

Track Judge Performance Space™ Graphs

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CAJ Software Inc, the publisher of Track Judge Reports, announces the release of Performance Space Graphs.

Handicappers can now see at a glance the relationship between early pace and overall speed for each horse in a race, and how each horse fits in the race compared to other horses in a race and the par for the race.

Background and introduction:

One of the most difficult tasks for a handicapper is the projection of the early speed of a race, and how each horse will finish after facing a projected early pace. The early pace of a race can be very difficult to project. Early pace depends on the early pace ability of each horse, the surface and distance of the race, age, sex and class of the horses, the running style mix of all the horses in the race, post position of each horse, and jockey tactics. With this much uncertainty, projecting the early pace sometimes is more of an art than a science. It is possible to display on a graph the relationship of early pace to overall speed for any horse, and to construct a "Performance Space" from the past performances. This "Performance space" shows the usual early and overall speed range for the horse.

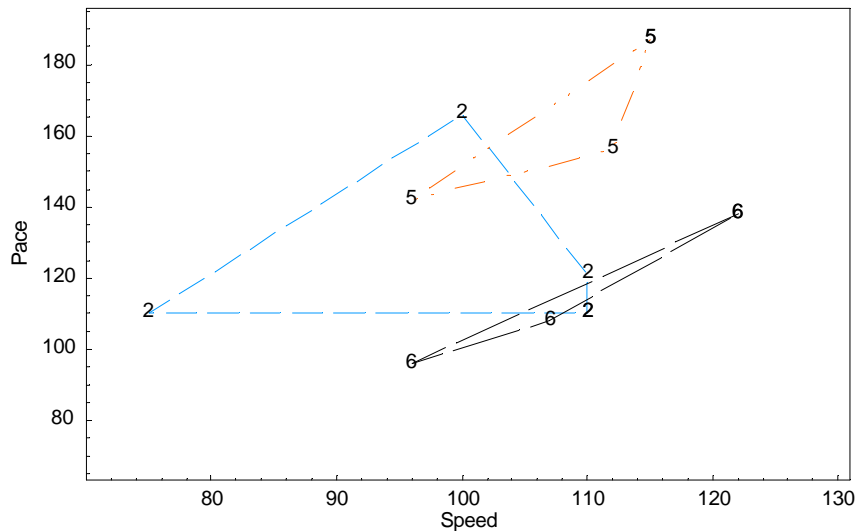
Before constructing a pace-speed graph, it is important to develop a valid, reproducible set of speed and pace ratings which are consistent from track to track across the country. Jim Cramer of Handicapper's Data Warehouse has developed superb speed and pace ratings. The Cramer Pace ratings are unique because they are directly related to the corresponding speed ratings, and mathematical comparisons between speed and pace ratings at different distances are possible.

Jim's pace ratings are generated by measuring the speed of the horse from the start of the race to the first quarter mile, and then calculating the speed rating the horse would have been given if he ran that speed for the entire race with no deceleration. With Cramer's pace numbers, the pace and speed numbers are all on the same scale, and comparisons and ratios are now valid. Jim includes daily variants and track to track variants in the creation of the numbers, so the user need not worry about them.

Relating Pace to Speed Graphically

Using an X-Y plot of the pace rating to the first quarter and its associated speed rating for the whole race, it is possible to derive the performance space or a performance envelope for each horse's past performances. This type graph is used frequently in aeronautical engineering to predict the performance of an airplane at various combinations of thrust, weight, angle of attack, etc. In the horse racing world, we will attempt to plot the envelope of a horse's past performances, and thereby see how this horse compares to other horses in today's race, and project the speed of the horse in situations he may not have faced before. The data used include the three most recent starts, the horse's fastest speed rating with its associated pace rating and the horse's fastest pace rating with its associated speed rating in the ten most recent races. A perimeter line is drawn around the data points and a performance space or area is created on the graph.

Simple Example Graph



The data in tabular form is:

Horse	Pace	Speed	Running Style	Line Pattern
5	187	115	EP	Red Dot-Dash
	156	112		
	146	96		
2	110	75	P	Blue Dashes
	110	110		
	121	110		
	166	100		
6	96	96	S	Black Long Dashes
	109	107		
	138	122		
	139			

This graph shows 3 different running style horses. Early and Early Presser horses, designated E or EP by Jim Cramer tend to have a faster time to the quarter pole and distribute more energy in the early part of a race. These horses plot in the upper portion of the graph, and are depicted as a red dotted or dot-dashed line.

