

Morgan Plus 4 Aero Project

Project Title: Morgan Plus 4 Aero Project

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1. Introduction

The Morgan Plus 4 Aero project consists of two parts, part 1 is to design an aerodynamics package for the existing Morgan Plus 4 body keeping the design and spirit of the existing car making it look like a Morgan. Part 2 is to do a full redesign of the car keeping only the chassis to make a completely different body in the style of a GT-Coupe.

The objectives of the two sides of the project are similar but also different. The Aero team's primary objectives are to reduce the drag of the existing car whilst also increasing the downforce, along side this however there has been a big consideration to prioritise the cooling package of the car as reports have said that the engine has significant overheating issues which would be severely problematic if the car was to compete in a racing scenario having to be pushed to the limit for a period of time. The full redesign's team has a lot more freedom in terms of what cooling availability there is in terms of radiator grill area as well as heat outlets from the engine bay, however their priority remains the same to create a design to reduce drag, reduce lift whilst increasing downforce.

It is no surprise to even an untrained eye that the Morgan Plus 4, although being a classic almost timeless design, is not the most aerodynamic of designs with the car suffering with significant drag and lift inspiring a new aerodynamic package to combat these issues. We would consider our project a success should we be able to design an aerodynamic package which mitigates the Morgan's shortcomings in downforce, cooling and drag as for the conceptual team they would consider their project a success if they successfully design a unique body around the Morgan chassis which far surpasses the original Morgan in terms of downforce and drag.

2. Team Structure

Name	Role	Responsibilities
Ryan Williams	Project Leader & Morgan Plus 4 CFD Engineer	To ensure all teams work as efficiently as possible overseeing the progress of both the conceptual team and the Morgan plus 4 team while making sure to communicate deadlines to the whole group. The Project Leader will also be responsible for creating the main documentation which includes the presentation and technical report to prove the team's progress. Also being a CFD engineer they are responsible for designing and performing CFD analysis on the area of the Morgan they have been assigned to trying to reach the targets the Technical Director has set. If they are unable to reach the targets set, they must report on why that is the case so it can be written up for the final report.
Thomas Holland	Morgan Plus 4 Team Leader	To manage and monitor the progress of the aerodynamic package for the existing Morgan Plus 4 design ensuring the completion of tasks before their deadlines as well as contributing to designs and engineering processes during the development process. The Morgan Plus 4 Team Leader is also responsible for communicating the progress of the Morgan Plus 4 Team to the Project Leader.
Oscar Price	Morgan Plus 4 Technical Director	To be responsible for the CFD methodology for the Aerodynamic package for the existing Morgan Plus 4 bodywork and to set performance goals in terms of downforce and drag working closely with the Team Leader
Luca Gray	Morgan Plus 4 CFD Engineer	To be responsible for designing and performing CFD analysis on the area of the Morgan Plus 4 Aerodynamic package they have been assigned to trying to reach the targets the Technical Director has set. If they are unable to reach the targets set, they must report on why that is the case so it can be written up for the final report.
Ethan Davies	Full Redesign Concept Team Leader	To manage and monitor the progress of the rectification the Morgan Plus 4 chassis with a GT coupe-type style bodywork trying to create the maximum amount of performance for the design. They are also responsible for ensuring the completion of tasks before their deadlines as well

		as contributing to designs and engineering processes during the development process. The Conceptual Team Leader is also responsible for communicating the progress of the Conceptual Team to the Project Leader.
Dominic Walton	Full Redesign Concept Technical Director	To be responsible for the CFD methodology for the Aerodynamic package for the full redesign concept and to set performance goals in terms of downforce and drag working closely with the Team Leader.
Alexandros Griffiths	Full Redesign Concept CFD Engineer	To be responsible for designing and performing CFD analysis on the area of the full redesign concept they have been assigned to trying to reach the targets the Technical Director has set. If they are unable to reach the targets set, they must report on why that is the case so it can be written up for the final report.

My role is that of the Morgan Plus 4 Team Leader which requires me to have good communication with those in my team including the Conceptual Team Leader and Project Leader, a good ability to coordinate tasks and sort them in a level of priorities considering deadlines and overall importance/dependence for other tasks and being able to identify which tasks suit particular team members' strengths. My Belbin test results came back as the coordinator which works well for my role as the coordinator is a traditional team leader type position which tends to focus on identifying the team's objectives and delegate tasks based on individual strengths. A big priority however is that I do not offload tasks onto other members of the team as it has been identified that a common shortcoming for those who align with the coordinator in the Belbin test tend to accidentally offload work onto others.

