



Quality *Golf* Stats

Everything you wanted to know about
OPTIMALFLIGHT reports



Outline

- OptimalFlight – an introduction
- OptimalFlight Reports
- Summary



OPTIMALFLIGHT

OptimalFlight is a QualityGolfStats.com Microsoft Excel™ application allowing golfers and club-fitters to:

- Take a closer interactive look at launch monitor data.
- Summarize results from a launch monitor session.
- Easily perform equipment studies (Driver, Shaft, Ball).
- Learn how the ball flight can be optimized and factors that can create more distance.
- Store ball flight results into a personal database.



OPTIMALFLIGHT

OptimalFlight can work with results from any launch monitor system (Vector, Zelosity, Trackman, AboutGolf, Flightscope).

- Proven results from 12+ months of ball flight data validation. If the data is unreasonable, OptimalFlight will let you know!
- Established support from a growing customer base of golfers and world class club-fitters.
- Long Drive professionals are using it to discover optimal launch conditions for 350-400 yard drives.
 - In 2007, a long drive pro who uses OptimalFlight has already won a competition.



OPTIMALFLIGHT Reports

OptimalFlight reports summarize launch monitor data unlike no other software application.

- A single report is an equivalent to hundreds of individual ball flight reports.
- It gives you the power of an expensive launch monitor system on your laptop or desktop with complete analysis of up to four ball flights at the same time.
- This slide show presentation will help you understand all information and what's happening in each graph in 5 seconds or less.



Data entry

Required data inputs for a ball flight:

- Ball Speed (mph or mps)
- Launch angle
- Backspin

Optional Inputs:

- Club data
- Carry* (yards or meters)
- Wind (mph or mps)
- Altitude (feet or meters)
- Units
- Roll Calibration - match roll result to LM system or actual on course results

The screenshot shows a data entry form for a golf ball flight. At the top, there are fields for Name, Notes, Location, and Date. Below these are Club / Shaft and a 'FLIGHT' section with four columns labeled A, B, C, and D. Each column has input fields for SPEED (mph), LAUNCH (deg), and SPIN (rpm). Below the flight section is a 'Carry (yds)' field and a 'WIND INFO' button. At the bottom, there are 'Flight Conditions' for WIND (mph) and ALTITUDE (ft), a 'Roll Calibration' section with 'STD' and 'Set to STD' buttons, and a 'UNITS' dropdown menu currently set to 'English'.

* From launch monitor system output



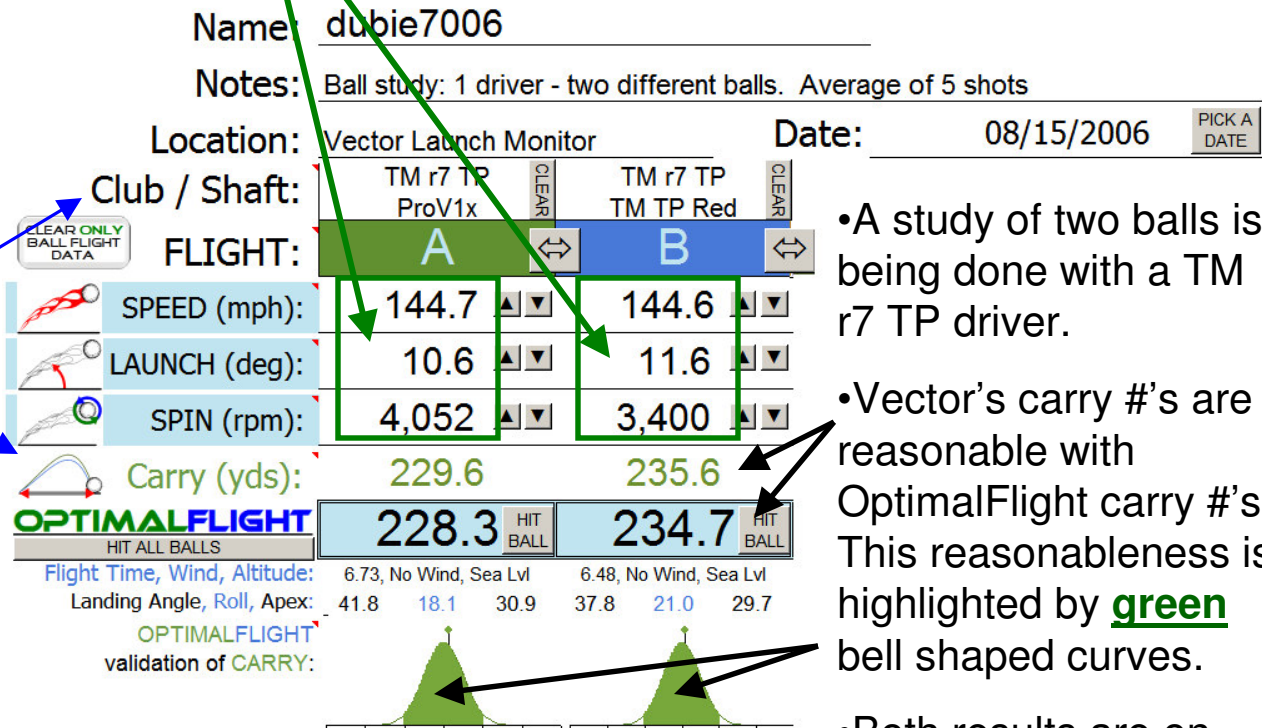
Example

Required data inputs for a ball flight:

- Ball Speed (mph or mps)
- Launch angle
- Backspin

Optional Inputs:

- Club data
- Carry*
(yards or meters)



•A study of two balls is being done with a TM r7 TP driver.

