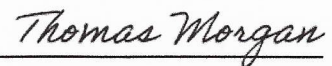


Letter of Understanding between the
PDS Cartography and Imaging Sciences Node and the
NASA Space Science Data Coordinated Archive for the
archiving MRO Raw Telemetry Data

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Approved by:



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CC: Cerese Albers, PDS/NSSDCA Program Executive, NASA HQ

Introduction

This is a Letter of Understanding (LOU) between the NASA Space Science Data Coordinated Archive (NSSDCA) and Planetary Data System's (PDS) Cartography and Imaging Sciences Node (CIS, aka "Imaging Node") at the Jet Propulsion Laboratory (JPL), California Institute of Technology. This LOU documents the roles for acquiring, managing, and preserving raw telemetry data from NASA's Mars Reconnaissance Orbiter (MRO) mission. It may be amended by mutual agreement.

MRO has returned data since launch on 12 August 2005. CIS has a long-standing agreement with the MRO science team and the MRO Raw Science Data Server (RSDS) to preserve compressed, raw telemetry data that cannot be formally archived by PDS due to its compressed format. Originally designated as a "safed dataset" around 2006 under Julia Henricks' leadership, this preservation effort maintains the data as originally created in compressed format. CIS currently holds about 29 TB of this non-PDS-formatted data and continues to receive new RSDS data about 3 to 4 times a year.

The PDS, established in 1990, is NASA's active archive for lunar and planetary digital data in PDS format from NASA missions, astronomical observatories, and laboratories. PDS handles data acquisition, management, dissemination, preservation, documentation, validation, and catalog management.

The NSSDCA was created in 1966 as NASA's primary static archive for space and Earth science data. It manages top-level data functions across all SMD space science programs and handles selected discipline-specific responsibilities through mutual agreements with relevant SMD divisions. Since the mid-1990s, NSSDCA has served as PDS's permanent deep archive under their [13 May 2016 Memorandum of Understanding \(MOU\)](#), which governs the deliveries of archived PDS-formatted data products from PDS to NSSDCA.

This LOU supplements the existing PDS/NSSDCA MOU to enable delivery of MRO's non-PDS-formatted, compressed, raw telemetry data from CIS to NSSDCA for long-term preservation.

Responsibilities

PDS CIS

- CIS shall organize the MRO raw telemetry data by time.
- For each delivery of MRO data, CIS shall:
 - Generate an XML-formatted manifest by executing the following actions:
 - Internally stage a directory tree, containing one or more target designations, and
 - Execute the NSSDCA-provided `xman` software (2026 version which generates only MD5 checksums) in generic mode on the directory tree;
 - Compute the MD5 checksum of the resulting XML-formatted delivery manifest; and
 - Make the directory tree, the XML-formatted delivery manifest, and the file containing its checksum available to the NSSDCA for downloading.
- CIS shall make intermittent deliveries instead of all at once and alert NSSDCA accordingly. Each delivery should be limited to approximately 5 TB or less.
- CIS shall prepare a detailed data description document or data users guide for this archive; provide or cite documentation on how to decompress the raw telemetry; and provide or cite documentation on the format(s) of the uncompressed data.
- CIS may assign a DOI to these data.
- CIS may request the NSSDCA return one or more deliveries, *e.g.*, CIS needs to restore data to an identical directory structure in the case of a device/machine failure.
- CIS may request testing the `xman` software, in coordination with the NSSDCA, for a sample delivery before production deliveries begin.

NSSDCA

- NSSDCA shall open a data collection in the [NSSDCA Master Catalog](#) for this archive and provide the ID to CIS.
- For each delivery, NSSDCA shall:
 - Confirm the MD5 checksum of the XML-formatted delivery manifest;
 - Download (ingest) the data and verify MD5 checksums against those provided in the delivery manifest;
 - Notify CIS that NSSDCA has ingested the data and accepts archival responsibility;
 - Write two copies to tape; and
 - Notify CIS after the data have been written to tape.
- NSSDCA may request testing the `xman` software, in coordination with the CIS, on a sample delivery before production deliveries begin.
- NSSDCA shall provide guidance to CIS personnel for downloading, installing, and executing the `xman` software (2026 version) in generic mode.
- If CIS requests a delivery be returned, NSSDCA shall retrieve the associated tape(s); electronically stage the data in the format and directory structure it was provided; and notify CIS.
- NSSDCA shall negotiate with the CIS any amendments to this LOU, as needed.