

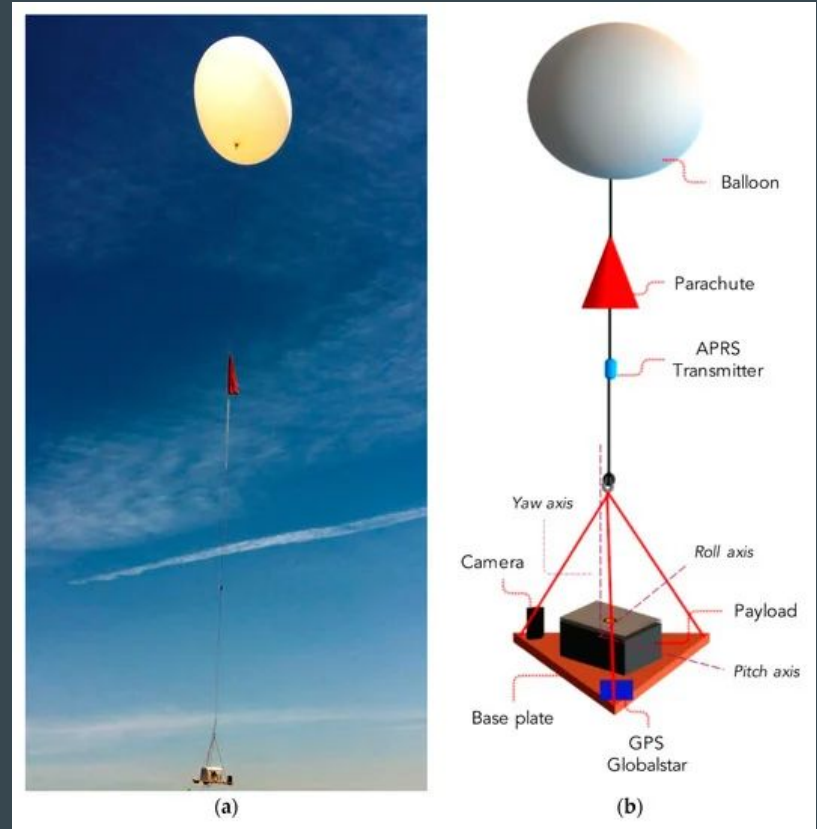
Problem and Users (Introduction)

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Our Project:

- Project: Make to Innovate (MTI) group H.A.B.E.T.
- Objective: Develop a high-altitude balloon project for atmospheric data collection and near-space video recording/streaming.
- Altitude Goal: Up to 30,000 meters.



What is the Problem at Hand?

- Problem #1: The M2I project HABET is attempting to recover a video signal of their weather balloon in flight but after a certain amount of distance the signal becomes weak and is lost.
- Problem #2: The M2I project HABET has sent other recording devices up in prior launches, but risks losing the camera.

How to Fix the Problem at Hand: Problem #1

- We will use GNU radio as well as a software defined radio to change the modulation frequency range to recover the signal.
- Use high-gain transmitters to increase signal strength and to ensure compatibility with existing systems and regulations
- Optimize transmission frequency by analyzing and selecting an optimal frequency for transmission that minimizes signal attenuation

How to Fix the Problem at Hand: Problem #2

- Enhance camera attachment mechanism by improving the design of the camera attachment to ensure a secure and reliable connection
- Implement tethering system by using tethers or safety cables to physically secure the camera to the weather balloon
- Enhance payload structure by strengthening the overall structure of the payload to withstand environmental stresses and potential impacts
- Conduct drop tests to simulate various scenarios and assess the resilience of the camera attachment system

Who Are the Users?

- The immediate users will be the H.A.B.E.T. group but the solution could be used by other groups and clubs in the future as well.
- Research institutions and scientific organizations to conduct studies on the atmosphere, climate change, and meteorological phenomena
- Educational institutions to learn about meteorology, atmospheric science, and scientific experimentation.



User Needs:

- The HABET team needs to be able to successfully recover a video signal of their weather balloon in flight at 30,000 meters
- The HABET team also needs to be able to send a camera up to 30,000 meters and successfully mount the camera so the payload doesn't fall
- The research and educational institutions needs data from 30,000 meters to track weather formations and climate change

Conclusion:

As we design our project, our early ideas help us tackle challenges like signal loss and camera detachment. We're improving antennas, refining transmission methods, and securing cameras. By learning from experiences, we're making our missions more reliable. Our goal is to bring advancements to weather balloon technology.