TAKE AIM TECHNOLOGIES

SHOT TRACKER™

Take Aim ™ Technologies

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Version 1.5
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ShotTracker from Take Aim™

Product Details

Architecture
    Quad-core CPU
    Gyros
    Accelerometers
    5 MP Camera (1920x1080) with diagonal FOV 22.2°
    Powered by 2 CR123 Batteries
Runtime on fresh recharged batteries ~ 2.5 hours
Dimensions: 6" L x 1.3" W x 2" H
Weight: 6.5 oz.

Deluxe Kit Contains
- ShotTracker & Case
- T-wrench
- Battery Charger
- 4 Rechargeable Batteries

Our Mission

At Take Aim™ our passion is empowering the clay target shooter and sportsman to improve their accuracy and elevate their shooting skills to the next level. Our technology delivers an enhanced shooting experience that calculates and presents detailed shot performance data and statistics.

ShotTracker mounts to the barrel of your shotgun turning it into an intelligent device that analyzes each shot. The analysis is delivered using the ClayTracker application.

How It Works

Take Aim's patented SmartShot™ software turns your shotgun into an intelligent device. The SmartShot™ software analyzes your shot to provide immediate feedback on how well your shot was aimed at the clay target, range & velocity of the target, and the motion of the shooter. The corrections needed to make the next shot perfectly aimed are furnished both audibly and visually.

The SmartShot software uses the ShotTracker's integrated sensors to monitor the motion of the shooter and the shotgun. When a shot is detected, the images from the on board camera are analyzed to compute the flight path and velocity of the clay target.

The flight path and velocity of the pellet cloud are calculated to ascertain the point where the clay and the pellets will intersect. At this intersection point, the SmartShot algorithms estimate the number of pellets that will impact the clay and how much kinetic energy they contain. This information is used to compute the probability of breakage for the clay.

Finally, the software computes the corrections needed to make the next shot perfectly aimed.

Hardware Platform

Mobile Application

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

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a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

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b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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Storage

To remove the ShotTracker from the storage case, hold the unit at the barrel clamp and gently pull the unit away from the case.

To place the ShotTracker into the case, insert the bottom of the unit first and then gently pivot the unit pushing down until it is secure.

Getting Started

Battery Charging

Before using your ShotTracker fully charge the four rechargeable Lithium-ion CR-123 batteries. Place the batteries into the L16340 battery charger and plug the charger into a USB charging port. Each charging slot has four LED indicators. When all four LEDs are on constantly (no flashing) that battery is full charged. If all four LEDs flash continuously when a battery is placed in the charger, the charger could not start the charging process (the battery was very depleted). Remove the battery and place it in a different slot for charging. If the battery does not begin to charge, it has reached its end of life, please recycle appropriately.

As the battery is charging, once it has reached 25% charge the bottom LED will stay on and the LED next to the bottom will begin to flash. This sequence will continue as the battery reaches 50% and 75% charge levels. Once the battery is completely charged all four LEDS will be constant on.

Fully charged batteries should be removed from an un-powered charger.

Battery Installation

Using your thumb, push the battery door lock to the left to release the door. Open the door to access the battery compartment.

ShotTracker uses two standard CR123 Lithium batteries. Four rechargeable lithium–ion batteries should give you six hours of run time at the shooting range.

To remove the batteries, use the pull tab.

When placing batteries in the compartment, the + terminal of both batteries should be pointing upward.

Close the battery door and use your thumb to press and slide the latch to the right to lock the door.

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Operation
First Time Setup

Out of the case, the ShotTracker needs three items completed to be ready to analyze your shot. Until these items are completed, the ShotTracker's LED with flash magenta. The three items are:
1. A completed profile in the Profiles section.
2. A completed boresight for that profile.
3. An active Session in the Let's Shoot section.

Once these three criteria are met, the ShotTracker is operational and the LED will function as detailed below.

To turn the ShotTracker on/off - briefly press ⏻ until the LED flashes red.

LED Indicator Light

Red Blinking – Unit booting
Steady Green – Unit ON and Ready for next Shot
Fast Green Blink – Processing shot data
Blue Blink – ClayTracker App connected via Wi-Fi
Steady Magenta – Idle mode. The shotgun is in the loading position or pointing down/up. Once the shotgun has returned to a ready position, Ready for Shot (steady green) mode will be active. Idle mode is entered six seconds after the shotgun barrel is pointed down at the ground (waiting between shots) or pointed up towards the sky (sitting in a gun rack).
Flashing Magenta – The ShotTracker is not completely configured. Three items are needed to initially configure the ShotTracker:
1. A completed profile in the Profiles section.
2. A completed boresight for that profile.
3. An active Session in the Let's Shoot section.

Once these three criteria are met, the ShotTracker is operational and the LED will function normally.
Slow Red Blink – Low batteries. Replace with a fresh set of batteries.
White Blink - The ShotTracker's memory is getting full. You will need to go to the History page and delete sessions to free up memory.

If the ShotTracker becomes unresponsive, you can perform a hard reboot by pressing and holding the On/Off button for 10 seconds.

Downloading ClayTracker™ Pro Application

The ClayTracker™ Application can be downloaded to your smartphone/iPad/tablet from

In the Apple App Store or the Android Play Store, search for *Clay-Tracker Pro*. See red icon below, download and install the free app. The app allows you to configure the ShotTracker's settings, create profiles, and view the shot analysis.

Connecting to the Wi-Fi
The ShotTracker has built-in Wi-Fi. You do not need any other source of Wi-Fi.

Step 1 – Turning on ShotTracker
Turn the ShotTracker on by pressing the button ⏻ until the LED flashes red.

Step 2 – Smartphone Settings Configuration
Open Settings on your smartphone/iPad/tablet and go to Wi-Fi section.

Step 3 – WiFi SSID & Passcode
Open the ShotTracker battery door and look on the label (see sample below) to find the ShotTracker's SSID and Passcode. In the Wi-Fi Settings, select the ShotTracker's SSID and enter the Passcode.

ShotTracker CTS-1000	
Serial #:	A1RG836DA14B
SSID:	ST_836DA14BB
Passcode: 11223344	
Patent:	10,782,096
Contains	FCC ID: TFB-1004
Contains	IC: 5969A-1004
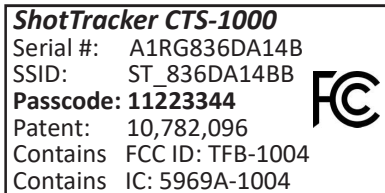
The ShotTracker is designed to connect to the ClayTracker Pro application over WiFi, The ShotTracker does not connect directly to the Internet.