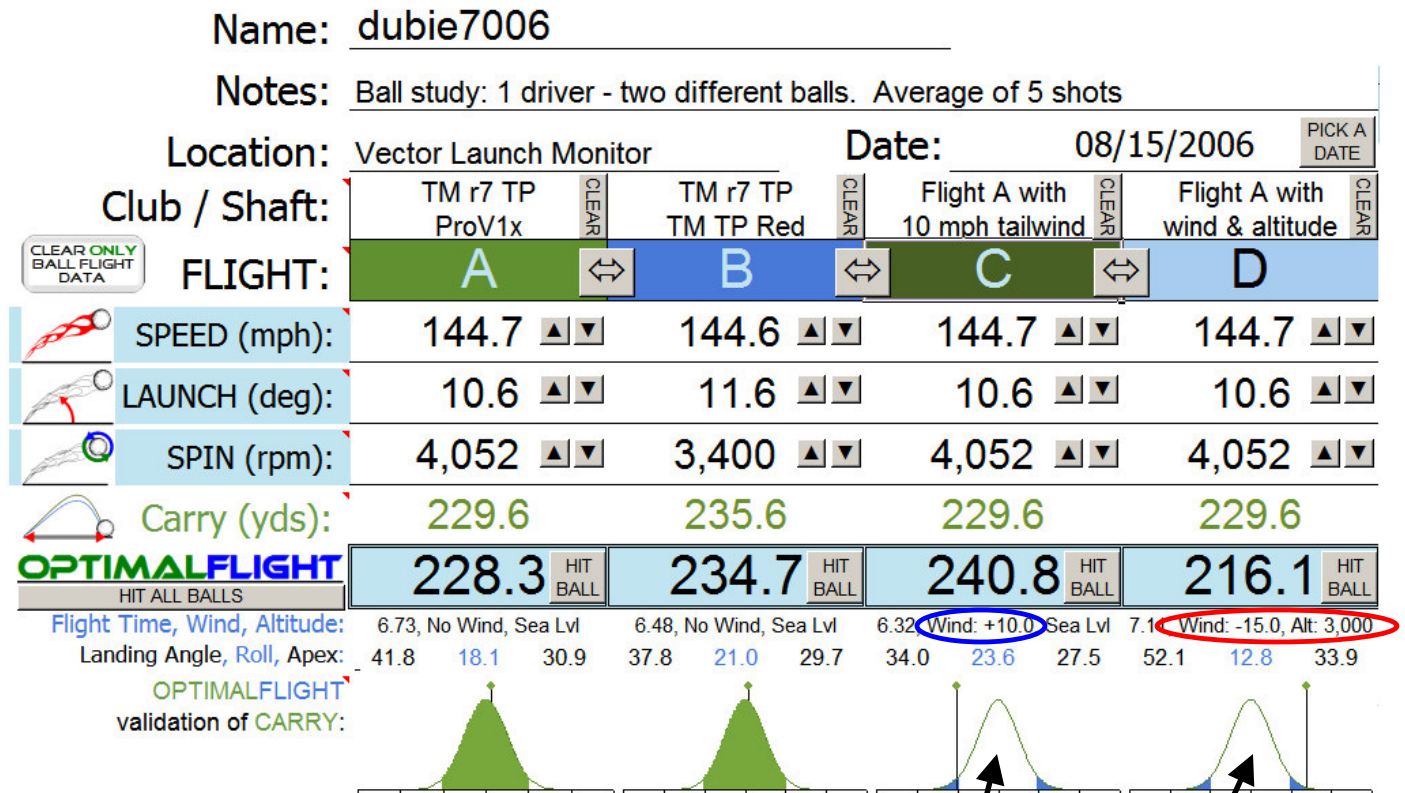
•Vector's carry #'s are reasonable with OptimalFlight carry #'s. This reasonableness is highlighted by **green** bell shaped curves.

•Both results are on target !

* From launch monitor system output



Wind & Altitude ball flight summary example



- Flight C has a **10mph** tailwind. OptimalFlight says to expect 240.8 yards, which is longer than the Vector estimate of 229.6 yards (which is based at no wind/sea level).
- Flight D has a **-15mph** headwind at **3,000 feet** of altitude. OptimalFlight says to expect 216.1 yards, which is shorter than the Vector estimate of 229.6 yards.

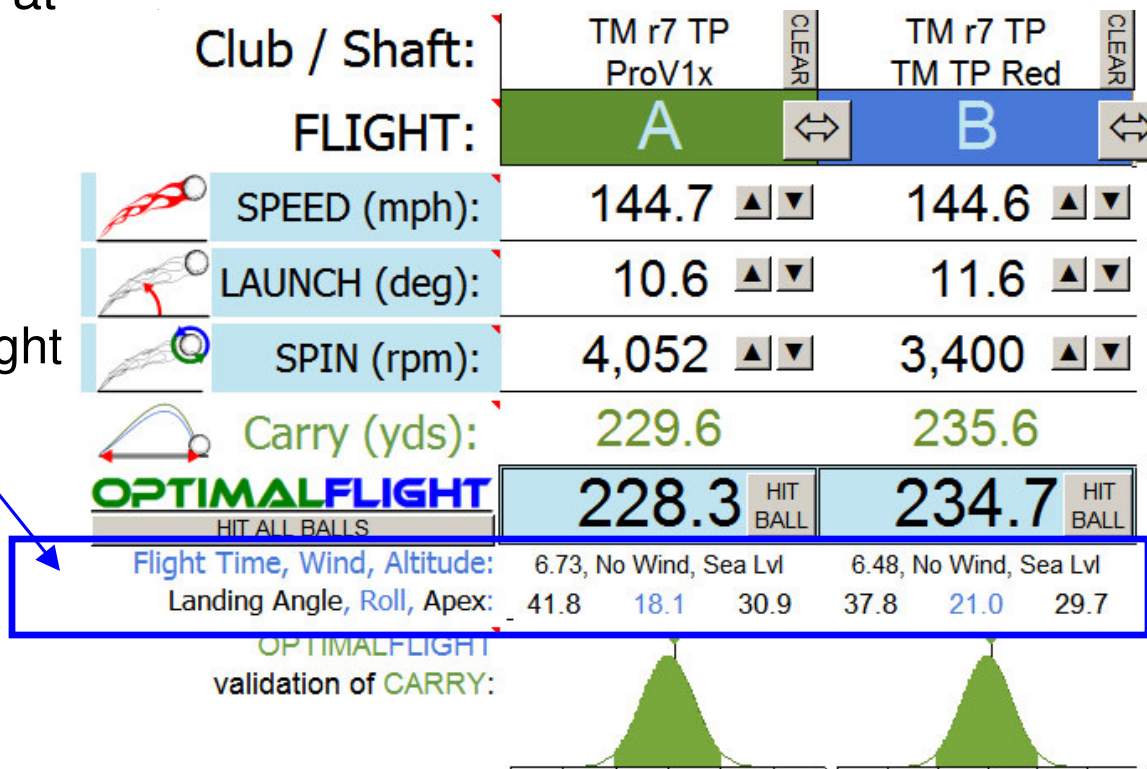


Ball flight data summary

Let's take a closer look at ball flight summary information.

It covers:

- Estimated Ball Flight Time (seconds)
- Wind
- Altitude
- Landing Angle
- Roll
- Apex (max height of ball flight)





Ball flight graphical illustration

- Estimated Ball Flight

Time (is 6.73 seconds)

- Wind (No Wind)

