How different are G lf Balls?

Do you know which ball works best for you? Do you go through the golf season trying out the latest and greatest ball? Did you try so many, you look back and say "I remember trying a sleeve of *Ball X* that was good, but I have tried so many I don't remember which one? Maybe I was just playing well that day."? I understand your struggles. After fitting more than 800 golfers a year, "which golf ball should I be playing for my swing?" is one of the most frequently asked questions I hear. Since we are a year-round outdoor facility in Canada, our range balls go through an extreme amount of wear and tear due to seasonal fluctuations in temperature. The most common comment I hear is "Oh, those are *just Range balls*, how much yardage do I expect to lose?" After spending a lot of time talking with golfers about different balls, I thought I would do my own test.

Since I was going to spend time collecting data, I thought I would kill two birds with one stone. There is so much talk about which launch monitor (LM) is the best, that I thought I would take this opportunity to put them head to head in the fairest way possible. Every brands die-hard followers and users believe *their LM* is the best, period! I have used and worked with most every LM on the market. They all have their own pros and cons, from tracking accuracy to software ease of use. When you spend every day using one specific LM, you start to become comfortable with it, and may become a bit biased. I feel this has a lot to do with personal preference and a comfort zone. I myself have used ***Flightscope*** for multiple years and am very comfortable with the software. My business is 95% custom fitting and feel Flightscope's software is great for that (there I go being biased). However, I also feel the two biggest competitors, ***TrackMan*** and ***Foresight***, put out a great product.

<u>I want to make one thing clear before I go any further.</u> **This test started for my own curiosity,** and as many variables were considered comparing the numbers. This test was not performed in a lab, and nor should it be. We do not play golf in a lab. I believe it is a great representation of real world outcomes. I performed Part 1 of the testing with a 7 iron. Since I haven't kept my game up as well as I should, my handicap is around 8, for all intents and purposes of this study. There will be some gaps if we look deep enough, but I hope you enjoy what you read.

I wanted to compare the three LM's in an indoor scenario, since there is a lot of discussion about which LM is the best indoors (also it's cold outside and I was testing a lot of premium golf balls I didn't want to waste). I don't know if the argument between "which is better, camera or radar based?" will ever be resolved, but I always enjoy the heated banter. We all learn if we keep an open mind and learn from one another.

The other topic that comes up often is the artificial hitting surface you use. For that reason, I wanted to test two used at our facility. One is the firm "Stance" mat (Fig 1) which golfers prefer most, and the other is the "Bristle" mat (Fig2)

Fig 1

Fig 2

How I set it up: We are fortunate to have a two bay Sim room for the testing. The three LM's I have access to are:

Trackman 3e (1) (Yes, my pic shows a TM4, but

We used a TM3e for testing)

Foresight GC2 (2)

Flightscope Xi Tour (3)

Fig 3

Fig 3

After setting up the LM's as accurately as possible, I was ready to go.

The next point of my test was to make sure I tested the balls and LM's with different clubs. I decided to test with a ***Driver, 7 iron, and perform a 100 yard shot*.** I thought it would give all LM's and golf balls the best chance to prove their worth, and to see if there was any significant discrepancy between them in their readings; from one end of the bag to the other. Since time is an issue, I decided to do the surface testing with a 7 iron. I decided that if the LM numbers were close than I would not test again with the wedge. Looking back, I may have tested with the wedge since it may have had the biggest difference on spin and launch due to surface interaction. (First thing I would do on my next go around!) Here are the results.

Launch Monitor On Hard Mat	Spin	Ball Speed	Launch	Height	Carry Yds
Flightscope	**5450**	**117.4**	**16.0**	**82**	**177**
GC2	**5906**	**115.4**	**16.7**	**NC**	**166**
TM 3	**5556**	**116.6**	**16.3**	**84**	**173**

Launch Monitor On Bristle Mat	Spin	Ball Speed	Launch	Height	Carry Yds
Flightscope	**5906**	**117.8**	**16.9**	**88**	**178**
GC2	**5855**	**116.3**	**16.4**	**94**	**170**
TM 3	**5848**	**116.6**	**16.8**	**85**	**174**

As you can see they are all close; close enough for the purpose of my test. Yes, we can examine these numbers and argue that there is a difference that should be investigated deeper. However, for what I am trying to do it is more than

accurate. You may tire of me saying this, but this i. There will be inconsistencies. That is part of the reason I wanted to do this, to show we are humans, not robots. The most unreliable variable in this test will be the human. Everything else is set up the same; serving as the constant. I don't know about you, but this is the exciting part of this test. It will demonstrate if any of these golf balls step up and can fill the inconsistent gaps that us golfers bring to the table.

Now for the Testing!

PART 1: 7 iron

I will be using the Flightscope Xi Tour (Fig 3), #3. The mat I will be using is the Stance mat (Fig 1). I would have preferred testing on the Bristle Mat (Fig 2), but our winter has been cold, and the Golf Canada Sim rooms have been booked solid.

I set up our hitting net and stance mat in our indoor bay. I measured **12 feet of ball flight** to the net and set the Flightscope at **10 feet from ball**. All balls were hit from the same spot and same setup. I tried to swing at my normal 75% to be as consistent as possible.

Flightscope Report You will see this report was based on "**Carry Distance**" for the 16 balls under comparison. I hit each golf ball 7 times. This way I could eliminate the best and worst shot and still have a 5 shot average. When you look at each golf balls detailed chart, most golfers will look at the second last line (AVG), which is the overall average of the 7 shots. I feel the last line (DEV), is an undervalued indicator. This line can tell us a lot more about the consistency of the 7 shots, and see which variable performs best.

I included screen shots for five separate variables, ***Grouping Area, Clubhead Speed, Spin Axis, Launch Angle to Target, and Spin Consistency***. This way you can compare the 16 Balls on the variable you desire.

FlightScope®

Detailed Report

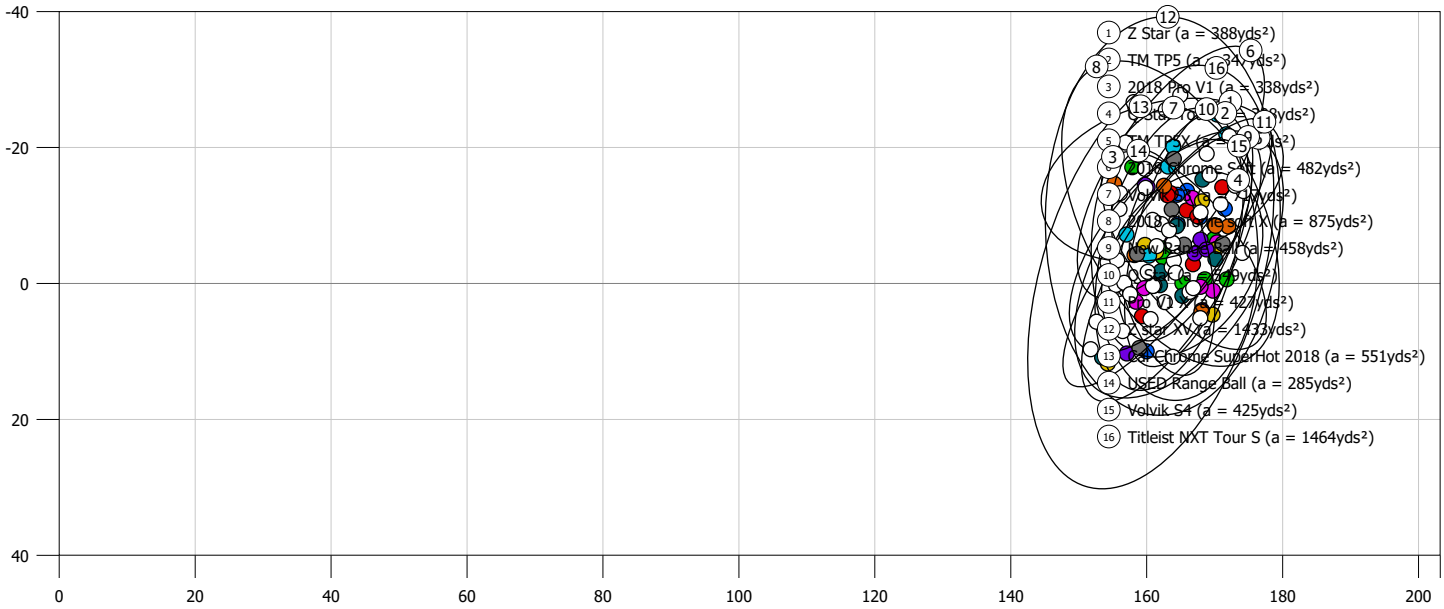
for **Robert Penner** on **March 3, 2018**

Summary

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						
Club	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Rating
Z Star	167	169	7.3 L	81.5	111.5	1.37	4954	3.2 L	18.6	1.9 L	42.6	84	5.7	straight	*
TM TP5	166	169	8.4 L	79.2	111.8	1.41	5296	5.4 L	17.2	1.9 L	41.0	77	5.6	draw	*
2018 Pro V1	166	168	4.8 L	79.4	112.3	1.42	5836	1.3 L	16.6	1.5 L	41.0	77	5.7	straight	*
Q Star Tour	165	168	2.8 L	82.7	110.9	1.34	4863	1.1 L	19.3	0.7 L	43.0	86	5.7	straight	*
TM TP5X	165	168	2.8 L	79.9	111.2	1.39	5183	0.8 R	17.9	1.0 L	41.8	80	5.7	straight	*
2018 Chrome Soft	165	168	16.3 L	81.4	109.3	1.34	4113	8.6 L	21.2	4.0 L	44.2	91	5.8	pull/draw	*
Volvik S3	164	168	4.3 L	80.4	110.6	1.37	4797	3.0 L	18.4	1.0 L	41.8	81	5.6	straight	*
2018 Chrome soft X	164	167	10.3 L	80.3	110.2	1.37	4807	5.6 L	19.7	2.7 L	43.2	86	5.7	draw	*
New Range Ball	164	165	2.3 L	80.3	111.6	1.39	6363	1.1 R	17.5	1.0 L	42.4	80	5.8	straight	*
Q Star	164	167	5.0 L	81.0	110.2	1.36	4859	3.2 L	18.3	1.3 L	41.6	79	5.6	straight	*
Pro V1 X	163	165	4.5 L	79.8	111.4	1.40	5996	0.7 R	16.6	1.7 L	40.7	75	5.6	straight	*
Z star XV	163	166	9.9 L	81.4	110.6	1.36	5194	6.7 L	17.2	2.2 L	40.3	75	5.5	draw	*
Cal Chrome SuperHot 2018	163	167	15.2 L	80.8	109.1	1.35	4253	6.7 L	19.9	4.2 L	42.6	84	5.6	pull/draw	*
USED Range Ball	163	165	3.0 L	81.9	110.2	1.35	5699	3.6 L	18.6	0.4 L	42.7	82	5.8	straight	*
Volvik S4	162	165	5.5 L	79.0	109.6	1.39	5044	3.4 L	18.7	1.2 L	42.1	80	5.6	straight	*
Titleist NXT Tour S	161	164	0.9 L	79.8	109.6	1.37	5176	0.8 R	17.6	0.5 L	40.7	75	5.5	straight	

Rated by carry distance

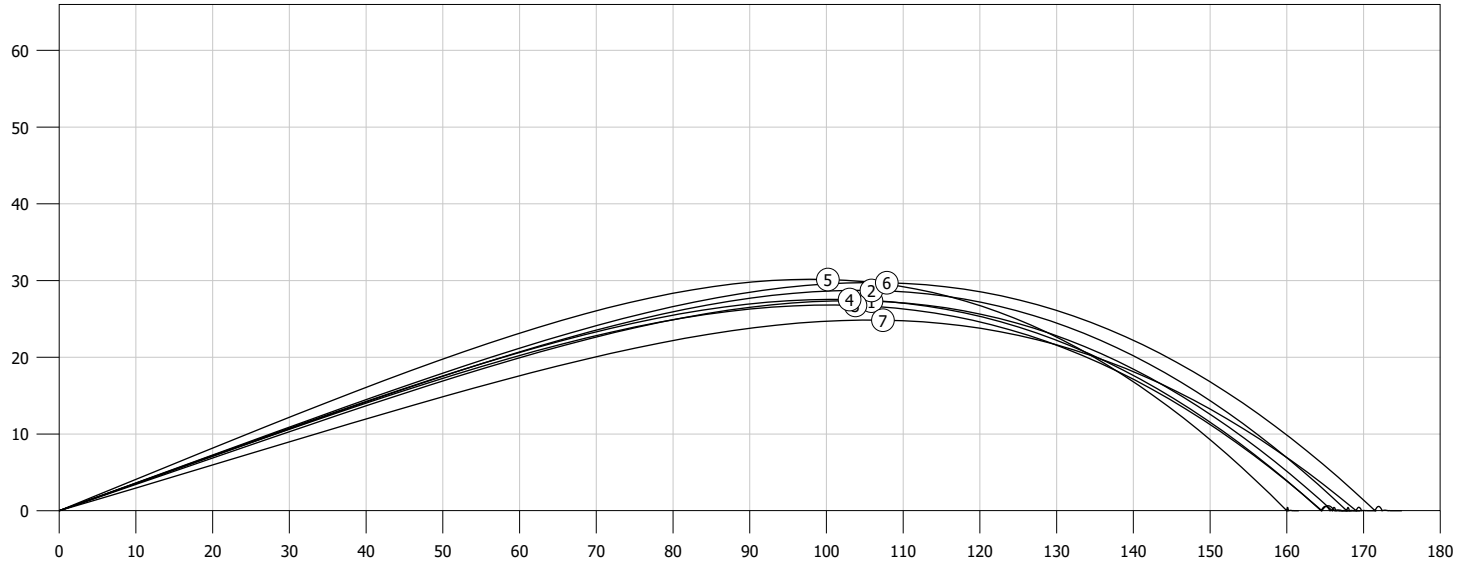
Grouping



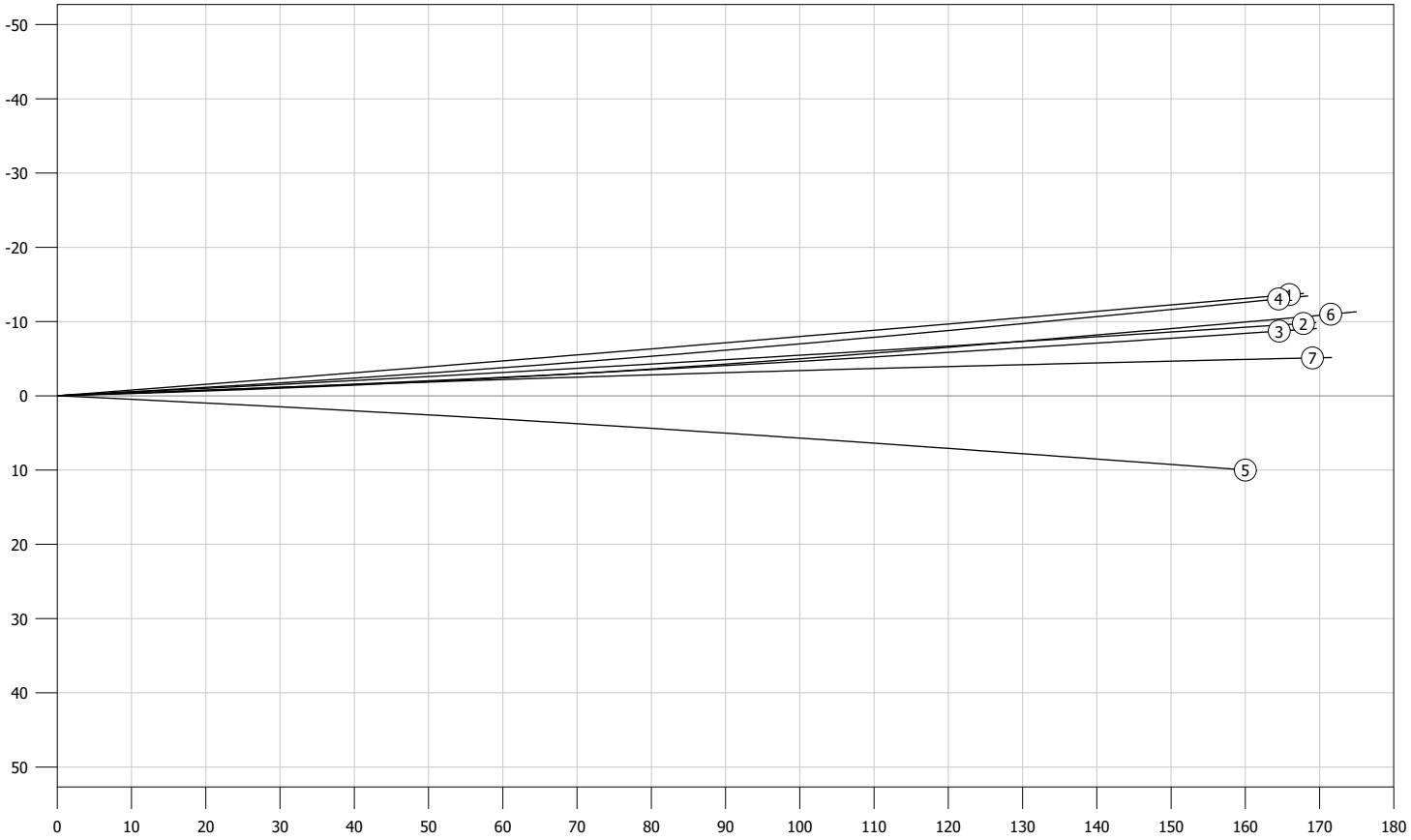
Z Star

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	166	168	13.6 L	79.6	112.1	1.41	5564	1.6 L	17.9	4.3 L	42.5	82	5.8	pull	+0.1	3.8 L	0.6 L	4.5 L	22.5	67.7	3.8 L
2	168	170	9.7 L	81.9	112.7	1.38	5624	2.3 L	18.5	2.8 L	43.6	86	5.9	straight	-4.0	1.9 L	1.3 L	3.1 L	26.5	65.1	3.8 L
3	165	170	8.7 L	78.1	109.5	1.40	3633	6.3 L	19.1	2.0 L	41.3	80	5.5	draw	-6.1	0.8 R	3.9 L	3.1 L	29.5	71.6	1.2 L
4	165	169	13.0 L	81.3	110.3	1.36	4259	8.2 L	19.0	3.0 L	42.2	83	5.6	draw	-5.6	0.6 R	5.0 L	4.4 L	29.0	72.6	1.2 L
5	160	162	10.0 R	82.1	108.4	1.32	5551	4.2 R	21.3	2.7 R	45.4	91	5.9	fade	-5.7	0.7 R	2.9 R	3.5 R	33.3	67.1	1.7 L
6	172	175	11.0 L	85.3	113.4	1.33	4493	10.6 L	19.1	1.5 L	43.4	89	5.8	draw	-5.4	3.0 R	6.4 L	3.4 L	29.0	69.8	1.0 R
7	169	172	5.1 L	82.3	114.2	1.39	5557	2.6 R	15.6	2.3 L	40.1	75	5.6	straight	-2.3	3.1 L	1.0 R	2.1 L	20.3	61.5	4.3 L
AVG.	167	169	7.3 L	81.5	111.5	1.37	4954	3.2 L	18.6	1.9 L	42.6	84	5.7	straight	-4.2	0.5 L	1.9 L	2.4 L	27.1	67.9	2.1 L
DEV.	3.7	4.1	8.1	2.3	2.2	0.03	815	5.5	1.7	2.2	1.7	5.5	0.2	-	2.3	2.5	3.3	2.8	4.4	3.9	1.9

Side View (yds)



