

The NASA SCIENTIFIC AND TECHNICAL INFORMATION SYSTEM

...And How to Use It



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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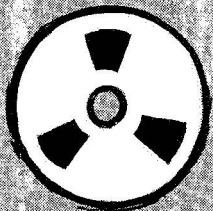
This publication is a guide to the NASA scientific and technical information system. It describes the services available from that system both to aerospace scientists and engineers and to many other searchers for technical information and data.

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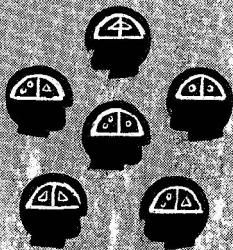
THE INFORMATION BANK



DISCOVERY



STORAGE



DISSEMINATION

Since 1958 the National Aeronautics and Space Administration has been discovering new things about materials, machinery, and human beings, as well as about the Earth, the Moon, and the universe. Mankind's gain would be slight if these many discoveries were not widely shared. From the beginning, therefore, the information and data acquired have been collected and made available to prospective users both within and outside of the aerospace community.

This is the primary function of NASA's scientific and technical information system. It assembles the results of worldwide aerospace research and development activities. It summarizes, indexes, and stores this wealth of knowledge. It helps individual persons find and benefit from the particular parts of this great mass of technical literature that are most likely to help them solve their problems.

The NASA information bank now contains more than half a million documents. Thousands more are added to it every month.

These government, industry, research institute, and university reports, journal articles, and reviews contain the details of findings of NASA personnel, contractors, subcontractors, and grant-holders. Along with these items the information bank regularly receives new technical literature and specialized reports such as project records, patents, etc., from other U. S. Government agencies, laboratories and institutions supported by private industry, and other major sources of aerospace knowledge throughout the world.

Many significant items are received routinely from other countries in exchange for information from NASA; others are specifically requested for interested users of the NASA system, and copies of these are kept for possible further dissemination.

HOW INFORMATION IS RECORDED

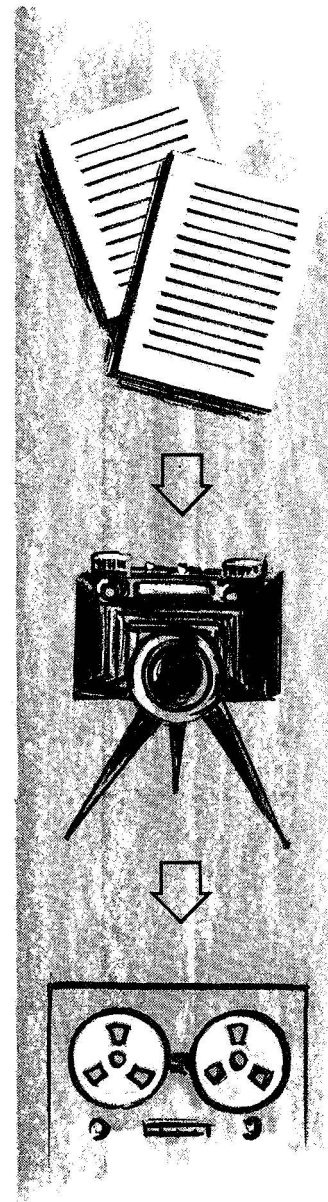
NASA has pioneered in automating the storage, retrieval, and dissemination of aerospace information and data.

The NASA Scientific and Technical Information Facility, in College Park, Md., receives hundreds of documents daily. These are promptly checked to avoid duplication, examined for relevance, and cataloged descriptively. Each document accepted as a potentially valuable addition to this information bank is then given an accession number and, if appropriate, is recorded on microfiche. The accession number serves as a unique identification tag for the document thenceforth, and both compact and full-size copies of every page can be made from the microform for storage and distribution as needed.

Professional indexers examine each item when it is deposited in the system, document the bibliographic data that accompanies it, and select terms under which it is listed in subject and other indexes.

Trained abstractors read the abstracts submitted with documents, sometimes edit and condense these summaries, and write abstracts of documents *which have been received without them*. Then, after further reviewing, complete bibliographic records are placed in the memory of a high-speed electronic computer. From then on, the machine provides ready access to the citations of all documents for all users.

From the day a document is acquired, it can be located quickly by its accession number. This number can be ascertained from other bibliographic information in the computer. A searcher need only know the corporate source, or the authorship, or the subject, or the number assigned to the document in another U.S. Government agency's information system, or the number of a contract under which the work was performed, to be directed to a report he needs.



HOW INFORMATION IS ANNOUNCED

The most widely used guides to the NASA scientific and technical information system's contents are two complementary abstract journals: *Scientific and Technical Aerospace Reports (STAR)* and *International Aerospace Abstracts (IAA)*.

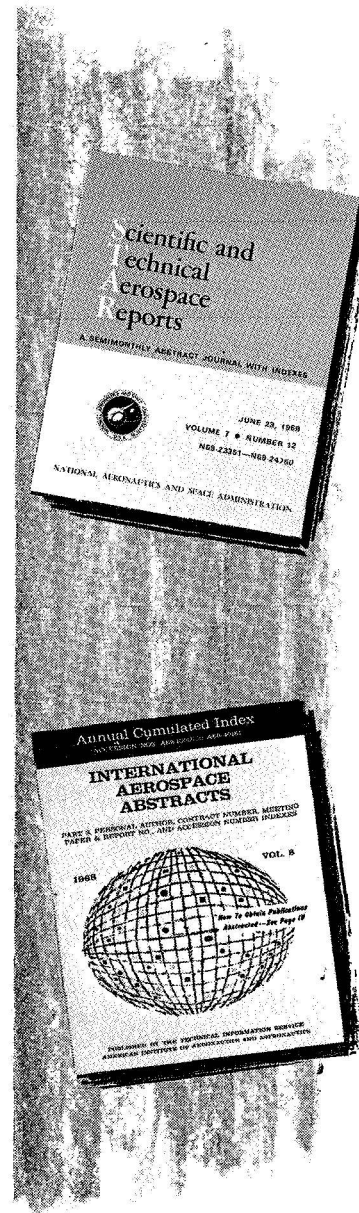
The abstracts in *STAR* cover worldwide report literature relative to space and aeronautics. The abstracts in *IAA* provide similar coverage of scientific and trade journals, books, and papers presented at meetings on aerospace research.

Both journals are issued twice a month. The Scientific and Technical Information Division of NASA's Office of Technology Utilization issues *STAR* on the 8th and 23d days of each month. The Technical Information Service of the American Institute of Aeronautics and Astronautics issues *IAA* under contract to NASA on the 1st and 15th days of each month.

Expert processing and modern methods of printing keep the coverage of both journals up to date. The abstracts in each one are intended not merely to suggest the subject matter, but to summarize the significant findings and innovations reported.

STAR and *IAA* are organized and indexed in basically identical ways. Subjects pertinent to a variety of disciplines are brought together in logical groups. A carefully structured indexing system further facilitates the use of each journal. A reader with a specific problem can find summaries of the documents most likely to help him without plowing through abstracts of many others.

Users of the NASA information bank also may learn of some additions to it in other ways, including *Selected Current Aerospace Notices* (see page 13), and special publications (see pages 16 and 22).