3. Group Tasks and Timings

Overall Project Tasks:

Task	Description	Responsible Team Member(s)	Start	Deadline
CFD & CAD	Start Learning CFD and create a solid method for further CFD Developments	All	06/10/2025	13/10/2025
	Understand the fundamentals of Aerodynamics	All	06/10/2025	13/11/2025
	Finalise the CFD Methodology	Technical Directors & CFD Engineers	01/11/2025	13/11/2025

	Get a full understanding of the terms to do with the software	All	06/10/2025	13/10/2025
	Gain a greater understanding of the CFD software by “messing around” with certain parameters	All	11/10/2025	13/11/2025
	Start and Finish Morgan CFD	All CFD Engineers & Technical Directors	14/11/2025	01/12/2025
	Complete the Mira Car Tutorials	All	06/10/2025	13/11/2025
Morgan Research	Start research for further development of the Morgan	Morgan Plus 4 Team	14/10/2025	07/11/2025
	Start creating a timeline for the development of the project	Project Leader, Morgan Plus 4 Team Leader, Conceptual Team Leader	07/10/2025	14/10/2025
	Finalise the Morgan Dimensions (engine, wheels and suspension)	All	07/10/2025	31/10/2025
	Establish a design for the full redesign concept	Conceptual Team	4/11/2025	30/11/2025
	Start work on our first design ideas (concepting)	Morgan Plus 4 Team, Conceptual Team	10/11/2025	08/12/2025
	Finish first draft of designs.	Morgan Plus 4 Team, Conceptual Team	01/11/2025	12/12/2025
Misc.	Start work on the presentation	Project Leader	31/10/2025	08/12/2025
	Establish Team roles, who is responsible for what areas etc.	All	07/10/2025	14/10/2025
	Put greater detail into the PowerPoint and start to write a script on what to say	Project Leader & Team Leaders	01/12/2025	12/12/2025

4. Detailed Breakdown of Individual Tasks

List your specific tasks below and provide key details for each:

Task Name	Description	Estimated Hours Required	Task Duration (days/weeks)
Establish Team Roles	Assign each role to a team member based on strengths and interests.	1 hour	1 week
Understand the Fundamentals of Aerodynamics	Using course content and reading material get an understanding on how drag, lift and downforce is created as well as the benefits and drawbacks of separating airflow.	12 hours	3 weeks
Group Meetings and Progress Updates (S1)	Hold a meeting with all group members keeping a track of progress, complaints, problems and new ideas.	12 hours	6 Weeks
Start learning CFD	Start learning CFD and create a method for further developments, play with the software and test different parameters and get a full understanding on the software. This includes completing the Mira Car tutorials and understanding the methodology needed to use Ansys	21 hours	3 Weeks
Research Potential Development Avenues	Research existing aerodynamic packages and aerodynamic package concepts such as rear wing designs to get a gauge on what developments can be made to the Morgan.	10 hours	5 weeks
Understand the current car	Understand the design behind the current Morgan Plus 4 design as the aerodynamic package should keep the spirit and aesthetics of the Morgan Plus 4.	2 hours	1 week
Sketch Concepts and different designs	Sketch potential routes to develop for an aerodynamic package including detail and	25 hours	7 weeks

	annotations to give further insights on any design aspects.		
Engineering Management Assignment	Complete an assignment where I rigorously plan my Level 5 group project with reference to my contribution to the overall project.	12 hours	4 weeks

Preliminary Bill of Materials	Estimated Costs (£)	Purchase Lead Times (days/weeks)
Polyester Resin	£7 to £13 per Kg	1 to 3 working days
Fibreglass Matting	£5.02 per m ²	2 to 5 working days
Pre-preg Carbon Fibre sheets	£15 to £25 per m ²	2 to 5 working days

