2021

Formula Simulator

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Content

Version Control

Version	Description	Date
0.1	First draft with the basic functionality of the application	23-12-20
0.2	Overhaul of the document, updated the quality of the text and also added in new additions	07-04-21

WORD OF WARNING: THIS GUIDE IS VERY INCOMPLETE

1. Introduction

This paper will serve as a guide for viewers for how the Formula Simulation, also known as HaanTECH™, application works and what all the numbers and icons mean. This guide explains the basic functionality of a simulation scenario and explains how one can create their own.

Starting with information about the different sort of participants and set values they might have, after that I will explain how a race works and last of all I will go into some of the other parts of the experience.

For further questions or advice, feel free to contact me over Discord by the username Haan#0420.

2. How it works – the participants

In this first chapter we are going to talk about all the persistent subjects which also exist outside a season. The values which these subjects have will be talked about but also what happens when they are added to a racing season. Not everything stays the same between the seasons, for example the racing skill of a driver, so those elements are bound to both a driver entry and a certain season.

There are a few categories of things that persist in between seasons and championships, these are:

1. Drivers
2. Teams
3. Engines
4. Tracks
5. Traits
6. Tyres
7. Strategies
8. Tyre Manufacturers

All of them except traits are required to have before a season can successfully be created. Each of these categories will be explained in the following chapters.

2.1. Drivers

First thing we are going to talk about are the drivers.

Here is where we begin to see how good a driver is. First of all we have a stat called skill, this defines how fast they are by themselves, this affects both their speed during qualifications and races.

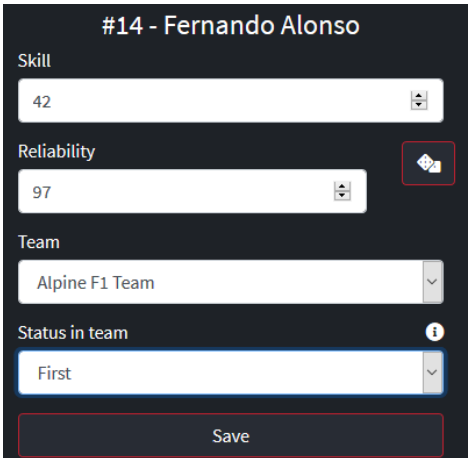


Figure 2: in-season info of driver

Reliability has to do with the odds of crashing out due to something in their control, for example colliding with another driver or crashing out by accident. A reliability check during race rolls a number between 1 to 100, if value rolled is more than the reliability of a driver then they will crash out. In the case of the image left where reliability is 92, this means that for every reliability roll there is an 8% chance the driver crashes out due to a mistake by himself.

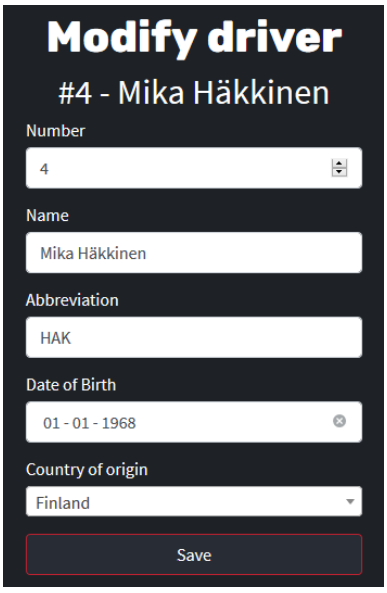


Figure 1: persistent info of driver

Last of all there is the status of a driver in the team, usually there is none but a team can opt to give their drivers a first and second status. The first

drivers gets a net bonus of +2 to their chassis and second drivers a net loss of -2 to their chassis, on top of that whenever a second driver ends a stint one position above a first driver then they will swap positions.

2.2. Teams

The information about a team outside a season is just what their abbreviation and where their home base is. Most of their info comes when a team joins a season though.

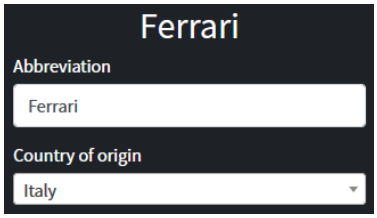


Figure 4: Info of team outside season

Team names can often change between seasons, while their abbreviation stays the same their full name can undergo a change each season. A team may choose to have different sponsorships each season which is reflected in their full name. The principal manages the team, it has no significant impact in the application but it just represents who is currently managing the team for that season. Colour and accent is also just for visual reasons, these are the main colours for a team in that respective season.

