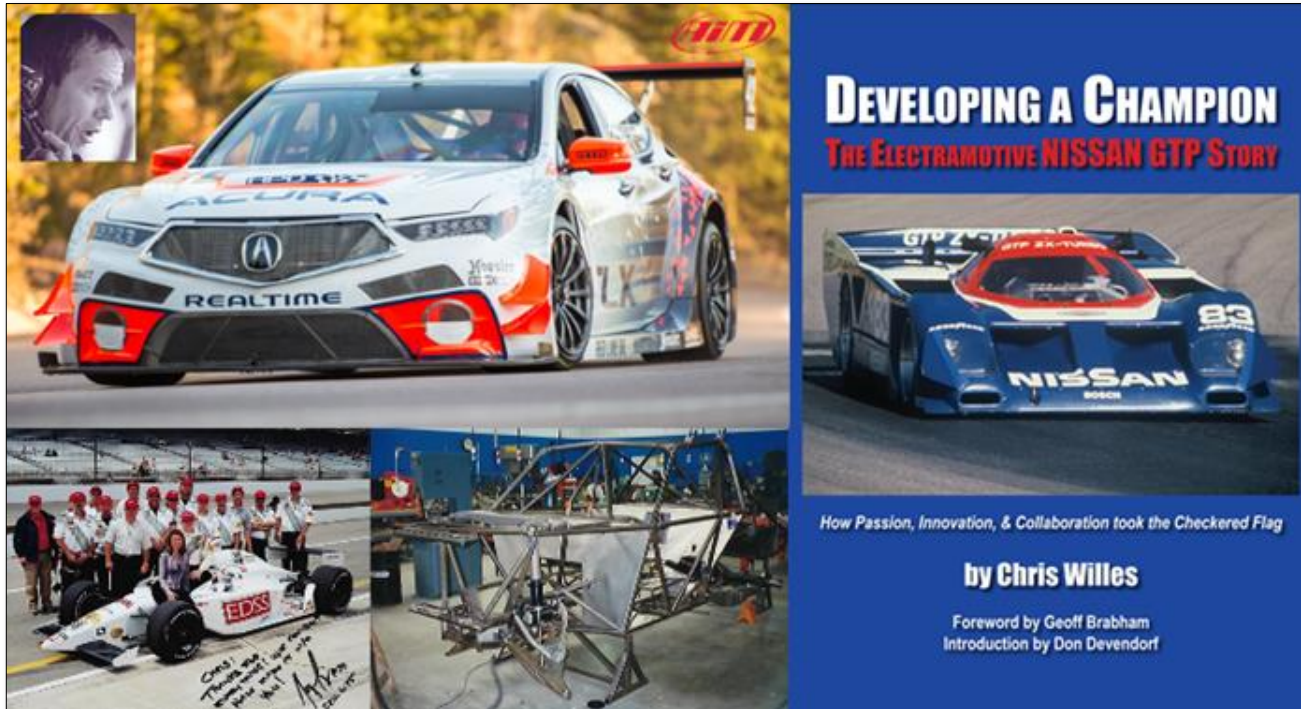




Developing A Champion

The Electramotive Nissan GTP Story



Host:

Roger Caddell

AiM Sports

National Training Manager

Guest:

Chris Willes

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The Electramotive Nissan GTP Story



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Tuesday September 7th, 2021

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Chris Willes

Developing A Champion The Electramotive Nissan GTP Story



- 1986-1989** Design engineer for Electramotive Engineering, Inc racing IMSA GTP cars.
- 1990-1993** Assistant Department Manager for the Nissan Performance Technology, Inc chassis department.
- 1995** Ivan Stewart to design the ProTruck chassis and suspension. A full-size, spec, off-road truck for desert racing.
- 1995-1998** Saleen Allen Racing to design the Saleen SR Widebody Mustang GT2 race car and FIA homologation car. Won the 1996 SCCA World Challenge GT2 Manufacturers Championship. Race engineered to 2nd place in class and 7th overall at the 1998 12 Hours of Sebring; pre-qualified two cars for the 1997 24 Hours of Le Mans, qualified 3rd in GT2 and retired at 16th hour during the race weekend.
- 1999-2001** Caldwell Development to design engine components for Chrysler Mopar V-8 LMP (LeMans Prototype) engine finishing 4th overall at the 2001 24 Hours of LeMans
- 2000** Truscetti Team Racing to race engineer driver Jaques Lazier in six races of the 2000 IRL season: resulting in (2) top 10 finishes, and a 13th place finish at the Indy 500.
- 2000-2005** ACS Express Racing to design and race engineer Trans-Am cars. Race engineered driver Boris Said in the ACS-designed and built Trans-Am car to the 2002 Trans-Am Driver's Championship and Team Owner's championship; including (8) wins and (11) top 3 finishes in (12) races.
- 2005-2010** ACS Express Racing to design and race engineer the 2006 ACS Ford Mustang Cobra World Challenge GT race car. Race engineered driver Brandon Davis in the ACS Ford Mustang Cobra to the 2009 World Challenge GT Drivers Championship.
- 2009** Awarded 2009 World Challenge Zimmerman Cup for 'Crew Chief of the Year'.
- 2014-2016** RealTime R&L Inc to design the chassis, suspension, and 4-wheel drive layout of the 2015 Acura TLX-GT 4WD World Challenge GT Car. Race Engineered Peter Cunningham in the Acura TLX-GT 4WD race car to the 2017, 2018, and 2019 Pikes Peak International Hillclimb Open Class, winning the class and finishing in the top-3 overall each year.
- 2016-2017** RealTime R&L Inc as lead race engineer to test and develop the components for the Acura NSX GT3 car for FIA homologation in conjunction with Honda Performance Development (HPD).
- 2016-2017** Weaver Racing Concepts to design the 2017 Weaver Trans-Am Car. Boris Said and Adam Andretti have both won Trans-Am races with the car.
- 2018** RealTime R&L Inc to race engineer Ryan Eversley in a 2018 Honda Civic TCR Race Car to win the 2018 World Challenge TCR Driver's Championship, finishing with (5) wins, and (11) top 3's.
- 2019** RealTime R&L Inc to race engineer the Acura NSX GT3 EVO to the 2019 SRO World Challenge Pro-Am Team Championship, winning eight races and including an overall win at Road America.