HOW *STAR* AND *IAA* SERVE SEARCHERS

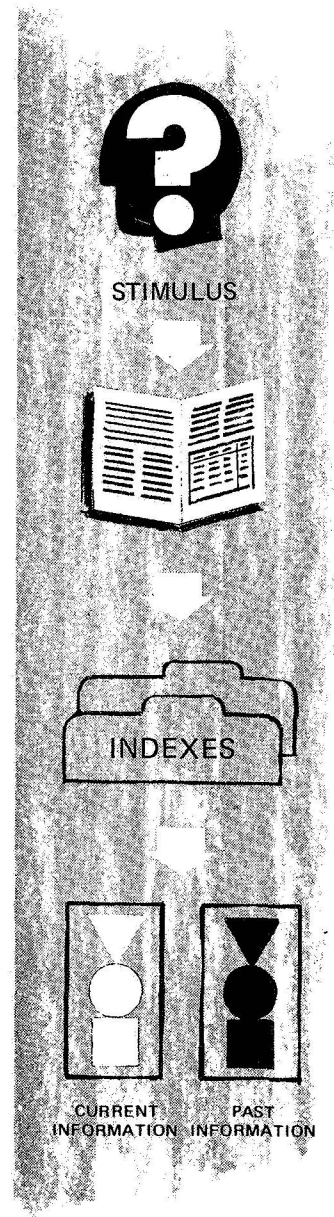
Readers of *STAR* and *IAA* use these two journals both to keep themselves abreast of current developments and to refresh and fill gaps in their recollections of previous discoveries and achievements.

The frequency of publication makes each abstract journal a *current-awareness tool* for many researchers. The coverage of the world's literature in their particular areas gives them a comprehensive view of the most recent advances and challenges.

The organization and indexing also make the two journals valuable *current searching tools*. If a user wants to find out what has just been reported on a particular subject, or what other organizations are doing about a problem, or what a well-known scientist has done recently, or what progress has been made under a contract he knows of, *STAR* gives him a ready answer, right on his desk.

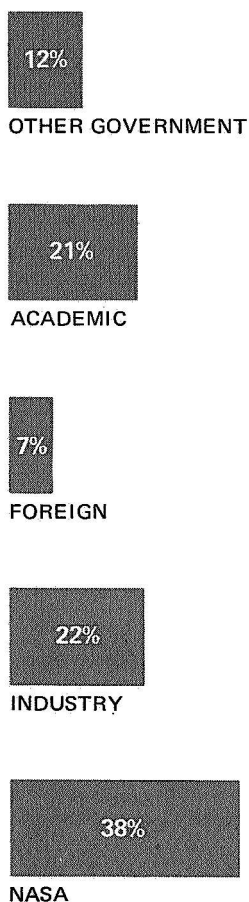
STAR and *IAA* also can serve a reader as *retrospective searching tools*. The cumulative indexes issued four times a year give researchers a handy means of investigating any portion of aerospace literature in depth. A scientist or engineer can quickly learn to use these indexes. Then, without going any farther than a nearby library, or possibly without even leaving his office, he can search technical literature extending back several years. Both journals are available in many libraries (see page 23).

In addition to saving time for workers in the aerospace field, *STAR* and *IAA* have proven helpful to professional persons in other fields. From the abstracts in these two journals, they have been guided to information and data—acquired in the course of exploring space—that have been extremely useful in manufacturing, transportation, health services, and other endeavors.



HOW TO OBTAIN *STAR* AND *IAA*

USERS OF NASA INFORMATION SERVICES



Anyone may subscribe to *STAR* and *IAA*. The annual subscription rate to each journal is \$54 within the United States and all other Western Hemisphere countries except Argentina, Brazil, French Guiana, Surinam, and British Honduras. Elsewhere it is \$68.25. Subscriptions to the cumulative indexes are \$30 for each journal for domestic subscribers and \$35 for foreign subscribers.

Subscriptions to *STAR* are filled by the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402 (from whom a single copy of *STAR* may be purchased for \$2.25, plus a 25 percent charge for foreign mailing). Subscriptions to *IAA* may be purchased from the American Institute of Aeronautics and Astronautics, Inc., 750 Third Avenue, New York, N.Y. 10017.

There is no charge for *STAR* to NASA technical and administrative personnel; NASA contractors, subcontractors, grant-holders, and consultants; or to many universities and colleges, or many public and special libraries. Foreign organizations that have agreed to exchange scientific and technical information of value with NASA, or to maintain collections of NASA publications for public reference, also may obtain *STAR* without charge.

NASA personnel wishing to receive *STAR* regularly should submit their requests through their technical libraries. Others eligible to receive *STAR* without charge should address their requests to the NASA Scientific and Technical Information Facility, P. O. Box 33, College Park, Md. 20740.

Every issue of each journal contains directions for obtaining copies of the documents abstracted in it. Microfiche of many documents is freely available to many users of the system, and for nominal sums to other persons consulting these journals.

HOW *STAR* AND *IAA* ARE ORGANIZED

The abstracts in each issue of *STAR* and *IAA* are grouped according to the subject matter. There are 34 categories (see the list on this page), and the scope of each category is explained in the Table of Contents of each issue. One of these categories, for example, is described in this way:

- 01 AERODYNAMICS
- 02 AIRCRAFT
- 03 AUXILIARY SYSTEMS
- 04 BIOSCIENCES
- 05 BIOTECHNOLOGY
- 06 CHEMISTRY
- 07 COMMUNICATIONS
- 08 COMPUTERS
- 09 ELECTRONIC EQUIPMENT
- 10 ELECTRONICS
- 11 FACILITIES, RESEARCH AND SUPPORT
- 12 FLUID MECHANICS
- 13 GEOPHYSICS
- 14 INSTRUMENTATION AND PHOTOGRAPHY
- 15 MACHINE ELEMENTS AND PROCESSES
- 16 MASERS
- 17 MATERIAL, METALLIC
- 18 MATERIALS, NONMETALLIC
- 19 MATHEMATICS
- 20 METEOROLOGY
- 21 NAVIGATION
- 22 NUCLEAR ENGINEERING
- 23 PHYSICS, GENERAL
- 24 PHYSICS, ATOMIC, MOLECULAR, AND NUCLEAR
- 25 PHYSICS, PLASMA
- 26 PHYSICS, SOLID-STATE
- 27 PROPELLANTS
- 28 PROPULSION SYSTEMS
- 29 SPACE RADIATION
- 30 SPACE SCIENCES
- 31 SPACE VEHICLES
- 32 STRUCTURAL MECHANICS
- 33 THERMODYNAMICS AND COMBUSTION
- 34 GENERAL

07 COMMUNICATIONS

Includes communications equipment and techniques; noise; radio and communications blackout; modulation telemetry; tracking radar and optical observation; and wave propagation. For basic research see: 23 Physics, General; and 21 Navigation.


The identification number which precedes the title of each category is used for indexing and computer processing.

The abstracts in each category appear in the order of the accession numbers given to documents when received. Here is a representative accession number (preceding a Lewis Research Center report):

N69-13256*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.


The letter "N" in a *STAR* entry indicates that there are no restrictions on distribution of the report. The "69" refers to the year in which this report was announced. The asterisk shows that the report originated within NASA, as in this case, or was produced by a contractor for NASA. The symbol "#" indicates that the document is available on microfiche, a compact method of storing and distributing copies.

The "corporate source" is always given after the accession number. In this case it was a NASA field center, but often it is an industrial concern, a university laboratory, or some other organization.

ACCESSION NUMBER  **N69-13256***# National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.