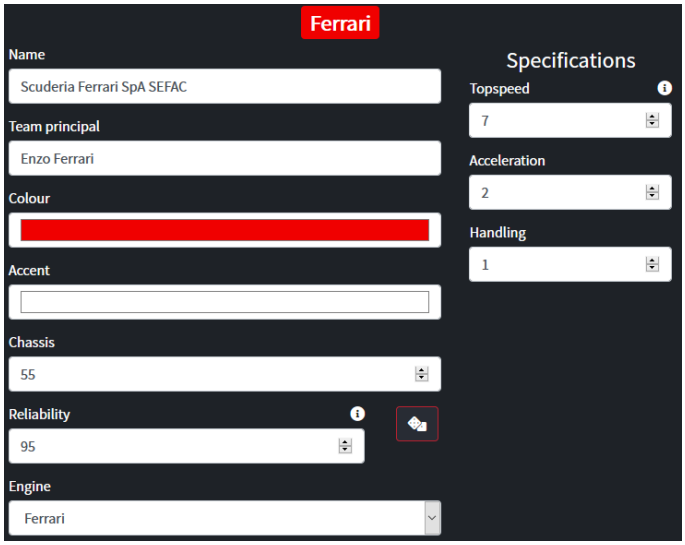


Figure 3: In-season info of a team

Chassis is like the driver skill except in here it represents how good the chassis is of a driver and is applied in qualifying and whenever the chassis is relevant in a stint. Reliability has to do with how reliable the car itself is. It works the same way as the driver reliability and is relevant whenever reliability is checked, it is however a separate roll so a very reliable car may still often experience a non-finish if their driver is unreliable and vice versa. Whenever the chassis reliability check is triggered then a driver will experience a non-finish due to the failure of their engine, hydraulics or etc.

Each team has three specifications, Topspeed/Acceleration/Handling, with in each a certain value. Every track has either topspeed, acceleration or handling as their specification. In a race the value of the specification from a team gets added up to their chassis total.

Last of all each team has to pick an engine that they use during a season. Every engine also has their own amount of power, for a team to be good it is important they also have a good engine under their hood.

2.3. Engines

Engines only have two values, their name and how much power they have. Engines have to exist but they don't need to be added to a season, any team can choose any engine that currently exists and is active. Not much else is there to be said about it.

Figure 5: Engine values

2.4. Tracks

This is where the races take place. Most info about a track that can be written outside a season once again have no effect on what happens in a race, except for Specification. As said before in teams the value of a specification that matches with the specification of a track gets added up to their chassis total.

Figure 6: Persistent info of a track

2.5. Traits

Traits are modifiers that can affect all kinds of values. There are three groups of traits: one for drivers, one for teams and one for tracks. These traits can swing all kinds of ways, only having positive effects, only negative or a bit of both. These possible effects are:

- QualyPace: Value that gets added/subtracted only during qualifications.
- DriverRacePace: Value that affects when driver skill is relevant in a stint.
- ChassisRacePace: Value that affects when chassis of a team is relevant in a stint.
- EngineRacePace: Value that affects when the power of an engine is relevant in a stint.
- ChassisReliability: Affects the reliability value of a team.
- DriverReliability: Affects the reliability value of a driver.
- MaximumRNG: Affects the maximum possible RNG in each stint, can be both negative and positive.
- MinimumRNG: Affects the minimum possible RNG in each stint, can be both negative and positive.

