# Space Mission Digital Target of Preservation Proforma (DTOPP) Checklist

## Introduction

This document supplies a checklist for a space mission, program, or project (hereafter referred to as simply “mission”) to document the policy which is implemented by that mission’s program/project management concerning what data is important enough to be preserved in the long term[[1]](#footnote-1), past the “event horizon” of system/software obsolescence. Proforma assumes the conventional business communications [definition](https://dictionary.cambridge.org/us/dictionary/english/pro-forma); an example to show how other documents of the same type should be written or prepared.

This DTOPP Checklist is an example intended to be used generally by an organization to tell the mission participants (stakeholders, customers, contractors, subcontractors, etc.) which digital data under this space mission program/project should be prepared for preservation. For example, when a certain data type is identified as a preservation target, subcontractors will know that they shall preserve adequate metadata or executable application software so that the data will be retrievable and understandable in the long term. Basically, this checklist is a coordination tool to ensure that ***failures*** to preserve mission products and information are made by a conscious choice of the mission management rather than by oversight.

The intention is that program management for the mission, in concert with their legal counsel and records manager, will establish this list during the pre-phase A (earliest) stage of the program, and will indicate by checkmarks the types of data that they expect to be preserved throughout the mission, and after mission termination. Concurrently, program management will then know what funding and resources to establish for the gathering of metadata, establishment of migration strategy, or arrangements for long-term hosting of applications as long as the object data is intended to be retrievable. It will also cause management to address strategies for turnover of long-term preservation object data to post-mission establishments (organization CIO, national archives, etc.) for long term preservation of that object data after mission termination.

 This DTOPP Checklist is intended to be formatted in a manner and in a sufficient level of detail that missions can use as attachments for contracts and other program/project management vehicles. If a mission finds portions of the checklist unsuitable, the CCSDS Data Archive Interoperability (DAI) Working Group (WG) welcomes participation and inputs to improve the Space Mission DTOPP Checklist for later use and for other missions.

It is recommended that this entire section, including this introductory material, should be included in mission/program/project documentation so that mission participants will understand the purpose, motivation and value of the DTOPP Checklist. This word-processing document can be used as a template for your specific mission. It should be distributed to your team and included as an attachment to contracts.”

## Space Mission DTOPP Checklist Form

Annex to *Information Preservation to Enable Long Term Use* (CCSDS 6NN…)

Mission Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Company/Agency: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contract (if applicable): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Level 1 statement (Chose one):

[x]  This agency chooses to enact long-term digital preservation for the valuable products of this mission as described below in the level 2 and 3 statements. Proceed to Level 2.

[ ]  This agency chooses to not enact long-term digital preservation for any data associated with this mission because no products of this mission will be of value to stakeholders, the public, or future mission developers after this mission terminates. No further completion of this form is needed. NOTE: Please consult legal counsel and records management before checking this box.

## Level 2 statement: (Choose all applicable)

|  |  |
| --- | --- |
|  | Data Type |
| [x]  | Spacecraft-originated Science Telemetry |
| [x]  | Other science data products |
| [x]  | Ground-originated Science Data |
| [x]  | Spacecraft originated Systems Telemetry |
| [x]  | Ground-originated Systems Data |
| [x]  | Spacecraft Engineering Data |
| [x]  | Test Article Engineering Data |
| [x]  | Spacecraft Design Data |
| [x]  | Spacecraft Operations Data |
| [ ]  | Mission Program/Project Data (budget, schedule, etc.) |
| [ ]  | Additional data types unique to this program/project (expand for your project) |

## Level 3 statement (Choose all applicable)

To reiterate, this proforma checklist is intended to be an example. It is essential that program and project management for space missions should clearly identify what digital assets and data are necessary to preserve the mission products in the long term, after the operational mission ground systems are obsolete. This form can be modified by a program/project to utilize program-specific terms and definitions. However, as a reminder, those program-specific terms and definitions need to be documented in order for non-program/project personnel and systems to recover and use the mission products.

### Spacecraft-originated Science Telemetry

Interpretation of the below list requires understanding of conventional definitions of Level 0, 1 and 2 telemetry processing. For the purposes of this generalized list, we have adopted these definitions:

* In level 0 processing, duplicate data are removed from the data stream, data are time ordered, and data quality and accounting summaries are appended.
* In level 1 processing, the data are separated out by instrument and each instrument data set is formatted to meet the requirements of that data set and team.
* Level 2 processing includes such operations as application of calibration data and detector response maps, organization of data into appropriate energy and time bins, and application of ancillary data.

|  |  |
| --- | --- |
|  | Data Type |
| [x]  | Raw Telemetry Data |
| [x]  | Level 0 Telemetry Products  |
| [x]  | Associated major/minor frame and channel structure definitions |
| [x]  |  |
| [x]  |  |
| [x]  |  |
| [x]  | Level 1 Telemetry Products |
| [x]  | Position, altitude and spin phase of the spacecraft |
| [x]  | Command history and comments |
| [x]  | Calibration of the spacecraft clock |
| [x]  |  |
| [x]  |  |
| [x]  | Level 2 Telemetry Products |
| [x]  | Calibration algorithms for all parameters |
| [x]  |  |
| [x]  |  |
| [x]  | Ancillary data |
| [x]  |  |
| [x]  | English Language Telemetry Terms and Definitions |

### Other Science Data Products

(Further elaborations of each item in section 1.4 – Level 2 – are needed)

(If advisable, section 1.4 should be revised to reflect the resulting structure of 1.5)

1. Definition of “Long Term” from OAIS (CCSDS standard **[650.0-M-2](https://public.ccsds.org/Pubs/650x0m2.pdf%22%20%5Ct%20%22_blank)**): A period of time long enough for there to be concern about the impacts of changing technologies, including support for new media and data formats, and of a changing Designated Community or changes to the Designated Community’s Knowledge Base, on the information being held in an OAIS. This period extends into the indefinite future.” [↑](#footnote-ref-1)