Document Summary:

This document contains a flowchart of steps to fully utilize OptimalFlight's RealTime feature with the main application (Flights A-D) and the Multi-Club Profiler (Flights 1-20).

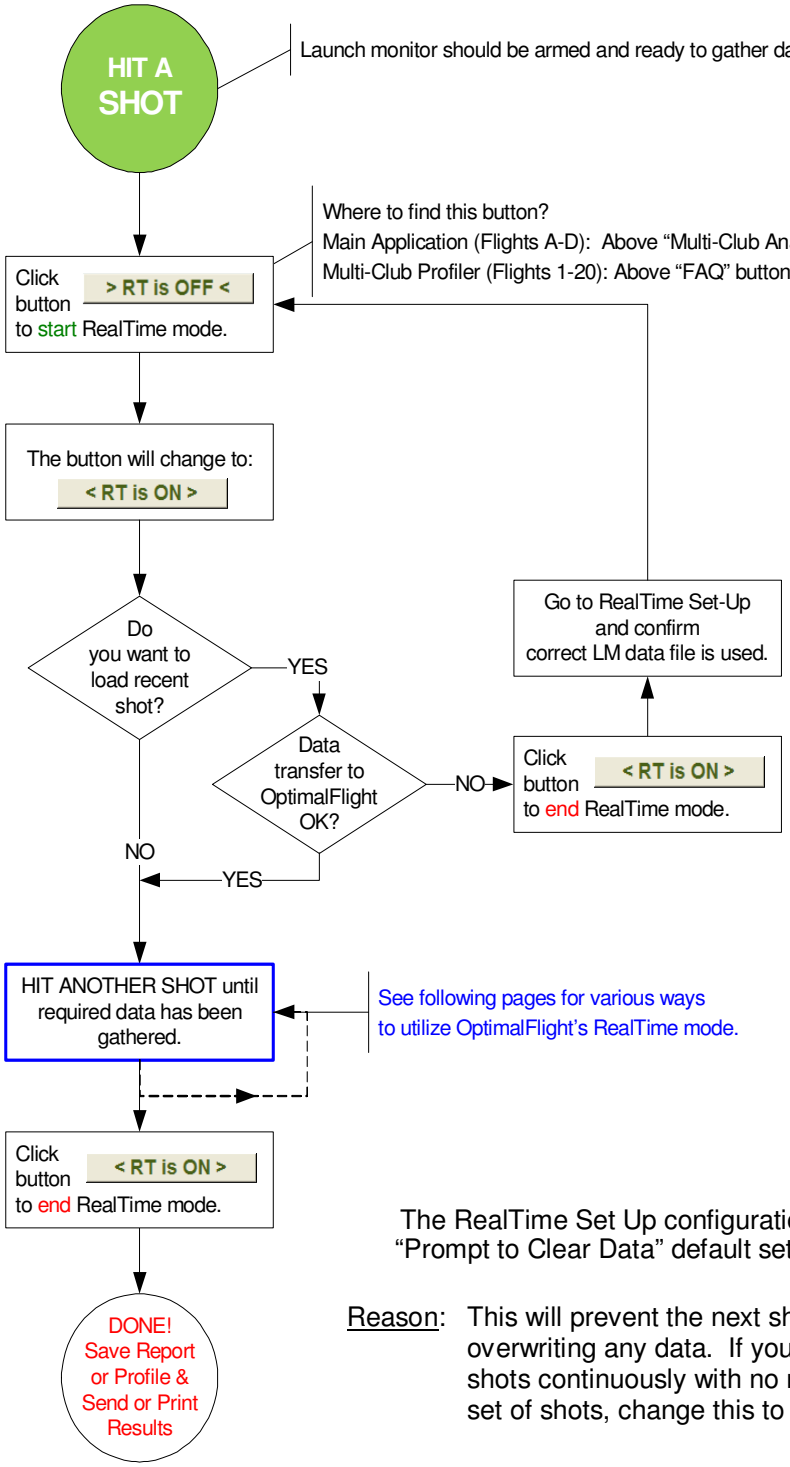
Prerequisites: OptimalFlight is set up to interface with the launch monitor's log file. See document OF-102 for details.