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Launching & Using ClayTracker

Once the Wi-Fi connection is established, open the ClayTracker app. When the app is successfully connected to the ShotTracker, the BLUE LED on the ShotTracker will blink every five seconds to indicate that the app and the unit are connected.
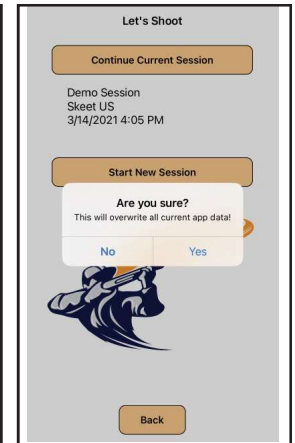
The first time an app connects to a new ShotTracker you will be prompted to answer several questions.
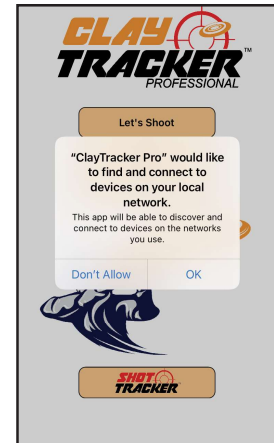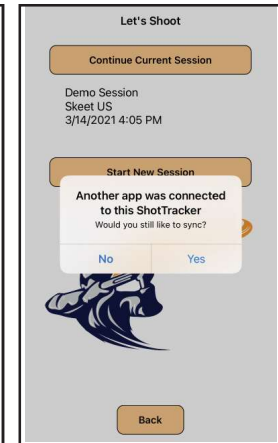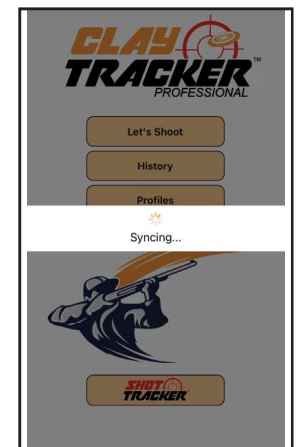

Select "Ok"   Select "Yes"   Select "Yes:

Every time the ClayTracker app connects to a ShotTracker, the app Syncs up to the database on the ShotTracker. Depending on the length of the Shot History and how recently the app has connected to the ShotTracker, this may take a few moments. During this time the Syncing message with the spinning disc will appear on the screen.

Once you are connected you will see the HOME page. From here you can access the four major functions of ClayTracker.

Main Menu Screen

Let's Shoot – Selecting this button lets you start a new shooting session or continue the previous session.

History – Selecting this button lets you view and review all the previous shooting sessions stored on the ShotTracker unit. The unit can hold up to 400 shots in memory.

Profiles – Selecting this button lets you set up a shooting profile for your shotgun and boresight the ShotTracker to your shotgun.

ShotTracker – Selecting this button lets you set the Trigger Detection Threshold for the ShotTracker so that each shot is detected. You can also get information on the ShotTracker's status including remaining battery life.

Setting Shot Detection Thresholds

The ShotTracker allows the user to set the threshold sensitivity for detecting that a shot was fired. From the Home Page, press the ShotTracker button to go to the ShotTracker settings page.

Initially set the threshold to 50. This will work for most shooters.

If you experience the ShotTracker not detecting a shot, move the detection threshold lower in small increments until the shot is detected.

If the ShotTracker detects a shot when the shotgun was not fired or multiple shots when only one was fired, raise the detection threshold in small increments until proper shot detection occurs.

Battery Type

The ShotTracker page contains the battery gauge. To get an accurate battery level, select the Battery Type field and scroll to the type of battery that is installed. The options are Lithium and Lithium-ion. Best performance is achieved using rechargeable Lithium-ion CR123 cells.

The Battery Level meter provides a relative battery charge level. Once the batteries go below 25% charge you should install fresh batteries soon.
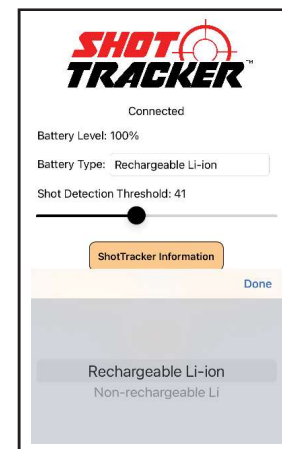
Factory Reset

The Factory Reset button is used to clear the shot information database in the ClayTracker application and reset the ShotTracker unit to factory settings. All data will be erased and the ShotTracker restored to its factory settings.
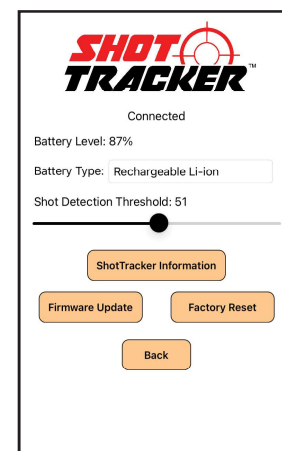
ShotTracker Information

The ShotTracker Information button provides all the details of the unit:

Serial Number:
Hardware Version:
Firmware Version:
Shot Data Space Remaining:
Lifetime Shot Count:
CPU Core Temperature:
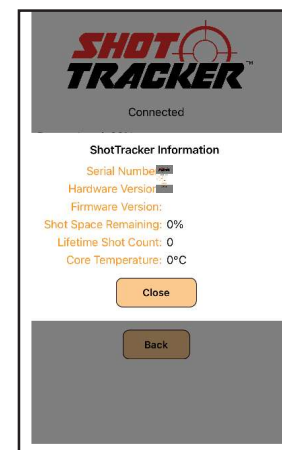
ShotTracker Information

If the ShotTracker Information button is grayed out and the top of the screen say Connected, the ShotTracker unit and ClayTracker app are not connected properly. There are two possible ways to correct this problem.

First turn off the ShotTracker , then delete and reinstall the ClayTracker app and finally turn the ShotTracker back ON and connect the WiFi.

If this does not work, press the Factory Reset button on the ShotTracker page. This will reset the ShotTracker to factory defaults and reinitialize the database. Previous shot history will be lost.

Firmware Update

Firmware updates for the ShotTracker are delivered using the ClayTracker app. From the ShotTracker page press the Firmware Update button. If a new version of firmware is available, you will be prompted on the process to update the unit.
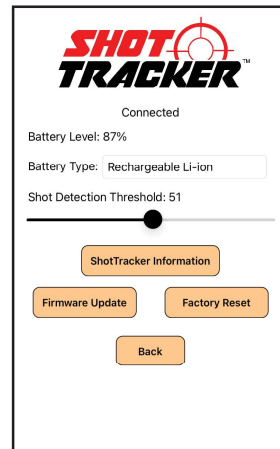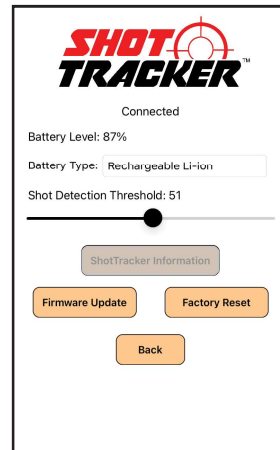
Mounting ShotTracker

CAUTION: Make sure the shotgun is unloaded before mounting / dismounting the ShotTracker.

Step 1 – Loosen Screw

Remove the ShotTracker from the storage case. Use the 9/64" Allen wrench to loosen the three silver mounting screws to open the clamp on the multi-guage barrel mount.

Step 2 – Place ShotTracker on Shotgun

Insure the protective rubber pads are properly attached to the barrel mount and slide the mount onto your shotgun's barrel. Place the ShotTracker as far back on the barrel as you like. Just be sure to leave enough space to activate the On/Off button.

FCC Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation. Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement: This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada: This Class B device meets all requirements of the Canadian Interference Causing Equipment Regulations. Cet appareil numerique de la classe B respecte toutes les exigences du Reglement sur le materiel broulleur du Canada.

