Letter of Understanding
between the
Planetary Data System's Small Bodies Node
and the
NASA Space Science Data Coordinated Archive

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1   INTRODUCTION

This is a Letter of Understanding (LOU) between the NASA Space Science Data Coordinated Archive (NSSDCA) and Planetary Data System's (PDS) Small Bodies Node (SBN) at the University of Maryland. It documents the roles of those organizations in the acquisition, management, dissemination, and long-term preservation of pre-archive planetary radar data from the Arecibo Observatory. This LOU may be amended as a result of further agreements between the NSSDCA and SBN.

After the Arecibo Observatory was decommissioned in 2020, the planetary community requested data acquired by the planetary radar system be preserved long term. The Lunar and Planetary Laboratory (LPL) at the University of Arizona holds the pre-archive planetary radar data and plans to use these data as the source for producing a bundle of processed, PDS-compliant products to be archived in the PDS. SBN is supporting this effort and presently holds a copy of the pre-archive data as an off-site backup for LPL. After LPL completes the PDS archive, SBN will delete their copy of the pre-archive data. To ensure there is an off-site backup of the pre-archive data, NSSDCA agreed to accept these data into its permanent, deep archive.

The pre-archive planetary radar data consist mostly of asteroid observations from the mid-1990's onward and include other planetary targets, *e.g.*, Mercury, Saturn satellites, as well as some non-Arecibo data. Data are FITS files or binary .rdf files, a radar format, and are organized by target designation. The pre-archive package also contains ancillary files associated with various stages of data collection.

The PDS was established in 1990. As an active archive within the NASA Science Mission Directorate (SMD) environment, the PDS is responsible for the acquisition, management, dissemination, and preservation of lunar and planetary digital data from NASA planetary missions, astronomical observations, and laboratory measurements. The PDS is also responsible for the definition, documentation, and validation of the contents of its archive and the management of its catalog.

The NSSDCA was created in 1966 as NASA's only archive for space and Earth science data. It is presently responsible for top-level data management functions that span all space science programs in the SMD scientific disciplines, and for selected discipline-specific responsibilities as defined by mutual agreements between the NSSDCA and the relevant SMD program division. Since the mid-1990's, the NSSDCA has maintained the permanent, deep archive for the PDS, as prescribed by the [Memorandum of Understanding (MOU) between the PDS and the NSSDCA dated 13 May 2016](). This MOU governs the delivery of archived data products from the PDS to the NSSDCA.

This LOU supplements to the PDS / NSSDCA MOU to describe the delivery pre-archive Arecibo planetary radar data from SBN to the NSSDCA.

2   RESPONSIBILITIES

2.1 SBN

- SBN shall remove non-Arecibo data and personally identifying information from their copy of the pre-archive planetary radar data before electronically transferring to the NSSDCA. The total data volume is ~70 TB.

- SBN shall organize the scrubbed data by target designation and determine if ancillary files related to data collection should be included.

- SBN shall generate a manifest for each delivery. This requires SBN to:
    - Internally stage a directory tree, containing one or more target designations, for each delivery.
    - Run NSSDCA-provided xman software in generic mode on a directory tree to generate the required manifest.
    - After the manifest is generated, zip the directory tree, compute the checksum, and post on a password protected server, setup by SBN, for NSSDCA to pull.
    - Alert NSSDCA when a zip file is posted and provide its checksum and the manifest.
    - SBN shall make intermittent deliveries instead of all at once.

- SBN shall provide samples for the NSSDCA to test its xman software.

- SBN should prepare a detailed dataset description document for these data and include or cite a document that describes the .rdf format if available.

- SBN may assign a DOI to these data.

2.2 NSSDCA

- NSSDCA shall open a collection in the NSSDCA Master Catalog and provide the ID to SBN.

- NSSDCA shall test its xman software on samples provided by SBN before production deliveries begin.

- For each delivery, NSSDCA shall:
    - Pull each delivery zip file from SBN's designated server.
    - Unzip and confirm checksums against the manifest.
    - Transform the delivery into Archival Information Packets (AIPs) and notify SBN that NSSDCA accepts archival responsibility.
    - Write the AIPs to archival tape for permanent preservation.
    - When done, notify SBN that NSSDCA has archived the delivery to tape.

- NSSDCA shall distribute these data, as requested, after SBN deletes their copy.
- NSSDCA shall electronically return the data to SBN, if requested.
- NSSDCA shall negotiate with the SBN any amendments to this LOU, as needed.