This is a basic outline of how OptimalFlight's RealTime feature can be used:

The following pages cover number of scenarios of gathering launch data in the "HIT ANOTHER SHOT" step.

- Gathering a set of shots
- Shot-to-Shot
- Full Bag Profiling

and more!

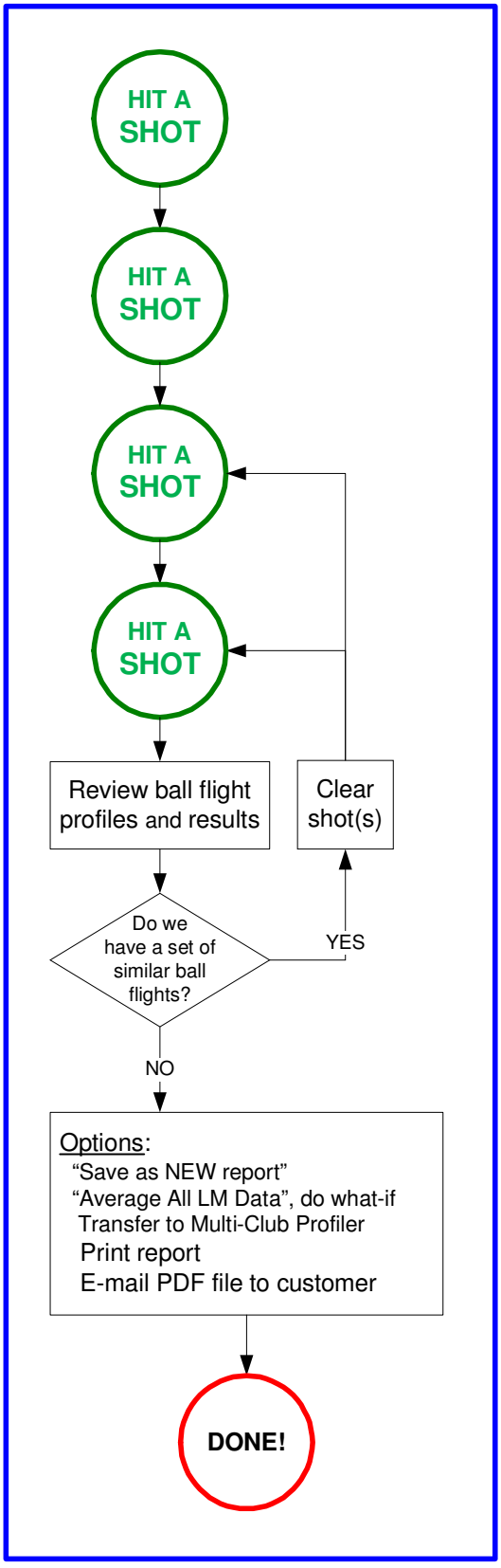


The RealTime Set Up configuration option of "Prompt to Clear Data" default setting is **YES**.

Reason: This will prevent the next shot from overwriting any data. If you want to hit shots continuously with no review after a set of shots, change this to NO.

- It is highly recommended time is taken to stretch, warm up, and hit practice shots before using the launch monitor.
- The goal is to be comfortable with the hitting area with a normal full swing.
    - It is unnecessary to max out a swing at 100-105% of effort.
    - It is more beneficial to swing the golf club with controlled and repeatable manner consistent with how the club is used on the course (stance, address position, tempo, effort).

RealTime Tasks:



Gathering a Set of Shots & Defining a Basic Ball Flight Profile

One golf shot is merely an observation. A **set** of shots helps establish a recurring and repeatable pattern of ball flights.

