

# Mission Control Technologies Project

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The Mission Control Technologies (MCT) project is a collaborative effort between NASA Johnson Space Center and NASA Ames Research Center to develop and deploy new user interface software to support real-time spacecraft mission operations. MCT provides a unique object-oriented method to manage data—vehicle telemetry, analysis data, archived information, and more—in an intuitive manner that increases the efficiency of the spacecraft operator. As compared to off-the-shelf tools, the MCT technique literally reverses the way in which operators interact with their tools, making the tools organize the data in the same way that the operator thinks of that data.

MCT provides users with the reusable building blocks necessary to assemble user interfaces in whatever form and organization they need (figures 1 and 2). A user can grasp the basic capabilities provided by MCT in minutes. MCT also provides industry standard plug-and-play interfaces that allow the software to be used in multiple facilities and by multiple organizations. The software components that make up MCT can be separately tested

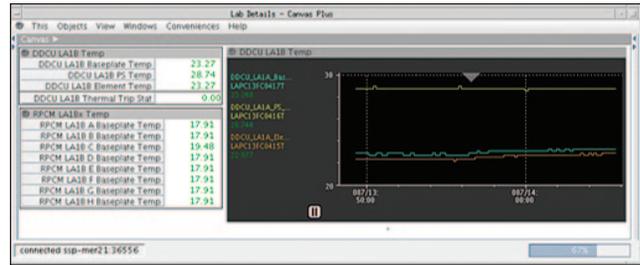


Fig. 2. Viewing International Space Station data in Mission Control Technologies.

and certified without requiring costly recertification of entire applications. MCT's architecture allows both easy integration of data from multiple sources and a cost-effective means to update the ways in which users view that data. MCT components will support vehicle telemetry monitoring, spacecraft commanding, ground-based performance analysis, and other operations functions. Separate development projects can use MCT to build other capabilities such as electronic procedure authoring and execution tools, and facility operation user interfaces.

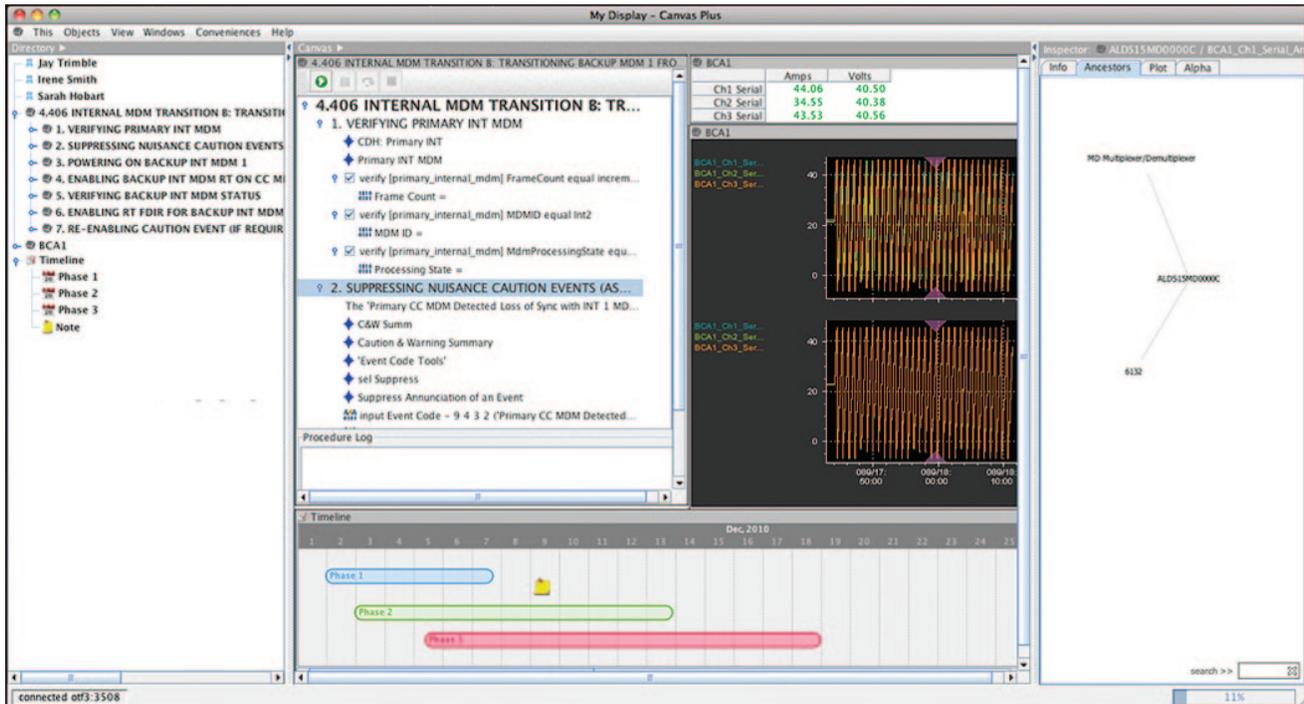


Fig. 1. A variety of software components available in the Mission Control Technologies toolkit.



Fig. 3. Collaborative design of Mission Control Technologies capabilities.

Since 2006, Johnson Space Center and Ames Research Center have worked together to define and develop this technology, teaming spacecraft operations personnel directly with user experience designers and software developers in a unique teamwork environment. To define the requirements and design for software deliveries, the team analyzes the processes through which users interact with their software tools and identifies the “pain points” and potential inefficiencies in those processes. From this research, the team first defines more efficient processes and then determines the requirements and design implementations necessary to support those processes (figure 3).

The first operational version of MCT is undergoing integration into the Mission Control Center, with future deliveries expanding MCT’s capabilities. By the end of 2012, MCT will replace multiple legacy software tools with a more streamlined and extensible toolset supporting the International Space Station and future spacecraft operations. Other NASA centers are investigating use of MCT to meet their operational needs as well.