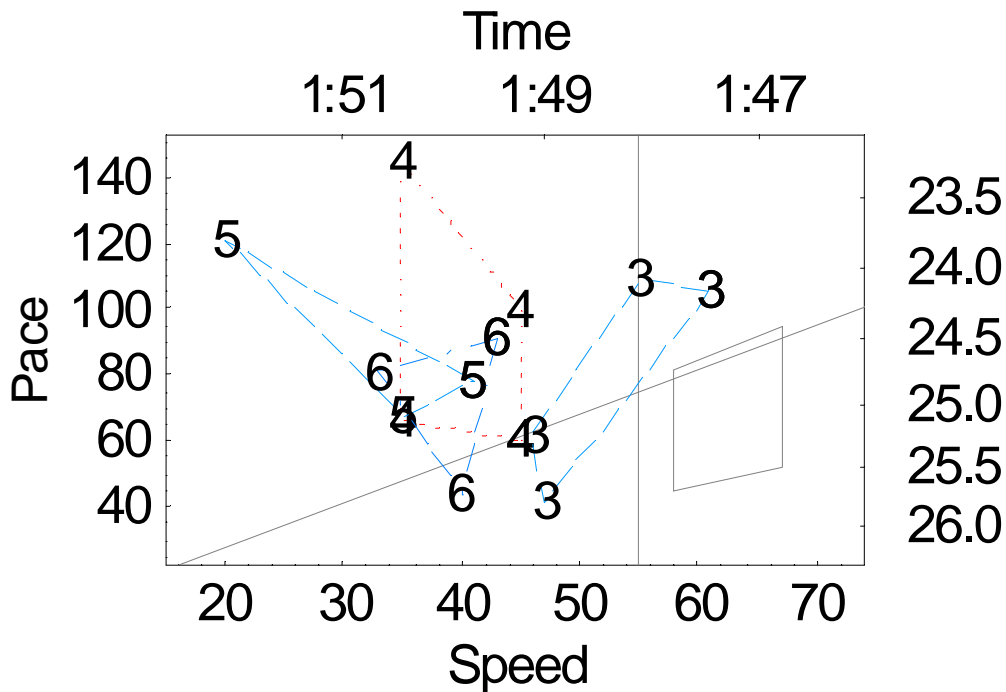
Mid pack horses, designated P or PS (presser and presser-sustained) are plotted in the middle of the graph in blue dashed lines.

Late horses, designated as S or SS (sustained or slow sustained) run in the back of the pack with no early energy, and are plotted at the bottom of the graph in black dashes for S horses and black solid lines for SS horses.

In the above graph, horse number 5, an EP horse, could be expected to run an early pace of between 146 and 187 with a speed of 96 to 115. Horse number 6, a S horse, should be expected to run a slow early pace of 96 to 139, and final speed numbers of 96 to 122. Horse 5 should have an easy lead in this simple 3 horse race, and might get an insurmountable advantage in a sprint, but horse 6 should be able to close well over a distance of ground.

The ratio of early pace to overall speed varies depending on the distance, surface, age, sex, class, track and running style. The average ratio of winners' pace to speed for the specific race type has been calculated from a database of all races run in the country, and is plotted when available as a diagonal line. The par range for pace and speed is also plotted when available as a box on the chart.

Pars and Times



In this graph, the average ratio of pace to speed for winners at the condition is seen as the upward sloping line from the lower left corner to the middle right. The box located between a speed rating of 55 to 65 shows the usual pace and speed ratings of winners at this track, surface, distance, class, age and sex.

The vertical line at a speed rating of 55 denotes the fastest last race speed rating of any horse in today's race. The intersection of the vertical last race speed line and the diagonal pace/speed ratio line is where most winners are found.

According to Jim Cramer, older horses in good condition tend to run the same speed number when winning on a regular basis. Within the same distance structure (route or sprint) horses tend to run the same number. It is possible, therefore to convert speed numbers run at one distance to those at another distance with this system. A conversion of a speed number run at today's distance and those run at other distances to expected time at today's distance is seen at the top margin of the graph. A speed rating of 65 is equivalent to a final time of 1:47 at this 8.5 furlong race. A pace rating of 120 is equivalent to a time of 23.7 seconds for the first quarter read on the right margin of the graph.

