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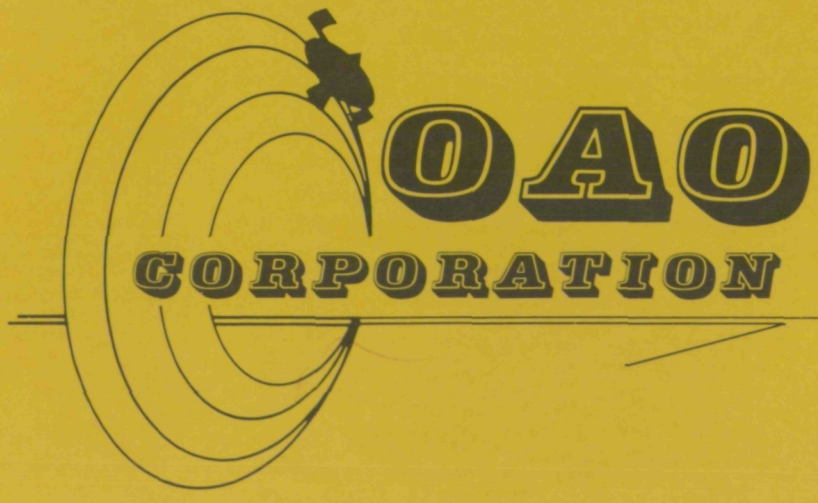

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ENGINEERING • SYSTEMS ANALYSIS • ENVIRONMENTAL SYSTEMS • SUPPORT SERVICES

OAO/SD-81/0020

DOCUMENT MANAGEMENT
FOR THE
ENVIRONMENTAL OBSERVATION DIVISION

October 1981

Prepared for
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National Aeronautics and Space Administration

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SECTION 1. INTRODUCTION

The mission program managers of the Environmental Observation Division (EOD) have a continuing need for ready access to an extensive series of planning, funding, coordinating, monitoring, and reporting documents which are generated during the life cycle(s) of their program(s). The requirement for ready access implies the existence of a structured search and retrieval system which is logical in terms of document descriptors such as date, source, document type, and subject matter. It also implies a physical arrangement which, as new documents are generated or received, permits easy entry into the system. It is estimated that the number of documents of each active program increases at the rate between 50 and 100 per month. This is a rate which imposes a heavy burden on both the Program Manager and limited available secretarial support. These documents are essential tools to the manager in the conduct of these programs. Too often, a key document(s) is required on a "crash" basis and the search and retrieval of the document is time-consuming and frantic.

The system which has been designed is believed to meet the needs of each mission program manager. Any structured document management system has four separate but interrelated components: Sort, catalog, file (storage), and retrieval. It is fair to state that almost any structured document management system will work provided people will understand and will maintain the system. However, it is certainly helpful if the system is designed to meet the requirements of the technical environment in which it will operate and is a system which the users can use comfortably.

At present, the system is manual but it has been designed for easy conversion to a computerized system using a small, relatively inexpensive microprocessor.

It should not be assumed that the system will guarantee that any one document will be automatically retrieved. The system, however, should provide that blind searches will not be necessary and that, even if a few pieces of information or descriptors are known about the document, the

search will be expedited such that documents can be retrieved in a reasonably short time.

A byproduct of the document effort, to date, is that duplicate, redundant, or obsolete documents have been removed from the active files. In addition, documents from completed programs have been archived in accordance with official NASA procedures. Records are being kept of cubic feet of documents either archived or destroyed. This purging of unnecessary documents, in itself, aids the storage and retrieval system.

It cannot be emphasized too highly that any document management system needs continual administration. The initial effort needs to be maintained on a continuous basis if the system is to be kept effective. A dedicated, document technician to serve all the program managers is necessary to implement and maintain this document management system.

SECTION 2. EOD DOCUMENT MANAGEMENT SYSTEM

2.1 GENERAL

The four essential elements of any document management system are:

a. Sort
b. Cataloging
c. File (storage)
d. Retrieval

Each of these for the EOD system will be discussed in turn.

2.2 SORT

The basic sort is chronological. This is the only sort to be used in the manual system. However, in a computerized system, it is practical to have specific listings (subsorts) by specific fields within the framework of the chronological sort. For instance, listings can be made by specific fields (descriptors):

a. By source
b. By mission
c. By subject matter

As an example, all correspondence by the Earth Radiation Budget Experiment (ERBE) Project Manager at Goddard Space Flight Center on fiscal matters can be so listed.

In the hard copy (hand typed) listing of the documents in the system, each sheet contains only the listed documents for that month and year. In many cases, most of the sheet is blank. While this seems to be a waste of paper, it does permit easy entry into the system of back-dated, overlooked, or recently received but late documents.

