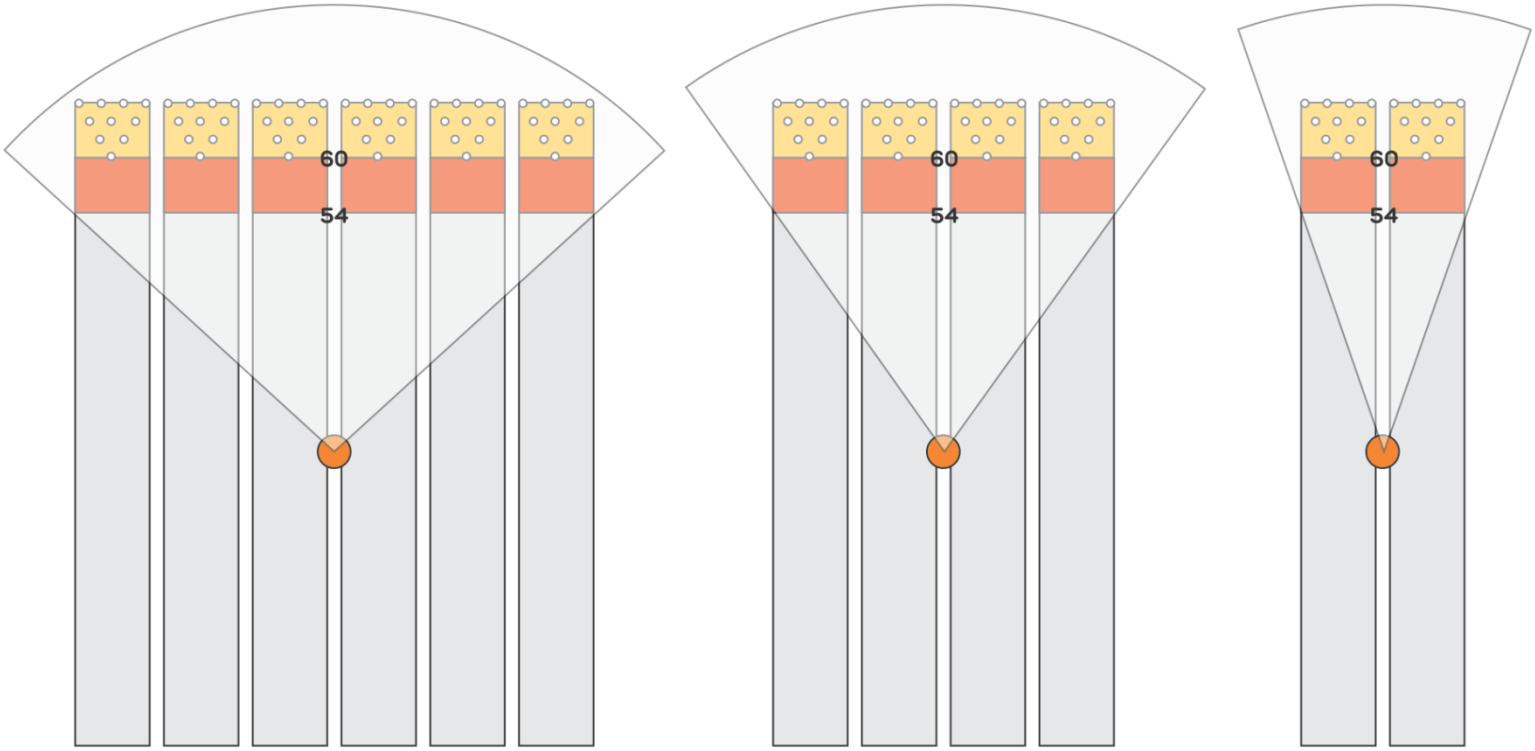
In order to provide the best conditions and data please determine the location of the sensor, use the ‘Blind Spot Locator’ application to determine the best position. For further verification, use a laser level, or your phone camera and observe any potential obstructions.

Specto’s main purpose is constructed on reading the ball path from foul line to the pocket area.

Pin deck area deflection and pin deck exit board data can only be read if the sensor can see the pin deck area clearly until the ball leaves the pin deck area. Please note, fast sweeps, or pindeck and center architecture , can prevent Specto from reading pindeck motion accurately.

SENSOR LOCATION

It is very important for the Specto sensor to clearly view the bowling ball in last 5-6 feet before the pins.



Determining Location:

This is an example of the Sensor location at 30 feet. The angles that are used is the necessary viewing area of the sensor. Use the Blind Spot Locator app to determine the best location for the sensor. By using your laser at the determined location, you can verify the clearest path to the last 5-6 feet of the lane as shown above.

