



Launch Services Program presents...

GRAIL

The Gravity Recovery and Interior Laboratory (GRAIL), will launch on a Delta II Heavy Launch Vehicle and use high-quality gravity field mapping of the moon to determine the moon's interior structure. GRAIL consists of two spacecrafts that will fly in tandem orbits around the moon for several months to measure its gravity field in great detail. GRAIL's primary science objectives will be to determine the structure of the lunar interior, from crust to core and to advance understanding of the thermal evolution of the Moon. GRAIL will also extend knowledge gained from the Moon to the other terrestrial planets. The new information that will be obtained will help when targeting a landing site for any future missions. Each spacecraft will carry multiple cameras onboard to document their views and to allow students and the public to view observations from the satellites.

Some of GRAIL'S Objectives will be the following:

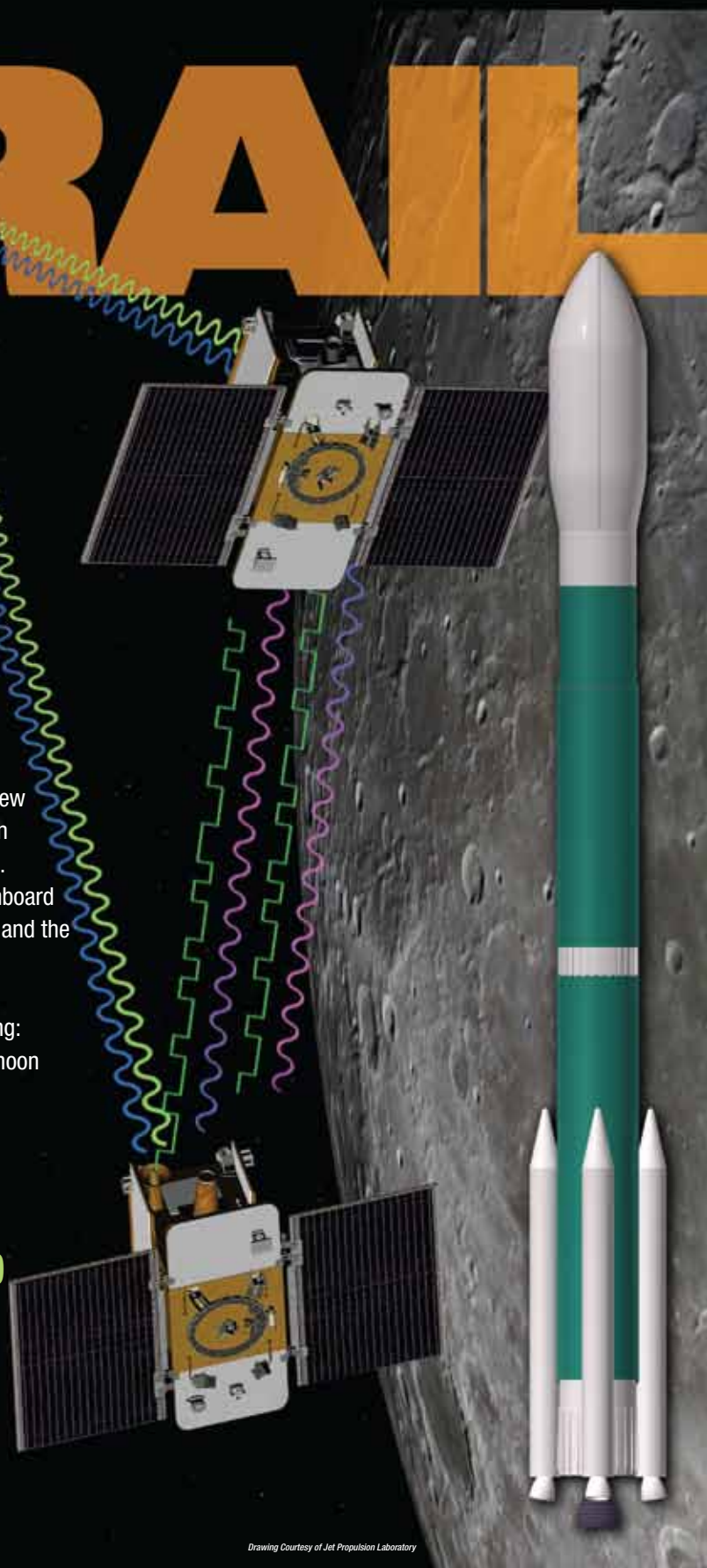
- Understanding the thermal evolution of the moon
- Determine the entire structure of the moon
- Provide a high resolution global gravity field
- Provide history of collisions with asteroids
- Determine desirable landing sites