Chris Willes

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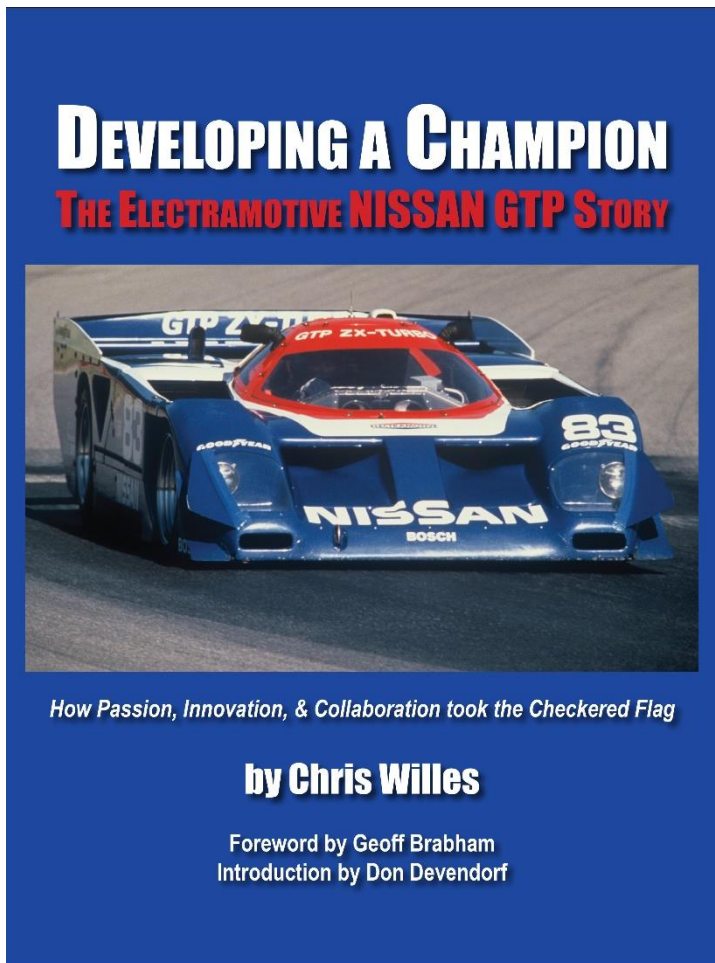
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The Electramotive Nissan GTP Story - Examples



Electramotive- The Beginning

Chapter 1

Racing enthusiasts and friends, Don Devendorf and John Knepp teamed up to propel Electramotive from a small race shop, starting in 1974, to a formidable force in the professional racing world by 1989. Don worked as a chief scientist for Hughes Aircraft in the radar systems group during the week and was an accomplished race car driver on the weekends. John had been working with a professional race team, Brock Racing Enterprises (BRE), as a mechanic, gaining valuable race experience. They met, became friends, and eventually created one of the most iconic brands in racing history, the Nissan GTP cars of the 1980s and 1990s.



The Electramotive Logo.
Image courtesy of John Knepp



Don Devendorf and John Knepp.
Photo courtesy of John Knepp



Geoff, shown here at Sears Point, drove to a second straight championship in 1989.
Photo courtesy of Dennis Ashlock

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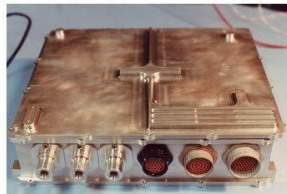
The Electramotive Nissan GTP Story - Examples

Chapter 2

The EECF

In 1981, Don Devendorf designed and built his own electronic engine control unit, which he called the Electronic Engine Control Processor (EECF). This engine control unit was one of the first of its kind in circuit racing. It electronically controlled the fuel injection, ignition timing, and boost of an engine and helped propel the Electramotive 280ZX Turbo to the 1982 IMSA GTO Championship. The succeeding EECF2, also state-of-the-art, was critical to the dominance of the Nissan GTP ZX Turbo in IMSA's GTP class from 1988 to 1991.

Don's brother, Dave, recalled how the project started in 1981. "Don went to Hughes Aircraft's upper management to propose an idea that he knew would help Hughes save a classified multi-billion dollar project already under way at the company that was floundering. After looking at his proposal, the management told Don it couldn't be done. Don said, 'That's because you don't know what you are doing!' He made a deal with his managers—if he fixed the problem and his solution accomplished what was needed to salvage the project, his reward would be a three-month vacation." During that time, Don was burning the candle at both ends, working for Hughes during the day and running a race team at night. Hughes agreed to give him what he wanted. "He went in, fixed the problem, and took his vacation," continued Dave. "Instead of resting, he took two Hughes engineers with him to design and build the first EECF at his home. When he went back to work and his bosses saw what he had built, they were totally impressed!"



The digital EECF2.
Photo courtesy of Brent Dussia



EECF2 installed in the GTP car.
Photo courtesy of Bruce Parrish

Chapter 11

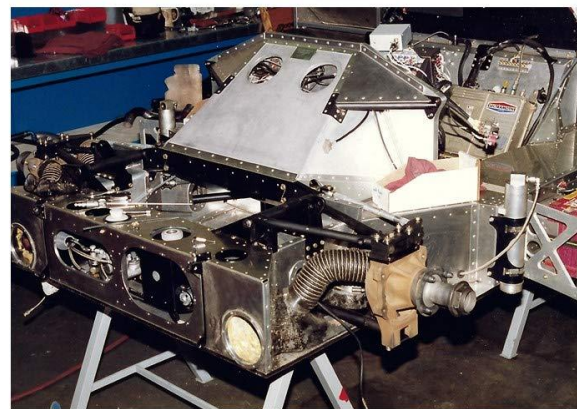
1988

The results of the 1987 season again proved the Nissan GTP ZX-Turbo had speed but, once again, the lack of reliability had kept it from winning regularly. One win, two top-five finishes, five poles, eight top-five starts, and three fastest race laps from a dozen races reflected this reality. Everyone on the team knew we had the car to challenge for wins, we just had to fix the reliability.

At the end of 1987, Brabham was asked about all the misfortunes. "After you get over the disappointment and you wake up the next morning," said Geoff, "I just stand back and look at the team and tell myself there is no way this team is going to be down for very long. There is just too much talent here." Kas added, "These are good people, and a lot of the pressure is internal pressure, pressure you put on yourself to do the best job you can."

