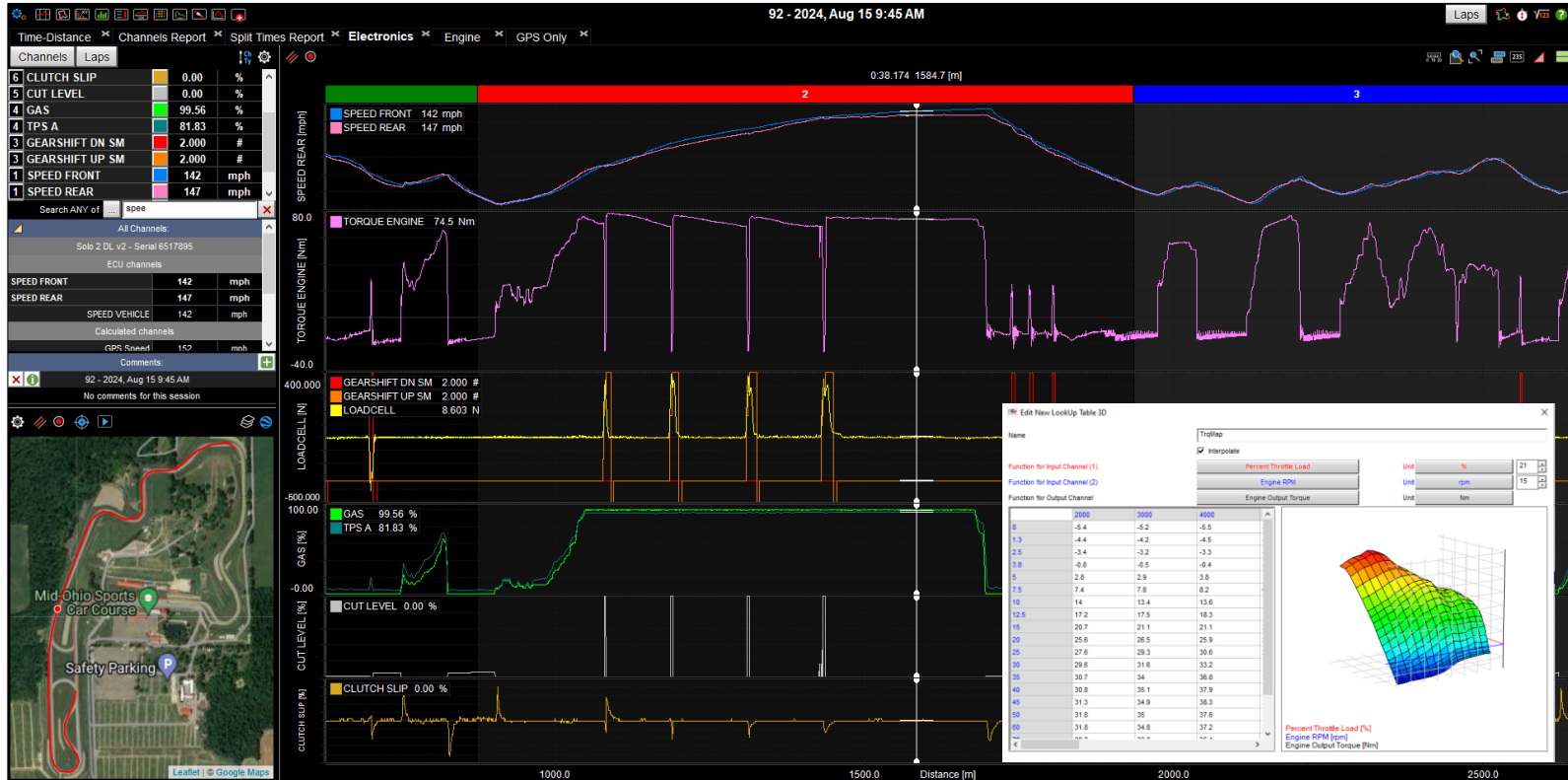


Moto Data Analysis

Using Data to Optimize... Everything!