Launch Vehicle: Delta II 7920H-10

Launch Location: Cape Canaveral

Air Force Station, FL

Launch Date: 2011



GRAIL

The GRAIL spacecraft is scheduled to launch side-by-side aboard a United Launch Alliance (ULA) Delta II 7920-10 Heavy rocket from Cape Canaveral, Florida, in 2011. The Delta II 7920H has nine graphite epoxy strap-on solid-rocket motors and the spacecraft is integrated in a 10 foot (3-meter) diameter composite payload fairing to protect the spacecraft during launch. GRAIL's short mission duration (270-days) includes a 90-day gravity mapping Science Phase.

Ka Band Ranging (DBR):

Tells the spacecraft (SC) how far apart they are from each other (down to the micron)

Low Gain Antenna (LGA):

Transmits data from the SC to earth

MoonKam (MK):

Education/Public Outreach camera where students can command image collection

Solar Array:

Collects Solar Energy power for the SC

StarTracker:

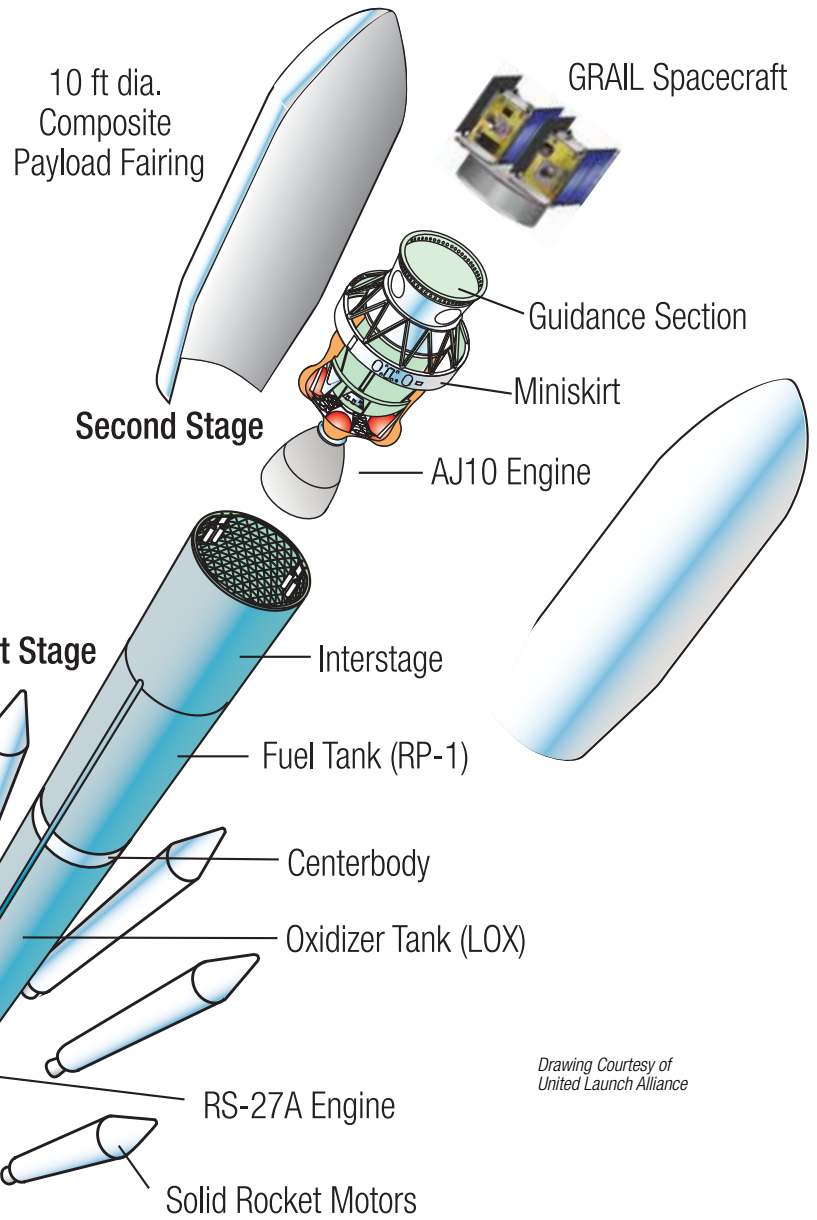
Tells the SC where they are oriented in the sky