ShotTracker
Contains FCC ID: TFB-1004
Contains IC: 5969A-1004

RoHS: ShotTracker products comply with the European Union's R0HS directive 2002/95/EC and similar regulations that may be adopted by other countries for European Sales.

For Support or Assistance contact Support@TakeAimTech.com or visit us at www.TakeAimTech.com

Step 3 - Alignment

Once the unit is placed at the desired position on the barrel, snug up the middle screw on the mount using the Allen wrench. Be careful to maintain a vertical alignment where the ShotTracker's camera is directly below the barrel.

Step 4 – Securely Tighten

When the unit is properly aligned, tighten all three silver mounting screws. The ShotTracker should be firmly mounted to the shotgun barrel.

Setting up Profiles

The ClayTracker app allows you to create a custom profile for your shotgun. Go to the Profiles page and select an existing profile to edit or add a new profile by selecting the Add Profile button.

To complete a profile, you will need to know the following:

- What choke is installed
- The ammo's pellet/shot size
- The ammo's Load Oz.
- The ammo's muzzle velocity
- The Point of Impact for your shotgun
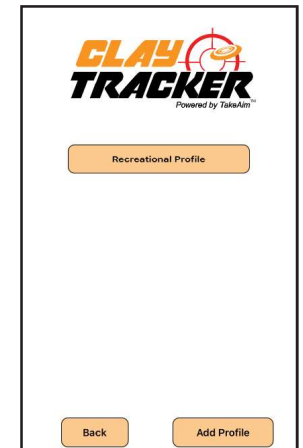
For additional details go to the Profiles Section of this document.

Profiles

The Profiles section allows you to create custom Profiles for your shotgun. This information is used by the ShotTracker's SmartShot™ software technology to analyze each shot. To create a new profile or edit a previously used profile, select the Profiles button from the Home page.
To create a new profile, select the Add Profile button.
To edit an existing Profile, select the Profile.
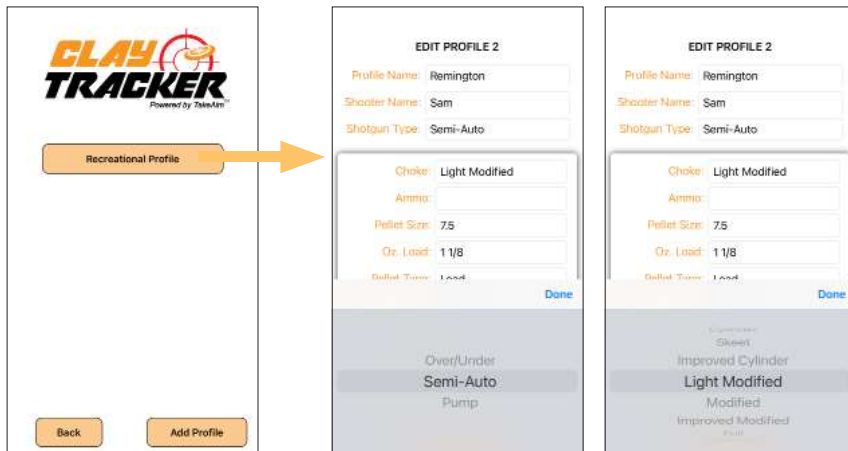
Completing the Profile

Profile Name: This is a text field where you give your Profile a name.
    For example: Jim's Beretta

Shooter Name: Enter your name or the shooter's name. For example: James

Shotgun Type: For this entry you can select from Over/Under, Semi-Auto, or Pump. For a single shot, single barrel shotgun (.410 Bore) use Pump.

Choke: For the choke type, you can choose from Cylinder, Skeet, Improved Cylinder, Light Modified, Modified, Improved Modified, Full, and Extra Full.

Ammo: This is a text field to record the type of ammo you are using. For example: Federal High Over All 12 gauge

Note – for an Over/Under shotgun you will have two sections to complete. One for the upper barrel and one for the lower barrel.

Purchaser assumes all liability, and as such, releases the Manufacturer from any liability for any accident, injury, damage, death, loss, illegal activity, or any other claim that may occur resulting from, or during use, of the Product, whether or not such use is foreseeable by the Manufacturer.

ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE APPLICABLE EXPRESS WARRANTY. ALL OTHER EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF NON-INFRINGEMENT, ARE DISCLAIMED.

Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to Purchaser. This warranty gives Purchaser specific legal rights, and Purchaser may also have other rights which vary by jurisdiction.

TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL MANUFACTURER BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, HOWEVER CAUSED REGARDLESS OF THE THEORY OF LIABILITY, ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT, EVEN IF MANUFACTURER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL MANUFACTURER'S LIABILITY EXCEED THE AMOUNT PAID BY PURCHASER FOR THE PRODUCT.

The foregoing limitations will apply even if any warranty or remedy provided under this Agreement fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to Purchaser.

Precautions

Read all of the gun manufacturer's safety information and safety instructions before handling the gun, installing the ShotTracker, or using the ShotTracker on a gun. Read and apply all of their instructions before using the ShotTracker to avoid injury. WARNING: Failure to follow these safety instructions could result in fire, electric shock, or other injury or damage.

Disposal information: Do not dispose of either the ShotTracker or batteries in a fire. Dispose of batteries in accordance with local laws and regulations.

Correct Disposal of this Product: This product should not be disposed of with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources.

ShotTracker Warranty and Return Policy

NEVER attempt to repair or modify the ShotTracker yourself. Disassembling a ShotTracker will cause damage that is NOT covered under the warranty. The ShotTracker does not contain any user replaceable parts, except the batteries.

Take Aim Technologies Development, LLC ("Manufacturer") warrants to the original end user ("Purchaser") that for the 1 year ("Warranty Period"), the ShotTracker and accessories ("Product") will be free from defects in materials and workmanship when properly installed and used for its intended purpose and in its intended operating environment.

This warranty does NOT apply to any Product that has been either:
(a) Disassembled example - front lens or mechanical housing
(b) Altered, repaired, or modified
(c) Damaged or destroyed by accidents or similar events or by any intentional, reckless or negligent acts or omissions of any party.

In the event of a defect, return the Product to the Manufacturer, but only after instructed to do so by the Manufacturer. Purchaser shall ship and bear the cost of shipping the Product to the Manufacturer and the Manufacturer shall bear the cost of shipping the Product back to Purchaser after the completion of service under this limited warranty. Purchaser's exclusive remedy and the Manufacturer's entire liability under this warranty will be for the Manufacturer at its option to repair or replace the Product or refund purchase price less any rebates. Manufacturer does not warrant against loss of any data (including data stored on Product returned to the Manufacturer for service), and assumes no liability for such loss.

Pellet Size: For this entry you can select from 7.5, 8, or 9.
Oz. Load: For this entry you can select from 1/2, 5/8, 3/4, 7/8, 1, 1 1/16, or 1 1/8.
Pellet Type: For this entry you can select from Lead or Steel.
Muzzle Velocity: This is a numeric field to enter the muzzle velocity of the round in feet per second.

All of the ammo specifications can be obtained from the top of the shotgun shell box.

ShotTracker supports analyzing different clay sizes/types including: Standard, Midi, Mini, Olympic, International, Battue, and Rabbit. Use the Clay Type field to make your selection. The default selection is Standard.