Host:
Roger Caddell
AiM Sports - National Training Manager

Co-Host:
Chloé Lerin
MotoAmerica Data Engineer



aimsports.com

Tuesday August 27th, 2024

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Chloé Lerin



- **Powertrain Performance Engineer at Harley-Davidson**
- **Winning Race Data Engineer at MotoAmerica (Team Hammer)**
- **AiM Trackside Support Technician**
- 12 Years in Internal Combustion Engine R&D
Works with Engine Dynos
- Master's degree in Mechanical Engineering from
the University of Wisconsin-Madison
- Engineering Diploma from UTT, France
- Amateur Motorcycle Club Racer #147



Chloé Lerin

Motorcycle Data Engineer



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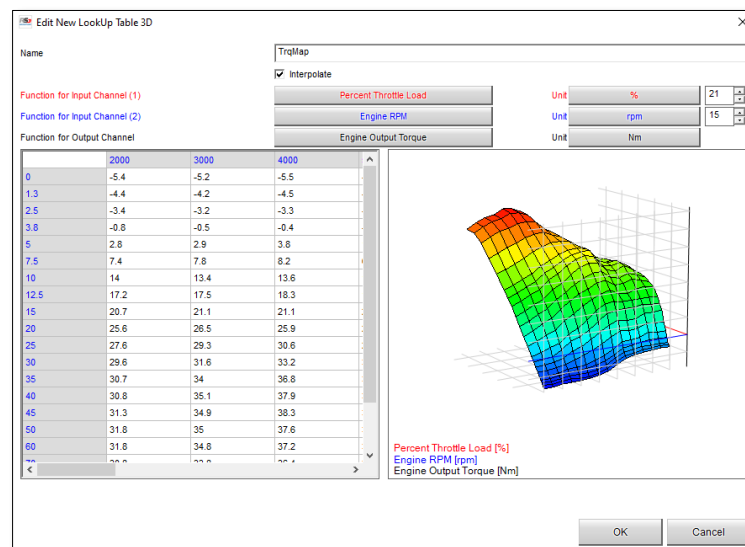
Today's Agenda



Here is a List of the General Topics for Today's Webinar

Please add any questions you may have to the Zoom 'Q&A' Function and we will fit in as many as we are able.

- Look Up Tables
- Gearing Calculations
- Shifting Strategies
- Corner Analysis Applied to Motorcycles



What Do We Use Data For?

All the Ways We Use AiM Data on a Race Weekend



- ☑ Learn the Track → GPS Data
- ☑ Improve Rider's Technique → Throttle & Brake*
- ☑ Setting the Bike to go Fast:
 - Select Gearing → RPM & Gear Position*
 - Set up Chassis and Suspension → Potentiometer Data
- ☑ Tune the Electronic Strategies:
 - Shifting: Engine Cuts, Rev Matching & Clutch Setup*
 - Engine Braking
 - Throttle or Torque Mapping*
- ☑ Check Engine Health → Channel Reports

