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ASD-TR-69-119

**A TECHNIQUE FOR THE ACQUISITION, STORAGE, AND  
RETRIEVAL OF SYSTEM SAFETY INFORMATION—WITH  
ATTACHED BIBLIOGRAPHY**

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AERONAUTICAL SYSTEMS DIVISION*

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MARTIN MARIETTA CORPORATION*

TECHNICAL REPORT ASD-TR-69-119

JULY 1970

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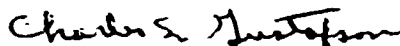
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FOREWORD

This report is the result of work carried out under the authority of Program 921A, Project 9072, Task 907201. It was a joint effort of the Design Handbooks Branch, Directorate of Engineering Standards, Deputy for Engineering, Aeronautical Systems Division, and the Martin Marietta Corporation, Denver Division, under contracts AF 33(615)-5196 and AF 33(615) 69-C-1087. Major Gary B. McIntire served as Project Engineer for the Design Handbooks Branch and Mr. George B. Mumma was Project Manager for Martin Marietta Corp. Mr. Thomas J. Lebel, as part of the Martin Marietta project group, developed the majority of the data techniques; the presentation of the data was under the direction of Mrs. Adlyn K. Chappell of the Design Handbooks Branch.

This report was submitted by the authors 17 November 1969.

Publication of this report does not constitute Air Force approval of the report's findings or conclusions. It is published only for the exchange and stimulation of ideas.

  
CHARLES E. GUSTAFSON  
Chief, Design Handbooks Branch  
Standards Division



ABSTRACT

A vast amount of safety information was acquired in the preparation of AFSC DH 1-6, and developing a system to make this information readily available led to the establishment of the RAIDS (Rapid Availability of Information and Data for Safety) method of information storage and retrieval. Acquired data is stored in the library in its original printed form. RAIDS provides three approaches to the identification and retrieval of data. The first approach is to organize the information into logical groups according to corporate authorship and then classify these groups alphabetically; further alphabetizing breaks the information into additional subclasses which are further reduced to item numbers. The second approach provides punched cards to retrieve the subject matter. The third approach provides indexing which identifies all the important ideas or concepts in the document and reduces them to concise, descriptive terms. These terms are coordinated in the index to present logical meaning to the searcher. Therefore, no matter how slight the searcher's recognition term may be, one of the RAIDS approaches will lead to the desired information.

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SECTION I  
INTRODUCTION

1. GENERAL

"Rapid Availability of Information and Data for Safety" (RAIDS) is a system that has been established as a solution to the problem of data storage and retrieval. This classification scheme for aerospace safety data is suitable for collections varying in size from 10 to over 10,000 items. The system is tailored to help the aerospace systems designer use it easily and effectively. Memory features are provided in the classification scheme, and electronic accounting machines are used for sorting, allowing anyone to rapidly and accurately locate specific safety data on any selected system within the aerospace vehicle.

2. IDENTIFICATION OF DATA

Many reference tools and specialized publications were searched to compile the aerospace safety data. Subject descriptors such as "systems engineering," "safety hazards," and "safety" gathered many titles together in the subject indexes of the more comprehensive abstracting journals. The publications listed following the organizations in the corporate author indexes also provided important references. Major reference tools searched included:

- a. National Aeronautics and Space Administration (NASA) — Scientific and Technical Aerospace Reports
- b. Defense Documentation Center (DDC) — Technical Abstract Bulletin
- c. Monthly Catalog — United States Government Publications
- d. International Aerospace Abstracts
- e. U. S. Government Research and Development Reports Index
- f. Engineering Index
- g. British Technology Index
- h. Bibliography of Air Force Flight Test Center Technical Publications and Presentations

- i. **Interscience Guides to Information Sources in Science and Technology. Volume 1: Space Science and Technology.** Fry, B. M. , and Morhardt, F. E. , (New York, John Wiley and Sons, Inc. , 1963)

Professional journals, proceedings, and periodicals serve as valuable reference sources in addition to providing actual data. The references listed with most articles in these publications often identify recently issued material concerned with the topic. Those publications which proved valuable included:

- a. **AIAA Journal**
- b. **Journal of the Royal Aeronautical Society**
- c. **SAE Journal**
- d. **Proceedings of System Safety Symposia**
- e. **Proceedings of the Annual Aerospace Reliability and Maintainability Conference**
- f. **Product Engineering**
- g. **Aviation Week and Space Technology**
- h. **Space/Aeronautics**
- i. **Approach**
- j. **American Aviation**

Bibliographies also provided useful references. Although many are identified in the listing of reference sources, two deserve specific mention: (1) NASA Literature Search No. 2833, entitled "Safety," dated 25 July 1966, lists 541 citations arranged by NASA Accession Number; and (2) a report bibliography from the Defense Documentation Center entitled "Systems Safety," issued in three sections — A, B, and C, identified as Literature Search ARB-No. 54474. Both provide sound basic references for recently published aerospace safety data within their collections.

### 3. DATA ACQUISITION

The Defense Documentation Center is one major source of data. Since the Safety Library filed a Field-of-Interest Register (Form 20) with DDC, it

follows the standardized procedure established for contractors. As directed by the pamphlet "DDC Services," the Library uses DDC Form 1 to order documents. Instructions for filling out Form 1 appear on the form itself.

Other important sources of data include:

- a. Publishers
- b. Universities
- c. Professional Societies
- d. Government agencies
- e. Aerospace system manufacturers
- f. Commercial airlines
- g. International organizations

#### 4. DATA CLASSIFICATION

The data forming the RAIDS Library is organized according to a logical pattern. Initially the items are classified according to corporate authorship and organized within an A to Z alphabet, where each letter is used to designate a separate source or type of source; Class B, for example, includes publications from the U. S. Army. This A to Z arrangement is essentially a classified source/corporate author list. The individual sources are listed within the alphabet to form a logical progression from government/military classes to general/multi-author classes. A few letters of the alphabet have not been used: I, O, and Q are not used because they may be confused with the numerals 1 and 0; and N, R, and T are reserved for future expansion.

A second letter of the alphabet is then added to the corporate author classes, thus dividing each class into a possible 25 subclasses. BD, for example, indicates data from the Army Missile Command while BE indicates the Army Board for Aviation Accident Research. Subclass letter Q has been omitted to prevent confusion with letter O and numeral 0. Even though classes A and B are approaching the limit, the maximum of 25 subclasses has yet to be reached in any class. Subclasses are identified for both present sources of information and expected sources; data has not been received for all listings. The subclass

form of entry is based on an Atomic Energy Commission publication: the JAWTIG Corporate Entry Authority and Report Series Codes (TW-1-14). Although few subclass titles follow it exactly, many approximate it, and most are formed according to its principles. Those that deviate significantly are usually followed by an explanatory note about the individualized scope or procedure involved.

Class C offers representative examples of the standard entries within the classification scheme. This class accommodates data published by the U. S. Navy. Subclass CD narrows the authorship to the Naval Aviation Medical Center of Pensacola, Florida (the form of entry follows the Corporate Entry Authority exactly).

Within the subclasses, each item is assigned an accession number to indicate the order in which the items are arranged in storage and to identify each item with a distinctive number. The notation scheme is mixed, therefore, for it contains both letters and numbers. A limit of two letters and three numbers has been established, thus allowing 23 classes, 25 subclasses within each class, and 999 items within each subclass. As an item is entered into the collection, it is marked with the identifying notation and stored with its subclass.

This arrangement of source corporate authors into a classified list forms the basis for the RAIDS classification scheme. The RAIDS classification scheme is not intended to offer a grouping of data according to informational content or subject matter. A subject approach to the data is provided through the use of punched cards.

The RAIDS catalog arrangement (classes and subclasses) is contained in Section II.

## 5. DATA STORAGE

The data gathered to form the RAIDS Library is stored in three basic forms: (1) three-ring note binders for technical reports and periodicals, (2) standard library storage on shelves for books, and (3) individualized bindings, containers, or arrangements for nonstandard materials. Most of the data is in technical reports; three-ring note binders serve to keep the items together and yet allow for modifications in the arrangement. Binders are also well suited for storing

individual periodicals. Unusually thick soft-bound technical reports, proceedings, or symposia are divided into several binders or rigidized with cardboard covers. Individual articles, reprints, copies, and correspondence are gathered into large groupings within one binder. Data on index cards are stored in file boxes. Periodicals are conveniently stored in individual rigid or flexible library periodical covers.

## 6. INDEXING

Indexing consists of identifying all the important ideas or concepts in a document and reducing this information to a number of concise terms. To determine what is important in a document, the indexer should be familiar with the discipline. Important ideas often can be found in the title, abstract, table of contents, figures, tables, conclusions, and recommendations. A scanning of the text should reveal any other pertinent information. The indexer should remember that documents can be retrieved only by coordinating the terms by which they are indexed. If an important idea is left out of the indexing of a document, that document is lost to those seeking that information. The indexer should give particular attention to the following:

- a. Application of the information, i. e. , aerospace or ground
- b. System(s) or subsystem(s)
- c. Hardware/material items
- d. Type of hazards
- e. Technical disciplines (reliability, maintainability, etc.)

Coordinate indexing is a new approach to overcome the lack of a common language between data originators and users; examples of the approach are the Uniterm system and the concept coordination system (see pages 46-55 of Item 2801 (XB 006), Appendix B). A combination of the Uniterm system and the concept coordination system formed the basis for the subjective indexing of the RAIDS Library. These systems utilize selected words/phrases to represent each document, which are arranged in indexes to facilitate searching. Coordinate indexing offers many advantages over other systems; (1) it is flexible and adjustable to particular needs and conditions; (2) communication is established

between originator and user since the index terms are selected from the information itself; (3) indexers exercise judgment in selecting the terms to enable retrieval; and (4) most importantly, it can easily be automated.

Coordinate indexing is a technique of indexing which can be described in terms of mathematical logic as well as in practical terms of physical retrieval of document identifications. As the name may imply, it is a pigeon-hole system similar to latitude and longitude identifications of geographical areas. It is possible to describe areas of the collection in terms of coordinates, so that a document can be identified. For example, it follows the logic that if a document is indexed by the terms "Aircraft" and "Collisions," the document discusses aircraft collisions. The terms are then arranged into a vocabulary so that any document can be retrieved as two or more of the terms in the index file intersect. This vocabulary is controlled by the publication of a Thesaurus of Terms for the given information retrieval system (see Appendix A).

The approach to vocabulary control which has become most widely used during the past few years is that of providing a thesaurus for the retrieval system. An information retrieval thesaurus generally has several characteristics: (1) it exhibits relationships among the terms - relationships such as synonymy and hierarchy; (2) it lists vocabulary terms authorized for use in the system; and (3) it defines the vocabulary terms to the extent required. The function of an information retrieval thesaurus is twofold: (1) to permit indexers of documents containing valuable technical information to index (i. e., describe) more fully, at different levels of generality, and from many technical points-of-view, the information contained in the documents, and (2) to permit searches for phase inquiries appropriate to the scope and degree of their immediate interest - inquiries employing all terms of the retrieval vocabulary which have appropriate meaning and specificity.

## 7. THE INDEXING OPERATION

So that the reader may better understand the system, a sample document was selected from the collection for demonstrating the generation, meaning,



and value of coordinate indexing terms. The document selected is described as follows:

A report from Parametrics, Inc., Waltham, Mass. prepared for the AF Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio, dated August 1966. The report, identified as AFAPL-TR-66-71, has been entered into the RAIDS Library as AG 062. The title reads: "Investigation of Hazardous Vapor Detection for Advance Flight Vehicles." In the table of contents, abstract, and text, descriptive phrases such as these appear: "techniques for the detection of hydrocarbon vapors and hydrogen aboard advanced aircraft," and "evaluation of the infrared technique for combustible fuel detection."

The title, which is the basic source of indexing terms, includes the significant words "hazardous vapor detection" and "advanced flight vehicles." A check of the thesaurus reveals that "vapor detection system" is an authorized term with the assigned code number of 09230. The term and the term code number are therefore entered in the proper columns of the indexing sheets and the code number is punched on the IBM card. Additional terms authorized by the thesaurus may be used to complete the indexing of the document.