The average launch conditions from a set of SIMILAR ball flights offers a high quality data summary for decision making. Additional data gathered, by golfers or robots, with similar ball flight patterns are unlikely to tell us any new actionable information.

How many shots are required for a basic ball flight profile?

- 3 to 4 shots in the main OptimalFlight application.
- 3 to 6 shots in the Multi-Club Profiler application. Additional shots up to n=20 is optional.

Let's get started!

- ❑ Is the launch monitor **ON** and ready to gather data?
  - ✓ Some systems need to have 'auto-arming' for automatic gathering of data without manual intervention on every shot.
- ❑ Is OptimalFlight running with RealTime mode **ON**?
- ❑ Gather initial set of **4** solid strikes! Try not to look at launch monitor on every shot. Stay focused on producing 4 similar swing and hits as possible. Assess the results afterwards!

Similar ball flight review can objectively be done using OptimalFlight's SIDE and TOP VIEW graphs (recognizing obviously unusual flights) or reviewing TrueFlight Average Differences (discard ball flight(s) with largest average difference). Note: The TrueFlight Average feature is only available in the main OptimalFlight application for Flights A-D.

The shot-to-shot consistency feedback graph can also be used as part of the similar ball flight review process. See page 7 on how to do this.

The value of individual shot launch data diminishes when we have an average of similar shots to work with. The remaining value of individual shot data is to show shot-to-shot dispersion.

- ➢ The main application of 4 flights offers a shot-to-shot consistency tool to analyze this.
- ➢ The Multi-Club Profiler offers advanced tools for a more in-depth analysis using more than 4 shots.

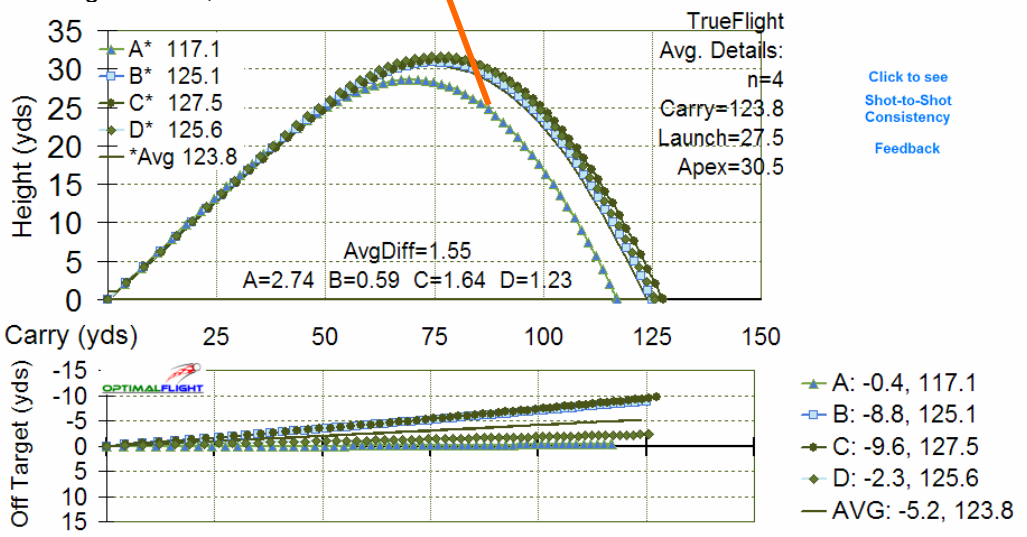
Saving the data offers an option to revisit this set of data for further review and analysis.

