

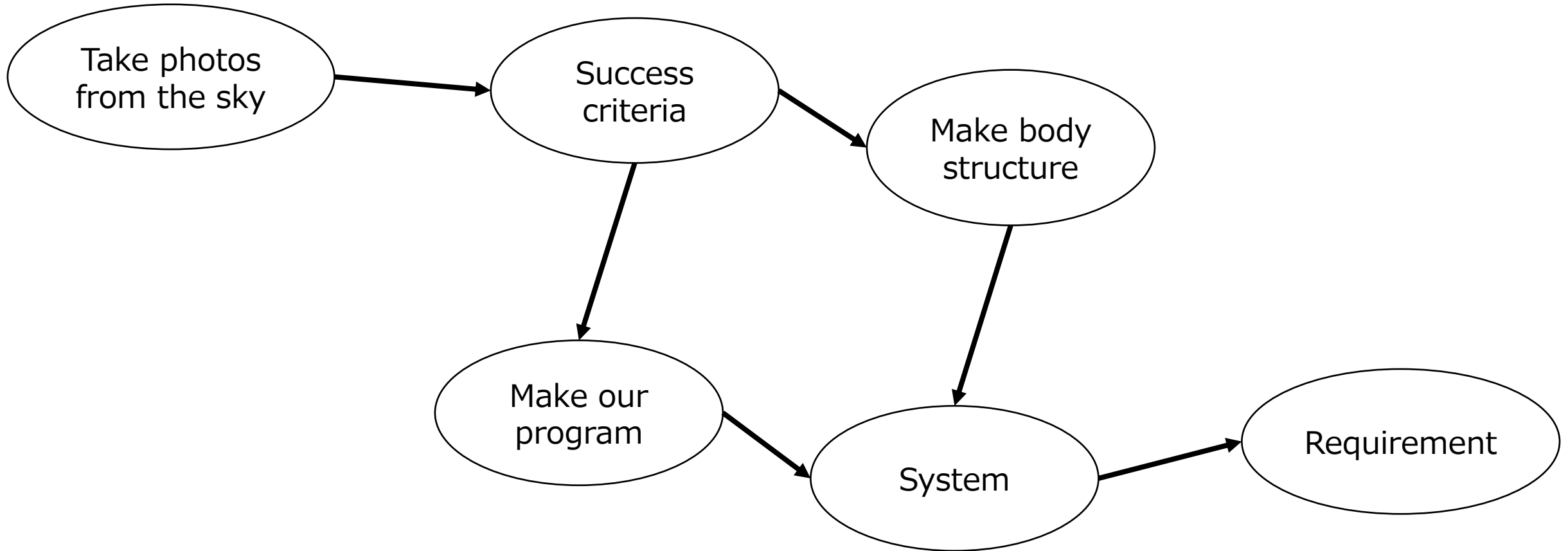
Final Presentation

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