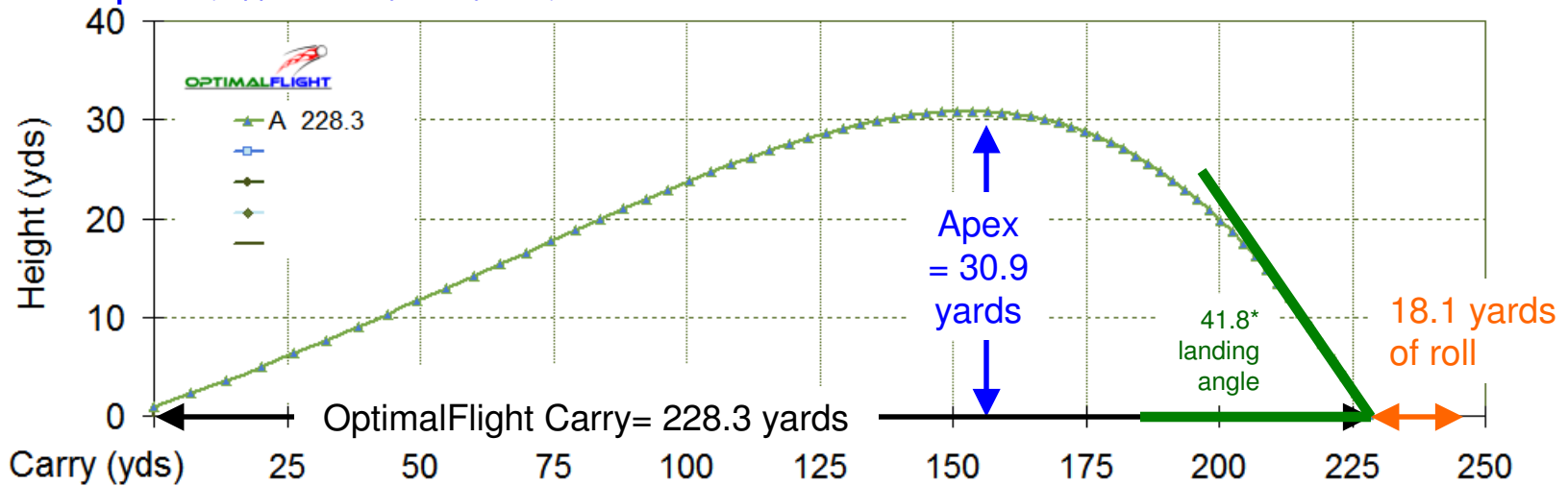
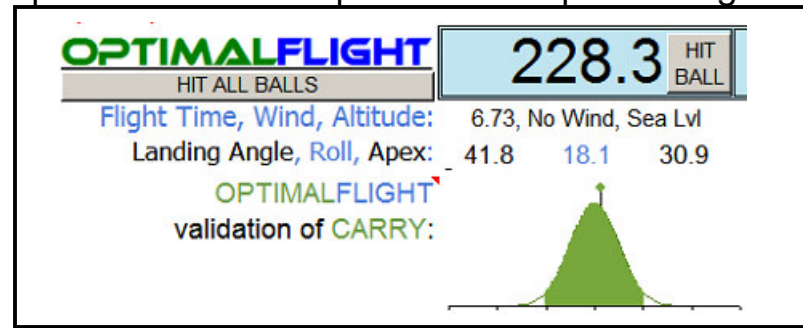
- Altitude (Sea Level)

- Landing Angle (41.8* degrees)

- Roll (18.1 yards, total distance = 228.3 + 18.1 = 246.4 yards)

- Apex (Approximately 30.9 yards)

The summary information for Flight A provides a general idea of what the ball flight looks like. A picture is more helpful with multiple ball flights.



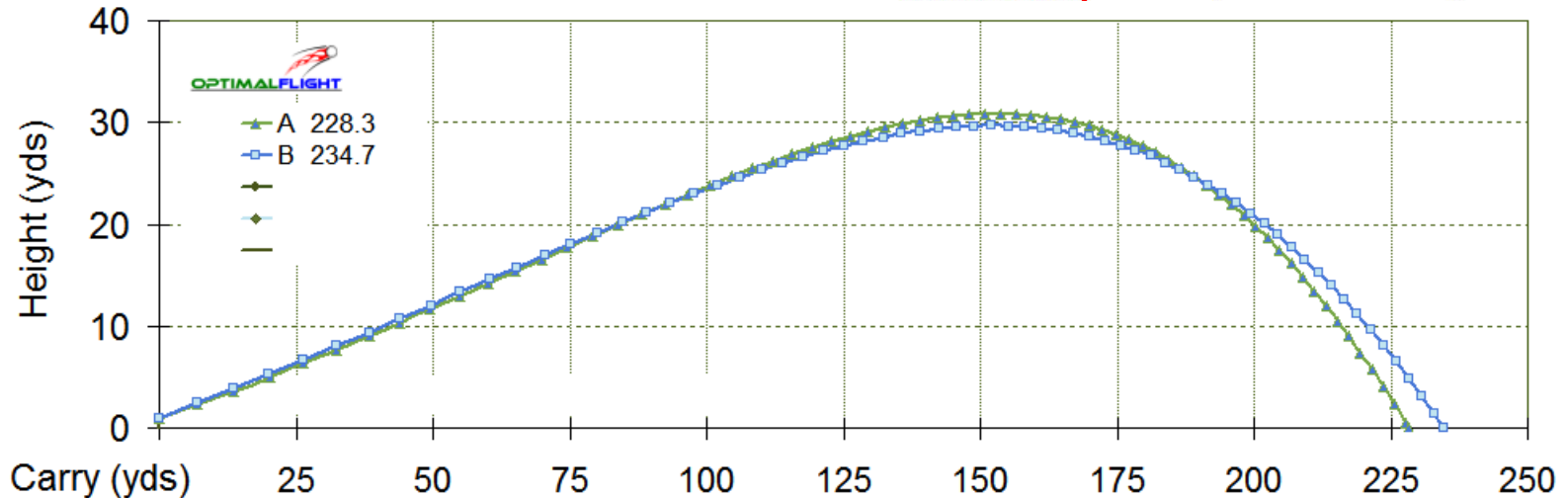


Ball flight graph summary

The ball flight picture shows a 6.4 yard difference due to ball choice (234.7-228.3=6.4).

Ball flight marker key:
A=Triangle, B=Box, C=Circle, D=Diamond

Club / Shaft:	TM r7 TP ProV1x	TM r7 TP TM TP Red
FLIGHT:	A	B
SPEED (mph):	144.7 ▲▼	144.6 ▲▼
LAUNCH (deg):	10.6 ▲▼	11.6 ▲▼
SPIN (rpm):	4,052 ▲▼	3,400 ▲▼
Carry (yds):	229.6	235.6
OPTIMALFLIGHT HIT ALL BALLS	228.3 HIT BALL	234.7 HIT BALL
Flight Time, Wind, Altitude:	6.73, No Wind, Sea Lvl	6.48, No Wind, Sea Lvl
Landing Angle, Roll, Apex:	41.8 18.1 30.9	37.8 21.0 29.7





OPTIMALFLIGHT Advanced Reports

The remaining graphs and summary tables demonstrates the power and benefits of using OptimalFlight with launch monitor data.

- Optimal Carry Profile
- Flight Summary Table
- Optimal Distance Profile (Carry + Roll)
- Relationship between Backspin and Landing Angle
- Roll Profile for various Landing Angles
- Ball Flight Distance Summary
- Graphical Summary of Inputs & Outputs



Optimal Carry Profile

Two ball flight optimization strategies are available.

- Carry
- Total Distance (carry + roll)

The Optimal Carry Profile graph explains how different levels of spin impacts **carry distance** for a given ball speed and launch angle. For simplicity, these graph examples will focus on Flight A (TM r7 w/ Pro V1x at 4052 rpm) with different levels of spin.