SENSOR LOCATION

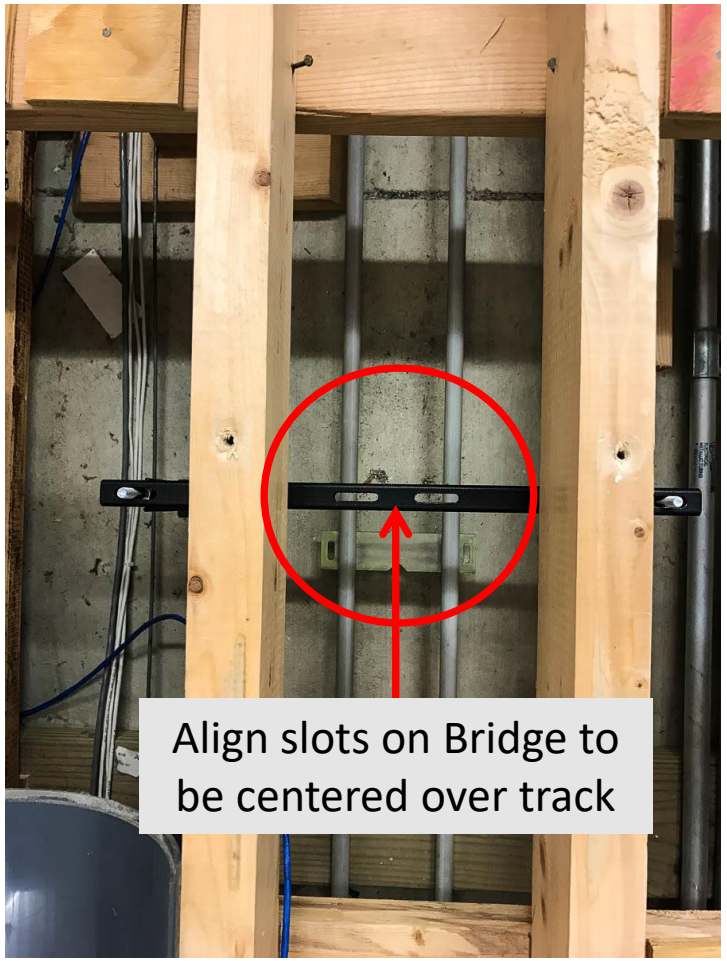
ISOLATION MOUNT ASSEMLBY

Complete
Isolation
Mounting
Assembly

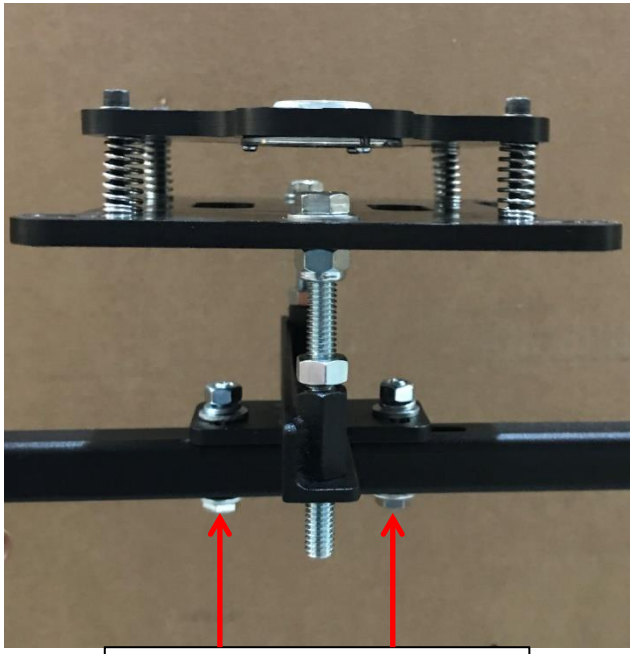
ISOLATION MOUNTING ASSEMBLY

- Strip the lanes free of lane conditioner.
- Remove capping, and if necessary, remove the gutters where the sensor is to be installed.
- Loosely assemble Sensor Bridge and place over and around ball track.
- Space the legs evenly on each side of the ball track and mark the hole locations. In some cases this may be on the outside of the 1 x 8's that may be installed parallel with the return track.
- Using a 3/8 masonry drill bit, drill holes on the marked locations and remove any dust and insert the anchors.
- Hammer the 3/8" anchor into the hole until 1 to 1½" of the anchor threads are left exposed.
- Install one of the feet of the Isolator bracket over the anchor and place a 3/8" washer, lock washer and nut on the threads and fasten down into place with your Impact screw gun. Now do the same for the opposite side.
- The adjusting All Thread on the feet should have a 5/16" nut, lock washer and washer on them. Slide the bridge across both feet, and adjust the bridge until it is just under the 2 x 4's. Slide a 5/16" washer, lock washer, and nut onto the All Thread of the feet and fasten down completely.

ISOLATION MOUNTING ASSEMBLY



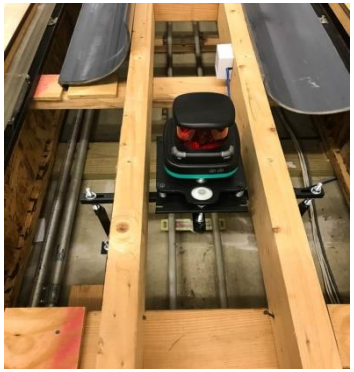
ISOLATION MOUNTING ASSEMBLY



INSERT BOLTS FROM THE BOTTOM UP TO PREVENT BALL DAMAGE!

- Using the supplied hardware, mount the complete Sensor plate assembly to the crossbar. Do this with the bubble level facing towards the foul line. It is VERY IMPORTANT to insert the ¼-20 bolts from the bottom up! This allows the extra needed clearance for bowling balls to pass without contacting the bolt.
- Add the remaining hardware and fasten into place with the assembly centered over the return track.

INSTALLING SENSOR



- Remove the sensor from the box. With the connections of the sensor facing the pins, install the sensor into the three slotted holes. Press down and turn into place until the sensor is locked in all the way.