Several improvements in performance and reliability marked the beginning of the 1988 season. The first improvement was the new Trevor Harris-designed tub and front suspension. The tub was stiffer than the Lola by a 50 percent margin, and the suspension was easier to access.

The first new tub, #8801, was delivered to the EEI shop right before Christmas of 1987. The crew immediately began disassembly of one of the Lola cars and transferred as many parts as possible to the new tub. A lot of fabrication was required, including new aluminum sheet metal intercooler and radiator mounts, seat mounting, electronics mounting, and bodywork mounting brackets, to name a few. The list of new detail parts seemed endless.



Chassis #8801 in the shop during the changeover in early 1988.
Photo courtesy of Bruce Parrish

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The Electramotive Nissan GTP Story - Examples



Race 2: Round 4, *Atlanta Journal/Constitution* Camel GP
Track: Road Atlanta
Distance: 500 kilometers
Date: April 10, 1988
Drivers: #3 Geoff Brabham and John Morton
#83 Geoff Brabham and John Morton

The team experienced a roller coaster ride of emotions at Road Atlanta. The car was fast, but in practice, a bolt from the track broke a timing belt and disabled the engine in the primary car—the new #8801 chassis. There was not enough time before qualifying to install a new engine. So the team went to the older backup chassis—Lola tub—and Brabham qualified it on the pole in record time.

During Sunday morning warm-up, however, in the new 88GTP chassis with a new engine installed and a full fuel load, Brabham went 0.2 seconds quicker than his pole time. He requested the new car for the race, knowing he would give up his pole position. IMSA allowed the last-minute change and placed the car 13th on the grid, behind all the GTP cars that had qualified. The car, chassis #8801, would run as the #3, because the #83 had been withdrawn.



After track debris disabled an engine, chassis #8801 started in the rear with a new number at Road Atlanta.
Photo courtesy of Mark Winderler

Brabham started the race and ran almost a second a lap faster than everyone. By Lap 25, he had taken the lead. During the first pit stop for a driver change on Lap 38, a fire caused from fuel leaking by the bodywork and onto the headers led to a 57-second pit stop. The team dealt with the fire and sent Morton on his way. John returned to the race not realizing the commotion from the fire caused a short fuel fill and a tire that did not get changed. Fifteen laps later, he ran low on fuel pressure and almost stopped on course. "It coughed in the esses," said Morton. He lost 15 seconds getting back to the pits.

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After the stop, John rejoined the race in fourth, 61 seconds behind the leading Jaguar of John Nielsen. Morton ran a strong stint, battling his way back to second, and taking the lead when both Jaguars pitted for their final stops. John pitted from the lead on Lap 91.

Brabham took over from Morton on the last stop and was 33 seconds behind with 33 laps to go. The team turned up the boost, which Bill Dailey recalled, "pushed the envelop on engine reliability." Brabham caught and passed the leading Jaguar at Turn 7, a slow-speed corner, with eight laps remaining to win the race, setting the fastest race lap on Lap 118 of 124. Geoff, John and the team were elated. "He slowed down going through the corner hoping I would lose my boost," said Brabham. "A pretty good tactic, I thought, but when we got out of the corner, the boost was still there." He added, "When you find yourself so far behind, all you can do is put your head down, run flat out and see who's won when you come up for air."

The team was eager to change its reputation of being fast but fragile. "We don't have a multi-car entry," argued Don, "and if we fall out there are not seven or eight other cars—like the Porsches—that go on and finish the race." Geoff added, "How many races has the Holbert team started and finished this year?" They had only finished two out of the four races.



Brabham came from 33 seconds behind with 33 laps remaining to beat the leading Jaguar.
Photo courtesy of Mark Winderler

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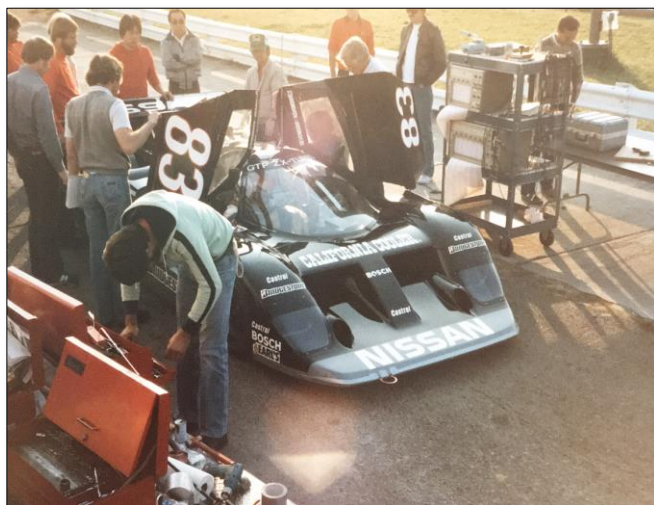


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Electramotive Data Logger(s)

Mobylogger & Micro-logger



1985 Riverside, CA Test



"There soon was a need to collect data on the engine. Don, along with the electronics team, developed data logging hardware and software that could be installed in the car to capture engine and chassis data... there were several types of data loggers available for the GTP program. One large unit for testing, and a smaller, lighter version for race weekends... the data recorder was the size of a carry-on suitcase. We lovingly referred to this data logger as the 'Mobylogger' for its size... A smaller, lighter, less powerful data logger was also used called the 'micro-logger.' This data logger was generally used during race weekends. Brent (Dussia) designed it, and Dave Martin wrote the software in Basic."

Pages 91-93

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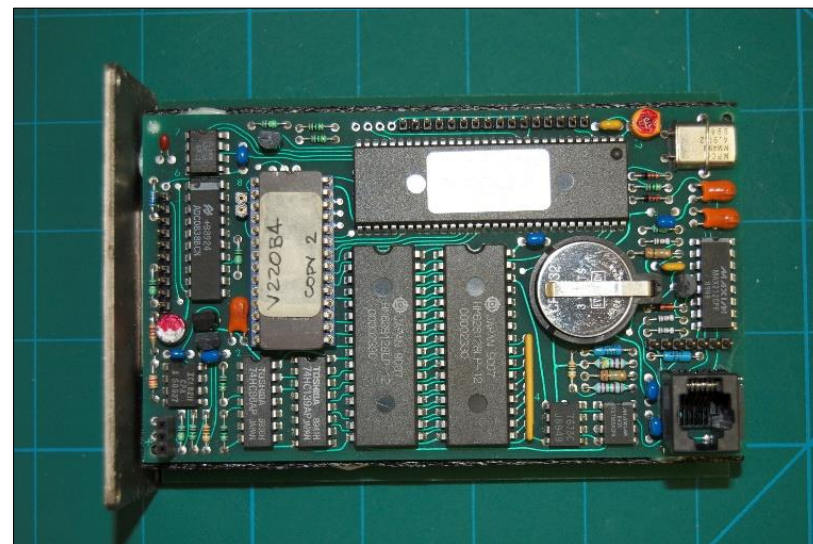
Mobylogger & Micro-logger

