RC Formula1 .com

Essential 1/12th & F1 RC Racer's Guide

Dave B Stevens

Aldritch

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Table of Contents

chapter 1

Introduction 10
1/12th Scale Foreword 11
F1 Foreword 12
Author's Preface 13
Introduction 14
How To Use This Book 14
The Cars 15
1/12 15
F1 16

chapter 2

The Process of Driving Faster 17
Introduction 18
Setup Theory 18
Setup Sheets 20
Weight Transfer – the Holy Grail 21
The Racing Line 22
Braking Point 23
Turn-in Point 23
Apex 24
Wide Corners 24
Geometric Apex 25
Late Apex 26
Early Apex 27
Overtaking on a Corner 27
The F1 Apex 28
Hairpins 29
Chicanes 29
Sweepers 30
Slipstream Overtaking 30
The Position of the Next Corner 31
Increasing Corner Speed 31
Mapping the Track 33
Perfect Practice Makes Perfect 35

Table of Contents

Driver Etiquette and Traffic 36
Lapping 36
Staggered Start Passing 36
How to Pass 36
Resolving Disputes 37
After a Crash 37
Hitting Someone From Behind 38
Marshals 38

chapter 3

Car Setup Reference 39
Ackermann 41
Battery Position 43
Bodies 43
Bump Steer 44
Camber 44
Camber Gain 46
Chassis Stiffness 47
Caster 48
Reactive Caster 49
Centre of Gravity 49
Damping 50
Side Damping 50
Damping Tubes 50
Side Shock 50
Centre Shock Damping 51
Oil 51
Piston Holes 52
Rebound 52
Springs 53
Preload 54
Shims 54
Shock Length 55
Differential 55
Ball Diff 55
Gear Diff 57
Droop 58
Rear Pod Droop 58

Table of Contents

Front Droop 60
ESC Settings 60
1/12th ESC Settings 60
F1 ESC Settings 61
Gearing & Rollout 61
Gearing for Final Drive Ratio or Rollout? 62
Final Drive Ratios 62
Gear Ratio Charts 63
So What FDR Should You Start With? 63
What Rollout Should You Start With? 63
Gear Mesh 64
End Bell Timing 64
Tuning Gearing for the Lowest Lap Times 65
Motor Temperature 65
Radio Settings 66
1/12th Radio Settings 66
F1 Radio Settings 67
Ride Height 68
Overview 68
Measuring Ride Height 69
Starting Ride Height 70
Front Ride Height 70
Middle Ride Height 72
Rear Ride Height 72
Roll Bars 75
Roll Centre 76
Front Roll Centre 77
Rear Roll Centre 78
Rollout 78
Shock Absorber 78
Side Links (to rear pod) 79
Springs 80
Centre Shock Spring 81
Front Springs & Lube 81
Side Springs 82
Setting Side Spring Preload (Coin Trick) 82
Steering Arm Ball-cup Location 83
Steering Linkage Angle 84
T-Bar 85
Toe 87
Track Width 89

Table of Contents

Tyres & Additives ____ 91
Rubber Tyres ____ 91
Foam Tyres ____ 91
Additive ____ 92
Tyre Warmers ____ 93
Weight ____ 94
Centre of Gravity ____ 94
Weight Balance (Side to Side) ____ 95
Moving Weight (Front to Rear) ____ 95
Adding Weight to Increase Steering or Rear Traction ____ 96
Wheelbase ____ 96
Wings ____ 97

chapter 4

Tweak ____ **98**
What is Tweak? ____ 99
Quick Checks ____ 100
Rear Pod ____ 100
Main Chassis ____ 103

chapter 5

Case Studies ____ **105**
Carpet Case Studies ____ 106
1/12th ____ 107
F1 ____ 114
Asphalt Case Studies ____ 121
1/12th ____ 122
F1 ____ 128