Sun Sensor:

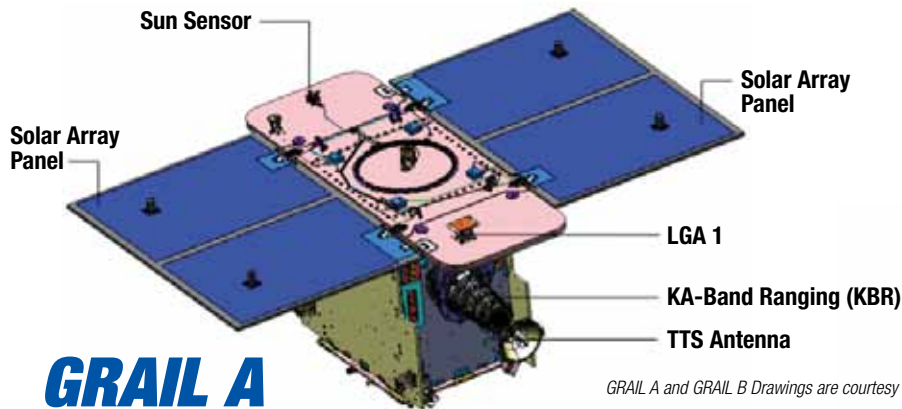
Gives the SC orientation relative to the sun

Time Transfer System (TTS) Antenna:

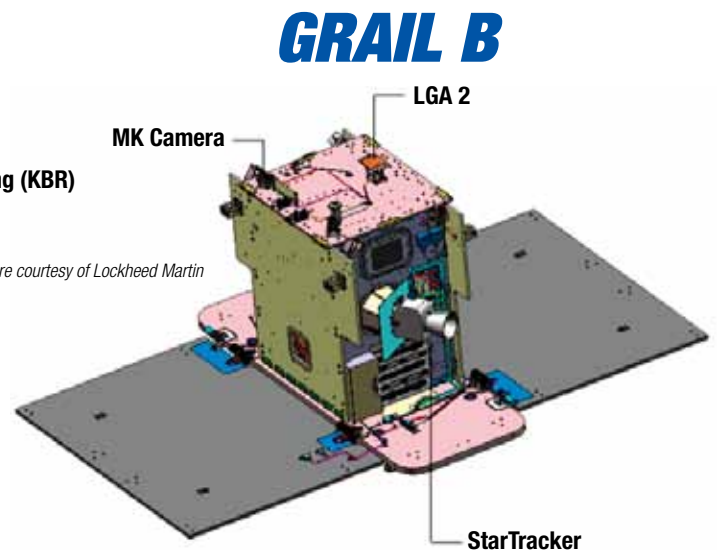
Keeps the two SC in sync



Drawing Courtesy of United Launch Alliance



GRAIL A



GRAIL B

GRAIL A and GRAIL B Drawings are courtesy of Lockheed Martin

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