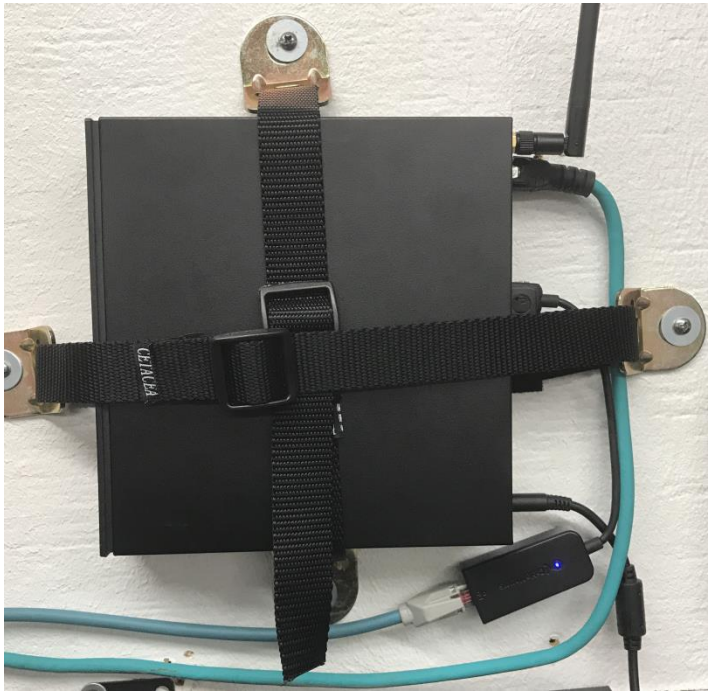
- With the your laser level placed on the lane, shoot the beam into the sensor and adjust the sensor plate until the beam hits the top portion of the ‘bullet’ or ‘eye’ inside of the red lens.

CABLE & CONTROLLER INSTALLATION

- With the gutter caps pulled up, take the power cable and run to the predetermined source. This would be either to the back of the pinsetters or up front under the ball return.
- Run the Green network cable to the location of your controller. This most likely will be on the back of the curtain wall.
- Wire tie the cable(s) neatly under the dropsweep and up the frame of pinsetter along with the existing cables and over to the Controller location.

CABLE & CONTROLLER INSTALLATION

- Using the supplied mounting straps, screw the metal brackets into place and tighten the straps around the controller.
- Plug the USB to Network Cable Adapter into the BLACK USB port on the controller. Plug the GREEN Network Cable from the SENSOR into the adapter.
- Take the bowling center network Cable and plug one into the open network port on the Controller.
- If a firewall exists, such as AMF scoring system, a switch will need to be installed before the AMF router.

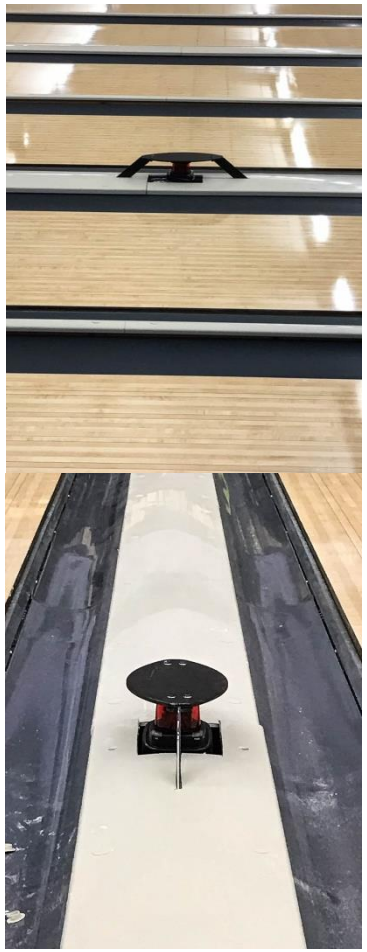


SENSOR GUARD INSTALLATION

- Remove the Top Plate, the 2 legs, the 4 mounting angles and hardware from the package.
- Take the Top plate along with one of the legs and using the supplied allen bolts, tighten one side of the assembly. Take the other leg and do the same. Make sure the assembly is straight and square after fastening tight.
- Take the aluminum mounting support brackets, and finger tighten the hardware into each of them. This would include the ¼ -20 x 1” bolt and washer pushed through the slotted portion of the mount angle and the leg, and place another washer, lock washer and nut and hand tighten. Do this to all four angles.

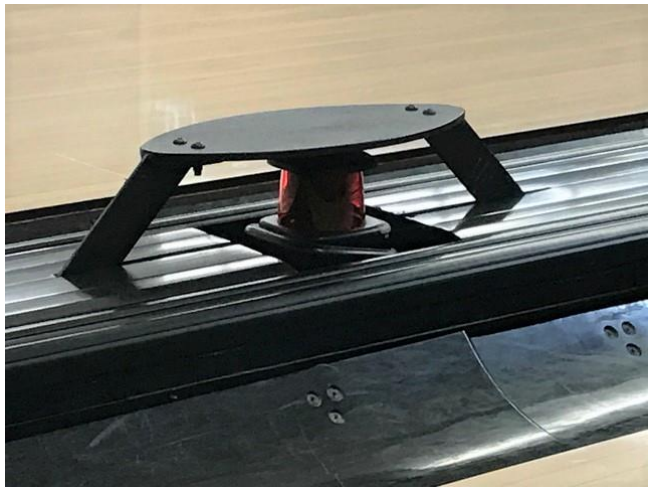
SENSOR GUARD INSTALLATION

- Position the guard over the sensor allowing a ½” gap between the top plate and the sensor.
- With the guard level from front to back and from and side to side, use a black marker and mark where the lag bolts will be screwed in.
- Using the supplied lag bolts fasten all of the mounting angles into place.
- Tighten the guard into place.



