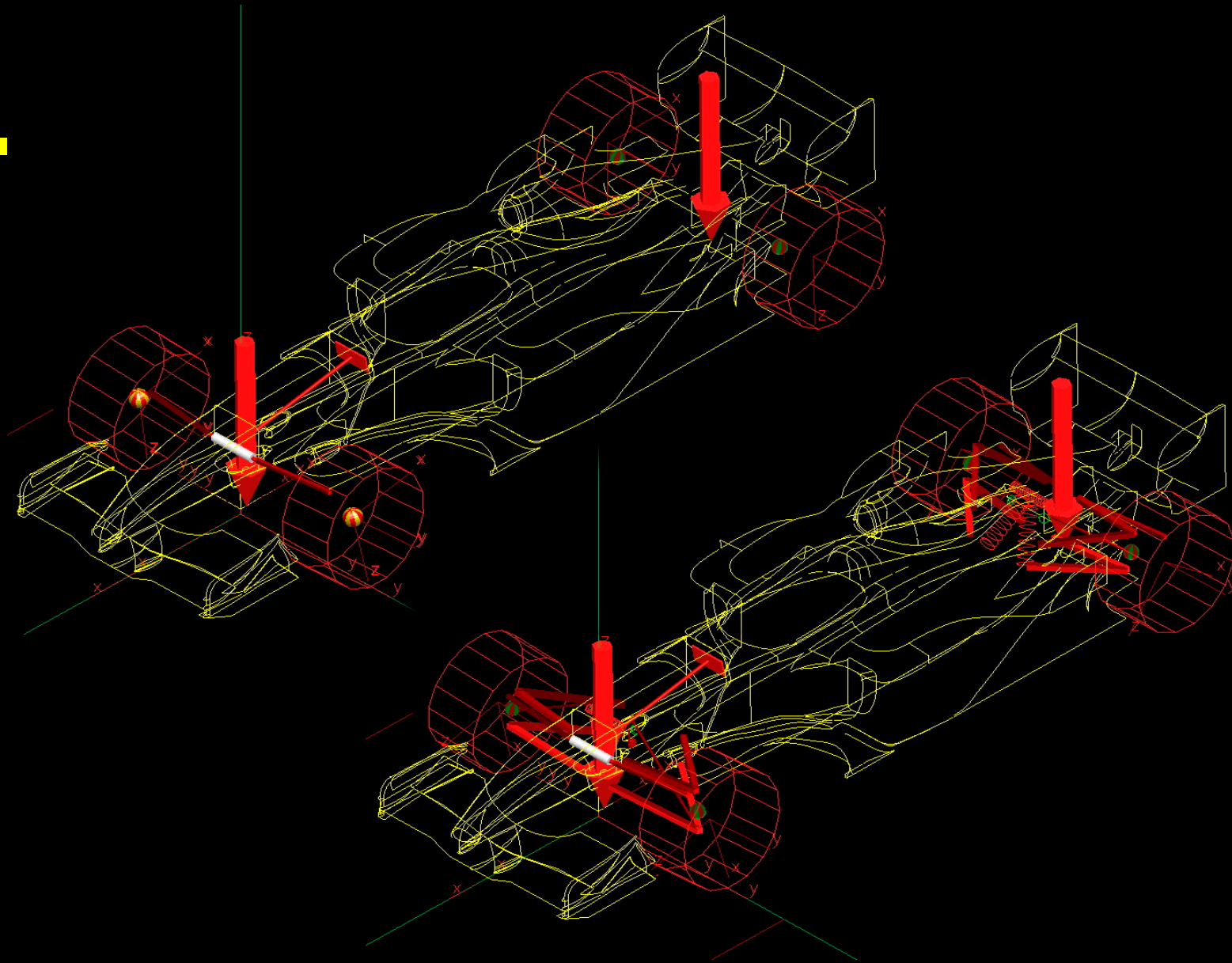


Using SIMPACK for Full Vehicle Dynamics Simulation at Jordan Grand Prix

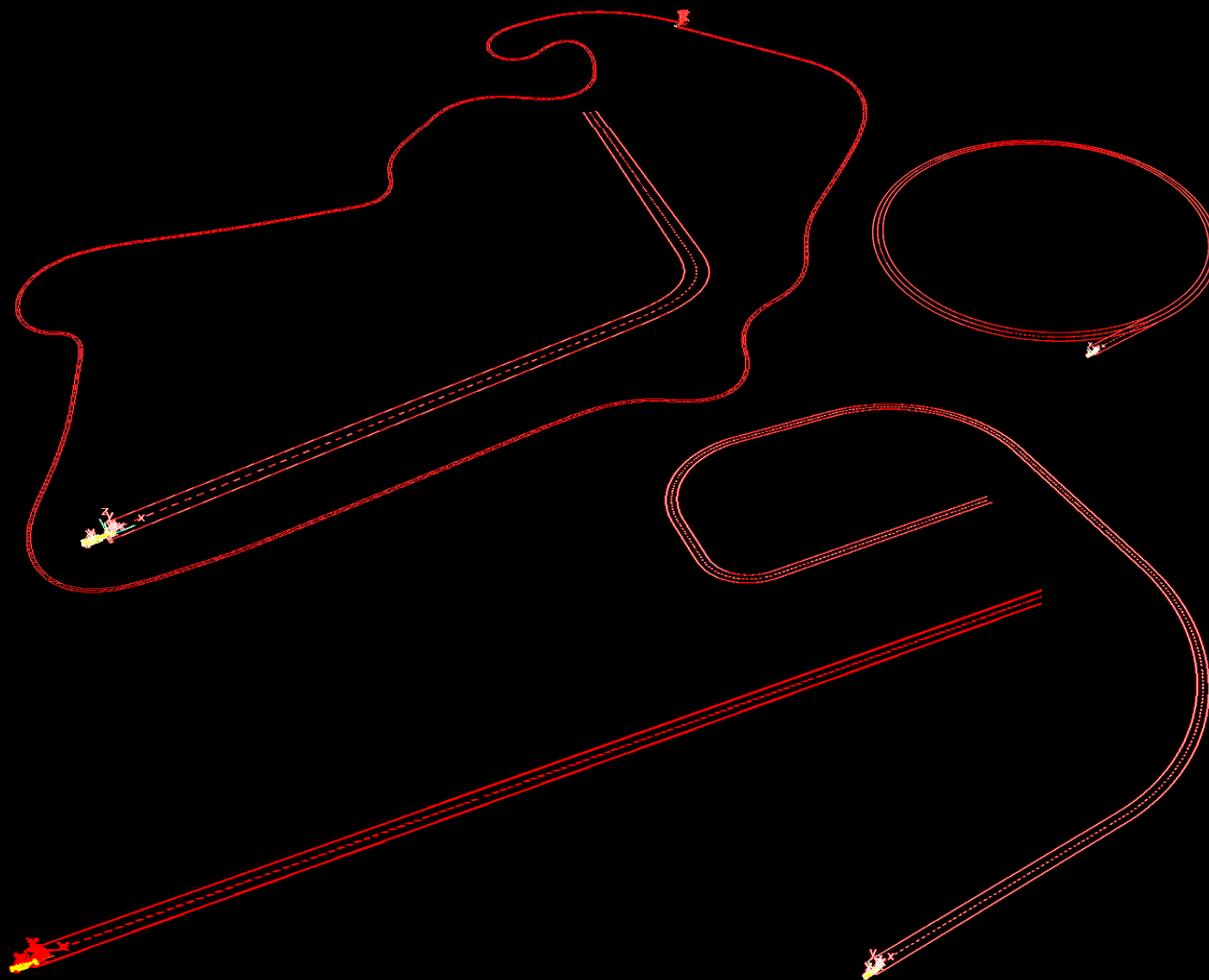
Richard Frith & James Knapton



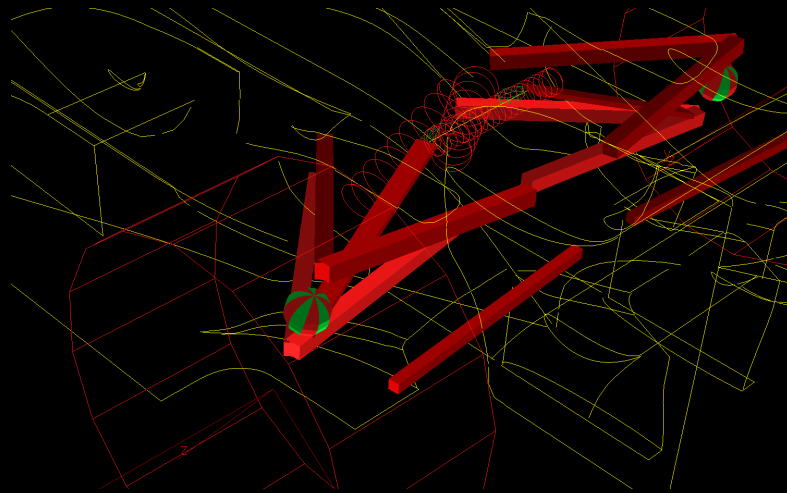
Models