#### 8. ESTABLISHING AND DELETING TERMS

The phrase "advanced flight vehicles" does not appear in the thesaurus. Before it can be used as an indexing term, it must be given a distinctive code number, and assigned to a group; this information is then key-punched onto an IBM card for inclusion in the master file of terms. In the thesaurus, "advanced flight vehicles" would fall between "adsorption" (code number 00290) and "aerial rudders" (code number 00300). To place the new term in the correct alphabetic sequence, it would be assigned a code number that is midway between the numbers of the terms that appear on either side of it. "Advanced flight vehicles," therefore, would be assigned code number 00295. After this is accomplished, the 85 term groups are examined and the term is assigned to one of them;

"Advanced flight vehicles" would be assigned to group (05) Aircraft. This information is then key-punched onto an IBM card. The IBM card is then filed into its correct place in the alphabetic list and included in the next print-out of the Thesaurus of Terms.

Terms may be deleted from the RAIDS System in two ways. If the term has not been used, deletion is merely a matter of removing the term card from its place in the arrangement. If the term has been used, a subject sort for the code number must be run, and these cards removed and destroyed. Then the term card may be removed and destroyed.

## 9. DATA RETRIEVAL

The RAIDS System provides three approaches for the identification and retrieval of data from the collection.

(1) The source/corporate authorship. The system catalog outline designates the class and subclass notation for this author. A visual search of the appropriate subclass will yield the data included under it with its numerical accession identifier. This approach is only useful when the author is known.

(2) A data search on a subject basis. A numerical identifier lists and assigns numbers to the significant terms under which safety data will be identified. This provides the numerical base by which to obtain a machine sort of IBM punched cards to identify and locate the desired data. The manner in which the data may be retrieved is only limited by the methods employed from the original indexing of the specific data. The data sorting machine should be able to select specific column and line combinations to enable selection of any data heading or category. Usually the end product of the automated portion of the system is a listed index of the items. A "tab run," as this listing is often called, is obtained by sorting the punched cards by subject code or other type of sort desired. Such a master list in print-out form, especially one associated with a sort by subject matter, can be issued periodically so as to be readily available to users of the system.

(3) Subject indexes and subject bibliographies prepared by the two previous approaches, separately or in combination. This method is only warranted

for subject areas which have a high demand level, since it requires additional personnel and time to maintain a current listing of documentation.

#### 10. BIBLIOGRAPHY

The bibliography provided in Appendix B is the resultant effort from the compiled information task performed under the contracts listed in the Foreword. The documents contained in the bibliography were acquired, classified, indexed, and are maintained at the Denver Division of the Martin Marietta Corp., as outlined in previous paragraphs. This bibliography is provided to stimulate the flow of safety information and to provide a source of usable safety data to all concerned persons involved with System Safety.

**SECTION II**  
**CATALOG ARRANGEMENT**

The catalog arrangement as used in the bibliography (see Appendix B) is discussed in detail under Section I, Paragraph 4, Data Classification. This arrangement is a classified listing by source corporate authors and forms the basis for the RAIDS classification scheme. The A to Z arrangement is as follows:

A	U. S. Air Force
B	U. S. Army
C	U. S. Navy
D	Other Department of Defense Agencies and documents
E	National Aeronautics and Space Administration
F	U. S. Government Agencies
G	Military and Federal Standard Publications (including MIL specs and MIL standards)
H	Martin Marietta Corporation
I	(Do not use)
J	North American Aviation, Inc.
K	Boeing Company
L	Lockheed Aircraft Corporation
M	Other Manufacturers
N	---- For future expansion ----
O	(Do not use)
P	Airlines
Q	(do not use)
R	---- For future expansion ----
S	Societies and Associations
T	---- For Future Expansion ----
U	Universities, Safety Research Centers, and Consultants
V	Vendor Data
W	Foreign Data (including international organizations)
X	Books
Y	Periodicals
Z	Index and related material

The source corporate author classes (A to Z) are further expanded into subclasses by adding a second letter. Then each class may be divided into possibly 26 subclasses. A listing of the subclasses follows.

**A U. S. AIR FORCE**

- AA Handbooks, Manuals, and Technical Orders (USAF)**
- AB Letters, Pamphlets, and Regulations (USAF)**
- AC Air Force Systems Command (Andrews AFB, Md.)**
- AD Aeronautical Systems Division (WPAFB, Ohio)**  
(includes SEG documents)
- AE Aerospace Medical Division (Brooks AFB, Texas) (including Medical Labs at other bases)**
- AF Space and Missile Systems Organization - SAMSO**  
(LA AFS, Calif.) (includes old BSD and SSD documents and SAFSL documents)
- AG Division of Laboratories (including WADC and RTD documents from the following laboratories)**
  - (1) Flight Dynamics Laboratory (AFFDL) (WPAFB, Ohio)
  - (2) Materials Laboratory (AFML) (WPAFB, Ohio)
  - (3) Aero Propulsion Laboratory (AFAPL) (WPAFB, Ohio)
  - (4) Avionics Laboratory (AFAL) (WPAFB, Ohio)
  - (5) Weapons Laboratory (AFWL) (Kirtland AFB, N. M.)
  - (6) Rocket Propulsion Laboratory (AFRPL) (Edwards AFB, Calif.)
  - (7) Armament Laboratory (AFAL) (Eglin AFB, Florida)
  - (8) Rome Air Development Center (RADC) (Griffiss AFB, N. Y.)
- AH For future expansion**
- AI Air Force Eastern Test Range (Patrick AFB, Florida)**
- AJ Air Force Western Test Range (Vandenberg AFB, Calif.)**
- AK For future expansion**
- AL Air Force Flight Test Center (Edwards AFB, Calif.)**
- AM Arnold Engineering Development Center (Arnold AFS, Tenn.)**
- AN For future expansion**
- AO Air Force Logistics Command (WPAFB, Ohio)**
- AP Air Force Military Airlift Command (Scott AFB, Ill.)**
- AQ Do not use**
- AR Office of Aerospace Research (Washington, D. C.)**  
(includes documents from the following laboratories)
  - (1) Aerospace Research Laboratory (ARL) (WPAFB, Ohio)
  - (2) Cambridge Research Laboratory (AFCRL) (Bedford, Mass.)
  - (3) Office of Scientific Research (AFOSR) (Washington, D. C.)
  - (4) Frank J. Seiler Research Laboratory (FJSRL) (USAF Academy, Colo.)
- AS Director of Aerospace Safety (DTIG) (Norton AFB, Calif.)**  
(includes MSO Kits, etc.)
- AT Electronic Systems Division (Bedford, Mass.)**

**AU** Armament Development and Test Center (ADTC) (Eglin AFB, Florida) (formerly APGC)  
**AV** Air Force Special Weapons Center (AFSWC) (Kirtland AFB, N. M.)  
**AW**  
**AX**  
**AY**  
**AZ** Other Air Force Data Sources

**B** U. S. ARMY

**BA** Handbooks, Manuals, Technical Orders and Bulletins  
**BB** Letters, Pamphlets, and Regulations  
**BC** Research and Development Command (including Army Engineering Research and Development Labs - Ft. Belvoir, Va.)  
**BD** Army Missile Command (Redstone Arsenal, Ala.)  
**BE** Aviation Materiel Command (St. Louis, Mo.) (including TRECOM documents) (including Army Aviation Materiel Laboratories, Ft. Eustis, Va., and Army Aviation Test Activities (Edwards AFB, Calif.))  
**BF** Army Munitions Command (Picatinny Arsenal, N. J.) (including Army Chemical Center - Edgewood Arsenal, Md. and former Ordnance Corps Documents)  
**BG** Army Satellite Communications Agency (Ft. Monmouth, N. J.)  
**BH** Army Materiel Command (Washington, D. C.)  
**BI** Army Combat Development Command (Ft. Belvoir, Va.)  
**BJ** White Sands Missile Range (New Mexico)  
**BK** Corps of Engineers, Army (Washington, D. C.)  
**BL** Harry Diamond Laboratories (Washington, D. C.)  
**BM** Army Electronics Command (Ft. Monmouth, N. J.) (including all Electronic Research and Development Laboratories)  
**BN** Human Engineering Laboratories (Aberdeen Proving Ground, Md.)  
**BO** Ballistic Research Laboratories (Aberdeen Proving Ground, Md.)  
**BP**  
**BQ** Do not use  
**BR**  
**BS** Army Board for Aviation Accident Research (Ft. Rucker, Ala.)  
**BT**  
**BU**  
**BV**  
**BW**  
**BX**  
**BY**  
**BZ** Other Army Data Sources

**C** U. S. NAVY

**CA** Handbooks, Manuals, Technical Orders

CB Letters, Pamphlets, and Regulations  
CC Naval Weapons Center (China Lake, Calif.)  
CD Naval Aviation Medical Center (Pensacola, Fla.)  
CE Naval Medical Research Institute (Bethesda, Md.)  
CF Naval Air Development Center (Johnsville, Pa.)  
CG Naval Safety Center (Norfolk, Va.)  
CH Office of Naval Research (including Naval Research Labs -  
Washington, D. C.)  
CI Naval Ordnance System Command  
CJ Ships System Command (Washington, D. C.)  
CK Naval Air System Command  
CL Naval Civil Engineering Laboratory (Port Hueneme, Calif.)  
CM Naval Material Command (Washington, D. C.)  
CN Naval Applied Science Laboratory (Brooklyn, N. Y.)  
CO Naval Ordnance Laboratory (White Oak) (Silver Springs, Md.)  
CP Naval Weapons Laboratory (Dahlgren, Va.)  
CQ Do not use  
CR Naval Undersea Warfare Center (Pasadena, Calif.)  
CS Naval Command Control Communications (San Diego, Calif.)  
CT Naval Electronics System Command  
CU Naval Ordnance Laboratory (Corona, Calif.)  
CV  
CW  
CX  
CY  
CZ Other Navy Data Sources (including Marine Corps.)

D OTHER DEPARTMENT OF DEFENSE AGENCIES AND PUBLICATIONS

DA Handbooks, Manuals, and Technical Orders  
DB Letters, Pamphlets, and Regulations  
DC Military Handbooks (MIL-HDBK)  
DD  
DE JANAF Documents  
DF  
DG  
DH  
DI  
DJ  
DK  
DL  
DM  
DN  
DO  
DP  
DQ Do not use  
DR  
DS  
DT

DU  
DV  
DW  
DX  
DY  
DZ Other Department of Defense Documents

E NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

EA Ames Research Center, NASA (Moffett Field, Calif.)  
EB Flight Research Center, NASA (Edwards AFB, Calif.)  
EC George C. Marshall Space Flight Center, NASA (Huntsville, Ala.)  
ED Langley Research Center, NASA (Langley Research Station, Va.)  
EE Lewis Research Center, NASA (Cleveland, Ohio)  
EF Manned Spacecraft Center, NASA (Houston, Texas)  
EG NACA Documents  
EH Goddard Space Flight Center (Greenbelt, Md.)  
EI Kennedy Space Center (Florida)  
EJ  
EK  
EL  
EM  
EN  
EO  
EP  
EQ Do not use  
ER  
ES  
ET  
EU  
EV  
EW Headquarters, NASA (Washington, D. C.) (including: TN, TND,  
CR, and SP reports)  
EX  
EY  
EZ

NOTE: JPL documents are filed under Universities Category - UC.

F U. S. GOVERNMENT AGENCIES (including State and Local Govern-  
ments)(Excluding DOD and NASA)

FA Federal Aviation Agency (Department of Transportation)  
FB Bureau of Mines  
FC Civil Aeronautics Board  
FD National Transportation Safety Board (Department of Transportation)  
FE Atomic Energy Commission



FF Department of Commerce  
FG U. S. Coast Guard (Department of Transportation)  
FH Department of Transportation (excluding FAA, NTSB, and USCG)  
FI  
FJ  
FK  
FL  
FM  
FN  
FO  
FP  
FQ Do not use  
FR  
FS State and Local Government Documents  
FT  
FU  
FV  
FW  
FX  
FY  
FZ Other U. S. Government Agencies

**G MILITARY AND FEDERAL STANDARD PUBLICATIONS**

A listing of publications under this class is not maintained due to continuous updating and cancellations which occur with these standards. For References to these standards, use the DoD Index of Specifications and Standards - Part I Alphabetical Listing, and Part II Numerical Listings. This index is available from:

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Philadelphia, Pennsylvania 19120

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- (2) Military Standards
- (3) Federal Specifications
- (4) Federal Standards
- (5) Qualified Products Lists
- (6) Industry Documents (AIA, ASA, ASTM, AWS, and MMPA)
- (7) Military Handbooks
- (8) Air Force - Navy Aeronautical Standards
- (9) Air Force - Navy Aeronautical Design Standards
- (10) Air Force - Navy Aeronautical Specifications
- (11) U. S. Air Force Specifications
- (12) Other Departmental Documents
- (13) Air Force - Navy Aeronautical Bulletins
- (14) U. S. Air Force Specification Bulletins

H MARTIN MARIETTA CORPORATION

HA (Enter Martin documents not otherwise provided for into an accession number sequence from 1 to 999 in HA.)