FITTING THE GUTTER CAPPING

- After the sensor guard has been installed a hole will need to be made for a proper fit.
- This hole, when done, should yield at least a 1” border around the sensor itself.
- A lengthwise cut will need to be made down the center of the capping to accept the leg of the guard.



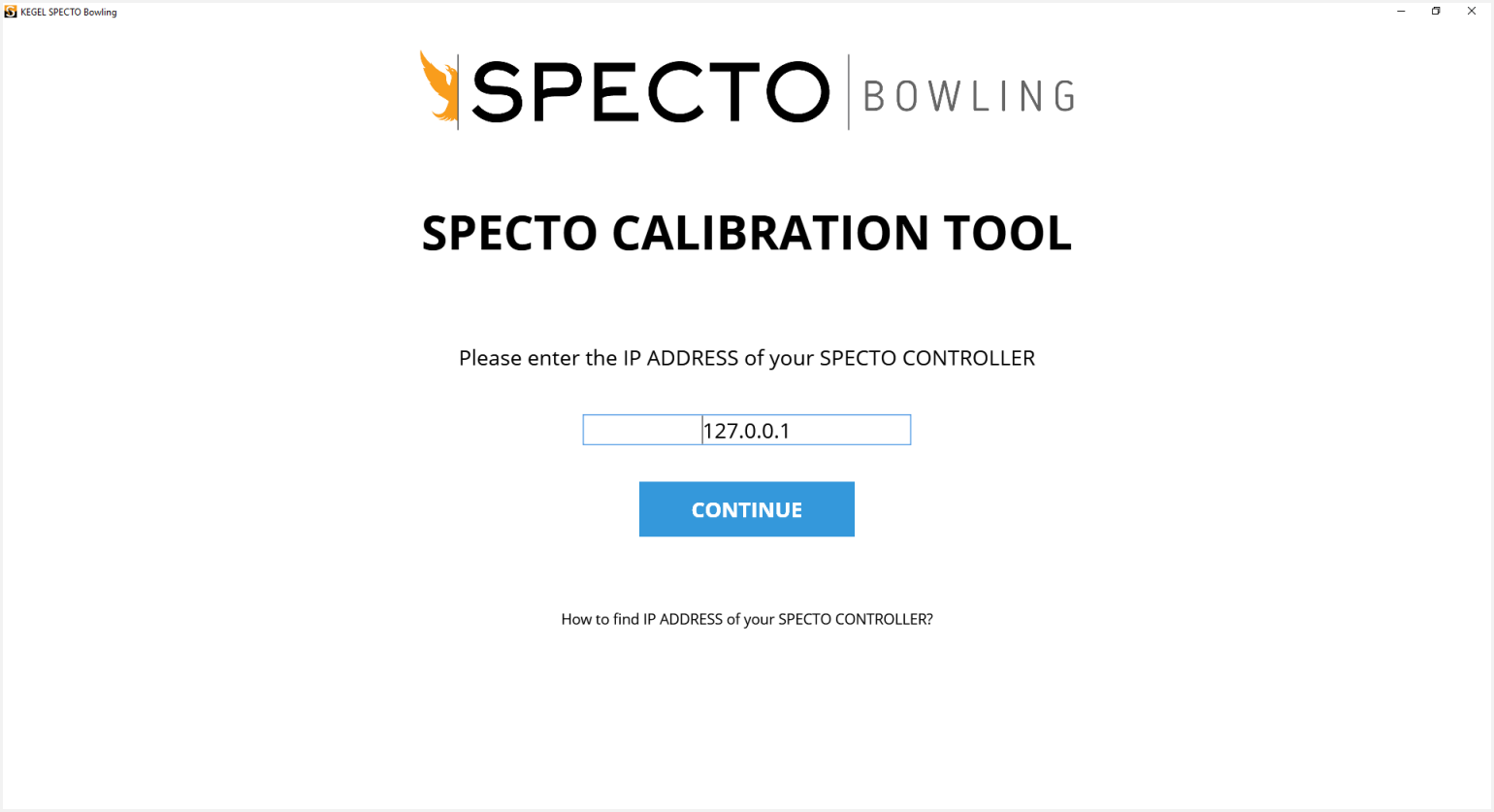
CALIBRATION

Begin Calibration by locating the IP address of the Controller. The easiest way to do this is by powering up the Controller, and within two minutes the IP address will be illuminated on the Specto Sensor.

There will be two sets of IP address separated by a semi-colon. The first set is for the controller and the second is the sensor IP address.

Internet **P**rotocol Address (or IP Address) is an unique address that computing devices such as personal computers, tablets, and smartphones use to identify itself and communicate with other devices in the IP network. Any device connected to the IP network must have an unique IP address within the network. An IP address is analogous to a street address or telephone number in that it is used to uniquely identify an entity.