Tracks



Case Study: Mk2 Rear Suspension



Project Goals



Improve transient handling
and chassis stability

Improve car response to
lateral disturbances

Improve mechanical grip

Test Methods

Confirmation of Kinematics and Compliance

- Single Corner Model
- FEMBS

'Steady State' Lateral Balance

- Steer Pad

Transient Response

- Step Steer

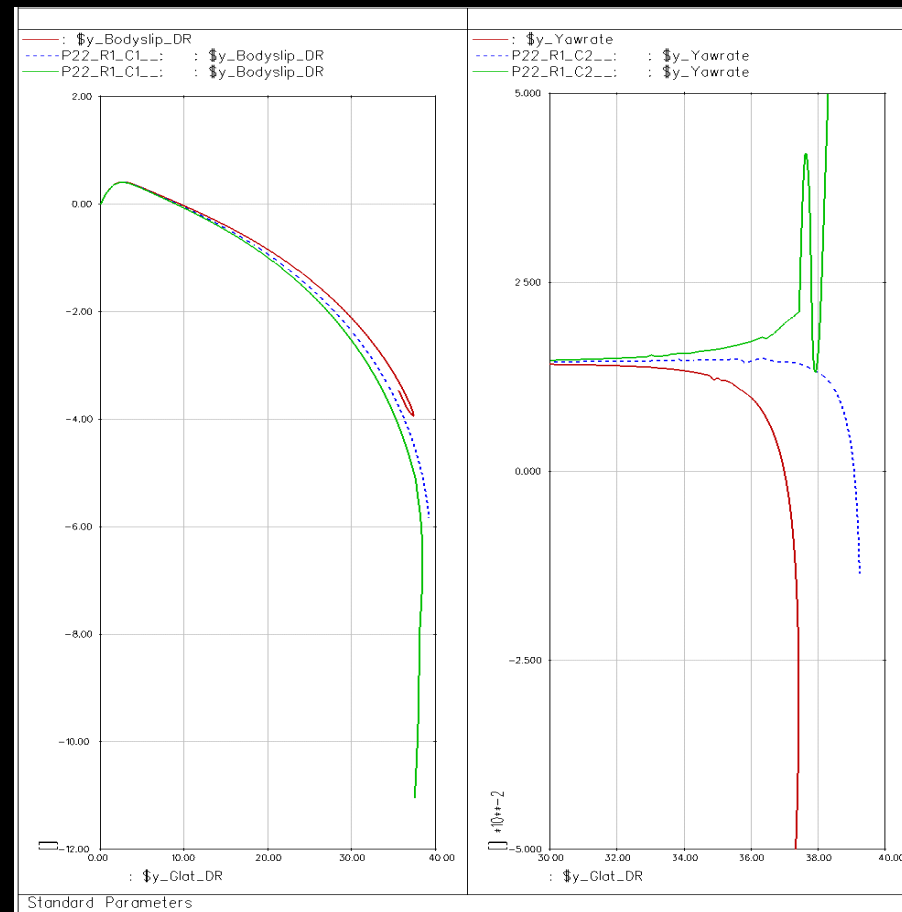
Generic Performance Assessments

- Lap Driver
- Effective Road Profile (ERP)