STABILITY ANALYSIS FOR UNLOADED EXTERNALLY PRESSURIZED GAS-LUBRICATED BEARINGS WITH JOURNAL ROTATION

David P. Fleming, Robert E. Cunningham, and William J. Anderson
 Washington Dec. 1968 35 p refs
 (NASA-TN-D-4934) Avail: CFSTI CSCL 131

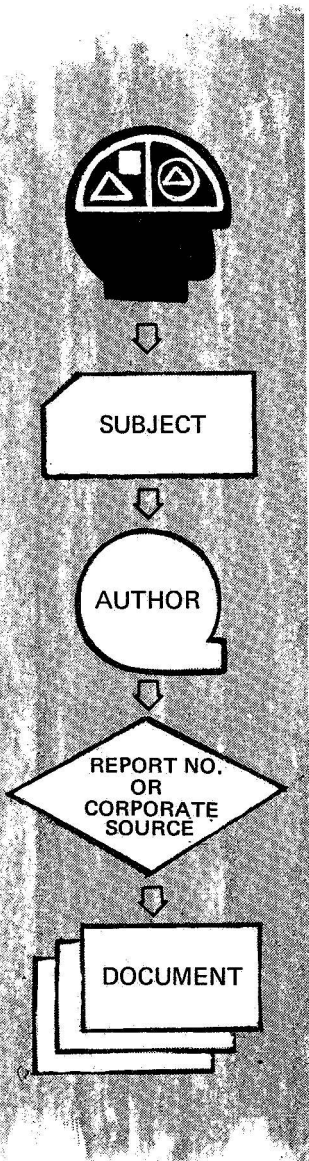
REPORT NUMBER  A small eccentricity analysis was performed for a bearing with two feeding planes, each of which is assumed to be a line source. Numerical results were obtained for a range of bearing number, pressure ratio, feeding parameter, and orifice recess volume. A digital computer program was written to obtain these results and is included. Steady-state load and attitude angle were obtained, as well as stability data. Stability decreased markedly with increasing recess volume; moreover, for large recess volume and low bearing number, an increase in pressure ratio decreased stability. There was no correlation between stability and steady-state attitude angle for any of the cases studied. Fair agreement was obtained with available experimental data. Author

Below the accession number and corporate source, the title of the report that the abstract covers appears in *bold face*, followed by the name of the author (or authors), the publication date, and other details as illustrated above. When the work has been done under a contract with NASA or some other Government agency, the contract number is also given.

In the *STAR* abstract reproduced in full here, the report number is followed by CFSTI, which means that the report is available from the Clearinghouse for Scientific and Technical Information, a U.S. Government sales agency.

CSCL 131 is the "COSATI code" number of the report. This indicates the subject category according to a Government code developed by the Committee on Scientific and Technical Information of the Federal Council for Science and Technology.

HOW *STAR* AND *IAA* ARE INDEXED



In every issue of *STAR* and *IAA*, abstracts are indexed by subjects, by authors' names, and by contract numbers. *STAR* also contains a corporate source index. The subject index describes the contents of each document, and often lists a single document under several terms. If there were two or more authors, a document is listed under each one's name. Two additional computer-generated indexes further facilitate the use of *STAR*: an accession/report number index, and a report/accession number index. *IAA* is indexed by meeting paper and report numbers, accession numbers, subjects, and personal authors.

The cumulative indexes, issued quarterly, to each journal are similar to the regular issue indexes. An annual index to *STAR* also has been issued since 1962, and to *IAA* since 1963.

A researcher using *STAR* or *IAA* is advised to turn at once to the most specific term that he can think of to describe the information or data that he is seeking. If nothing is listed under that term, he should look under related or broader terms. More than 13,000 terms are used for indexing.

These terms are listed in the *NASA Thesaurus* (SP-7030). The indexing of all documents acquired by the NASA scientific and technical information system since January 1, 1968, has been governed by this thesaurus. It provides a structured indexing vocabulary with more than 200 groups of related terms derived from the 34 subject categories in the two abstract journals. The terms were chosen on the basis of their significance, frequency of use in aerospace literature, and effectiveness as aids to retrieving information in that literature. The thesaurus shows the relationships between those terms. (Its use is explained on page 10.)

HOW THE THESAURUS HELPS SEARCHERS

The *NASA Thesaurus* (NASA SP-7030) directs a searcher for specific facts to the terms that are used to index those facts in the NASA information bank. It lists all subject terms in use alphabetically.

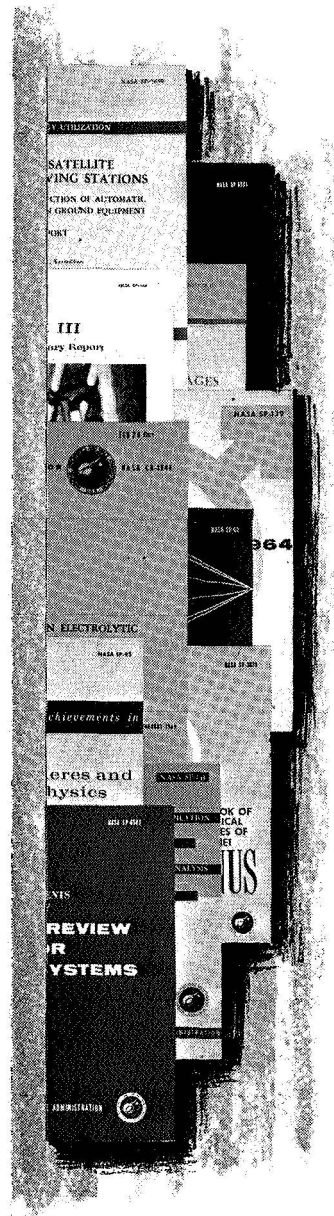
This list is followed by four appendixes. One is a hierarchical display of broad and narrow terms. Another lists subject terms alphabetically by subcategories. The third appendix is a permuted index, and the final one is a list of all postable terms.

A page (232) from the *NASA Thesaurus* is reproduced here. A user who turns to, say, "electron radiation," finds there two four-digit numbers and how the term is defined. The first two digits of each number are those of broad categories (that correspond to those in *STAR*) and the last two digits refer to subcategories in which allied terms about "electron radiation" may be found. The searcher is then given some "BT," "NT," and "RT" terms which are, respectively, broader terms, narrower terms, and related terms. An asterisk in front of one of these terms indicates it is a main entry in the hierarchical arrangement.

Suppose that the first term that came to the mind of a searcher was "electron paths" rather than "electron radiation." Under that phrase, on this page, he would be advised to use another term, "electron trajectories." Turning to it, in the next column, he would be reminded that it is "UF" (used for) electron paths, and some broader and related terms would be suggested to him.

These and other labels are explained in the introduction to the thesaurus.

The cross-reference structure is like that in the Department of Defense *Thesaurus of Engineering and Scientific Terms* (AD 672 000), which was prepared in conjunction with the Engineers Joint Council.