2.3 CATALOGING

A line entry to catalog each document has been limited to 80 characters; this is a limit imposed by potential use of microcomputers. The 80 characters are divided into the following fields described in Table 2-1.

Table 2-1. Character Definitions and Entries

No. of Characters	Definitions (Subsection)	Entry (field or descriptors)
4	2.3.1	Date
40	2.3.2	Title
4	2.3.3	Source-author
4	2.3.4	Source-organization
3	2.3.5	Document type
5	2.3.6	Mission (Project)
4	2.3.7	Action (What the document does?)
4	2.3.7	Object (What the document does to what?)
4	2.3.8	Storage/filing (retrieval) number
8		Blank spaces (for separation of fields)

A sample cataloging sheet, showing the physical arrangment of the 80 columns is shown in Figure 2-1. It should be noted that eight blank columns are used to delineate each field entry. While this may seem wasteful in that eight columns of information are lost, the deliberate decision was made that the blank spaces between fields are needed to avoid a "too busy" looking sheet which may hamper ready identification of documents in a visual search mode.

The explanation of each field entry or descriptors with the associated coding follows.

SHEET ___ OF ___

PROG. MGR ___

DATE ___

OSTA DOCUMENT STORAGE & RETRIEVAL WORK SHEET

DATE	TITLE	AUTHOR	ORGANIZATION	DOC. TYPE	MISSION	ACTION	OBJECT	STORAGE NUMBER

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Figure 2-1. Sample Cataloging Sheet

2.3.1 DATE (FOUR CHARACTERS)

Experience shows that people seldom remember a specific day of the month in connection with a given document. Accordingly, the date is given only for the month and year. The abbreviations for the months are given in Table 2-2.

Table 2-2. Months and Abbreviations

Month	Abbreviation
January	JA
February	FE
March	MR
April	AP
May	MA
June	JU
July	JL
August	AU
September	SE
October	OC
November	NO
December	DE

The last two digits of the year supplied are used as the date coding (i.e., 1981 or 1962).

2.3.2 TITLE

Limited to 40 characters. Titles will probably require some reduction and abbreviations. There are no set rules for this.

2.3.3 AUTHOR

Person (by title) generally responsible for authorship and/or signature on document. The categories of authors are defined in Table 2-3.

Table 2-3. Author Categories

Name	Abbreviation	Coverage
Director	DIR	The head of any large organization, whether government, private sector, university, etc.
Administrator	ADMN	A upper management official in any large organization. Examples may be: Head of a GSFC Directorate or Associate Administrator for Space and Terrestial Applications.
Division Head	DVHD	A middle management official in any large organization. Example may be a Division Head or Branch Head.
Program Manager	PRMG	Self-explanatory - usually only applicable to NASA/Headquarters personnel.
Project Manager	PJMG	Self-explanatory - as a rule, applicable to a NASA field center person or to contractor personnel having that title.
Scientist	SCI	Applicable to the large group in that discipline. Could be: lead scientist, principal investigator, staff scientist, chairman of a scientific group, experimental scientist, theoretical scientist, etc.
Engineer	ENG	Applicable to the large group in that discipline. Could be: system engineer, sub-system engineer, R&QA engineer, etc.

Table 2-3. Author Categories (cont.)

Name	Abbreviation	Coverage
Business	BUSS	Any person, either in government or private sector, involved in: finances, contracting, fiscal, marketing, or other business activities.

2.3.4 SOURCE - ORGANIZATION

The organization that the author is affiliated with. In general, the organization is generally defined by class. For example, no specific university will be coded; the source organization will be coded as "UNIV" if the author is affiliated with a university. However, if the number of documents from a given source (university) warrant the action, a specific university can be coded as a descriptor. The categories of source organizations are given in Table 2-4.

2.3.5 DOCUMENT TYPE

Every document has some characteristic that is easily remembered. Usually, it is a physical characteristic such as it being a letter, a TWX, a chart, or a transparency. Sometimes, it is the general nature of the document such as it being a report, a paper, a critical design review, a Form 533, etc. This is most helpful in searching for the document. The abbreviations used are given in Table 2-5.

2.3.6 MISSION

This field lists the applicability of the document to an appropriate program or mission. The five characters allowed for this entry are usually sufficient to fully utilize the commonly used mission acronyms such as HCCM, SAGE, ERBE, HALDE, etc. This entry is potentially very useful if a centralized document storage and retrieval activity is ever adopted.

