

**Activity 2.3.3 Flight Control Design**

Introduction

A pilot interacts with a machine through a variety of ways. Manipulating buttons, dials, and flight controls with fingers is a primary interaction method. An aerospace engineer designs the controls with human factors as a constraint. For example a switch that a pilot must actuate can look differently in a light aircraft than a space craft flown by an astronaut in a life sustaining suit with a bulky glove.

In this activity you will experience an increasing challenge of manipulating controls with variety of gloves.

Equipment

* Computer with flight simulator software.
* Joystick.
* Variety of gloves increasing in size e.g. latex glove, mitten, baseball glove, welding glove.
* Engineering notebook
* Stopwatch
* Activity 2.3.2 Reaction Time

Procedure

1. Start the word processing software.
2. Divide into groups of two under the direction of your teacher.
3. Student #1 will be the data entry person and student #2 will be the timer.
4. Student #1 will don the thinnest glove
5. Student #2 will begin timing and counting errors while student #1 recalculates the equations from Activity 2.3.2 Reaction Time. Stop the timer upon completion of this entry. Record the time, number of errors and any observations.
6. Switch roles and repeat steps #4 and #5 above.
7. Student #1 will don the thickest glove.
8. Student #2 will begin timing and counting errors while student #1 recalculate the equations from Activity 2.3.2 Reaction Time. Stop the timer upon completion of this entry or 5 minutes, whichever occurs first. Record the time, number of errors and any observations.
9. Switch roles and repeat steps #7 and #8 above.
10. Launch the flight simulation software and load a scenario with which you are familiar.
11. Student #1 will don a thick glove.
12. Student #2 will observe the effectiveness of student #2 as a five minute flight is simulated. Record observations in the engineering notebook.
13. Switch roles and repeat steps #11 and #12 above.

**Conclusion**

1. Explain how an aerospace engineer needs to consider the human interface when designing flight controls.
2. Explain how flight controls in the future could be designed more effectively.