ELECTRON OPTICS
(CON'T)

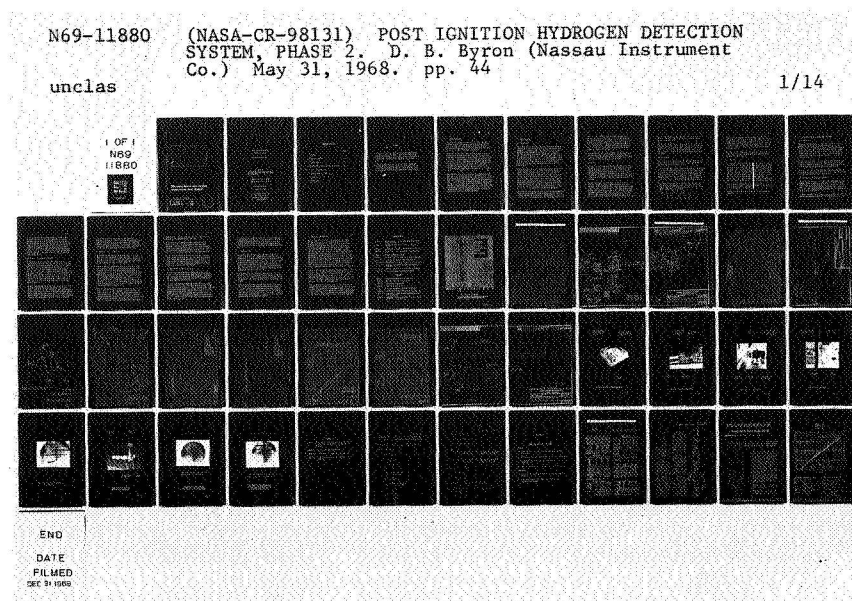
NASA THESAURUS (ALPHABETICAL LISTING)

ELECTRON OSCILLATIONS
ELECTRON PHOTOGRAPHY
OPTICS
PARTICLE TRAJECTORIES
STEERING
ELECTRON ORBITALS
2401 2403 2404
BT ORBITALS
RT ELECTRON TRAJECTORIES
ELECTRON OSCILLATIONS
2402 2403
BT #OSCILLATIONS
RT ELECTRON OPTICS
ELECTRON TRANSFER
ELECTRON TRANSITIONS
PLASMA OSCILLATIONS
TRANSIENT OSCILLATIONS
ELECTRON PARAMAGNETIC RESONANCE
1411 2310 2402 2403 2602
UF ELECTRON SPIN RESONANCE
BT MAGNETIC RESONANCE
PARAMAGNETIC RESONANCE
ELECTRON PATHS
USE ELECTRON TRAJECTORIES
ELECTRON PHOTON INTERACTIONS
0604 2402 2403
RT #PARTICLE INTERACTIONS
PLASMA-PARTICLE INTERACTIONS
POLARONS
SUPERCONDUCTIVITY
THERMODYNAMIC COUPLING
ELECTRON PHOTOGRAPHY
0605 1407
BT #IMAGERY
#PHOTOGRAPHY
RT ELECTRON BEAMS
ELECTRON MICROSCOPES
ELECTRON OPTICS
ELECTRON SCATTERING
ELECTRON PHOTON CASCADES
0902 1001 1002 2402 2403
RT BREMSSTRAHLUNG
CASCADES
COSMIC RAY SHOWERS
ELECTRON SCATTERING
PAIR PRODUCTION
SECONDARY COSMIC RAYS
ELECTRON PLASMA
2402 2403 2502
BT CHARGED PARTICLES
IONIZED GASES
#PARTICLES
PLASMAS (PHYSICS)
RT ELECTRON BEAMS
ELECTRON DECAY RATE
HELIUM PLASMA
HIGH TEMPERATURE PLASMAS
LANDAU DAMPING
METALLIC PLASMAS
PLASMA WAVES
PLASMA-PARTICLE INTERACTIONS
RAREFIED PLASMAS
RELATIVISTIC PLASMAS
THERMAL PLASMAS
ELECTRON PRECIPITATION
1302 2402 2403
BT CORPUSCULAR RADIATION
#PARTICLES
RT AURORAS
ELECTRON ENERGY
ELECTRON MOBILITY
PRECIPITATION
RADIATION BELTS
SECONDARY COSMIC RAYS
TRAPPED PARTICLES
ELECTRON PRESSURE
2403 3201
BT #PRESSURE
RADIATION PRESSURE
RT ELECTRON ENERGY
ELECTRON FLUX DENSITY
ELECTRON IRRADIATION
ELECTRON PROBES
0601 1411 2402 2403
BT #MEASURING INSTRUMENTS
RT CHEMICAL ANALYSIS
ELECTRON BEAMS
#IRRADIATION

MICROWAVE PLASMA PROBES
SPECTROMETRY
ELECTRON RADIATION
2402 2403
IRRADIATION CONSISTING OF ELECTRONS—
EXCLUDES ELECTROMAGNETIC RADIATION
BT CORPUSCULAR RADIATION
#PARTICLES
NT BETA PARTICLES
ELECTRON BEAMS
RT BREMSSTRAHLUNG
ELECTRON FLUX DENSITY
ELECTRON IRRADIATION
ELECTRON SOURCES
NUCLEAR RADIATION
PLASMA RADIATION
PROTON IRRADIATION
RADIATION
RADIATION EFFECTS
ELECTRON RECOMBINATION
0604 2401 2403
BT #RECOMBINATION REACTIONS
NT RADIATIVE RECOMBINATION
RT ELECTRON-ION RECOMBINATION
ION RECOMBINATION
NEUTRAL PARTICLES
ELECTRON SCATTERING
1002 2402 2403
UF ELECTRON COLLISIONS
ELECTRON INTERACTIONS
BT #NUCLEAR REACTIONS
#SCATTERING
RT ATOMIC COLLISIONS
ELASTIC SCATTERING
ELECTRON CAPTURE
ELECTRON DIFFRACTION
ELECTRON PHOTOGRAPHY
ELECTRON PHOTON CASCADES
INELASTIC SCATTERING
ION SCATTERING
NUCLEAR SCATTERING
#PARTICLE INTERACTIONS
PHOTON-ELECTRON INTERACTION
RAMSAUER EFFECT
RECOIL IONS
ELECTRON SOURCES
1002 2402 2403
RT ELECTRON EMISSION
ELECTRON RADIATION
ENERGY SOURCES
#ION SOURCES
POWER SUPPLIES
RADIATION SOURCES
SOURCES
ELECTRON SPIN
2402 2403
BT PARTICLE SPIN
#SPIN
RT ANGULAR MOMENTUM
NUCLEAR SPIN
SPIN DYNAMICS
ELECTRON SPIN RESONANCE
USE ELECTRON PARAMAGNETIC RESONANCE
ELECTRON STATES
0604 2401 2402 2403 2601 2603
BT ELECTRON ENERGY
ENERGY LEVELS
#LEVEL (QUANTITY)
#PARTICLE ENERGY
RT #EXCITATION
GROUND STATE
ELECTRON SWEEPING
USE SWEEP FREQUENCY
ELECTRON TELESCOPES
USE PARTICLE TELESCOPES
ELECTRON TEMPERATURE
ELECTRON ENERGY
ELECTRON TRAJECTORIES
2402 2403
UF ELECTRON PATHS
RT #TRAJECTORIES
#TRAJECTORIES
RT DIFFRACTION PATHS
ELECTRON BEAMS
ELECTRON DIFFRACTION
ELECTRON DIFFUSION
ELECTRON GUNS
ELECTRON IMPACT
ELECTRON ORBITALS

THE ADVANTAGES OF MICROFICHE

The NASA Scientific and Technical Information Facility photographs documents that it stores, page by page, to produce compact, inexpensive copies in accordance with Federal Microfiche Standards. Up to 70 pages of text can be recorded in an 18:1 reduction on a 4- by 6-inch film rectangle, and every page can be read or duplicated with a magnifying device. The viewing apparatus can be used on a desk or tabletop. The master films can be used to make either more microfiche or full-size copies of the original documents, and the cost of a microfiche copy is usually less than that of a hard copy. These features have made it possible to keep large collections of documents wherever they may be needed. Many libraries now have microfiche viewers.