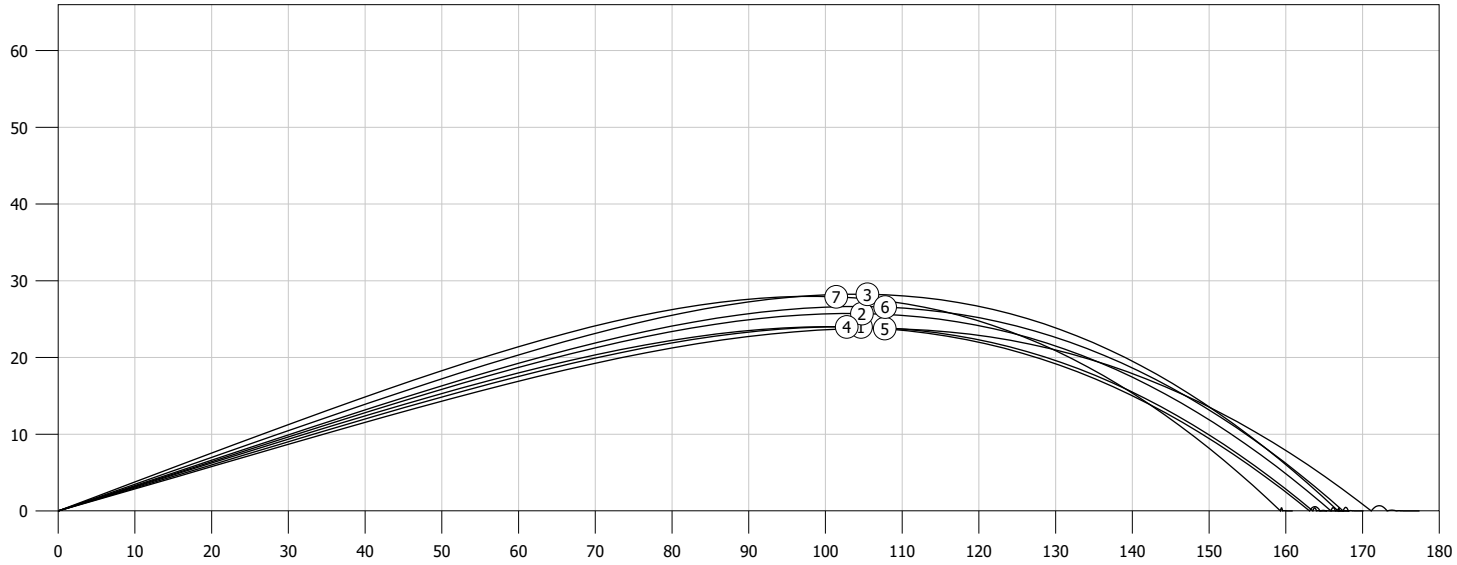
Top View (yds)

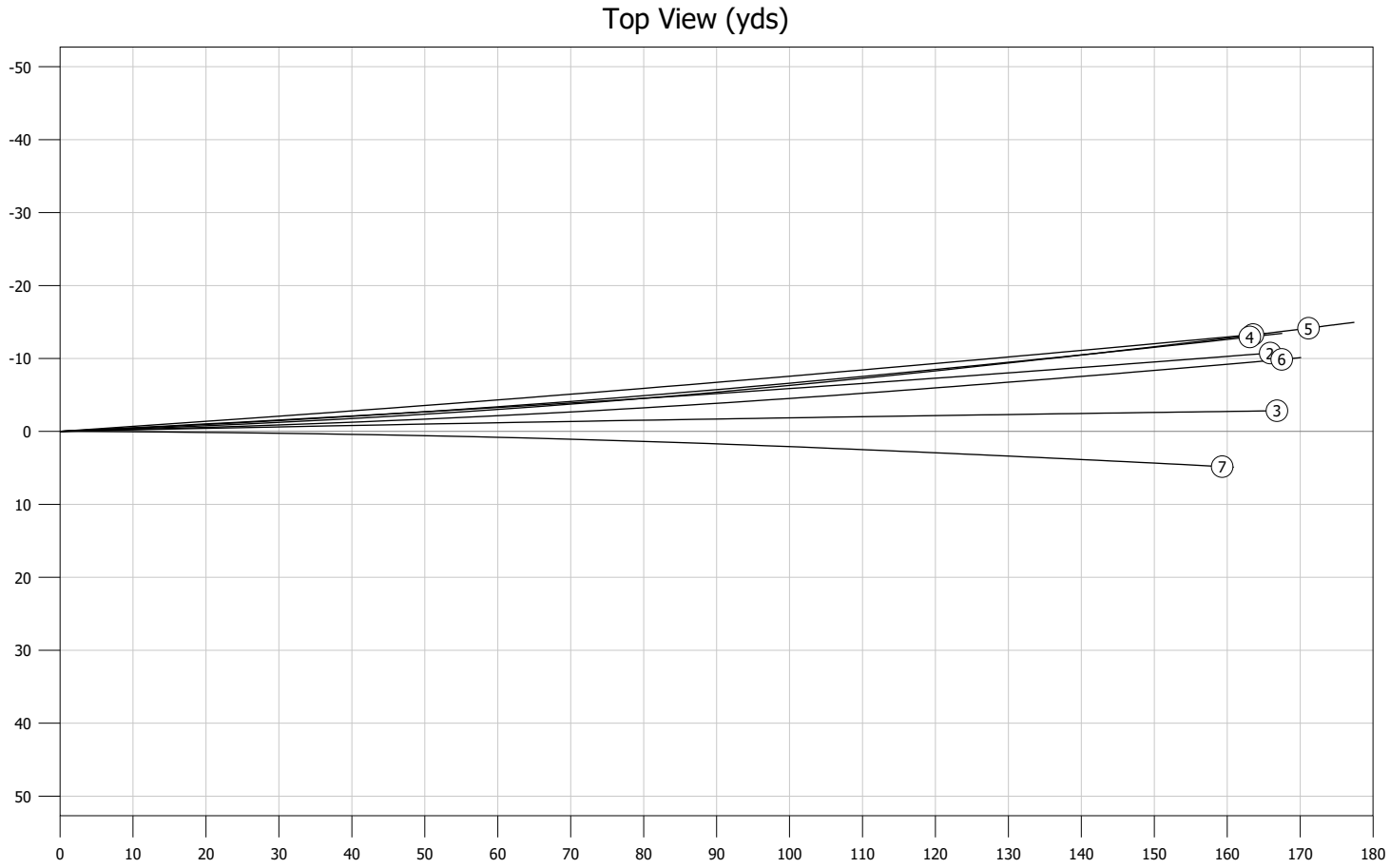


TM TP5

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	164	166	13.3 L	79.4	112.0	1.41	6078	3.8 L	15.7	3.8 L	39.9	72	5.6	pull	-1.1	2.7 L	1.4 L	4.1 L	19.7	69.3	3.1 L
2	166	169	10.7 L	79.1	112.4	1.42	5584	4.3 L	16.8	2.8 L	41.2	77	5.7	draw	-2.3	1.4 L	1.9 L	3.2 L	22.4	64.6	2.5 L
3	167	168	2.8 L	78.6	112.5	1.43	6029	1.1 R	18.1	1.2 L	43.4	85	5.9	straight	-2.4	1.6 L	0.5 R	1.1 L	24.6	60.5	3.0 L
4	164	168	12.9 L	81.7	110.8	1.36	4508	11.6 L	16.6	2.4 L	39.2	72	5.4	draw	-4.4	1.9 R	5.8 L	3.9 L	23.7	67.7	0.1 R
5	172	178	14.2 L	79.3	114.1	1.44	3754	16.5 L	15.7	1.8 L	38.0	71	5.4	draw	-6.8	4.8 R	9.2 L	4.3 L	24.1	73.7	2.8 R
6	168	170	9.9 L	78.9	112.8	1.43	5343	10.0 L	17.3	1.3 L	41.7	80	5.7	draw	-5.2	2.7 R	5.4 L	2.7 L	25.5	74.8	1.2 R
7	159	161	4.8 R	77.0	108.4	1.41	5780	7.2 R	19.8	0.2 R	43.7	84	5.8	fade	-0.7	2.4 L	3.4 R	1.0 R	26.3	65.3	2.7 L
AVG.	166	169	8.4 L	79.2	111.8	1.41	5296	5.4 L	17.2	1.9 L	41.0	77	5.6	draw	-3.3	0.2 R	2.8 L	2.6 L	23.8	68.0	1.0 L
DEV.	3.8	5.1	7.0	1.4	1.8	0.03	863	8.0	1.4	1.3	2.1	5.8	0.2	-	2.3	2.9	4.3	1.9	2.2	5.1	2.4

Side View (yds)

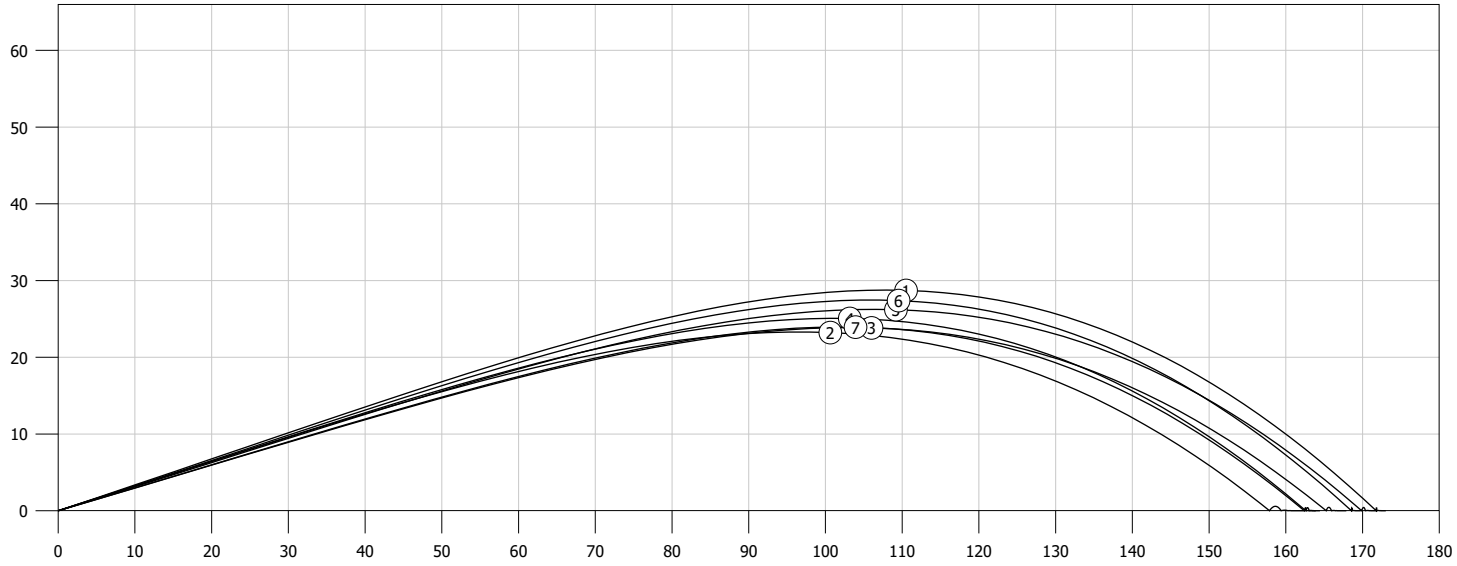




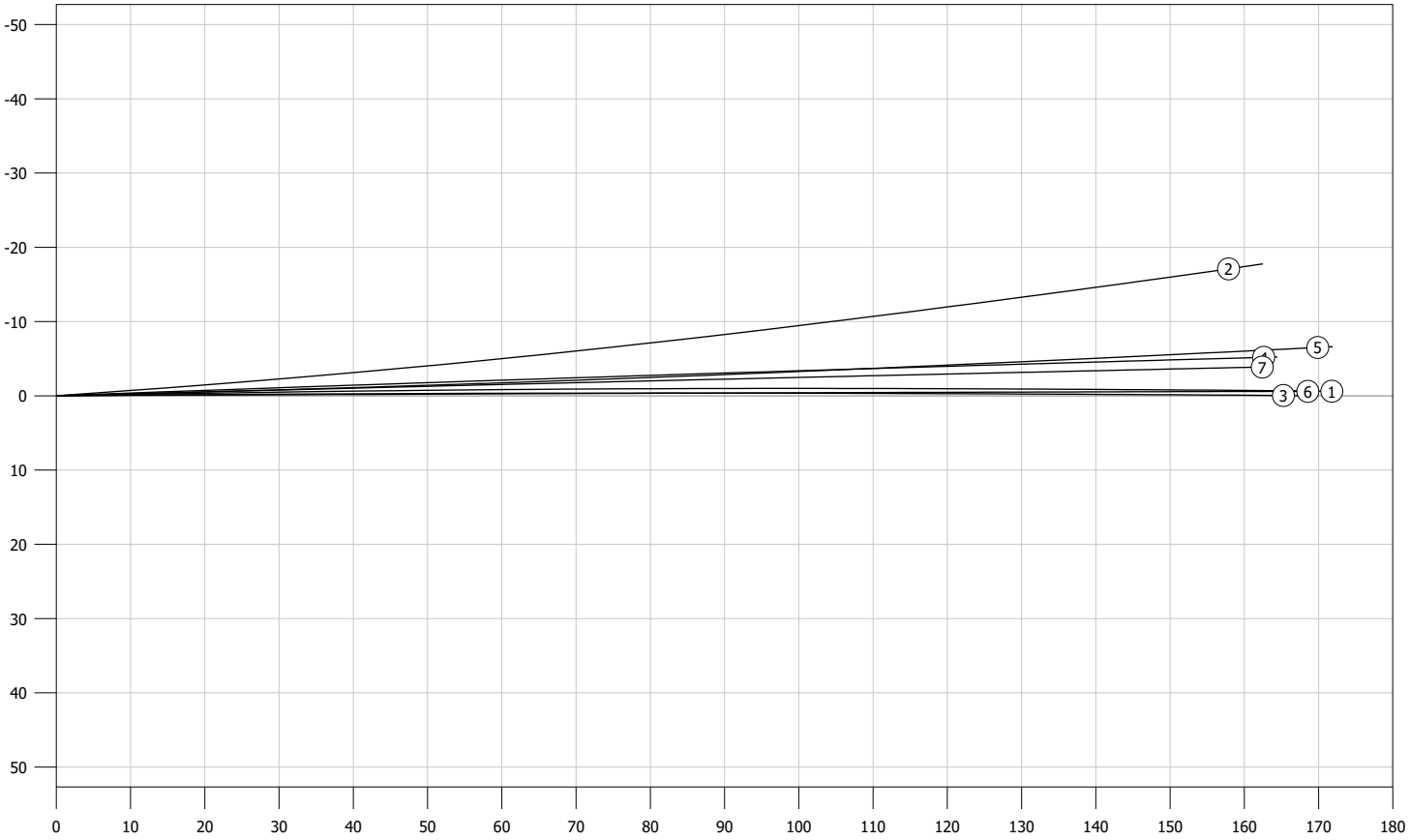
2018 Pro V1

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	172	173	0.6 L	82.4	115.0	1.40	6274	3.7 R	17.5	1.1 L	43.5	86	6.0	fade	-0.9	2.2 L	1.5 R	0.8 L	22.5	67.2	2.6 L
2	159	163	17.1 L	76.6	108.4	1.41	4364	13.4 L	17.2	3.8 L	38.9	70	5.3	pull/draw	-2.7	0.9 R	6.2 L	5.3 L	23.4	72.8	0.1 R
3	165	168	0.0	78.2	112.5	1.44	5668	2.3 R	15.6	0.5 L	39.5	72	5.5	straight	+0.4	1.1 L	0.7 R	0.4 L	18.7	72.8	0.9 L
4	163	165	5.2 L	78.3	110.8	1.42	5898	1.3 R	16.9	2.1 L	41.0	75	5.6	straight	+0.4	2.5 L	0.5 R	2.0 L	20.7	66.2	2.3 L
5	170	172	6.5 L	78.2	114.3	1.46	5757	3.7 L	16.4	1.4 L	41.4	79	5.7	straight	-2.3	0.1 L	1.6 L	1.7 L	21.5	61.8	1.4 L
6	169	170	0.6 L	80.7	113.8	1.41	6446	0.3 R	17.0	0.3 L	42.7	82	5.9	straight	-4.1	0.4 L	0.1 R	0.2 L	23.9	59.6	2.8 L
7	162	164	3.9 L	81.0	111.5	1.38	6445	0.6 R	15.7	1.5 L	40.1	72	5.6	straight	-3.6	1.7 L	0.3 R	1.4 L	21.3	64.9	3.4 L
AVG.	166	168	4.8 L	79.4	112.3	1.42	5836	1.3 L	16.6	1.5 L	41.0	77	5.7	straight	-1.8	1.0 L	0.7 L	1.7 L	21.7	66.5	1.9 L
DEV.	4.7	3.9	6.0	2.0	2.3	0.03	724	5.8	0.7	1.2	1.7	6.2	0.2	-	1.8	1.2	2.6	1.7	1.7	5.0	1.2

Side View (yds)



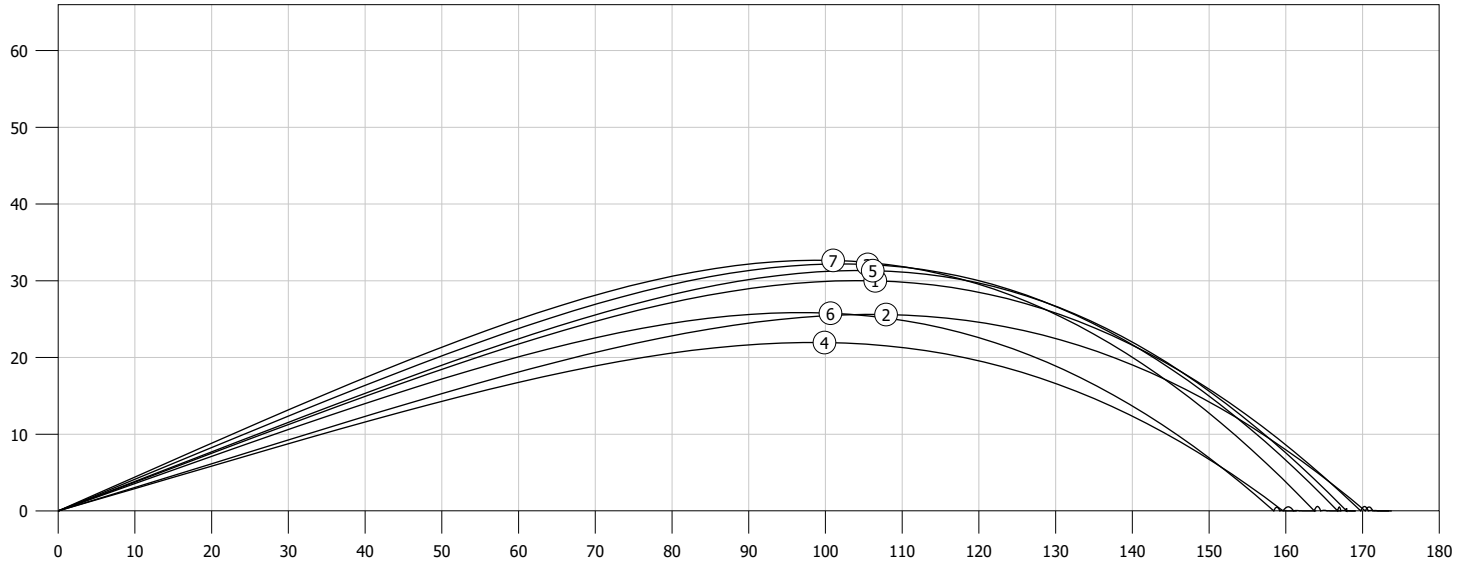
Top View (yds)