*Use of Math Channels

Rider Techniques

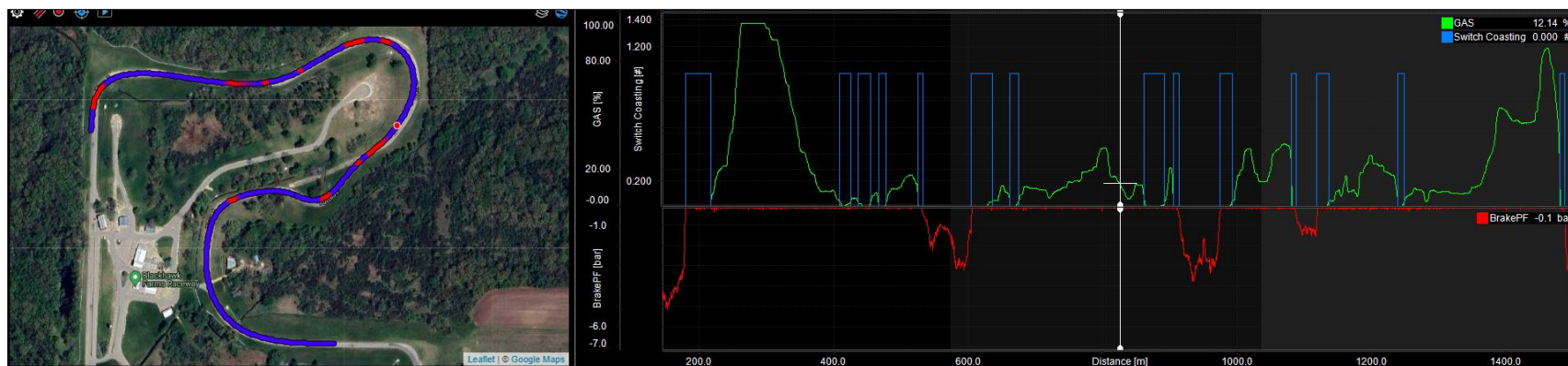
Building on Ray Phillip's Channels



Identifying Areas of Improvement Made Easy with a Coasting Channel

Coasting in this Case = Rider Applies No Brakes and No Throttle

✓	Lap	△	Time	Dist [m]	Max [rpm] RPM	Max [mph] GPS Speed	Min [mph] GPS Speed	Max [m] Distance Coasti...	Max [s] Lap Cumul Tim...
	out		0:20.413						
✓	1		1:36.382	2681.4	13296	125	33	382.2	15
✓	2		1:32.570	2690.0	13358	126	35	387.8	14
✓	3 (best)		1:31.375	2686.6	12541	120	35	398.2	15
✓	4		1:33.359	2688.2	12896	118	33	292.6	11



Using Data to Optimize, Everything!

Rider Techniques

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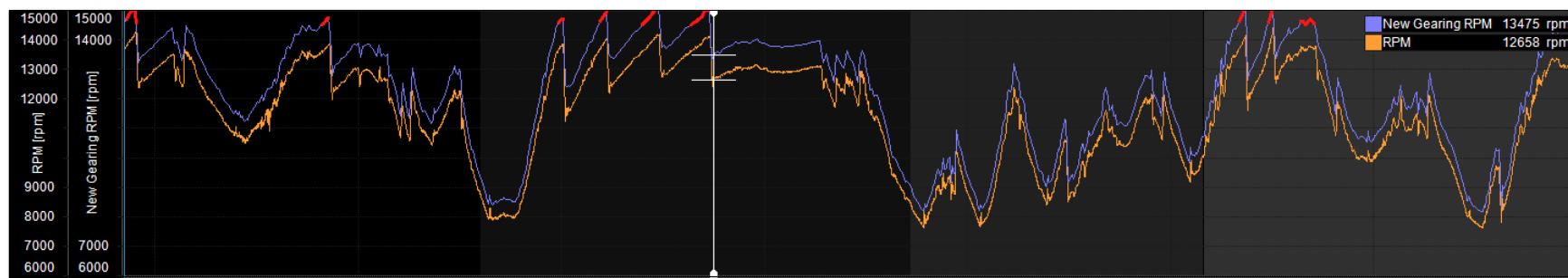
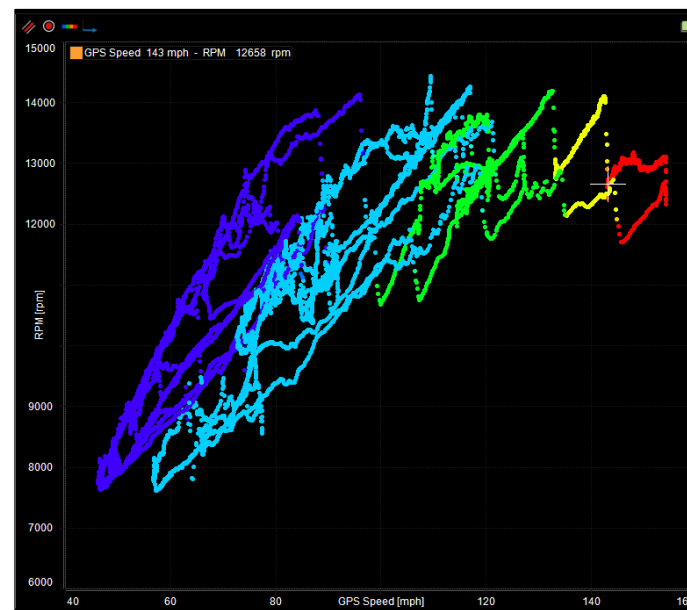
Setting up the Bike to Go Fast

How to Quickly Estimate the Effects of a Gearing Change



Impacts of a Gearing Change:

- **Wheel Speeds:** Taller Gearing → Increase Top Speed, Soften Drive out of Corner
- **RPM:** Shorter Gearing → Faster RPM Rise, Watch for RPM Limiter



Tuning the Electronics Strategies

What are the Common Strategies Available?



