

Innovative avionics enable search for habitable planets

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The search for habitable planets continues with the March 6 launch of the Kepler spacecraft, the latest in NASA's series of low cost, highly focused Discovery missions. Kepler, built by Ball Aerospace & Technologies Corp., includes redundant avionics systems designed and built by Southwest Research Institute (SwRI) to help guide and control the spacecraft as it stares deep into space, watching for planets orbiting stars.

SwRI's avionics suite is equipped to control [spacecraft](#) attitude, thermal management and power distribution. SwRI also produced the emergency mode spacecraft computer and a redundant command and telemetry system for spacecraft-to-ground communications. With Kepler's launch, SwRI maintains a track record of more than 50 spacecraft system launches with no on-orbit failures.

The [Kepler](#) mission is set to determine the number of Earth-like planets in the galaxy by looking for planets in the "habitable zone" around stars. Earth maintains an orbit in the habitable zone around the Sun where water can maintain its liquid state, allowing the diversity of life on Earth. The spacecraft watches for tiny flickers in the brightness of a star that could indicate a planet passing in front of it.

Kepler will make hourly observations for upwards of four years in an earth-trailing, heliocentric orbit. It will observe a broad region of the summer-time sky between the constellations Cygnus and Lyra using a photometer to measure the brightness of stars.

SwRI's hardware takes advantage of historically proven designs from previous [NASA](#) missions, including the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) mission, the Swift Gamma Ray Observatory and the Deep Impact Discovery mission.

"It's a question of focusing resources on core capabilities, which, for our organization, includes the design and manufacturing of spacecraft command and data handling systems," says Buddy Walls, manager of Avionics Systems in the SwRI Space Science and Engineering Division. "Leveraging our capabilities allows spacecraft vendors to focus on the mission issues and overall spacecraft architecture without supporting yet another internal design staff."

In addition to offering spacecraft avionics and computers, the SwRI staff has extensive expertise in spacecraft instruments, theoretical and observational studies, space plasma physics, data analysis and science support, planetary exploration and stellar astronomy.

More information: Kepler is a NASA Discovery mission. NASA Ames Research Center, Moffett Field, Calif., is the home organization of the science principal investigator, and is responsible for the ground system development, mission operations and science data analysis. Jet Propulsion Laboratory, Pasadena, Calif., manages the Kepler mission development. Ball Aerospace & Technologies Corp. of Boulder, Colo., is responsible for developing the Kepler flight system and supporting mission operations. For more information about the Kepler mission, visit <http://www.nasa.gov/kepler>.

Source: Southwest Research Institute

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