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Writing Diagnostic

The purpose of this paper is to summarize events that occurred during a weather balloon launch that took place on September 5, 2020 near Delta, UT. The weather balloon's mission was to take an image of the curvature of the Earth, which it accomplished successfully. This paper discusses events before the launch, during the ascent period, during the descent period, and during the payload recovery.

Before the weather balloon's launch, researchers constructed a set of instruments, called a payload. The payload consisted of a GPS module to track the location of the balloon, a radio transmitter to send the GPS coordinates back to the ground, a camera to take a picture of the curvature of the Earth, and an SD card to store images on. On the morning of the launch, researchers took a 200 g Kaymont weather balloon to a local party store to be filled with helium. Calculations showed the balloon needed to be filled to a diameter of approximately 36 in.; however, the balloon was only filled to a diameter of approximately 34 in. Because the balloon was underfilled, more helium was added at the launch site.

The weather balloon started its ascent at 1:35 pm. Thirty minutes into the balloon's ascent, it stopped reporting its location. Researchers on the ground did not know the balloon's location for 22 min. After 22 min., the balloon began to send location updates again. The balloon had an average ascent rate of 2.5 m/s (8.2 ft/s) and was in the ascent stage for 2 hr 46 min. The balloon spent most of its flight in ascent.

After reaching an altitude of 25,976 m (85,223 ft), at 4:21pm, the weather balloon burst, and the payload began its decent. The payload started descending at a rate of 17 m/s (55 ft/s); however, as it descended, the surrounding air pressure increased exponentially, causing the descent rate to slow to 7 m/s (23 ft/s). During the descent, the parachute became entangled in the remnants of the burst weather balloon and did not deploy correctly. Researchers estimated that the descent rate would have been decreased to half speed if the parachute had deployed correctly. In total, the descent period lasted for 33 min before the payload landed in a field.

The recovery of the payload took 26 min. When the payload hit the ground, it lost power and was unable to send location updates. As a result, the recovery team had to spend additional time searching for the payload. The field was very thick, which made searching for the payload difficult. Immediately after the payload's recovery, the recovery team reviewed the images captured on the SD card and verified that the weather balloon project had successfully completed its mission of capturing an image of the curvature of the Earth.

This paper gives a summary of events that occurred during a recent weather balloon launch. The weather balloon's mission was to take an image of the curvature of the Earth, which it accomplished successfully. This paper addresses the events that happened before the launch, during the ascent period, during the decent period, and during the payload recovery. Although there were some technical difficulties in the design of the payload and during the flight, the weather balloon project succeeded completing its mission.