chapter 6

Other Body Shells ____ **132**
GT12 ____ 133

Table of Contents

LMP1 134
Group C 135
Alonso & Webber Model 136

appendix A

Glossary 138

appendix B

eBook 141

appendix C

Checklists 142
Quick Reference 142
After Run Checks 143
Change of Direction (Chicane) 144
Easier to Drive – How To 144
Fast Sweeper Cornering 145
New Car – How to Set Up 145
Re-building a Car 146
Rear Traction – How to Increase 147
Steering 148
Too Much Steering (Oversteer) 148
General Oversteer 148
Oversteer at Corner Entry 148
Oversteer at Mid-corner 148
Oversteer at Corner Exit 149
Oversteer On-power 149
Not Enough Steering (Understeer) 149
General Understeer 149
Understeer at Corner Entry 149

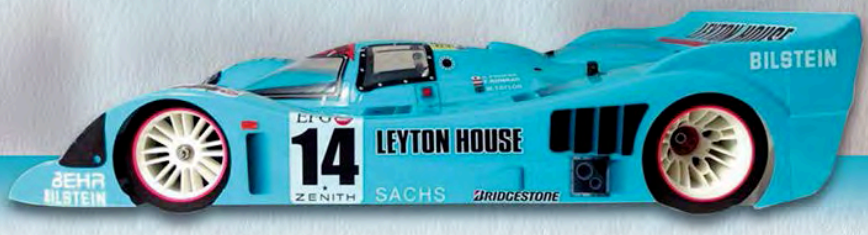
Table of Contents

Understeer at Mid-corner ____ 150
Understeer at Corner Exit or at High Speed ____ 150
Steering Response Changes for No Apparent Reason ____ 150
Traction Rolling ____ 151
Troubleshooting ____ 151
Car 'Hops' or 'Chatters' Across the Track ____ 151
Car Wanders on the Straight ____ 151
Tyres Picking Up Carpet Debris from Track ____ 151
Inconsistent Handling ____ 152
Lacking Acceleration or Started Oversteering ____ 152

Chapter

1

Introduction



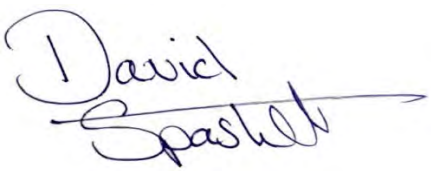
1/12th Scale Foreword

I started racing 1/12th in the mid-1980s, just as the UK racing scene began racing on carpet. My interest in motorsport developed into a passion for RC racing. Not just the driving and the race itself, but also the preparation and technology behind the products. 1/12th has always been my favourite class. I love the pure nature of it, striving to extract 100% from the entire package in order to be at the front.

When I first saw this book, I thought what a great idea and how useful it will be to the new drivers coming into the sport. I was impressed by the straightforward, easy to understand explanations, and the comprehensive coverage. I don't think I have ever seen an RC book with this much detail.

The future of our sport is bright, and the introduction of the IFMAR 13.5 Stock class is a great idea. However, I would like to see regulation to prevent winners from re-entering Stock at subsequent world championships, to encourage them to bring their talents to Modified.

Whether you are a Stock beginner or an experienced Modified driver, I'm sure you'll find that the information in this book can help take your racing to the next level!



David Spashett

- ✓ *3 x 1/12th IFMAR World Champion*
- ✓ *IFMAR Pro 10 World Champion*
- ✓ *IFMAR World Cup Touring Car Champion*
- ✓ *14 x European Champion (1/12th, Pro 10, Touring Car and 200mm Nitro)*

Author's note:

David Spashett is one of the most accomplished drivers in the world. He holds the record for the most IFMAR World Championships/World Cups won in a single season (3). David owns Zen Racing UK, an importer and distributor of racing kits and parts. He was not paid to support this book.