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J NORTH AMERICAN AVIATION, INC.

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JQ Do not use  
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K BOEING COMPANY

KA (Enter Boeing documents not otherwise provided for into an accession number sequence from 1 to 999 in KA.)

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L LOCKHEED AIRCRAFT CORPORATION

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LT  
LU  
LV  
LW  
LX  
LY  
LZ

Do not use

M OTHER MANUFACTURERS

MA Aerojet-General Corporation  
MB Aerospace Corporation  
MC Bendix Corporation  
MD McDonnell-Douglas Aircraft Corporation  
ME General Dynamics Corporation  
MF Grumman Aircraft Engineering Corporation  
MG General Electric Corporation  
MH Thiokol Chemical Corporation (including Reaction Motors Division,  
etc.)  
MI Thompson-Ramo Wooldridge, Inc.  
MJ United Aircraft Corporation (including Hamilton Standard Incorp.,  
Pratt & Whitney Aircraft Division, Sikorsky Aircraft Division,  
United Technology Center)  
MK Rand Corporation (Santa Monica, Calif.)  
ML Ford Motor Company (including Philco, Aeronutronics, etc.)  
MM Fenwal Incorporated  
MN  
MO Bellcom Incorp. - Bell System (Washington, D. C.)  
MP Du Pont De Nemours and Company  
MQ Do not use  
MR  
MS  
MT  
MU

MV  
MW  
MX  
MY  
MZ Other Manufacturers

P AIRLINES

PA American Airlines  
PB Continental Airlines  
PC Pan American World Airways  
PD Trans World Airlines  
PE United Airlines  
PF Eastern Airlines  
PG National Airlines  
PH  
PI  
PJ  
PK  
PL  
PM  
PN  
PO  
PP  
PQ Do not use  
PR  
PS  
PT  
PU  
PV  
PW  
PX  
PY  
PZ

S SOCIETIES AND ASSOCIATIONS (Including Complete Proceedings,  
Symposia, Technical Papers, etc.)

SA Air Line Pilots Association  
SB American Institute of Aeronautics and Astronautics (AIAA, IAS, and  
ARS Documents)  
SC International Civil Aviation Organization (ICAO)  
SD American Standards Association  
SE Society of Automotive Engineers  
SF Flight Safety Foundation (including AvSER Documents)  
SG National Safety Council  
SH National Board of Fire Underwriters

SI Institute of Electrical and Electronic Engineers  
SJ American Society of Mechanical Engineers  
SK National Fire Protection Association  
SL Underwriters Laboratories, Inc.  
SM Aerospace Medical Association  
SN American Society for Safety Engineers  
SO American Society for Quality Control  
SP Air Transport Association of America  
SQ Do not use  
SR  
SS  
ST  
SU  
SV  
SW  
SX  
SY  
SZ Others

U UNIVERSITIES, SAFETY RESEARCH CENTERS, AND CONSULTANTS

UA University of Southern California (Los Angeles, Calif.) Aerospace  
Safety Division  
UB Battelle Memorial Institute (Columbus, Ohio)  
UC California Institute of Technology (Pasadena, Calif.) Jet Propulsion  
Laboratory  
UD Guggenheim Aviation Safety Center at Cornell University (Ithaca and  
New York City, N. Y.)  
UE Guggenheim Center for Aerospace Health and Safety at Harvard  
University (Cambridge, Mass.)  
UF Southwest Research Institute (San Antonio, Texas)  
UG Johns Hopkins University (Silver Springs, Md.) Chemical Propulsion  
Information Agency  
UH Stanford University (Calif.)  
UI University of Denver (Denver, Colo.) Denver Research Institute  
UJ Columbia University (New York, N. Y.)  
UK  
UL University of Illinois (Urbana, Ill.)  
UM University of New York (New York, N. Y.)  
UN  
UO  
UP  
UQ Do not use  
UR  
US  
UT  
UU  
UV  
UW  
UX

UY  
UZ Others

V VENDOR DATA

VA (Enter all data of a commercial nature - advertisements, announcements, manufacturers' specifications, etc. - into an accession number sequence from 1 to 999 in VA.)

VB  
VC  
VD  
VE  
VF  
VG  
VH  
VI  
VJ  
VK  
VL  
VM  
VN  
VO  
VP  
VQ Do not use  
VR  
VS  
VT  
VU Do not use  
VV Do not use  
VW Do not use  
VX Do not use  
VY Do not use  
VZ

W FOREIGN DATA

WA Canada  
WB Great Britain  
WC France  
WD Germany  
WE U. S. S. R.  
WF Belgium  
WG Sweden  
WH Denmark  
WI Netherlands  
WJ Japan  
WK China

WL Australia  
WM  
WN  
WO  
WP  
WQ Do not use  
WR  
WS  
WT  
WU Do not use  
WV International Federation of Air Line Pilots Associations  
WW International Sources (including United Nations, NATO, etc.)  
WX Do not use  
WY Do not use  
WZ Do not use

X BOOKS

XA (All books are entered into alphabetical subclasses by the initial letter of the main entry. Within the subclass, individual books are numbered in order of accession. The main entry of a document will usually be the author - personal or corporate. When no author can be identified or is of minor importance, the title will be used as the main entry.)

XB  
XC  
XD  
XE  
XF  
XG  
XH  
XI  
XJ  
XK  
XL  
XM  
XN  
XO  
XP  
XQ  
XR  
XS  
XT  
XU  
XV  
XW  
XX  
XY  
XZ



Y PERIODICALS

- YA (Individual periodical titles will receive an accession number in subclass YA)
- YA 001 AOPA Pilot (Aircraft Owners and Pilots Association)
  - YA 002 Astronautics and Aeronautics
  - YA 003 Aerospace Maintenance Safety (GPO for USAF)
  - YA 004 Aerospace Medicine (Aerospace Medical Association)
  - YA 005 Defense Industry Bulletin (Dept. of Defense)
  - YA 006 Aerospace Safety (GPO for USAF)
  - YA 007 Air Force and Space Digest
  - YA 008 Air Line Pilot (ALPA)
  - YA 009 Flight Magazine
  - YA 010 Flight Safety
  - YA 011 Space/Aeronautics
  - YA 012 American Aviation
  - YA 013 Approach (U. S. Naval Safety Center)
  - YA 014 Crossfeed (USN)
  - YA 015 Aviation News (FAA)
  - YA 016 Aviation Week and Space Technology
  - YA 017 National Guard Montly Maintenance Summary
  - YA 018 U. S. Army Montly Maintenance Summary
  - YA 019 Combat Crew (SAC)
  - YA 020 Product Engineering
  - YA 021 ESSO Aviation News Digest
  - YA 022 MAC Flyer
  - YA 023 NASA - Manned Flight Awareness
  - YA 024 Undersea Technology
  - YA 025 USAF Safety Kits
  - YA 026 U. S. Army Aviation Digest
  - YA 027 Weekly Summary: Army Aircraft Accidents . . .
  - YA 028 Weekly Summary of Aircraft Accidents (U. S. Navy)
  - YA 029 ICAO Bulletin (International Civil Aviation Organization)
  - YA 030 National Safety News (NSC)

YB (Subclass YB will contain individual issues of periodicals containing important articles. Place here only those periodicals not found in YA. Each issue will receive an accession number and be fully identified, including a complete reference to the article of interest.)

YC  
 YD  
 YE  
 YF  
 YG  
 YH  
 YI  
 YJ

PERIODICALS (CONTD)

- YK
- YL
- YM
- YN
- YO
- YP
- YQ Do not use
- YR
- YS
- YT
- YU
- YV Do not use
- YW Do not use
- YX Do not use
- YY Individual periodical articles (including reprints, reproduction, cut-outs, etc.)
- YZ Do not use
  
- Z RAIDS LIBRARY CATALOG, MANUAL, AND RELATED MATERIAL
  
- ZA RAIDS Library Catalog
- ZB RAIDS Manual
- ZC Corporate Entry Authority and Report Series Codes used by the Joint Atomic Weapon Technical Information Group. (W T1-14) (January, 1966)
- ZD Correspondence (unarranged and not numbered)
- ZE Other Safety Library Systems (This subclass includes all documents explaining other systems. Bibliographies or catalogs of individual collections are not included unless they form part of an explanation.)
- ZF Bibliographies (Of any type, from any source, on any subject; exceptions to this general form subclass may be found in ZE or within the authors' subclass.)
  
- ZG
- ZH
- ZI Do not use
- ZJ
- ZK
- ZL
- ZM
- ZN
- ZO
- ZP
- ZQ Do not use
- ZR
- ZS
- ZT
- ZU
- ZV

ASD-TR-69-119

RAIDS, LIBRARY CATALOG, MANUAL,  
AND RELATED MATERIAL (CONTD)

ZW  
ZX  
ZY  
ZZ Do not use

### SECTION III

#### RAIDS LIBRARY BIBLIOGRAPHIC FORM

This section provides a recommended format for reporting documentation in bibliographic form from the RAIDS library. All data services provided to requestors were compiled by the use of these established formats.

For definitions of the terms used to identify the sections of a bibliographic entry, as well as further examples, see the Standard for Descriptive Cataloging of Government Scientific and Technical Reports; Revision No. 1, October 1966. (AD C41 092).

The following information shall be included, in the order presented, for each bibliographic entry:

1. Author(s), if any. The names are written in full as given on the document, omitting titles, degrees, and other honorifics; the names should be written in the inverted form.  
Example: Abraham, J. and Gunnick, J. L.

If more than two authors appear, cite the first and "et al" to the section.

Example: Smith, H. R. , et al.

If the document was compiled by an editor or editors, cite the editor(s) and add "editor(s)" to the section.

Example: Smith, H. R. and others, editors.

If no authors or editors are given, begin the entry with the title.

2. Title (including classification, if applicable). A simple title, as given on the title page, describes the document without superfluous elements.

Example: Title on document - Quarterly Progress Report on the Development of a Fire-Resistant Water-Base Hydraulic Fluid.

Title as entered - Development of a Fire-Resistant Water-Base Hydraulic Fluid. Quarterly Progress Report.

3. Originating agency (also referred to as the corporate author). The simplest heading consists of one organizational name and geographic name. The number of organizational elements displayed on the document may vary from one to six, however. When more than two organizational elements are displayed, the originating agency of the bibliographic entry includes only two; these two should be the largest and the smallest, and are written Largest, Place name, Smallest.

**Example: International Telephone and Telegraph Corporation,  
Fort Wayne, Ind., ITT Industrial Laboratories**

**Note: For magazine or journal articles, give the name of the publication, volume number, issue number, date, and inclusive pages; the source should be cited: Published in: . . . (journal citation)**

**Example: "Numerical Safety Goals - Are they Practicable."  
Published in: Annals of Reliability and Maintainability, Volume 5,  
July, 1966. pp. 490-493.**

4. **Report number. The citation of a report number should follow as closely as possible the way the number appears on the report. Often the only editing required is the insertion of a hyphen wherever a space appears.**

**Example: AFAPL-TR-66-19.**

**If more than one report number appears on the document, choose the most prominent or distinctive and disregard the others.**

5. **Publication date. Enter the month and year only. If no date appears on the title page or cover, one of the following may be used: Date work completed, date submitted, date typed.**

**Example: May, 1966.**

**If no date can be found, enter "no date."**

6. **Number of pages. List the number of pages, followed by the letter pp.**

**Example: 64 pp.**

**If the document is printed (1) without pagination, or (2) with complicated or irregular paging, enter " 1 Vol."**

7. **Accession number. This number is assigned for purposes of control by one of the government documentation centers. The accession number is always preceded by one or more letters. At the present time, the accession numbers of the following centers take the form noted - Defense Documentation Center accession numbers are written AD 642 349; NASA Scientific and Technical Information Facility accession numbers are written N66-10142; Clearinghouse for Scientific and Technical Information accession numbers are written PB 168 270.**

8. **RAIDS Library identification number. This number, composed of two letters and three numerals, identifies the placement of the document in the RAIDS Library. This section of the bibliographic entry should be cited - Example: (RAIDS No. AG 040).**

9. **Martin Research Library identification number. If the document is on loan from Martin Research Library collection, cite the identification number as the final section of the bibliographic entry.**

**Example: (RL 21372).**

These sections make the RAIDS Library Bibliographic Form. If the information for any section, other than those cases discussed, cannot be ascertained, proceed to the following section and advance that following section to the placement of the mission section.