An IP address is written in "dotted decimal" notation, which is 4 sets of numbers separated by period each set representing 8-bit number ranging from (0-255). An example of IPv4 address is 216.3.128.12


KEGEL SPECTO Bowling
SPECTO BOWLING
SPECTO CALIBRATION TOOL
Please enter the IP ADDRESS of your SPECTO CONTROLLER
127.0.0.1
CONTINUE
How to find IP ADDRESS of your SPECTO CONTROLLER?

KEGEL SPECTO Bowling

SPECTO CONTROLLER IP: specto-tlv.ddns.net

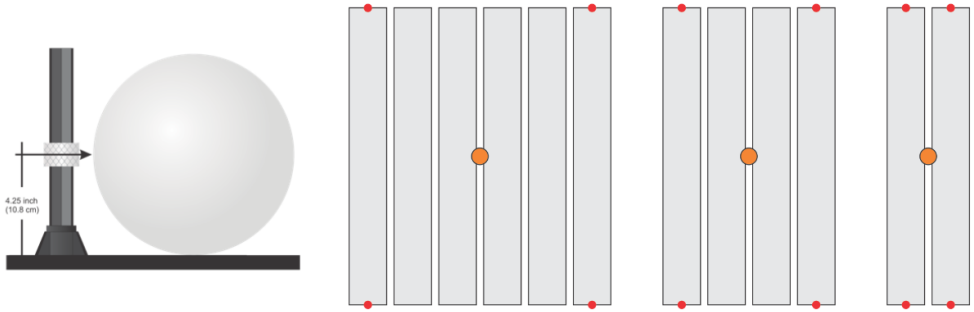
PLEASE CHOOSE SENSOR:

SpectoSensor on lanes 7 to 9, IP 10.0.0.151:5040

Position the calibration sticks to the furthest outside lanes at the foul line on the 20th board and around 54-55 feet on the 20th board as shown below.

CLICK ALIGN

Please remember to adjust the height of the reflector tapes on the calibration sticks to 4 ¼ (10.8 cm)



ALIGN

CALIBRATION CHECK

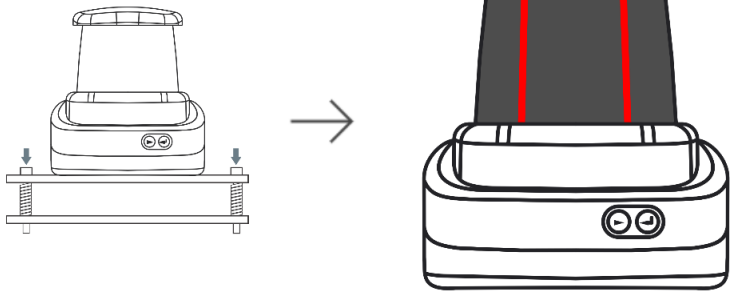
If you wish to check the status of your current calibration, please click Calibration Check.

KEGEL SPECTO Bowling

CHECK YOUR SENSOR FOR VERTICAL RED BEAMS

Adjust your sensor level until you see 2 beams from the front and two from the back calibration sticks.
Remember to set the height of the reflector tapes on the calibration sticks to the center of bowling ball.

THEN CLICK OK



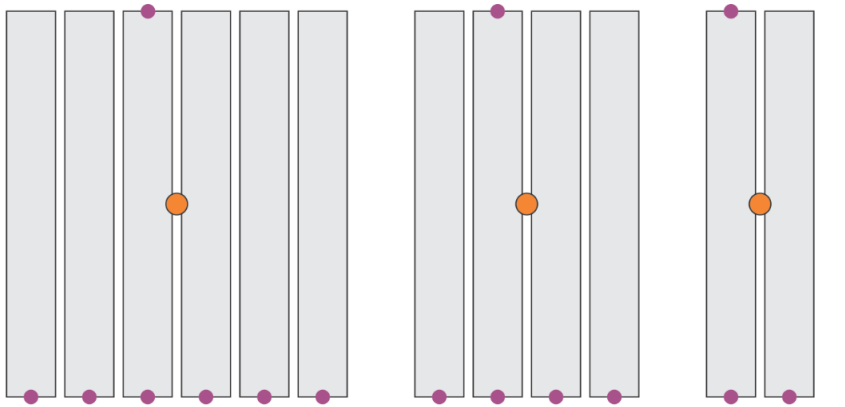
The drawing here is a conceptual presentation.
The actual proximity of the beams may vary
according to the number of lanes.

OK

KEGEL SPECTO Bowling

PLACE BOWLING BALLS ON THE LANES

PUT ONE BOWLING BALL ON TOP OF THE 20th BOARD AT THE FOUL LINE OF EACH LANE THAT SPECTO WILL USE.
PLACE ONE MORE BALL ON THE ADJACENT LANE AROUND 54-55 FEET ON TOP OF 20th BOARD.
CLICK SCAN.