Similar Shot Analysis Tips

Similar set of shots, Flight A appears to be different in the side view summary

You have two options:

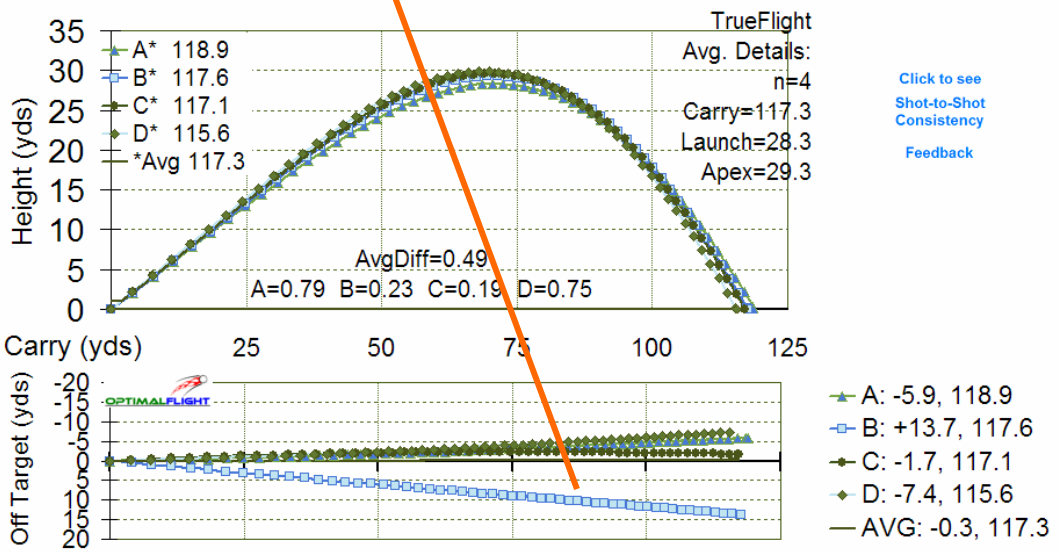
- Exclude Flight A.
- Clear Flight A data, hit another shot.



Similar set of shots, Flight B has an unusual horizontal launch angle

You have two options:

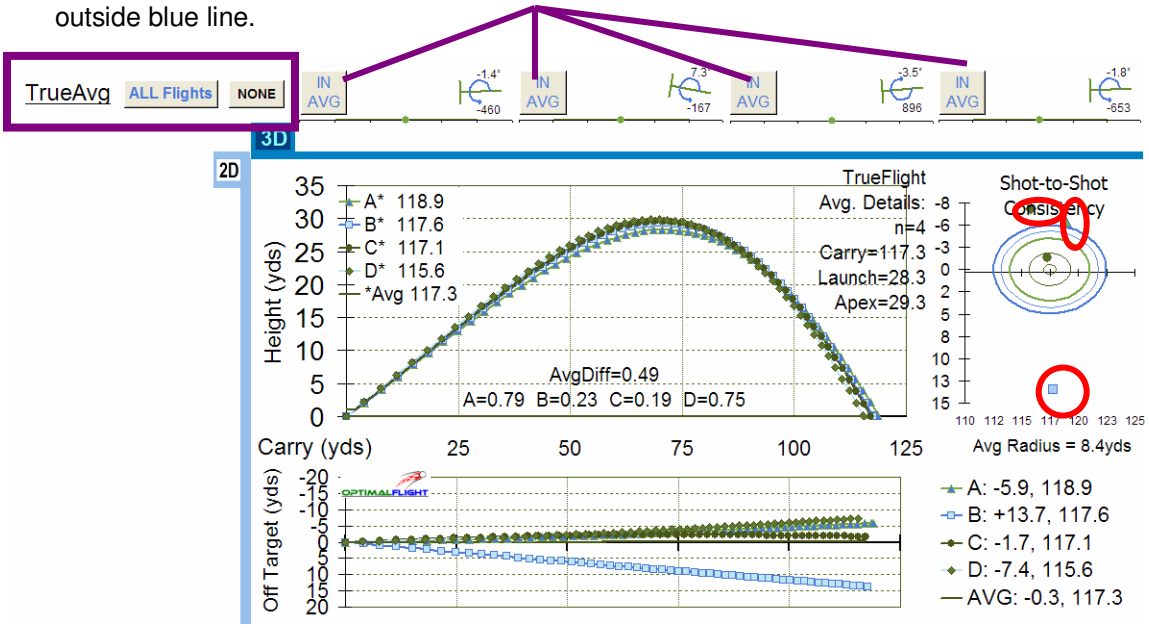
- Include it in the average summary analysis and focus the fitting on the primary 3 launch measurements (Ballspeed, Launch Angle, and Spin)
- Exclude it and hit another shot. *This option makes sense <u>only if</u> you have a launch monitor system producing **actionable** sidespin **and** push/pull or horizontal launch angle measurements.*