Examples of entry types:

**Technical report**

Abraham, J. and Gumnick, J. L.  
Fire and Explosion Detection for Advanced Flight Vehicles.  
International Telephone and Telegraph Corporation, Ft. Wayne,  
Ind.  
ITT Industrial Laboratories (AFAPL-TR-66-19)  
May, 1966. 64 pp.  
(AD 484 614)  
(RAIDS No. AG 040)

**Journal article**

Steiglitz, William I.  
"Numerical Safety Goals - Are They Practicable."  
Published in: Annals of Reliability and Maintainability,  
Volume 5, July, 1966. pp. 490-493.  
(RAIDS No. SE 002)

**Book**

Haddon, William; Suchman, Edward A. ; and Klein, David.  
Accident Research; Methods and Approaches. New York, N. Y. ,  
Harper and Row, 1964.  
(RAIDS No. XH 001)

**Periodical article**

Peters, George A. and Hall, Frank S.  
"To Cut Down Accidents - Design for Safety."  
Published in: Product Engineering, Volume 36, No. 19,  
September 13, 1965. pp. 125-128.  
(RAIDS No. YY 023)

**Professional Society Publication**

ALPHA B-727 Evaluation Committee.  
Evaluation Report of the Boeing B-727 Airliner;  
Phase II - Performance and Flight Characteristics.  
Chicago, Air Lines Pilots Association, 1965. 77 pp.  
(RAIDS No. SA 016)

Note that the examples of the form of the entry point out that entry sections 1. (author), 2. (Title), and 8. (RAIDS Library identification numbers) begin on new lines.

## APPENDIX A

## THESAURUS OF SAFETY ENGINEERING TERMS

This thesaurus is an alphabetical list of terms authorized for use in subject indexing the documents of the RAIDS library.

TERM	CODE NUMBER	GROUP NUMBER
Abandonment	00010	26
Abdomen	00020	63
Abort and Destruct Systems	00040	06
Abrasives	00050	42
Absorption	00060	62
Abstracts	00070	19
Acceleration Tolerance	00080	63
Acceleration	00090	53
Acceptability	00100	51
Accessibility	00110	51
Accident-Incident	00113	74
Accident Investigations	00140	74
Accident Prevention	00145	74
Accidents	00150	74
Acoustics	00210	01
Additives	00250	42
Adhesives	00270	02
Adsorption	00290	62
Aerodynamics	00390	31
Aeronautics	00410	04
Aging (Materials)	00450	37
Aging (Physiology)	00460	63
Ailerons	00470	29
Air	00480	62
Air Brake Flaps	00490	29
Air Conditioning Equipment	00510	17
Air Force	00520	57
Air Navigation	00530	04
Air Route Traffic Control Centers	00550	04
Air Routes	00560	04
Air Safety	00565	74
Air Traffic	00570	04
Air Traffic Control Systems	00580	04
Aircraft	00590	05
Aircraft Cabins	00610	05
Aircraft Canopies	00620	05
Aircraft Equipment	00630	05
Aircraft Engines	00640	25
Aircraft Fires	00660	74
Aircraft Markings	00680	05
Aircraft Seats	00690	05

TERM	CODE NUMBER	GROUP NUMBER
Aircraft Tires	00700	05
Airframes	00720	05
Airplane Engine Noise	00730	01
Airplane Noise	00740	01
Airports	00750	04
Airspace	00760	04
Airworthiness	00790	52
Alloys	00800	51
All Weather Aviation	00810	04
Altimeters	00830	30
Altitude Chambers	00840	39
Ammunition	00845	06
Analysis	00870	51
Anatomy	00880	63
Antennas	00920	08
Approach	00940	04
Approach Indicators	00950	30
Approach Lights	00960	04
Aprons	00970	04
Arming Systems	00975	06
Arms	00980	63
Army	00990	57
Army Aircraft	01000	05
Arresting Barriers	01002	04
Arresting Gear	01010	04
Astronauts	01020	59
Atmosphere (Properties)	01040	50
Atmospheric Electricity	01070	50
Atmosphere Entry	01050	76
Atmospheric Escape	01080	26
Atmospheric Precipitation	01090	50
Atmospheric Temperature	01110	50
Atmospherics (Communications)	01120	24
Attitude Control Systems	01130	29
Attitude Indicators	01140	30
Aurorae	01170	50
Automatic Landing Systems	01210	04
Automation	01220	51
Automotive Safety	01225	74
Aviation Medicine	01250	47
Aviation Personnel	01260	59
Awards	01270	51
Ballistics	01275	06
Barges	01280	83
Batteries and Components	01300	21
Bays	01310	33
Beacons	01320	55
Bearings	01330	40



TERM	CCODE NUMBER	GROUP NUMBER
Bibliographies	01350	19
Biochemistry	01370	10
Biology	01380	10
Biometrics	01382	63
Bionics	01390	10
Bipropellants	01400	72
Bird Strikes	01405	74
Elast	01420	27
Bolts	01510	18
Bombs	01515	06
Bonding	01520	78
Boundary Layer Control Systems	01550	29
Brakes	01555	29
Brazing	01560	48
Breathing Apparatus	01570	65
Budgets	01590	20
Buoyancy	01610	62
Burning Rate	01620	12
Cables (Mechanical)	01640	78
Calibration	01650	51
Cargo	01670	83
Cartridges (Pad)	01680	06
Casualties	01690	59
Catastrophe Analysis	01720	74
Centrifugal Pumps	01740	67
Centrifuges	01750	39
Ceramics	01755	11
Chains	01760	78
Charts	01765	19
Checkout Procedures	01780	39
Chemicals	01785	11
Chemical Analysis	01790	11
Chemical Compounds	01800	42
Chemical Elements	01810	11
Chemical Properties	01820	11
Circuits (Electrical)	01830	22
Civil Aviation	01840	04
Classification	01850	19
Clean Rooms	01860	39
Cleaning	01870	37
Cleaning Compounds	01880	42
Clear Air Turbulence	01890	50
Climatology	01900	50
Climbing (Flight)	01910	04
Closed Ecological Systems	01920	10
Clouds	01950	50
Coast Guard	01960	57
Coatings	01970	28

TERM	CODE NUMBER	GROUP NUMBER
Cold Flow Tests	01980	39
Cold Weather Tests	01990	39
Collision Avoidance	02000	04
Collisions	02010	74
Colors	02020	56
Combustion	02030	12
Command and Control Systems	02040	13
Communication Equipment	02050	13
Communication Systems	02060	13
Compatibility	02080	51
Components	02085	51
Compressed Gas Cylinders	02100	16
Compressors	02120	14
Computers	02130	15
Concussions	02140	85
Conductivity	02150	62
Configuration	02153	51
Confinement	02155	51
Connectors (Electrical)	02158	22
Construction	02160	78
Containers	02170	16
Contamination	02180	51
Control	02190	51
Control Knobs	02210	29
Control Simulators	02230	39
Control Surfaces	02240	29
Controlled Atmospheres	02250	39
Convection (Atmospheric)	02270	50
Coolants	02280	42
Cooling	02290	62
Cooling and Ventilating Equipment	02300	17
Corrosion	02330	62
Costs	02340	20
Couplings	02350	18
Cracks	02365	45
Cranes	02367	36
Crash Injuries	02370	74
Crash Protection	02375	74
Crash Testing	02380	39
Crew	02410	59
Crew Safety	02415	74
Crew Stations	02417	05
Cryogenic Propellants	02430	72
Cryogenics	02440	71
Damage	02450	51
Data	02460	51
Data Processing Systems	02470	15
Data Storage Systems	02480	15

TERM	CODE NUMBER	GROUP NUMBER
Deaths	02490	74
Decompression	02520	04
Decontamination	02530	51
Defects (Materials)	02540	51
Deflagration	02550	27
Deformation	02570	45
De-Icing Systems	02590	42
Density	02600	62
Descent	02605	04
Department of Defense	02610	57
Derricks	02615	36
Deserts	02620	33
Design	02630	51
Design Review	02640	19
Designators	02645	51
Destruct Charges	02650	06
Detection	02655	51
Detonation	02660	27
Detonators	02670	06
Dictionaries	02680	19
Diffusion	02700	62
Directories	02750	19
Disaster	02755	74
Disconnect Fittings	02760	18
Diseases	02770	58
Dispenser	02775	06
Display Systems	02780	51
Disposal	02790	51
Dissemination	02800	51
Distress Signals	02820	26
Ditching	02822	04
Diving	02825	74
Docking (Orbital)	02827	77
Documentation	02830	19
Dosage	02833	51
Drawings	02835	19
Drones	02880	05
Drugs	02900	60
Ductility	03000	45
Dust	03005	50
Dyes	03010	42
Economics	03030	20
Education	03040	75
Effectiveness	03050	51
Ejection	03060	51
Elastomers	03065	51
Electric Cables	03070	22
Electric Discharges	03080	23

TERM	CODE NUMBER	GROUP NUMBER
Electric Motors	03090	41
Electrical Equipment	03110	22
Electricity	03130	23
Electromagnetic Properties	03140	23
Electromagnetic Waves	03150	24
Electromagnetic Interference	03160	24
Electromechanical Valves	03170	84
Electronic Equipment	03180	22
Elevators (Hoist)	03195	36
Emotions	03200	66
Energy (Ordnance)	03205	21
Engine Starters	03240	25
Engines (Ion)	03250	25
Environmental Control Systems	03255	51
Environmental Tests	03260	39
Environment	03270	51
Erectors	03280	78
Escape Systems	03290	51
Evaporation	03300	62
Excavation	03305	33
Exhaust Gases	03310	12
Exhaust Systems	03320	25
Exits	03325	51
Exo-Atmospheric Escape	03330	26
Experiments	03335	39
Explosion Effects	03340	27
Explosions	03350	27
Explosive Actuators	03360	06
Explosive Initiators	03370	06
Explosives	03372	06
Explosives Safety	03375	74
Exposure	03380	63
Exposure Suits	03390	65
Extravehicular Activity	03393	74
Facilities	03395	04
Failure (Mechanics)	03400	45
Failure Mode Analysis	03410	74
Fatigue (Mechanics)	03430	45
Fatigue (Physiology)	03440	63
Fault Tree Analysis	03450	74
Feasibility Studies	03470	51
Federal Budgets	03480	20
Fibers	03490	79
Filters	03505	51
Finishes and Finishing	03510	28
Fire Control (Ordnance)	03515	06
Fire Detection and Suppression Systems	03520	74
Fire Extinguishers	03530	74

TERM	CODE NUMBER	GROUP NUMBER
Fire Extinguishing Agents	03535	74
Fire Protection	03538	74
Fire Protective Clothing	03540	65
Fire-Resistant Coatings	03550	28
Fires	03560	74
First Aid	03570	74
Fittings	03580	18
Flammability	03590	62
Flame Arresters	03600	12
Flame Propagation	03610	12
Flameout	03620	04
Flames	03630	12
Flanges	03640	78
Flares	03655	06
Flight	03670	04
Flight Check	03680	51
Flight Clothing	03690	65
Flight Control Systems	03700	29
Flight Instruments	03710	30
Flight Paths	03720	04
Flight Plans	03730	04
Flight Recorders	03740	38
Flight Simulators	03750	04
Flight Speeds	03770	04
Flight Testing	03780	39
Fluid Dynamic Properties	03810	31
Fluid Flow	03820	31
Fluids	03830	62
Fluorine	03835	11
Foams	03840	62
Fog	03860	50
Fracture (Mechanics)	03870	45
Fractures (Bone)	03880	58
Freezing	03900	62
Friction	03910	62
Fuel Cells	03920	21
Fuel Contamination	03940	32
Fuel Pumps	03950	67
Fuel Seals	03960	02
Fuel Systems	03970	25
Fuel Tanks	03980	16
Fuel Thickeners	03990	42
Fuels	04000	32
Fuselages	04010	05
Fuzes	04015	06
Gantries	04020	78
Gas Turbines	04030	14
Gases	04050	62

