Hot Air Balloon Project Specification Addendum for Design Engineering Class: Dec 2009

Student teams in the Design Engineering Class are expected to be experts in the Hot Air Balloon Design process from previous year's experience.

They are expected to perform at an exemplary level on all basic requirements as specified in the HAB Student Project Guide.

In addition, Design Engineering students are expected to meet the following extensions:

1. Instead of lofting eggs, you will design your balloon with a gondola such that it will carry 1 of 3 possible payloads:
    a. Video Telemetry System #1 (Short-range, low-resolution, lighter weight)
    b. Video Telemetry System #2 (long-range, high-resolution, greater weight)
    c. RC Telemetry System (GPS and barometric altimetry)
2. One objective is to publicly showcase live telemetry during the event
3. The second objective is to make reports, images, and videos that are posted on the Endeavour InvenTeam website as follows:
    a. Depending upon the selected system, one of the two following products:
        i. GPS track & altimetry data graph superimposed upon an oblique Google Earth image of the school athletic field.
        ii. Video (in mpg format) of the flight as recorded from the balloon.
    b. Your entire Design portfolio should be in MS Word format (images or drawings can be created in Word or scanned in as images).
    c. Images taken during the construction and launch should help explain the process.
    d. Videos (in mpg format) and/or images of the launch and recovery of the balloon & telemetry system taken from the ground will demonstrate the excitement of this event.

4. The Student Project Guide is hereby amended as follows:
    a. Page 1 Requirements: The total surface area restriction of 25 sheets or 10 m^2 is removed. You may make your balloon any size and are only limited by practical engineering limitations. No Egg is required.
    b. Page 2 Product Design Specification: This document is very important, must be much more detailed, and as a minimum, should include sections on issues relating to:
        i. Balloon lift, stability, durability, flight duration, & safety
        ii. Telemetry functional analysis (how it works), Operations procedures (check list of all needed components and procedures), and Range testing (understanding radio, video, and antennas),
        iii. Data Analysis (how to display live data, record it, convert it and present it). What equipment, programs, and procedures will be needed?
    c. Page 3 Final Design: Besides drawings of the balloon and gondola, this now includes:
        i. Telemetry Equipment checklist (list each and every piece of equipment, battery, cable, etc. that is needed)
        ii. Telemetry Procedure checklist (Check-off list of all steps before, during and after launch).
        iii. Data Analysis Procedure (how data (video or GPS) will be recorded, converted, analyzed, and presented)
    d. Page 4 Project Portfolio: Your expanded portfolio must be assembled into a single MS Word file and stored on the network as V:/GeneralStudent/InvenTeam/ HAB Project. This folder should also include a gallery of images, videos, and graphs.
    e. Page 4: Add the requirement that all of this must be assembled into an attractive and professional webpage.
    f. Page 5 Grading: This will be amended to add the following:
        i. Flight telemetry showcased successfully = 20
        ii. Competition bonuses will be changed to Best showcase = 10, and Longest flight = 10
        iii. Website content and design = 50 (graded)