Prior to performing a Boresighting, you can set your shotgun's Point of Impact (POI). Use the Point of Impact field and Range to POI field to set your shotgun's POI. The default selections are 50/50 at 40 yards. For additional details on POI, see Appendix A.

When you have completed editing the Profile, press the Back button to leave the editing page.

To complete the Profile, perform a Boresight procedure.

Boresighting the ShotTracker

Before you take your first shot, you need to boresight the ShotTracker to your shotgun. To boresight the unit, you need to be in a position to stabilize your shotgun and aim at an object that is 10 to 30 yards away.

Step 1 – Getting Ready to Boresight

Turn on the ShotTracker and connect the ClayTracker app. Go to the Profiles Page, select the Profile you will be using and then Set Boresight.

The ShotTracker does not analyze my shot?

The ShotTracker uses multiple algorithms and process to analyze each shot. Shots that contain a cluttered background, especially a dark clustered background (i.e. continuous line of trees), can cause the processing of the shot to continue for more than 30 seconds. To keep this from delaying your shooting, the ShotTracker stops processing an shot if the analysis is not completed with in 30 seconds.

My Smart Phone alerts that there is no Internet access over Wi-Fi.

This is normal. When you are connected to the ShotTracker, you will not have access to the Internet over Wi-Fi. You will have Internet access on your smart phone via cellular data if that service is available based on cellular coverage.

What do the green circle and the purple ring mean on the Results Page?

The area inside the green circle represent the region where there is a 90% probability of breaking the clay. This means that for 9 out of 10 shots in the green the clay will break. It is also true that 1 out of 10 times it will not break.

Clays in the purple ring have a 5% probability of breaking. Clays that are on the outer edge of the purple ring and beyond have a less than 5% chance of breaking.

How do I Boresight the ShotTracker?

To boresight the ShotTracker to your shotgun, turn on the ShotTracker, launch the ClayTracker application and select Profile from the Home page. Next, select from the list the Profile corresponding to your shotgun. Determine what object you want to use for your boresighting target (i.e. the top corner of the high house, the back corner of the trap house….). With the ShotTracker firmly mounted to your shotgun (turned on with a green LED), press the Set Boresight button on the Profile page. Stabilize the shotgun while aiming at the boresight target and press the Begin Boresight button. Keep the shotgun stabilized on the boresight target for 5 seconds until the ClayTracker application "beeps".

Next, zoom in on the boresight image and touch your boresight aiming point to place a red reticle on the aim point. When the reticle is properly placed, press the Continue button.

Now enter the distance from where you were standing while boresighting the shotgun to the boresight aim point in yards. Then enter the distance from the ShotTracker lens to the end of the shotgun's muzzle in inches. Finally, enter the distance from the muzzle of the shotgun to the far end of the buttstock in inches. Press the Done button to complete the boresighting.

During a shooting session, how can I find out my Profile details without going back to the Profile page?

On the Results pages for any Shot Result, you can press the Shot Detail icon (the orange clay target on the bottom right side of the page). This will pop up a page that shows all of that shot's details including: Choke, Pellet Size, oz., Load, Pellet Type, Muzzle Velocity and Clay Target Type. Press the Close button to exit this screen.

My Smart Phone cannot connect to the ShotTracker Unit.

Check and make sure that your phone is not set for a VPN connection on WiFi.

Step 2 - Boresighting
When you are ready to boresight, press the Begin Boresight button and immediately stabilize your shotgun while aiming at your boresight target. Wait for the Beep (5 second timer) and your boresight image will appear.
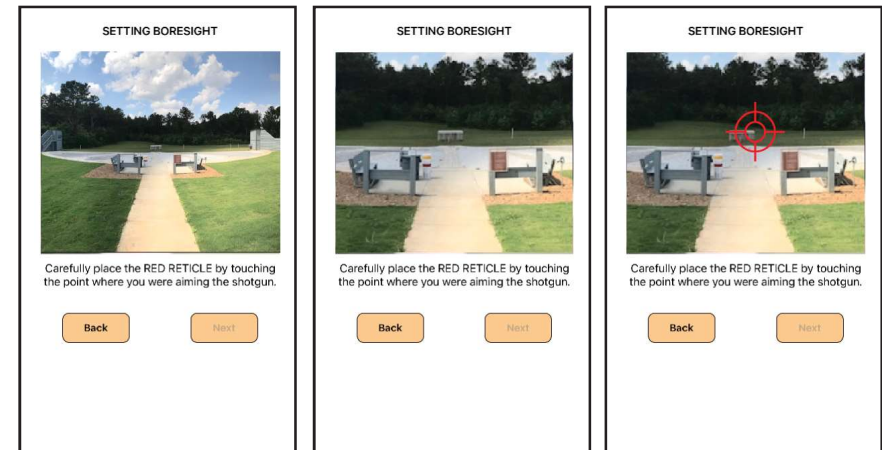
| Boresight aim point is the upper right corner of the trap house. | Using your fingers, zoom in on the upper right corner of the trap house. | Use your finger to place the red reticle on your boresight aim point. |
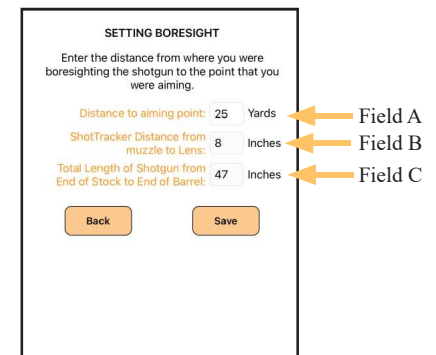
Step 3 – ShotTracker Placement
To complete the Boresight process, you need to measure three distances.

1. Measure the distance from the boresight aim point to the muzzle of the shotgun (yards) and enter this value in field A.
2. Measure the distance from the muzzle to the lens of the ShotTracker (inches) and enter this value in field B.
3. Finally, measure the distance from the muzzle to the end of the buttstock (inches) and enter this value in field.

Distance from muzzle to lens

Distance from muzzle to end of buttstock
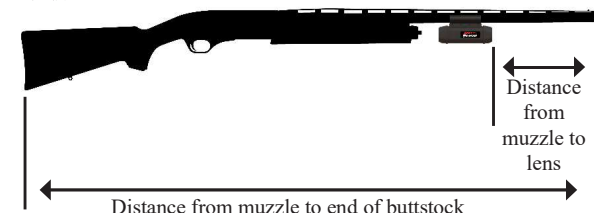
Once you have entered the three numbers, press Save to return to the Profile. Press Back to return to the Profiles page and Back again to return to the Home page.

Remember each profile needs to have its own boresight.

Let's Shoot
Now you are ready to begin your ShotTracker shooting session.