TERM	CODE NUMBER	GROUP NUMBER
Gas-Generating Systems	04060	35
Gaskets	04070	02
Gasostat Testing	04090	39
Gears	04100	41
Gelled Fuels	04110	32
Gels	04120	62
General Aviation Aircraft	04130	05
Generators (Electric)	04140	21
Glass	04145	11
Glide Path	04150	04
Gravity	04170	76
Greases	04180	40
Ground Powered Vehicles	04183	83
Ground Safety	04185	74
Ground Speed	04190	04
Ground Support Equipment	04200	04
Ground-Position Indicators	04210	30
Grounding (Electrical)	04225	23
Guidance	04230	54
Guide Vanes	04240	29
Guided Missiles	04270	34
Guns	04285	06
Gyro Compasses	04290	54
Gyro Stabilizers	04300	54
Gyroscopes	04310	38
Handbooks	04320	19
Handling	04330	51
Hatches (Spacecraft)	04340	77
Hazardous Materials	04345	74
Hazard Effects Analysis	04350	74
Hazards	04360	74
Head	04380	63
Headgear	04390	65
Health	04395	47
Heat	04410	80
Heat Shields	04420	77
Heat Tolerance	04430	63
Heat Transfer	04440	80
Heat Treatment	04450	37
Heating	04460	62
Helicopter Rotors	04490	03
Helicopters	04500	05
Helium	04510	11
High Energy	04515	21
High Pressure Research	04530	71
High Temperature Research	04540	71
High-Altitude	04550	52
Historical Summary	04555	19

TERM	CODE NUMBER	GROUP NUMBER
Hoists	04560	36
Hooks	04580	18
Hose Fittings	04610	18
Hoses	04620	78
Human Engineering	04630	71
Humidity	04640	50
Hybrid Rocket Propellants	04650	72
Hydraulic Actuators	04660	35
Hydraulic Fluids	04670	42
Hydraulic Pressure Pumps	04680	67
Hydraulic Servomechanisms	04690	35
Hydraulic Systems	04700	35
Hydrazine	04705	32
Hydrogen	04710	11
Hydroplaning	04715	05
Hydrostatic Testing	04720	39
Hypergolic Ignition	04730	12
Hypergolic Rocket Propellants	04740	72
Hypoxia	04745	63
Ice	04750	50
Ice-Formation Indicators	04760	49
Ice Prevention	04765	49
Identification	04770	51
Ignition	04780	12
Ignition Systems	04790	25
Illumination	04800	56
Impact Shock	04820	46
Impact Tests	04830	39
Impurities	04840	51
Indexes	04850	19
Industrial Hygiene	04855	47
Industrial Research	04860	71
Industrial Safety	04865	74
Industrial Training	04870	82
Inertial Guidance	04890	54
Inertial Navigation	04900	54
Information Retrieval	04910	19
Information Transmission	04915	19
Ingestion (Engines)	04920	25
Injuries	04925	74
Inspection	04930	51
Installation	04940	51
Instrument Dials	04950	38
Instrument Panels	04960	38
Instrumentation	04970	51
Instrument Flight	04980	04
Instrument Landings	04990	04
Insulation	04995	51

TERM	CODE NUMBER	GROUP NUMBER
Intensity	05000	51
Interference	05010	51
Internal Combustion Engines	05020	25
Interviews	05025	19
Intravehicular Activity	05027	74
Ion Engines	05030	25
Jet Engine Noise	05050	01
Jet Engines	05060	25
Jet Plane Noise	05070	01
Jet Planes	05080	05
Jet Propulsion	05090	64
Jet Pumps	05100	57
Jettisonable Equipment	05120	05
Job Performance	05125	51
Joints	05130	78
Kerosene	05140	32
Laboratory Equipment	05150	39
Laboratories and Testing Facilities	05155	39
Laminates	05170	78
Landing Aids	05180	04
Landing Fields	05190	04
Landing Gear	05200	05
Landing Impact	05210	46
Landing Lights	05220	05
Landings	05230	04
Lasers	05240	07
Launch Vehicles (Aerospace)	05250	73
Law	05260	75
Leakage	05275	51
Leakage (Fluids)	05280	51
Learning	05290	66
Libraries	05330	75
Licensing	05340	75
Life Support	05360	63
Lift	05370	31
Light	05380	56
Lighting Equipment	05390	56
Lightning	05395	62
Lightning Protection Equipment	05400	22
Liquid Rocket Propellants	05410	72
Liquids	05420	62
Liquified Gases	05430	62
Load Distribution	05440	46
Logistics	05450	51



TERM	CODE NUMBER	GROUP NUMBER
Low Pressure Research	05460	71
Low Temperature Research	05470	71
Low-Altitude	05480	52
Low-Temperature Lubricants	05490	40
Lubricants	05500	40
Lubrication	05510	40
Lunar Craft	05520	77
Lunar Surface	05525	33
Machines	05530	41
Machining	05540	37
Magnetism	05560	23
Maintainability	05570	51
Maintenance	05575	51
Maintenance Equipment	05580	36
Maintenance Personnel	05590	59
Malfunction Detection Systems	05600	74
Malfunctions	05610	51
Management (Engineering)	05620	75
Man-Machine Systems	05630	75
Maneuverability	05640	51
Manned	05650	52
Manned Spacecraft	05660	77
Manufacturing Methods	05670	51
Marine Equipment	05675	83
Marker Lights	05680	55
Markings	05685	
Mars (Planet)	05690	09
Masers	05700	07
Materials	05705	51
Mathematical Analysis	05710	44
Mathematical Models	05720	44
Mathematical Prediction	05730	44
Mathematics	05740	44
Measurement	05750	51
Measuring Devices (Electrical and Electronic)	05760	22
Mechanical Valves	05770	84
Mechanical Fasteners	05780	18
Mechanical Properties	05790	45
Mechanics	05800	46
Medical Equipment	05810	47
Medical Examination	05820	47
Medical Research	05830	71
Medical Services	05835	47
Medicine	05840	47
Melting	05850	62
Metabolism	05870	63
Metal Joints	05880	48
Metals	05890	11

TERM	CODE NUMBER	GROUP NUMBER
Metecrites	05900	09
Meteorological Charts	05910	49
Meteorological Instruments	05920	49
Meteorological Phenomena	05930	50
Meteorology	05940	50
Meters	05950	38
Microfiche	05960	19
Microfilm	05970	19
Microwaves	05975	24
Military Law	06000	75
Military Personnel	06020	59
Military Requirements	06030	51
Military Training	06040	82
Misalignment	06050	51
Missile Transporters	06060	83
Mixtures	06070	43
Mobility	06075	83
Model Tests	06080	39
Moisture	06090	62
Moistureproofing	06100	28
Momentum	06110	53
Monopropellants	06130	72
Monte Carlo Method	06140	44
Moon Safety	06150	09
Moral Obligations	06160	51
Mortality Rates	06170	44
Motion	06180	53
Motion Pictures	06190	61
Motion Sickness	06200	58
Motivation	06210	66
Mounting Brackets	06230	78
National Aeronautics and Space Administration		
NASA	06235	57
Navigational Aids	06250	55
Navigation	06260	54
Navy	06270	57
Nets	06280	78
Neutralize	06285	11
Nitrogen	06320	11
Noise	06330	01
Non-Destructive Testing	06350	37
Non-Metals	06360	11
Nonpowered Flight	06370	04
Nose Cones	06380	34
Nuclear Reactors	06382	04
Nuclear Safety	06385	74

TERM	CODE NUMBER	GROUP NUMBER
Oceans	06390	33
Odors	06400	62
Oil Seals	06410	02
Oil Tanks	06420	16
Oils	06430	43
Operation	06440	51
Optical Equipment	06450	56
Optical Phenomena	06460	56
Optical Properties	06470	56
Optics	06480	56
Ordnance	06490	06
Ordnance Operated Valves	06500	84
Overpressures	06520	27
Oxidation	06530	11
Oxygen	06540	11
Oxygen Consumption	06550	63
Packaging	06555	51
Paints	06570	28
Parachutes	06580	04
Particles	06590	43
Passengers	06600	59
Passivation	06605	11
Patents	06610	19
Pathology	06620	58
Penetration	06640	51
Perception	06650	63
Performance (Engineering)	06655	74
Pharmacology	06670	60
Photographs	06680	61
Photography	06690	61
Photographic Equipment	06700	61
Photographic Recording Systems	06710	70
Physical Fitness	06720	63
Physical Properties	06730	62
Physiology	06740	63
Pilot Crew Station	06750	05
Pilots	06770	59
Pipes	06780	78
Planets	06800	09
Plastics	06820	11
Pneumatic Devices	06830	35
Pneumatic Servomechanisms	06840	35
Pneumatic Systems	06850	35
Poisoning	06860	81
Poisonous Gases	06870	81
Polar Regions	06880	33
Political Ramifications (Accidents)	06890	74
Pollution	06895	51

TERM	CODE NUMBER	GROUP NUMBER
Positioning Devices (Machinery)	06910	36
Powders	06930	43
Power Equipment (Electric)	06940	21
Power Equipment (Mechanical)	06942	21
Preservation	06945	51
Pressure	06950	62
Pressure Gages	06960	38
Pressure Regulators	06970	35
Pressure Suits	06980	65
Pressure Vessels	06990	35
Pressurization Systems	07000	35
Probability	07010	44
Procedures	07015	19
Programming (Computers)	07020	15
Propellants	07030	06
Propellers (Aerial)	07040	03
Proposals	07045	19
Propulsion	07050	64
Protective Screens	07060	78
Protective Shields	07065	78
Protective Treatments	07070	28
Protective Clothing	07080	65
Protective Masks	07090	65
Psychology	07100	66
Public Relations	07110	75
Pumps	07120	67
Purification	07130	51
Pyrotechnics	07135	06
Quality Control	07140	37
Quantity-Distance	07145	27
Racks	07147	78
Radar	07150	68
Radar Equipment	07160	68
Radiation	07165	24
Radio Equipment	07180	69
Radio Interference	07190	69
Radio Receivers	07200	69
Radio Reception	07210	69
Radio Signals	07220	69
Radio Transmission	07230	69
Radio Transmitters	07240	69
Rainfall	07260	50
Ranges (Establishments)	07270	39
Range Safety	07275	74
Rate-of-Climb Indicators	07280	30
Recorders	07310	38

TERM	CODE NUMBER	GROUP NUMBER
Recording Systems	07320	70
Recovery	07325	26
Reduction	07330	51
Redundant Components	07340	51
Re-Entry Vehicles	07350	77
Refueling	07370	51
Regulations	07375	19
Regulators	07380	51
Reinforcing Materials	07390	78
Release Mechanisms	07400	38
Reliability	07410	51
Reports	07420	19
Rescue Systems	07430	26
Rescues	07440	26
Respiration	07460	62
Restraining Devices	07470	18
Retro Rockets	07480	73
Reviews	07490	19
Rhythm (Biology)	07500	10
Rivets	07510	18
Rivers	07520	33
Rocket Launchers	07525	73
Rocket Motors	07530	73
Rocket Motors (Liquid Propellant)	07540	73
Rocket Motors (Nuclear)	07545	73
Rocket Motors (Solid Propellant)	07550	73
Rocket Motor Noise	07560	01
Rocket Propellant Grains	07580	06
Rocket Propelled Sleds	07590	39
Rocket Propulsion	07600	64
Rockets	07610	73
Rotation	07630	53
Runways	07640	04
Rupture	07650	46
Sabotage	07660	74
Safety Audit	07670	39
Safety Devices	07680	74
Safety Engineering Analysis	07690	19
Safety Harnesses	07700	74
Safety Management Systems	07710	75
Salvage	07720	74
Sampling	07730	44
Satellites (Artificial)	07740	77
Scattering	07750	51
Scientific Research	07760	71
Scientific Personnel	07770	59
Screws	07780	18
Sealing Compounds	07790	02

TERM	CODE NUMBER	GROUP NUMBER
Seals (Stoppers)	07800	02
Security	07820	51
Selection	07830	51
Sensitivity	07840	51
Sensors	07850	38
Sensory Mechanisms (Physiology)	07860	63
Separation	07870	51
Separation Bolts	07880	18
Shear Stresses	07890	45
Shock (Mechanics)	07900	46
Shock (Pathology)	07910	58
Shock Resistance (Mechanics)	07920	46
Shock Waves (Mechanics)	07930	46
Simulation	07940	51
Siting	07945	51
Slushing	07970	51
Slurry Fuels	07980	32
Smokes	07990	43
Snow	08000	50
Solar Cells	08005	22
Solar System	08010	09
Soldering	08020	48
Solid Rocket Oxidizers	08030	72
Solid Rocket Propellants	08040	72
Solids	08050	43
Solutions	08060	43
Solvents	08070	11
Sonic Boom	08080	01
Sonic Fatigue	08090	45
Sources	08100	51
Space	08105	09
Space Biology	08110	10
Space Capsules	08120	77
Space Environmental Conditions	08140	76
Space Flight	08150	76
Space Medicine	08160	47
Space Navigation	08170	54
Space Perception	08180	63
Space Stations	08190	77
Spacecraft	08200	77
Spacecraft Cabins	08220	77
Spacecraft Components	08230	77
Sparks	08250	23
Specifications	08255	19
Speeches	08260	19
Stabilization	08290	51
Stalling	08310	04
Stall-Warning Indicators	08320	30
Standardization	08330	51
Standards	08335	19