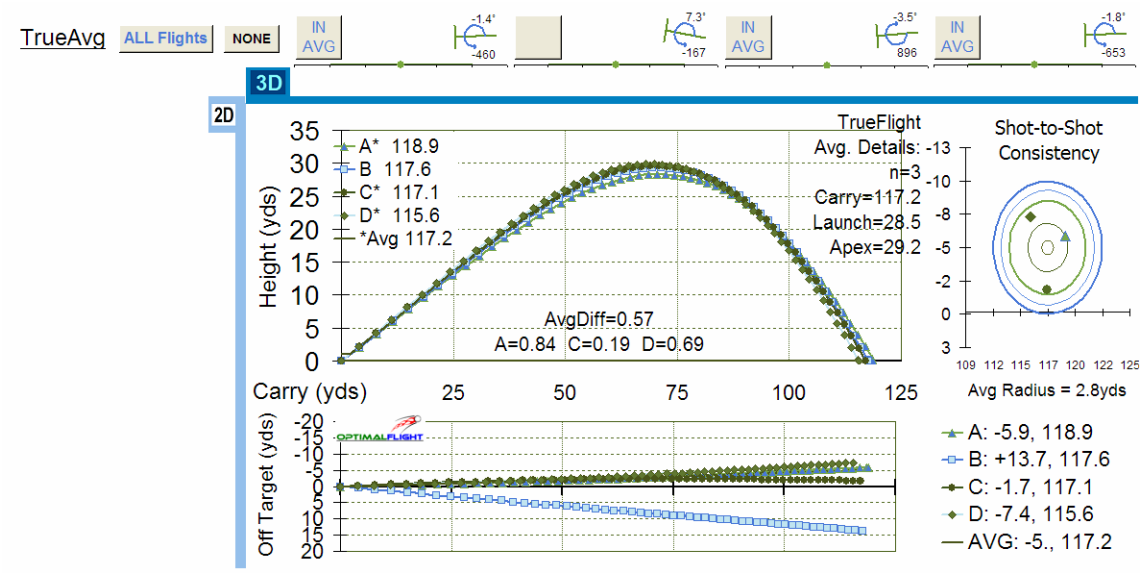
Similar Shot analysis and selection by using Shot-to-Shot consistency feedback

The unusual horizontal launch angle example is being revisited with Shot-to-Shot consistency graph. To see this graph, either **click** on "Shot-to-Shot feedback" text or the Show or Hide Consistency Plot feedback button.

In the first graph, all 4 shots are in the **TrueAvg** . The right Shot-to-Shot plot shows only 1 of 4 inside the outside blue line.



By clicking on the **IN AVG** button for Flight B, it will exclude that flight from the average. The Shot-to-Shot consistency graph automatically updates and the 3 shots are considered similar for carry location. Additional review of the SIDE and TOP ball flight views will help validate how alike they are.



What to do when you have a set of similar shots?

These options available are for the main OptimalFlight application with Flights A-D:

- **Save as NEW report**
  The data is saved for future review and analysis. A report number is assigned.

- **Average All LM Data, do what-if**
  The individual shot data is averaged. If the data has not been saved yet, doing so would be a good idea because all data is cleared and the average is placed in Flight A. The application is now set up for easy what-if analysis with Flights B-D.

- **Transfer to Multi-Club Profiler**
  All flights and average is transferred to the MultiClub Profiler, where a full bag distance profile can be created.