- Shifting Strategies: Engine Cuts, Rev Matching & Clutch Setup
- Engine Braking
- Throttle or Torque Response



Important Channels to Log:

- Wheel Speeds
- RPM
- Throttle Plate Position
- Engine Torque

Most Race ECUs have an Extensive List of Channels

AiM Sports Racing ECU Connections: [CAN Protocols](#)

But what if they are not?

Look Up Tables

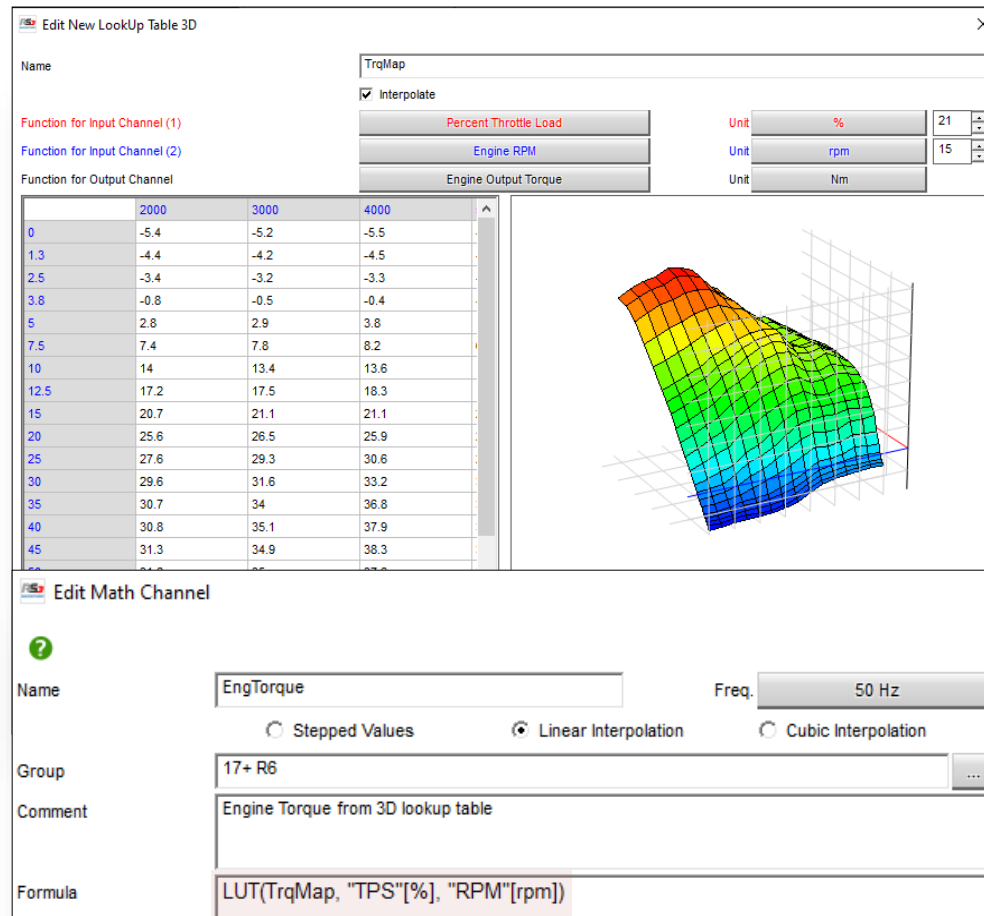
What are they Used For?



Look Up Tables are Tools Used to Store Pre-Calculated Data Without the Need for Complex Calculations

Accessing the Data from a Look Up Table is Typically Faster than Performing the Calculations

In the Case of Racing Data, Look Up Tables Could be ECU Data that is not Broadcast on the CAN protocol. i.e. Ignition Timing, Fueling, Torque



Using Data to Optimize, Everything!

