Deceleration Subsystem (DSS) Drogue Parachute Drop Test (DDT-2): The second drop test of the new Ares I First Stage booster drogue parachute was successfully conducted at the U.S. Army's Yuma Proving Grounds (YPG) in Yuma, Arizona, on February 28. The 68-ft diameter parachute, attached to a 50,000-lb Jumbo Drop Test Vehicle (JDTV), was extracted from an Air Force C-17 aircraft at an altitude of 25,000 ft. After extraction from the aircraft, the JDTV was allowed to descend under a 12-ft diameter programmer parachute to an altitude of approximately 15,000 ft and a targeted dynamic pressure of 400 lb/ft^2 for initial deployment and inflation of the drogue test parachute. All parachute systems performed as designed and all hardware and parachute systems were recovered from the drop zone without damage. All onboard and range instrumentation and video data was recorded and is currently being processed. Early indications are that all test objectives have been met.

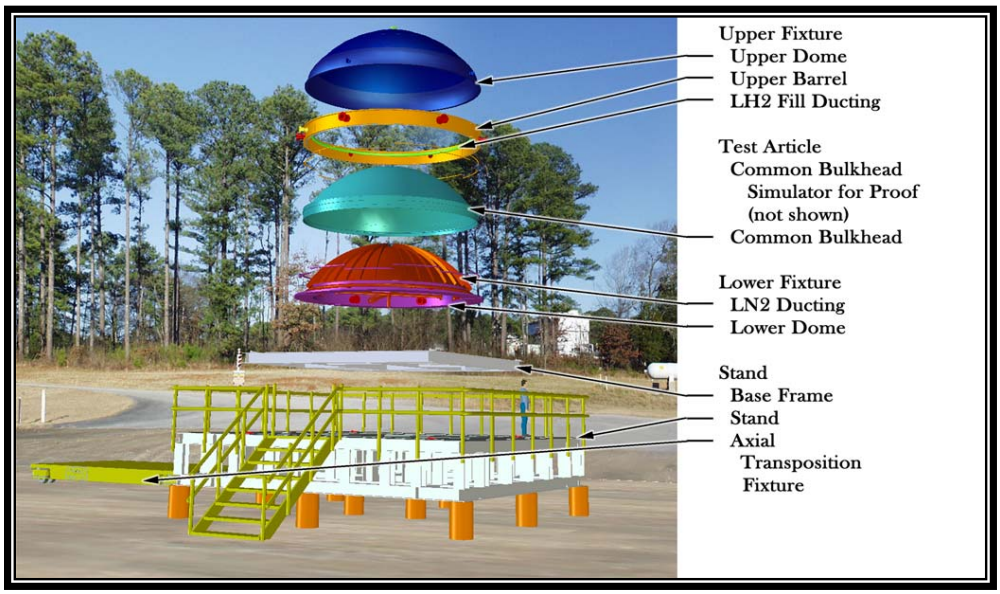
Dart Release from Cradle Extraction System (CES)

Dart on the Ground with the FS Recovery Parachute

Recent activities specific to the Elements include:

- **Upper Stage (US)**
  - ***US Integration Test Subsystem:*** An Initial Lay Out Review (ILOR) for the Ares I Upper Stage Common Bulkhead proof pressure test fixture was successfully completed on February 26 at Marshall Space Flight Center (MSFC). The Common Bulkhead proof test fixture is a complicated set of tooling that will be capable of testing the 18-foot diameter metallic and composite structure of the Common Bulkhead with pressurized cryogenic fluids (Liquid

Hydrogen (LH2) or Liquid Nitrogen (LN2). Participants from MSFC, Glenn Research Center (GRC), and Boeing participated in the review. Preliminary test requirements, fixture designs, and structural and thermal analyses were reviewed, along with assembly procedures and transportation plans. A depiction of the Common Bulkhead proof test fixture revealing its major components is provided below. The view is superimposed over the proposed test site near Test Stand 500 in the MSFC East Test Area. A second depiction below shows the fixture in its assembled test configuration. The team is hoping to complete the final design of the proof test fixture by April 2. Once the design is complete, fixture fabrication/procurement activities will commence.



Bulkhead Proof Test Fixture

Common Bulkhead Proof Test Fixture in its Assembled Test Configuration

- ***US Thrust Vector Control (TVC) Subsystem:*** Progress has been made on the TVC 2-axis rig assembly. Four diagonal braces were installed between the thrust cone and the base of the 2-axis rig. Final grouting of the base to the foundation was completed, followed by the final concrete pour around the base to form the foundation. Prior to the foundation pour, below-grade electrical conduits were put into place.

TVC 2-Axis Rig with Diagonal Braces Installed

TVC 2-Axis Rig After Final Concrete Pour

- ***TVC Engineering Model Accumulators Arrive:*** Three TVC Engineering Model hydraulic accumulators from Tara Technologies in Daytona Beach, Florida, arrived at NASA Glenn Research Center (GRC) on February 24. Two of these accumulators will be used for the build-up of the full TVC Engineering Model system on the 2-axis rig later this summer.

TVC Engineering Model Hydraulic Accumulators

- **Flight and Integrated Test Office (FITO) and Ares I-X**

  - ***Ares I-X Roll Control System (RoCS) Element:*** Activities specific to the RoCS Element include:

    - By mutual agreement to allow more data review time, the RoCS (incremental) Acceptance Review date has been moved to March 10. The fairing stiffener and fastener concept is being run back through ATA for stress contour verification before proceeding

to final design at Teledyne. Titanium and rivets are on order in anticipation of a successful review. A draft informational/status briefing has been distributed to meet Kennedy Space Center (KSC) Resolution Action Center Action Item #53, discussing the fairing fix concept and roles and responsibilities for execution.

- A Peacekeeper (PK) Booster Cartridge disassembly shop router is being drafted at Teledyne in order to get to the propellant to do a chemical assay, in support of a PK ordnance waiver.
- Another fill valve cap weld route sheet was delivered to KSC, but comments to it continue to come in to Teledyne.
- The Change Request for transferred work to modify the RoCS drop hazard Mat Frames to correct interference with the interstage doubler "nozzles" was presented and approved at the Ares I-X Control Board (XCB).
- Verification closure and preparation of RoCS Verification Requirements Document (Version 2.0) continues.

- ***Test Stand (TS) 4550 – Facility Modifications:*** Working platforms are being installed to facilitate the inspection of certain existing connections of Test Stand 4550 steel members. Approximately 75 structural connections are of interest. This effort focuses on the structural steel connections that are associated with the roof derrick crane load path to be used for the stacking of Integrated Vehicle Ground Vibration Test (IVGVT) test articles. Required repairs are then made to those connections that require attention. This effort is well underway and is approximately 25% complete, with a target completion by this fall.

Structural Connections on TS 4550

- **Project Integration (PI)**

  - ***Ares Education Outreach:*** The Ares Projects outreach team supported a video shoot on February 23–27 by The Futures Channel for six education-related micro-documentaries to be posted on the outlet's website (www.futureschannel.com). The Futures Channel was founded in 1999 with the goal of using new media technologies to create a channel between scientists, engineers, explorers, and visionaries shaping the future and students who will one day succeed them. These videos are designed to be used by educators to enliven curricula, engage

students, and otherwise enhance the learning experience. The Ares outreach team leverages communications media such as The Futures Channel to extend and magnify its traditional outreach efforts.

The Ares Projects looks forward to the First Stage Cluster Drop Test in April.

…and as of this Ares Projects Weekly Summary, there are only 127 days until the first Ares I test flight, Ares I-X!!!