- **Print Report**
  The report would be printed to the computer's default printer. If the default printer is a PDF utility (ex: pdf995 tool), the report will be generated as a PDF file instead of a hard copy.

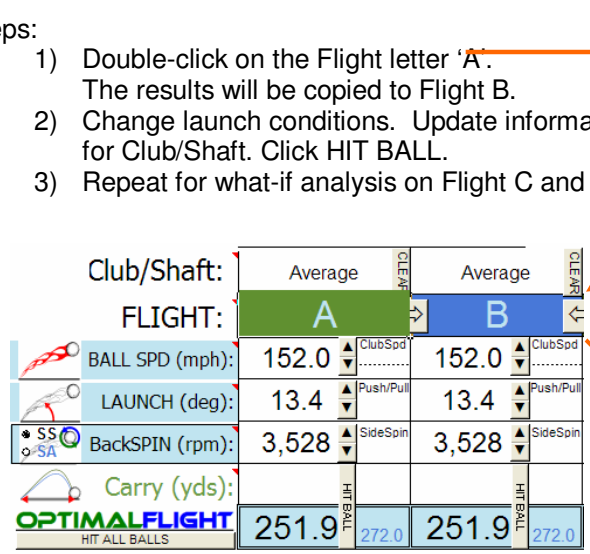
- **E-mail report as a PDF to customer**
  OptimalFlight clubfitting sponsors have the capability of instantly emailing OptimalFlight reports to the customer. It provides a service unlike no other and offers a very effective way to summarize results from a launch monitor session.

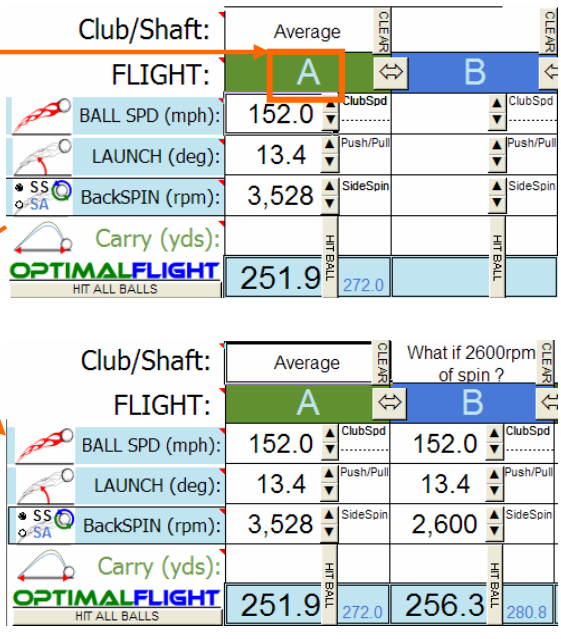
  Other options:
  - Interact with and review the ball flight in over five 3D perspectives.

Tips and Tricks for What-if Analysis

Duplicate launch results and environment conditions from one column to another
This trick works only for copying data quickly from Flight A to B, B to C, and C to D).
The ⇔ button can be used to swap and arrange the columns as necessary.

Steps:
1) Double-click on the Flight letter 'A'.
   The results will be copied to Flight B.
2) Change launch conditions. Update information for Club/Shaft. Click HIT BALL.
3) Repeat for what-if analysis on Flight C and D.





Shot-to-Shot Consistency Challenge

What is it? It offers a review of a shot-to-shot consistency performance with regard to 5 levels of performance. (Robot indoors, Robot outdoors, Pro, Semi-Pro, and Baseline)

How is it done? It takes 3-5 minutes a club. This challenge is a great way to introduce the launch monitor to a golfer, it's benefits, and the services you can provide with it.

1) Select a club.
2) Hit 4 strikes and attempt to repeat same normal full swing 4 times.
   Same set up, tempo, timing, rhythm for each shot.
3) Optionally, throw out the worst shot of 4 or decide to keep the 4 as is.