Optimal Carry Profile

with Max ROLL Zone
Launch Angle @ Ball Speed

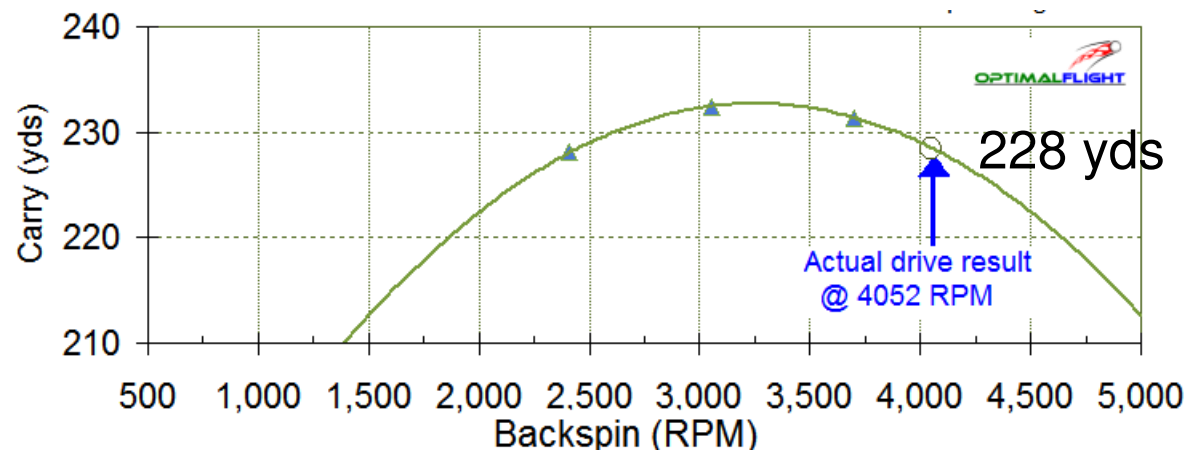
○ Actual drive result

▲ A: 10.6°@144.7

■ B

● C

◆ D





Optimal Carry Profile

Optimal Carry Profile
with Max ROLL Zone
Launch Angle @ Ball Speed

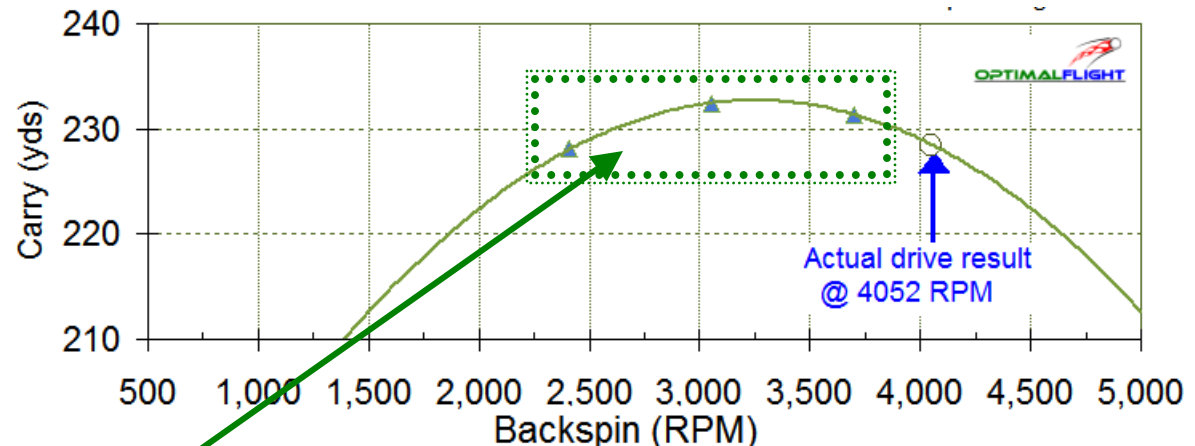
○ Actual drive result

▲ A: 10.6°@144.7

■ B

◆ C

◆ D

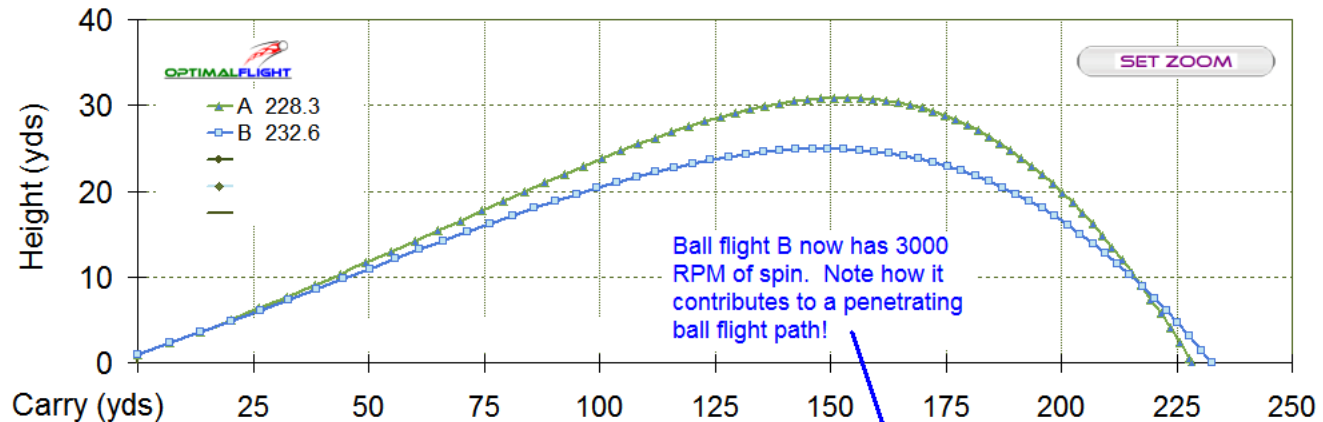


In this graph, the actual drive result is not optimal. It is outside the 3 markers identifying the range of spin maximizing total distance. An “actual drive result” within *the left half of these 3 markers* is desirable to maximize roll.

Let's see what if the ball flight looks with 3,000 RPM of spin?



