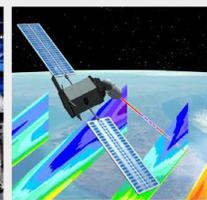
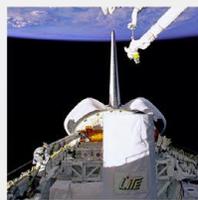
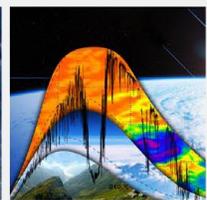
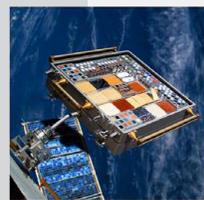
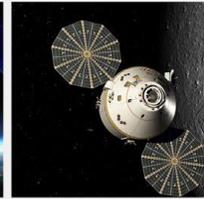
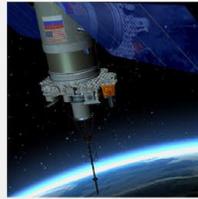
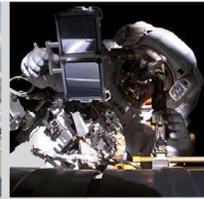




# Engineering Directorate

## NEWSLETTER

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### Check it out!

The ED Website:  
<http://engineering.larc.nasa.gov/>

Watch the NEW  
Engineering Channel.  
LaRC Digital TV Channel 37.2.  
Videos updated Monthly.

### ENGINEERING DIRECTOR'S NOTE

Recently, the Engineering Directorate (ED) demonstrated their unique, innovative, and integrated core capabilities. These capabilities enabled ED to improve products or processes and demonstrate value to the concurrent design and fabrication of a 37.7% scale KIOWA helicopter wind tunnel model.

ED's Technical Services (TS) collaborated with the Army, engineering, contractors & LaRC's 14' x 22' test facility specialists to turn the idea of a 37.7% KIOWA helicopter into a reality. Of significance, this is the one of the most complex models the TS has fabricated, and it includes 348 data acquisition instruments (i.e. pressure transducers, strain gauges, and accelerometers). TS assumed responsibility to fabricate the model knowing the significant risks inherent in concurrent design and fabrication, along with meeting an aggressive schedule. Of note, TS was involved early in the model project-planning phase, and was instrumental in helping to formulate efficient fabrication methods and recommend model materials. Ultimately, the success of the model is attributed to the effective coordination and collaboration of tasks among 80 in-house civil servant employees, as well as support from three Contractors (i.e. STC, Modern Machine & Vision Machine). Of note, the model fabrication drew from 15 different types of fabrication processes all integrated to create the finished model. A partial list includes composites, metal machining, digital manufacturing, welding, instrumentation, and in-process quality assurance. To effectively schedule and track the complex model, TS recently implemented an electronic scheduling system, E2. This system enabled TS to track the progress of hundreds of parts and timing of completed components in order to assure successfully delivery.

Of significance, unlike the conventional method of building a model from molds starting with the skins and then building the model inward, the KIOWA model was built on a replica test facility balance beginning with the inner most components and building outward. The model was required to be built on a compound angle, slightly pitched and rolled adding an additional challenge. The accuracy of the build was verified during each step using a laser. This fabrication method, combined with post model delivery support, assured accurate re-assembly of the model in the test facility and without delays. In conclusion, this high risk, concurrent design and fabrication model was completed on schedule, albeit approximately four months from receipt of the first drawing. The model was delivered on July 22, 2011.