6 LANES SETUP | 4 LANES SETUP | 2 LANES SETUP

SCAN

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SPECTO | BOWLING

KEGEL SPECTO Bowling

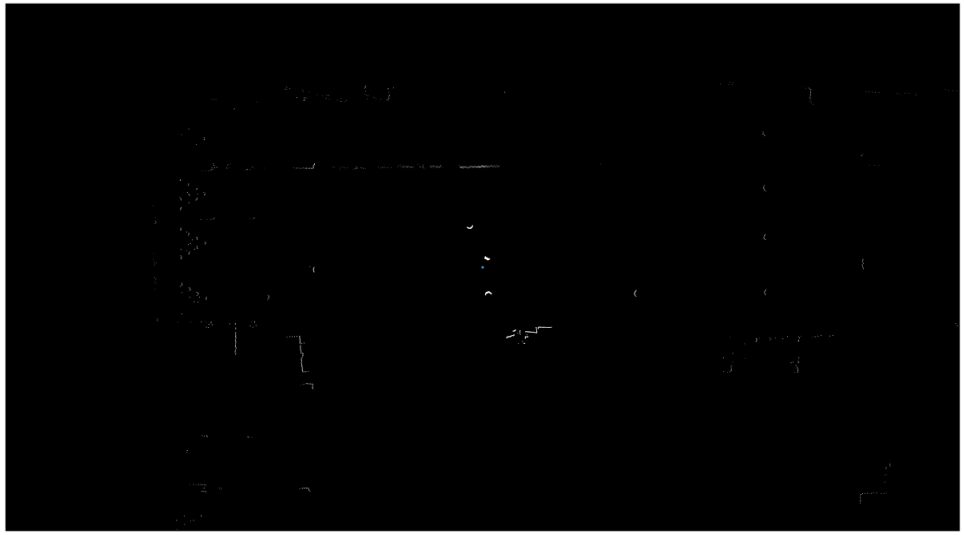
MARK THE BOWLING BALLS WITH THE CROSSHAIR CURSOR and CLICK CALIBRATE

Use the mouse wheel to zoom in and out, you can drag the view area to pan.

Marked bowling balls appear in color according to their coverage ratio, higher is better:

- High coverage (over 80%)
- Medium coverage (50% - 80%)
- Low coverage (Less than 50%)

Make sure you are not using a dark urethane ball.
If low coverage continues please re-align the sensor.



BACK TO SENSOR ALIGNMENT | RESCAN | CALIBRATE

KEGEL SPECTO Bowling

MARK THE BOWLING BALLS WITH THE CROSSHAIR CURSOR and CLICK CALIBRATE

Use the mouse wheel to zoom in and out, you can drag the view area to pan.

Marked bowling balls appear in color according to their coverage ratio, higher is better:

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- Low coverage (Less than 50%)

Make sure you are not using a dark urethane ball.
If low coverage continues please re-align the sensor.

BACK TO SENSOR ALIGNMENT | RESCAN | CALIBRATE

KEGEL SPECTO Bowling

CHECK THE POSITIONS OF THE BOWLING BALLS

Use the mouse wheel to zoom in and out, you can drag the view area to pan.

Marked bowling balls appear in color according to their coverage ratio, higher is better:

- High coverage (over 80%)
- Medium coverage (50% - 80%)
- Low coverage (Less than 50%)

Make sure you are not using a dark urethane ball.
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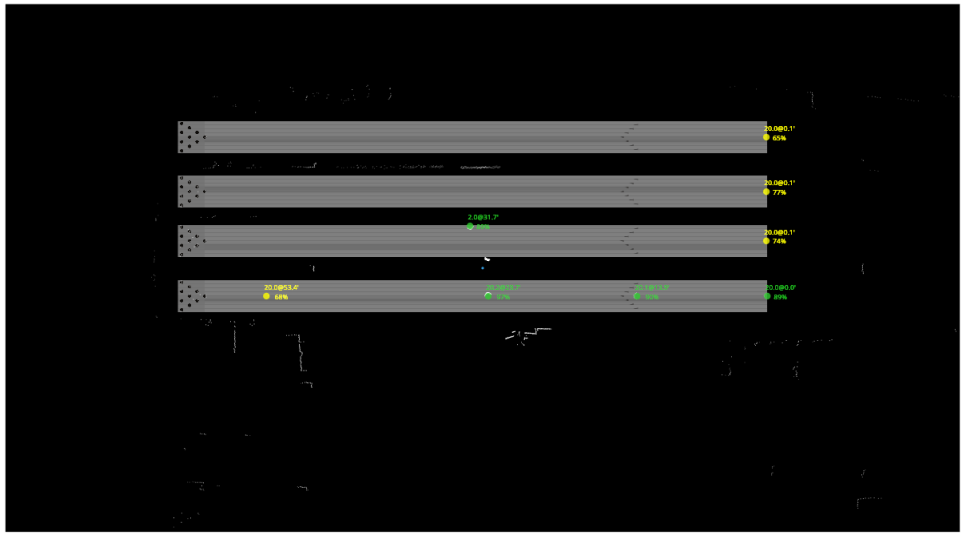