Table 2-4. Source Organizations Categories

Name	Abbreviation	Coverage
NASA Headquarters	HQ	Self-evident
Goddard Space Flight Center	GSFC	Self-evident
Langley Research Center	LaRC	Self-evident
Jet Propulsion Laboratory	JPL	Self-evident
Marshall Space Center	MSL	Self-evident
Houston Space Center	HST	Self-evident
NASA Center	CNTR	Any NASA center not covered by the above.
National Oceanic & Atmospheric Agency	NOAA	Self-evident
Federal	FED	Any other federal agency other than NASA, NOAA, or legislature.
Legislature	LEG	Any federal and state legislative body. It is anticipated that the preponderant bulk of the legislative bodies will be either the U.S. Senate or the House of Representatives.
University	UNIV	Self-evident
Foreign	FRN	Self-evident
Contractor	CTR	Self-evident
Foreign University	FRN	Self-evident
Foreign Contractor	FRN	Self-evident
Foreign Government	FRN	Self-evident
Unknown	UNKN	Source of document not identificable.
Other	OTR	Any category not covered by the above.

Table 2-5. Document Abbreviations

Document Identifier	Abbreviation
Letter	LTR
Memorandum	MMO
Report	RPT
Photograph	FTO
Transparency	TSP
Program Operating Plan	POP
Reference	REF
Note	NTE
Drawing	DRW
Chart	CHT
TWX	TWX
Minutes	MIN
Paper	PAP
Hard Copy	HRD
Form*	FRM
Critical Design Review	CDR
Conceptual Design Review	COR
Printout	POT

*Any government standardized form which is always given an identification number. Examples are a financial reporting form usually referred to as Form 533 or STS 100.

2.3.7 ACTION AND OBJECT

The next two fields attempt to describe, in the most general manner, the subject matter of the document. The first field (action or verb) describes what is being done to the second field (object).

The coding for the action field is given in Table 2-6.

Table 2-6. Action Field Coding

Abbreviation	Word
PLAN	Plan
STDY	Study
IMPL	Implement
MONI	Monitor
REPT	Report
PRCR	Procure
PRES	Present
INFO	Inform
CNFM	Confirm
COMM	Comment
OUTL	Outline
RQST	Request
REVW	Review

The coding for the object field is given in Table 2-7.

An inherent problem in any cataloging system dealing with a wide diversity of documents, in form and content, is judgement in classification. Some of the fields such as dates are relatively clearcut. Many others are not. For example, it is quite common for an individual in middle management to also function as a participant in a technical group. It is often difficult to determine which "hat" he is wearing when he generates the document. Another example could be the classification of a "document type". Is it a memorandum or a report? These are not comparable and a document could be both. A memorandum is usually considered to be a short, interoffice

Table 2-7. Object Field Coding

Abbreviation	Word
S/C	Spacecraft
PRJT	Project
PRGM	Program
BUDG	Budget
INST	Instrument
TECH	Technology
SCI	Science
GDLN	Guideline
DSGN	Design
DATA	Data
MGMT	Management
MTG	Meeting
RESP	Responsibility
EXP	Experiment
STAT	Status
PROP	Proposal
PAP	Paper (as in professional journal, etc.)
FLGT	Flight
IMPL	Implement
CHNG	Change

communication whereas a report is usually considered to be a detailed, formal multi-paged document. However, a memorandum can be quite lengthy and a formal report can be short.

These five details can be quite troublesome until the system becomes well seasoned and the "modus operandi" understood by all.

It would have been helpful to have a third field to modify the object field so as to further define the subject matter. For example, instead of coding in that the memo on the Nimbus-7 mission "reviews experiments" to have it

code "reviews SMMR experiment." However, the necessity of limiting the coding to 80 characters precludes the additional modifying field.

2.3.8 FILING/STORAGE

The last element in the document system is, having determined the existence of a desired document, to know where it is filed or stored.

The basic rationale behind the filing system is to file documents according to distinct phases of a major program (Filing codes B to F inclusive). However, there are a number of filing areas which do not fit neatly into this system. Fiscal, for instance, is of prime importance to NASA Headquarters personnel. It is, therefore, the first filing code listed Others, which are self-explanatory, are listed.

A filing system is often the most difficult element of a documentation system. The reason is that any system in use by an engineer or scientist usually is very subjective; he uses that system that he is most familiar and comfortable with. Most engineers prefer to file documents of a similar nature in one filing area. This is, of course, quite easy if there is a recurring monthly document status report such as a MICS or a Form 533. This provides the program manager with a convenient, single source for a "crisis file" or an overall program history review.

