



F-22 Flight Controls
 Lt Col Randy "Laz" Gordon, PhD, USAF


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Personal Background




US Air Force Academy Class of 1998
 (B.S. in Aero Engineering/Math Minor)
 Pilot since 1995, Fighter Pilot Since 2000
 (2 Combat Tours – Iraq and Afghanistan)
 Air Force Institute of Technology Class of 2006
 (M.S. in Aero Engineering/Systems Engineering)
 US Air Force Test Pilot School Graduate
 (Flown 76 different aircraft, Primary F-15C/E, F-16A/C, A-10A/C, Global Express BD-700, F-22A)
 FAA Instructor, Airline Transport Pilot
 (3000 hrs flight time)
 US Air Force Air University (PhD Strategy, 2013)
 NASA Astronaut Finalist
 F 22A Squadron Commander
 Presidential Fellow, DARPA Fellow
 Harvard Business School Alumn (Conferred 2018)
 MIT Technology Fellow (Conferred 2018)

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AFWERX


Design Thought Experiment



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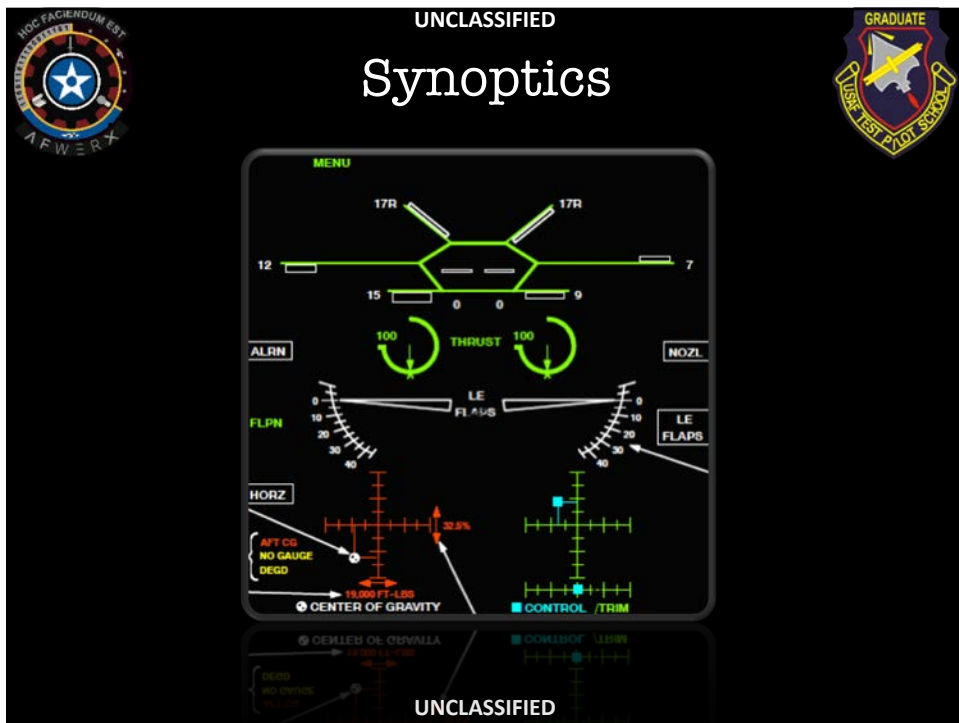
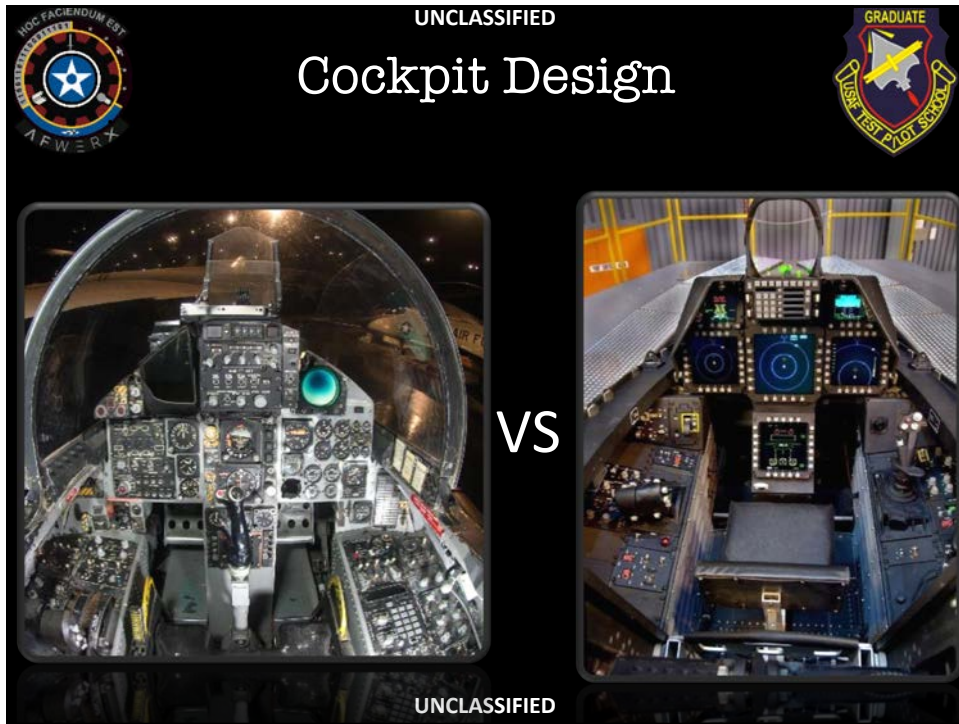
Thrust Vectoring