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Electramotive Micro-logger

Specs and Images

The Electramotive 'Micro-logger' has two Hitachi HM628128LP-12 CMOS Static Ram Chips for a Total of 256k bytes of Data Memory and a Sampling Rate of 6.25 Hz



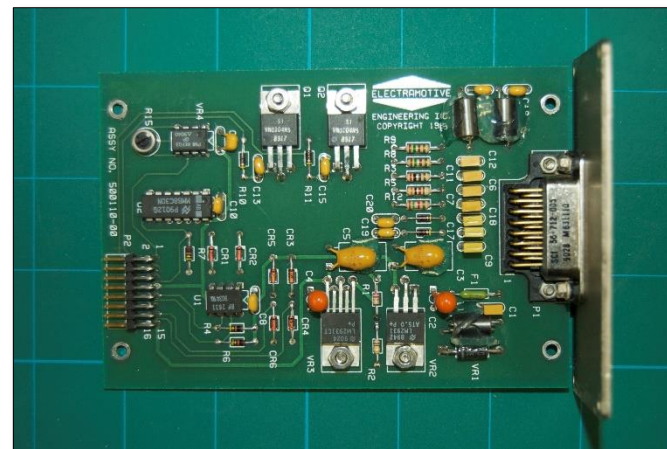
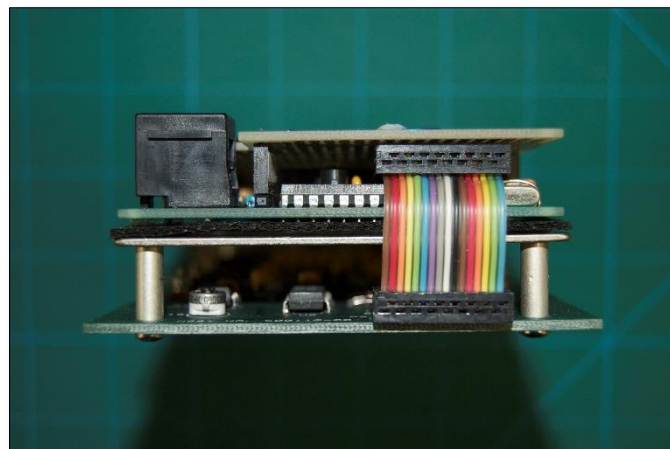
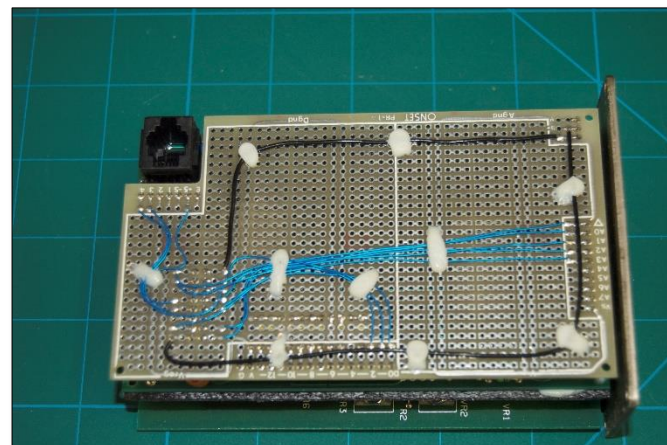
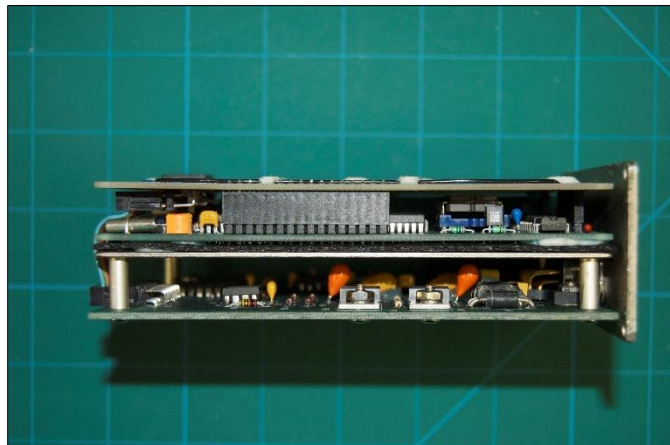
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Micro-logger Specs and Images

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Electramotive Micro-logger

Specs and Images



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Micro-logger Specs and Images