Optimal Carry Profile



Optimal Carry Profile

with Max ROLL Zone
Launch Angle @ Ball Speed

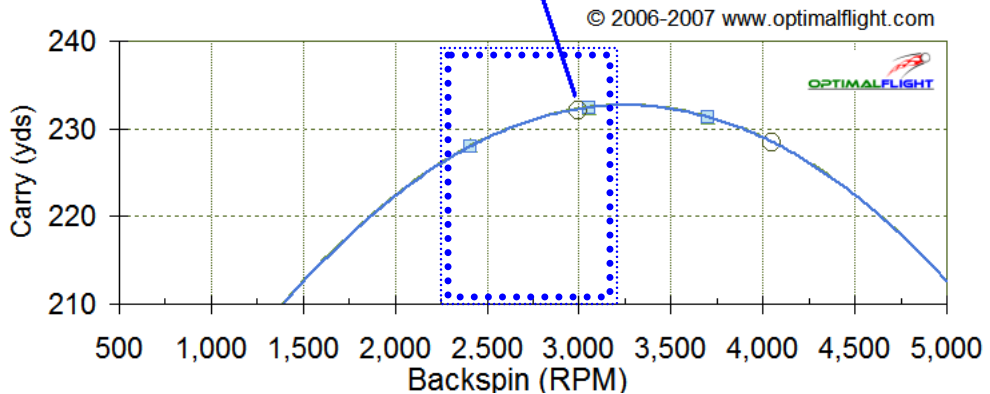
○ Actual drive result

▲ A: 10.6° @ 144.7

■ B: 10.6° @ 144.7

◆ C

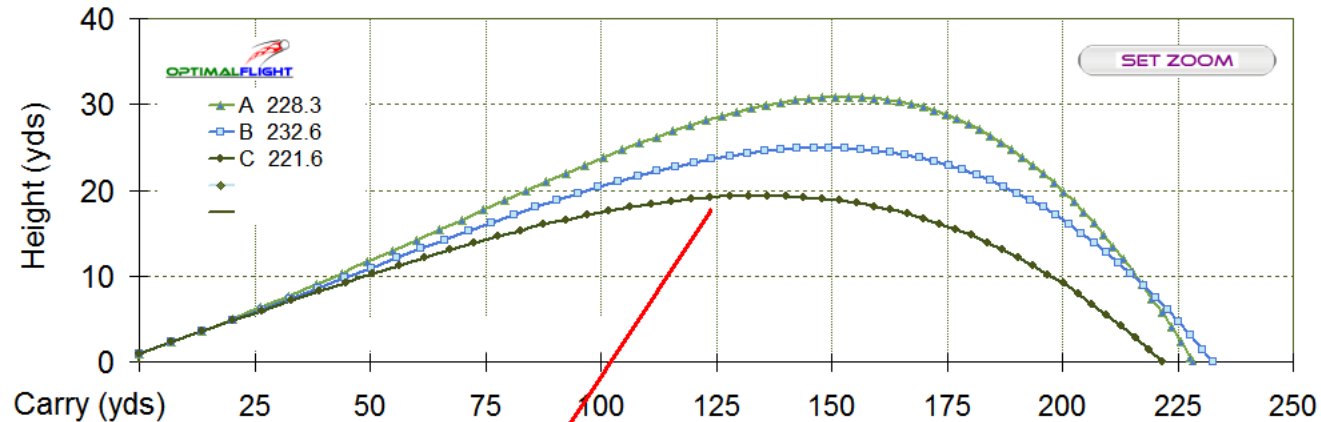
◆ D



A ball flight with 3,000 RPM of spin maximizes carry and total distance. It is also within the left two ball flight markers favoring a flatter angle of descent to benefit roll-out.



Optimal Carry Profile

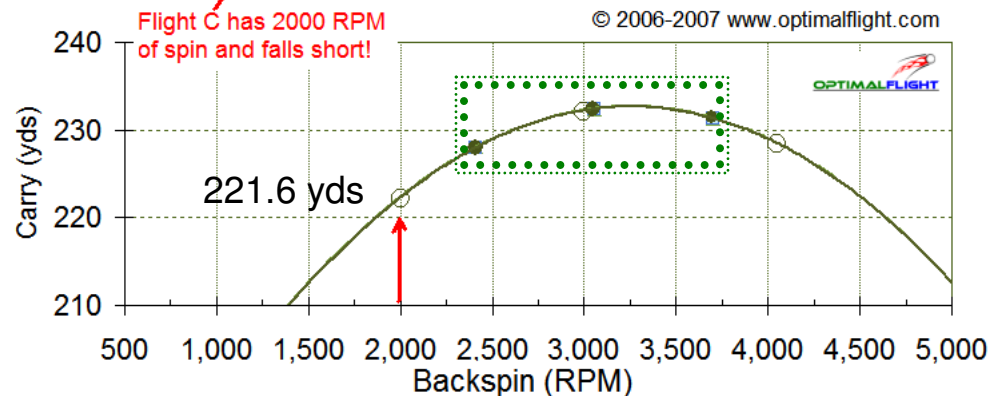


Optimal Carry Profile

with Max ROLL Zone
Launch Angle @ Ball Speed

○ Actual drive result

- ▲ A: 10.6°@144.7
- B: 10.6°@144.7
- ◆ C: 10.6°@144.7



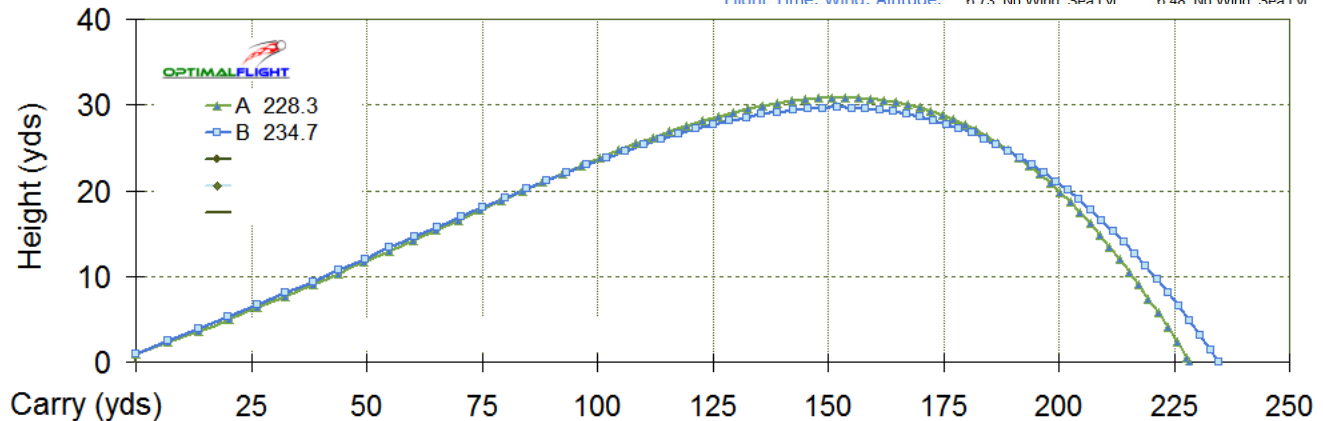
A 3rd ball flight with 2,000 RPM is too low and cannot stay up in the air. It is outside the Max ROLL Zone defined by the three markers within the dotted rectangle.



Optimal Carry Profile

A quick review of the two ball study shows a better ball flight for Flight B due to lower spin and increased launch.

Club / Shaft:	TM r7 TP ProV1x	TM r7 TP TM TP Red
FLIGHT:	A	B
SPEED (mph):	144.7	144.6
LAUNCH (deg):	10.6	11.6
SPIN (rpm):	4,052	3,400
Carry (yds):	229.6	235.6
OPTIMALFLIGHT	228.3 HIT BALL	234.7 HIT BALL
Flight Time: Wind: Altitude: 6.73 No Wind Sea Lvl 6.48 No Wind Sea Lvl		



Optimal Carry Profile
with Max ROLL Zone
Launch Angle @ Ball Speed

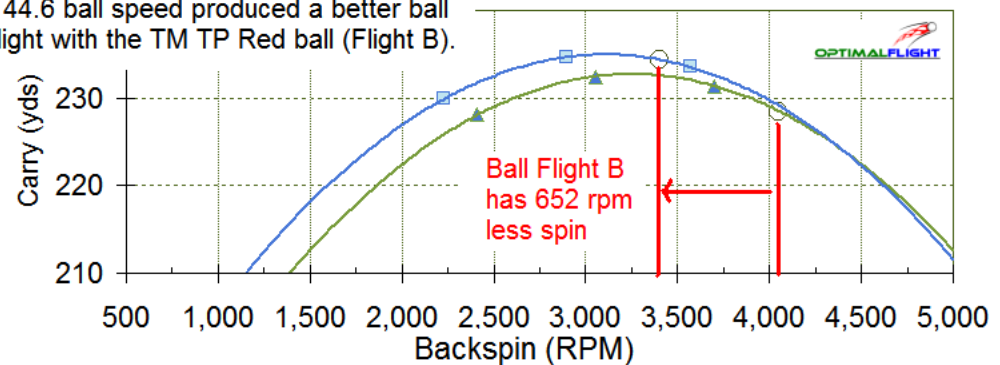
○ Actual drive result

▲ A: 10.6° @ 144.7

■ B: 11.6° @ 144.6

In this particular ball study, the golfer's 144.6 ball speed produced a better ball flight with the TM TP Red ball (Flight B).

