Using The Advanced Multi Mission Operations System (AMMOS)

The AMMOS is a NASA resource developed to reduce the cost and/or risk in:

- **Developing the Mission Operations System**
- **Conducting Mission Operations**

William Knopf
Program Executive for AMMOS/PDS/NSSDCA/Cassini/GRAIL/Mission Operations
Planetary Science Division, Science Mission Directorate, NASA HQ
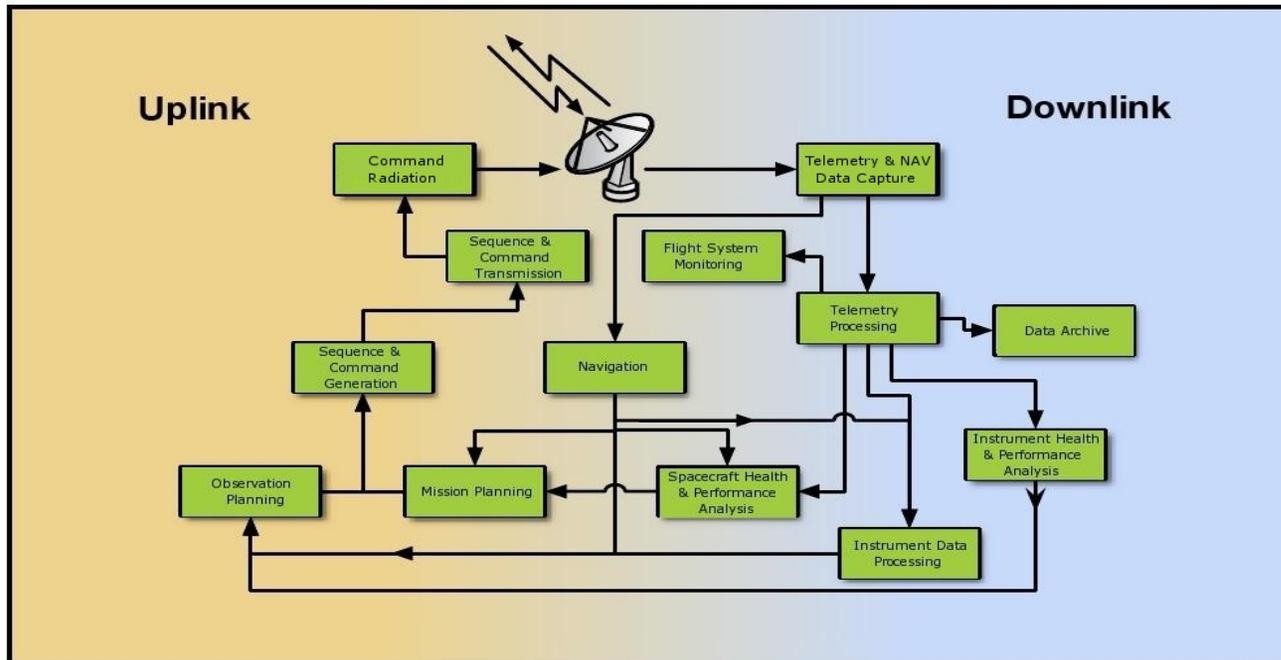
Andrew Dowen
Project Manager for AMMOS
JPL

