



AiM Webinar
"Calculated Corner Radius"
4/23/2020 Edited Q&A

1. **Q:** Does the Corner Radius formula exist in RS2?
A: It is not a pre-defined channel but you can built it using the math tools. We will also supply the Math channel used in this webinar in the description of the Youtube video for those that are interested.
2. **Q:** Is this way to think in cars (with the corner radius channel) analogue to that of motorcycles with Lean angle channel?
A: Live answered
3. **Q:** Can you suggest best apex types for big bend, LRP, International horseshoe, and Daytona. Just as examples
A: live answered
4. **Q:** Is there a formula for gps based radius
A: live answered
5. **Q:** So GPS vs. internal Gyros - if I have an MXG 1.0 - is it better to use Lat_Accel and Long_Accel from the internals?
A: Using GPS channels you're referring to the exact driven line.
6. **Q:** I'd like to see some of this corner radius data along with steering angle data.
A: The data we are using today does not have steering angle available.
7. **Q:** Surely the type of car also factors into the early/mid/late apex decision for a given corner? eg a momentum car like a Spec Miata vs a power/downforce car like an Fatlantic?
A: live answered
8. **Q:** Off topic question, but in case you want to answer. Where do you recommend we place our segment divisions for split reports?
A: This really depends on if you are trying to analyze corners/straights, braking zones, high load zones. Allowing the automatic segmentation and working from there is a good way to start.
9. **Q:** it is possible to have the GPS as in the image that explained the curve
A: live answered
10. **Q:** But a motorcycle does not have a lateral G for the calc. You will only know progression of GPS X&Y locations over a series of locations.
A: GPS Lateral acceleration is the effective lateral acceleration the bike would have had riding that corner perfectly vertical.
11. **Q:** what is considered a non aero car?
A: live answered: A car w/out down force that can modify cornering behavior.

12. **Q:** How do you zoom in and out?

A: I use my scroll wheel on the mouse but you can also use the up and down arrow keys on the keyboard. Just click on the measures graph and use the hot keys mentioned.

13. **Q:** Sorry I missed the coloring set up of the gps track. Can that be reviewed very briefly?

A: Toggling the "per lap color" will change it from data color to lap color. We will be covering this in depth in a future webinar.

14. **Q:** Is max g lat the same regardless of corner radius or not?

A: The three variables that are bound together are speed-latacc-radius, as shown in the formula.

15. **Q:** What is the gps Slope Channel

A: GPS Slope is a native channel with GPS, it is the slope of the traveled line. The last webinar was specifically on this and the uses of it. What we are using here is the derivative of GPS slope, the "slope speed". $\text{deriv}(\text{GPS_Slope})$

16. **Q:** Odd Question: for GPU map, does it use the same executable? or a unique .exe? (my work, I use 3D performance monitoring tools, and I'm trying to whitelist the GPS map, the rest of the app is whitelisted now, but whitelisting the main executable didn't seem to prevent the tool from trying to function on the GPS Map

A: When exporting data .gpk file is what we use to house all of our GPS based information.

17. **Q:** Can we see the steering channel? It might help to understand the W turn if the driver was correcting for oversteer.

A: live answered

18. **Q:** So would want to do two calls? One based on GPS-Lateral G and a second calc based on Accelerometer-G..... when they are different, the track has camber or off camber.

A: The GPS lateral G's are not affected by camber/banking, the internal accelerometer is. The difference in the two on banking, for example, would give the degree of banking, whereas $1g = 90^\circ$.

19. **Q:** Is a math channel required for motorcycle lean angle?

A: RSA math channels, look for a bike_angle channel, it gives a normally good estimation of it

20. **Q:** I guess my question is: is there a way to know if i maximize the available grip?

A: Knowing what the vehicle is capable of is crucial. You can use data from bad laps where the car lost grip in a corner to locate the g threshold at the point before the loss of grip to give you a good idea of the Max G load you should be targeting.

21. **Q:** The way you are seeing corner radius right now is just telling you how you ARE actually taking it. aka late or early apex, Correct? How would you use this data to determine if you should be changing your approach....aka you are driving early apex and should be doing a late apex

A: This is a larger topic that we will give it deserved time to in a future webinar. If you have the time to discuss this further please reach out to us via phone (800) 718-9090 or by email Support@AiMSports.com

