

# THE EFFECT OF HYPER GRAVITY ON MANUAL CONTROL TASKING ABILITY

## Summary

This experiment will be the first to study the effect of the G-Excess illusion on a subject's ability to manually control and stabilize a vehicle's tilt angle. While perceptions are interesting from theoretical perspective, the true concern is that illusory perceptions will impact piloting performance resulting in accidents. This experiment will study the impact on pilot manual control in a controlled task across a range of angular roll tilt frequencies. Pilots will be tasked with keeping the ATFS-400 gondola upright (in reference to the net gravitational vector) in response to a pseudorandom roll disturbance at varying G levels.

## Objectives

- To study the effect of the G-excess illusion on the manual stabilization of a rate-controlled vehicle
- To provide data to support the development of future countermeasures to the G-excess illusion, including displays, training, and different vehicle designs, which can be tested in a controlled laboratory setting
- To adapt the ATFS-400 for manual stability and control testing for future sub-orbital pilot testing and more general academic research

## Customer/Partner

Massachusetts Institute of Technology partnered with ETC

## Status

Subject recruitment and testing is underway (January 2013). Centrifuge runs will start in February 2013.

## Future Publications

Annals New York Academy of Sciences  
Journal of Vestibular Research  
Aviation Space and Environmental Medicine