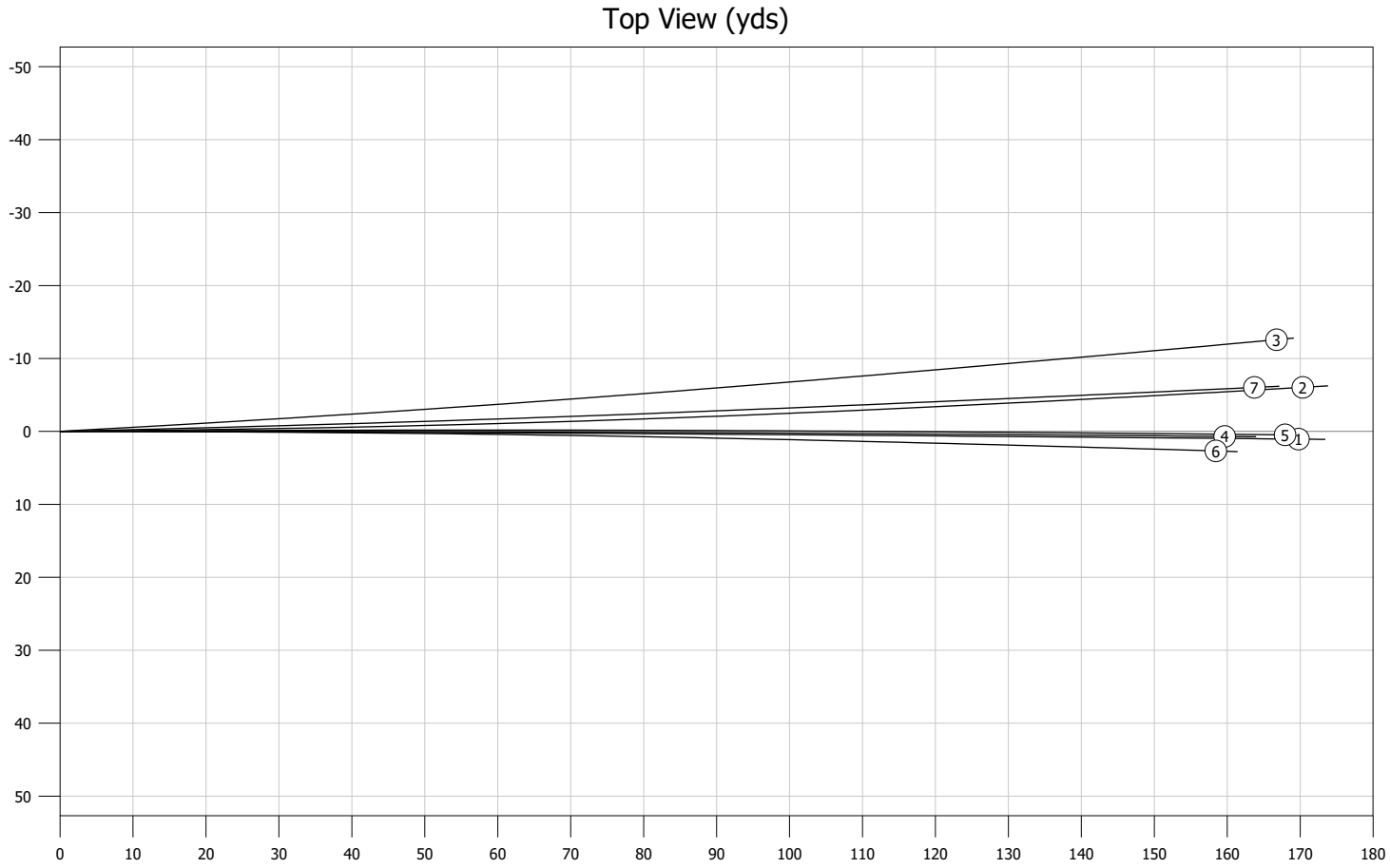


Q Star Tour

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	170	173	1.1 R	82.6	112.1	1.36	4185	1.4 R	19.8	0.1 R	43.7	90	5.8	straight	-5.9	0.5 L	0.9 R	0.3 R	30.5	62.3	3.6 L
2	170	174	6.0 L	78.7	114.3	1.45	4992	7.7 L	16.2	0.5 L	40.3	77	5.6	draw	-4.0	2.3 R	3.6 L	1.3 L	22.5	68.3	0.7 R
3	167	170	12.6 L	81.8	111.1	1.36	4919	5.8 L	21.5	3.1 L	45.8	97	6.0	draw	-5.4	0.3 L	3.9 L	4.3 L	33.4	69.6	2.3 L
4	160	164	0.7 R	83.6	109.7	1.31	4834	1.7 R	15.6	0.1 L	37.7	66	5.2	straight	-2.1	0.6 L	0.7 R	0.1 R	20.2	60.1	1.8 L
5	168	169	0.5 R	82.5	112.8	1.37	6099	2.2 R	19.9	0.4 L	45.6	94	6.1	straight	-2.5	1.2 L	1.2 R	0.0	27.8	59.3	2.7 L
6	158	161	2.7 R	85.6	107.8	1.26	5001	5.0 R	18.9	0.0	41.6	77	5.5	fade	-2.8	1.9 L	2.5 R	0.7 R	26.2	63.8	3.2 L
7	164	167	6.0 L	84.3	108.4	1.29	4010	4.2 L	23.2	1.3 L	46.1	98	5.9	straight	-7.5	1.0 R	3.4 L	2.4 L	38.5	62.4	3.0 L
AVG.	165	168	2.8 L	82.7	110.9	1.34	4863	1.1 L	19.3	0.7 L	43.0	86	5.7	straight	-4.3	0.2 L	0.8 L	1.0 L	28.4	63.7	2.3 L
DEV.	4.8	4.6	5.5	2.2	2.4	0.06	677	4.8	2.7	1.1	3.2	12	0.3	-	2.0	1.4	2.7	1.8	6.3	3.9	1.4

Side View (yds)

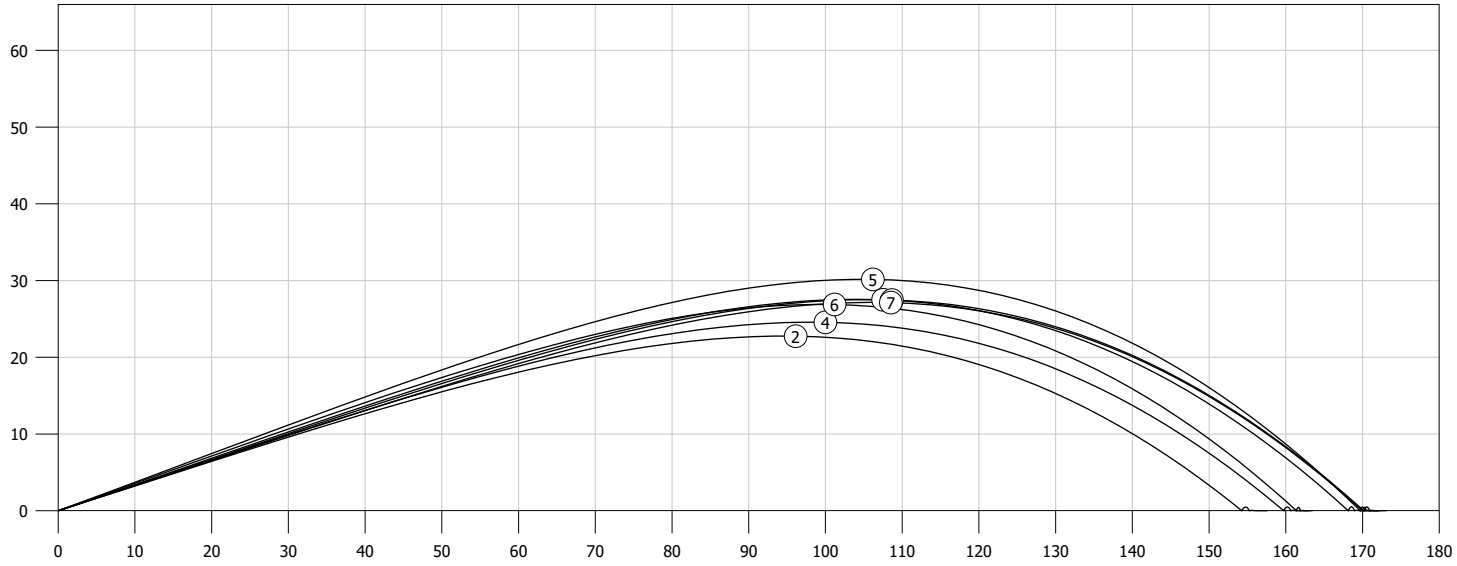




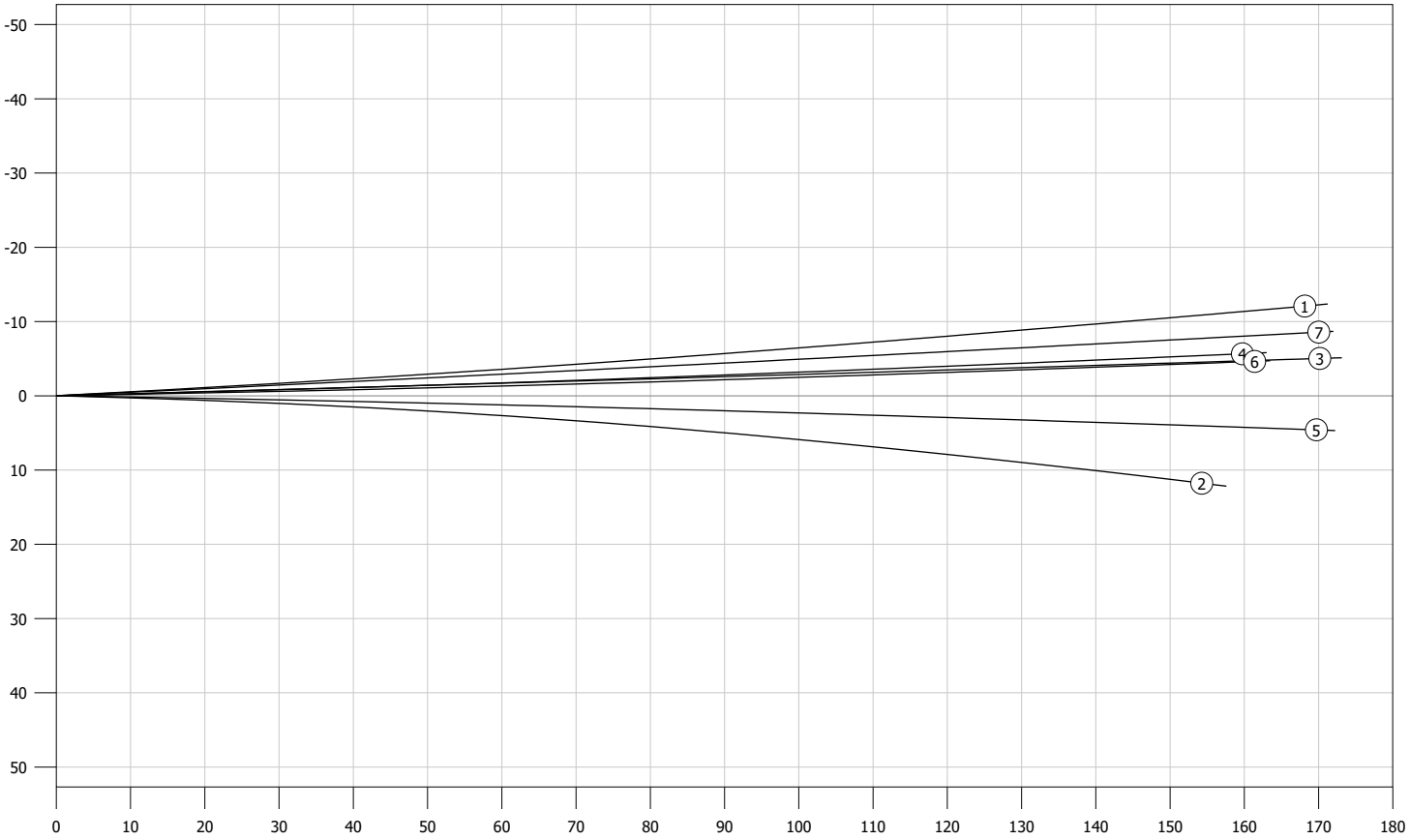
TM TP5X

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	169	172	12.1 L	81.2	112.7	1.39	4892	5.6 L	18.0	3.0 L	42.2	83	5.7	draw	-3.1	0.9 L	2.7 L	3.7 L	24.9	71.7	2.0 L
2	155	158	11.8 R	81.7	107.1	1.31	5358	15.8 R	17.2	1.4 R	39.2	68	5.3	fade	-2.8	4.3 L	7.4 R	3.2 R	23.6	67.4	5.4 L
3	170	173	5.0 L	78.2	113.5	1.45	4993	0.6 L	17.6	1.6 L	42.0	83	5.7	straight	-3.7	1.4 L	0.3 L	1.6 L	24.6	65.9	3.0 L
4	160	163	5.7 L	79.6	108.9	1.37	4993	3.2 L	17.6	1.4 L	40.4	74	5.4	straight	-2.5	0.3 L	1.5 L	1.8 L	23.7	65.8	1.4 L
5	170	172	4.6 R	79.0	112.9	1.43	4992	2.9 R	19.4	1.0 R	44.2	91	5.9	straight	-3.6	0.2 L	1.5 R	1.4 R	27.8	68.6	1.6 L
6	161	164	4.6 L	77.1	109.4	1.42	5393	3.2 L	18.8	1.0 L	42.5	81	5.7	straight	-3.2	0.2 R	1.6 L	1.4 L	26.4	72.6	0.8 L
7	170	172	8.6 L	82.7	114.1	1.38	5662	0.8 L	17.0	2.7 L	42.0	82	5.8	straight	-2.9	2.4 L	0.4 L	2.8 L	23.0	68.0	3.6 L
AVG.	165	168	2.8 L	79.9	111.2	1.39	5183	0.8 R	17.9	1.0 L	41.8	80	5.7	straight	-3.1	1.3 L	0.4 R	1.0 L	24.9	68.6	2.5 L
DEV.	6.3	6.0	8.2	2.0	2.7	0.05	288	7.1	0.9	1.7	1.6	7.1	0.2	-	0.5	1.6	3.4	2.4	1.7	2.6	1.6

Side View (yds)



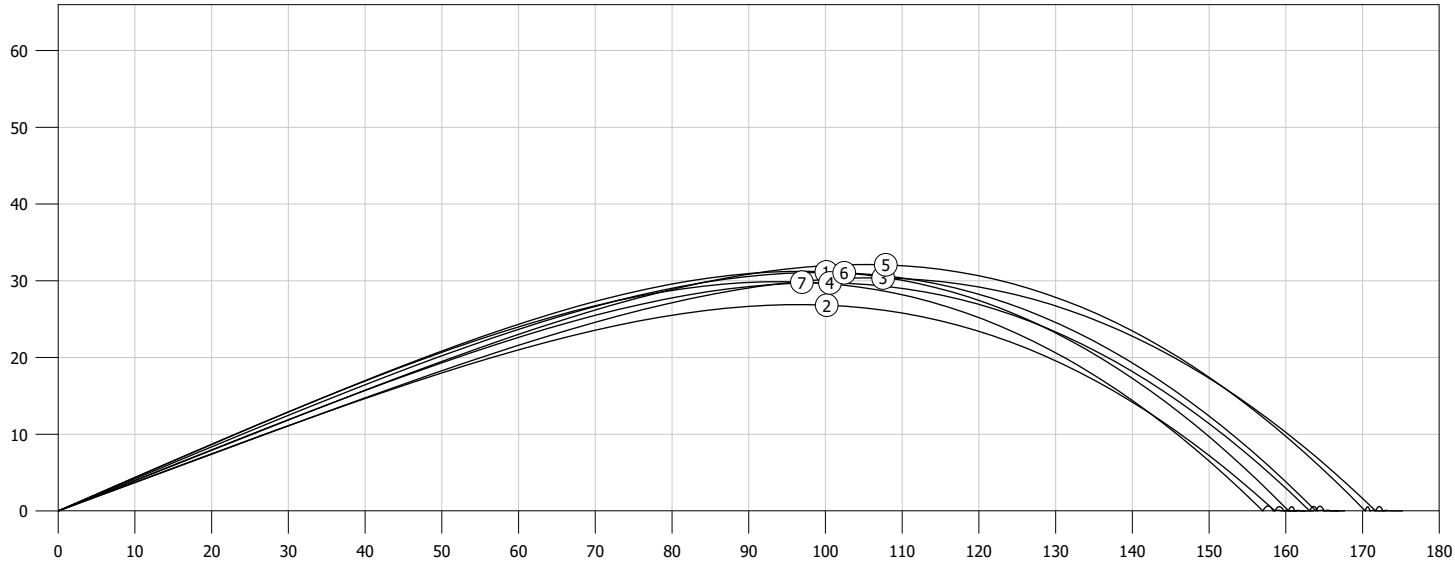
Top View (yds)

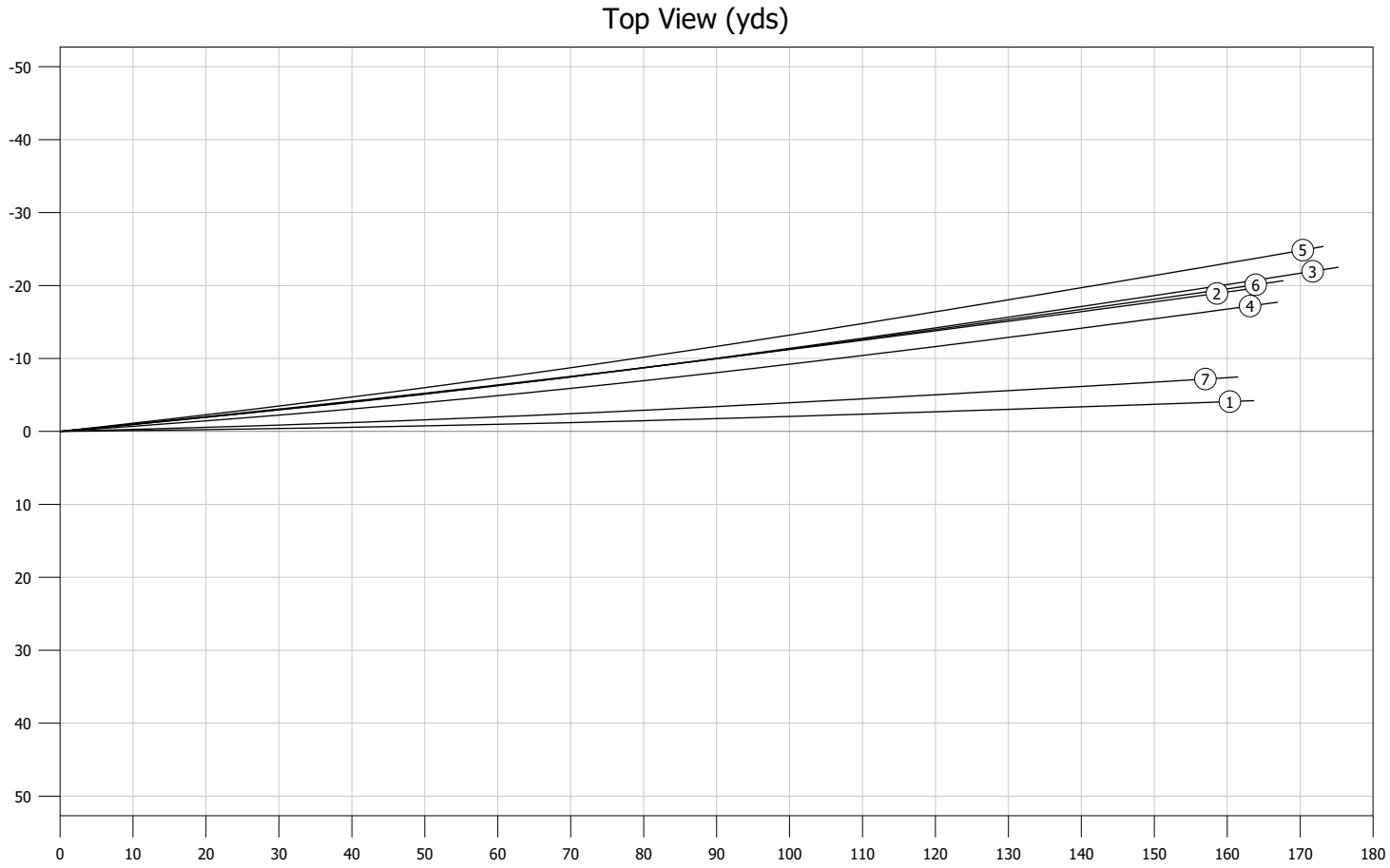


2018 Chrome Soft

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	160	164	4.1 L	86.8	107.2	1.23	4136	4.9 L	22.8	0.6 L	45.4	94	5.8	draw	-8.3	2.1 R	4.0 L	1.9 L	38.2	67.4	1.4 L
2	160	164	18.9 L	77.3	107.7	1.39	4247	6.8 L	19.7	5.6 L	42.1	81	5.5	pull/draw	-7.7	2.3 L	4.8 L	7.1 L	32.1	70.3	5.0 L
3	173	177	21.9 L	78.7	113.7	1.45	4380	10.3 L	19.4	5.2 L	43.7	91	5.9	pull/draw	-6.9	0.4 L	6.9 L	7.3 L	30.9	69.8	3.0 L
4	164	168	17.2 L	85.3	109.1	1.28	4113	11.9 L	21.0	3.8 L	44.0	89	5.7	pull/draw	-7.8	2.3 R	9.0 L	6.8 L	35.1	70.4	0.5 L
5	172	175	24.8 L	82.5	113.4	1.38	4681	9.9 L	20.5	6.2 L	45.2	96	6.0	pull/draw	-0.3	2.5 L	4.8 L	7.4 L	27.3	69.1	2.7 L
6	165	169	20.1 L	77.8	108.9	1.40	3862	8.9 L	22.1	5.3 L	44.7	93	5.8	pull/draw	-8.4	0.6 L	7.1 L	7.7 L	37.2	69.1	3.8 L
7	157	162	7.2 L	81.5	104.9	1.29	3370	7.7 L	23.2	1.4 L	44.5	90	5.6	draw	-10.3	3.2 R	6.8 L	3.6 L	39.9	69.6	0.7 L
AVG.	165	168	16.3 L	81.4	109.3	1.34	4113	8.6 L	21.2	4.0 L	44.2	91	5.8	pull/draw	-7.1	0.2 R	6.2 L	6.0 L	34.4	69.4	2.4 L
DEV.	6.1	5.8	7.7	3.7	3.3	0.08	414	2.3	1.5	2.2	1.1	5.1	0.2	-	3.2	2.3	1.8	2.3	4.5	1.0	1.7