Starting a Session
From the Home page select Let's Shoot, then press Start New Session. In the text box, enter where you are shooting today and select which discipline you are shooting. The ShotTracker customizes the Results page based on the shooting discipline that is selected to insure that the most useful data is presented.
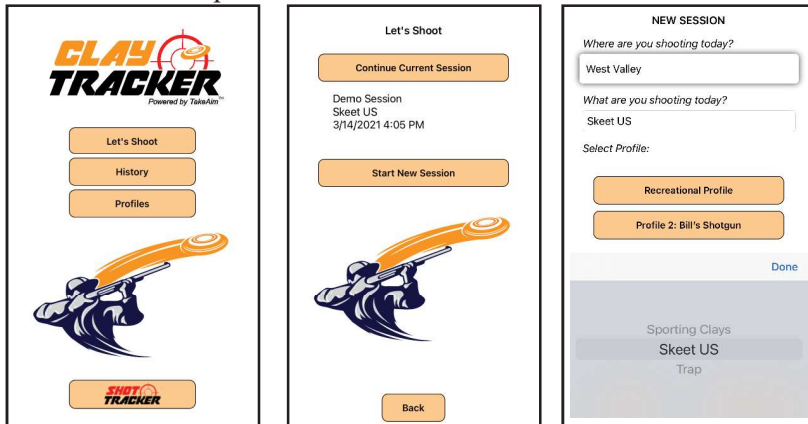
After you have selected you shooting discipline, select the profile you will be using. That Profile will be highlighted with an orange border.

Press Continue and wait for the Steady On green LED. Now you are ready to shoot.

To conserve the battery, turn the ShotTracker off when you are done shooting or taking a break.
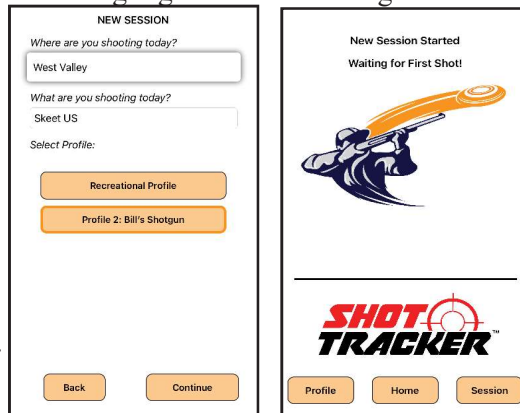
Troubleshooting / FAQs - continued
Which Profile is currently active in my shooting session?

On the Profiles page, the active Profile's button will have an orange border around it. From the Results page you can select the Profile button in the lower left hand corner to be taken to the active Profile.

How do I make Profile changes during a shooting session?

During a session, to make Profile changes to the Profile you are using (i.e. change a choke, change ammo, select a different clay target type….), go to the Profile button at the bottom of the Results page (NOTE: Make sure you are connected to the ShotTracker). That will take you to the Profile currently in use and allow you to enter Edit Profile mode. Once your edits are complete, select the Back button. Confirm your changes are correct. Then press Back again to return to the Results page. Your changes will take effect on the very next shot.

I make adjustments to my Profile and the Shot Results don't reflect the change.

If you made adjustments to a Profile and those changes are not being reflected in your shot Results, you might not be editing the active Profile being used in the Current Session. To make Profile changes to the Profile you are using during a session, edit the Profile from the Results page. See FAQ – How do I make Profile changes during a shooting session?

I'm getting Good Shot and Great Shot, but the clay is not breaking. What is going on?

Check your boresight. Shoot a position seven, low house on a skeet range. If you are aiming at the clay, the boresight should be in the center of the green circle. If it is, then you need to check your shotgun and ammo at a pattern board to see your POI is correct and that your ammo/choke combination is producing a uniform pattern. Inexpensive ammo can sometimes have "holes' or "gaps" in the pellet pattern distribution.

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Troubleshooting / FAQs

I have a blinking magenta LED.

The ShotTracker has not been configured. Complete a Shooter Profile with a boresight and start a new session.

I am getting 2nd shot detected when I only shot once.

The "Shot Detection Threshold" may be set too low. Inside the ClayTracker application, from the Home page go to the "ShotTracker" page. If the detection threshold is low (between 0 and 20), raise the detection threshold by 10. NOTE: you must be connected to the ShotTracker for this change to take effect.   If this does not correct the problem, raise the threshold some more until the false 2nd shot detections stop.

I fire my shotgun and no shot is detected (No flashing green LED)

The "Shot Detection Threshold" may be set too high. Inside the ClayTracker application, from the Home page go to the "ShotTracker" page. If the detection threshold is high (higher than 60), lower the detection threshold by 10. NOTE: you must be connected to the ShotTracker for this change to take effect.   If this does not correct the problem, lower the threshold some more until the shot is detected.

How do I connect the ClayTracker Application to the ShotTracker?

Download the ClayTracker Pro application from your Apple or Android store. Place fresh batteries in the ShotTracker unit and note the SSID and PASSWORD marked on the battery door, then turn the unit on. Go to Settings on your smart phone and select Wi-Fi connectivity. Select the SSID and enter the PASSWORD that you noted from the battery door label. Exit Setting and launch the ClayTracker Pro application. Select the ShotTracker button on the Home page. The top of the ShotTracker page should show you are Connected. Also, when the ClayTracker application is connected to the ShotTracker, the blue LED on the ShotTracker will flash every few seconds to indicate the two are connected.

Continuing a Current Session

When you begin shooting again after turning the ShotTracker off, you can either start a new session or you can continue with your previous session. To continue with your previous session, from the Home Page press Let's Shoot and then press Continue Current Session.

Shot Results

After each shot you will hear audible feedback and be presented with a Shot Results page. The Shot Results page is customized for skeet, trap and sporting clays and will include information from the following list.

The Result of your shot: Example - The center of your pattern was high and to the left.
Correction for a perfectly aimed next shot: Example - 50% more lead
Clay Flight Path: Example - Crossing Left To Right
Range to Clay at time of shot: Example - 20 yards
Clay Crossing Speed: Example - 43 MPH
Probability of Break: Example - High

Shot Detected, No Clay Found – If the ShotTracker cannot find a clay target in the camera images or is unable to determine shot results, "Shot Detected, No Clay Found" will be displayed and delivered audibly. You will still be able to see the video imagery of the shot by pressing the Simple Panoramic button.

Reading the Graph

Purple Ring - Effective Pattern - Clays in inner half of the purple ring have a 5% probability of breaking. Clays on the outer edge of the purple ring and beyond have a less than 5% probability of breaking.

Green Circle - Crush Zone - Clays in the green circle have a 90% probability of breaking the clay (9 out of 10 break and 1 out of 10 does not).

Black Barrel with green T - where you were aiming with respect to the clay when you pulled the trigger.

Red Reticle - Aim Point for a perfectly aimed shot (does not appear when it is a Great Shot).

TRACK - Pressing this button presents you with the last five barrel positions leading up to trigger pull.

Shot Details Icon -   Pressing this icon takes you to the Shot Details popup that contains detailed information about the shot. You can also access the Simple Panoramic View from this popup. To view the Simple Panoramic images you must be connected to the ShotTracker over WiFi.

Touching the sky blue background toggles off and on a one foot reference grid on the graph.
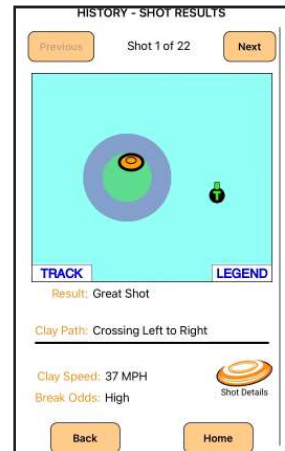
Shot Processing - Shooting Doubles

When the ShotTracker's LED is Steady Green, it is ready to process a shot. After a shot is detected and being processed (Flashing Green LED), the unit continues to collect information for ten seconds. If a second shot occurs during that 10 seconds, that shot's information is analyzed and presented after the first shot's Results are presented.