THE SCAN SERVICE

Selected Current Aerospace Notices (SCAN) are issued as a special service to scientists and engineers serving NASA and its contractors.

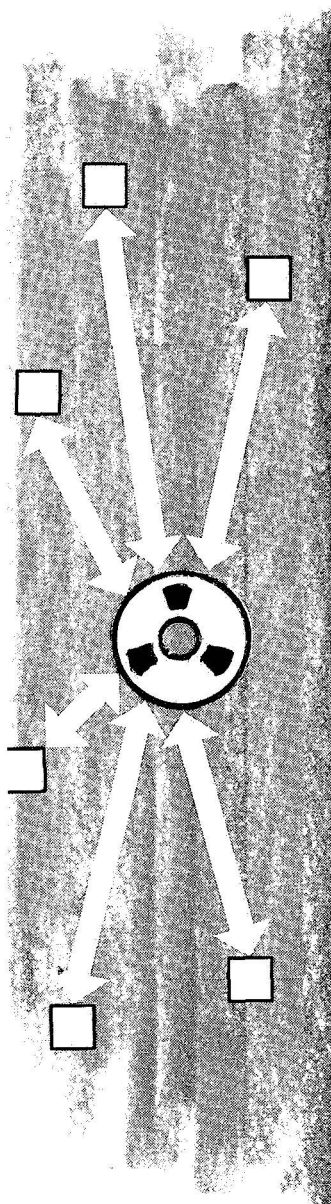
SCAN is a relatively new, highly effective way of announcing technical information to prospective users promptly. Every second week, a computer searches the latest reports received by the NASA Scientific and Technical Information Facility and the Institute of Aeronautics and Astronautics for data and information pertinent to about 200 topics (such as those listed at the right). Bibliographic and indexing information describing those documents is printed out in *NASA/SCAN Notifications*. These are duplicated and sent to several hundred organizations where librarians distribute them to individuals registered to receive this service.

Each person receives only notifications of new findings in the technical areas in which he has expressed interest. To obtain a report or article listed in a notification, he need merely check that item, write his name and mail code on the notification, and send it back to his local librarian. If a microfiche or hard copy is not already available locally, the organization's library can readily obtain one.

SCAN is an effective way for a designer of, say, an instrument for chemical analysis to be certain that new reports and journal articles that might affect his design are brought to his attention as soon as they are deposited in the NASA information bank. Several thousand individuals now receive *NASA/SCAN Notifications*, and have found this service helpful in their work for NASA and its contractors.

Aerial Photography
Aerospace Medicine
Analytical Chemistry
Biinstrumentation
Boundary Layer Flow
Chemical Analysis
Combustion Physics
Gravitational Collapse
Helicopters
Hydraulic Shock
Induction Heating
International Cooperation
Jet Propulsion
Laminated Materials
Launch Vehicles
Lunar Surface
Machine Tools
Manned Spacecraft
Mechanical Shock
Microwaves
Natural Resources
Nuclear Propulsion
Oceanography
Orbital Assembly
Photochemical Reactions
Planetary Landings
Pyrolytic Materials
Radar Equipment
Semiconductors
Spaceborne Computers
Temperature Measurement
Ultrasonic Testing
Vehicle Servicing
Weather Forecasting
X-Ray Inspection

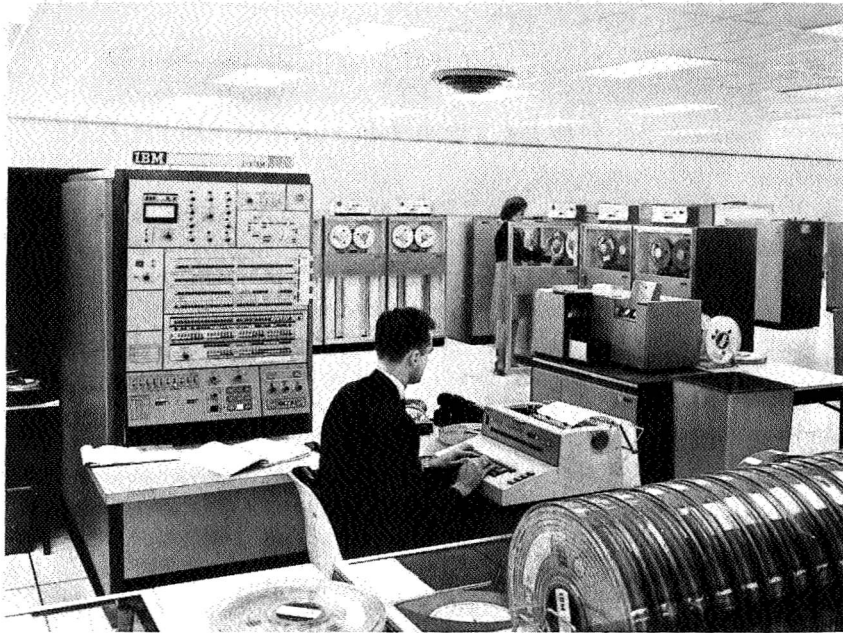
FAST MACHINE ACCESS TO THE INFORMATION BANK



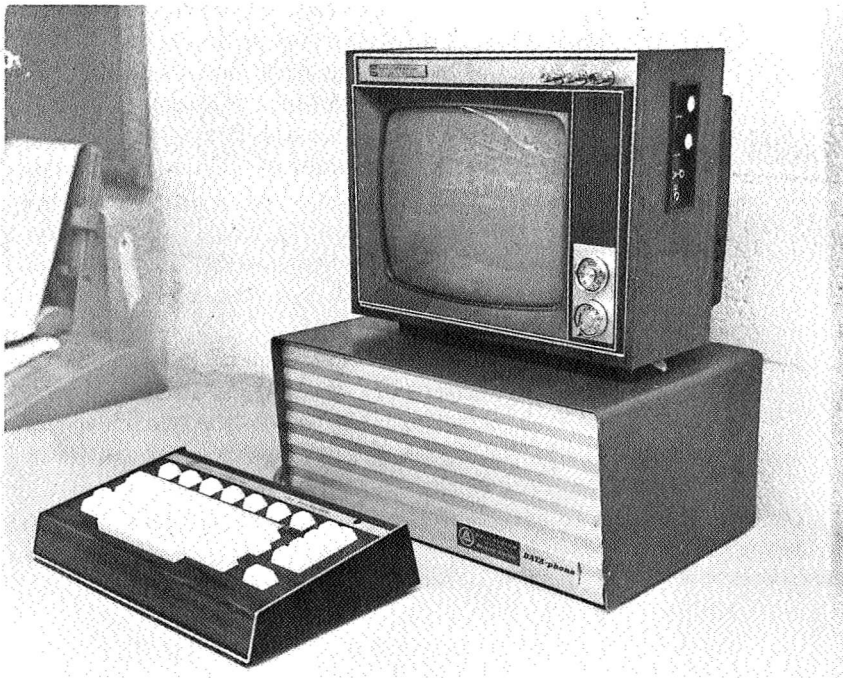
Computer searches of the NASA information bank are made available in three different ways. The central computer at the space agency's information facility in College Park, Md., makes hundreds of searches each month to satisfy requests from users. In addition, master index tapes are provided to major participants in the NASA system so that they can make their own searches to satisfy local needs. Finally, the NASA/RECON (remote console) service gives users hundreds of miles apart almost instant machine access to the central information store.

