

Demonstration Proposal

Computer-Based Instruction and Reference Documentation System for the Orbit Determination Program

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JPL and Raytheon are jointly working to develop a Computer-Based Instruction (CBI) and reference system for JPL's Orbit Determination Program (ODP). The ODP is JPL's main software tool for trajectory determination in use and developed at JPL over the last 40 years to navigate and support interplanetary and earth-orbiting space missions.

New navigators traditionally acquire experience and instruction with the ODP through 'on-the-job' training under the tutelage of expert senior staff. This method has proven successful with JPL's significant record of achievement in navigation, even while placing a burden on senior staff who need to dedicate their primary efforts to current and future flight projects. Mentoring new personnel, while a critical function, is also time consuming, and thus tools to aid this task are of great value. It is necessary to capture the first generation of interplanetary navigators' legacy accomplishments and experience for the reference and guidance of future navigators. Faster and more frequent missions compound the problems of workload and staffing requirements with the demand to maintain an informed workforce.

The proposed solution is to produce a computer-based instruction and reference documentation system for both new navigators and expert users that captures best practice methods on how to run the ODP software. Full utility of the tool will allow instruction for novice navigators while providing detailed reference for experts in everyday use. The proposed solution is a web-based distribution interface that allows linkage to the existing documentation with simplified maintenance, updating, configuration control and accessibility. This web-based interface allows parallel browse, search and indexing features with dramatically more flexibility and cost-focus over traditional CD-ROM based delivery methods. An added benefit is that the web system becomes an inherently portable document format.

The CBI for ODP will contain descriptive "how to" methodology for each model or process in the ODP. The emphasis is on how to perform explicit tasks and not the underlying theory that is well addressed by existing documentation. The system will contain examples and exercises showing process flow, program inputs and outputs, full description of input parameters and output messages, and a descriptive troubleshooting section to de-mystify common pitfalls, mistakes and error messages.

We will demonstrate the prototype web interface system with the latest content and updates (refer to the screen shot image below). The interface follows a common web-based help paradigm using a menu of pages or topics and incorporates Index and Search menus to allow the user to navigate the reference content.

Although nothing should remove the valuable interaction with the experience of JPL navigators, the proposed CBI serves to augment the existing legacy of expert navigators acting as an aid to both current and future navigation staff. Collecting, structuring and distributing the history of knowledge gained over the last 40 years are formidable tasks.

