Boeing Joint Strike Fighter Virtual Reality Lab Goes On Line

Boeing has opened a new virtual reality lab that allows designers and maintainers to evaluate and test the Joint Strike Fighter (JSF) supportability in a virtual environment using the same three-dimensional modeling data used to design the aircraft.

In the virtual environment, JSF developers can "walk" around the aircraft as if it were on a flightline or carrier deck and simulate a maintenance task, such as loading a weapon or removing a part. The lab's virtual reality tools allow designers to see first-hand whether a specific maintenance task is feasible with the current design, thereby eliminating the need to build expensive hardware mockups. Virtual mockups can be updated quickly by simply loading a software program onto a personal computer.

According to George Strohsahl, Boeing JSF supportability director, the ability to bring JSF maintainers into the loop early in the design process is critical to reducing total ownership cost for the weapon system. Identifying potential supportability problems before the aircraft's configuration is frozen avoids costly redesign efforts once the weapon system is fielded.

He added that the company has integrated advanced collision detection and other cutting edge technologies into its virtual modeling environment, allowing even faster real-time visualization and problem-solving.

"With the help of the company's virtual environments, a maintainer will be able to "see" an actuator in the aft fuselage, see where it is in relation to other parts, and decide if another access door or panel is needed to get to that part," Strohsahl said. "That information can be shown to the design engineers during an interactive design review so the necessary design changes can be made much earlier in the process."

In the lab, users can either don a head-mounted display and "data gloves" to physically immerse themselves in the virtual environment, or they can choose to manipulate the actions of pre-programmed mannequins to evaluate various maintenance tasks.

By placing themselves in the virtual environment, the user can see finger movements on the display, and is able to reach out and grasp hardware, flip switches and operate a variety of support equipment. All of the lab's tools and software are commercial-off-the-shelf, which helps keep development costs down and takes advantage of the latest innovations in the commercial marketplace.

Because the graphic databases of virtual reality can be changed more quickly and at significantly less cost than actual hardware, Boeing also is exploring the use of virtual reality to train JSF warfighters. During the JSF program's concept development phase, Boeing technicians are developing a training program for loading weapons in a virtual environment to compare the effectiveness of virtual training against conventional hardware simulators.

The virtual reality lab in Seattle also is being used in conjunction with its companion laboratory in St. Louis, to conduct design reviews. In keeping with the Boeing "design anywhere, build anywhere" philosophy, participants in both labs can cooperatively work in the same shared virtual environment.

Boeing has explored the use of virtual environments for supportability assessments since 1993, and already is realizing positive results on the F/A-18E/F and other programs.

###

99-81

For further information:
Chick Ramey
(206) 662-0949