This summary can be interpreted as a performance summary with this club, 80% of the time.

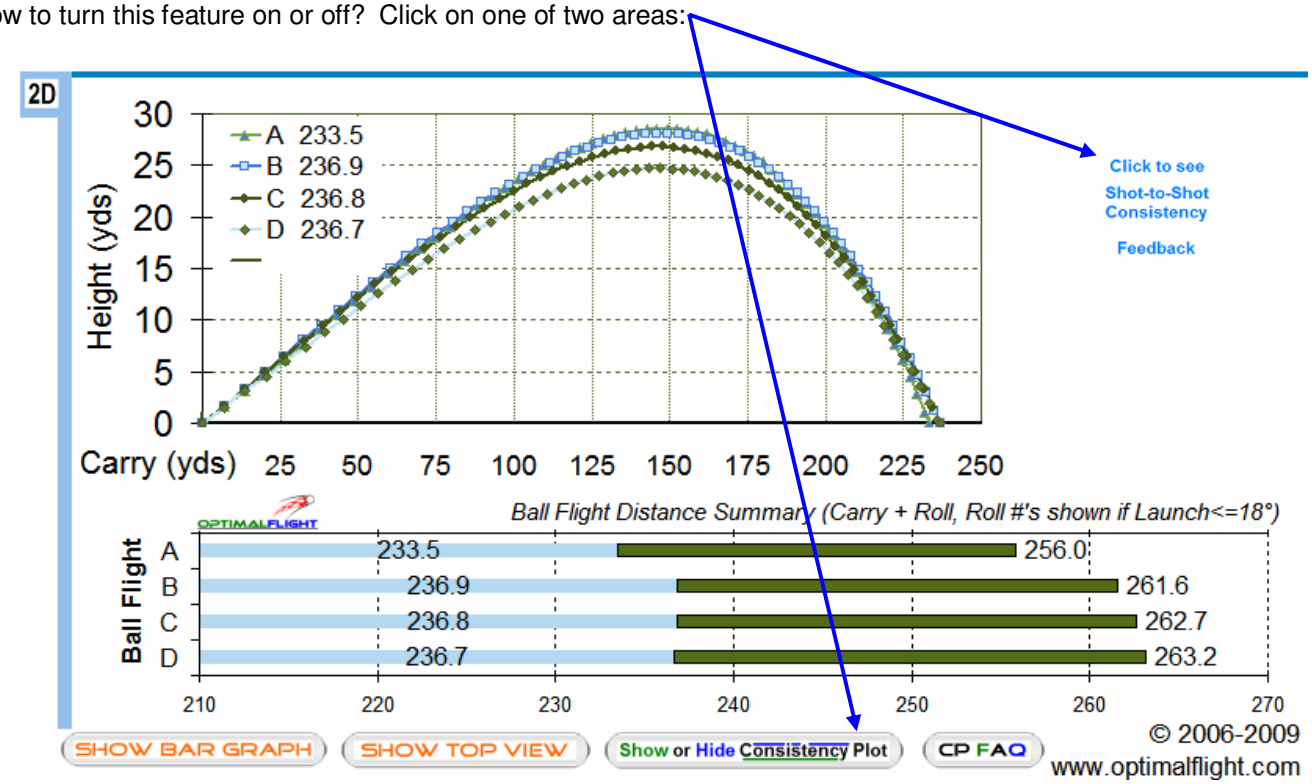
Which shots are shown in the Shot-to-Shot Consistency feedback graph ?

All shots from Flights A, B, C, D or only for the shots included in the TrueFlight Average.