Analysis Methods

Steer Pad

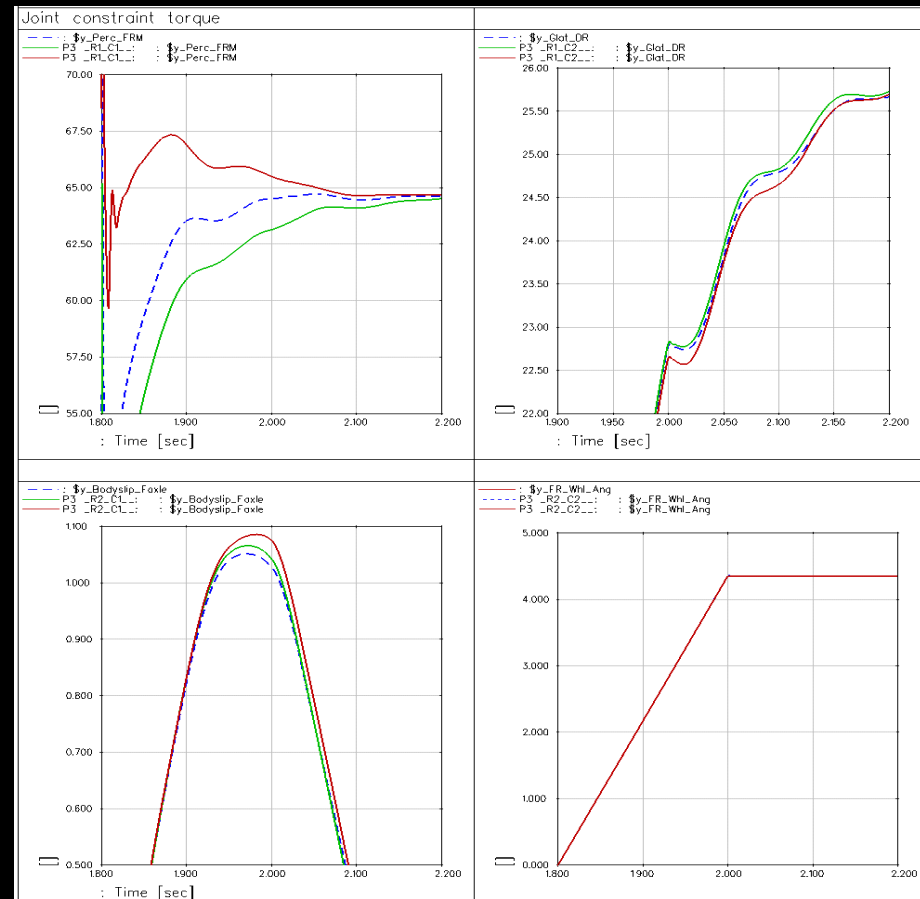
- Set-Up Development
- 'Balance Equivalence'



