Project Status Report #1

Team Name: Autonomists

Date: December 22, 2025

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1. Brief Idea

The team has successfully completed the initial hardware set-up for the BFMC 2026 challenge and successfully controlled the car via the GUI. As of this report, the vehicle is fully operational, communication is established via the Startup GUI, and the team is currently transitioning into the embedded development phase on the STM32 platform.

2. Technical Developments & Task Status

2.1 Power System Restoration & Custom Integration

- **Battery Integration:** As the kit was provided without a power source, we successfully integrated a **GenX 7.4V 2S 3300mAh 40C LiPo** battery (as shown in Img4) to support sustained high-performance testing.
- **Power Board Troubleshooting:** Initial diagnostics revealed that the **BAT2** port on the power board was damaged and failing to receive power when the switch was engaged. After performing continuity testing, we successfully rerouted the battery input to the **BAT1** port, effectively restoring power to all onboard systems (as shown in Img3).

2.2 Sensor Diagnostics & Verification

- **IMU Troubleshooting:** During early integration, we observed inconsistent data streams from the Inertial Measurement Unit (IMU). To determine if the issue was hardware-level damage or software-related, we interfaced the IMU with our own Raspberry Pi(as shown in Img2).
- **Validation Results:** Data logs from the RPi 5 confirmed the hardware's integrity. This diagnostic step allowed us to conclude that the hardware is functional and the previous issues were likely related to mounting offsets or initial calibration needs.

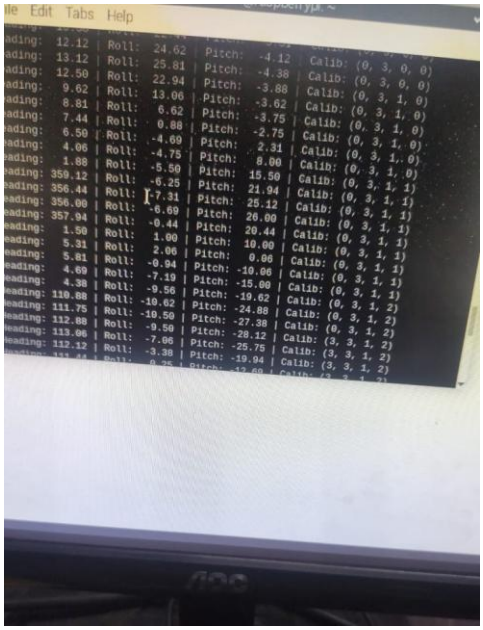
2.3 Current Stage: Embedded Development & Control

With the hardware verified, we have officially moved into the Embedded Development Phase:

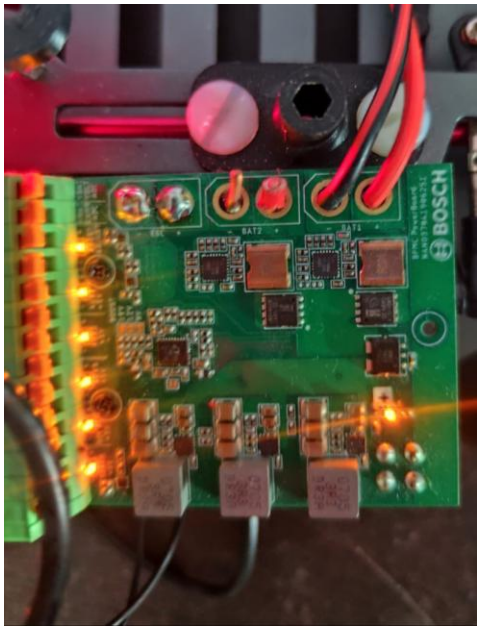
- **Successful Control of Car:** The team successfully controlled the car via given GUI and startup codes. It can be seen in the video that we attached on the site.
- **Low-Level Control:** We are currently utilizing the provided startup code to analyse the interaction between the Raspberry Pi 5 (Brain) and the Nucleo Board (Embedded).
- **Mechanical Calibration:** Our mechanical team is also currently starting with mechanical calibration of the provided car chassis.

3. Images

Img1. GUI activation



Img2. IMU troubleshooting



Img3. Re-routed to BAT1 from BAT2

Img4. New GenX 7.4v Batttery