Seated at a console with a cathode ray tube and typewriter keyboard, each user of RECON can ask the computer in Maryland what documents have been deposited in the NASA storehouse that meet his particular needs. The computer quickly responds by displaying the answer on the inquirer's cathode ray tube. If the person at the console is interested in some or all of the documents cited, he can order the computer to print out the citations for them. If the list is long, he can instruct the computer to print it out on a high-speed machine and have it mailed to him. If he wants only a few items, he can push a button that will cause the computer to print out the selected citations immediately on a printer beside the cathode ray tube he is reading. His librarian can then obtain copies of the documents for him.

It is easy to learn to use RECON. Trained persons and instruction books are available to guide novices. If the computer's answer to a RECON user's first question lists documents that obviously do not contain what he wants, he can sharpen his questions—in terms of subject matter, source, authorship, or combinations of these and still other index controls—until the machine's responses meet his specific requirements.



This kind of library . . .



. . . Serves scientists at remote consoles.

THE NASA PUBLICATION PROGRAM

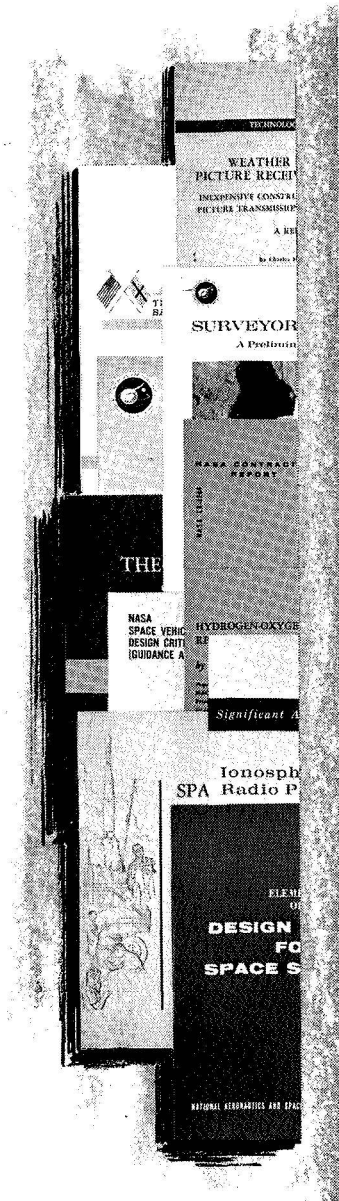
NASA's own formal scientific publications are an important part of the agency's scientific and technical information system. These documents include (1) reports containing significant and complete contributions to scientific or technical knowledge; (2) reports of similar quality but lesser scope; (3) technical memorandums or working papers of specialized utility; (4) translations of scientific or technical material from other languages; and (5) reports on NASA-sponsored investigations performed by contractors and grantees.

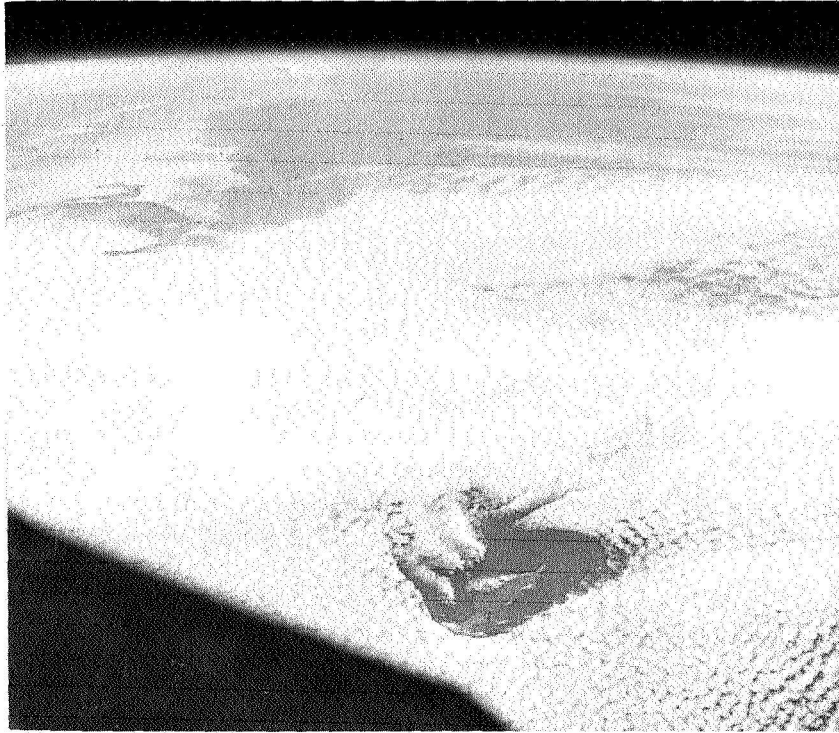
In addition, NASA also prepares and releases a number of Special Publications, which include program summaries, project results, conference proceedings, monographs, handbooks, sourcebooks, and bibliographies. A number of these Special Publications are made widely available because of the broad potential usefulness of the findings, developments, and innovations that are reported in them. The General Series is devoted to matters of widespread interest and importance. (Representative titles of publications in this series are listed on the next page.) The Technology Utilization Series contains information that is especially likely to be of substantial utility outside as well as within the aerospace field (this series is further described on page 18).

The other four series consist of (1) Histories and Chronologies, (2) Management, Evaluation, and Analysis Standards, (3) Handbooks, Compilations, Charts, and Tables, and (4) Bibliographies and Other Reference Works.

Many of these Special Publications may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

All of them are obtainable through the Federal Clearinghouse for Scientific and Technical Information, Springfield, Va. 22151.





An island off the coast of Baja California as photographed from a Gemini spacecraft.

A catalog of *NASA Special Publications Currently Available* is issued annually.

The General Series has included such popular volumes as:

Exploring Space With a Camera (SP-168).

Earth Photographs From Gemini VI Through XII (SP-171).

The Book of Mars (SP-179).

Batteries for Space Power Systems
(SP-172).

Scientific Satellites (SP-133).

Summary of Gemini Extravehicular Activity
(SP-149).

The historical works have included annual chronologies of statements, events, and other developments relevant to aeronautical and space advances. The handbooks and compilations have covered the physical properties of other planets.

TECHNOLOGY UTILIZATION PUBLICATIONS

As a special aid to persons and companies not directly involved in aerospace activities, the NASA Office of Technology Utilization issues numerous publications regarding advances that are likely to be transferable from one field to another.

TECH BRIEFS are one- or two-page announcements of innovations, concepts, devices, and techniques. Many of these briefs simply state a specific problem, a solution, and a source of more information about it. Others notify readers of the availability of new computer hardware and software. Several thousand of these briefs have been issued and indexed for continued use.