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Optimal Carry Profile

Final notes regarding Optimal Carry Profile:

- An unique Optimal Carry profile exists for a ball speed and launch angle combination.
- Altitude and wind also affect carry and it's Optimal Carry Profile.



Flight Summary Table

The Flight summary table compares **current shot** result to the result of an optimized ball flight.

- Flight A is 1000 rpm higher than optimal spin.
- Flight B is 503 rpm higher than optimal spin.

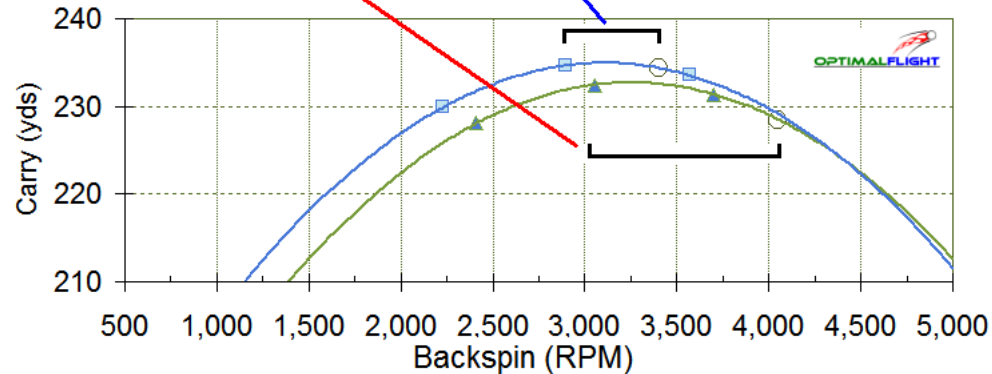
	CURRENT	OPTIMAL	+/-	CURRENT	OPTIMAL	+/-
Total Distance & FLIGHT #:	246.4	255.3	A	255.7	257.9	B
Carry (yds)	228.3	232.5	4	234.7	234.7	
ROLL:	18.1	22.9	5	21.0	23.3	2
SPIN:	4,052	3,052	-1,000	3,400	2,897	-503
OPTIMAL Distance Zone:	NO	2410-3700		YES	2230-3570	

Flight B is within the three Max Roll Zone markers. When this happens, the summary table highlights it with a "YES" Optimal Distance Zone result.

Optimal Carry Profile
with Max ROLL Zone
Launch Angle @ Ball Speed

○ Actual drive result

▲ A: 10.6°@144.7
■ B: 11.6°@144.6





Flight Summary Table

The optimal distance zone regions are:

- 2410-3700 rpm of spin for Flight A
- 2230-3570 rpm of spin for Flight B

The +/- column shows the difference from optimal flight.

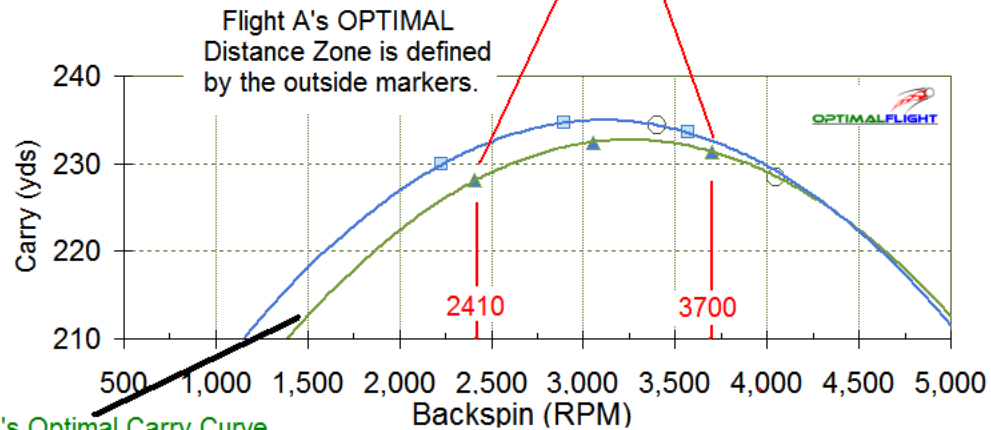
	CURRENT	OPTIMAL	+/-	CURRENT	OPTIMAL	+/-
Total Distance & FLIGHT #:	246.4	255.3	A	255.7	257.9	B
Carry (yds)	228.3	232.5	4	234.7	234.7	
ROLL:	18.1	22.9	5	21.0	23.3	2
SPIN:	4,052	3,052	-1,000	3,400	2,897	-503
OPTIMAL Distance Zone:	NO	2410-3700	YES	2230-3570		

Optimal Carry Profile
with Max ROLL Zone
Launch Angle @ Ball Speed

○ Actual drive result

▲ A: 10.6°@144.7

■ B: 11.6°@144.6



Flight A's Optimal Carry Curve
(for different levels of spin)

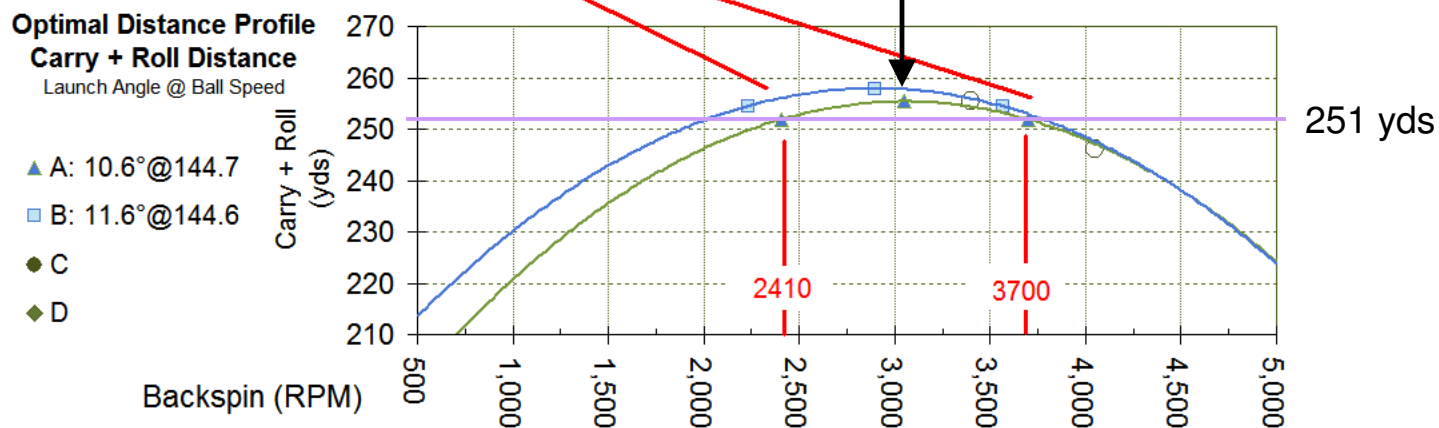


Optimal Distance Profile (Carry + Roll)

It is similar to the Optimal Carry Profile and represents TOTAL distance. The Optimal Distance Zone values are defined by this graph. We can see that for Flight A, the carry + roll distance at 2410 rpm of spin is similar to at 3700 rpm of spin (approx. 251 yards total distance).