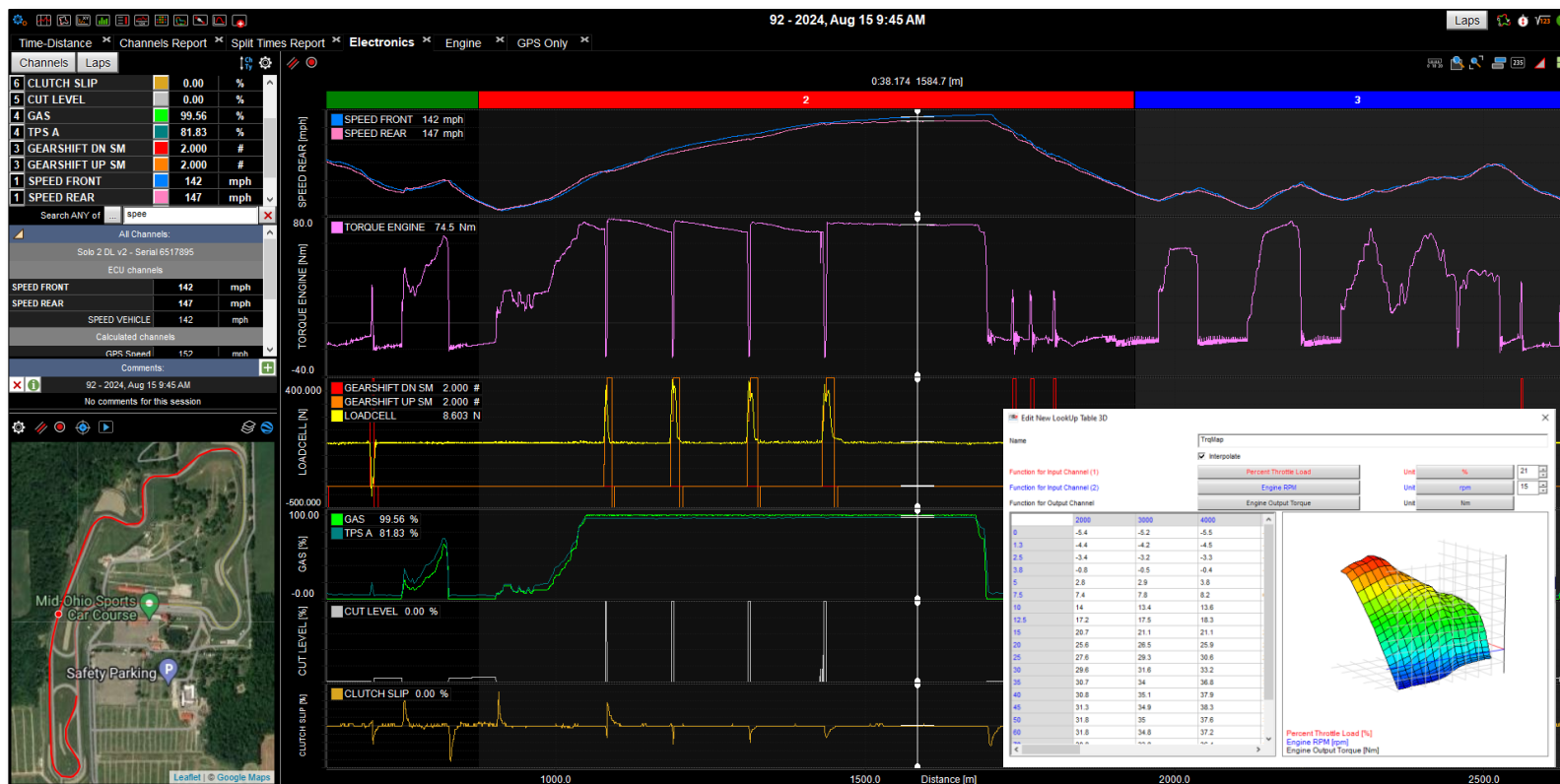
Look Up Tables



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Live Race Studio 3 Demo



Using Data to Optimize, Everything!

Live Race Studio 3 Demo

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We Have Answers!
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Currently **249** Videos and Growing

YouTube www.youtube.com/aimdata

Moto Data Analysis
Using Data to Optimize ... Everything!

