



Preliminary Design Review

PannonSat

1. Introduction

School: Benedictine High School of Pannonhalma

Class	Name	Role
/	Martyn Lord	Mentor
10.	Bálint Balassa	Technical support
10.	Vilmos Fókás	Team leader, 3D design
10.	Jácint Juhász-Matafán	PCB design
10.	Illés Sárossy	Programming, Outreach
10.	Zalán Sorosi	Parachute design

2. Primary Mission

In the primary mission of the CanSat project, measuring temperature and air pressure is essential, which will be provided by a BMP280 sensor. Radio communication will be ensured by a LoRa WLR089U0 module, both in the air and at the ground station. Our main control unit will be an Arduino Nano RP2040 Connect, as it is sufficiently compact and capable of handling many tasks.

3. Secondary Mission

Our secondary mission aims to initialize a dual-parachute system. With the help of a magnet, for the first part of the flight, one remains unloosened, whereas for the second, the magnet will let go and deploy the second parachute. This allows us to gather data at two different speeds, while also giving us control of the flight as shown in figure 3. From the horizontal speed and the descending velocity, the program calculates the ideal timing to deploy the second parachute. We will also implement an SD logging system, a camera for a video of the flight, GPS, and an IMU for accurate location tracking.

4. Outreach

One of our team's priorities is to propagate CanSat. In our school we intend to make a presentation, to showcase our work, and inspire potential future competitors. We have created a [website](#), [GitHub repository](#), and [Instagram account](#) to make our work open source.

From August to October, we conducted an outreach program for possible sponsorships, resulting in establishing a partnership with 77 Elektronika Kft., who gratefully supported us with 500€.

5. Devices

- Arduino Nano RP2040 Connect
- LoRa WLR089U0
- BMP280
- TEMT6000
- Li-ion 18650
- OV2640-ESP32
- 5V electromagnet
- GY-NEO8MV2 GPS



6. Risks and Expected Difficulties

- Parachute entanglement
- Excessive swinging of the smaller parachute after the second one has opened
- Losing radio signal

7. Management

We use a Gantt chart to organize the tasks and to schedule the work to be completed. All project materials and completed parts are stored in a shared Google Drive account, so everything stays organized and easy to track.

	Sept-Oct	Nov-Dec	Jan-Febr	March	April
Planning					
Building					
Testing					
Final preparation					

Gantt-chart

8. Software

Our concept involves an advanced data management system, where data is stored temporarily in a databank, from which certain modules can independently access the contents of it. The modules shown in figure 4, are all connected by the Main module, which schedules and configures tasks, through our Software Timer.



Figure 1.

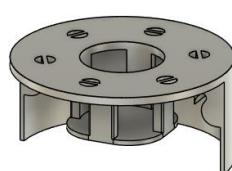


Figure 2.

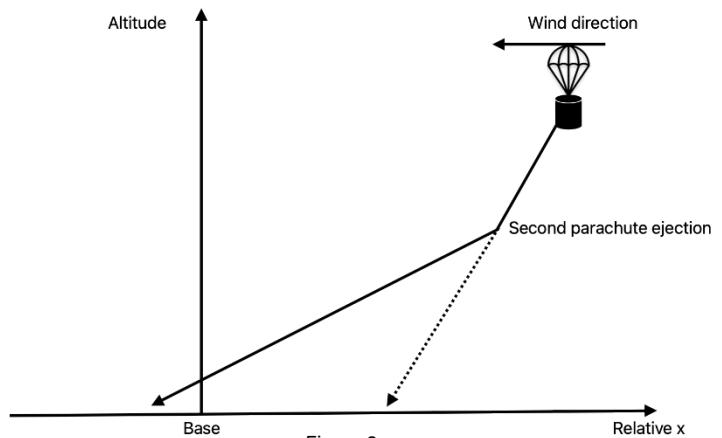


Figure 3.

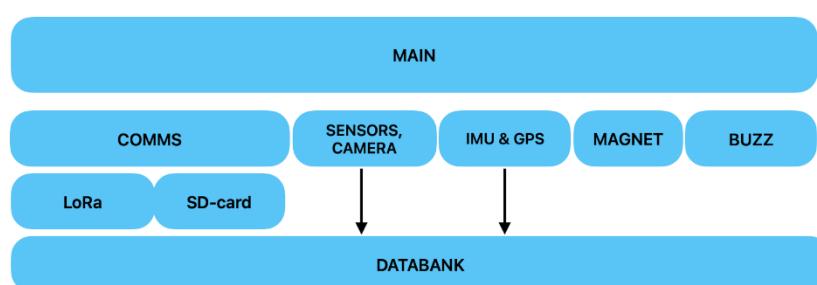


Figure 4.