The ShotTracker analyzes the clay target closest to the boresight. When shooting doubles in skeet if you are hitting the first target late in its flight, the ShotTracker may pick up the second clay in its field of view. If the second clay happens to be closer to the boresight than the first clay, you may get unusual shot analysis results.

Shot Processing Time

The ShotTracker contains various SmartShot software algorithms for detecting and analyzing your shot. Some off the algorithms process the information rapidly and present the results in under two seconds. For shots where there is a complex back ground (trees, foliage, broken clay debris fields..), some of the more advanced algorithms are invoked and shot processing time can be longer. If after 30 seconds the ShotTracker cannot find a solution, it will discontinue processing the shot and return to Ready Mode.

Sample POI of 50% / 50%

The red cross hair denotes the center of the shot pattern (using the mark made in the center hole of the template).

The red circular dot is the Point of Aim (reference sight picture previously shown).

The large red circle is 30" in diameter.
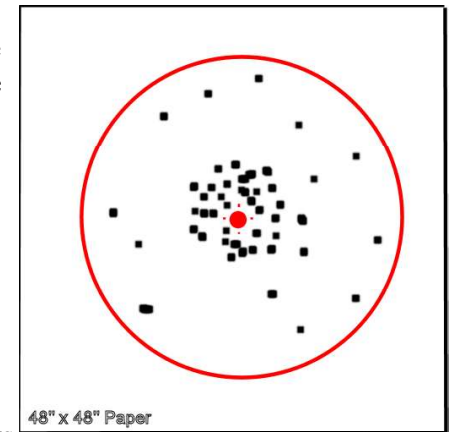
The distance between the two marks is 0" (they are on top of each other). Therefore the POI is 0" above the POA. From the table above this gives us a 50% / 50% Point of Impact.

Sample POI of 90% / 10%

The red cross hair denotes the center of the shot pattern (using the mark made in the center hole of the template).

The red circle dot is the Point of Aim (reference sight picture previously shown).
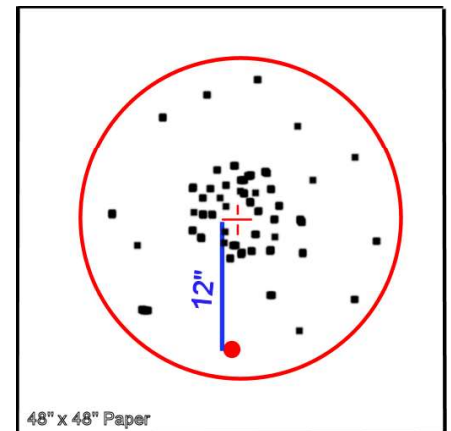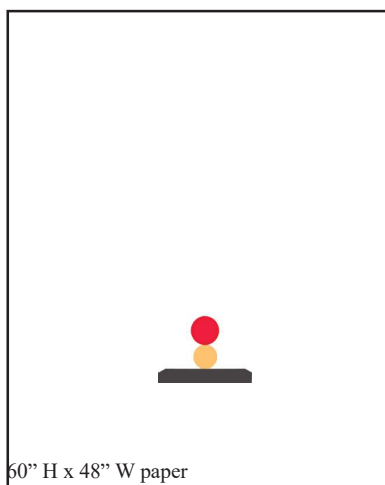
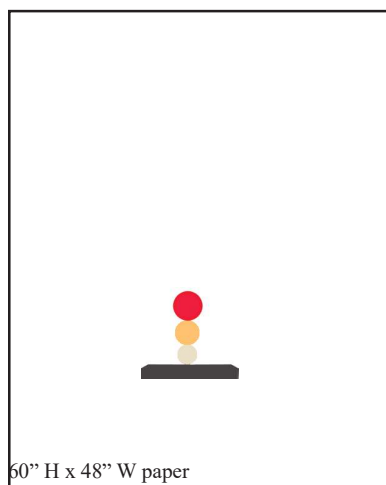The large red circle is 30" in diameter.

The distance between the two marks is 12". Therefore the POI is 12" above the POA. From the table above, this gives us a 90% / 10% Point of Impact.

Proper point of aim for both single bead and front with mid-bead sight.

60" H x 48" W paper

60" H x 48" W paper

Front bead sight   Front and mid-bead sight

The target is shot 3 times. This gives a denser pattern to examine. After the pattern paper is recovered, a template 30 inches in diameter with a center hole is placed on the pattern and moved around to cover the most pellet holes. A mark is made through the center hole onto the paper and the template is set aside. Next, measure from the mark denoting the center of the pattern to the center of the aiming point; up, down, right or left. With these measurements one can determine where the center of the pattern is in relationship to the aiming point.

Results for Skeet Shot

The Results for this skeet shot show that the clay was in the Green Zone. Based on that you would hear "Great Shot". The clay had a crossing velocity of 37 MPH crossing left to right with a High probability of breakage.

Pressing the **Shot Details** icon reveals information concerning the profile and the shot including whether this shot was a first shot or second shot, the range to the clay and the correction needed to make the next shot perfectly aimed.
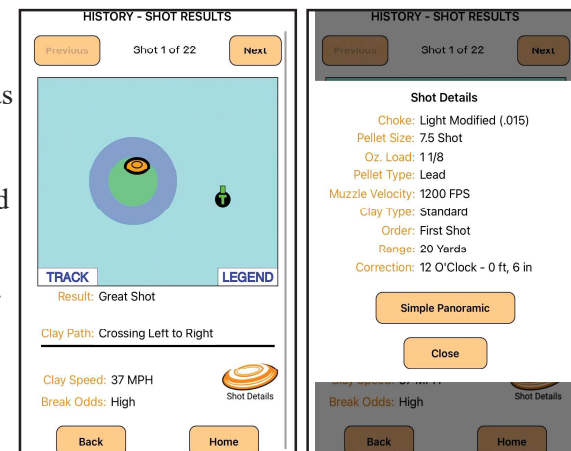
Pressing the **Simple Panoramic** button on the Details popup displays a slow motion playback of the flight of the clay with a red reticle marking the boresight. The imagery covers the one second before trigger pull, trigger pull (green border) and 0.25 seconds after trigger pull.

Back on the Results graph, pressing **TRACK** shows a slow motion playback of your barrel's position with respect to the clay leading up to the trigger pull. When the barrels are all stacked on top of each other, that shows that you were stable and matching the speed of the clay prior to pulling the trigger. If the barrels are spaced out you were either accelerating or decelerating prior to the trigger pull.

The barrel sequence is 5 - 4 - 3 - 2 - 1 - T with T being the trigger pull.

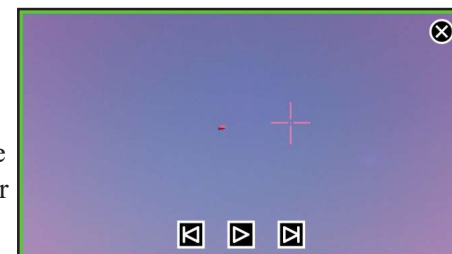If a red reticle is shown, that is where you should have been aiming for a perfectly aimed shot.