Side View (yds)

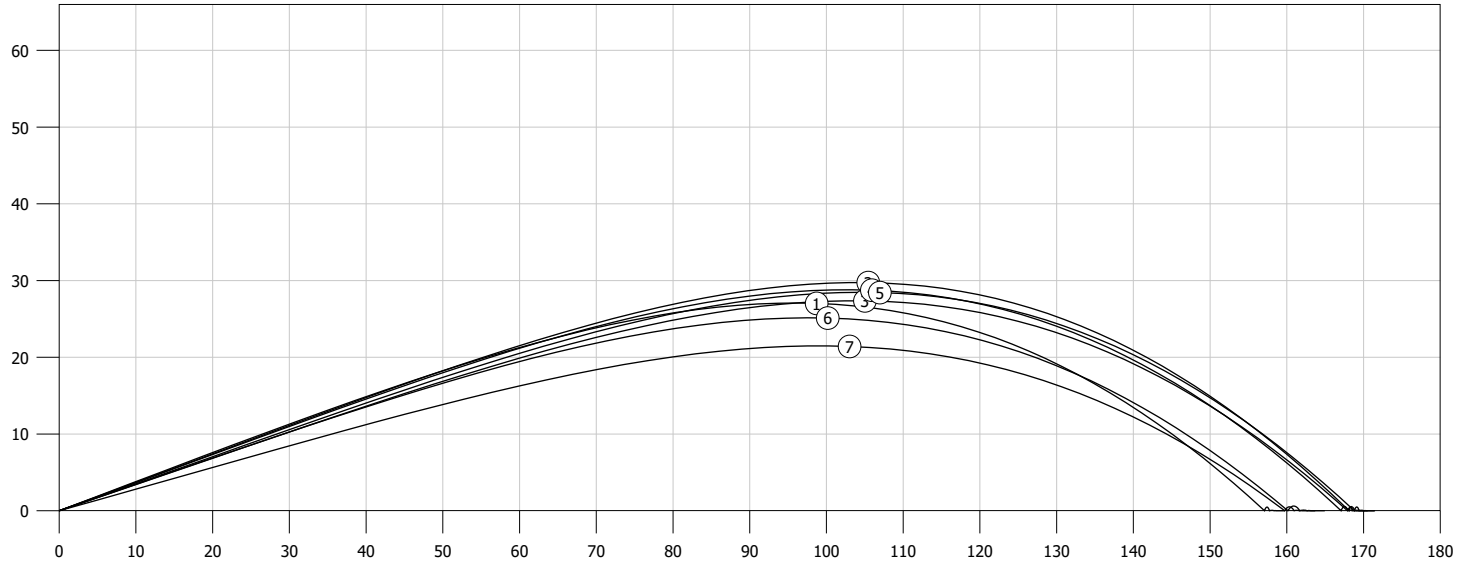




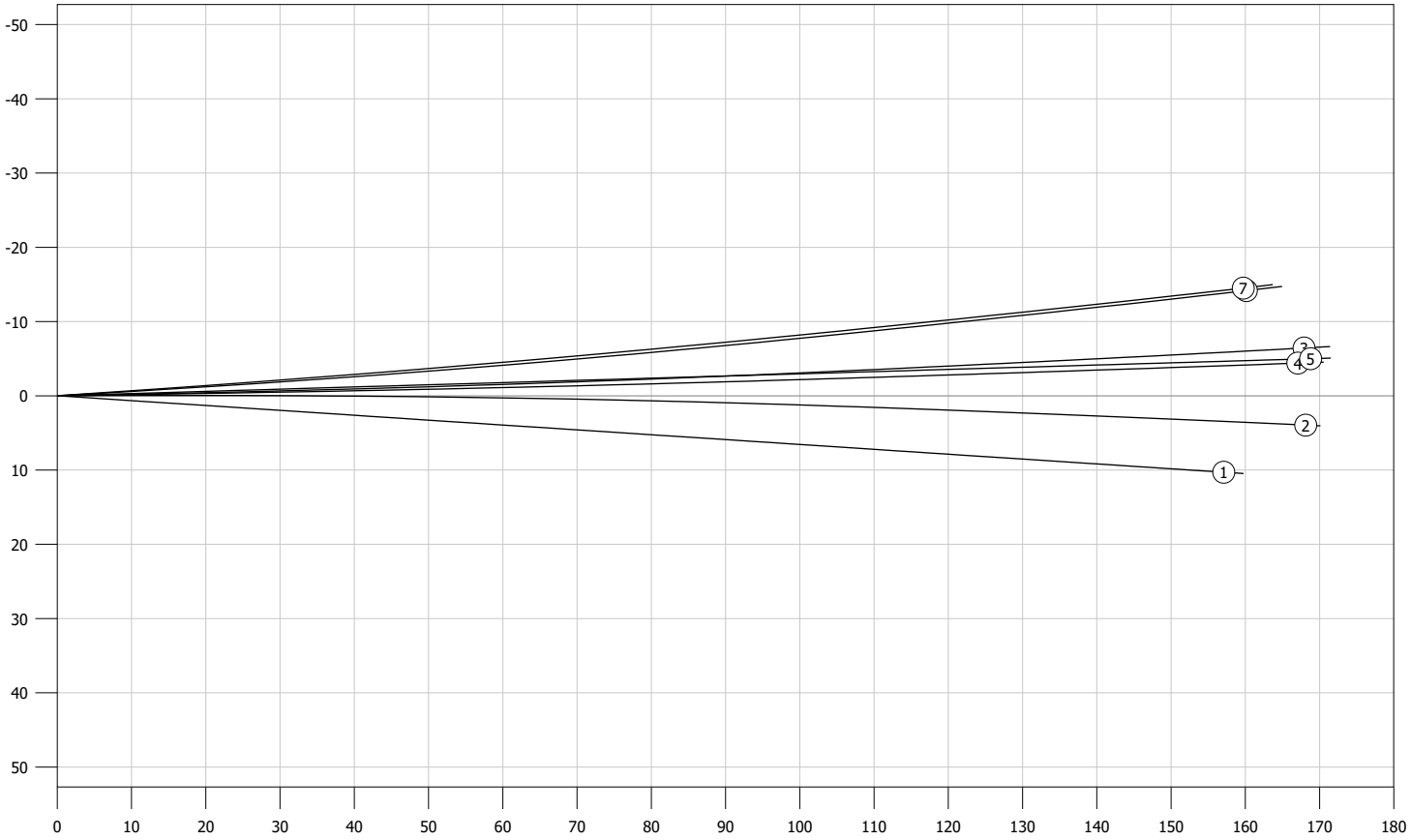
Volvik S3

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	157	160	10.3 R	81.8	107.0	1.31	5009	0.1 L	20.0	3.8 R	42.9	81	5.6	push	-4.4	3.8 R	0.0	3.8 R	29.6	70.7	2.2 R
2	168	170	4.0 R	82.4	112.4	1.36	5347	7.9 R	19.3	0.3 L	44.3	89	5.9	fade	-1.3	3.2 L	3.8 R	0.6 R	26.0	62.8	3.9 L
3	168	172	6.4 L	81.0	112.2	1.38	4628	6.0 L	18.1	1.0 L	41.9	82	5.7	draw	-3.5	1.2 R	3.0 L	1.8 L	25.3	71.6	0.1 R
4	167	171	4.4 L	80.1	111.3	1.39	4437	3.9 L	19.3	0.8 L	43.2	86	5.8	straight	-5.2	0.9 R	2.3 L	1.4 L	29.0	68.8	1.1 L
5	169	172	5.0 L	-	112.7	-	5061	0.0	18.4	1.7 L	43.0	85	5.8	straight	-	-	-	-	-	-	-
6	161	166	14.2 L	78.7	108.3	1.38	3949	11.1 L	18.4	3.2 L	40.3	75	5.4	draw	-5.3	1.5 R	6.4 L	5.0 L	27.6	70.0	0.5 L
7	160	164	14.5 L	78.4	110.5	1.41	5148	7.7 L	15.0	3.7 L	37.3	65	5.2	pull/draw	+0.6	1.8 L	2.3 L	4.1 L	17.8	65.9	1.5 L
AVG.	164	168	4.3 L	80.4	110.6	1.37	4797	3.0 L	18.4	1.0 L	41.8	81	5.6	straight	-3.2	0.4 R	1.7 L	1.3 L	25.9	68.3	0.8 L
DEV.	4.7	4.4	9.0	1.7	2.2	0.04	486	6.2	1.6	2.4	2.3	8.4	0.2	-	2.4	2.5	3.4	3.2	4.3	3.4	2.0

Side View (yds)



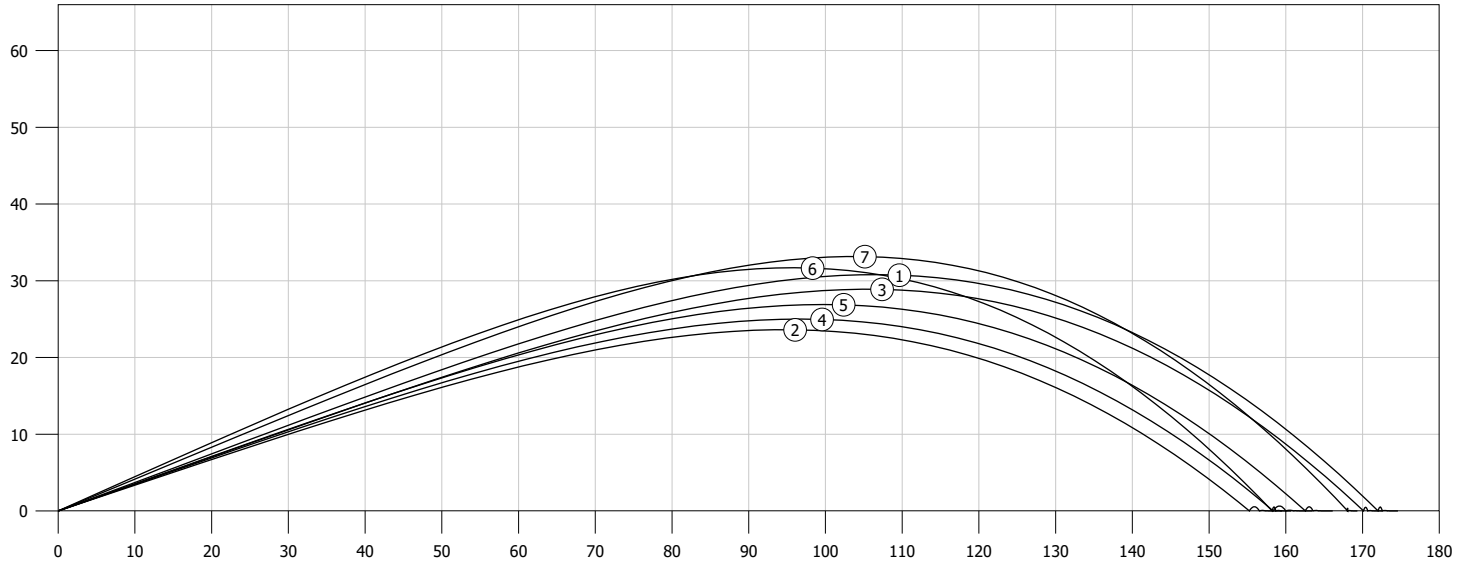
Top View (yds)

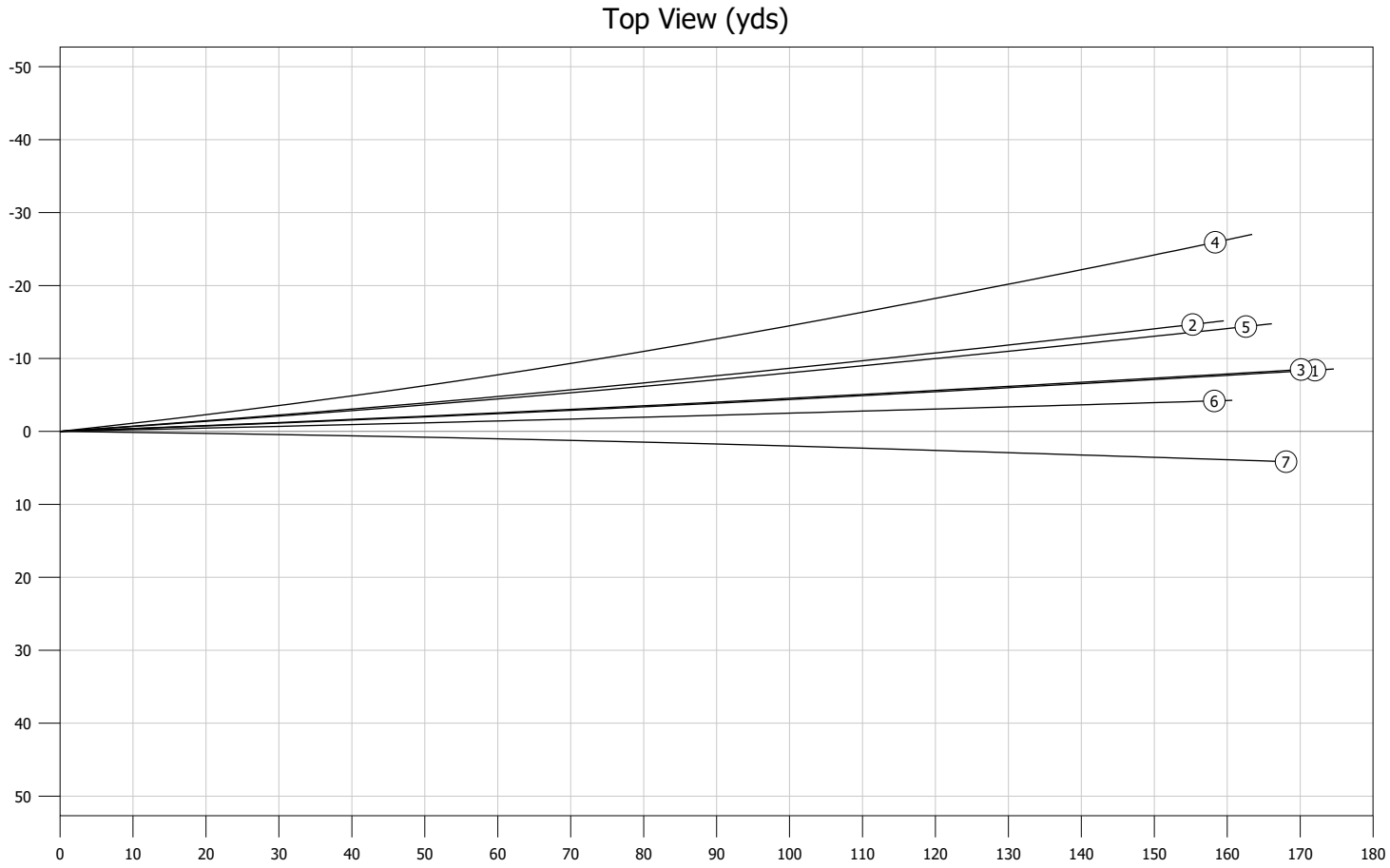


2018 Chrome soft X

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	172	175	8.4 L	80.1	113.9	1.42	4965	3.5 L	19.4	2.0 L	44.4	92	6.0	straight	-3.3	0.7 L	1.9 L	2.5 L	27.5	70.0	1.9 L
2	156	160	14.7 L	77.6	106.8	1.38	4478	8.1 L	17.9	4.0 L	39.6	71	5.3	pull/draw	-3.8	0.9 L	4.2 L	5.0 L	25.4	72.1	2.1 L
3	170	173	8.5 L	80.1	113.5	1.42	5216	3.1 L	18.4	2.2 L	43.2	87	5.9	straight	-3.0	1.0 L	1.5 L	2.6 L	25.5	70.6	2.1 L
4	160	166	25.9 L	76.5	108.2	1.41	3932	18.9 L	18.5	6.1 L	40.2	75	5.4	pull/draw	-5.6	2.2 R	11.7 L	9.5 L	28.5	69.8	0.1 R
5	163	167	14.4 L	77.8	109.8	1.41	4576	7.0 L	18.8	3.7 L	41.9	81	5.6	pull/draw	-2.6	1.1 L	3.5 L	4.6 L	26.0	68.5	2.1 L
6	158	161	4.2 L	82.4	106.7	1.29	4666	1.3 L	23.2	1.3 L	46.3	95	5.9	straight	+0.1	0.7 L	0.7 L	1.4 L	31.7	71.2	0.7 L
7	168	169	4.2 R	87.8	112.3	1.28	5813	3.0 R	21.4	0.7 R	46.9	99	6.2	straight	-4.1	0.6 L	1.9 R	1.2 R	31.9	64.9	2.5 L
AVG.	164	167	10.3 L	80.3	110.2	1.37	4807	5.6 L	19.7	2.7 L	43.2	86	5.7	draw	-3.2	0.4 L	3.1 L	3.5 L	28.1	69.6	1.6 L
DEV.	6.3	5.6	9.4	3.9	3.1	0.06	599	6.9	1.9	2.2	2.8	11	0.3	-	1.7	1.2	4.3	3.4	2.8	2.3	1.0

Side View (yds)