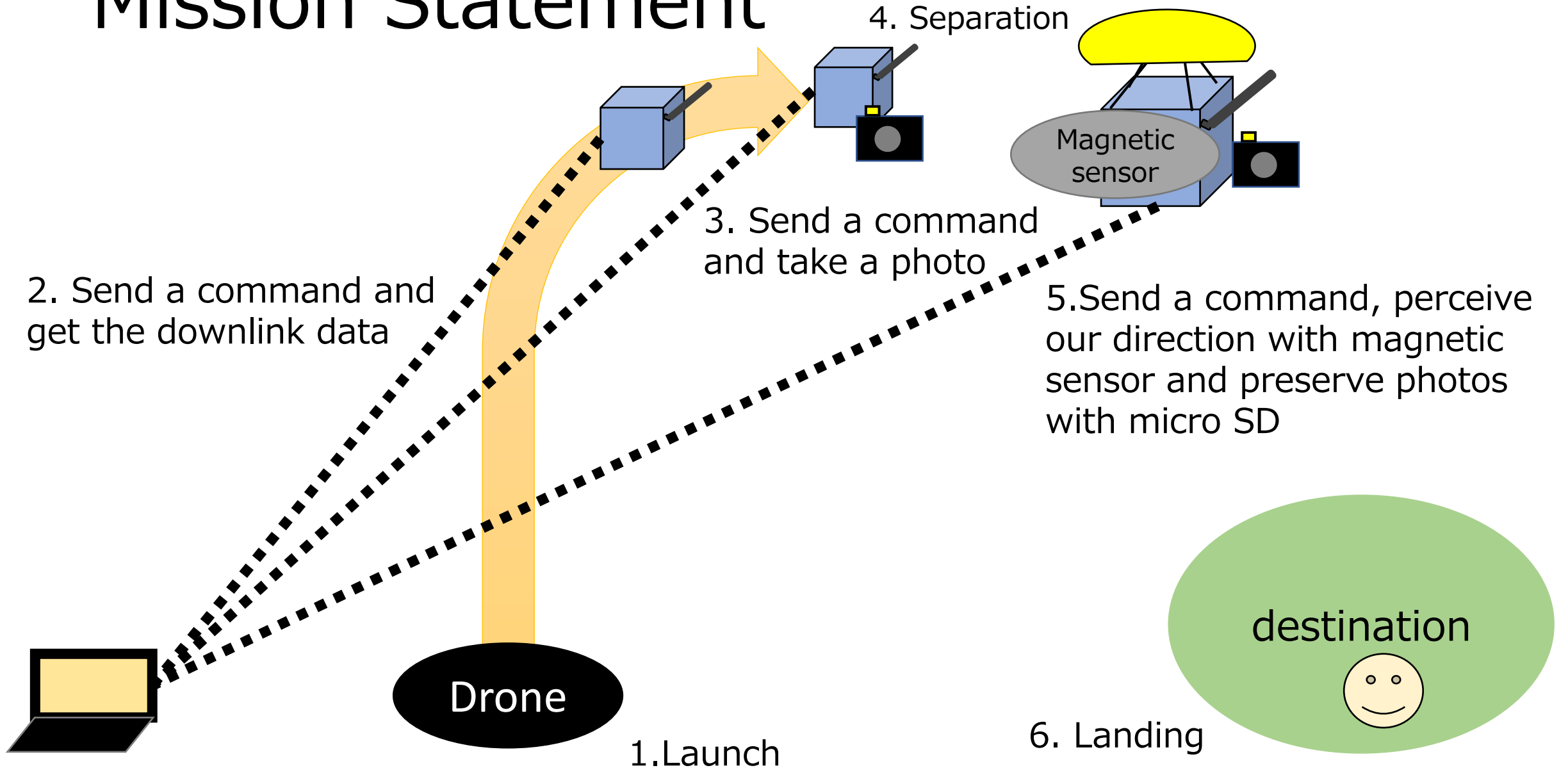