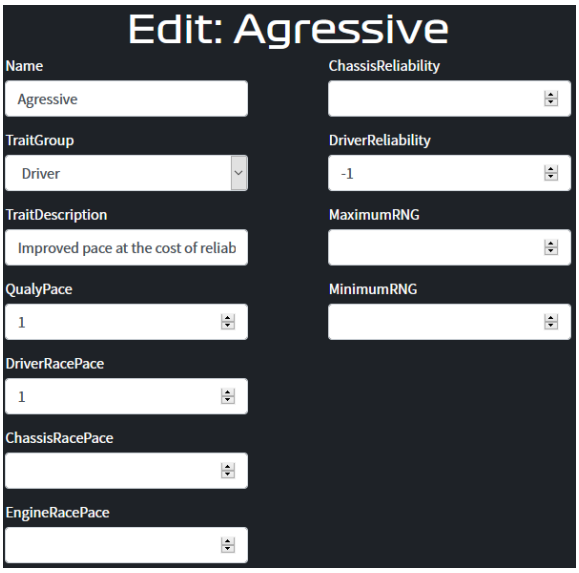
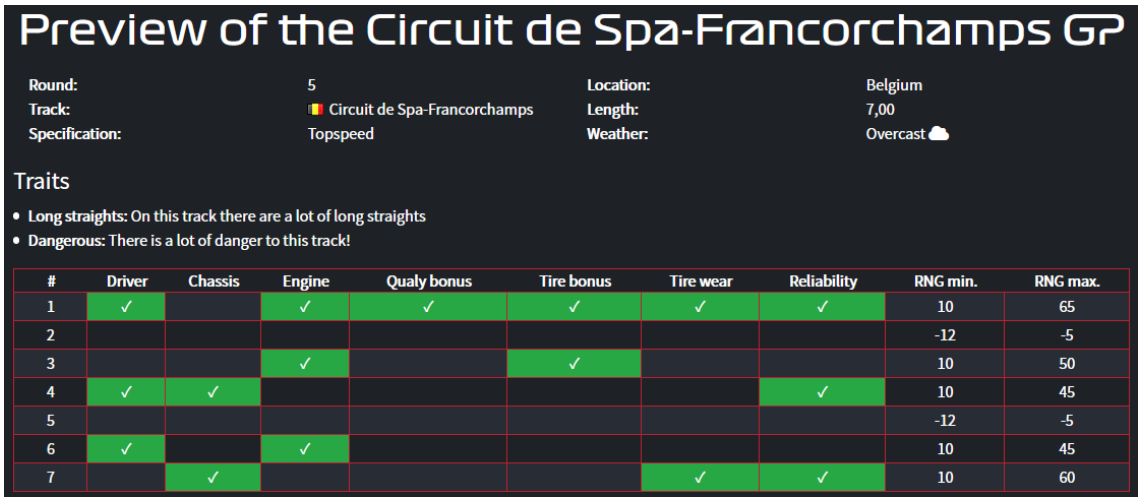


Figure 7: example of a trait

Drivers, teams and tracks all can have multiple traits.

3. How it works – Race Weekend

The main events of this application are of course the race weekends. Let's dive right into it.



Preview of the Circuit de Spa-Francorchamps GP

Round:	5	Location:	Belgium
Track:	Circuit de Spa-Francorchamps	Length:	7,00
Specification:	Topspeed	Weather:	Overcast

Traits

- **Long straights:** On this track there are a lot of long straights
- **Dangerous:** There is a lot of danger to this track!

#	Driver	Chassis	Engine	Qualy bonus	Tire bonus	Tire wear	Reliability	RNG min.	RNG max.
1	✓		✓	✓	✓	✓	✓	10	65
2								-12	-5
3			✓		✓			10	50
4	✓	✓					✓	10	45
5								-12	-5
6	✓		✓					10	45
7		✓				✓	✓	10	60

Figure 8: Preview before a race

The preview before every race tells you how the race is going to look like and what is actually happening in each stint. First of all you see the information about the track at the top, afterwards the traits that are in effect for the respective circuit.

The table represents what happens each stint. Every row represents one stint, which can be seen in the leftmost column. Each row has their selection of green checks which tells us which values are applied in a stint and tops it off with the minimum and maximum possible random value that gets added on top of the set values. The set values each column represents are:

- Driver: The skill of a driver.
- Chassis: The performance of the chassis for each driver.
- Engine: The power of the engines each team uses.
- Qualy bonus: The bonus a driver gets for their position in qualifying, this always happens in the first stint and usually only once.
- Tire bonus: A set bonus of 10 to all drivers with softs.
- Tire wear: RNG between -20 and 0 for all drivers with softs.
- Reliability: Performs a reliability roll for both drivers and teams to see if they DNF.
- RNG min/RNG max: Between which two values the random number is rolled.

As you see there are rows with no green cells and a negative RNG min/RNG max, these represent pitstops. On a fundamental level this is a completely random subtraction of every drivers score.

To see how it all looks like in a race, see the next page!