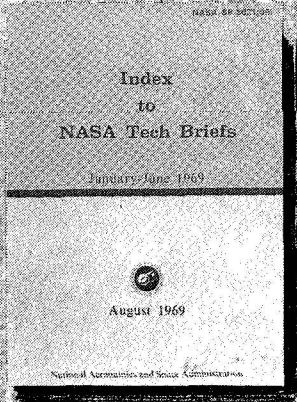
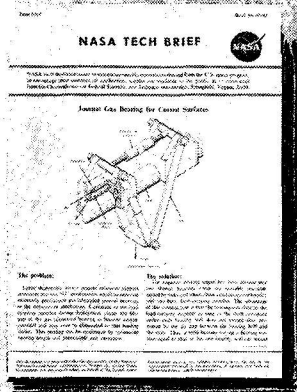
Some are issued jointly by the Atomic Energy Commission and NASA regarding work that one or both agencies have sponsored, and these are designated as AEC-NASA Tech Briefs.

Because these many briefs report advances in different kinds of work, they are categorized to save their users' time. A company or individual may subscribe to receive them all or only those pertaining, say, to "energy sources," or in some other particular category.

In addition to Tech Briefs, subscribers may receive compilations of items applicable in given categories of work.

Tech Brief subscription costs vary depending on the number of categories included. Subscriptions orders should be addressed to the Clearinghouse for Federal Scientific and Technical Information, Attention Code 410.14, Springfield, Va. 22151.

Inquiries about these publications should be addressed to the Technology Utilization Division, Code UT, NASA, Washington, D.C. 20546.



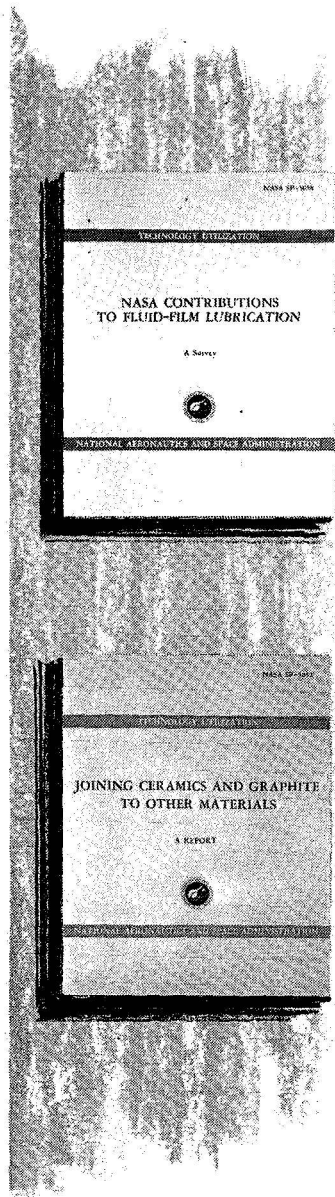
The Technology Utilization Series of Special Publications includes both special reports and surveys prepared to facilitate the transfer of new aerospace technology and discoveries to other fields in which they can be put to constructive use.

TECHNOLOGY UTILIZATION REPORTS are detailed descriptions of developments and innovations of high promise. Representative titles of such reports are: *Induction Heating Advances: Applications to 5800^oF.* (NASA SP-5071), *Weather Satellite Picture Receiving Stations* (NASA SP-5080), and *Earthquake Prediction from Laser Surveying* (NASA SP-5042).

TECHNOLOGY UTILIZATION SURVEYS are comprehensive state-of-the-art accounts, identifying substantial contributions to technology by NASA researchers or NASA contractors. Representative titles include *Teleoperators and Human Augmentation* (NASA SP-5047), *Solid Lubricants* (NASA SP-5059), and *Air Pollution Monitoring Instrumentation* (NASA SP-5072).

Titles of these reviews and surveys are announced in *STAR* as they are published. Special notices of them also are sent to persons who have requested that they be kept informed of additions to this series. These publications are also listed in the Office of Technology Utilization's annual catalog of *NASA Special Publications Currently Available*.

The public may purchase copies of Technology Utilization reports and surveys from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or the Clearinghouse for Scientific and Technical Information, Springfield, Va. 22151, depending on which sales agency is designated in the announcements and listings.



LOCAL EXPERT GUIDANCE TO INFORMATION

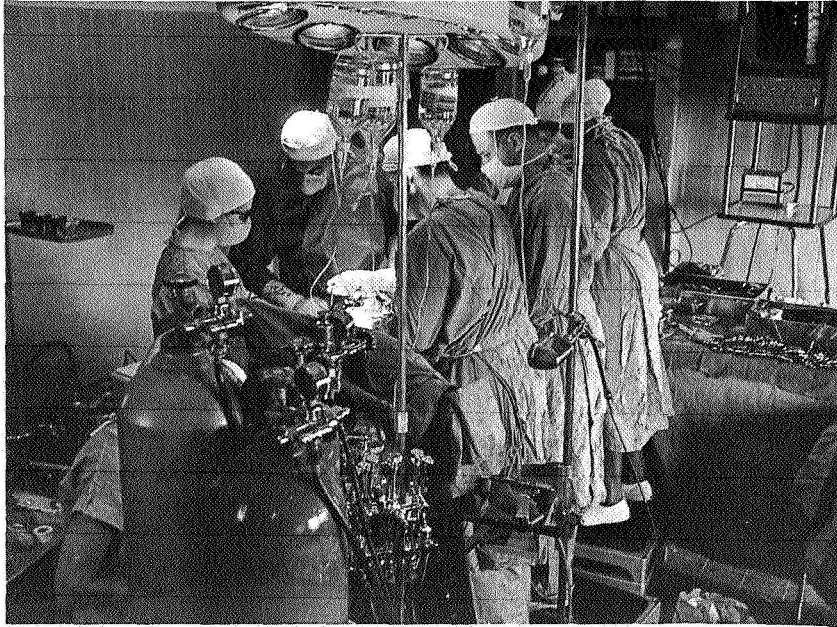
To help industrial firms, research organizations, and others not connected with NASA get and use data and information acquired by NASA, the Office of Technology Utilization has helped to establish Regional Dissemination Centers. Technically qualified men at these centers translate non-aerospace problems into the aerospace vocabulary, and use computers to locate pertinent documents in the NASA information bank. These centers are at universities and not-for-profit institutions, and typically provide three basic services to their clients:

SELECTIVE DISSEMINATION. "Interest profiles" are prepared to reflect the activities and needs of a client, and used in computer searches for relevant new information. Experts screen the documents found in this way and forward those that appear to match the client's profile to that client's personnel.

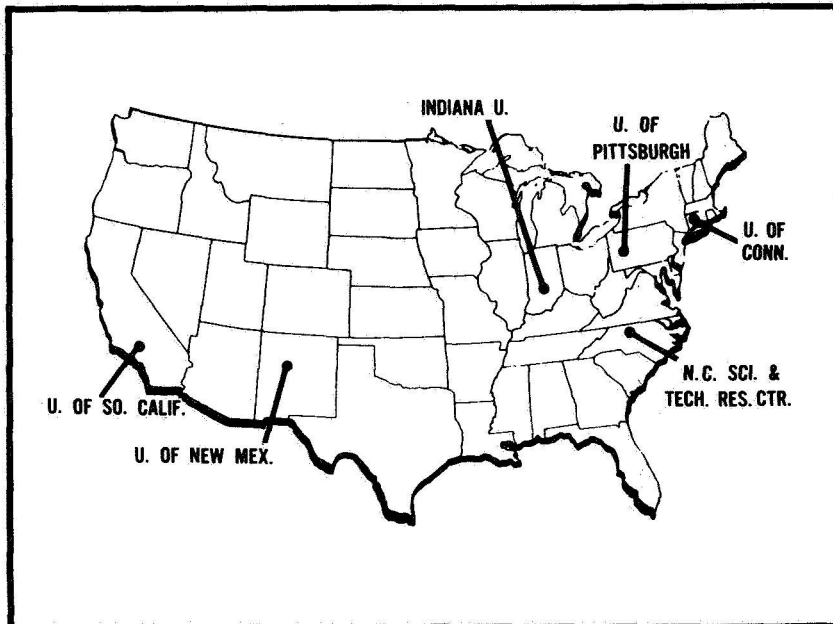
RETROSPECTIVE SEARCHES. These are made in response to technical questions from companies by searching computer tapes of citations of NASA's vast collection of documents.