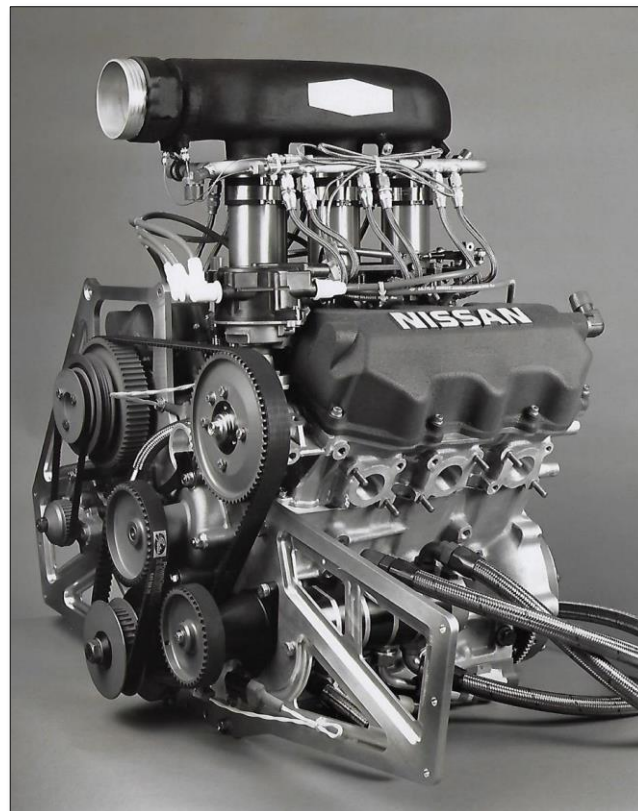
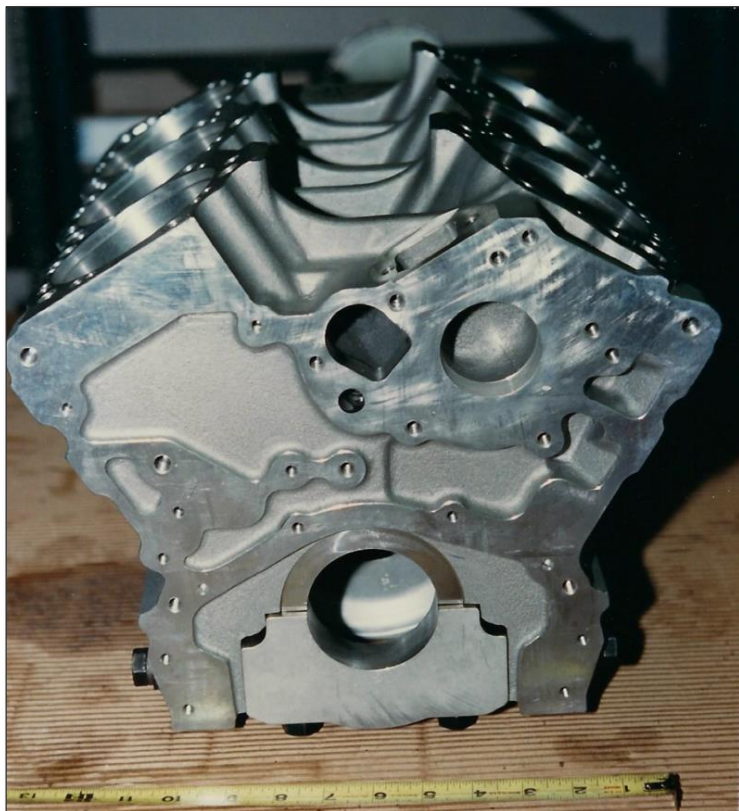
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The Nissan VG30 Aluminum Engine Block



The 1987 Electramotive Nissan VG30 V-6 Group C Engine



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The Nissan VG30 Aluminum Engine Block



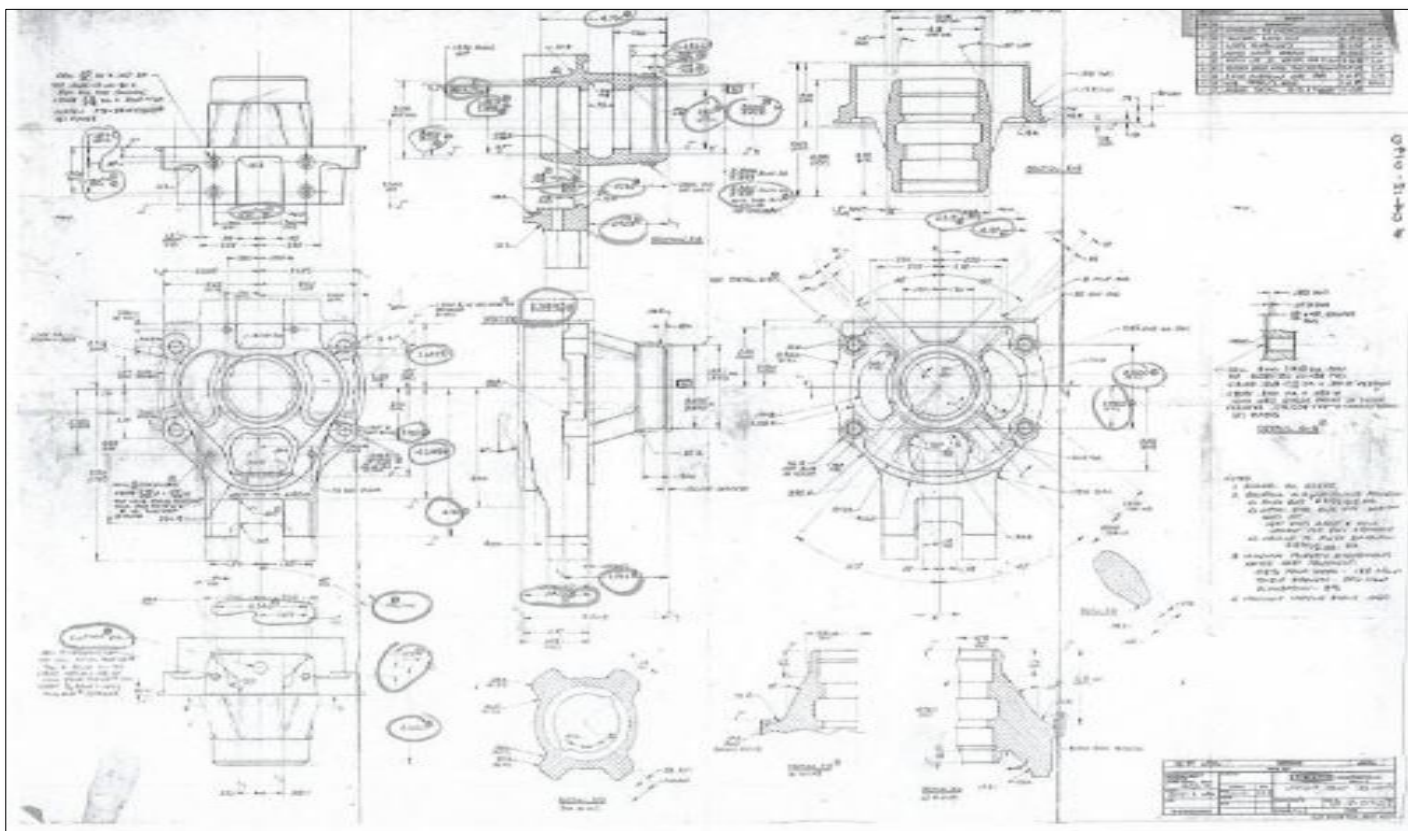
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Conversion From Hand Drawings to CAD

Hand Drawing of the 88GTP Front Upright



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Conversion From Hand Drawings to CAD