Analysis Methods

Step Steer

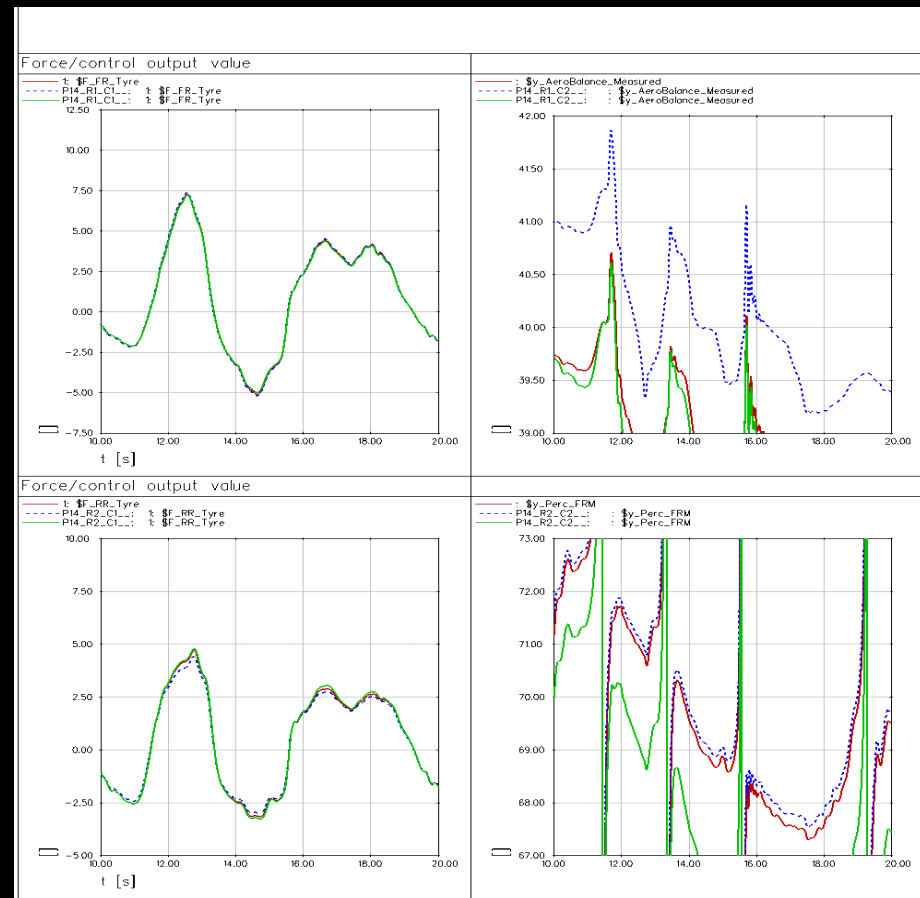
- Transient Versus Steady State Balance



Analysis Methods

Lap Driver

- Corner Analysis
- Tyre Usage
- Aero Platform Effects



Full-Scale Testing

Detail Design

Parts Issued For Production

Track Testing

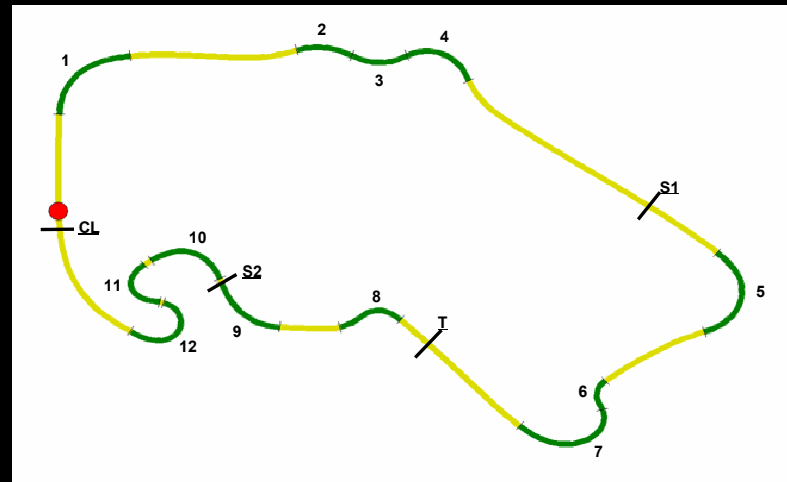
- Driver Comments
- Driver Index Ratings
- Data Analysis