Circuit de Spa-Francorchamps

Pos.	Nr.	Name	Team	PWR	Grid	1	2	3	4	5	6	7	Score	Gap	Pts.
1	5	Alain Prost	Equipe Renault Elf	139	0	235	-11	86	127	-5	130	107	669	*Leader*	9
2	75	Didier Pironi	Scuderia Ferrari SpA SEFAC	154	5	206	-11	109	146	-12	117	100	655	*+3.78*	6
3	16	Derek Daly	TAG Williams Team	137	6	183	-7	87	127	-11	122	123	624	*+12.15*	4
4	9	Elio de Angelis	John Player Team Lotus	131	7	197	-5	94	113	-8	132	87	610	*+15.93*	3
5	45	Chico Serra	Fittipaldi Automotive	113	7	180	-12	91	111	-10	121	97	578	*+24.57*	2
6	55	Andrea de Cesaris	Marlboro Team Alfa Romeo	124	15	152	-10	90	131	-5	120	99	577	*+24.84*	1
7	6	Keke Rosberg	TAG Williams Team	140	3	202	-9	69	120	-7	113	85	573	*+25.92*	
8	89	Eddie Cheever	Equipe Talbot Gitanes	132	10	155	-9	80	113	-9	121	69	520	*+40.23*	
9	22	Michele Alboreto	Team Tyrrell	124	5	165	-5	105	99	-12	99	54	505	*+44.28*	
10	72	Raul Boesel	Rothmans March Grand Prix Team	101	17	105	-7	105	105	-12	106	82	484	*+49.95*	
11	43	Mauro Baldi	Arrows Racing Team	124	6	135	-11	80	105	-5	108	69	481	*+50.76*	
12	56	Marc Surer	Arrows Racing Team	125	11	137	-7	53	127	-11	109	62	470	*+53.73*	
13	43	Ricardo Paletti	Osella Squadra Corse	113	13	100	-11	83	109	-9	114	80	466	*+54.81*	
14	20	Bruno Giacomelli	Marlboro Team Alfa Romeo	120	6	136	-12	77	105	-9	90	60	447	*+59.94*	
15	77	Derek Warwick	Candy Toleman Motorsport	94	7	129	-11	84	101	-7	100	41	437	*+62.64*	
16	72	Manfred Winkelhock	Team ATS	114	12	105	-8	56	91	-9	117	71	423	*+66.42*	
17	20	Eliseo Salazar	Team ATS	113	2	194	-9	71	97	-5	86	-	DNF	*Collision*	
18	52	Jean-Pierre Jarier	Osella Squadra Corse	114	12	121	-6	79	106	-7	88	-	DNF	*Electrics*	
19	36	Jan Lammers	Theodore Racing Team	100	12	106	-6	64	73	-10	109	-	DNF	*Clutch*	
20	61	Niki Lauda	Marlboro McLaren International	139	12	181	-6	58	-	-	-	-	DNF	*Electrics*	
21	41	Jochen Mass	Rothmans March Grand Prix Team	107	8	154	-10	86	-	-	-	-	DNF	*Engine*	
22	15	Jacques Laffite	Equipe Talbot Gitanes	133	9	162	-10	67	-	-	-	-	DNF	*Electrics*	
23	15	Nigel Mansell	John Player Team Lotus	120	1	133	-6	82	-	-	-	-	DNF	*Accident*	
24	9	Riccardo Patrese	Parmalat Racing Team	141	22	-	-	-	-	-	-	-	DNF	*Accident*	
25	11	René Arnoux	Equipe Renault Elf	134	22	-	-	-	-	-	-	-	DNF	*Engine*	
26	2	Gilles Villeneuve	Scuderia Ferrari SpA SEFAC	155	21	-	-	-	-	-	-	-	DNF	*Damage*	
27	3	Nelson Piquet	Parmalat Racing Team	137	21	-	-	-	-	-	-	-	DNF	*Accident*	
28	86	John Watson	Marlboro McLaren International	140	18	-	-	-	-	-	-	-	DNF	*Damage*	
29	28	Roberto Guerrero	Ensign Racing	107	13	-	-	-	-	-	-	-	DNF	*Collision*	

Figure 9: Race

As you can see, the total of all these values as shown in the table above can result in unpredictable races. The score of each driver represents how fast they are. DNFs happen randomly during the reliability checks and the cause of it is randomly determined by then. The column PWR is the total of chassis + driver skill + engine power + possible trait modifiers are driver has. Grid shows how much they have either sunk or risen compared to their starting position. Pts are what is awarded when they finish in that position at the end of the race.