Host:
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- All New 2020 - 24 Live Webinar Videos
 - Software Updates with Race Studio 3
 - Pre-Calculated Gear Position Function
 - Configuring WiFi Communication
 - Customizing AiM Device Logos
 - Race Studio 3 Basic Configuration - Part 1
 - Race Studio 3 Basic Configuration - Part 2
 - **I Have Downloaded my Data, Now What - Part 1*
 - **I Have Downloaded my Data, Now What - Part 2*
 - GPS Lap Insert
 - Selection Criteria
 - Data Views
 - Sensor Calibration
 - Measure Units
 - Conditional Alarms
 - Sort Channels
 - Gear Position
 - Test Properties
 - Firmware Update
 - Per Lap Color
 - Solo Configuration
 - Export Tests
 - Transmit Tracks
 - Channel Reports
 - Gps Manager Overview
 - Setting Time
 - New GPS Track
 - Track Mapping
 - Webinars
- * Most Popular and Recommended*

Detailed Corner Analysis
Using New & Better Match Channels

Host:
Roger Caddell
AIM Sports - National Training Manager

Co-Host:
Ray Phillips
Professional Training Manager, Owner

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Bringing Data Support and Training to You

Data Download Options
In Race Studio 3

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Additional Materials

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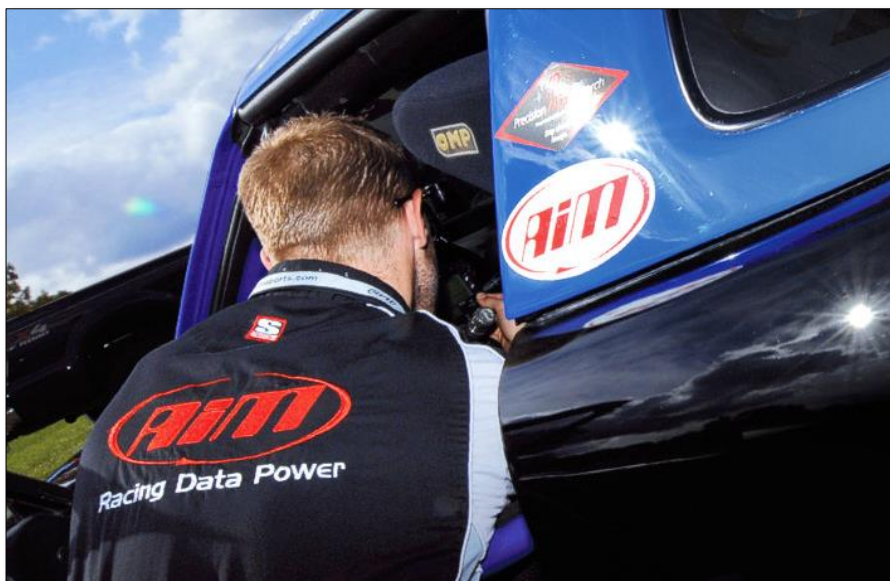
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Customer Support



AiM Sports Technical Support Staff Regularly
Attend Races and Other Events

Look For Us At An Event Near You
Or Call Us At **800.718.9090**



Customer Support

At An Event Near You!