Results for Trap Shot

The Results for this trap shot show that the clay was in the Green Zone. You would hear "Great Shot". The clay was 41 yards away at trigger pull and had very little cross velocity.

Pressing the **Shot Details** icon reveals information concerning the profile and and the shot. Also available is whether this shot was a first shot or second shot and the correction needed to make the next shot perfectly aimed.
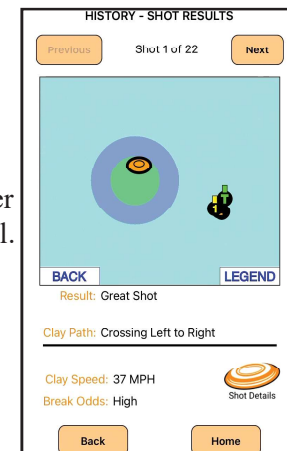
Pressing the **Simple Panoramic** button on the Details popup displays a slow motion playback of the flight of the clay with a red reticle marking the boresight. The imagery covers the one second before trigger pull, trigger pull (green border) and 0.25 seconds after trigger pull.

Back on the Results graph, pressing **TRACK** shows a slow motion playback of your barrel's position with respect to the clay leading up to the trigger pull. When the barrels are all stacked on top of each other, that shows that you had a stable lead as you were tracking the clay prior to pulling the trigger. If the barrels are spaced out you were either accelerating or decelerating prior to the trigger pull.

Barrel sequence is 5 - 4 - 3 - 2 - 1 - T with T being the trigger pull.

If a red reticle is shown, that is where you should have been aiming for a perfectly aimed shot.
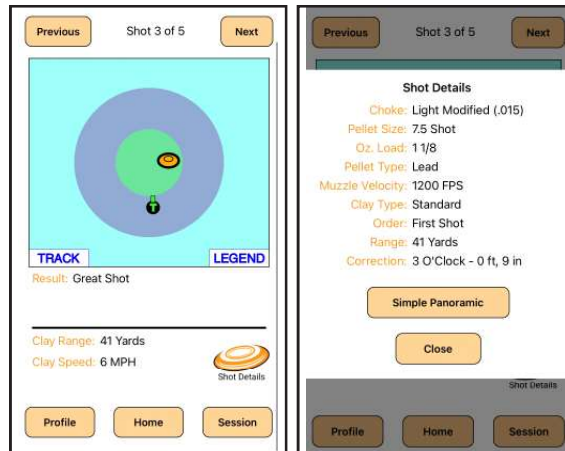
Point of Impact Table

Point of Impact Pattern	Center of Pattern with respect to POA
50% / 50%	0" High
60% / 40%	3" High
70% / 30%	6' High
80% / 20%	9" High
90% / 10%	12" High
100% / 0%	15" High

All data references a 30" circle target at 40 yards.

Shotguns can be configured for different POIs for different situations. To determine your shotgun's POI, you can do a pattern board test. Detailed instructions are below.

To perform the patterning you will need:
- A safe range to do the testing
- Several large pieces of white butcher paper that are 48"x48"
- Something to hold the paper in place (a wooden frame, for example)
- A way to measure a 30" circle on the paper and the center point of the circle
- A marker to put a red aiming dot or "cross hair aiming point" on the paper

Determining a Shotgun P.O.I.

POI testing is typically done at a range of 40 yards. The shotgun is shot from a shooting bench using a front and rear rest. A sheet of paper at least 48" square (60" H x 48" W preferred) is used and is marked with a center aiming point 3 inches in diameter.

The shooter will use the sight picture appropriate for the type of shotgun being tested (single front bead or front with mid-bead). In all cases, the center aiming point (red circle) should be sitting on top of the front bead as shown in the following images.

Appendix A – Advanced Boresighting

Point of Aim

The generally accepted Point of Aim for shotguns with a single front bead is the top of the bead. If you were boresighting on white paper with a RED dot at least 10 yards away, your sight picture would look like the picture below.

Front bead: Correct sight picture for a shotgun with a single front bead sight.

Some shotguns have a front bead sight along with a mid-bead sight. The generally accepted Point of Aim for this type of sight is forming a figure 8 with the mid-bead on the bottom and the front bead on top with your target sitting on top of the front bead. If you were boresighting on white paper with a RED dot at least 10 yards away, your sight picture would look like the picture below.

Front plus mid-bead: Correct sight picture for a shotgun with a front bead and mid-bead sight.

Point of Impact

Point of Impact (POI) is defined loosely as the relationship between the center of a shotgun pattern and a correct Point of Aim on the shotgun. Point of Impact and Point of Aim are closely related. Most shotguns have a POI of 50%/50%. This mean 50% of the pattern is above your Point of Aim and 50% of the pattern is below the Point of Aim at 40 yards. The following table lists typical POIs.

Results for Sporting Clays Shot

The Results for this sporting clays shot shows that the clay was in the edge of the shot pattern. The audio track "The center of the shot pattern was low and to the left" would be heard. The red reticle shows the proper aim point to put the the center the pattern on the clay. The clay was 38 yards away at trigger pull and was crossing right to left at 12 MPH.


Pressing the **Shot Details** icon reveals the shotgun and clay details. Also available is whether this shot was a first shot or second shot and the correction needed to make the next shot perfectly aimed.

Pressing the **Simple Panoramic** button on the Details popup displays a slow motion playback of the flight of the clay with a red reticle marking the boresight. The imagery covers one second before trigger pull, trigger pull (green border) and 0.25 seconds after trigger pull.

Back on the Results graph, pressing **TRACK** shows a slow motion playback of your barrel's position with respect to the clay leading up to the trigger pull. In this shot the shooter was still accelerating to get ahead of the clay when the trigger was pulled. Also, the shooter twitched and dipped their barrel at trigger pull. The red reticle is shows the aim point to make this a perfectly aimed shot.

For this shot the correction would be raise your previous aim point, lessen your lead by 50% and try to match the clay speed.
Barrel sequence is 5 - 4 - 3 - 2 - 1 - T with T being the trigger pull.
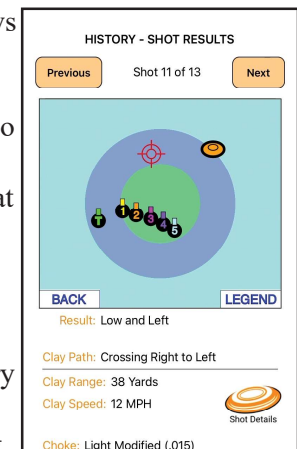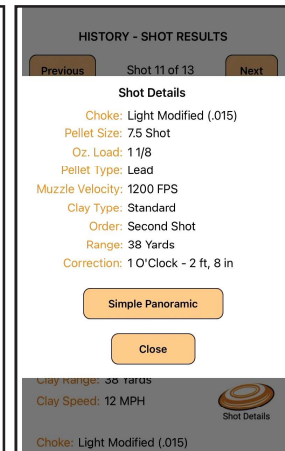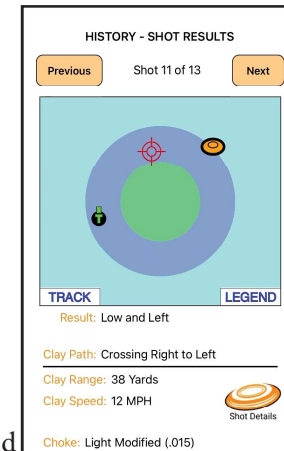
TRACKER Feature Detail