	CURRENT	OPTIMAL	+/-	CURRENT	OPTIMAL	+/-
Total Distance & FLIGHT #:	246.4	255.3	A	255.7	257.9	B
Carry (yds)	228.3	232.5	4	234.7	234.7	
ROLL:	18.1	22.9	5	21.0	23.3	2
SPIN:	4,052	3,052	-1,000	3,400	2,897	-503
OPTIMAL Distance Zone:	NO	2410-3700	YES	2230-3570		

The middle marker represents the optimal distance result (255.3 yds @ 3052 rpm for Flight A)



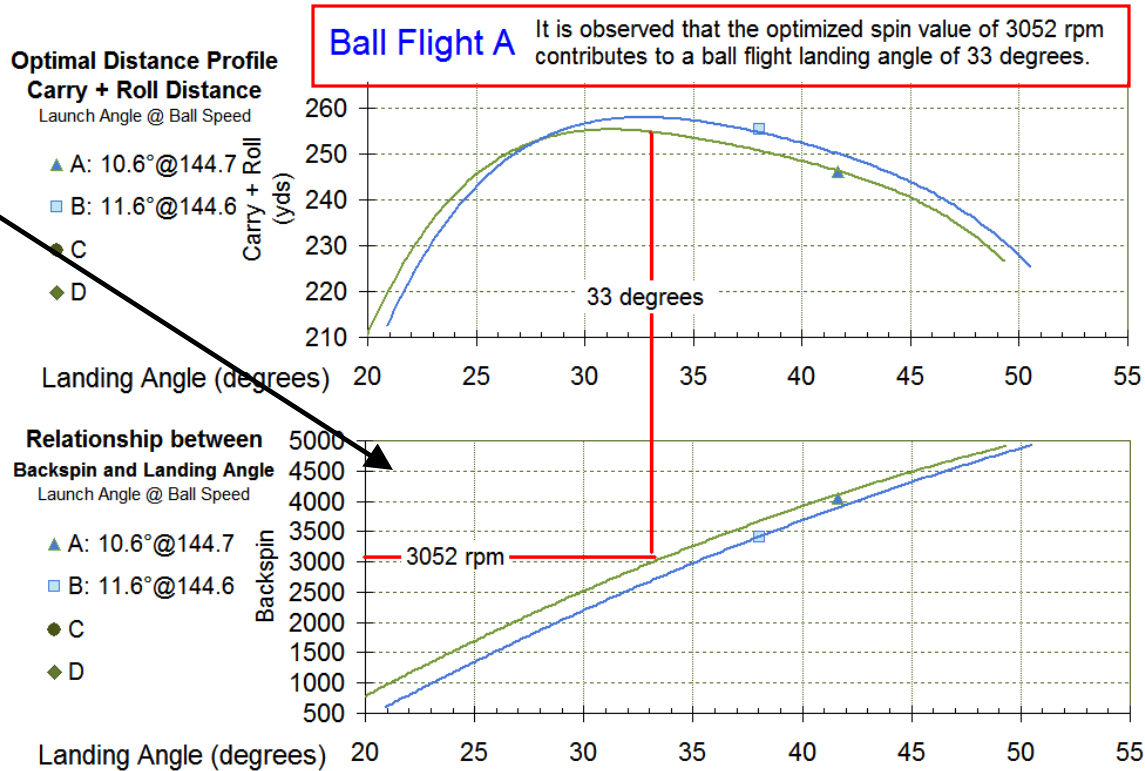


Backspin and Landing Angle

The Optimal Distance Profile shows the distance result for various landing angles. Both ball flights can be improved. It is easy to see Ball Flight B has a more favorable landing angle result (closer to peak) than Ball Flight A.

A quick look at the this graph indicates the amount of spin it takes to achieve a landing angle. The above graph can be reviewed to determine the distance result !

For Flight B, a 35* landing angle corresponds to 3000 rpm of spin and a carry+roll result of 256 yards.





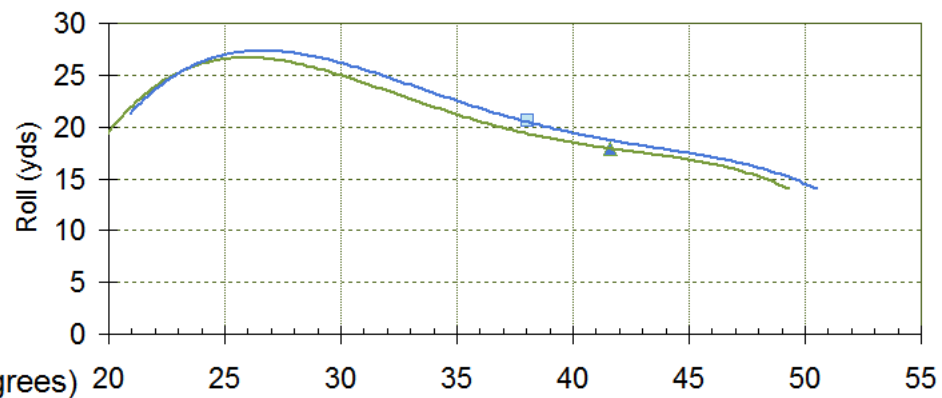
Roll Profile for various Landing Angles

The Roll Profile graph estimates the amount of roll at the end of the ball flight.

- The steeper the landing angle, roll is minimized.
- The flatter the landing angle, roll is maximized (up to a certain landing angle).

**Roll Profile for
for various Landing Angles**
Launch Angle @ Ball Speed

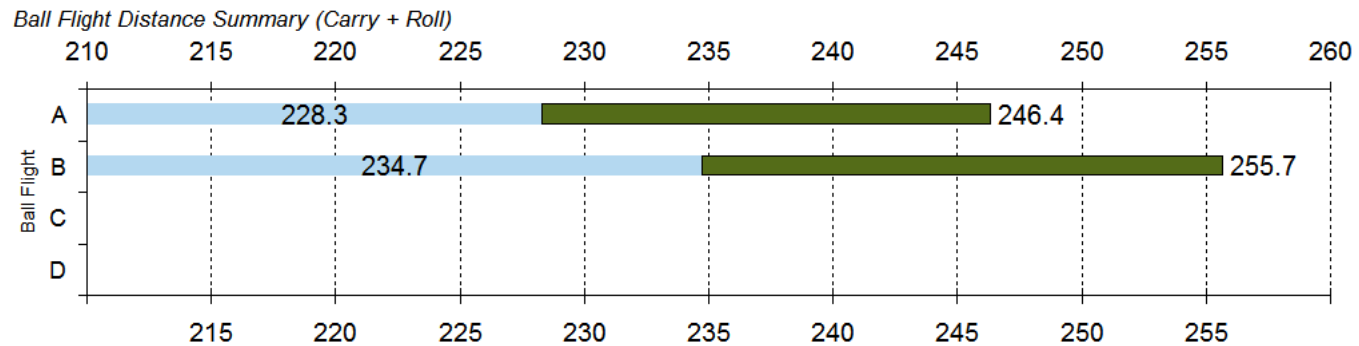
- ▲ A: 10.6°@144.7
- B: 11.6°@144.6
- ◆ C
- ◆ D





Ball Flight Distance Summary

It is a bar chart summary of how much of the ball flight is carry and total distance result.