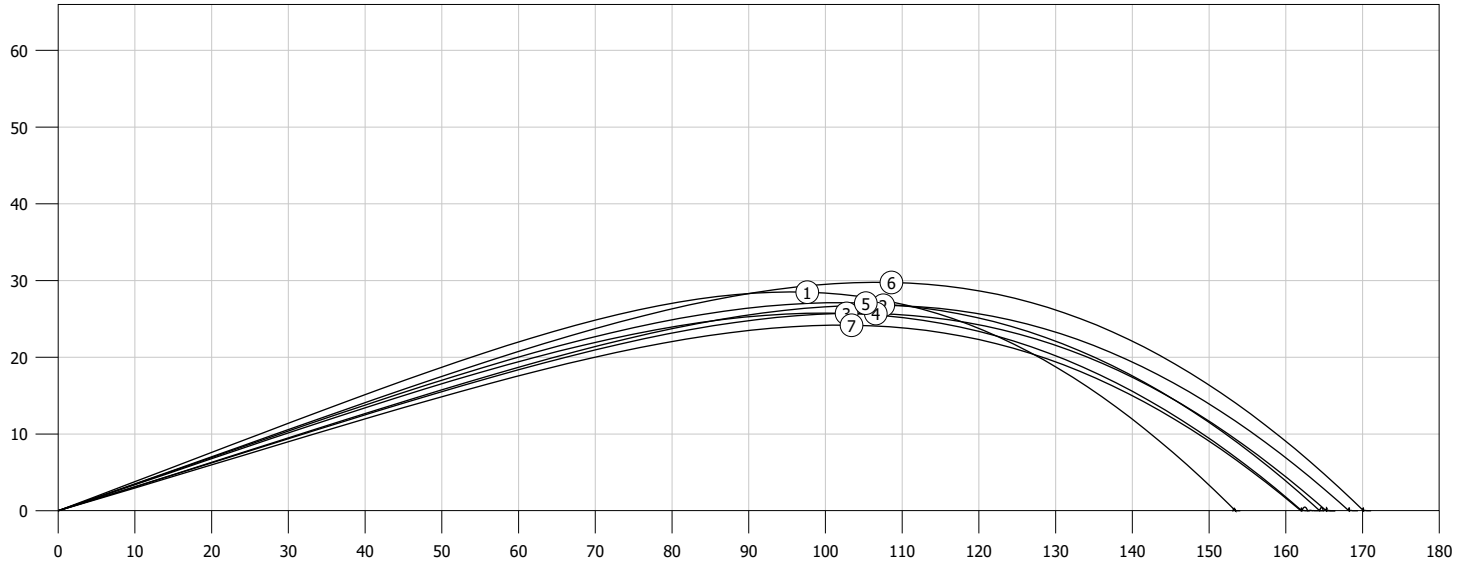


New Range Ball

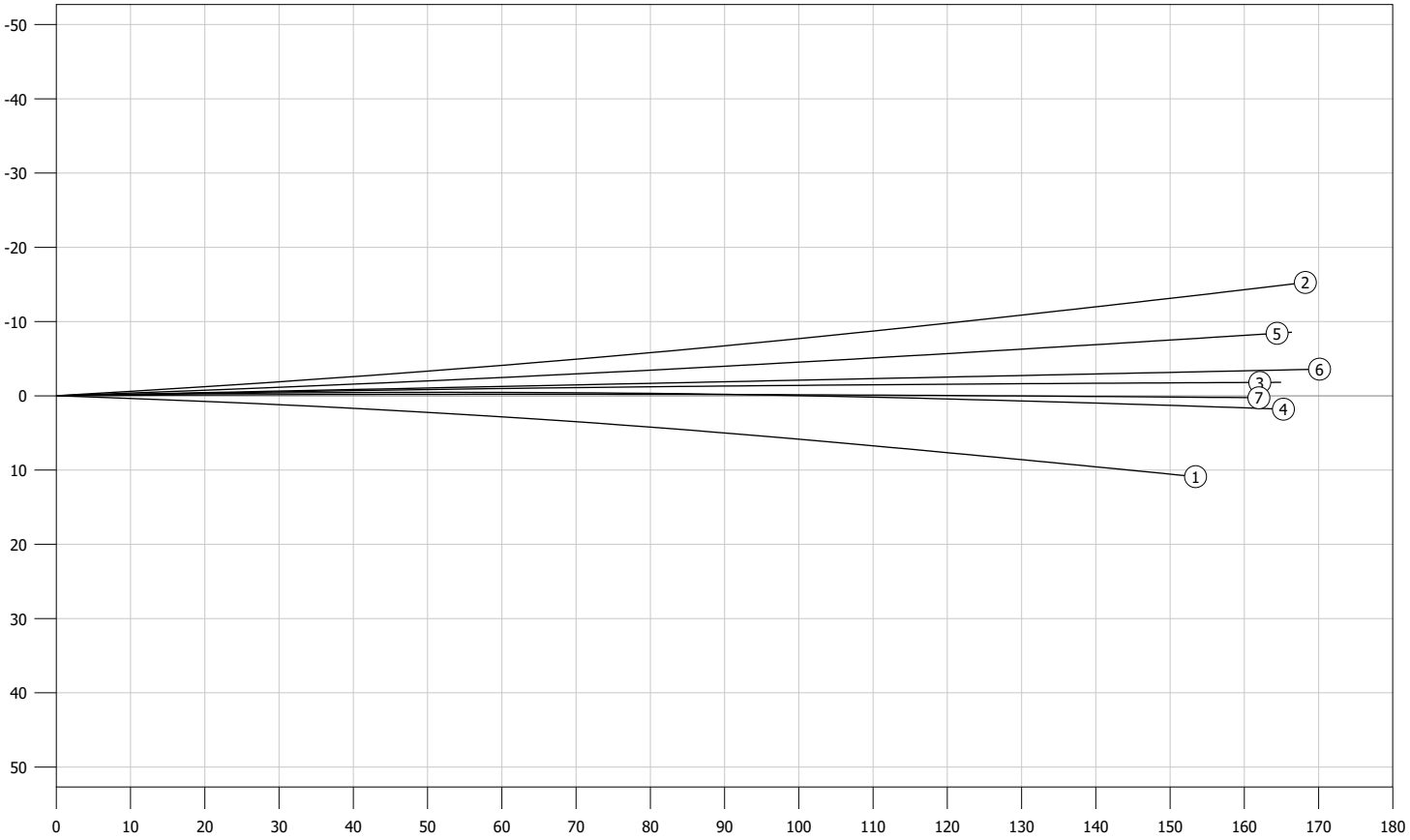
	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	154	154	10.9 R	80.2	107.2	1.34	7266	9.1 R	20.0	1.9 R	44.7	86	5.9	fade	-2.2	1.7 L	4.8 R	3.1 R	27.8	65.0	2.7 L
2	169	170	15.3 L	80.5	114.5	1.42	6667	8.1 L	16.3	3.2 L	42.1	80	5.9	draw	-3.3	0.4 L	3.6 L	4.1 L	22.2	65.5	1.9 L
3	162	165	1.8 L	80.5	109.8	1.36	5138*	2.4 R *	17.9	1.1 L	41.3	77	5.6	straight	-1.1	1.9 L	1.0 R	0.9 L	23.3	66.4	2.4 L
4	165	166	1.8 R	81.1	112.8	1.39	6647	7.0 R	16.3	1.0 L	41.5	77	5.8	fade	-2.7	3.3 L	3.0 R	0.3 L	21.7	66.2	4.5 L
5	165	167	8.4 L	81.6	111.1	1.36	5488	4.4 L	18.2	2.0 L	42.5	81	5.7	draw	-3.0	0.4 L	2.2 L	2.5 L	25.1	70.4	1.4 L
6	170	171	3.6 L	80.2	114.4	1.43	6558	0.0	18.2	1.2 L	44.3	89	6.1	straight	-1.2	1.2 L	0.0	1.2 L	23.8	68.7	1.6 L
7	162	163	0.3 R	77.7	111.5	1.44	6780	2.0 R	15.7	0.4 L	40.4	73	5.6	straight	-1.7	1.0 L	0.8 R	0.2 L	20.0	62.0	1.9 L
AVG.	164	165	2.3 L	80.3	111.6	1.39	6363	1.1 R	17.5	1.0 L	42.4	80	5.8	straight	-2.2	1.4 L	0.5 R	0.9 L	23.4	66.3	2.4 L
DEV.	5.4	5.5	8.2	1.2	2.6	0.04	760	6.0	1.5	1.6	1.6	5.6	0.2	-	0.9	1.0	2.9	2.2	2.5	2.7	1.1

*No spin measured, this is an estimation.

Side View (yds)



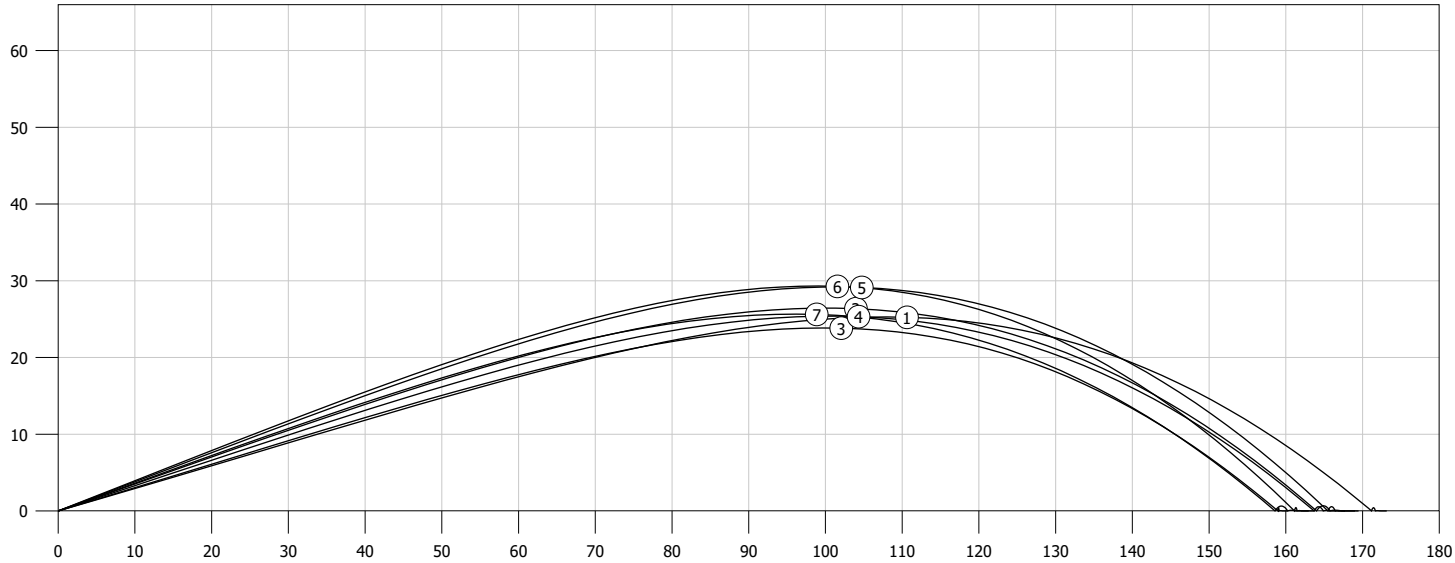
Top View (yds)

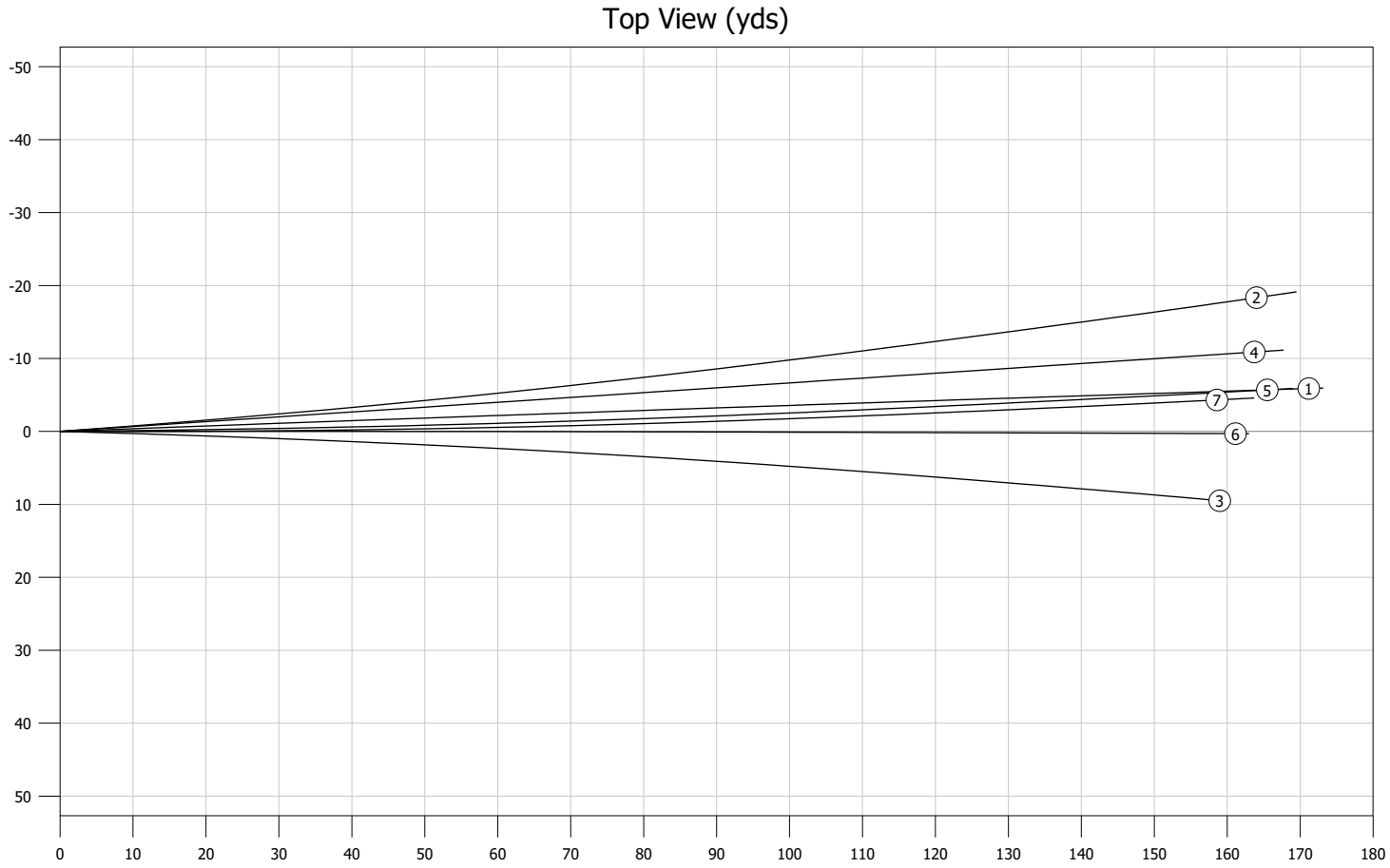


Q Star

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	171	173	5.9 L	82.7	115.5	1.40	5886	0.8 R	15.3	2.1 L	40.5	76	5.7	straight	-3.3	2.4 L	0.3 R	2.1 L	20.4	61.1	4.2 L
2	165	171	18.3 L	79.3	109.5	1.38	3513	13.7 L	19.0	4.1 L	41.0	79	5.5	pull/draw	-6.3	2.0 R	8.8 L	6.7 L	29.7	76.2	0.5 R
3	159	161	9.5 R	80.5	110.1	1.37	6758	8.2 R	16.1	1.6 R	40.3	71	5.6	fade	-3.0	1.2 L	3.5 R	2.4 R	21.6	63.3	2.7 L
4	164	168	10.9 L	-	110.5	-	4494	0.0	17.5	3.8 L	40.5	76	5.5	pull	-	-	-	-	-	-	-
5	166	169	5.7 L	78.5	110.3	1.41	4331	7.9 L	20.0	0.5 L	43.6	88	5.8	draw	-5.7	3.1 R	5.1 L	2.0 L	30.9	72.5	1.3 R
6	161	163	0.3 R	82.7	108.8	1.32	5350	0.7 R	20.6	0.0	44.5	88	5.8	straight	-2.9	0.3 L	0.4 R	0.1 R	29.4	64.9	1.6 L
7	159	164	4.3 L	82.5	106.8	1.29	3679	10.6 L	19.5	0.2 R	40.9	77	5.4	draw	-7.3	5.2 R	7.3 L	2.1 L	31.5	65.7	1.9 R
AVG.	164	167	5.0 L	81.0	110.2	1.36	4859	3.2 L	18.3	1.3 L	41.6	79	5.6	straight	-4.8	1.1 R	2.8 L	1.7 L	27.2	67.3	0.8 L
DEV.	4.4	4.6	8.7	1.9	2.6	0.05	1191	7.7	2.0	2.1	1.7	6.2	0.2	-	1.9	2.9	4.9	3.0	4.9	5.8	2.4

Side View (yds)

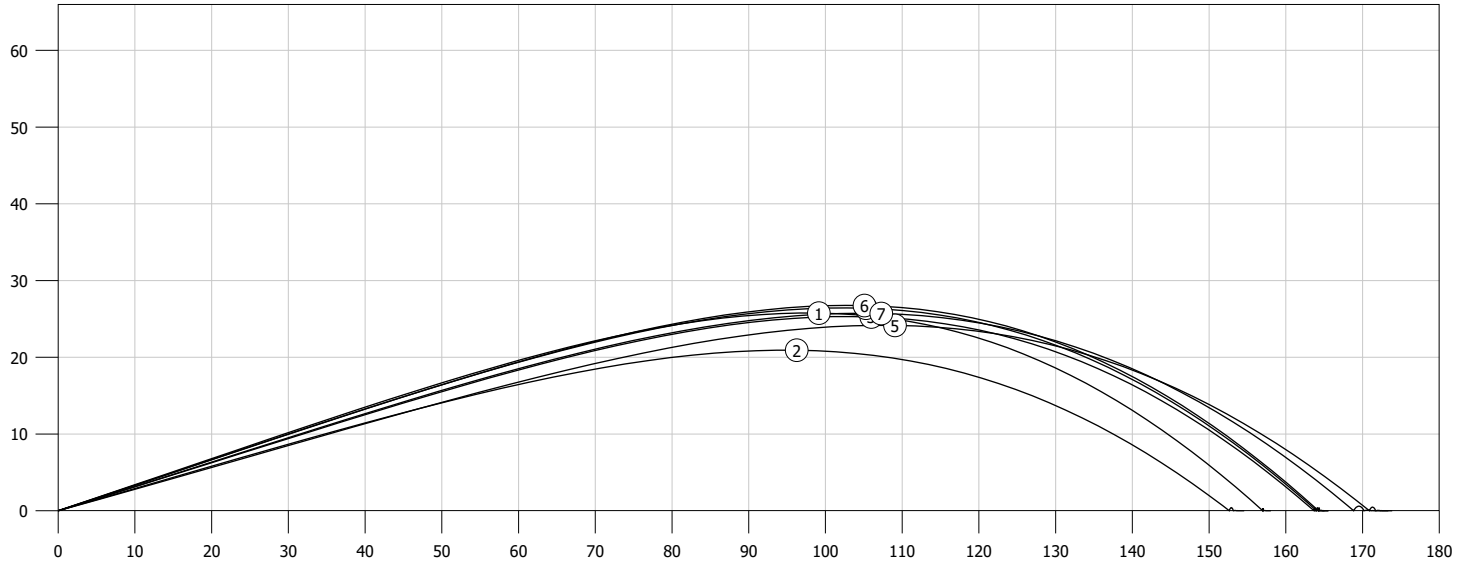




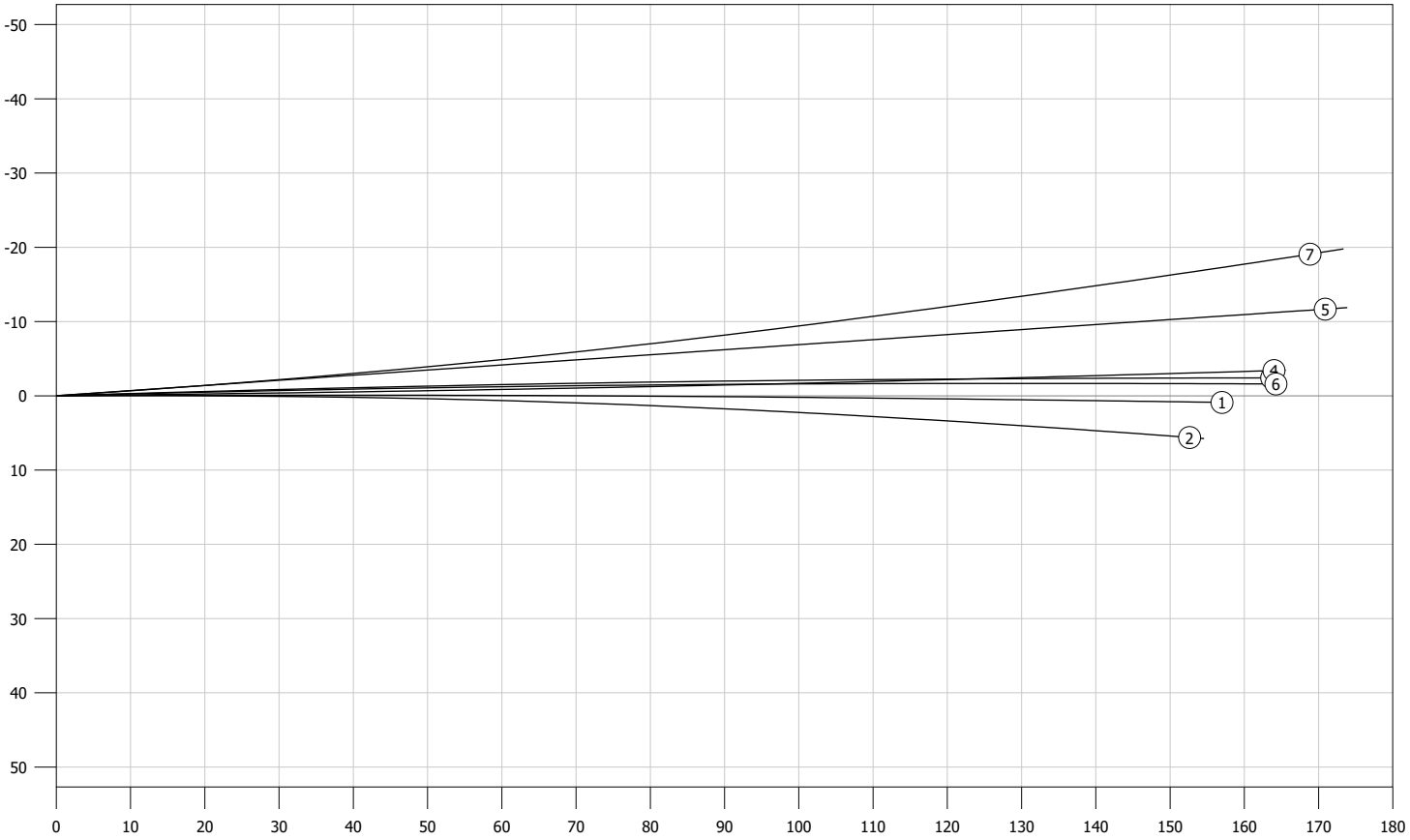
Pro V1 X

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	157	158	0.9 R	81.1	108.3	1.34	6708	2.5 R	17.9	0.2 L	42.1	77	5.7	straight	-3.8	1.2 L	1.3 R	0.1 R	25.3	68.7	2.7 L
2	153	155	5.6 R	78.5	107.2	1.37	6427	11.6 R	15.5	0.3 L	37.9	63	5.2	fade	+0.8	3.3 L	3.6 R	0.3 R	18.4	70.1	3.0 L
3	164	165	2.4 L	80.8	111.9	1.39	6479	4.0 R	16.4	1.7 L	41.3	76	5.7	fade	-2.5	3.1 L	1.7 R	1.4 L	21.7	67.7	4.1 L
4	164	166	3.4 L	78.9	111.4	1.41	6056	2.7 L	17.4	0.6 L	42.1	79	5.8	straight	-4.1	0.4 R	1.3 L	0.9 L	24.7	68.5	1.2 L
5	171	174	11.7 L	78.1	115.6	1.48	5493	0.3 R	14.7	4.0 L	39.3	73	5.6	pull	-2.5	4.1 L	0.1 R	3.9 L	18.9	64.3	5.3 L
6	164	166	1.6 L	78.5	111.8	1.42	6407	4.1 R	17.3	1.5 L	42.4	80	5.8	fade	-1.3	2.8 L	1.7 R	1.1 L	22.5	68.0	3.4 L
7	170	174	19.1 L	82.5	113.3	1.37	4403	14.9 L	16.8	3.6 L	40.2	77	5.5	pull/draw	-2.4	1.5 R	6.6 L	5.1 L	22.6	68.3	0.6 R
AVG.	163	165	4.5 L	79.8	111.4	1.40	5996	0.7 R	16.6	1.7 L	40.7	75	5.6	straight	-2.3	1.8 L	0.1 R	1.7 L	22.0	68.0	2.7 L
DEV.	6.6	7.4	8.3	1.7	2.9	0.05	805	8.2	1.2	1.5	1.7	6.0	0.2	-	1.6	2.1	3.3	2.0	2.6	1.8	1.9