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Landing Mode



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This slide features a central photograph of an F-35 fighter jet on a runway. The aircraft is viewed from a front-quarter perspective, with its landing gear fully extended. The runway is marked with red lights, and a forested hillside is visible in the background under a clear sky. The slide is framed by a black border containing logos for AFWEX (top left) and the USAF Test Pilot School Graduate (top right), and the word 'UNCLASSIFIED' at the top and bottom.

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Air Refueling Mode



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This slide features a central photograph of an F-35 fighter jet in flight, viewed from a rear-quarter perspective. The aircraft is positioned to receive fuel from a large, white, funnel-shaped aerial refueling probe. The background shows a view of the Earth from above, with white clouds and blue sky. The slide is framed by a black border containing logos for AFWEX (top left) and the USAF Test Pilot School Graduate (top right), and the word 'UNCLASSIFIED' at the top and bottom.

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Limiters




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Detailed description: This slide features a central image of an F-35 fighter jet in flight against a clear blue sky. The jet is shown from a three-quarter rear view, banking slightly. The slide is framed by a black border. In the top left corner is the AFWERX logo with the motto 'HOC FACIENDUM EST'. In the top right corner is the USAF Test Pilot School logo with the word 'GRADUATE' above it. The word 'UNCLASSIFIED' appears at the top center and bottom center of the slide.


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Pilot Command System



VS



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Detailed description: This slide compares a physical aircraft with its digital cockpit interface. On the left is a photograph of an F-35 fighter jet flying through a cloudy sky. In the center, the word 'VS' is written in large white letters. On the right is a screenshot of the Pilot Command System (PCS) cockpit display, which shows various flight parameters and control elements. The display includes a heading scale at the top with '000/75' and '180' markings, a central heading indicator, and a vertical speed scale on the right with '1800', '000', and '000' markings. The slide is framed by a black border. In the top left corner is the AFWERX logo with the motto 'HOC FACIENDUM EST'. In the top right corner is the USAF Test Pilot School logo with the word 'GRADUATE' above it. The word 'UNCLASSIFIED' appears at the top center and bottom center of the slide.

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Real World Implications (Good and Bad)



- [Flight Controls Video \(Raptor Demo\)](#)
- [YF-22 Touch and Go](#)

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Questions



- [Raptor Demo](#)



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16.687 Private Pilot Ground School
IAP 2019

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