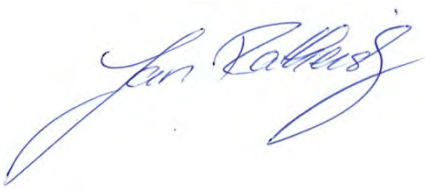
F1 Foreword

I've raced RC cars since the age of 6, but only at a high level for the last five years or so. When I started in F1, in the early 2000s, it was a fun second class. It is now a main professional class, and IFMAR recognised this in making it a world championship class. Many manufacturers are investing in F1, so drivers now have a great deal of choice of which kit to run.

My suggestion, as shown in this book, is to not start with a pro driver's setup. Instead, start with the manufacturer's basic setup and change it step by step. Never make more than one change at a time. Write down how the car feels in a notebook, or on your phone, and tune from there. This book provides a lot of setup information, and I hope it will help you to increase your knowledge and find good setups for yourself.

As long as you have time to practice, do it as much you can. Change, drive, repeat. Learn to feel how the car reacts before making small adjustments until the car drives the way you would like.

I drive all over the world. In the last year, this has included: Korea, Japan, USA, Australia, Philippines, China, South Africa and all over Europe. I'm pleased to report that F1 is alive and well and going from strength to strength.



Jan Ratheisky

- ✓ *2018 IFMAR World F1 Champion*
- ✓ *3 x European F1 Champion*
- ✓ *6 x European Touring Series F1 Champion (26 rounds won)*
- ✓ *3 x International Indoor Championships F1 Champion*

Author's note:

Jan Ratheisky is one of the most accomplished F1 drivers in the world. He also works full time, is the proud father of Emely and Marlon, and still manages to not only attend most of the large race events around the world but to win them! He was not paid to support this book and asked me to highlight to readers that "RC isn't my job" and that his support of this book is provided "just for fun."

Author's Preface

In 2007, my 11-year-old son, Aaron, bought an RC car on eBay. As soon as I saw it, I was hooked, and Aaron and I spent most weekends at the track from then on.

At the start of 2012, I bought a Tamiya F104 X1 and was surprised at how difficult it was to find information on how to set up and drive F1 cars. My website www.RCformula1.com went live in June 2012 to bring F1 enthusiasts information to maximise their enjoyment of this fantastic class. In the early years, it was the only dedicated RC F1 website, and it is still the most read, with nearly 6 million page views as of early 2019.

There is a lot of information on the web about setting up pan cars. However, it is often hard to find, incomplete, brand-specific, out of date or on a forum where the discussion lacks the necessary context to make it truly useful.

I wrote this book to create a comprehensive manual that racers can follow to improve their lap times, regardless of their skill level or the car they drive. I spent 30 years as a business consultant, and part of my skillset is to extract technical experience from experts in the field, pull in relevant information from multiple sources, and present it in an easy to apply "how-to" format.

About the Author

In 2013 Dave set a Guinness World Record for: The longest distance covered by a battery-operated remote-controlled car, using an F1 car (a Tamiya F104 v2).

One of the inhibitors to growing the F1 class in Australia was the lack of a national set of rules. Dave worked with racers and clubs throughout the country to rectify this and these national rules are still administered by RC Formula1 today.

Dave has been published in a number of magazines including his regular column in Racing Lines magazine. He is a former president of the Templestowe Flat Track Racers RC club and a former board member of the Victorian On Road Tracks Executive Committee. He lives in Melbourne, Australia with his wife and sons.

Connect with Dave via: Facebook facebook.com/DaveBStevens.Author
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Introduction

The 1/12th Modified class has long been an IFMAR Worlds class. It has been joined in the last few years by the 1/12th Stock class (13.5 motor with Non-Timing ESC), and in 2018 Formula 1 became an IFMAR Worlds class (21.5 handout motor with Non-Timing handout ESC). In this book, these are all referred to as pan car classes.

Racers moving from 4WD cars to pan cars sometimes find them difficult to set up and drive. This often occurs due to a lack of understanding of pan car set up and driving techniques, and in this book, we try to provide a complete reference to these fantastic cars.