Carole Boyles
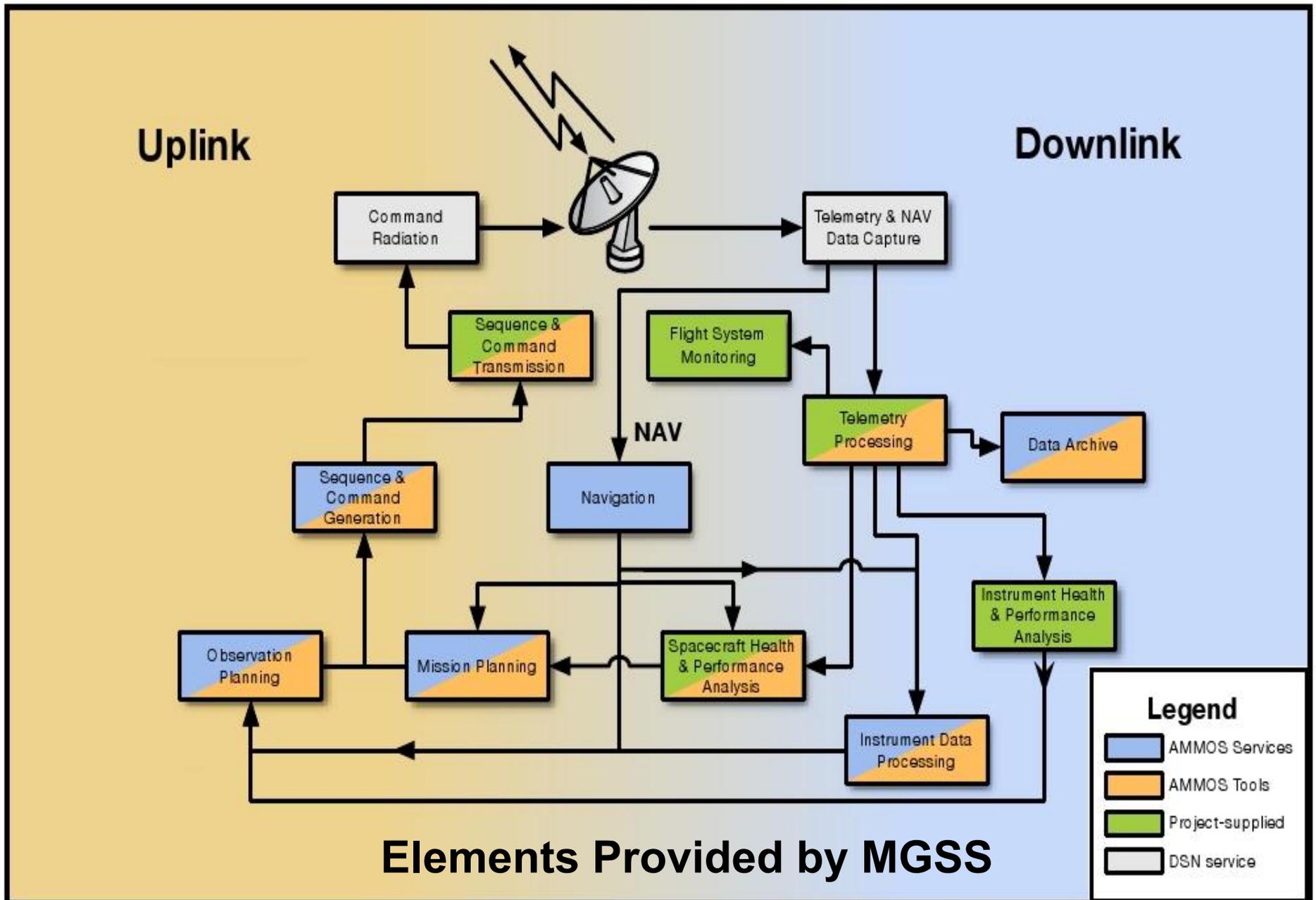*Deputy Project Manager for AMMOS*
JPL

Background

A typical decomposition of an MOS into Functional Elements is shown below

The **AMMOS is based upon a simple idea:**

Provide a common core set of Mission Operations System capabilities (tools and services).

Allows the mission to shorten development/test time & cost for inherited capabilities and focus development on mission unique capabilities.

Elements Provided by MGSS

MGSS Business Model

- Multi Mission Ground System and Services (MGSS) Office is the NASA Program Office responsible for the AMMOS.

- AMMOS tools and their lifetime maintenance are funded by the NASA Science Mission Directorate, Planetary Science Division and are available *free of charge* to all missions

- Each Flight Project funds the cost to adapt the AMMOS tools (e.g. CMD and TLM dictionaries, flight rules & constraints, etc.) as needed

- NASA HQ/PSD strongly encourages the use of AMMOS tools when appropriate for your ground system solution.

AMMOS Contributions

- AMMOS tools and services contain contributions and collaborations from the NASA community including (but not limited to) the following:

  - AMES, JHU/APL, JPL, GSFC, MSFC.

Contacts for AMMOS

- Website: http://AMMOS.jpl.nasa.gov

- Contact MGSS Program Office at: ammos_info@jpl.nasa.gov , or
  - William.knopf-1@nasa.gov   (202) 358-0742
  - Andrew.z.dowen@jpl.nasa.gov   (818) 354-8191
  - Carole.a.boyles@jpl.nasa.gov   (818) 393-6991

Mission Timeline for Teams with MGSS

- Competing missions contact MGSS during the Proposal phase to take advantage of inheritance and Cost/Risk benefits

- Non-Competing missions contact MGSS in Pre-Phase A

- By the end of Phase B, flight projects have a good understanding of the schedule and product deliveries desired by MGSS. This commitment of schedule and products is translated into a Service Level Agreement (SLA).

- MGSS supports missions from inception through Phase E of the mission

Collaborations between MGSS and PDS

- MGSS and PDS have strengthened their collaboration to further mutli-mission support by:

  - Addressing the data processing gap between mission data and development/delivery of products to PDS

  - Provide multi-discipline / multi-mission tools across the PDS and flight projects

- MGSS developed a tool called "AMMOS PDS Pipeline Service" (APPS) to automate the PDS data delivery process. The tool includes:

  - Label Design

  - Transformation

  - Validation includes both XML and JSON reports

  - Bundling

- The APPS tool is current being used by the InSight Project

AMMOS Collaboration with PDS
APPS Pipeline View

PDS4 Model

APPS

Label Design Tool (LDT)

Transformation Service

Validation Service

Report

Bundle Builder

Mission Label

Template

Data + Label

Product SIS

Product Generator

PDS Archive(s)

Legend: APPS Component | Mission Component | PDS Component