However, this ready identification for filing purposes is not true of most documents. The decision to determine the category in which to file the document can be quite difficult because of the complexities of the subject matter covered. The worst offender in this case is in filing correspondence. Accordingly, the documentation system has adopted an simple system which has proven quite practical and useful. All correspondence is grouped into four categories. These are:

a. Incoming - NASA. For this purpose, NASA includes only Headquarters and GSFC.

b. Outgoing - NASA.

c. Incoming - External to NASA. For this purpose, External to NASA includes all other NASA activities as well as all patently non-NASA activities.

d. Outgoing - External to NASA.

Documents, when practical, will be three-hole punched and filed in appropriately labeled loose leaf binders. If the document is too thick, or otherwise too impractical, to store in a loose leaf binder, it will be stored in a magazine shelf holder.

The file or storage codes are shown in Table 2-8.

If there is more than one loose leaf binder for any one filing category, the file code will add a third alpha character to indicate this, as for example, B1a and B1b (Theoretical & Planning Studies).

If the document will be stored in a magazine holder, the file code will have, as the fourth digit, the letter "m" appended, as for example, B/bm.

Table 2-8. Filing or Storage Codes

Filing Code	Filing Subject
	Fiscal-A
A1	Authorization - House/Senate, Budget Justification, Congressional Testimony Appropriate - House/Senate
A2	New Start Budgets, PAD's
A3	Proposals & Contracts
A4	Budget & Cost Reviews, 533's
A5	Reimbursibles
	Conceptual - B
B1	Theoretical & Planning Studies
B2	AO's, MOU's, Others
	R&D, Test - C (Research, Development, & Testing)
C1	Request for Proposals, Project Documentation (Project Plans, PEPPP, EPPP), Others
C2	MICS Weekly Status Reports
	Launch/Operations - D
D1	Plans (SIRD, Network Support, Data Management, etc.), Launch Documentation (launch date schedule)
D2	Mission Operations
D3	Mission Success Criteria Documentation
D4	Others
	Reviews - E
E1	Conceptual, S/C
E2	Experiment, Launch
E3*	Monthly (OSTA MICS)
E4*	Monthly (Project MICS)

Table 2-8. Filing or Storage Codes (cont.)

Filing Code	Filing Subject
E5*	Monthly (mini DMSPRB)
E6*	SCOES
	Science - F
F1	Experiment Documentation, General Correspondence
F2	Minutes of Meetings, Workshops
	NASA Internal - G
G1	Guidelines
G2	Press Kits, Press Reports
G3	Management Instructions (NMP)
	Applications - H
H1	Journal Articles
H2	NASA Publications
H3	Commercial Literature
	Personal - I
I1	Notes, etc.
I2	Photos, Transparencies, Engineering Drawings
	Correspondence - J
J1	Incoming - NASA
J2	Outgoing - NASA
J3	Incoming - External to NASA
J4	Outgoing - External to NASA

*Applicable only to contain programs

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OAOCO Information Center
Document Data Sheet
(DDS)

Process Data:

1. OAOCO Report No.	2. Other Report No.	3. Project Name
OAO/SD-81/0020		EOD Document Management System

4. Title and Subtitle	5. Project Manager
Document Management for the Environmental Observation Division	Huston, W.
	6. Report Date: Oct 1981

7. Author(s)	8. Contract or Grant No.
Harris, L.	NASW-3358

9. Performing Organization Name and Address	10. Type of Report
OAO Corporation 7500 Greenway Center Greenbelt, Maryland 20770	SD
	11. No. of Pages: 18 pp

12. Sponsoring Agency Name and Address	13. Distribution Statement
Environmental Observation Division Office of Space and Terrestrial Application National Aeronautics and Space Administration Washington, D.C. 20546	X Unlimited ___ Limited ___ Proprietary ___ Restricted

14. Supplementary Notes

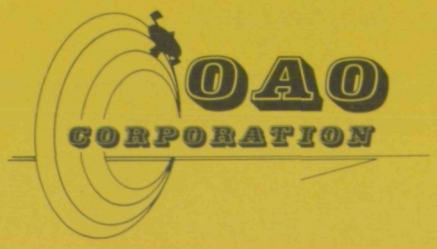
15. Abstract (Author-generated)

The mission program managers of the Environmental Observation Division (EOD) have a continuing need for ready access to an extensive series of planning, funding, coordinating, monitoring, and reporting documents which are generated during the life cycles of their programs. This report describes a management document system which sorts, catalogs, files (stores) and references these documents.

16. Major Subject Code(s)	17. Minor Subject Code(s)

18. Key Words (Selected by Author(s))	19. Security Classif.
Management Information System	X Unclassified ___ Confidential ___ Secret ___ Top Secret

DDS-Rev. 2, June 1981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