It is very achievable to have a car which has sufficient rear-end grip and still has enough steering to turn tight corners, and this guide will provide you with the information to set up the car to be both easy and fun to drive fast.

This book is also available in eBook format, for ease of access at the track (refer to page *141*).

How To Use This Book

The Process of Driving Faster starting on page *17* covers setup theory, a driving tutorial, and how to apply this theory to any track.

Car Setup Reference starting on page *39* covers the A–Z of setup settings from Ackermann to Wings and everything in between.

Tweak starting on page *98* covers how to ensure all your tyres touch the ground with equal pressure and what happens if they don't. It also describes how to fix a car that is "tweaked".

Case Studies starting on page *105* describes actual race meetings, and how skilled drivers approached their setup, what changes they made, why, and the results.

Appendix A – Glossary on page *138* defines core technical terms referred to in this book.

Appendix C – Checklists on page *142* covers all of the common problems and situations you might encounter. Car is spinning out? Wanders on the straight? Doesn't have enough steering? We've got you covered.

The Cars

1/12

- 1S Lipo battery
- Mini servo (often low profile, lightweight)
- Brushless motor: Typically 13.5 (stock) or open motor (Modified)

David Spashett's Roche P12 Evo

F1

- 2S Lipo battery
- Standard servo (often low profile)
- Brushless motor: Typically 21.5 or 25.5

Jan Ratheisky's Xray X1 2019

Chapter

2

The Process of Driving Faster

Introduction

Being able to drive faster, on a given track, is a process which involves the following steps:

1. Determine a base setup for the track.
2. Map the Racing Line for the track.
3. Practice the Racing Line for the track.
4. Tune your car's setup so that you can drive it as quickly as you are able, as close to the Racing Line as possible.
5. Practice the Racing Line for the track until qualifying starts.

Setup Theory

A car's handling is determined by the contact patch of the tyre on the racing surface. In a full-size car, the area of each tyre which touches the road is about the size of a size 10 shoe. In an RC car, this might be the size of your fingernail or smaller.

How the tyres interact with the track determines how the car corners, accelerates and brakes. So tyre choice is the most important factor in car handling. However at most large race meetings, a control tyre is used, meaning everyone has the same brand and compound of tyre. So the advantage goes to those who set up their car so that those tyres provide the right amount of grip at the right time.

Ignoring other factors for the moment, the easier the car is to drive, the faster you will be able to drive it. Changing the car's setup will make the car easier to drive near its performance limit. This should allow you to drive it faster.

In this book, we explain what each setting is, why it changes the behaviour of the car, how to make each change and the result you should expect.

Make small changes, one at a time and measure the result based on what you were trying to achieve (refer to Mapping the Track on page *33*). Note whether the car felt better or worse and any impact on lap times. We say small changes because adding a 0.5mm shim or changing a setting by 0.5 degree may make a noticeable difference, and if you jump to a 2mm shim or 1.5 degree change, then you may miss the sweet spot.

We recommend that you keep track of your setup changes and record which setups work best at different tracks under various conditions.

A car that "feels" faster is not necessarily turning faster lap times. Use a stopwatch or timing system to check if it really is quicker, and not just easier to drive.

For the car to respond correctly to setup changes, it must be in good working order. In other words: the car is not tweaked (page *98*), the suspension is free, dampers (page *50*) and differential (page *55*) is correctly built, no broken binding or loose parts, and the car has proper weight balance left to right (page *94*).

Many setup adjustments interact with other settings. For example, changing the middle ride height will also change the rear droop. These interactions are explained under the relevant headings.

Fine-tuning the setup will make the car easier to drive near its performance limit. This should allow you to drive it faster.

Start with a base setup, make changes so that the car drives the lines you want (see The Racing Line on page *22*), then stiffen the car up as much as practical while making sure it is still as easy for you to drive as possible. As you gain experience, you will be able to short cut this process.

Use our After Race Checklist on page *143* to identify problems before the next run.