Side View (yds)



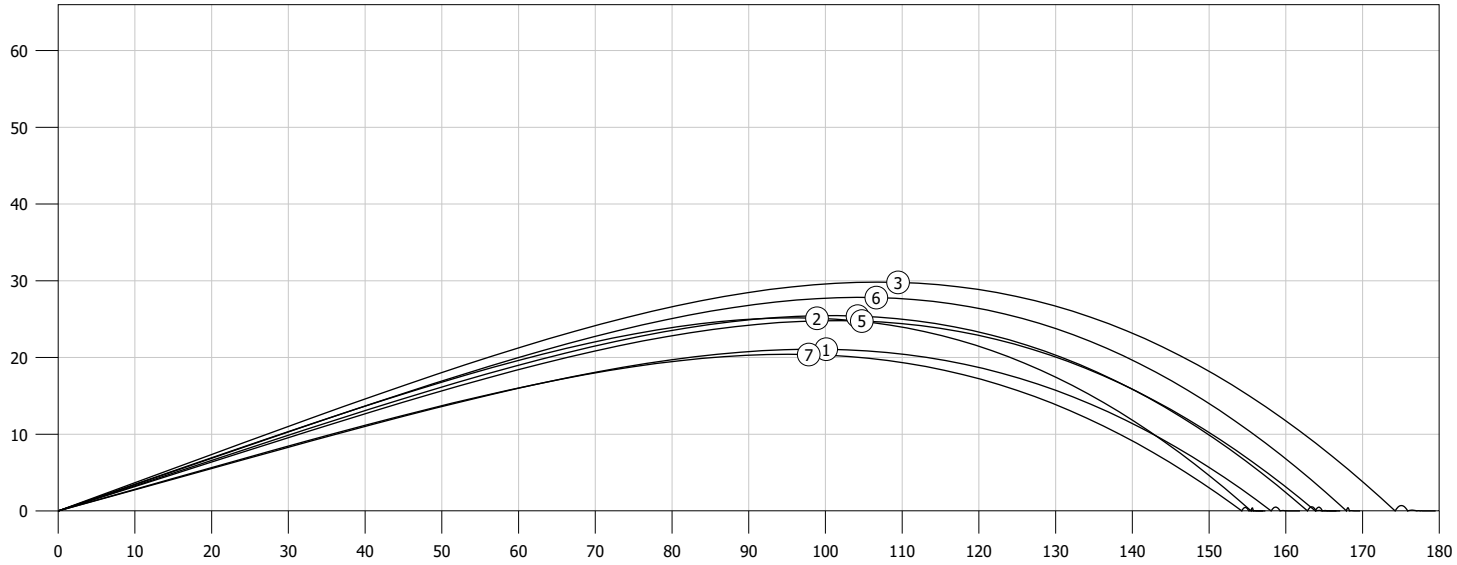
Top View (yds)

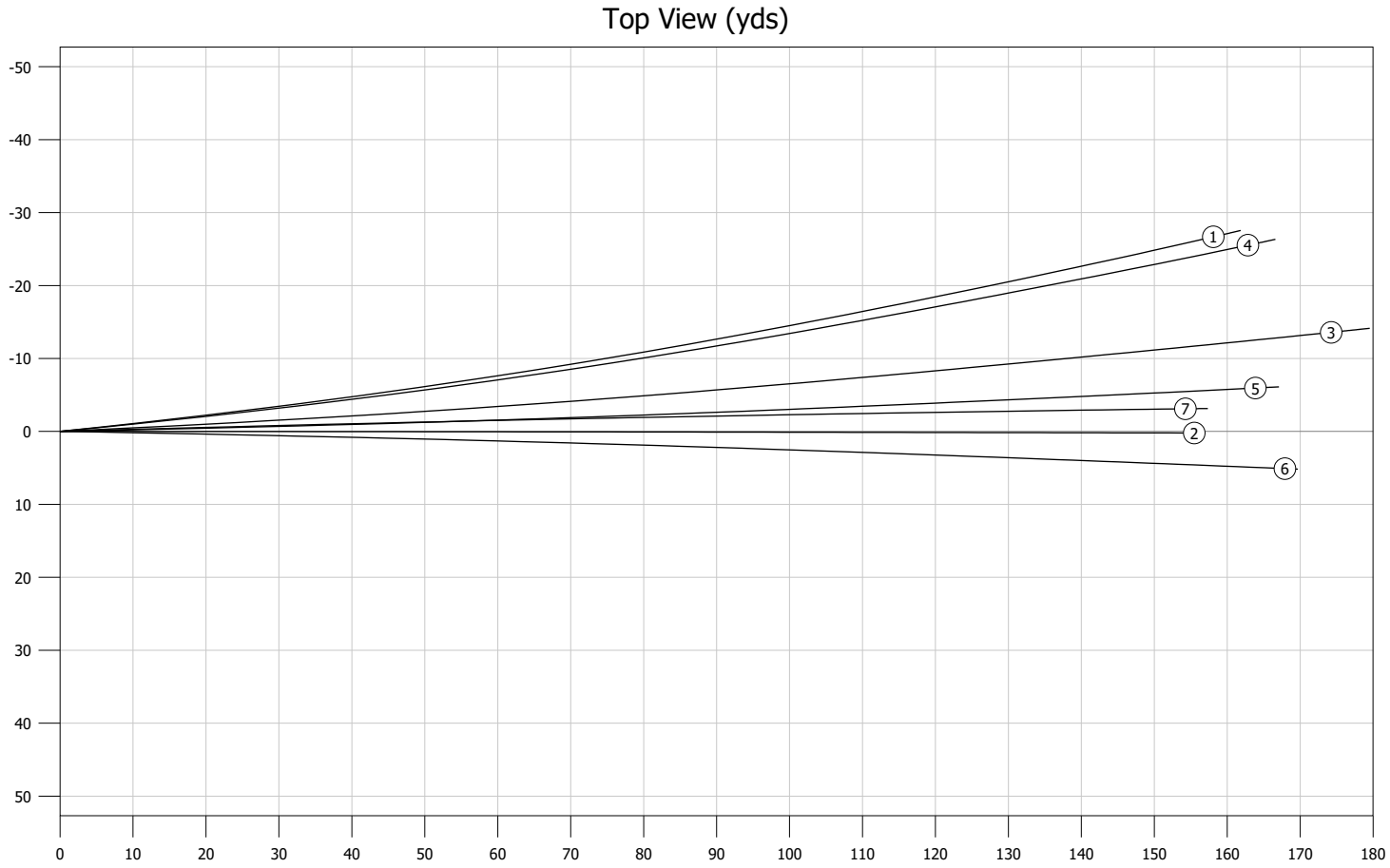


Z star XV

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	160	164	26.7 L	80.0	111.2	1.39	5573	19.1 L	14.7	5.8 L	37.0	63	5.2	pull/draw	-2.3	0.1 R	7.4 L	7.4 L	19.1	69.3	0.8 L
2	155	157	0.2 R	84.4	107.0	1.27	6070	0.2 R	18.4	0.0	41.7	75	5.6	straight	-4.5	0.1 L	0.1 R	0.1 R	26.6	63.6	2.3 L
3	175	180	13.6 L	80.2	113.0	1.41	3355	10.7 L	19.9	2.6 L	42.8	90	5.8	draw	-6.6	2.4 R	7.2 L	4.8 L	31.6	67.1	0.4 L
4	165	169	25.5 L	80.1	111.4	1.39	4850	18.4 L	17.4	5.4 L	40.7	76	5.5	pull/draw	-5.2	2.2 R	10.4 L	8.2 L	26.0	68.0	0.0
5	164	167	5.9 L	81.1	111.1	1.37	5064	4.9 L	16.9	1.1 L	40.3	74	5.5	draw	-2.8	0.6 R	2.2 L	1.6 L	22.8	66.2	0.7 L
6	168	170	5.1 R	84.0	112.8	1.34	5710	3.5 R	17.9	1.0 R	42.8	84	5.8	straight	-2.6	0.2 L	1.6 R	1.4 R	24.4	63.5	1.6 L
7	154	157	3.1 L	79.7	107.8	1.35	5735	2.4 R	15.1	1.6 L	36.9	61	5.2	straight	-3.7	2.4 L	1.0 R	1.4 L	20.4	61.8	4.4 L
AVG.	163	166	9.9 L	81.4	110.6	1.36	5194	6.7 L	17.2	2.2 L	40.3	75	5.5	draw	-4.0	0.4 R	3.5 L	3.1 L	24.4	65.6	1.4 L
DEV.	7.2	7.9	12	2.0	2.3	0.05	912	9.5	1.8	2.6	2.5	10	0.3	-	1.6	1.6	4.8	3.7	4.2	2.7	1.5

Side View (yds)

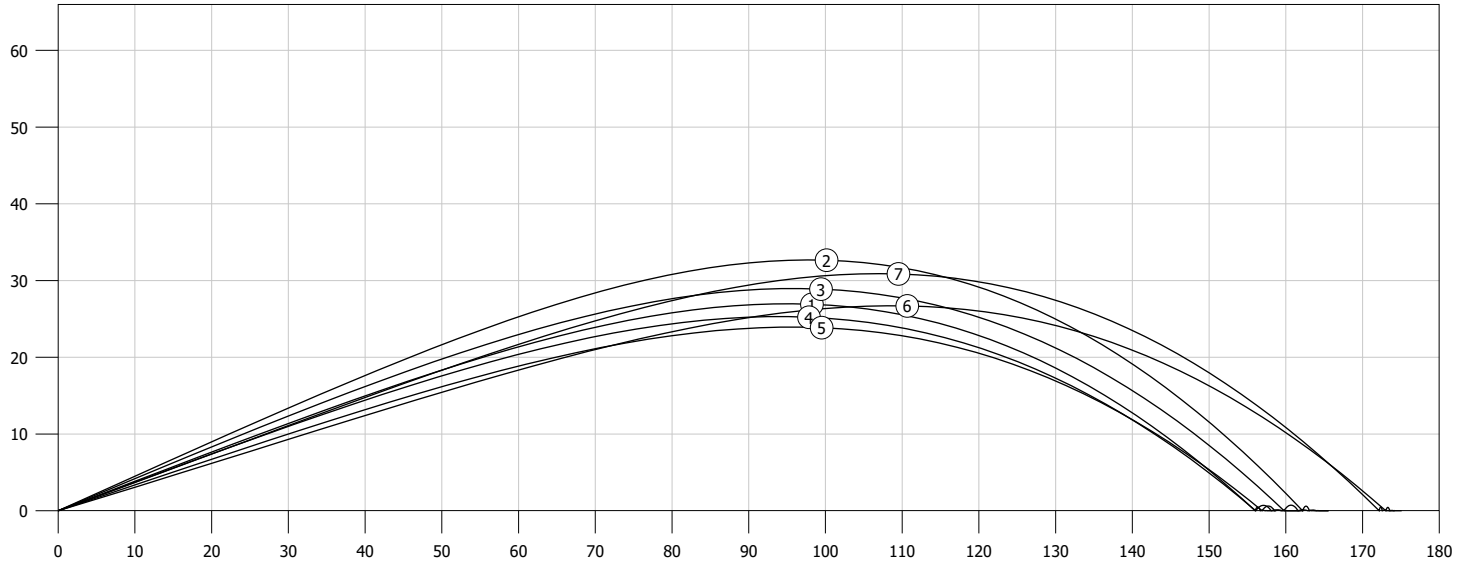




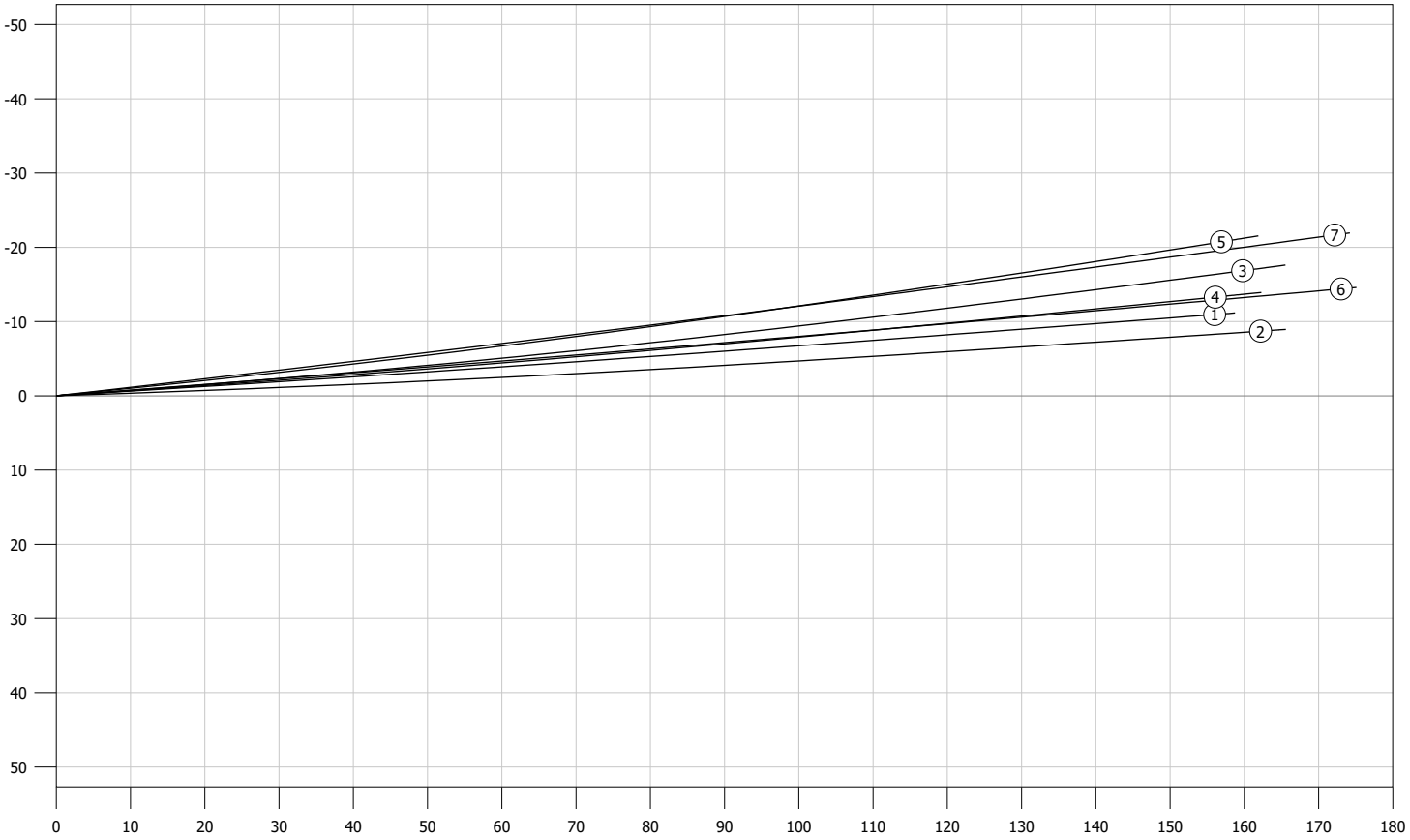
Cal Chrome SuperHot 2018

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	156	159	10.9 L	80.8	106.4	1.32	4955	2.6 L	20.2	3.5 L	42.8	81	5.6	pull	-5.8	2.3 L	1.7 L	4.0 L	31.3	69.4	4.5 L
2	162	166	8.7 L	79.6	107.6	1.35	3848	6.5 L	23.6	1.9 L	46.2	98	5.9	draw	-2.6	1.1 R	4.3 L	3.2 L	35.0	70.5	0.2 R
3	161	166	16.8 L	80.0	105.9	1.32	2904	13.6 L	22.6	4.0 L	43.2	87	5.6	pull/draw	-3.2	2.2 R	8.9 L	6.7 L	33.8	71.4	1.1 R
4	157	163	13.3 L	79.0	105.1	1.33	3116	7.5 L	20.2	3.8 L	40.5	76	5.3	pull/draw	-3.8	0.6 L	4.4 L	5.0 L	29.6	68.8	2.1 L
5	158	163	20.7 L	77.9	107.5	1.38	3995	11.5 L	18.0	5.6 L	39.5	72	5.3	pull/draw	-9.3	0.0	8.1 L	8.1 L	30.5	70.9	3.3 L
6	174	176	14.4 L	88.4	116.1	1.31	5678	2.0 L	16.0	4.3 L	41.4	80	5.8	pull	-1.7	3.7 L	0.8 L	4.5 L	20.5	65.7	4.4 L
7	174	176	21.7 L	79.8	114.8	1.44	5276	3.3 L	19.0	6.4 L	44.4	93	6.0	pull	-4.3	5.1 L	1.9 L	6.9 L	27.8	73.8	6.3 L
AVG.	163	167	15.2 L	80.8	109.1	1.35	4253	6.7 L	19.9	4.2 L	42.6	84	5.6	pull/draw	-4.4	1.2 L	4.3 L	5.5 L	29.8	70.1	2.8 L
DEV.	7.5	6.4	4.8	3.5	4.4	0.04	1073	4.5	2.6	1.5	2.3	9.3	0.3	-	2.5	2.6	3.2	1.8	4.7	2.5	2.7

Side View (yds)



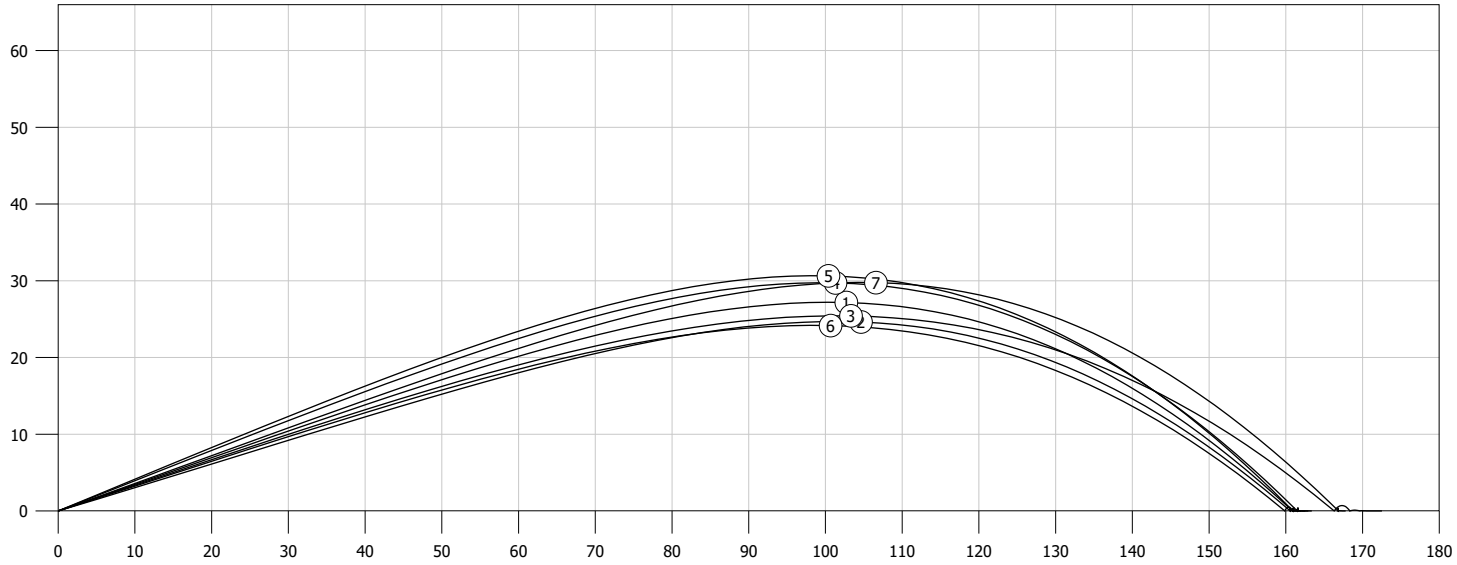
Top View (yds)