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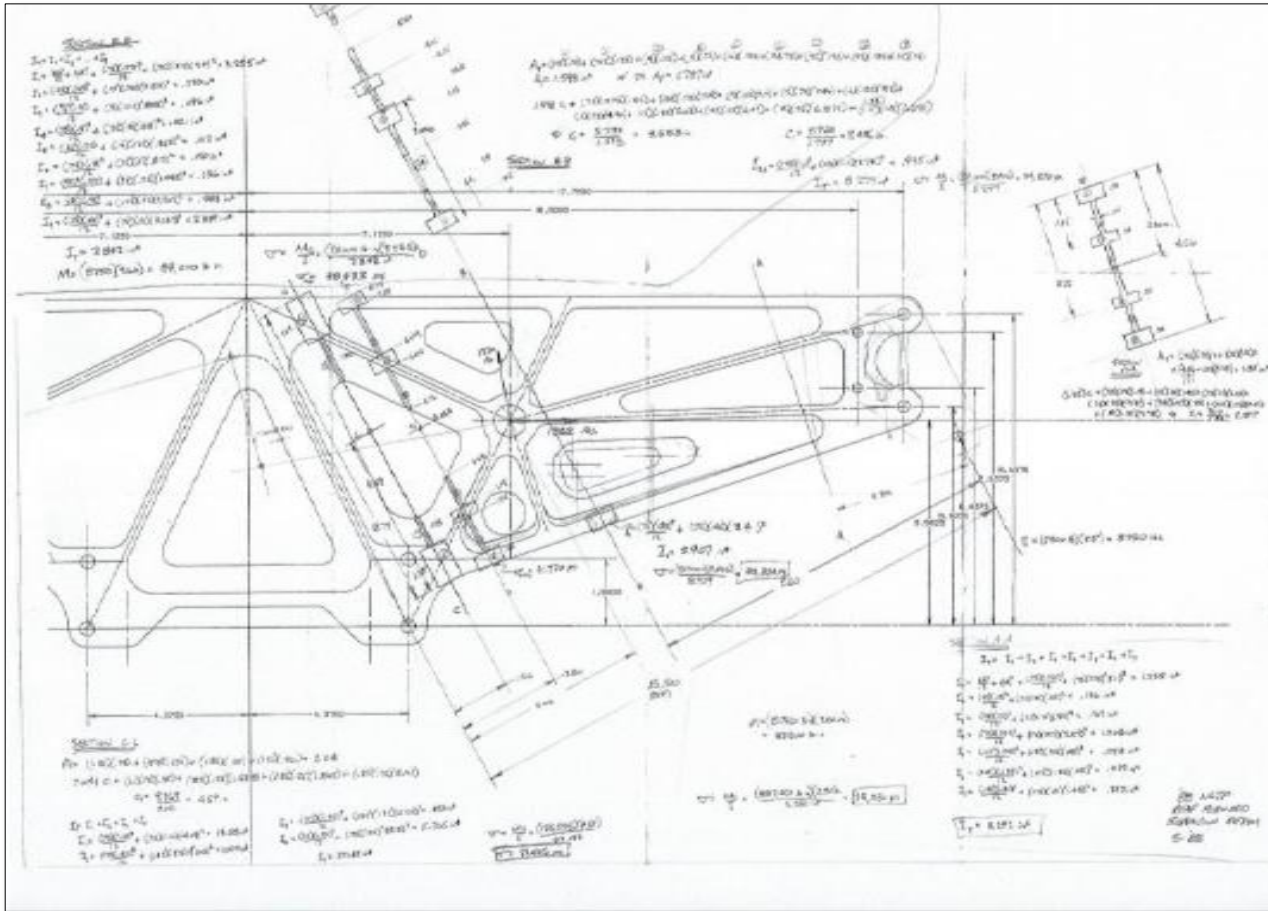


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Conversion From Hand Drawings to CAD

Anvil 1000MD CAD Drawing of the Rear Chassis Cross Beam



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The Electramotive Nissan GTP Story



Don Devendorf and John Knepp, the founders of Electramotive, Inc. & Electramotive Engineering, Inc.



1977 IMSA RS Championship-winning Electramotive Datsun B210

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The 1979 IMSA GTU
Championship-
winning Electramotive
Nissan 280ZX



The 1982 IMSA GTO Championship-winning
Electramotive Nissan 280ZX Turbo



Wes Moss,
VP, Electramotive
Engineering, Inc.

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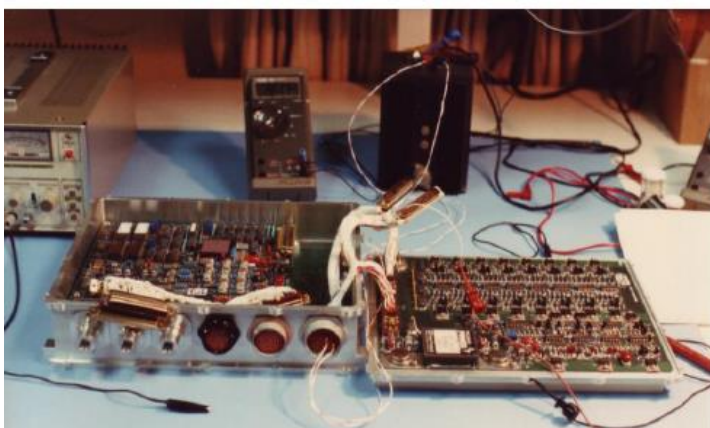
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The Electronic Engine Control Processor (EECP) and inventor Don Devendorf