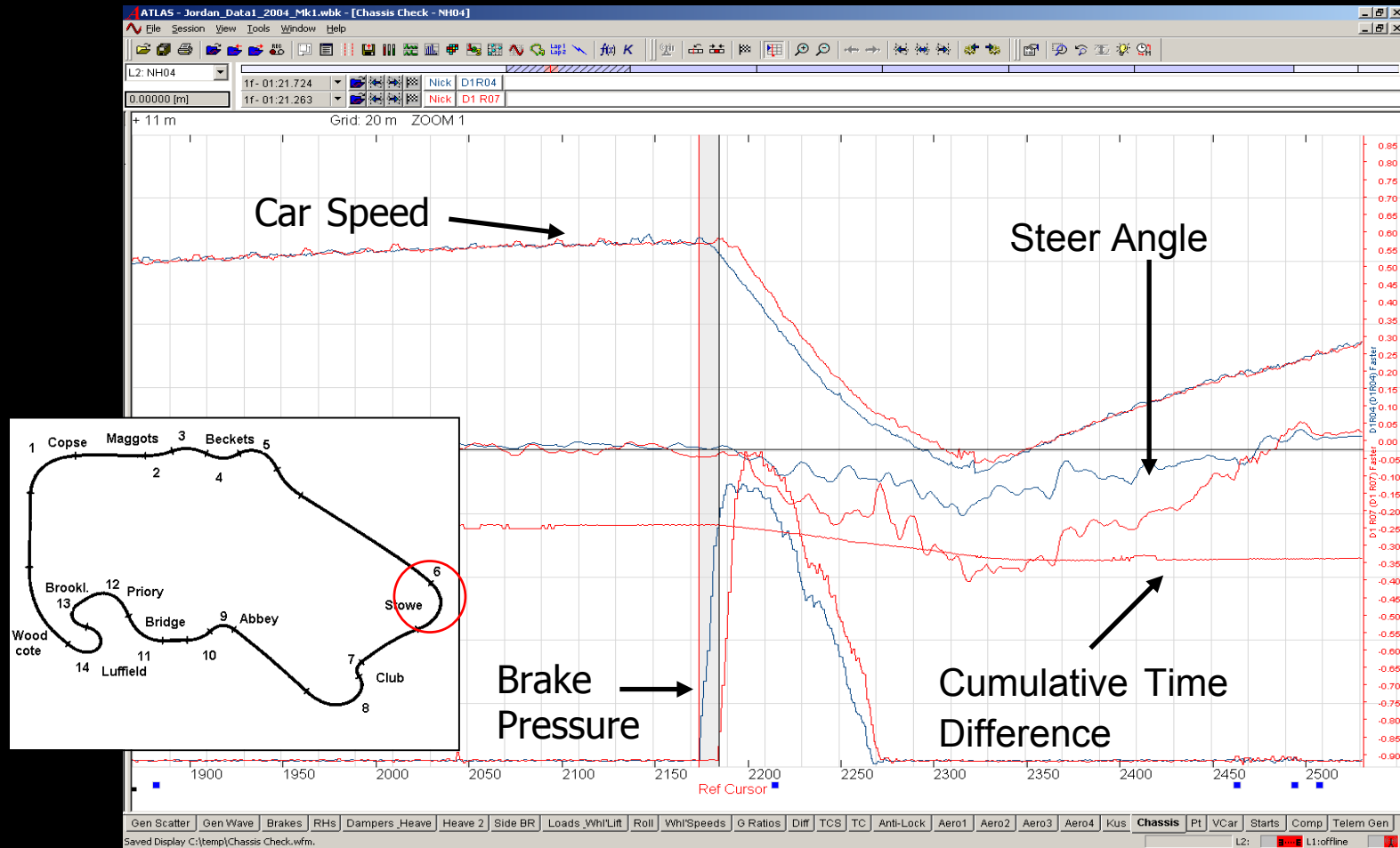
Driver Feedback

Setup	Driver Comments	HST	CoD	BS	CBT_HS	CBT_LS	Kls	Khs	Tls	LSB	HSB	Score (/100)	Lap Time	Additional Comments
Baseline Mk1	Front tyre heat-up a little slow. Degradation as normal. HS stability increases as tyre pressure go up. A little too much US on 1st timed lap Stability not too good in high speed on 1st lap. Balance closer together than at the weekend. Less bottoming.	5	5	5	5	5	5	5	5	5	5	50	1.21.724	New Tyres, brake test on in-lap
Mk2 Baseline	Installation Lap - car feels bit better, less balance change with throttle use. Timed Lap - Clearly better, balance closer together, improved steering and braking, less movement in high speed corners. T3-more grip.	7	6.5	6	7	7	5.5	6.5	5.5	5.5	7	63.5	1.21.263	New Tyres, brake test on in-lap

HST - High Speed Stability
CoD - Change of Direction
BS - Braking Stability
CBT-LS - Combined Braking and Turn-in (Low Speed)
CBT-HS - Combined Braking and Turn-in (High Speed)
Kls - Kerbing (Low Speed)
Khs - Kerbing (High Speed)
Tls - Traction (Low Speed)
LSB - Low Speed Balance
HSB - High Speed Balance



Track Data Analysis



Future Projects

Code Export

Powertrain Modelling

Control Systems Integration

Driver Model Development