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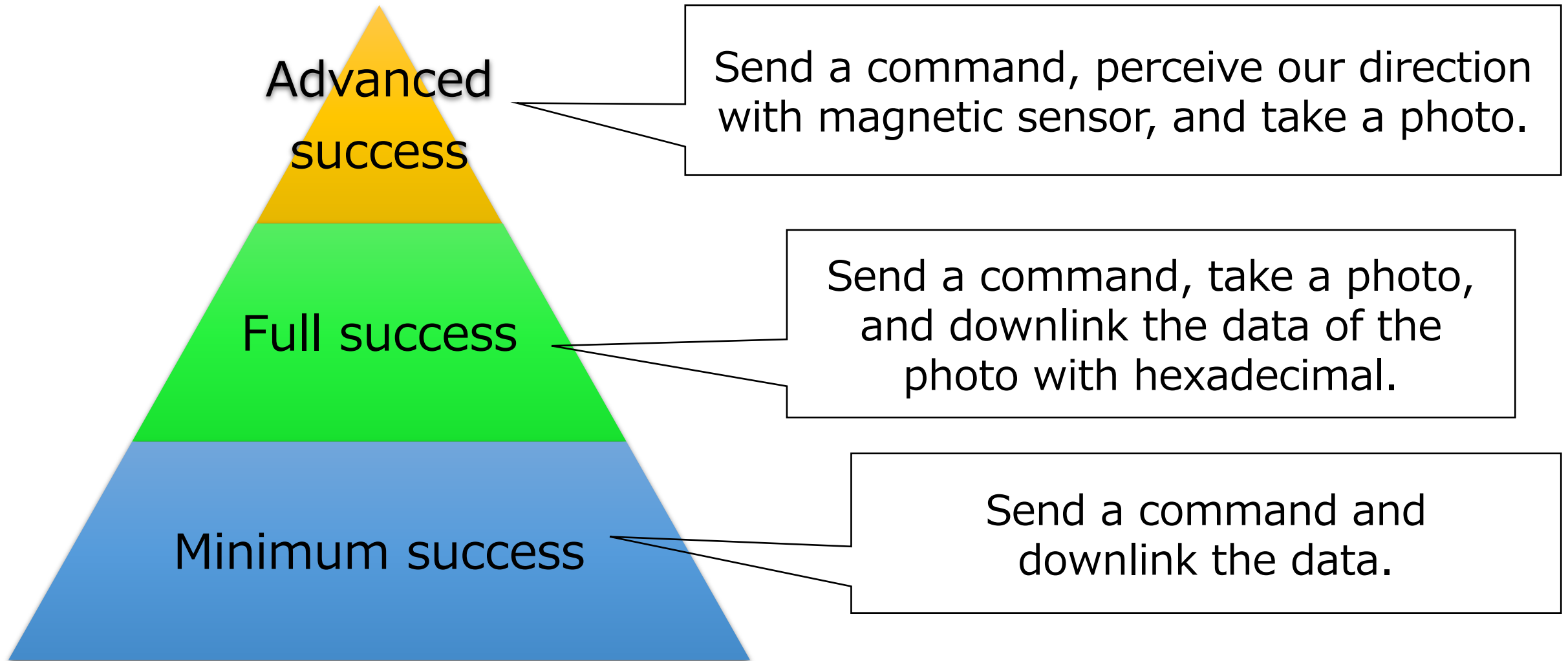
Mission Statement



