



# Gmax Race Post-race Feed Specification

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- The Gmax Race system tracks race horses during real-time. Its minimal infrastructure makes it easy and economical to use, and allows the system to be shared between racecourses where travel times permit.
- The system is not intended to replace the information that can be readily observed by viewers from live TV pictures, commentary or photo finish systems. It is intended to complement those systems by providing greater insight into the progress of the race, particularly where views from cameras or the grandstand may be less clear, or for use cases where a video feed is not practical (such as use on mobile devices).
- Various data feeds are available. This document describes the protocol for a 'Post Race' feed, which provides a summary of the race by 'section' measured for each horse after the race is complete. It is intended for post-race analysis and to aid form estimation for future races.
- The system is under active development. Feedback on possible future improvements is welcome.

- Each time a horse passes a 'Gate' (for example, a particular distance from the finish line), the Gmax Race system generates a message with the following parameters:

Description	Name	Type	Example	Notes
Unique Horse/Race Identifier	I	String	3020160112131004	String containing numeric identifiers for racecourse, date, race start time and horse
Gate Name	G	String	1f	String identifying the Gate in question.
Length to finish	L	Number	100.6	Distance in meters to the finish line of the 'Gate'
Sectional Time	S	Number	10.63	Sectional time in seconds between the current Gate and the previous Gate
Running Time	R	Number	46.721	The total time between the official start of the race and when the horse passed this Gate.
Distance Back	B	Number	1.5	Estimated distance in meters from the leading horse at this Gate to the current horse
Distance Ran	D	Number	202.6	Length of the path in that section (distance travelled)
Number of Strides	N	Number	28.7	Estimated number of strides made by the horse during this section

- For each race, the data is provided as a ECMA-404 JSON array, with each object in the array formatted as in the example below:  

```
{"I":"3020160112131004","G":"1f","L":201.2,"S":10.63,"R":46.721,"B":1.5,"D":202.6,"N":28.7}
```
- A message will be output for every Gate/Horse that is successfully tracked
- The data for a particular can be requested using http from the following URL by providing the 'Sharecode' – the unique identifier for each race, and your subscriber license key. E.g.:  
[https://www.gmaxequine.com/TPD/client/sectionals.ashx?Sharecode=30201601121310&k=\[license key\]](https://www.gmaxequine.com/TPD/client/sectionals.ashx?Sharecode=30201601121310&k=[license key])

- Horse identifier
  - This allows unique identification of the race. Additional meta-data (race start time, racecourse etc.) for the race can be requested using the separate Gmax "Race List" data feed.
- Resolution/Accuracy
  - Current 1-sigma sectional timing accuracy of the tracking system is estimated to be approx.  $\pm 0.0.8s$ , the accuracy can be considered to be normally distributed
  - The data in this feed is typically subject to additional review/correction processes to further enhance accuracy. For example, data may be corrected with reference to photo finish results. Correction practices may vary between racecourses, contact us for more detailed information if required.
- Distance Back
  - Distance back is an estimate of what the distance between the horse in question and the leading horse was, when the horses are equally spaced (in time) either side of the Gate.
- Stride count/frequency/length
  - Stride count can be readily used by the client in combination with sectional time and distance ran to calculate average stride length and frequency over the section
- Usage
  - For best efficiency and scalability, we request that the data from this feed is cached by subscribers who are expecting a large number of requests from end users (e.g. consumers using your website or mobile apps).
  - We reserve the right to impose 'fair usage' limits on repetitive requests
- Official distance
  - The 'Length' parameter represents the official distance remaining along the official running line. Note that horses may in fact run a greater or smaller distance to reach the finish ('Distance Ran'), depending on how much their actual path deviates from the official running line.
- Sectional Times
  - Sectional times are provided between pre-defined locations ('gates') on the racecourse. Gates are positioned at intervals back from the start line and spacing may vary to suit standard practice at different racecourses.
  - Note that in races with a running start a section may be provided for the period prior to the horses reaching the start line (the 'run-up')

- Note that finish time is not necessarily the same as the official race result, since horses may be penalised for infringement of the rules.
- Although the Running Time for each horse at each previous Gate allows for a straightforward estimate of race order at that point, we recommend careful consideration of the accuracy of the system in the way in which this is presented to the user. i.e. sometimes the race order inferred from these times may not be correct.
- Instead, the data can be presented to give the user a clear indication of the distribution of the field, without necessarily providing exact information on the position of every horse.
- Examples of the presentation of this data include:
  - <https://www.gmaxequine.com/tpd/public/sectionals.aspx>
  - <http://www.attheraces.com/racecard/Lingfield/14-April-2017/1610/> (click on sectional times/tools/stride data tabs)

- The Gmax Race system will attempt to maintain the feed as reliably as possible. However, we advise end users to consider the following failure modes, some of which may be beyond Gmax's control

Failure Mode	Likely Effect on data feed
System wide failure – for example, due to failure in equipment or operations at the racecourse	Complete data may not be available for that race
Tracker is physically damaged/not carried	Some sectional times for that horse may be missing/incorrect
Tracker is carried on the wrong horse	Data will appear as normal, but the error may be apparent with reference to other information (such as TV images, official results etc)



- Subscribers to this feed will be kept informed of updates, and as far as possible this will be introduced by extending the data feed described herein to ensure backward compatibility. End users should design their applications to be tolerant to additional JSON messages/objects appearing in the data in future.
- Consultation is currently underway on improvements to the horse/racecourse identifier, to provide better support for operations globally, and the variety of different identifiers used by different stakeholders in the industry.

If this feed does not meet your requirements, please contact us. Other feeds are also available, including:

- Live tracking data feed, provides the live co-ordinates of each horse in a low-latency data feed
- Live 'Progress' data feed, which summarises the progress of the race as a whole including live running order of the horses, provided as a live low-latency data feed
- Live 'Probability' data feed, providing the live estimated probability of various race outcomes, intended for use primarily by in-race gambling systems.
- By prior arrangement only: a test data feed streaming replays of pre-recorded examples of one or more of the above data feeds, intended for use in final testing by client applications.
- Historical 'Points' data feed, providing the co-ordinates of each horse throughout the race for previously tracked races.
- 'Sectionals History' data feed, providing the historical distribution of sectional times for each race distance/track combination, to allow the sectionals data for any particular race to be put into context.
- Racecourse 'Routes': files containing a description of the official running line at racecourses, derived from on-site surveys.
- 'Race List' feed, providing meta information on the race such as scheduled start time, racecourse name etc.



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