TERM	CODE NUMBER	GROUP NUMBER
Stars	08340	09
State-of-the-Art Reviews	08350	19
Static Electricity	08360	23
Statistical Analysis	08370	44
Sterilization	08375	51
Storable Propellants	08380	72
Storage	08390	16
Storage Tanks	08400	16
Strain (Mechanics)	08410	45
Stress (Mechanics)	08420	45
Stress (Physiology)	08430	63
Stress(Psychology)	08440	66
Structural Properties	08460	78
Structures	08470	78
Subsonic Aircraft	08485	05
Supersonic Flight	08520	04
Supersonic Aircraft	08530	05
Supports	08540	78
Surface Properties	08550	62
Survival	08570	26
Survival Systems	08580	26
Swept Wings	08590	03
Symposia	08600	19
System Safety Engineering Plan	08610	19
Systems Engineering	08615	74
Systems Safety	08625	19
Tables	08630	44
Take Off	08640	04
Tank Entry	08650	39
Tank Vents	08660	16
Tanks (Containers)	08680	16
Taxiing	08690	04
Taxiways	08692	04
Technical Information Centers	08700	19
Techniques	08710	51
Temperature	08720	62
Temperature Control	08730	38
Tensile Properties	08750	45
Terrain Avoidance	08770	54
Test Equipment	08790	39
Test Methods	08800	39
Tests	08810	39
Tethering	08820	74
Textiles	08830	79
Theory	08840	51
Thermal insulation	08850	42
Thixotropic Rocket Propellants	08860	72
Thrust	08870	53

TERM	CODE NUMBER	GROUP NUMBER
Thrust Reverse	08880	53
Thrust Vector Control Systems	08890	29
Time	08900	51
Timing Devices	08910	38
Tolerances (Physiology)	08920	63
Touch	08940	63
Touchdown	08950	04
Toxicity	08970	81
Toxic Tolerances	08960	81
Toxins and Antitoxins	08980	60
Tractors	08990	83
Tracking Systems	08995	68
Trade-Off Studies	09000	74
Trailing Control Surfaces	09010	29
Training	09020	82
Training Devices	09030	82
Transport Planes	09050	05
Transportation	09060	83
Tropical Regions	09080	33
Tubes (Electron)	09085	22
Tumbling	09090	53
Turbine Parts	09100	14
Turbines	09110	14
Turbofan Engines	09120	25
Turbojet Engines	09130	25
Turbulence	09140	31
Undersea Technology	09155	71
Underwater	09160	71
Vacuum Apparatus	09180	39
Vacuum Chambers	09185	39
Vacuum Measuring Devices	09190	38
Vacuum Pumps	09200	67
Vacuum Seals	09210	02
Vacuum Systems	09215	02
Valves	09220	84
Vapor Detection Systems	09230	74
Vaporization	09240	62
Vapors	09250	43
Velocity	09270	53
Ventilation	09280	17
Vents	09285	78
Vessels (Ships)	09287	83
Vibration	09290	53
Viscosity	09300	62
Visibility	09310	56
Vision	09320	63



TERM	CODE NUMBER	GROUP NUMBER
Visual Flight	09330	04
Volume	09340	62
Vortex Generators	09350	29
Vulnerability	09360	51
Wake	09380	31
Warheads	09385	06
Warning Systems	09390	74
Water	09400	11
Weapon Systems	09403	34
Weather	09405	50
Weather Forecasting	09410	50
Weight	09420	62
Weightlessness	09430	76
Welding	09440	48
Welds	09450	48
Wind Tunnels	09470	39
Winds	09480	50
Windshields	09485	05
Wings	09500	03
Wire	09510	78
Wounds and Injuries	09520	85
Writing (Composition)	09525	19
X-Rays	09530	24
Yaw	09540	53
Yawmeters	09550	30
Zero G	09560	18

## SAFETY ENGINEERING TERM GROUPS

Each entry consists of three parts

1	The TERM. . . . .	Abandonment
2	The TERM CODE number. . . .	00010
3	The TERM GROUP CODE number . .	26

## (01) ACOUSTICS

Acoustics	00210	01
Airplane Engine Noise	00730	01
Airplane Noise	00740	01
Jet Engine Noise	05050	01
Jet Plane Noise	05070	01
Noise	06330	01
Rocket Motor Noise	07560	01
Sonic Boom	08080	01

## (02) ADHESIVES AND SEALS

Adhesives	00720	02
Fuel Seals	03960	02
Gaskets	04070	02
Oil Seals	06410	02
Sealing Compounds	07790	02
Seals (Stoppers)	07800	02
Vacuum Seals	09210	02
Vacuum Systems	09215	02

## (03) AERODYNAMIC CONFIGURATIONS

Helicopter Rotors	04490	03
Propellers (Aerial)	07040	03
Swept Wings	08590	03
Wings	09500	03

## (04) AERONAUTICS

Climbing (Flight)	00191	04
Aeronautics	00410	04
Air Navigation	00530	04
Air Route Traffic Control Centers	00550	04
Air Routes	00560	04
Air Traffic Control Systems	00580	04
Airports	00750	04
Airspace	00760	04
All Weather Aviation	00810	04
Approach	00940	04
Approach Lights	00960	04
Aprons	00970	04
Arresting Barriers	01002	04
Arresting Gear	01010	04

Automatic Landing Systems	01210	04
Civil Aviation	01840	04
Collision Avoidance	02000	04
Ditching	02822	04
Decompression	02520	04
Descent	02605	04
Facilities	03395	04
Flameout	03620	04
Flares	03655	04
Flight	03670	04
Flight Paths	03720	04
Flight Plans	03730	04
Flight Simulators	03750	04
Flight Speeds	03770	04
Glide Path	04150	04
Ground Speed	04190	04
Ground Support Equipment	04200	04
Instrument Flight	04980	04
Instrument Landings	04990	04
Landing Aids	05180	04
Landing Fields	05190	04
Landings	05230	04
Nonpowered Flight	06370	04
Nuclear Reactors	06382	04
Parachutes	06580	04
Runways	07640	04
Stalling	08310	04
Supersonic Flight	08520	04
Takeoff	08640	04
Taxiing	08690	04
Taxiways	08692	04
Touchdown	08950	04
Visual Flight	09330	04

(05) AIRCRAFT

Aircraft	00590	05
Aircraft Cabins	00610	05
Aircraft Canopies	00620	05
Aircraft Equipment	00630	05
Aircraft Markings	00680	05
Aircraft Seats	00690	05
Aircraft Tires	00700	05
Airframes	00720	05
Army Aircraft	01000	05
Crew Stations	02417	05
Drones	02880	05
Fuselages	04010	05
General Aviation Aircraft	04130	05
Helicopters	04500	05
Hydroplaning	04715	05
Jet Planes	05080	05
Jettisonable Equipment	05120	05

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Landing Gear	05200	05
Landing Lights	05220	05
Pilot Crew Station	06750	05
Subsonic Aircraft	08485	05
Supersonic Aircraft	08530	05
Transport Planes	09050	05
Windshields	09485	05

(06) AMMUNITION AND EXPLOSIVES

Abort and Destruct Systems	00040	06
Arming Systems	00975	06
Ammunition	00845	06
Ballistics	01275	06
Bombs	01515	06
Cartridges (Pad)	01680	06
Destruct Charges	02650	06
Detonators	02670	06
Dispenser	02775	06
Explosive Actuators	03360	06
Explosive Initiators	03370	06
Explosives	03372	06
Fire Control (Ordnance)	03515	06
Fuzes	04015	06
Guns	04285	06
Ordnance	06490	06
Propellants	07030	06
Pyrotechnics	07135	06
Rocket Propellant Grains	07580	06
Warheads	09385	06

(07) AMPLIFIERS

Lasers	05240	07
Masers	05700	07

(08) ANTENNAS

Antennas	00920	08
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(09) ASTRONOMY

Mars (Planet)	05690	09
Meteorites	05900	09
Moon Safety	06150	09
Planets	06800	09
Solar System	08010	09
Space	08105	09
Stars	08340	09

(10) BIOLOGY

Biochemistry	01370	10
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Biology	01380	10
Bionics	01390	10
Closed Ecological Systems	01920	10
Rhythm (Biology)	07500	10
Space Biology	08110	10

## (11) CHEMISTRY

Ceramics	01755	11
Chemical Analysis	01790	11
Chemical Compounds	01800	11
Chemical Elements	01810	11
Chemical Properties	01820	11
Chemicals	01785	11
Fluorine	03835	11
Glass	04145	11
Helium	04510	11
Hydrogen	04710	11
Metals	05890	11
Neutralize	06285	11
Nitrogen	06320	11
Non-Metals	06360	11
Oxidation	06530	11
Oxygen	06540	11
Passivation	06605	11
Plastics	06820	11
Solvents	08070	11
Water	09400	11

## (12) COMBUSTION

Burning Rate	01620	12
Combustion	02030	12
Exhaust Gases	03310	12
Flame Arresters	03600	12
Flame Propagation	03610	12
Flames	03630	12
Hypergolic Ignition	04730	12
Ignition	04730	12

## (13) COMMUNICATIONS SYSTEMS

Command and Control Systems	02040	13
Communication Equipment	02050	13
Communication Systems	02060	13

## (14) COMPRESSORS AND TURBINES

Compressors	02120	14
Gas Turbines	04030	14
Turbine Parts	09100	14
Turbines	09110	14

## (15) COMPUTERS AND DATA SYSTEMS

Computers	02130	15
Data Processing Systems	02470	15
Data Storage Systems	02480	15
Programming (Computers)	07020	15

## (16) CONTAINERS AND PACKAGING

Compressed Gas Cylinders	02100	16
Containers	02170	16
Fuel Tanks	03980	16
Oil Tanks	06420	16
Storage	08390	16
Storage Tanks	08400	16
Tank Vents	08660	16
Tanks (Containers)	08680	16

## (17) COOLING AND VENTILATING

Air Conditioning Equipment	00510	17
Cooling and Ventilation Equipment	02300	17
Ventilation	09280	17

## (18) COUPLINGS, FITTINGS AND FASTENINGS

Bolts	01510	18
Couplings	02350	18
Disconnect Fittings	02760	18
Fittings	03580	18
Hooks	04580	18
Hose Fittings	04610	18
Mechanical Fasteners	05780	18
Restraining Devices	07470	18
Rivets	07510	18
Screws	07780	18
Separation Bolts	07880	18

## (19) DOCUMENTATION

Abstracts	00070	19
Bibliographies	01350	19
Charts	01765	19
Classification	01850	19
Design Review	02640	19
Dictionaries	02680	19
Directories	02750	19
Documentation	02830	19
Drawings	02835	19
Handbooks	04320	19
Historical Summary	04555	19
Indexes	04850	19
Information Retrieval	04910	19

Information Transmission	04915	19
Interviews	05025	19
Microfiche	05960	19
Microfilm	05970	19
Patents	06610	19
Procedures	07015	19
Proposals	07045	19
Regulations	07375	19
Reports	07420	19
Reviews	07490	19
Safety Engineering Analysis	07690	19
Specifications	08255	19
Speeches	08260	19
Standards	08335	19
State-of-the-Art Reviews	08350	19
Symposia	08600	19
Systems Safety Engineering Plan	08610	19
Systems Safety	08625	19
Technical Information Centers	08700	19
Writing (Composition)	09525	19

## (20) ECONOMICS

Budgets	01590	20
Costs	02340	20
Economics	03030	20
Federal Budgets	03480	20

## (21) ELECTRICAL POWER EQUIPMENT

Batteries and Components	01300	21
Energy (Ordnance)	03205	21
Fuel Cells	03920	21
Generators (Electric)	04140	21
High Energy	04515	21
Power Equipment (Electric)	06940	21
Power Equipment (Mechanical)	06942	21

## (22) ELECTRICAL AND ELECTRONIC EQUIPMENT

Circuits (Electrical)	01830	22
Connectors (Electrical)	02158	22
Electric Cables	03070	22
Electrical Equipment	03110	22
Electronic Equipment	03180	22
Solar Cells	08005	22
Lightning Protection Equipment	05400	22
Measuring Devices (Electrical and Electronic)	05760	22
Tubes (Electron)	09085	22

## (23) ELECTRICITY AND MAGNETISM

Electric Discharges	03080	23
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Electricity	03130	23
Electromagnetic Properties	03140	23
Grounding (Electrical)	04225	23
Magnetism	05560	23
Sparks	08250	23
Static Electricity	08360	23

(24) ELECTROMAGNETIC WAVE PHENOMENA

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## BIBLIOGRAPHY OF SYSTEM SAFETY DATA

The following bibliography is arranged by source/corporate author and in numerical sequence by the RAIDS catalog number, which appears in parentheses at the end of each entry. Missing sequential catalog numbers indicate that previously cataloged items have been deleted as not being pertinent.