Mission Statement



Success Criteria

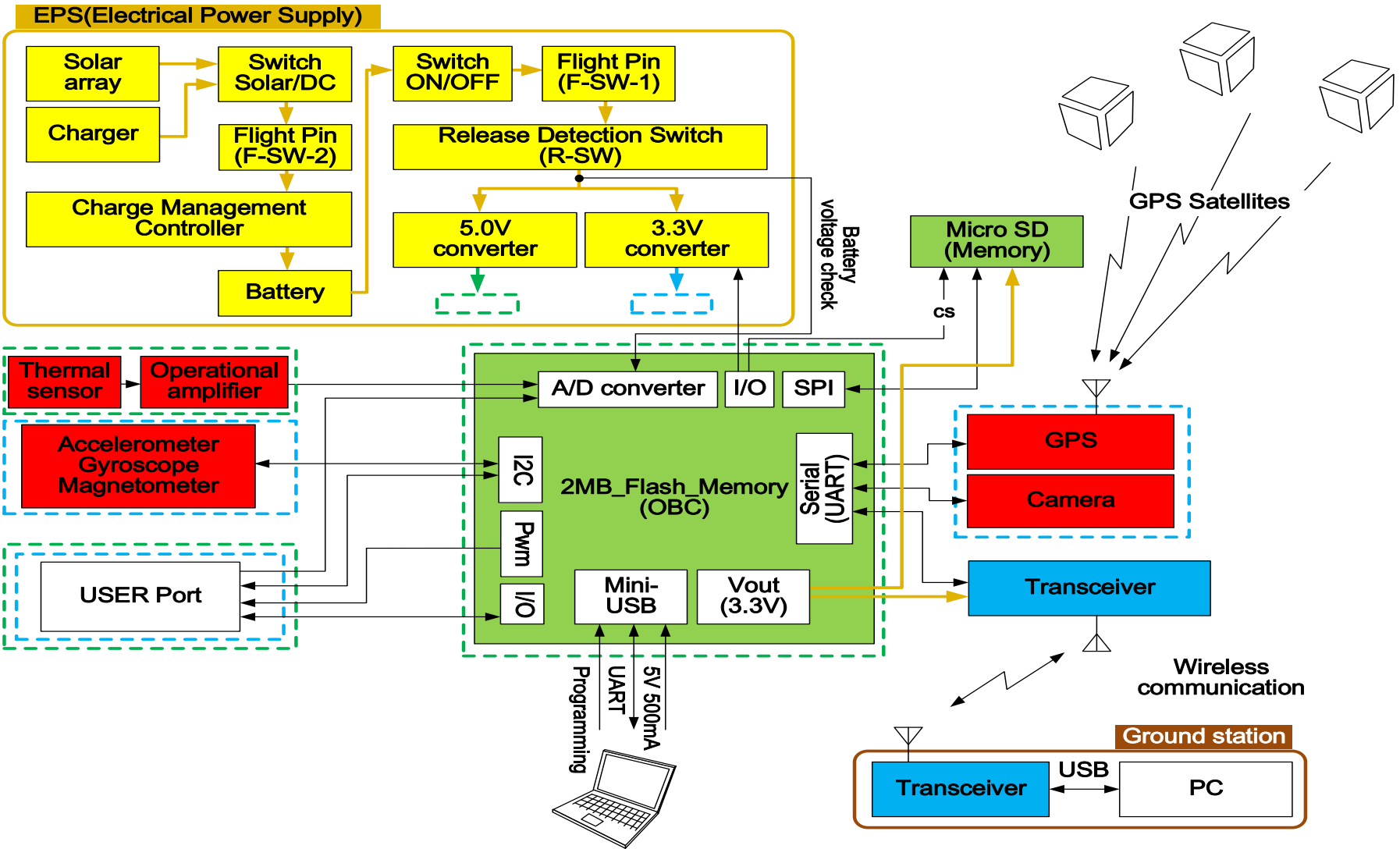


Mission Requirement

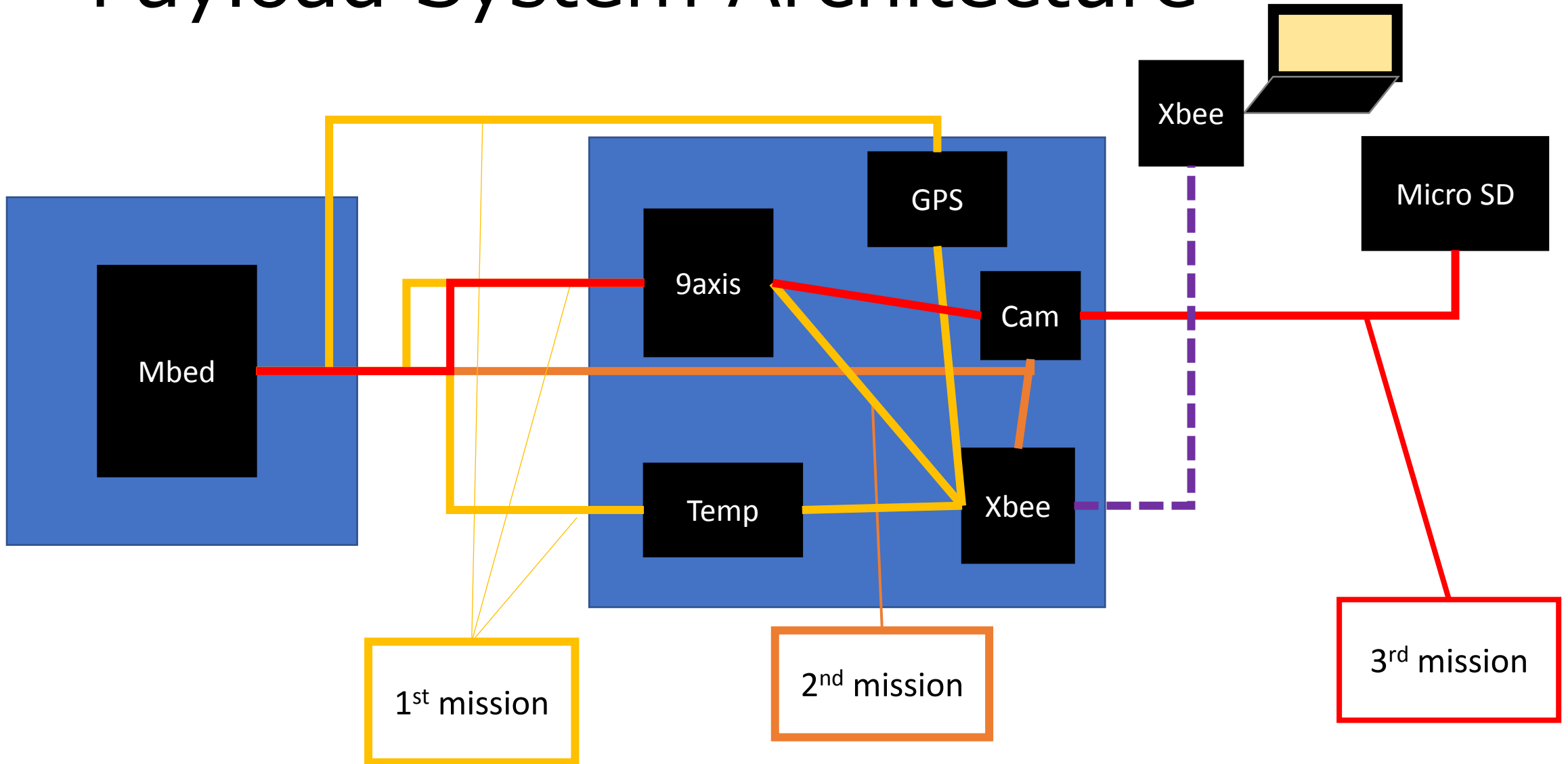
Event	Requirement	Required function	Verification way
Preparation phase	Set a camera and a parachute	Strings of a parachute connect Hepta tightly	Pull strings and check the hardness
Standby time phase	Programming is working on the ground	All 3 programming work properly	Send command from our PC and check the result
	Battery voltage is 4V or more	Function to charge from the external source	Confirm the battery is charged
	Turn on the switch of the mbed	Push the button of the mbed	Press the button firmly
Launch phase	Send the sensing start command (1 st phase)	Function to send commands	Check whether teraterm is working
	Get the data by downlinking from the Hepta (data: longitude, latitude, height, angular velocity) and check the data whether it is correct or not	Letter 'H' appears before the data	Look at the teraterm and confirm that there is the letter 'h'
	Send the sensing start command(2 nd phase)	Function to send commands	Check whether teraterm is working
	Get the picture data by downlinking from the Hepta	Letter 'H' appears before the character string of the data	Look at the teraterm and confirm that there is the letter 'e'
*Extra launch phase	Convert the picture data to actual picture	Able to see the picture on the laptop	Not decided yet
Mission phase	Send the sensing start command(3 rd phase)	Function to send commands	Check whether teraterm is working
	When Hepta reach to the certain distance from point we previously decided	Control the magnetic sensor by programming	Look at the teraterm and confirm that there is the letter 'p'
	Save the picture data on the SD	Function to save the data on the SD	Check the SD in the analysis phase
Analysis phase	Check the data in the SD	Get the picture data and can see it on the laptop screen	Put SD on the PC and check the file



Bus System Architecture



Payload System Architecture



Validation and Verification Plan/Testing

1. Flight test(9/12)

We confirmed to get the data whatever distance between our satellite and ground station was.