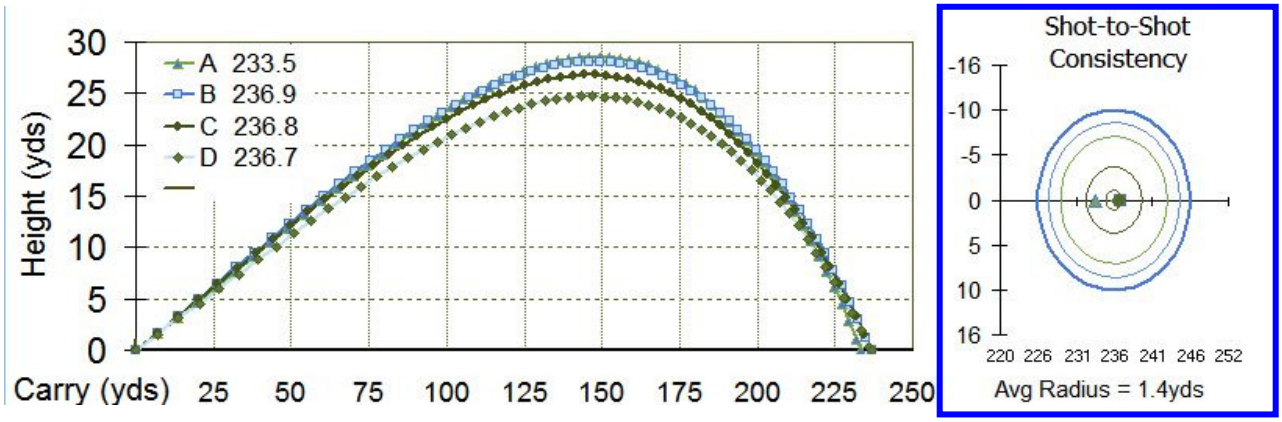
What you can do with this data?

- Save the report.
- Print out the report.
- Send it as a PDF.
- Transfer the average to the multi-club profiler for full bag profiling and repeat process for another club.

How to turn this feature on or off? Click on one of two areas:

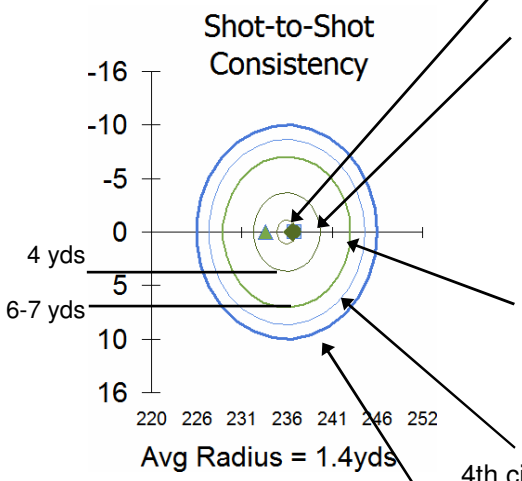


The Shot-to-Shot Consistency Plot will appear on the right side of the ball flight profile.



Interpreting the Shot-to-Shot Results

The shot to shot consistency plot has 5 circles with the shot results overlaid.



Smallest inside circle represents typical results from a robot under **indoor** controlled environment conditions.

2nd smallest circle represent results from a robot under **outdoor** conditions.

The *difference* between indoors and outdoors is due to environment and uncontrollable random factors.

- Shot-to-shot results under indoor climate controlled conditions has significantly less variation than outdoors.

Middle ring = shot to shot dispersion of a professional or sub-par golfer with an extremely repeatable swing.

- In this particular example, a golfer of this level of skill may be able to detect an off target issue of 4 yards.

4th circle represents a shot to shot dispersion of a semi-professional or scratch - 5 handicap player.

- In this particular example, a golfer of this level of skill may be able to detect an off target issue of 6.5 yards.

Outside ring = shot to shot dispersion of a good set of launch monitor measurements or baseline.

- A 50% reduction in shot-to-shot dispersion from the outside ring is equal to the middle ring.

The rings here are mathematically determined based on average carry result. Expect more dispersion further away and less dispersion for shorter distances (ex: 150 yards).

In summary, this particular set of 4 shots was struck exceptionally well. It is comparable to a robot outdoors.