The Unit
Balloon Fest Protocol

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Purpose: to measure air pressure as altitude increases

Equipment: Helium balloon, gondola, stopwatch, LabPro, laptop computer, blue tape,
Jar, barometer, and 1000 ft. cord.

Payload: Gondola, LabPro, barometer, and a jar.

Weight: 40.75 oz

Setup

Payload and Lift

Through our calculations we have discovered that we need over 38.67kg/ft of lift to get our payload of the ground. This, then, requires that we make sure the balloon filler can produce enough helium to meet our requirements.

Pre-Launch Procedure and Station Coordination

1.Verify with the other team sharing a station with you the experiments being attempted
2. Plan out how to time the experiments so that both teams have a chance to use the appropriate equipment
3. Make sure that all equipment is accounted for
4. Set up station with alotted equipment, starting with the table
5. Examine each instrument for possible malfunction
6. Check that each instrument has adequate batteries
7. Connect barometer to jar
8. Once LabPro and laptop set-up is complete (see next paragraph for instructions), connect LabPro to barometer
9. Fit payload into the gondola securely
10. Divide cord into 100 m sections using blue tape
11. Attach gondola to balloon
12. Ready stopwatch for start

Laptop Pre-Launch Procedure

1. Connect LabPro to computer
2. Verify fresh batteries in LabPro
3. Start Logger Pro software and open saved experiment file
4. Verify that “Interface is connected”
5. Open Experiment menu, select Show Sensors:
Ch1 = barometer (kPa)
6. Open Experiment menu, select Data Collection:
Mode = 1 sample/second, Check over sampling
7. Open Experiment menu, select Remote Setup:
Review Settings
Select OK
Make sure the yellow LED on LabPro is turned ON and stays on
8. Disconnect the USB cable from the LabPro. Logger Pro and the Laptop computer can be shutdown.

Procedure:

1. Verify barometer working
2. Make sure payload fits in gondola
3. Verify jar and barometer are secure

Flight Procedure:

1. Fill balloon with helium
2. Verify lift
3. Verify equipment working
4. Let out 100ft. of cord and tie with light blue tape
5. Repeat step 4 until all cord is out
6. Collect data
7. Bring the balloon down

LabPro Data Recovery:

1. Verify that the green light is still flashing on the LabPro every sample interval
2. Press the start/stop button to stop the collection of data. The LabPro should beep once and all lights go out.
3. Restart Logger Pro and the Laptop computer if needed.
4. Reconnect the LabPro (USB) to the computer and verify that the “Interface is connected”
5. “Remote Data Available” window opens:
Select “yes”
6. “Retrieve Remote Data” window open:
and save data in program
7. Once data is verified and saved:
Open Experiment menu

Select Reconnect Interface
8. “Remote Data Available” window opens:
Select “No” to erase data on LabPro
9. Repeat these steps until all data is gathered

Data Analysis:

1. Fill-in all of log form with gathered data (3 sets are required to make sure that the readings were recorded)
2. Observe and record any strange occurrences in flight
3. Transfer information into a saved form onto the laptop
4. Analyze the data in the Logger Pro program
a. Add a new folder named “Pressure vs. Altitude”
4. Transfer graphs to Power Point
a. In LabPro, select graph window, Ctrl-C to copy the graph
b. Open Power Point Presentation, select new page, Ctrl-V to paste the graph on the power-point presentation
5. Take the filled-out Event Log and transfer it to the power-point

Presentation

1. Arrange all folders on power-point to suite presentation
2. Divide up the topics into reasonable sections, so that each team-member can be given the chance to experience presenting to a certain degree
3. Mentally prepare for show-time