22. **Q:** What exactly are you looking at to determine a late or early apex in the data. Where do you want the cursor?
A: It is the shape of the curve. This was covered towards the beginning. We will have this posted on YouTube shortly after it is over to be able to go over it again.
23. **Q:** Some folks recommend from start of a brake zone to start of the next, but others say NOT to do that. Confusing, There are a lot of different ways to use that tool.
A: The upcoming webinars will hopefully help clear that up for you. It is a topic all onto itself.
24. **Q:** How many attending seminar today?
A: Just under 200
25. **Q:** What is the easiest way to figure out what line is truly faster for over lap time?
A: Late, mid or early apex for any given turn. For example you could create a map with splits, and use the split report for this analysis.
26. **Q:** How could you compare your lap , to an IDEAL lap, where the proper apexes have clearly been laid down, for instance by a pro or your coach?
A: You can overlay laps from different tests. If you have Pro coach data you can overlay your drive line on top of theirs. We have videos on Youtube to help explain in more detail how to use multiple laps from multiple tests: I believe it is this one:
<https://www.youtube.com/watch?v=KogdoMZyWPE&t=1779s>
Feel free to look over all the videos we offer at <https://www.youtube.com/user/aimdata/videos>
27. **Q:** Does motorcycle lean angle make this not usable data? Would it show where you achieve max lean or tightest turn radius?
A: Using GPS data the GPS lat acceleration is not affected by lean angle, it's the acceleration bound to cornering of the driven line
28. **Q:** Under units in the Math Channel def of Corner Radius, what should I set Full Scale and Zero scale to? Right now I'm looking at 1200 and -1200 respectively, and chart is a flat line.
A: This will depend on the track and vehicle but you can re-scale any channel by double clicking on the Y axis units. This will give you an idea of the scaling that needs to be applied in the math channel settings.
29. **Q:** It appears that 8 total laps are selected but only 4 total showing???
A: There are 4 laps from each session. 2 sessions in total and we are only working with one session now.
30. **Q:** How do you recognize a better line with this?
A: live answered
31. **Q:** Is there anyway to "zero" the time compare to only the zoomed in segment?
A: live answered
32. **Q:** Things like late braking into a decreasing radius can be very difficult for a driver to get a handle on what cost me the most overall time. Data is everything.
A: Agreed!

33. **Q:** Do you find that a driver has one or two "bad" corners? A couple of tips on how to fix them?
A: Taking them one turn at a time, I think is the most important starting point. Overlaying faster and slower laps, looking at apex, entry and exit speeds. That would be a great place to start.
34. **Q:** Once I have max g load, is it a constant or is it corner radius dependent?
A: It is constant but dependent on speed. Accelerating requires grip too and it must come from your max lateral G. Here is a video describing g sum to better explain. <https://www.youtube.com/watch?v=WPnYF8aGwF8&t=306s>
35. **Q:** How important is the real Position in this case?
A: live answered
36. **Q:** Wouldn't the scaling have to be done in the general tab to keep it for all future tests?
A: If you are intending this Math Channel to be included in all test files you open the math channel and its scaling need to be made in the general tab.
37. **Q:** So there is no easy way with data to tell if I'm maximizing the speed through a corner, right?
A: This is just one tool for your toolbox. The next few webinars will add more tools and hopefully make this question a bit easier to answer for you.
38. **Q:** When will the next version of the Software will be available
A: ☐ It will be in beta in May
39. **Q:** If you're comparing two different laps from either a different session, day, or driver, how would you apply an offset in the GPS to account for the alignment error?
A: With the new GPS hardware this is less of a problem but some of the older units may need to be tweaked a bit. We have a upcoming Webinar topic that will help explain how to adjust, if needed, the data for your analysis.
40. **Q:** How do you change lap colors in KML In Google Earth?
A: Right click the trace and change properties
41. **Q:** Will there be a session on exporting and overlay to google earth?
A: Yes, we will have a webinar on track maps in general.
42. **Q:** The google earth thing is cool, how does that work? Do you have to google search the track first?
A: The data has embedded position thanks to GPS to automatically find the location when exporting .KML files and using Google Earth software.
43. **Q:** Jeremy talked about Max G for a specific corner based on speed? Is that a math channel as well? how do we get them?
A: The math channels will be available through email and are posted in the first few minutes of this webinar. Also look at the video on calculating G-SUM: <https://www.youtube.com/watch?v=WPnYF8aGwF8&t=717s>
44. **Q:** How do I get the gps map?
A: We will be doing an entire webinar on track maps. To have the gps laps exported to Google Earth you can export the .kml file. From File > Data Export.

45. **Q:** How do I open the Google earth file? I saved it via the KML file like you showed. But i missed how to open it.
A: Go into Google Earth and go to File > Open and navigate to the location of the saved .KML file
46. **Q:** Does max g change with speed? non-aero car isn't max g fixed?
A: there can be other things affecting lateral grip, typically track conditions and elevation changes.
47. **Q:** Can we have Jeremy give more seminars...he is great!
A: Absolutely! We have him signed up for more already!
48. **Q:** Radius and speed relation always results in max g?
A: Normally yes, if it doesn't happen you should look for a reason for it not to.
49. **Q:** How to exactly enter this math channel into your software?
A: We will have a webinar on Math Channels coming up very soon. But if you would like to review this video on math channels it is already available: https://www.youtube.com/watch?v=raPWKW8T_QA&t=61s
50. **Q:** Can we get Peter Krause to do more of these ?
A: Yes! We have it planned to do more with him as well.
51. **Q:** Is there a way to calculate when a car is "slidding too much"?
A: This is a topic that requires many different tools. We have lined up a few up coming webinars to make sure your toolbox is properly equipped.
52. **Q:** How can we get the beta?
A: The website will have a download link for those wishing to see/work with the beta software.
53. **Q:** Will the formula/math channel be emailed to everyone, or will a 'request for info' be necessary?
A: It will be available on the Youtube channel in the description of the video. And can be received through requests made to Roger@AiMSports.com via email.