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## DTS's Data Acquisition Systems Play Key Role in Helping Improve Aircraft Crash Performance

**Seal Beach, CA (Nov. 2014)** – Aircraft impact testing and hard landing tests are an important part of research for understanding crash dynamics and improving occupant safety at NASA Langley Research Center in Hampton, Virginia.

For over 13 years, DTS ([Diversified Technical Systems, Inc.](http://www.dtsweb.com)) small on-board data acquisition (DAS) systems have been an important component to many tests at Langley, since they are rugged enough to survive harsh impacts and still accurately deliver critical test data.

Recently a 45-foot-long CH-46E Sea Knight marine helicopter was dropped 30 feet at 30 miles an hour during the Transport Rotorcraft Airframe Crash Testbed (TRACT 2) full-scale crash test at NASA Langley's Landing and Impact Research (LANDIR) facility.

The helicopter had 13 instrumented crash test manikins and two non-instrumented manikins on board, along with DTS's data acquisition systems to capture all the action. Cables hauled the helicopter fuselage into the air and then swung it to the ground, much like a pendulum. Just before impact, pyro-technic devices released the suspension cables from the helicopter to allow free flight of the 10,500-pound fuselage and its "passengers."



*Technicians at NASA Langley hoisted the 10,500 pound helicopter instrumented with data recorders and 15 test manikins 30 feet into the air before dropping it at 30 mph.*

*Photo courtesy of NASA Langley/David C. Bowman.*



*Crash test manikins designed to measure human injury and survivability were equipped with sensors and DTS TDAS G5 data acquisition systems to record the valuable test data.*

*Photo courtesy of NASA Langley/David C. Bowman.*



Nearly 40 cameras and 350 data channels recorded every move. Even the helicopter's unusual black and white speckled paint job was part of a special camera technique called full field photogrammetry designed to capture detailed movement. High-speed cameras filming 500 images per second track each dot so researchers can see exactly how the fuselage buckled, cracked or collapsed under crash loads.

"We are looking for ways to make helicopters safer so they can be used more extensively in the airspace system," said Rotary Wing Project Manager Susan Gorton. "The ultimate goal of NASA rotary wing research is to help make helicopters and other vertical take off and landing vehicles more serviceable -- able to carry more passengers and cargo -- quicker, quieter, safer and greener."

Currently NASA uses DTS's miniature on-board DAS at four different facilities for a wide variety of dynamic tests including Orion space capsule re-entry splash down testing, heavy payload and flight testing, aero brake testing, and low density supersonic decelerator testing for the next generation Mars landing.

For more information on DTS's data acquisition systems, visit [www.dtsweb.com](http://www.dtsweb.com) or contact [sales@dtsweb.com](mailto:sales@dtsweb.com).

### **About DTS**

Founded in 1990 by three crash test engineers, DTS data recorders and sensors are used worldwide in crash, blast and biomechanics testing by top automakers, aerospace and leading research facilities. The U.S. Army named a DTS helmet sensor that records head forces in an effort to improve soldier safety and reduce traumatic brain injuries as one of "The Greatest Inventions." *Inc. Magazine* has named DTS three times as one of the fastest-growing private companies in the U.S. Based in Seal Beach, California, DTS has technical centers in Michigan, Australia, China, U.K. and Japan.

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