2. Thermal test(9/13)

We confirmed to get the data whatever temperature our satellite was exposed to.

3. Before launching...

We checked the Voltage of our satellite and confirmed our programs whether it worked or not.

If we succeed our mission...

- 1st mission

Command Get104

H00D1FFF10016FC4404584080FF750053FFD7000000000000000000000000C9807A1

- 2nd mission

Command Get101

EFF D8 FF E0 00 11 4A 46 49 46 00 01 01 01 00 00
00 00 00 00 0A FF DB 00 43 00 08 06 06 07 06 05
08 07 07 07 09 09 08 0A 0C 14 0D 0C 0B 0B 0C 19
12 13 0F 14 1D 1A 1F 1E 1D 1A 1C 1C 20 24 2E 27 ...

- 3rd mission

Command Get112

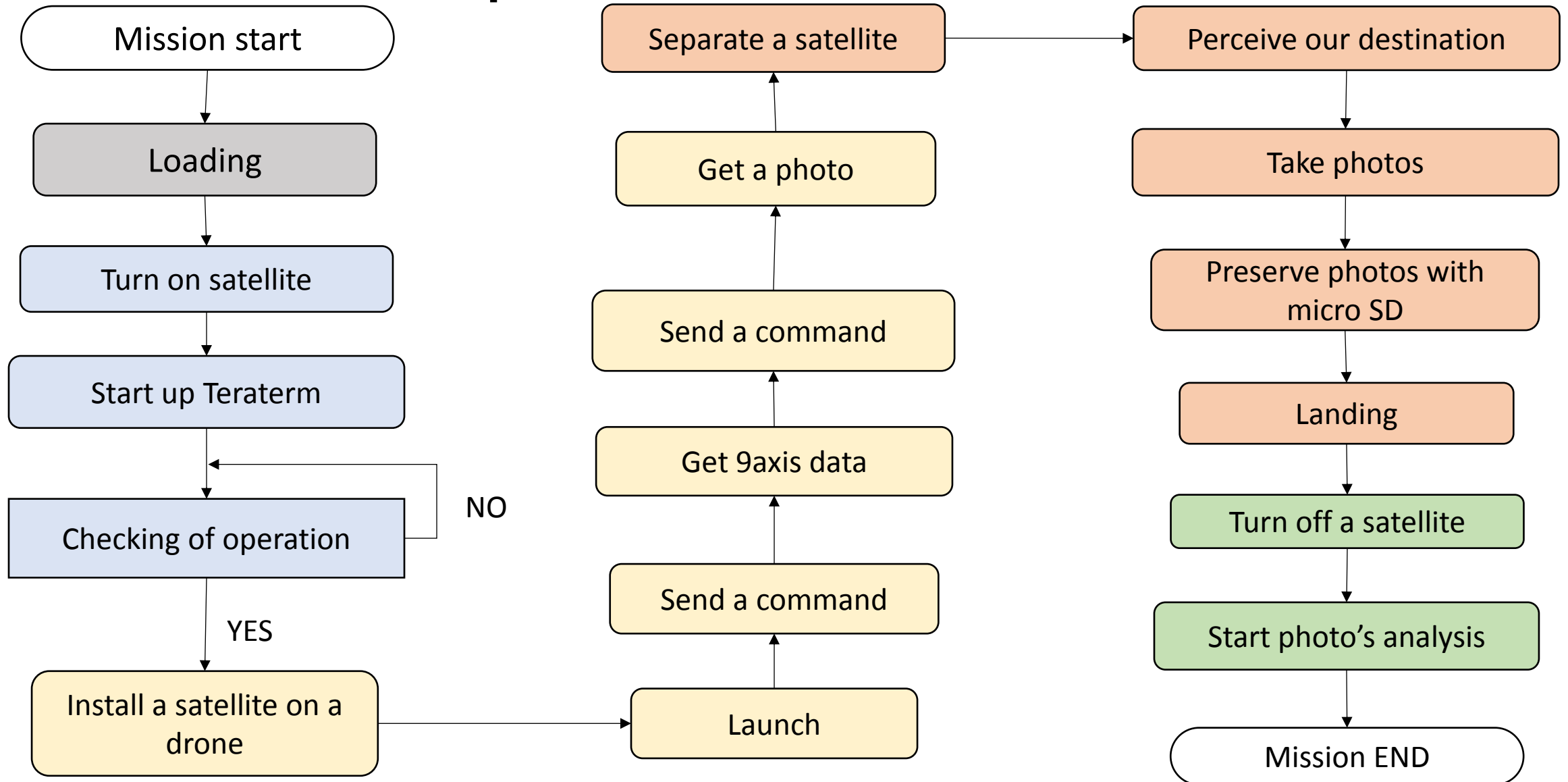
Magnetometer Mode

-24.600000,19.799999,-8.100000

now our destination

Camera Snapshot Mode

Mission Sequence



Flight Result: First Attempt

- downlink and uplink test while drone is ascending

→ We could not communicate with Hepta .

- taking a picture while Hepta is descending

→ able to save the photo data in the SD

Flight Result : First Attempt

rcmd=0, cmdflag=0

rcmd=0, cmdflag=0

rcmd=112, cmdflag=1

Command Get112

Magnetometer Mode

0.000000,0.000000,0.000000

Magnetometer Mode

12.600000,-6.600000,-5.400000

now our destination

Camera Snapshot Mode

Teraterm data

Couldn't communicate between
satellite in drone and groundstation



Photo data

Advanced
success

Flight Result: Second Attempt

- downlink and uplink test while drone is ascending
 - We could get the data of 1st mission, but could not get the data of 2nd mission.
- taking a picture while Hepta is descending