After awarding the points the standings are automatically updated with each finishing result a driver had over a season and the total amount of points they gained with it.

World Drivers' Championship - 1982

#	Nr.	Driver	Team	SOU	BRA	USA	ITA	BEL	MON	USA	CAN	NET	ENG	FRA	GER	AUS	FRA	ITA	USA	Pts.	Avg.
1	6	Keke Rosberg	TAG Williams Team	DSQ	DNF	4	-	7	2	7	1P	DNF	4	7	5	DNF	1P	DNF	2P	39	4
2	5	Alain Prost	Equipe Renault Elf	DNF	DNF	2	DNF	1P	DNF	DNF	2	DNF	10	1	DNF	DNF	DNF	1	DSQ	38	2,83
3	75	Didier Pironi	Scuderia Ferrari SpA SEFAC	5	1	DNF	2	2	DNF	DNF	DNF	4	12	4	3	-	-	-	-	33	4,12
4	11	René Arnoux	Equipe Renault Elf	3P	DNF	5P	3	DNF	DNF	1	5	1P	6	9	DNF	DNFP	DNF	DNF	DNF	31	4,12
5	9	Elio de Angelis	John Player Team Lotus	DNF	DNF	7	-	4	1	4	DNF	DSQ	DNF	14	11	6	11	3	1	29	6,2
6	3	Nelson Piquet	Parmalat Racing Team	DNF	DNF	DNF	-	DNF	5	8P	7	3	1	6	2	7	6	7	3	27	5
7	86	John Watson	Marlboro McLaren International	DNF	DNF	DNF	-	DNF	DNF	2	3	5	5	12	1	DNF	7	4	9	26	5,33
8	9	Riccardo Patrese	Parmalat Racing Team	4	DNFP	DNF	-	DNF	DNFP	3	4	7	9	3	DNFP	5	2	DNF	DNF	22	4,62
9	16	Derek Daly	TAG Williams Team	DNF	11	DNF	-	3	6	6	8	DNF	7	11	DNF	1	4	DNF	5	20	6,2
10	66	Patrick Tambay	Scuderia Ferrari SpA SEFAC	-	-	-	-	-	-	-	-	-	2	8	4	DSQ	3	2P	6	20	4,17
11	61	Niki Lauda	Marlboro McLaren International	6	5	6	-	DNF	3	5	6	DNF	3P	5P	DNF	DNF	5	DNF	DNF	19	4,89
12	15	Jacques Laffite	Equipe Talbot Gitanes	DNF	DNF	DNF	-	DNF	7	10	DNF	2	18	2	DNF	3	10	DNF	4	19	7
13	2	Gilles Villeneuve	Scuderia Ferrari SpA SEFAC	DNF	DNF	1	1P	DNF	-	-	-	-	-	-	-	-	-	-	-	18	1
14	26	Carlos Reutemann	TAG Williams Team	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	1,5
15	15	Nigel Mansell	John Player Team Lotus	7	3	DNF	-	DNF	DNF	DNF	14	12	11	15	8	2	13	6	10	11	9,18
16	55	Andrea de Cesaris	Marlboro Team Alfa Romeo	2	DNF	DNF	4	6	DSQ	DNF	DNF	8	8	DNF	9	DNF	12	10	DNF	10	7,38
17	89	Eddie Cheever	Equipe Talbot Gitanes	DNF	DNF	3	-	8	4	9	12	DNF	14	10	7	4	DNF	8	7	10	7,82
18	68	Slim Borgudd	Team Tyrrell	DNF	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	3	7
19	22	Michele Alboreto	Team Tyrrell	DNF	DNF	11	5	9	9	11	10	9	21	DNF	12	DNF	9	12	11	2	10,75
20	45	Chico Serra	Fittipaldi Automotive	13	DNF	17	-	5	12	20	11	DNF	DNF	22	14	DSQ	17	9	14	2	14

4. Examples

Without any prior knowledge it is hard to setup a balanced simulation season, for that reason this chapter exists to show examples of multiple aspects of HaanTECH to give the user an idea on how to setup their own seasons.

4.1. Drivers, teams and engines

Haha.

4.2. Tracks and their stint setups

Haha.

4.3. Tyres and strategies

Haha.

4.4. Traits

Haha.