PUBLICATIONS DISTRIBUTION. Member companies receive copies of Technology Utilization Publications when issued, and whenever an item attracts especial interest, the center obtains fuller information or backup data from the source. Specialists at the centers also frequently notice other reports likely to be helpful to a company and send industrial applications reports to that company.

Both small and large companies have taken advantage of the services of Regional Dissemination Centers at annual fees ranging from a few hundred dollars to \$5000 or more for maximal service. Additional information about these centers may be obtained from the Director, Technology Utilization Division, Code UT, NASA, Washington, D.C. 20546.



Technology to develop space has been helpful in the care of the sick as well as in industrial processes and the management of large complex undertakings for mankind's benefit.



Regional Dissemination Centers at the six locations shown here are helping to surmount geographical obstacles to the transfer of aerospace technology.

ADDITIONAL AIDS TO TRANSFERRING KNOWLEDGE

The National Aeronautics and Space Act of 1958 required that: "The aeronautical and space activities of the United States be so conducted as to contribute . . . to the expansion of human knowledge of phenomena in the atmosphere and space. The Administration shall provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."

This publication reviews some but not all of the steps taken by the Office of Technology Utilization to provide access to the NASA scientific and technical information system. This office also has made special efforts to assist biomedical workers and computer users.

BIOMEDICAL APPLICATION TEAMS at the Midwest Research Institute in Kansas City, Mo., the Research Triangle Institute in Durham, N.C., and Southwest Research Institute in San Antonio, Tex., familiarize themselves with biomedical problems and search the technical information system for information likely to be helpful in solving medical and public health problems.

A similar approach to transferring aerospace technology is being undertaken in two newly established TECHNOLOGY APPLICATIONS TEAMS whose purpose is to apply aerospace technology to the solution of problems in various public sector areas of concern, such as air and water pollution, law enforcement, mine safety and transportation.

COSMIC, a Computer Software Management and Information Center, specializes in reproducing and distributing computer software developed for NASA to other potential users of it. This center is at the University of Georgia in Athens, Ga.

LIBRARIES WHERE NASA PUBLICATIONS ARE AVAILABLE

Anyone wishing to consult NASA publications and sponsored documents may do so at a large number of public, university, and other libraries. The most nearly complete collections, however, are available at the public libraries (usually the central ones) in the following cities:

CALIFORNIA: Los Angeles, San Diego	MICHIGAN: Detroit	OHIO: Cleveland, Cincinnati, Dayton, Toledo, Akron
COLORADO: Denver	MINNESOTA: St. Paul, Minneapolis	OKLAHOMA: Oklahoma City
CONNECTICUT: Hartford	MISSOURI: Kansas City, St. Louis	TENNESSEE: Memphis
DELAWARE: Wilmington Institute Free Library	NEW JERSEY: Trenton	TEXAS: Forth Worth, Dallas
MARYLAND: Enoch Pratt Free Library, Baltimore	NEW YORK: New York, Brooklyn, Buffalo, Rochester	WASHINGTON: Seattle
MASSACHUSETTS: Boston		WISCONSIN: Milwaukee

In addition, NASA's technical documents and bibliographic tools are deposited in 11 special libraries. Each library listed below is prepared to furnish to the general public services of personal reference, interlibrary loans, photocopies, and help in obtaining personal copies of NASA documents by microfiche if requested. These special libraries are located as follows:

CALIFORNIA: Univ. of California Library, Berkeley	GEORGIA: Georgia Institute of Technology, Atlanta	NEW YORK: Columbia Univ., New York
COLORADO: Univ. of Colorado Libraries, Boulder	ILLINOIS: The John Crerar Library, Chicago	PENNSYLVANIA: Carnegie Library of Pittsburgh
DISTRICT OF COLUMBIA: Library of Congress	MASSACHUSETTS: Mass. Instit. of Technology, Cambridge	TEXAS: Southern Methodist Univ., Dallas
	MISSOURI: Linda Hall Library, Kansas City	WASHINGTON: Univ. of Washington Library, Seattle

SERVICES AVAILABLE TO NASA PERSONNEL

(and NASA contractors, grantees, consultants)

Type of Service	How Obtained by NASA Personnel Only	How Obtained by NASA Contractors, Grantees, Consultants
STAR Subscription; quarterly cumulative indexes	Apply in writing to NASA Scientific & Technical Information Division, Code US1, NASA, Washington, D.C. 20546.	Register with NASA Sci- entific & Technical Info. Facility, P.O. Box 33, College Park, Md. 20740, using registration form (NASA Facility Form 713). STAR and indexes follow automatically.
STAR Announced documents and NASA publications	Copies of any reports not sent without charge on initial distribution must be purchased from CFSTI (p. 16).	Purchase from CFSTI (p. 16) copies of any reports not sent to you on initial distribution after register- ing (Form 713).
IAA Subscription; quarterly cumulative indexes		Once you're on STAR mail- ing list, IAA and indexes come automatically.
IAA Announced documents	Purchase from Ameri- can Institute of Aero- nautics & Astronautics, 750 Third Ave., New York, N.Y. 10017.	Purchase from American Institute of Aeronautics & Astronautics, 750 Third Ave., New York, N.Y. 10017.
Thesaurus	STAR subscribers get it automatically.	Inquire of NASA Scientific & Technical Info. Facility
Computerized literature searches and specially tailored bibliographies	Request from NASA STI Facility, College Park, Md., giving name and mail code.	Technical librarians of U.S. Government agencies and domestic universities write to NASA STI Facility, Col- lege Park, Md., giving Requester Identification Number.
SCAN	Apply through your NASA librarian.	After registering with Facil- ity (above) contractors and grantees apply at own organization's library. Con- sultants apply through NASA Hq. library.
RECON	Apply at your main library.	

SERVICES AVAILABLE TO THE PUBLIC

Type of service	How obtainable
STAR Subscription; quarterly cumulative indexes	Purchase from Supt. of Docs., GPO (see p. 5).
STAR Announced documents and NASA publications	Purchase from CFSTI or Supt. of Docs., GPO.
IAA Subscription; quarterly cumulative indexes	Purchase from AIAA, 750 Third Ave., New York, N.Y. 10017 (see p. 5).
IAA Announced documents	Purchase from AIAA, 750 Third Ave., New York, N.Y. 10017 (see p. 5).
NASA Thesaurus	Purchase from CFSTI or Supt. of Docs., GPO, for \$8.50.
Computerized literature searches; specially tailored bibliographies	Obtainable through NASA regional dissemination centers (see p. 20) on a fee basis. Apply for information to Director, Technology Utilization Division (Code UT), NASA, Washington, D.C. 20546.

For further information
about the NASA scientific and technical information programs, write to:

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