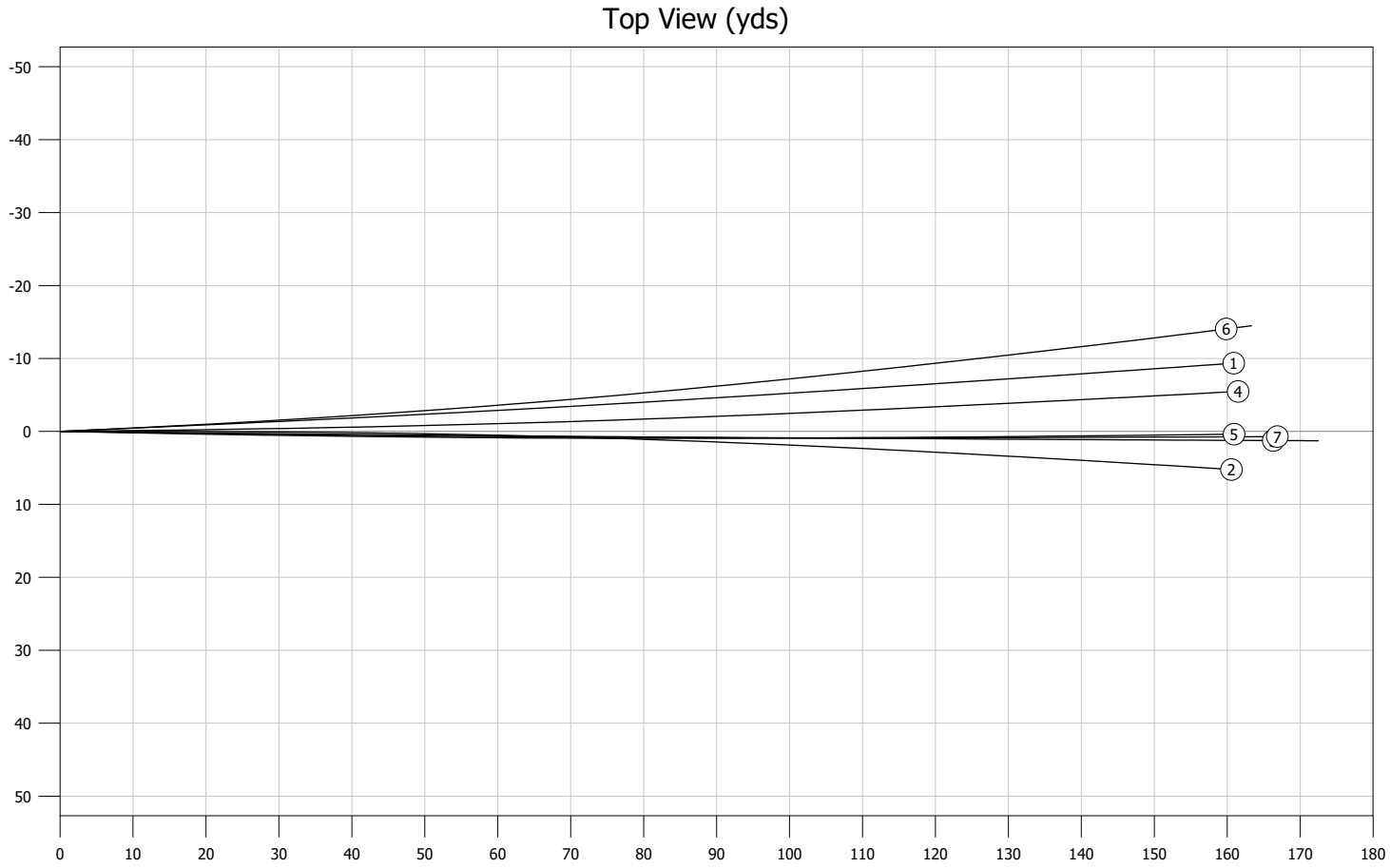


USED Range Ball

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	161	162	9.3 L	78.3	110.2	1.41	6538	3.9 L	18.2	2.4 L	42.9	82	5.8	draw	-3.6	0.9 L	2.0 L	2.9 L	25.6	67.3	2.4 L
2	161	162	5.2 R	81.7	111.1	1.36	7158	8.9 R	16.0	0.2 L	41.0	74	5.7	fade	-0.8	2.9 L	3.3 R	0.4 R	20.1	67.0	3.2 L
3	166	173	1.3 R	80.2	110.0	1.37	3244	1.4 L	18.2	0.7 R	39.9	76	5.4	straight	-1.9	1.2 R	0.7 L	0.5 R	24.5	76.1	0.7 R
4	162	163	5.5 L	87.4	109.3	1.25	5766	6.8 L	20.5	0.4 L	45.0	89	5.9	draw	-6.0	2.7 R	4.6 L	1.8 L	32.1	63.9	0.2 L
5	161	163	0.4 R	82.6	108.6	1.31	5505	5.3 L	21.5	1.3 R	45.7	92	5.9	draw	-7.2	3.9 R	3.9 L	0.0	35.2	66.2	0.7 R
6	160	164	14.0 L	81.0	109.5	1.35	5054	13.6 L	17.2	2.4 L	39.9	73	5.4	draw	-6.0	3.2 R	7.8 L	4.6 L	26.1	66.7	0.6 R
7	167	168	0.7 R	82.3	112.9	1.37	6625	2.8 L	18.7	0.9 R	44.5	89	6.1	straight	-6.3	2.1 R	1.7 L	0.4 R	28.8	66.9	0.6 L
AVG.	163	165	3.0 L	81.9	110.2	1.35	5699	3.6 L	18.6	0.4 L	42.7	82	5.8	straight	-4.6	1.3 R	2.5 L	1.1 L	27.5	67.7	0.6 L
DEV.	2.8	4.0	6.8	2.8	1.4	0.05	1302	6.8	1.9	1.5	2.4	8.1	0.3	-	2.5	2.4	3.5	2.0	5.0	3.9	1.6

Side View (yds)

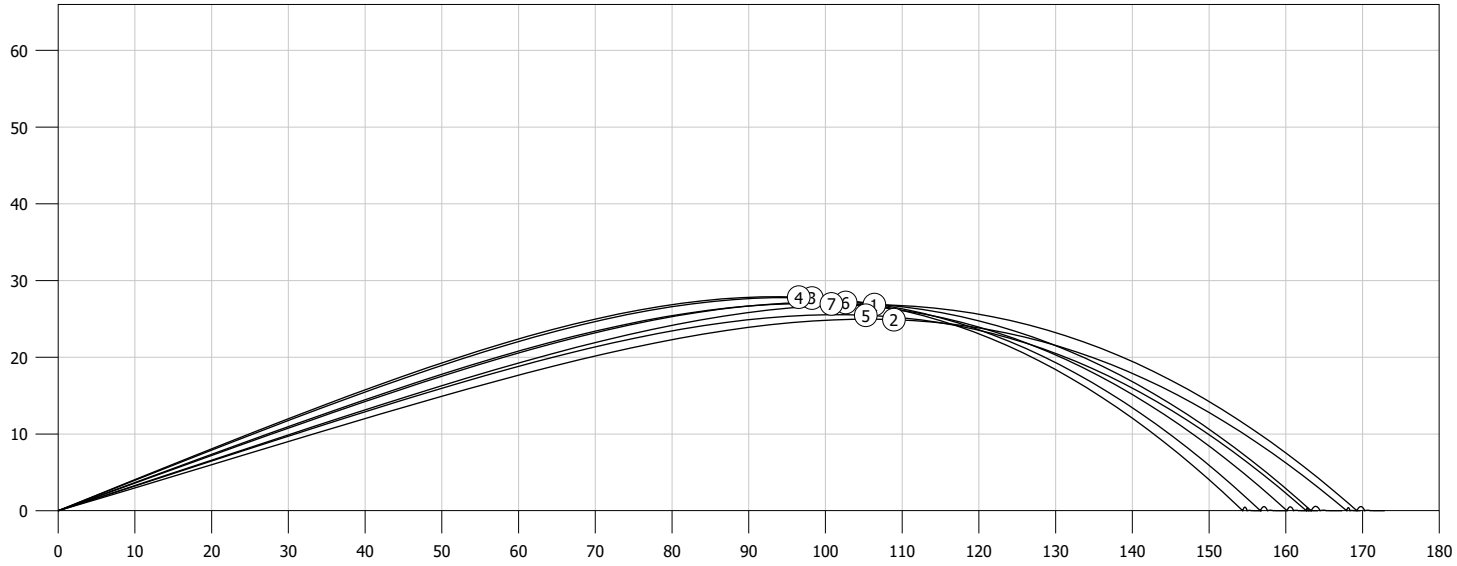




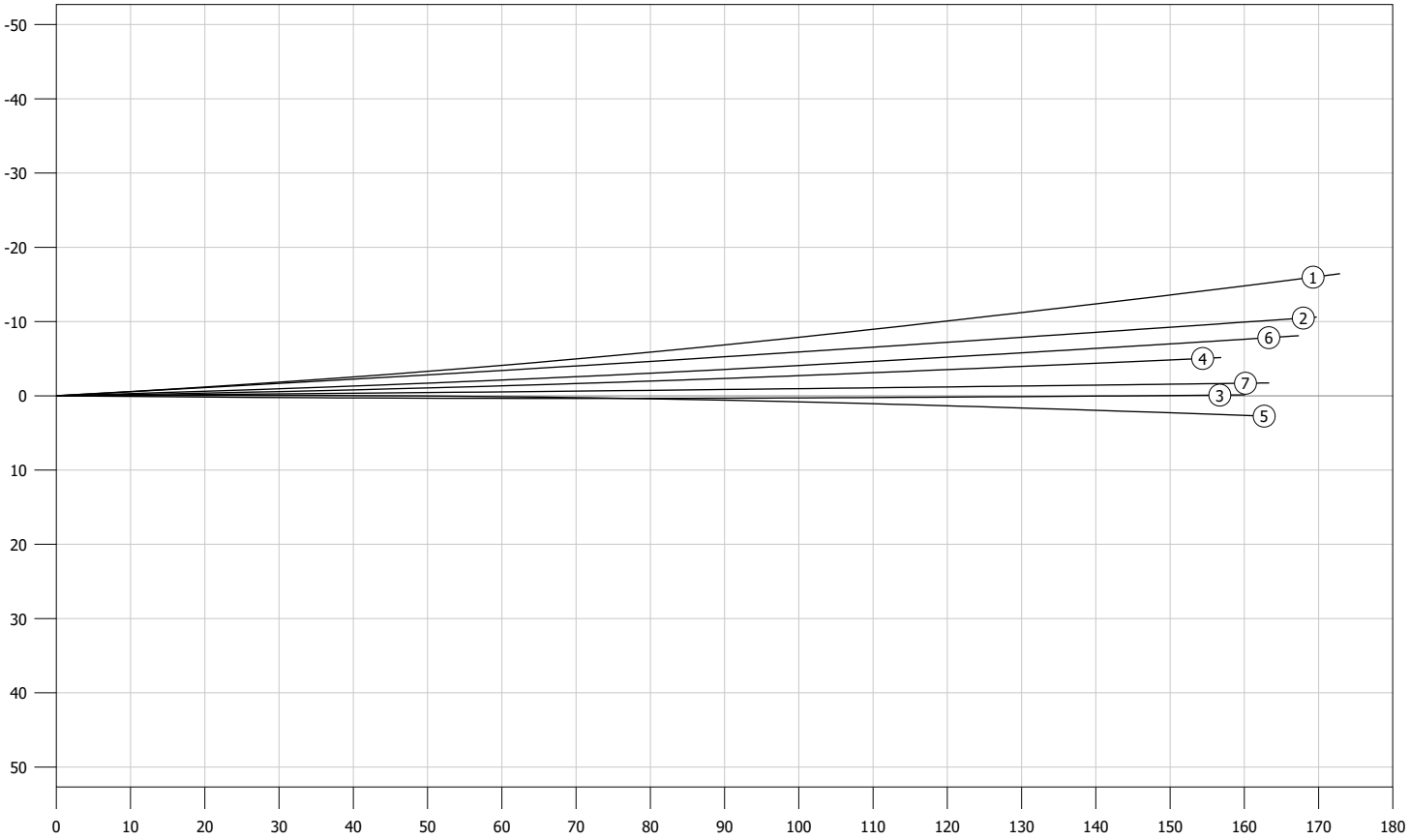
Volvik S4

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	170	174	16.0 L	77.3	113.4	1.47	4740	11.7 L	17.3	3.0 L	41.3	81	5.6	draw	-3.5	1.3 R	5.7 L	4.5 L	24.2	65.6	0.3 L
2	168	170	10.5 L	79.7	114.0	1.43	6041	2.2 L	15.6	3.1 L	40.5	75	5.7	straight	-2.1	2.4 L	0.9 L	3.2 L	20.1	65.2	3.3 L
3	157	160	0.1 L	79.9	106.1	1.33	4402	3.5 L	21.0	0.6 R	43.2	83	5.6	straight	-5.7	2.2 R	2.3 L	0.1 L	32.6	63.0	0.7 L
4	154	157	5.0 L	83.1	105.3	1.27	4979	5.2 L	21.3	0.9 L	43.9	84	5.6	draw	-4.2	1.5 R	3.3 L	1.8 L	31.9	65.2	0.5 L
5	163	164	2.8 R	79.0	111.0	1.41	6207	6.0 R	17.0	0.3 L	41.5	77	5.7	fade	-1.6	2.3 L	2.5 R	0.2 R	22.2	59.3	3.3 L
6	164	168	7.8 L	75.2	109.5	1.46	4239	6.5 L	19.1	1.6 L	42.0	81	5.6	draw	-3.8	1.0 R	3.6 L	2.5 L	27.5	67.0	0.6 L
7	160	163	1.7 L	78.8	108.2	1.37	4703	0.9 L	19.5	0.4 L	42.4	81	5.6	straight	-4.8	0.0	0.6 L	0.6 L	28.9	64.2	2.3 L
AVG.	162	165	5.5 L	79.0	109.6	1.39	5044	3.4 L	18.7	1.2 L	42.1	80	5.6	straight	-3.6	0.2 R	2.0 L	1.8 L	26.8	64.2	1.6 L
DEV.	5.7	5.8	6.5	2.4	3.4	0.07	777	5.4	2.1	1.4	1.1	3.2	0.1	-	1.4	1.8	2.6	1.7	4.8	2.5	1.4

Side View (yds)



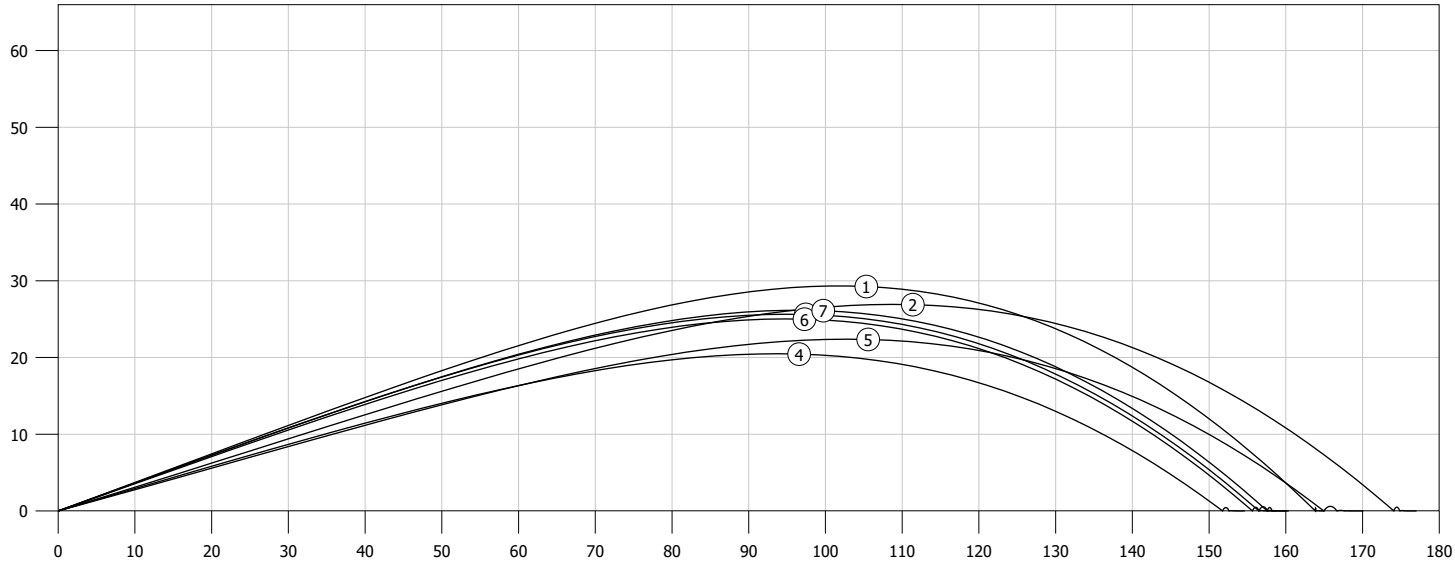
Top View (yds)