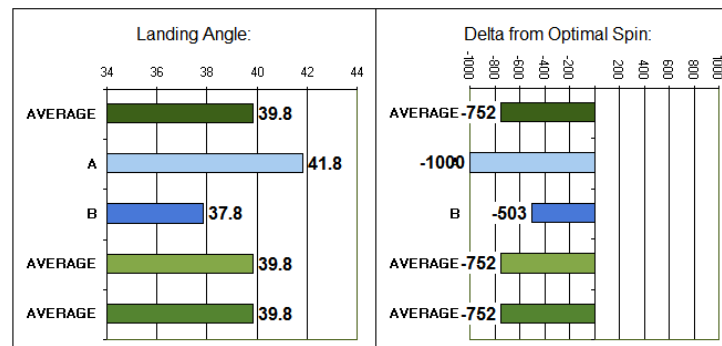
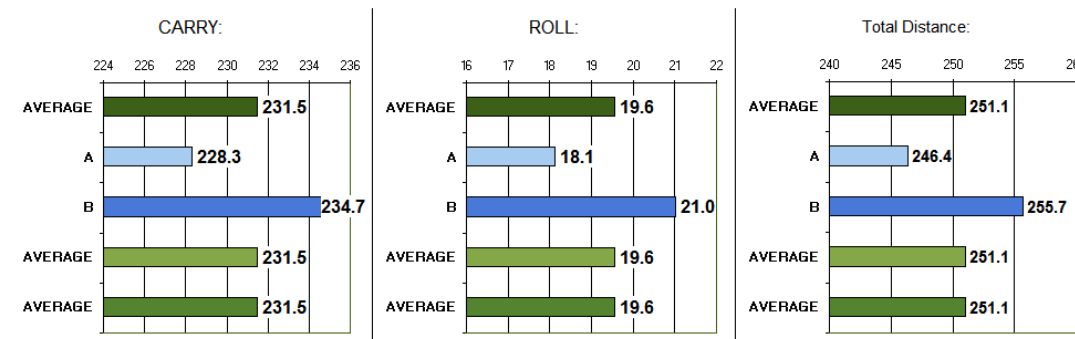




Graphical Summary of Inputs & Outputs

It contains graphical summary of all relevant input and outputs.

The below example shows CARRY, ROLL, Total Distance, Landing Angle, and Delta from Optimal Spin output data in a simple bar chart form with an average calculation.



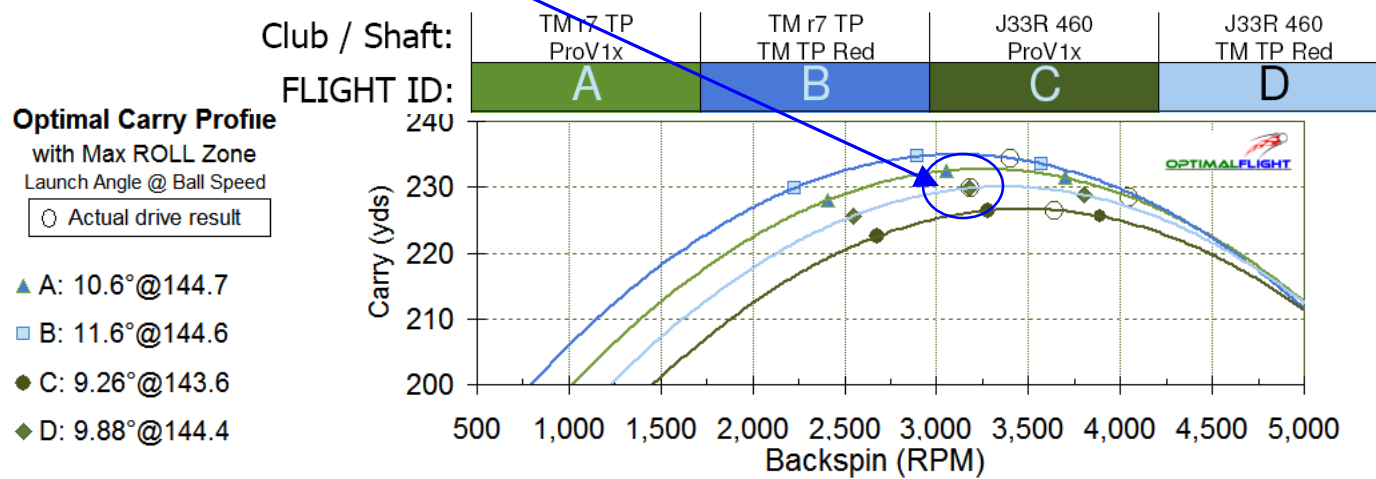

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Ball Study conclusions

A simple ball study was presented (1 driver with 2 brands of balls) and a significant effect by ball was observed.

- The golfer tested another driver, turning the simple study into a 2 drivers with 2 brands of balls study.
 - Ballspeeds were similar.
 - The ball effect was confirmed with an interesting twist.
 - There was a significant effect on results by driver head.
 - A more optimal ball flight was discovered!





Other noteworthy features

OPTIMALFLIGHT contains a sample report database.

- The full 2x2 driver study in this presentation is available for interactive review (sample report #6).
 - Once the data was typed in, the driver and ball effects can be analyzed on the spot.
- The sample report database showcases great examples and studies with launch monitor feedback. There are now over 20 reports available for review.
- A special sample database can be set up to benefit teaching professionals or club-fitters with advanced classes with launch monitor data.



Summary

- ★ **OPTIMALFLIGHT** is a world class program that works well with launch monitor data, recreating the ball flights, and a lot more!
- Launch monitor time is valuable session time with golf equipment. Capture vital data in quick clubs, shafts, balls studies and save it into a personal launch monitor database.
- Most systems analyze one ball flight at a time. **OPTIMALFLIGHT** can handle up to 4 shots simultaneously!
- Perform easy “what if” analysis and get quick answers you can trust.
- A single **OPTIMALFLIGHT** report is an equivalent to hundreds of individual ball flight reports.



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<http://www.qualitygolfstats.com>

- Golf Services

<http://www.qualitygolfstats.com/golfservices.html>

- Golf Links

<http://www.qualitygolfstats.com/golflinks.html>

- Advertising

<http://www.qualitygolfstats.com/advertising.html>