 - not able to save the photo data in the SD

Flight Result : Second Attempt

rcmd=0, cmdflag=0
rcmd=104, cmdflag=1

Command Get104

H28DFF33CE6C6FEF81C5839E8000000000000232C3A168C00411760450BB707A1
H01E4FFDEFE46079C29E03614FFF0FFD4000C232C3A198C00411760450BBB07B2
HFD8A06DA009A03EC14F43E0C000AFF0FFFA232C3A168C00411760450BC1079C
H0016FE3100300990097440040033FFCFFFF5232C3A168C00411760450BB907AB

rcmd=0, cmdflag=0
rcmd=0, cmdflag=0
rcmd=112, cmdflag=1

Command Get112

Magnetometer Mode
0.000000,0.000000,0.000000
Magnetometer Mode
11.100000,-8.400000,-6.900000

Minimum
success

Couldn't communicate between
satellite in drone and groundstation

Advanced success,
but we could not get the photo

Conclusion

Our satellite couldn't communicate with Antenna when it was in drone. So, we couldn't archive our all mission.

However, we could send a command and downlink a little, and take a photo.

Recommendation and Future Work (Mission)

- Try again

In a gymnasium, ground station was able to communicate with Hepta.



Use a process of try and error and recognize the maximum distance between ground station and Hepta

Recommendation and Future Work (Mission)

- Future work

Detect the place where we want to take a picture



Rotate servo motors



Take a picture and save the data in SD card

Feedback and Recommendation (CLTP)

We had to change our mission.

Before deciding your mission, you should see videos of previous experiment



You can view on Hepta clearly



You can set the practicable mission smoothly

Thank you for your attention.