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- 495. Test Facilities Handbook: Policies and Procedures. Vol. 1 7-63. (AM 002)
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- 2418. FSF Pilots Safety Exchange Bulletin 66 100/101, Instrument Navigation - Physiological Aspects of Instrument Flying. 2-66. (SF 015)
- 2419. 17th Annual International Air Safety Seminar. 10-64. 90pp. (SF 016)
- 2420. 18th Annual International Air Safety Seminar. 11-65. 178pp. (SF 017)
- 2421. Crash Safety Investigation Reference Manual. 10-62. 94pp. (SF 018)
- 2422. AvSER 65-13, Aircraft Litter Retention System Design Criteria (No date). (SF 019)
- 2423. Andrews, Kenneth R. Crime and Punishment "Achieving Safety Through Discipline?" (Seminar Paper). 11-52. (SF 020)
- 2424. Taylor, Vernon A. Critical Factors in Approach and Landing Accidents - 1959 - 1963. (Interim Report). 5-64. 7pp. (SF 021)
- 2425. Andrews, Kenneth R. Morale and Safety in Aviation (paper). 11-51. (SF 022)
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2427. 14th Annual International Air Safety Seminar. 11-61. 101pp. (SF 024)
2428. FSF Pilots Safety Exchange Bulletin 66-102/104, Approaches and Departures. 4-66. (SF 025)
2429. Crash Survival Investigator's School General Outline/Program of Instruction. 10-65. 307p. (SF 026)
2430. RD-65-4, A Study of Arresting Gear - The Cost of Accidents. 1-65. 57pp. (AD 466 379). (SF 027)
2431. Pilots Safety Exchange Bulletin 66-107/108, Modified Precision Approach. 10-66. 4pp. (SF 028)
2432. Caldara, Joseph D., Maj. Gen. USAF (Ret.) "Forward Thinking for Unassisted Egress in the New Environment." (paper) 11-67. (SF 029)
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- (1) New Rescue Net
  - (2) Your Own Rooftop Heliport
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2434. Flight Safety Foundation, Inc. - 1967 Annual Report. (SF 031)
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2436. Aerospace; Air Transport Industries, National Safety Congress Transactions. 1964. Vol. 2. (SG 001)
2437. Safe Practices Pamphlet No. 60, Chemical Laboratories. 1952. (SG 002)
2438. Aerospace; Air Transport Industries National Safety Congress Transactions. 1965. Vol. 2. (SG 003)
2439. Data Sheet 579. Applications of Electric Plug and Receptacle Configurations. 1966. 5pp. (SG 004)

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- 2440. Data Sheet 580, Jet Engine Noise. 1966. 8pp. (SG 005)
- 2441. Data Sheet 583, Portable Grinders. 1966. 4pp. (SG 006)
- 2442. Data Sheet 585, Management Policies on Occupational Safety. 1966. 11pp. (SG 007)
- 2443. Aviation Ground Operations Safety Handbook. (No date.) (SG 008)
- 2444. NSC Transactions - Management Vol. 26. 1966. 32pp. (SG 009)
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- 2446. Data Sheet 385, Electric Cords and Fittings. 1966. 5pp. (SG 011)
- 2447. Data Sheet 591, Centrifuges. 1967. 4pp. (SG 012)
- 2448. Aerospace; Air Transport Industries. National Safety Congress Transactions. 1966. Vol. 2. (SG 013)
- 2449. Rules for Safety. 1967. (SG 014)

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NATIONAL BOARD OF FIRE UNDERWRITERS (NBFU)

- 2450. NBFU No. 10, Installation, Maintenance and Use of Portable Fire Extinguishers. 6-62. 69pp. (SH 001)
- 2451. NBFU No. 11, Foam Extinguishing Systems. 6-60. 63pp. (SH 002)
- 2452. NBFU No. 12, Carbon Dioxide Extinguishing Systems. 7-62. 62pp. (SH 003)
- 2453. NBFU No. 13, Sprinkler Systems. 6-61. 143pp. (SH 004)
- 2454. NBFU No. 14, Standpipe and Hose Systems. 10-62. 16pp. (SH 005)
- 2455. NBFU No. 15, Water Spray Systems for Fire Protection. 7-57. 52pp. (SH 006)
- 2456. NBFU No. 19, Motor Fire Apparatus. 6-61. 52pp. (SH 007)

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2457. NBFU No. 20. Centrifugal Fire Pumps. 3-62. 76pp. (SH 009)
2458. NBFU No. 22. Water Tanks. 3-62. 117pp. (SH 009)
2459. NBFU No. 24. Outside Protection - Yard Piping Supplying Water for Fire Extinguishers. 7-69. 40pp. (SH 010)
2460. NBFU No. 26. Supervision of Valves Controlling Water Supplies for Fire Protection. 7-58. 9pp. (SH 011)
2461. NBFU No. 30. Storage, Handling and Use of Flammable Liquids. 11-61. 49pp. (SH 012)
2462. NBFU No. 31. Oil Burning Equipment. 6-61. 53pp. (SH 013)
2463. NBFU No. 33. Spray Finishing. 6-61. 23pp. (SH 014)
2464. NBFU No. 34. Dip Tanks. 7-57. 19pp. (SH 015)
2465. NBFU No. 37. Installation and Use of Combustive Engines and Gas Turbines. 7-59. 10pp. (SH 016)
2466. NBFU No. 40. Storage and Handling of Cellulose Nitrate Motion Picture Film. 11-53. 31pp. (SH 017)
2467. NBFU No. 44. Storage and Handling of Combustible Fibres. 12-53. 19pp. (SH 018)
2468. NBFU No. 48. Storage, Handling and Processing of Magnesium. 6-61. 19pp. (SH 019)
2469. NBFU No. 51. Installation and Operation of Gas System for Welding and Cutting. 6-60. 19pp. (SH 020)
2470. NBFU No. 54. Installation of Gas Appliances and Gas Piping. 3-59. 84pp. (SH 021)
2471. NBFU No. 56. Use of Flammable Anesthetics. 7-62. 41pp. (SH 022)
2472. NBFU No. 58. Storage and Handling of Liquefied Petroleum Gases. 6-61. 75pp. (SH 023)
2473. NBFU No. 60. Installation and Operation of Pulverized-Fuel Systems. 6-58. 22pp. (SH 024)
2474. NBFU No. 63. Prevention of Dust Explosions in Industrial Plants. 12-49. 10pp. (SH 025)

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- 2475. NBFU No. 69, Inerting for Fire and Explosion Prevention. 7-56. 37pp. (SH 026)
- 2476. NBFU No. 75, Protection of Electronic Computer Systems. 8-62. 19pp. (SH 027)
- 2477. NBFU No. 80, Installation of Fire Doors and Windows. 7-62. 58pp. (SH 028)
- 2478. NBFU No. 82, Incinerators. 7-58. 16pp. (SH 029)
- 2479. NBFU No. 86, Class A Ovens and Furnaces. 11-50. 111pp. (SH 030)
- 2480. NBFU No. 90A, Installation of Air Conditioning and Ventilating Systems of Other than Residence Type. 6-60. 23pp. (SH 031)
- 2481. NBFU No. 91, Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal of Conveying. 7-61. 18pp. (SH 032)
- 2482. NBFU No. 96, Ventilation of Restaurant Cooking Equipment. 7-59. 7pp. (SH 033)
- 2483. NBFU No. 385, Tank Vehicles for Flammable Liquids. 6-60. 18pp. (SH 034)
- 2484. NBFU No. 565, Nonflammable Medical Gas Systems. 6-62. 13pp. (SH 035)
- 2485. NBFU No. 566, Bulk Oxygen Systems at Consumer Sites. 7-57. 6pp. (SH 036)
- 2486. NBFU No. 410, Control of Operational Hazards in Aircraft Hangers. 8-54. 9pp. (SH 037)

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INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)

- 2487. 1st IEEE Annual Communications Convention. 7-65. 780pp. (SI 001)
- 2488. CP 62-1133, Aircraft Protection From Thunderstorm Electromagnetic Effects. 4-62. (SI 002)
- 2489. Aircraft Antenna System Lightning Protection. 9-55. (SI 003)

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- 2490. 7th National Convention on Military Electronics Proceedings. 9-63. (SI 005)
- 2491. Case and Cable Shielding, Bonding, and Grounding Considerations in Electromagnetic Interference. IRE Transactions on Radio Frequency Interference. 10-62. (SI 006)
- 2492. Interference Problems of Co-Channel Communication Satellite Systems. IRE Transactions on Radio Frequency Interference. 10-62. (SI 007)
- 2493. Electromagnetic Susceptibility Testing Techniques for Airborne Equipment. IEEE Transactions on Radio Frequency Interference. 3-63. (SI 008)
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- 2495. ASME Boiler and Pressure Vessel Code, Section VIII, Unfired Pressure Vessels, 1965. (SJ 001)
- 2496. ASA B31.1 - 1955, Code for Pressure Piping. 11-65. 136pp. (SJ 002)
- 2497. 65-AV-14, Meador, B. M. Economic Impact of Aircraft Maintenance. 3-65. 5pp. (SJ 003)
- 2498. 63-WA-288, Nesbitt, Lloyd B. Problems on Cryogenics. 11-63. 4pp. (SJ 004)
- 2499. 59-AV-11, Nan, Richard A. Environmental Control Systems for Manned Space Vehicles. 3-59. 9pp. (SJ 005)
- 2500. ASA A40.8-1955, National Plumbing Code. 1955. 174pp. (SJ 006)
- 2501. 60-AV-27, Hallengsworth R., and Ostgaard, M. A. Safety Considerations for Flight Control Systems. 6-60. 8pp. (SJ 007)
- 2502. Annals of Assurance Sciences 1968. Seventh Reliability and Maintainability Conference. (SJ 008)



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SOCIETIES AND ASSOCIATIONS  
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2503. National Fire Codes (10 volumes) (SK 001)
- (1) Vol. 1 - Flammable Liquids
  - (2) Vol. 2 - Gases
  - (3) Vol. 3 - Combustible Solids, Dusts, and Explosives
  - (4) Vol. 4 - Building Construction and Facilities
  - (5) Vol. 5 - Electrical
  - (6) Vol. 6 - Sprinklers, Fire Pumps, and Water Tanks
  - (7) Vol. 7 - Alarm and Special Extinguishing Systems
  - (8) Vol. 8 - Portable and Manual Fire Control Equipment
  - (9) Vol. 9 - Occupancy Standards and Process Hazards
  - (10) Vol. 10 - Transportation
2504. NFPA 410C, Aircraft Fuel System Maintenance. 5-62. (SK 002)
2505. NFPA 414, Aircraft Rescue Fire Fighting Vehicles. 1963. (SK 003)
2506. NFPA 78, Lightning Protection Code. 1965. (SK 004)
2507. NFPA 85, Explosion Prevention Watertube Boiler-Furnaces. 1965. (SK 005)
2508. NFPA 490, Storage of Ammonium Nitrate. 1965. (SK 006)
2509. NFPA Publications List. 1966-1967. (SK 007)

SO

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2510. ASQC Configuration Management Symposium - Technical Papers. 1i-65. 358pp. (SO 001)

SP

SOCIETIES AND ASSOCIATIONS  
AIR TRANSPORT ASSOCIATION OF AMERICA

- 2511. ATA Spec. No. 100, Specification for Manufacturers' Technical Data. (SP 001)
- 2512. Airport Surface Conditions. 8-65. 19pp. (SP 002)

