CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
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Project Number
J0333

Project Title
The Effect of Noise on Pilots' Performance

Abstract

Objectives/Goals
Our project objective is to determine if cockpit noise affects the performance of pilots. We believe that increased noise will serve as a distraction, and therefore lessen the pilot's performance.

Methods/Materials
We selected 4 test subjects, who were not pilots. We trained them in the use of a computer program, Flight Simulator 2004. We ran this computer program on a Dell laptop with a flight yoke attachment. After a period of initial training, we observed their performance on simulated take-offs and landings under varying noise levels. We rated take-off performance on a point scale according to how centered they stayed on the runway, maintenance of 10 degrees upward pitch, and smoothness of rate of climb. We similarly rated landing performance according to adherence to glide slope, remaining centered to the runway during the approach, an even rate of descent, and smoothness of touch down

Results
All of our test pilots were able to complete successful take-offs. Their rated performance on take-offs did drop substantially with higher noise levels.

Only 3 of our 4 test pilots were able to successfully complete a landing, and 2 of the other pilots had great difficulty achieving consistent landing patterns. We could not yet demonstrate a clear pattern of performance with relation to cockpit noise, given the overall poor performance on landings.

Conclusions/Discussion
Our conclusion is that noise does adversely affect pilot performance, once they've achieved a basic level of proficiency. Our test pilots achieved proficiency in take-offs, and increasing noise did adversely affect their performance at this task. We underestimated the technical difficulty and time required to train test pilots in the landing phase of simulated flight. As such, our pilots did not achieve sufficient baseline skill consistency at landings to adequately judge the added effect of noise.

Summary Statement
We explored the effects of noise on pilots' performance using a computer flight simulator.

Help Received
Mother helped with typing and editing. Parents supplied computer equipment. We borrowed a decibel meter from a family friend.