Report No	1
Team	UADE Racing Team
Date	December 22nd, 2025

1 Introduction

This report summarizes the first development sprint of the BFMC 2026 project for the reporting period November - December 2025. Our focus was to establish a reliable technical baseline: bring up the vehicle with the official start-up code, set up the simulation toolchain, and define the initial hardware expansion plan. During this sprint we also aligned internal responsibilities for each workstream to improve execution speed.

2 Planned activities

Enumeration of the activities planned at the beginning of the reported period (including owners and activity type):

- Vehicle bring-up on the physical car (update/development) - Owner: Garcia Lucio.
- ROS environment installation and configuration on a dedicated PC (environment preparation) - Owner: Giannetto Chiara.
- Gazebo simulator setup and validation for BFMC workflows (environment preparation/research) - Owner: Guzzo Tomás.
- Hardware planning: define compute + sensor stack and rough budget (research/planning) - Owner: Marchese Nicolas.
- Evidence capture and report packaging (documentation) - Owner: Marcoff Joaquin.

3 Status of planned activities

Description of the planned activities, progress, and key results:

3.1 Vehicle bring-up and start-up code execution

Status: Completed

Implementation: The official BFMC start-up scripts were deployed and executed on the physical vehicle. We verified a stable boot sequence, reliable communication between the onboard computer and the low-level control unit, and successful actuation of steering and throttle commands across repeated test runs.

Difficulties: None blocking. Minor iteration was required to repeat tests consistently and confirm stability.

3.2 ROS environment installation and configuration

Status: Ongoing

Implementation: A dedicated computer was prepared with ROS and the Gazebo simulator. We started validating execution of ROS nodes, topic communication, and the modular integration approach (perception, control, planning) using the official BFMC repositories and configuration files.

Difficulties: Configuration and integration are still in progress to ensure full compatibility with the BFMC packages.

3.3 Gazebo simulator setup and validation

Status: Ongoing

Implementation: Gazebo was installed and initial scenarios were executed to validate vehicle spawning, control, physics stability, and sensor emulation feasibility.

Difficulties: Additional validation is required to lock down a consistent simulation workflow for rapid iteration.

3.4 Hardware planning and required components

Status: Completed (planning)

Implementation: We defined an initial hardware expansion list to support future autonomy work: LiPo battery (2S or 3S) with XT90 connector; main compute unit as NVIDIA Jetson Orin Nano Developer Kit; sensors including a 360-degree LiDAR and short-range Time-of-Flight proximity sensors. Estimated total budget (excluding battery): 370 USD.

Difficulties: Component selection will be revisited after initial perception-to-control validation.

4 General status of the project

The vehicle platform is operational with the official start-up code verified on hardware. The simulation stack (ROS + Gazebo) is installed and partially validated; full configuration and repeatable test scenarios are still being finalized. Autonomous features are not yet implemented on the physical vehicle; development is moving from baseline bring-up toward building a first perception-to-actuation loop (camera to steering) in the next period.

Current status snapshot

- Vehicle control: Operational
- Start-up code: Verified
- ROS environment: Installed (configuration in progress)
- Gazebo simulator: Installed (configuration/validation in progress)
- Autonomous features: In development

5 Upcoming activities

Enumeration of activities planned for the next reporting period:

- Integrate camera input into the control loop.
- Implement a basic perception-to-actuation pipeline (camera to steering).
- Develop and test initial autonomous behaviors in simulation.
- Prepare the hardware platform for upcoming sensor integration and compute upgrade.