The Completed Full Page Graph

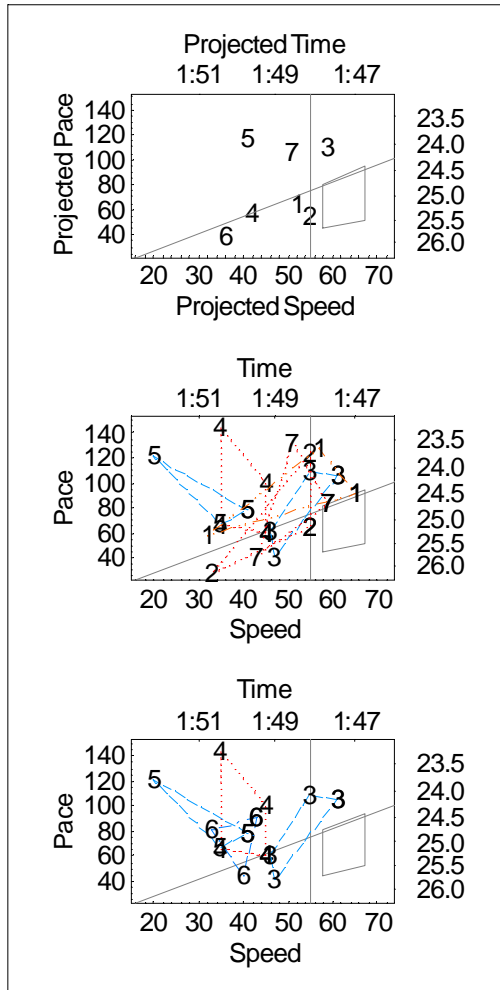
The top panel in every graph shows the projected pace and speed for horses in today's race. The middle and bottom panels show the past performance plots for each horse.

In races with more than six runners, the graph is broken into several subplots, in descending speed order. The top three ranked early horses are included in every subplot.

Track Judge Performance Space Report

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On visual inspection of the graphs, several things are immediately apparent.

1. The horses with the fastest pace ratings will be seen at the top of the page.
2. The horses with the fastest overall speed ratings will be seen at the right of the page.
3. The early pace scenario may be projected by looking at the early pace ability of the top early ranked horses, and comparing the corresponding speed rating for today's anticipated early pace for each of the early horses.
4. Certain horses completely dominate a race. These horses are plotted in the upper right of the graph, and exceed the pace and speed ratings for all other contenders in a race. These horses usually pay \$2.80 or so to win, but occasionally, the crowd misses them and a good price is found.
5. It is possible to determine the "Anaerobic Threshold" of a horse. When you see a horse with a very high pace rating and a very slow speed rating, it is apparent that the horse went too fast early in the race, and just stopped at the end. When this horse runs a slower early pace, you can see the improved speed rating associated with the slower, less taxing early pace. The fastest pace rating of horse 5 in this graph shows an anaerobic pattern.

Using the Graphs

The only way to become proficient in graphical interpretation is to gain personal experience from frequent analysis of the graphs. You will see patterns emerge as you see the graphs of many races. I have started giving names to the various patterns as I start to recognize them.

1. **The dominant horse**. Described above, this horse exceeds the field in pace and speed. The only questions here are what are the odds being offered, and is there a horse in the field who can improve significantly today?

2. **The overbet favorite** with no chance. You will occasionally see heavily bet horses that plot on the lower left quadrant of the graph. These horses are slow in early and overall speed. I can't understand why they are heavily bet, but I certainly won't bet on them. Look for value elsewhere.

3. **The early pace battle**. You will see patterns with two closely matched horses in early speed and overall speed. Sometimes it is possible to project the final speed of each horse. Look at the fastest pace rating of the slower early pace horse. Draw a line from that point to the pace-speed line of the faster horse, parallel to the speed axis. From that intersection, read down to the speed axis what the projected speed of the second horse will be, if he runs the projected pace of today's race. In general, an Early or EP horse will run just fast enough to stay ahead of the second fastest early horse.

4. **Chaos**. The graph has no clear patterns. All horses may plot out in the same general area. The graph is of no help in this situation.

5. **The par horse**. Sometimes only one or two horses plot into the par box. If no other horses plot significantly better than par, bet the par horse!

6. **Place and show patterns**. Frequently you will see horses that plot at the correct par speed, but are significantly higher or lower than par in pace. These horses tend to place or show if there is a horse that fits par in the race.

7. **Turf Races**. As most horseplayers know, turf races are won by established turf runners or well bred turf horses with good late speed. Late running turf winners plot close to the vertical speed line towards the bottom of the graph.

The Track Judge reports and Performance Space Graphs are now available on the Internet.

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