Specialist Equipment Needed

- High performance computer for Ansys simulations
 - Including Ansys software

5. Project Milestones

- Milestone 1: All group members have a good understanding on ANSYS and know the procedures of use including how to experiment using different meshes to get the best outcome for any simulations (Target Date: 07/11/2025)
- Milestone 2: All group members complete and submit their Engineering Management assignment to have every member obtain a better understanding of what their individual objectives are for the group project including deadlines for each section as well as being able to highlight and understand any weaknesses they may encounter which they might not foresee before the completion of the assignment and communicate any problems in the next group meeting (Target Date: 23/11/2025)
- Milestone 3: Complete the semester 1 group project presentation including segments for each team member with a rough script or talking points for each slide to ensure a smooth presentation. All members must show good understanding of the project and objectives showing some independence of developing their own part of the presentation showing their own contributions (Target Date: 08/12/2025)

6. Gateway Objective for Your Project Area

To have a solid base concept and idea to develop for the aerodynamic package for the Morgan Plus 4. (Target date: 12/12/2025)

Criteria for Success: The concept must meet the restrictions made in the regulations for the Welsh Sports & Saloon Car Championship as state in chapter 4 of the regulations¹. The concept must also meet realistic expectations of what can be manufactured and what is affordable to develop as a design meaning expensive ideas such as a fan for downforce as seen on the Brabham BT46B. The design must also be understood and expandable by all those in the Morgan Plus 4 Aero team with annotations giving a detailed description of each components target purpose and outcome when tested in Ansys.

7. Risk Assessment

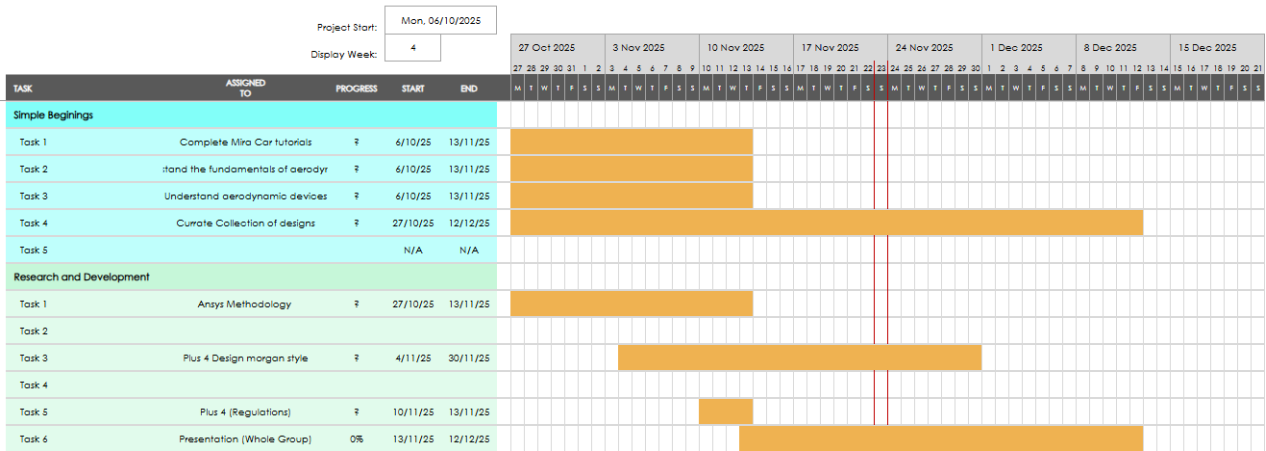
Area of Concern 1: Failure to keep motivation within team members and cause burnout with overworking any one member. Risk level: Moderate

Mitigation Strategy: Encourage asking for assistance or working as a group with those who might not necessarily be part of that area of development, also communicate with the conceptual team leader and collaborate with any potential clashes in similar steps such as CFD mesh development. Also consider each team member's strengths and interests making sure that everyone has an interest in what their working on.

Area of Concern 2: Failure to meet deadlines for required parts of the project due to miscommunication and difficulty of tasks. Risk Level: High

Mitigation Strategy: Schedule meetings of varying lengths to ensure everything needing to be mentioned is said and that deadlines are communicated clearly. Discuss availability of each member over the course of the week making sure that everyone has enough time to do whatever group tasks they have been assigned as well as required activities outside of the project.

8. Personal Gantt Chart



9. Appendices

- ¹ (Welsh Sports & Saloon Car Championship, 2025)
<https://www.wrda.co.uk/assets/files/2025%20Champ%20Regs%20Published%20Copy.pdf>