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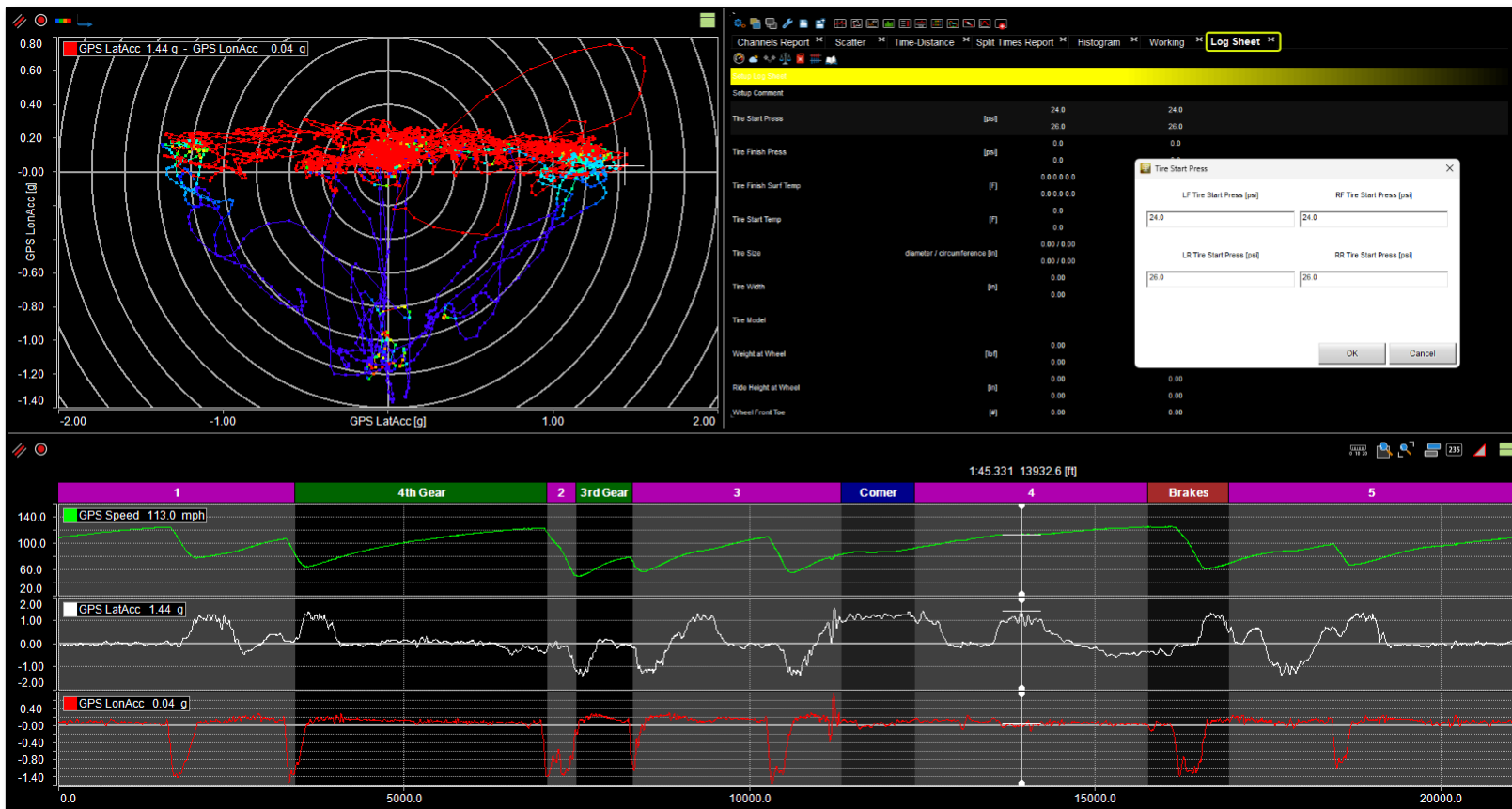


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#5-16
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If You Have Questions

Next AiM Sports Webinar

Tuesday, September 10th, 2024 – 6pm Pac / 9pm East



Roger Caddell

AiM Sports - National Training Manager

Matt Romanowski

Owner - TrailBrake.com

Next Webinar

2nd & Last Tuesday of Each Month

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We Have Answers!

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#182

Contact Information

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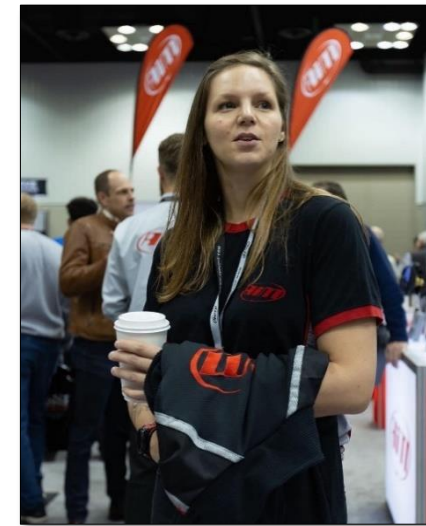
 @unical_racing



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