The TRACKER feature provides an analysis of your shot indicating how stable your lead was and how well you were matching the clay's speed. To access this analysis press, the TRACK icon in the lower left corner of the Results graph.
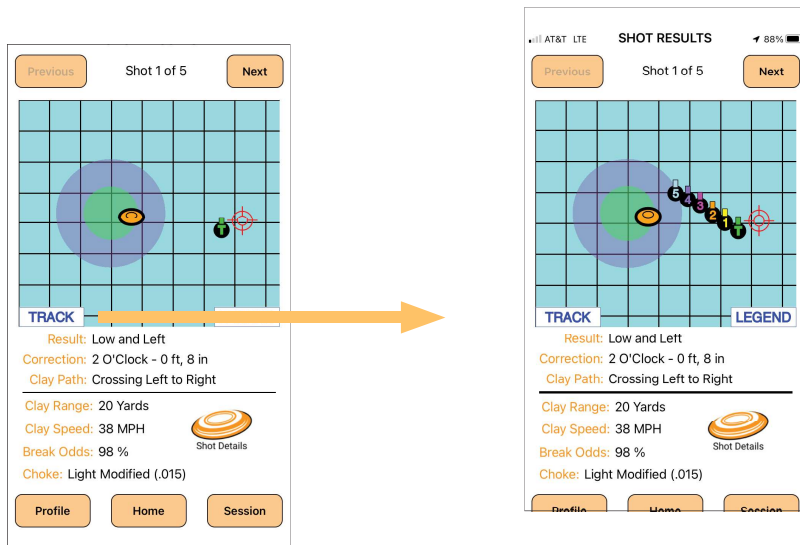

The graph shows the barrel position with respect to the clay leading up to the trigger pull (barrel with green T).

- Barrel 5 represents the barrel position 0.166 seconds before the trigger pull. At this time the barrel is ~9" in front of the clay and 12" above the clay.
- Barrel 4 represents the barrel position 0.133 seconds before the trigger pull. At this time the barrel is ~12" in front of the clay and ~11" above the clay.

History

The History button on the Home Page will take you to a list of all the sessions that are saved on the ShotTracker. This page will also provide you with the total number of shots that the ShotTracker has processed.

On the Session history page, selecting a Session will take you to the last shot in that session. You can use Previous and Next to scroll through all the shots for a session.
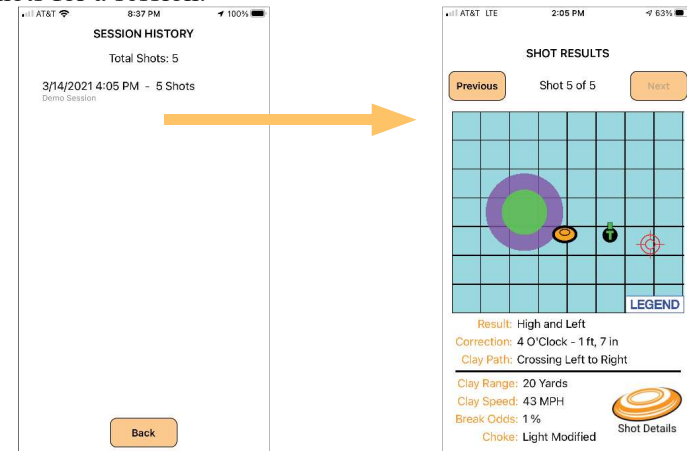
To access the Simple Panoramic images you will need to be connected to the ShotTracker unit. If you are viewing many Simple Panoramic shots at the end of a shooting session, place the ShotTracker in a position such that Idle mode is active. For instance if the ShotTracker is not mounted to your shotgun, place in camera lens down on a table with the lens cap installed. This will preserve battery life.

The ShotTracker can hold up to 400 shots in memory. When you are done with a session and no longer need the history, you can free up memory and delete the session by "left swiping" on the session you want to delete and pressing Delete.
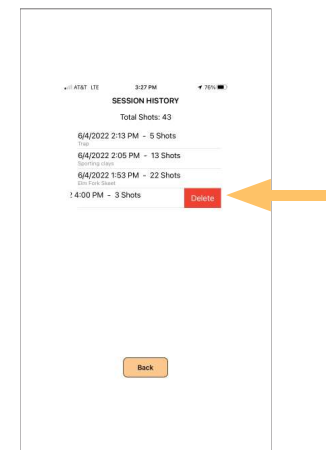
Again, the images for Simple Panoramic are stored on the ShotTracker. To view these images the ShotTracker must be turned ON and you must be connected to the ShotTracker.

Notable Points

- The Trigger Pull image has a Green border.
- You can touch the screen at any time during the viewing of the imagery to stop and enable screen controls - Single Step Forward - Play - Single Step Backward.
- Starting at the image 0.47 seconds before trigger pull, you can see a commercial airliner fly across the imagery.
- This imagery is of the first shot of a pair. In the last image just below and to the right of the boresight reticle, you can see the second clay come into view.

- Barrel 3 represents the barrel position 0.1 seconds before the trigger pull. At this time the barrel is ~18" in front of the clay and ~9" above the clay.
- Barrel 2 represents the barrel position 0.066 seconds before the trigger pull. At this time the barrel is ~24" in front of the clay and ~6" above the clay.
- Barrel 1 represents the barrel position 0.033 seconds before the trigger pull. At this time the barrel is ~30" in front of the clay and even with the clay.

The shooter was accelerating, increasing the lead during the last 0.2 seconds before the trigger pull.

In the case where the shooter matches the speed of the clay, all of the barrel positions would be stacked on top of each other.

Simple Panoramic Feature Detail

Pressing the Simple Panoramic button on the Shot Details popup starts a slow motion imagery progression of the flight path of the clay starting one second prior to trigger pull, including trigger pull (green boarder) and one-quarter second after trigger pull. The ShotTracker must be on and the ClayTracker app connected to see the imagery. Below is a High House, Position 4 shot.

Loading Images
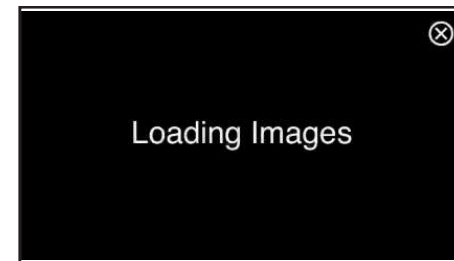
1.07 seconds before trigger pull

1.00 seconds before trigger pull

0.93 seconds before trigger pull

0.87 seconds before trigger pull

0.27 seconds before trigger pull

0.20 seconds before trigger pull

0.80 seconds before trigger pull

0.73 seconds before trigger pull

0.13 seconds before trigger pull

0.07 seconds before trigger pull

0.67 seconds before trigger pull

0.60 seconds before trigger pull

Trigger pull

0.53 seconds before trigger pull

0.47 seconds before trigger pull

0.07 seconds after trigger pull

0.13 seconds after trigger pull

0.40 seconds before trigger pull

0.33 seconds before trigger pull

0.20 seconds after trigger pull

0.27 seconds after trigger pull