I want to do it again

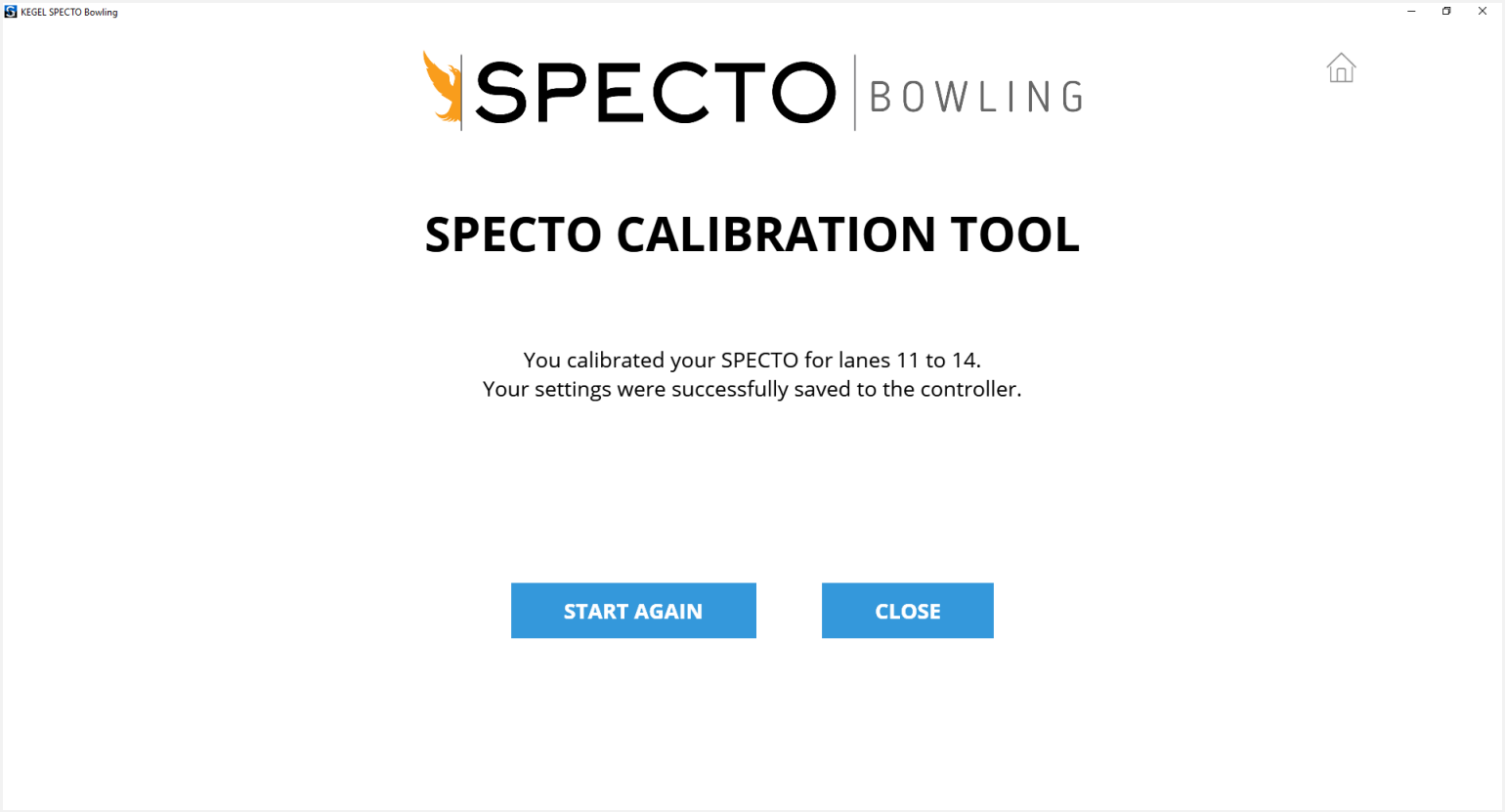
RE-CALIBRATE

REFRESH

Please enter starting lane number

11

SAVE

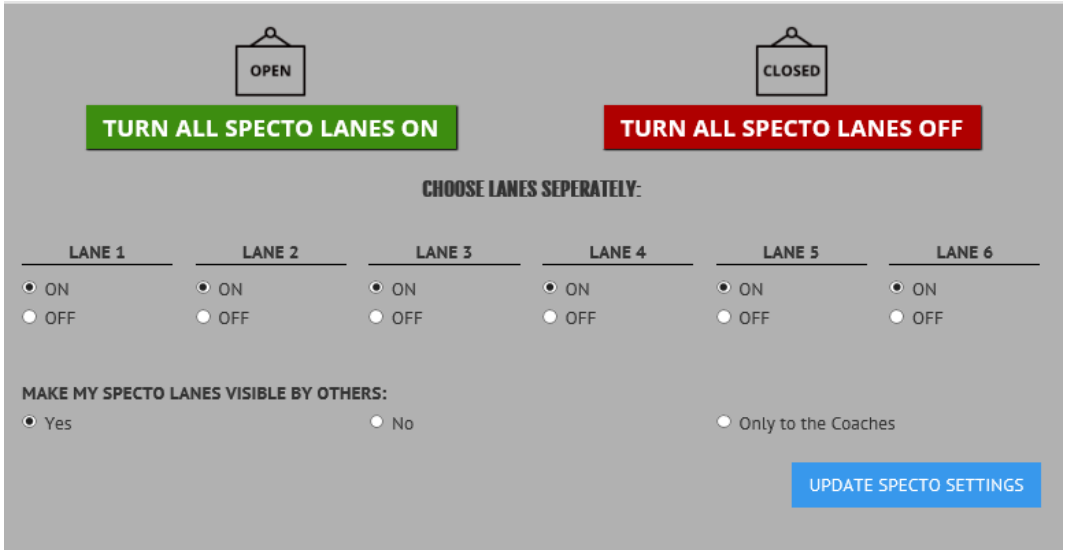

KEGEL SPECTO Bowling
SPECTO BOWLING
SPECTO CALIBRATION TOOL
You calibrated your SPECTO for lanes 11 to 14.
Your settings were successfully saved to the controller.
START AGAIN
CLOSE

BOWLING CENTER DASHBOARD

BOWLING CENTER DASHBOARD

The Bowling Center will have control of what lanes will be activated with Specto.