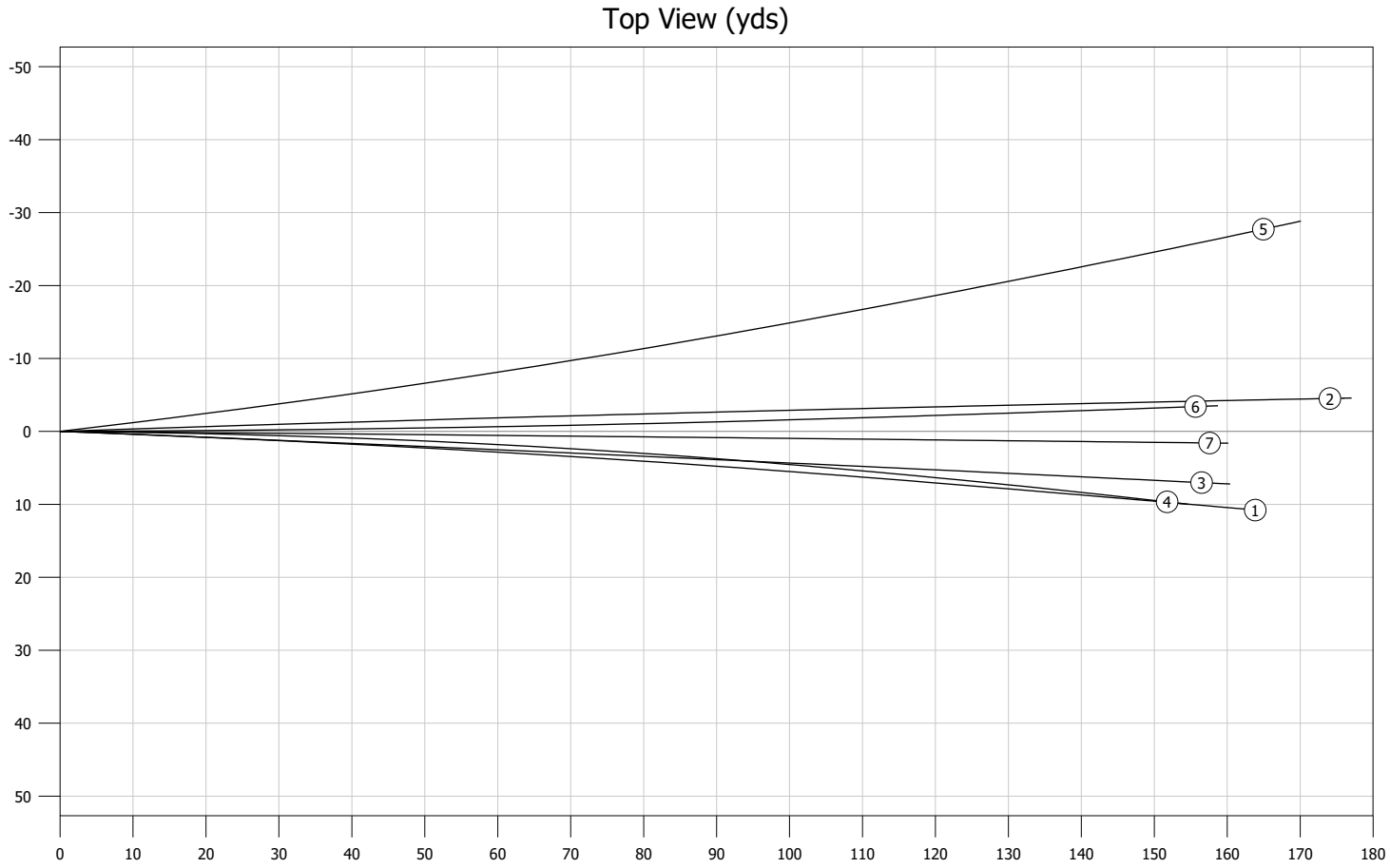


Titleist NXT Tour S

	Distance (yds)			Speed (mph)			Spin		Ball Angle (°)						Club Angle (°)					Swing Plane (°)	
Shot	Carry	Total	Lateral	Club	Ball	Smash	(rpm)	Axis (°)	Launch Vert.	Launch Horz.	Descent	Height (ft)	Flight (s)	Classification	Angle of Attack	Club Path	Face to Path	Face to Target	Dynamic Loft	Vertical	Horizontal
1	164	165	10.8 R	81.5	111.1	1.36	6095	7.3 R	19.4	2.1 R	44.5	88	6.0	fade	+1.5	0.2 L	2.9 R	2.7 R	24.1	72.0	0.3 R
2	174	177	4.5 L	80.5	115.9	1.44	5178	2.0 R	16.3	1.9 L	41.3	81	5.7	straight	-1.6	2.5 L	0.8 R	1.7 L	21.0	67.1	3.2 L
3	157	161	7.0 R	79.1	106.4	1.35	4367	1.5 R	19.4	2.3 R	41.3	77	5.4	straight	-4.8	1.6 R	0.9 R	2.5 R	28.8	65.6	0.5 L
4	152	155	9.7 R	79.0	106.8	1.35	6009	15.9 R	15.6	0.5 R	37.2	61	5.1	fade	-1.6	4.4 L	6.2 R	1.8 R	20.1	63.8	5.2 L
5	167	173	27.7 L	81.2	113.4	1.40	4403	16.0 L	14.8	6.6 L	37.4	67	5.3	pull/draw	-2.6	1.6 L	6.3 L	7.9 L	19.4	68.7	2.6 L
6	156	159	3.4 L	77.6	106.5	1.37	4993	5.7 L	18.9	0.2 L	41.2	75	5.4	draw	-3.5	2.0 R	3.0 L	1.0 L	26.8	70.3	0.8 R
7	158	160	1.6 R	80.2	107.3	1.34	5187	0.4 R	19.2	0.5 R	42.1	78	5.6	straight	-2.4	0.3 R	0.2 R	0.5 R	26.5	67.7	0.6 L
AVG.	161	164	0.9 L	79.8	109.6	1.37	5176	0.8 R	17.6	0.5 L	40.7	75	5.5	straight	-2.1	0.7 L	0.2 R	0.4 L	23.8	67.9	1.6 L
DEV.	7.7	8.0	13	1.4	3.8	0.04	686	10.0	2.0	3.1	2.6	8.8	0.3	-	1.9	2.3	4.0	3.7	3.7	2.8	2.2

Side View (yds)




Top View (yds)
-50
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30
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50
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
5
2
6
7
3
4
1

Grouping Area

FlightScope® Main Menu Focus Band

Club Comparison Center | Name Robert Penner

Results: Grouping Area (Minimize)

Club	Rating	Distance (yds) Carry	Total	Lateral	Speed Club (mph)	Ball (mph)	Smash	Spin (rpm)	Axis (°)	Ball Angles (°) Vert.	Horz.	Descent Vert.	Height (ft)
USED Range Ball	*****	163	165	3.0 L	81.9	110.2	1.35	5699	3.6 L	18.6	0.4 L	42.7	82.
2018 Pro V1	*****	166	168	4.8 L	79.4	112.3	1.42	5836	1.3 L	16.6	1.5 L	41.0	76.
TM TP5	*****	166	169	8.4 L	79.2	111.8	1.41	5296	5.4 L	17.2	1.9 L	41.0	77.
Z Star	*****	167	169	7.3 L	81.5	111.5	1.37	4954	3.2 L	18.6	1.9 L	42.6	83.
Q Star Tour	*****	165	168	2.8 L	82.7	110.9	1.34	4863	1.1 L	19.3	0.7 L	43.0	85.
Volvik S4	****	162	165	5.5 L	79.0	109.6	1.39	5044	3.4 L	18.7	1.2 L	42.1	80.
Pro V1 X	****	163	165	4.5 L	79.8	111.4	1.40	5996	0.7 R	16.6	1.7 L	40.7	75.
New Range Ball	****	164	165	2.3 L	80.3	111.6	1.39	6363	1.1 R	17.5	1.0 L	42.4	80.
2018 Chrome Soft	****	165	168	16.3 L	81.4	109.3	1.34	4113	8.6 L	21.2	4.0 L	44.2	90.
Q Star	****	164	167	5.0 L	81.0	110.2	1.36	4859	3.2 L	18.3	1.3 L	41.6	79.
Cal Chrome SuperHot 2018	****	163	167	15.2 L	80.8	109.1	1.35	4253	6.7 L	19.9	4.2 L	42.6	83.
TM TP5X	***	165	168	2.8 L	79.9	111.2	1.39	5183	0.8 R	17.9	1.0 L	41.8	80.
Volvik S3	***	164	168	4.3 L	80.4	110.6	1.37	4797	3.0 L	18.4	1.0 L	41.8	80.
2018 Chrome soft X	**	164	167	10.3 L	80.3	110.2	1.37	4807	5.5 L	19.7	2.7 L	43.2	85.
Z star XV		163	166	9.9 L	81.4	110.6	1.36	5194	6.7 L	17.2	2.2 L	40.3	74.
Titleist NXT Tour S													

Clubhead Speed

FlightScope® Main Menu Focus Band

Club Comparison Center | Name Robert Penner

Results: Clubhead Speed

Club	Rating	Distance (yds) Carry	Total	Lateral	Speed Club (mph)	Ball (mph)	Smash	Spin (rpm)	Axis (°)	Ball Angles (°) Vert.	Horz.	Descent Vert.	Height (ft)
Q Star Tour	*****	165	168	2.8 L	82.7	110.9	1.34	4863	1.1 L	19.3	0.7 L	43.0	85.
USED Range Ball	****	163	165	3.0 L	81.9	110.2	1.35	5699	3.6 L	18.6	0.4 L	42.7	82.
Z Star	***	167	169	7.3 L	81.5	111.5	1.37	4954	3.2 L	18.6	1.9 L	42.6	83.
2018 Chrome Soft	***	165	168	16.3 L	81.4	109.3	1.34	4113	8.6 L	21.2	4.0 L	44.2	90.
Z star XV	***	163	166	9.9 L	81.4	110.6	1.36	5194	6.7 L	17.2	2.2 L	40.3	74.
Q Star	***	164	167	5.0 L	81.0	110.2	1.36	4859	3.2 L	18.3	1.3 L	41.6	79.
Cal Chrome SuperHot 2018	**	163	167	15.2 L	80.8	109.1	1.35	4253	6.7 L	19.9	4.2 L	42.6	83.
Volvik S3	**	164	168	4.3 L	80.4	110.6	1.37	4797	3.0 L	18.4	1.0 L	41.8	80.
2018 Chrome soft X	**	164	167	10.3 L	80.3	110.2	1.37	4807	5.5 L	19.7	2.7 L	43.2	85.
New Range Ball	**	164	165	2.3 L	80.3	111.6	1.39	6363	1.1 R	17.5	1.0 L	42.4	80.
TM TP5X	*	165	168	2.8 L	79.9	111.2	1.39	5183	0.8 R	17.9	1.0 L	41.8	80.
Titleist NXT Tour S	*	161	164	0.9 L	79.8	109.6	1.37	5176	0.8 R	17.6	0.5 L	40.7	75.
Pro V1 X	*	163	165	4.5 L	79.8	111.4	1.40	5996	0.7 R	16.6	1.7 L	40.7	75.
2018 Pro V1		166	168	4.8 L	79.4	112.3	1.42	5836	1.3 L	16.6	1.5 L	41.0	76.
TM TP5		166	169	8.4 L	79.2	111.8	1.41	5296	5.4 L	17.2	1.9 L	41.0	77.
Volvik S4													

Spin Axis

FlightScope® Main Menu Focus Band

Club Comparison Center | Name Robert Penner | GO

Results: Spin Axis (Minimize)

Club	Rating	Distance (yds) Carry	Total	Lateral	Speed Club (mph)	Ball (mph)	Smash	Spin (rpm)	Axis (°)	Ball Angles (°) Vert.	Horz.	Descent Vert.	Height (ft)
Q Star Tour	*****	165	168	2.8 L	82.7	110.9	1.34	4863	1.1 L	19.3	0.7 L	43.0	85.
2018 Pro V1	***	166	168	4.8 L	79.4	112.3	1.42	5836	1.3 L	16.6	1.5 L	41.0	76.
New Range Ball	***	164	165	2.3 L	80.3	111.6	1.39	6363	1.1 R	17.5	1.0 L	42.4	80.
Z Star	***	167	169	7.3 L	81.5	111.5	1.37	4954	3.2 L	18.6	1.9 L	42.6	83.
Volvik S4	**	162	165	5.5 L	79.0	109.6	1.39	5044	3.4 L	18.7	1.2 L	42.1	80.
Volvik S3	**	164	168	4.3 L	80.4	110.6	1.37	4797	3.0 L	18.4	1.0 L	41.8	80.
TM TP5X	**	165	168	2.8 L	79.9	111.2	1.39	5183	0.8 R	17.9	1.0 L	41.8	80.
USED Range Ball	*	163	165	3.0 L	81.9	110.2	1.35	5699	3.6 L	18.6	0.4 L	42.7	82.
Pro V1 X	*	163	165	4.5 L	79.8	111.4	1.40	5996	0.7 R	16.6	1.7 L	40.7	75.
Q Star	*	164	167	5.0 L	81.0	110.2	1.36	4859	3.2 L	18.3	1.3 L	41.6	79.
Cal Chrome SuperHot 2018	*	163	167	15.2 L	80.8	109.1	1.35	4253	6.7 L	19.9	4.2 L	42.6	83.
2018 Chrome soft X	*	164	167	10.3 L	80.3	110.2	1.37	4807	5.5 L	19.7	2.7 L	43.2	85.
2018 Chrome Soft	*	165	168	16.3 L	81.4	109.3	1.34	4113	8.6 L	21.2	4.0 L	44.2	90.
TM TP5		166	169	8.4 L	79.2	111.8	1.41	5296	5.4 L	17.2	1.9 L	41.0	77.
Titleist NXT Tour S		161	164	0.9 L	79.8	109.6	1.37	5176	0.8 R	17.6	0.5 L	40.7	75.
Z star XV													

Launch Angle

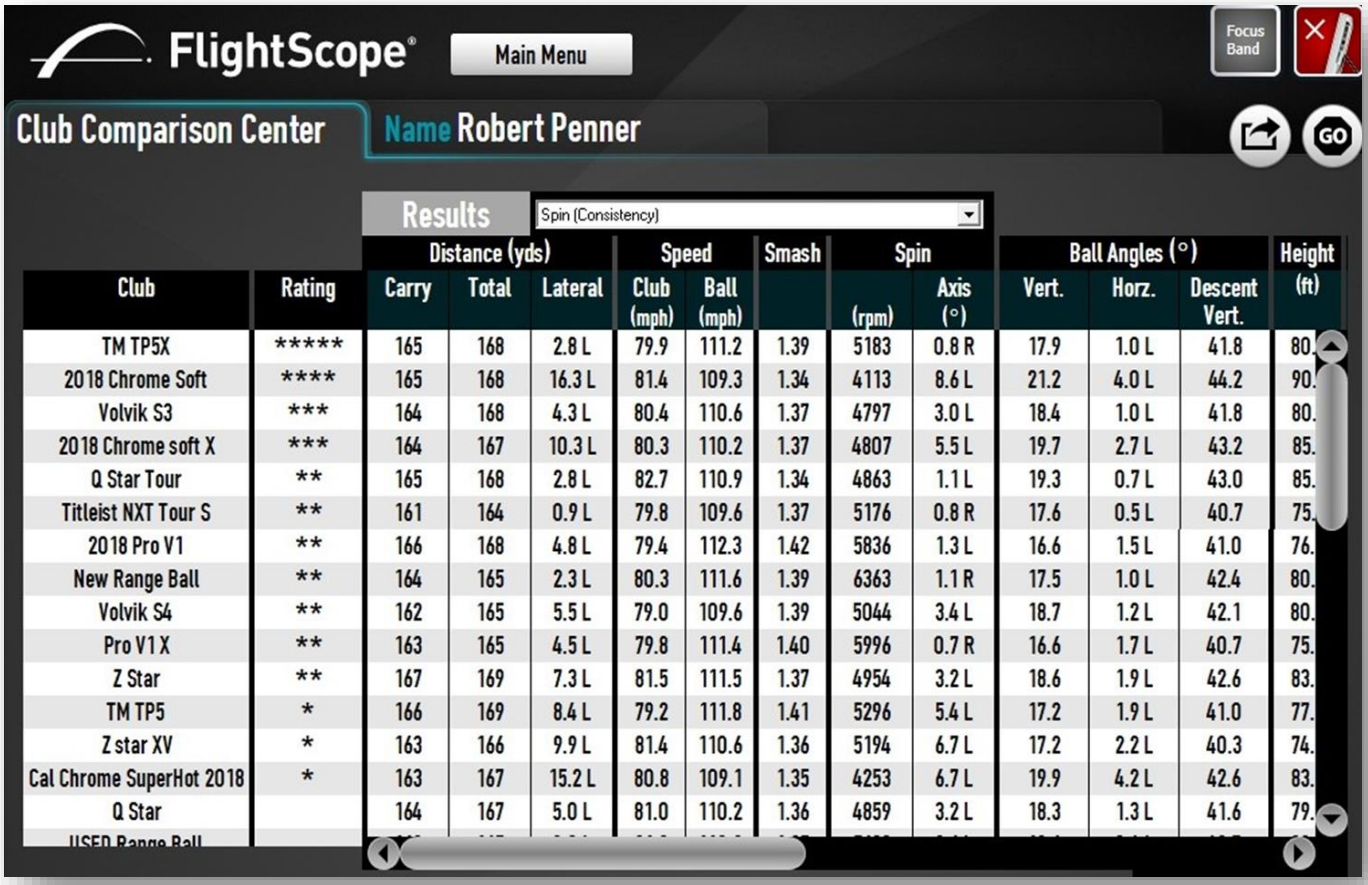
FlightScope® Main Menu Focus Band

Club Comparison Center | Name Robert Penner | GO

Results: Launch Angle (Target) 0.0 °

Club	Rating	Distance (yds) Carry	Total	Lateral	Speed Club (mph)	Ball (mph)	Smash	Spin (rpm)	Axis (°)	Ball Angles (°) Vert.	Horz.	Descent Vert.	Height (ft)
Pro V1 X	*****	163	165	4.5 L	79.8	111.4	1.40	5996	0.7 R	16.6	1.7 L	40.7	75.
2018 Pro V1	*****	166	168	4.8 L	79.4	112.3	1.42	5836	1.3 L	16.6	1.5 L	41.0	76.
Z star XV	****	163	166	9.9 L	81.4	110.6	1.36	5194	6.7 L	17.2	2.2 L	40.3	74.
TM TP5	****	166	169	8.4 L	79.2	111.8	1.41	5296	5.4 L	17.2	1.9 L	41.0	77.
New Range Ball	***	164	165	2.3 L	80.3	111.6	1.39	6363	1.1 R	17.5	1.0 L	42.4	80.
Titleist NXT Tour S	***	161	164	0.9 L	79.8	109.6	1.37	5176	0.8 R	17.6	0.5 L	40.7	75.
TM TP5X	**	165	168	2.8 L	79.9	111.2	1.39	5183	0.8 R	17.9	1.0 L	41.8	80.
Q Star	**	164	167	5.0 L	81.0	110.2	1.36	4859	3.2 L	18.3	1.3 L	41.6	79.
Volvik S3	**	164	168	4.3 L	80.4	110.6	1.37	4797	3.0 L	18.4	1.0 L	41.8	80.
Z Star	*	167	169	7.3 L	81.5	111.5	1.37	4954	3.2 L	18.6	1.9 L	42.6	83.
USED Range Ball	*	163	165	3.0 L	81.9	110.2	1.35	5699	3.6 L	18.6	0.4 L	42.7	82.
Volvik S4	*	162	165	5.5 L	79.0	109.6	1.39	5044	3.4 L	18.7	1.2 L	42.1	80.
Q Star Tour	*	165	168	2.8 L	82.7	110.9	1.34	4863	1.1 L	19.3	0.7 L	43.0	85.
2018 Chrome soft X		164	167	10.3 L	80.3	110.2	1.37	4807	5.5 L	19.7	2.7 L	43.2	85.
Cal Chrome SuperHot 2018		163	167	15.2 L	80.8	109.1	1.35	4253	6.7 L	19.9	4.2 L	42.6	83.
2018 Chrome Soft													

Spin Consistency



FlightScope® Main Menu Focus Band

Club Comparison Center Name Robert Penner GO

Results Spin (Consistency)

Club	Rating	Distance (yds) Carry	Total	Lateral	Speed Club (mph)	Ball (mph)	Smash	Spin (rpm)	Axis (°)	Ball Angles (°) Vert.	Horz.	Descent Vert.	Height (ft)
TM TP5X	*****	165	168	2.8 L	79.9	111.2	1.39	5183	0.8 R	17.9	1.0 L	41.8	80.
2018 Chrome Soft	****	165	168	16.3 L	81.4	109.3	1.34	4113	8.6 L	21.2	4.0 L	44.2	90.
Volvik S3	***	164	168	4.3 L	80.4	110.6	1.37	4797	3.0 L	18.4	1.0 L	41.8	80.
2018 Chrome soft X	***	164	167	10.3 L	80.3	110.2	1.37	4807	5.5 L	19.7	2.7 L	43.2	85.
Q Star Tour	**	165	168	2.8 L	82.7	110.9	1.34	4863	1.1 L	19.3	0.7 L	43.0	85.
Titleist NXT Tour S	**	161	164	0.9 L	79.8	109.6	1.37	5176	0.8 R	17.6	0.5 L	40.7	75.
2018 Pro V1	**	166	168	4.8 L	79.4	112.3	1.42	5836	1.3 L	16.6	1.5 L	41.0	76.
New Range Ball	**	164	165	2.3 L	80.3	111.6	1.39	6363	1.1 R	17.5	1.0 L	42.4	80.
Volvik S4	**	162	165	5.5 L	79.0	109.6	1.39	5044	3.4 L	18.7	1.2 L	42.1	80.
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Z star XV	*	163	166	9.9 L	81.4	110.6	1.36	5194	6.7 L	17.2	2.2 L	40.3	74.
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Q Star		164	167	5.0 L	81.0	110.2	1.36	4859	3.2 L	18.3	1.3 L	41.6	79.
USED Range Ball													

Conclusion. The test findings revealed no significant difference in any of the balls for my handicap and ball striking ability. You will notice that the Range ball and Used Range ball (we used a Titleist Pinnacle mid price point range ball) *wasn't always last in the results*. They were also very close in ball speed as well as spin with some very good golf balls. This has debunked the myth that a cheap range ball underperforms and that you should figure in a yardage loss when at the practice range. You may have to reassess your true yardage you hit the ball if you believe it is the range ball. What I did find was there was a dramatic difference in ***FEEL*** from one golf ball to another. Personally, I like the feel of a golf ball that is a bit on the softer side and believe it would be more beneficial to spend time finding a ball with a feel you enjoy while putting and work back from there; versus chasing claims made by ball manufacturers stated on the box.

I hope you have enjoyed reading the data from **Part 1: 7 iron**. Please look forward to **PART 2: Driver.** We will have multiple Golfers with different swing speeds.

By Robert Penner

Owner, Ted & Dave Custom Golf

TED&DAVECUSTOMGOLF