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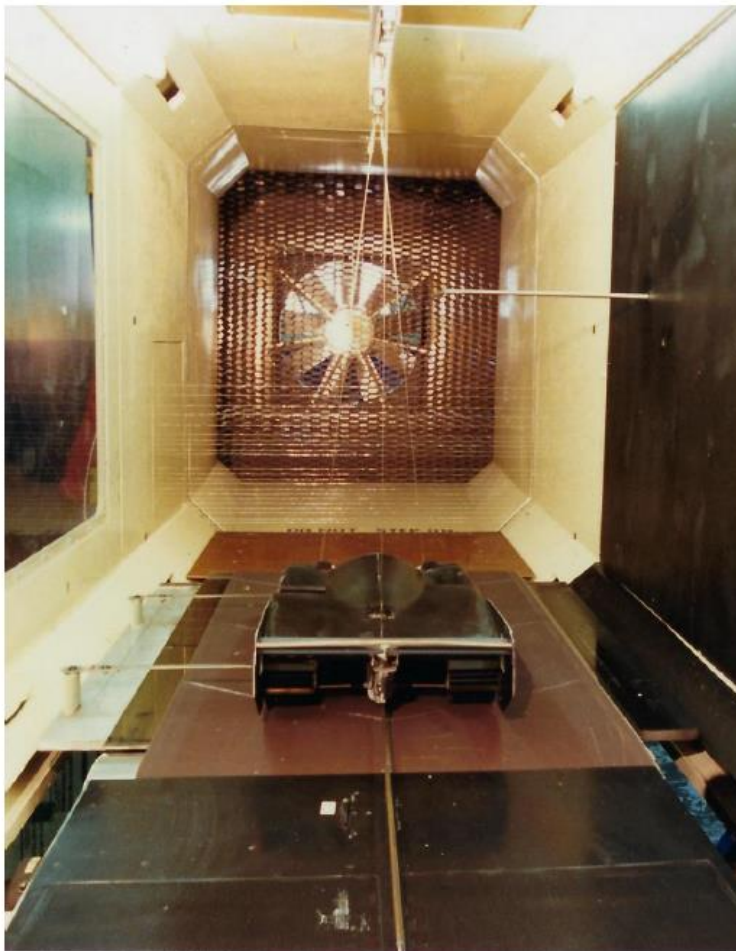
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The 1/7-Scale Electramotive Wind Tunnel



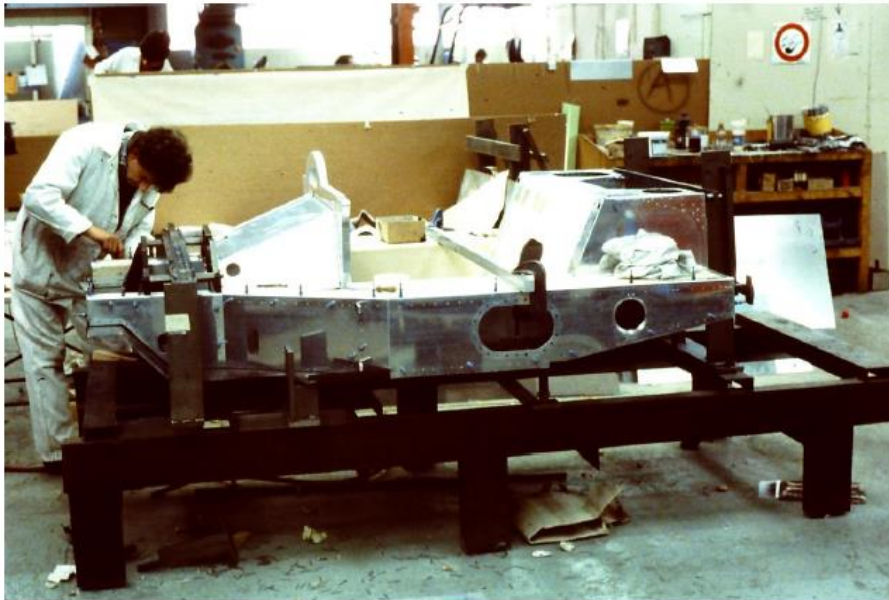
From left: Yoshi Suzuka, Trevor Harris, Don Devendorf, and Wes Moss



Underside of Electramotive model

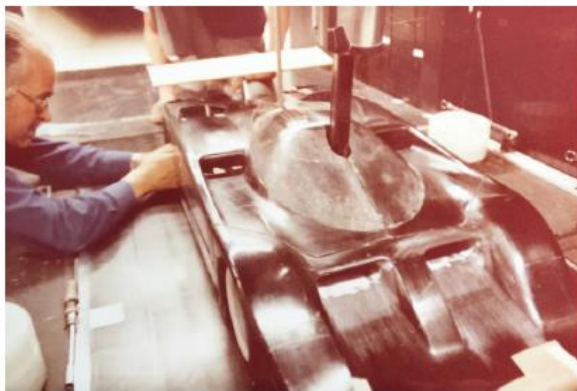
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From left clockwise:

- 1) First Nissan Lola T810 built at Lola Cars in the UK.
- 2) 1985 Nissan GTP at Pocono.
- 3) Eric Broadley works on the Lola model in the Imperial Wind Tunnel.



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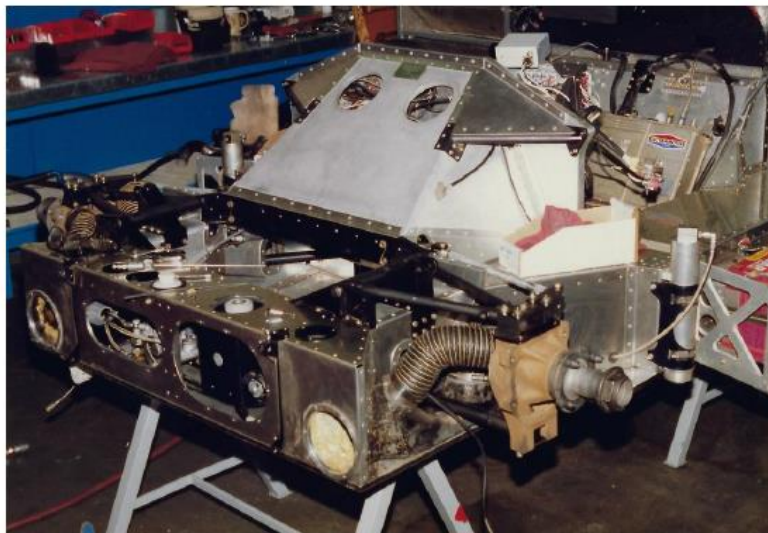
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From left in clockwise direction:

- 1) The Trevor Harris-designed 88GTP chassis.
- 2) Victory lap at West Palm Beach.
- 3) On the way to the first of eight straight wins at Road Atlanta in 1988.