To do this, the bowling center must supply a ‘general’ email address that will be stored in the ‘cloud’. This will be used for the Control Desk to log in and have the ability to activate or de-activate Specto on the lane a particular customer is using.



BOWLING CENTER DASHBOARD

If the control personnel hands out lane 3 to the Specto customer, simply click the ‘On’ button for lane 3. If in the event the lane 3 Specto customer has completed his session, you may turn it off at the control desk, but it will still be actively open on the customers device.

MAINTENANCE / TROUBLESHOOTING

TROUBLESHOOTING

Shots dropping out:

- Dirt or debris on the Sensor's red cover can cause "phantom" reads, they can be seen when zooming in on the "check calibration" view in the calibration tool
- Bowler crossing the foul line
- Interference with the Sensor. (Not a clear path to bowling ball to read data)

Lines are not straight:

- Bowling Ball issue. (old urethane or certain dark colored balls)

TROUBLESHOOTING

Intermittent Pindeck Exit Data:

- Too much interference from the Pins
- Pinsetter rake is too fast
- Missing the head pin, if the ball gets behind it then there will be no clear path

Shots not being recorded:

- Not connected to the Network
- Bowling Ball issue. (old urethane or certain dark colored balls)

Not connecting / cannot log on:

- Internal internet not working
- The controller is not responding (reboot)
- Wrong IP address

MAINTENANCE

Not much maintenance is needed to operate year round. However, it's a good idea to periodically wipe down the red lens with a soft micro-fiber towel.

If the sensor should get bumped, kicked etc. it would be a good idea to check the calibration immediately. Refer to the Calibration section.

SPECTO TERMINOLOGY

Mobile App: Mobile app which is available for IOS and Android environments. It shows up to 10 data points and has a 3D view option.

Coaches App: It is an advanced app made for coaching and training. Can show up to 35 data points and has more features.

Live Mode: In live mode all shots are shown back to back on a selected lane

Session: A series of shots recorded and saved.

My Session: A series of shots recorded and saved by the bowler for any purpose.

Challenge Session: A predefined series of shots with a “challenge aim” which has to be performed by a bowler and the results are saved and ranked.

Ranking Session: 5-10-15 back to back shots made by bowler to see the level of bowler in terms of accuracy, repetition and consistency.

Practice Session: A predefined series of practice drills with defined goals which has to be performed by a bowler and the results are saved and ranked.

Deep Practice: A screen mode that the bowler can choose one topic to focus, define his/her target range for success and see his/her performance clearly without any distractions.

DATA ITEM DESCRIPTION

LOFT - Point when the sensor reads over 60% of the ball surface for the first time.

LAYDOWN POINT – Board position of the ball at launch.

ARROWS BOARD – Board at which the ball is located at the arrows. (15feet).

PATTERN EXIT – Board at which the ball is located at the pattern exit point.

BREAKPOINT BOARD – Board at which the ball was at its outmost position.

BREAKPOINT DISTANCE – Distance at which the ball was at its outmost position.

BREAKPOINT LENGTH – Distance the ball traveled on the breakpoint boa**rd.**

TRUE BREAKPOINT – Distance at which the ball was farthest away from the direct path to the pins.

ENTRY BOARD – Ball position at 59.5 feet.

PIN DECK EXIT – Ball position a the end of the pin deck.

PIN DECK DEFLECTION – The difference between the Entry Board and Pin Deck Exit board.

DATA ITEM DESCRIPTION

CUSTOM POSITION – Board position of the ball at the custom marked distance.

LAUNCH SPEED – The average speed of the ball in the first 3 feet after LOFT.

ENTRY SPEED – The average speed of the ball between 57 and 59.5 feet.

SPEED LOSS – The difference between the Launch Speed and the Entry Speed.

MAX SPEED LOSS – The difference between the Launch Speed and the Entry Speed.

AVERAGE SPEED – Is Calculated by the time it takes from Launch to Entry, divided by distance traveled.

CUSTOM SPEED – Allows you to slide the number located on the bottom of the lane image to help you locate the speed and board number you were located at the footage selected.

LAUNCH ANGLE – The angle the ball traveled the first 10 feet.

BREAKPOINT ANGLE – Total angle between launch and impact.

DATA DESCRIPTION

ENTRY ANGLE – The angle of the ball between 51 and 55 feet.

MAX ANGLE DISTANCE – Distance where the ball hit its maximum angle.

SKID – The length at which the ball does not changed path.

HOOK – The length at which the ball continues to hook.

HOOK BOARD – Board position of the ball where it started to change direction.

ROLL – The length at which the ball stops the Hook phase.

ROLL BOARD – Board position of the ball when its completed its change of direction.

REVS – Calculated/measured revolutions of the ball.

READ – The distance on the lane at which the ball first slows down.

MAX HOOOK DISTANCE – Distance at which the ball changes direction the most.

FULL RACK – Lets you know if First or Second shot.

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