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- 2513. AIR 290-60-FR-225, Human Factors Methods for System Design. 1963. 382pp. (AD 232 646). (SZ 001)
- 2514. SC-DC-3553, Aerospace Nuclear Safety. 10-63. 365pp. (SZ 002)
- 2515. Record of National Symposium on Extended Range and Space Communications. 10-58. 119pp. (SZ 003)
- 2516. 2nd National Flight Safety, Survival and Personal Equipment Symposium. 10-64. 273pp. (N65-29750 through N65-29771). (SZ 004)
- 2517. 7th Annual East Coast Conference on Aeronautical and Navigational Electronics. 10-60. 187pp. (SZ 005)
- 2518. 8th Annual East Coast Conference on Aerospace and Navigational Electronics. 10-61. (SZ 006)
- 2519. 1962 Wescon Technical Papers. Part 5, Sessions on Aeronautical and Navigational Electronics, Military Electronics, Space Electronics and Telemetry. 8-62. (SZ 007)
- 2520. ATC Report No. ARTC-37, Aircraft Alighting Dynamics. (Aerospace Industries Association). 6-64. 84pp. (AD 442 495). (SZ 008)
- 2521. Cutler, Walter. Panic and Its Control. 6-57. 11pp. (SZ 009)
- 2522. Liquefied Petroleum Gas - Safe Handling and Use. 1965. 64pp. (SZ 010)
- 2523. Liston, David, Jr. Information Systems - Proceedings of 8th Annual Institute in Technical and Industrial Communications, CSU, Ft. Collins, Colorado. 1966. (SZ 011)
- 2524. Lederer, Jerome. Wright Brothers Award Presented by National Aeronautic Association to Jerome Lederer. 12-65. 4pp. (SZ 012)

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2525. Newman, M. M. The Use of Triggered Lightning to Study the Discharge Process in the Channel and Application to V. L. F. Propagation Studies. 1958. 12pp. (SZ 013)
2526. Occasional Paper No. 1. Collins, Lloyd R. Anthropology Psychology Engineering. 4-64. 32pp. (SZ 014)
2527. Serling, Robert J. (editor) The Newsmen and Air Accidents. 20pp. (SZ 015)
2528. Catastrophic Accidents in Government Programs. 2-64. 20pp. (SZ 016)
2529. Accident Case Histories. (Manufacturing Chemists Association). 9-66. (SZ 017)
2530. Threshold Limit Values for 1966. 5-66. (SZ 018)
2531. Lodge, George T. A Seasonal Pattern in Pilot-Factor Aircraft Accidents. No date. (SZ 019)
2532. SP-2031/000/01, Jarrett, Hilton F. The Systems Approach to Fire Protection Problems: An Overview. 4-65. 15pp. (AD 615 118). (SZ 020)
2533. Study of Engineering Terminology and Relationships Among Engineering Terms. (Final Report) (Engineers Joint Council). 8-63. (SZ 021)
2534. ASTM Metric Practice Guid, 2nd Edition. (ASTM). 12-66. (SZ 022)
2535. SNT Airframe Subcommittee Report No. 1 (Revised), Recommended Ultrasonic Acceptance Standards for Airframe Aluminum Alloy Plate, Forgings, and Extrusions. (Society for Nondestructive Testing). 2-64. (SZ 023)
2536. Paper No. 124, Helicopter Cargo Restraint. (American Helicopter Society, Inc.). 4-67. (SZ 024)
2537. Paper No. 117, CH-54A Engine Inlet Air Particle Separator. (American Helicopter Society, Inc.). 4-67. (SZ 025)
2538. Hydraulic Institute Standards. 11th Edition. 1965. (SZ 026)
2539. Electronic Industries Association (EIA) - Index of EIA and JEDEC Standards and Engineering Publications. 12-67. (SZ 027)

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- 2540. EIA Maintainability Bibliography - Requirements and Specifications (No date). (SZ 028)
- 2541. AAS Preprint 62-36, Gervais, R. L. and Johnson, M. C. Abort During Manned Ascent into Space. 1-62. (SZ 029)
- 2542. EIA Safety Engineering Bulletin No. 1. System Safety Education and Training Guide. 8-68. (SZ 030)
- 2543. Guide for Source Indexing and Abstracting of the Engineering Literature. (Engineers Joint Council.) 2-67. (SZ 031)

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- 2544. Missile Safety Officers Course - Course Outline. 1962. (UA 001)
- 2545. Aircraft Accident Investigation Staff Training Requirements. 1962. (UA 002)
- 2546. Miller, C. O. Safety During System Effectiveness Effort. A Management or Engineering Cost Item? 6-65. (UA 003)
- 2547. Miller, C. O. System Safety and Management. 11-65. (UA 004)
- 2548. Miller, C. O. The Safety Information Challenge. 10-64. (UA 005)
- 2549. Miller, C. O. Safety Related to System Engineering. 1-65. (UA 006)
- 2550. Miller, C. O. The Engineer, Lawyer, and Flight Safety. 4-62. (UA 007)
- 2551. Miller, C. O. Survey of Aerospace Safety Information Sources, Data Sheet. 6-65. (UA 008)
- 2552. Miller, C. O. Industry Safety Information Interchange Systems. Part II. Current Safety Information Classification, Storage and Retrieval. 6-65. (UA 009)
- 2553. Miller, C. O. The Role of System Safety in Aerospace Management. 8-66. (UA 010)

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BATTELLE MEMORIAL INSTITUTE

- 2554. DMIC Report 224, Ignition of Metals in Oxygen. 2-66. (UB 001)
- 2555. DMIC-TN, Methods of Controlling and Extinguishing Titanium Fires. 7-64. 33pp. (AD 609 341). (UB 002)
- 2556. DMIC-TN, Fire Hazards Associated with the Use of Titanium in Aircraft. 6-64. 5pp. (AD 609 342). (UB 003)
- 2557. DMIC-TN, Stress Corrosion of Ti-6Al-4V in Liquid Nitrogen Tetroxide. 4-66. 5pp. (UB 004)
- 2558. DMIC-TN, The Stress-Corrosion and Accelerated Crack-Propagation Behavior of Titanium and Titanium Alloys. 2-66. 30pp. (UB 005)

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- 2559. DMIC Memorandum 173, Reactivity of Titanium with Gaseous  $N_2O_4$  Under Conditions of Tensile Rupture. 8-63. (UB 006)
- 2560. Operating Manual for use in Abstracting and Coordinate Indexing. 1964. (UB 007)
- 2561. REIC Report 42, Radiation Effects, State of the Art. 1965-1966. 6-66. (UB 008)

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- 2562. CR 56459, An Evaluation of the Communication Blackout Problem for a Blunt Mars-Entry Capsule and a Potential Method for Elimination of Blackout. (TR32594) (N64-24039) 4-64. 22pp. (UC 001)
- 2563. Space Flight Operation. Johnson, Marshall. (No date). 5pp. (N66-13846). (UC 002)
- 2564. Deep Space Network Summary, Vol. III. (UC 003)
  - Summary (1) 565 thru 665 (N65-32867)
  - Summary (2) 765 thru 965 (N66-10422)
  - Summary (3) 965 thru 1065 (N66-14967)
  - Summary (4) 1165 thru 1265 (N66-18023)
  - Summary (5) 367 thru 467 (N67-30371)
- 2565. NASA CR-952, Leakage Testing Handbook. 4-68. (UC 004)
- 2566. NASA CR 88-88952 (Tech Report 32-1177), Surveyor III Mission Report. Part II, Scientific Results. 6-67. (N67-38161 thru N67-38168). (UC 005)
- 2567. NASA CR-87990 (Tech. Memo 32-355), Proceedings of the 2nd Aerospace Mechanisms Symposium. 5-67. (N67-36202 thru N67-36225). (UC 006)
- 2568. Space Exploration Programs and Space Sciences (Space Programs Summary). 9-64. 63pp. (N64-33813). (UC 007)
- 2569. JPL SPEC CMO-50349-DSN-B, Design Specification Vacuum Chamber for High Vacuum System. 8-66. 16pp. (UC 008)

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2570. NASA CR-83992, Spacecraft Material Guidebook. 1966. 1 Vol. (N67-26005). (UC 009)
2571. NASA SPL-TR-32-1142, A Method for Predicting Solar Cell Current-Voltage Curve Characteristics as a Function of Incident Solar Intensity and Cell Temperature. 7-67. (N67-30868). (UC 010)
2572. Report No. 2736, Pressurization Systems Design Guide. 3 Vol. (X67-10763). (UC 011)
- Vol. I - System Analysis and Selection
- Vol. IIa - System Analysis and Selection
- Vol. IIb - Design Procedures and Data.
2573. Design Guide for Pressurized Gas Systems. (UC 012)
- Vol. I - NASA CR-86590 (N67-32147)
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2574. JPL Safety Practices (Selected categories). (UC 013)
2575. NASA CR-62957, Voyager Spacecraft System Study. Phase I, Titan IHC Launch Vehicle. 8-64. (N65-24997). (UC 014)
2576. 67-192, Large Area Solar Array Design. 4-67. (N67-26008). (UC 015)
2577. Supporting Research and Advanced Development. Vol. III, Space Program Summary 34-47. 10-67. (N68-12306 to N68-12328). (UC 016)
2578. NASA CR-87990 (TM 33-355), Proceedings of the 2nd Aerospace Mechanisms Symposium. 5-67. (N67-36203 through N67-36226). (UC 017)
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2582. Lewis, William L. Design for Safety. 1963. (UD 002)
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2586. AV-CIR-5-SS-96, Harbrook, A. Howard. Gross Pattern of Injury of 109 Survivors of Five Transport Accidents. 7-56. 54pp. (UD 006)
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2588. SwRI No. 03-1787, A Study of the USAF School of Aerospace Medicine Human Centrifuge and Rotational Flight Simulator. (UF 001)
- (1) Phase I - Final Report (centrifuge). 10-5. (AD 624 546)
- (2) Phase II - Final Report (simulator). 11-65.
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2589. SwRI No. 103-1213-3, Crash-Fire Prevention System for a Supersonic Commercial Transport. 4-63. 9pp. (AD 467 237). (UF 002)
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2591. Report 00.165 (NASw - 416), Study of Optimum Environmental Protection Against Meteoroid Penetration. 2-63. (UF 004)



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JOHN HOPKINS UNIVERSITY  
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2592. CPIA 50, Static Testing with Toxic Exhaust Products. 5-64. 24pp. (UG 001)
2593. CPIA 3, Static Test Safety Manual. 12-62. 40pp. (UG 002)
2594. CPIA 57, Minutes First Meeting - Working Group on Hazards. 10-64. 20pp. (UG 003)
2595. CPIA 103, Minutes Second Meeting - Working Group on Hazards. 12-65. 120pp. (AD 481 631). (UG 004)
2596. CPIA-140 Hazards Working Group Third Meeting Bulletin. 3-67. 120pp. (Jung Hotel, New Orleans, La.). (UG 005)
2597. MIPR No. ERDL-21-61, Flame Inhibition Research: Quarterly Progress Reports. (UG 006)
- (1) TG 376-5, Nov 61 - Jan 62, (AD 278 058)
- (2) TG 376-8, Aug 62 - Oct 62, Yearly Summary Nov. 61 - Oct 62, (AD 294 601).
2598. Halogenated Solvents (Chap 22) Rough Draft (Provisional) Data for ICRPG Handbook - Working Group on Hazards. (UG 007)
2599. TG-864, Aircraft Tractor Rocket - Escape System - Six-Degree-of-Freedom Digital Simulation. 2-67. (AD 654 446). (UG 008)
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2602. Report No. 2, SRI Project No. CU-971, Analysis, Storage, and Handling of Magnesium and Boron Slurries. 2-54. (AD 30 604) (UH 001)
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  - (5) ACR-516R - Radar Signal Drop Buoy
  - (6) ACR-4F - Rescue-Lite
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  - (8) ACR-L-C Combi Lite
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13. ABSTRACT A vast amount of safety information was acquired in the preparation of AFSC DH 1-6, and developing a system to make this information readily available led to the establishment of the RAIDS (Rapid Availability of Information and Data for Safety) method of information storage and retrieval. Acquired data is stored in the library in its original printed form. RAIDS provides three approaches to the identification and retrieval of data. The first approach is to organize the information into logical groups according to corporate authorship and then classify these groups alphabetically; further alphabetizing breaks the information into additional subclasses which are further reduced to item numbers. The second approach provides punched cards to retrieve the subject matter. The third approach provides indexing which identifies all the important ideas or concepts in the document and reduces them to concise, descriptive terms. These terms are coordinated in the index to present logical meaning to the searcher. Therefore, no matter how slight the searcher's recognition term may be, one of the RAIDS approaches will lead to the desired information.		

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