Trevor Harris,
Designer



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John Morton's horrific crash at Lime Rock in 1988



Geoff Brabham, in the #83, secures his first of four IMSA Drivers Championships in the streets of Columbus, Ohio in 1988 with Derek Daly in the #84

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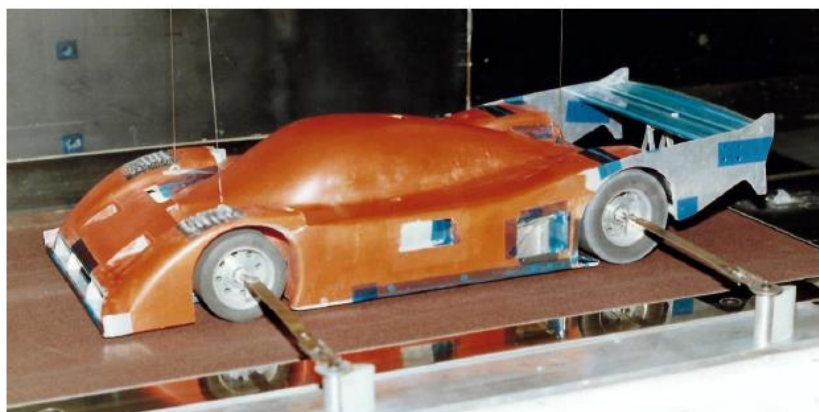
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Geoff Brabham at Sears Point on the way to the 1989 IMSA Drivers and Manufacturers Championships



Development continued with the NPT-90 wind tunnel model at Electramotive In 1989.

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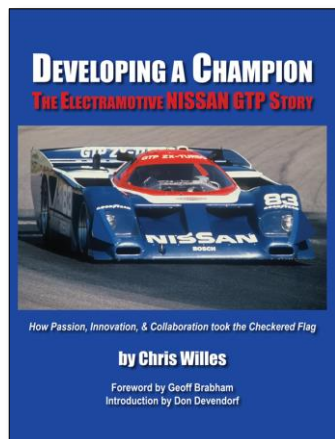
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by Chris Willes
Foreword by Geoff Brabham
Introduction by Don Demmeist

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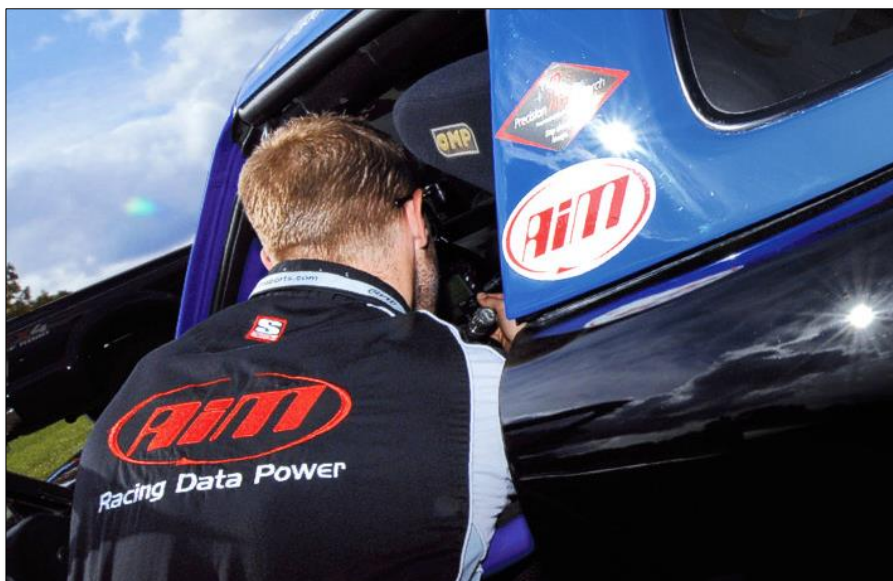
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Host:

Roger Caddell

AiM Sports - National Training Manager



Guest:

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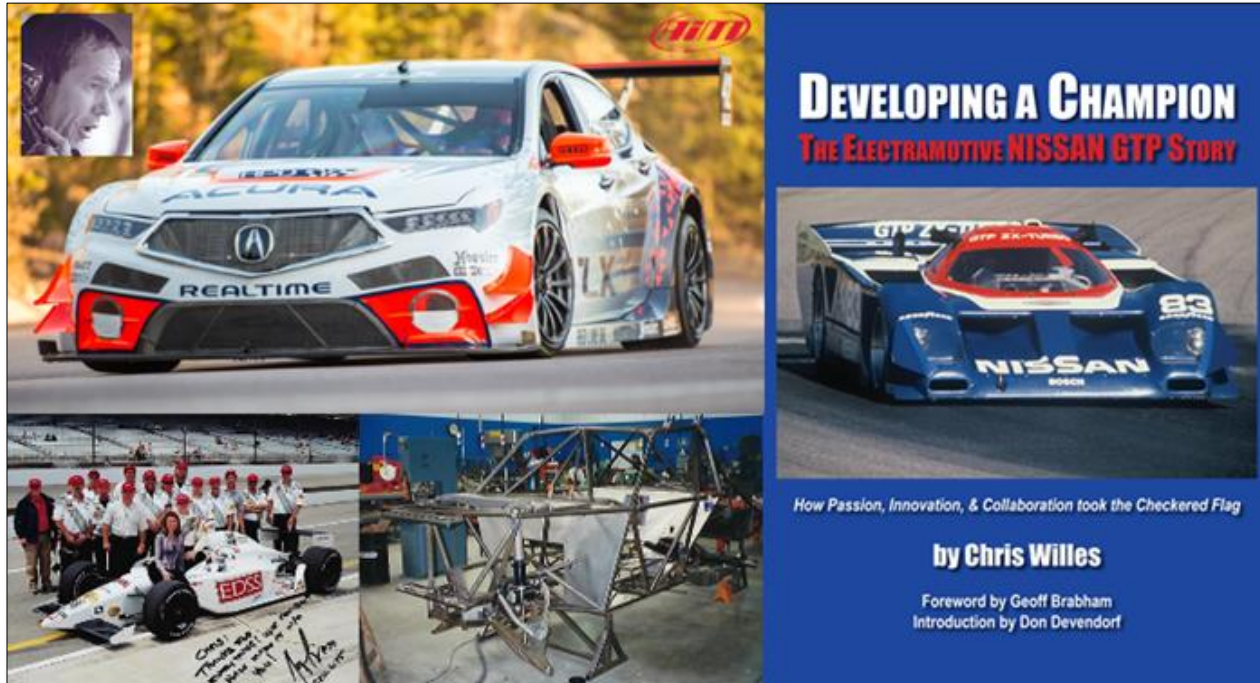
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