

A helium-filled mylar balloon carrying a smartphone and traditional geophysical sensors ascended to a stratospheric height of 35 km over the surface detonation of a chemical explosive, with a total propagation distance of 127 km. The smartphone was configured to collect multi-modal data at high rates from internal sensors. Analysis of the data shows successful collection of the explosion signal by both the smartphone's microphone and its accelerometers, the first from an ascending balloon. Comparison of the acoustic signal with that collected by other microphones, both airborne and ground-based, provides insight into the possibilities and limitations of collecting acoustic data from the stratosphere.