NASA HHR-50

HISTORY AT NASA

The NASA History Office

NASA Headquarters
Washington, DC 20546

June 1986

Progress, far from consisting in change, depends on retentiveness. . . . Those who cannot remember the past are condemned to repeat it.

—George Santayana
The Life of Reason (1905)

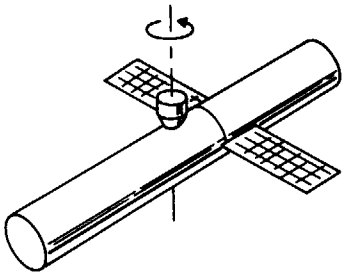
. . . leaders of large enterprises sometimes find it difficult to relate their way of working to the experiences and needs of others. But . . . many large-scale endeavors of the past and present are open to the responsible scholar. We in NASA would welcome such research. Indeed, we feel a responsibility to give as much assistance to the inquiring scholar as possible.

—James E. Webb
Space Age Management (1969)

CONTENTS

PART I

LANGLEY RESEARCH CENTER: CONFIGURATIONS STUDIED 1959-1962



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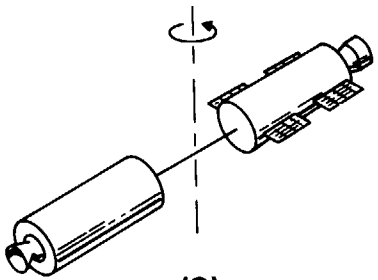

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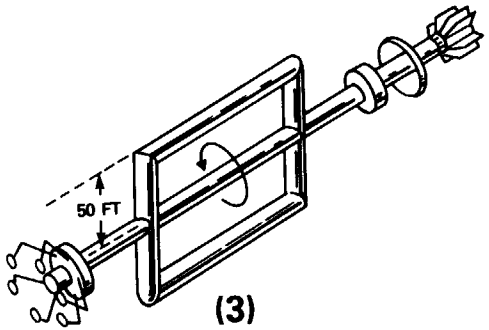

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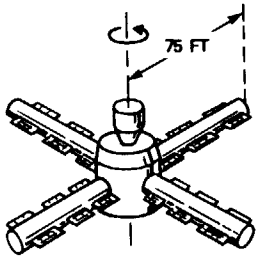

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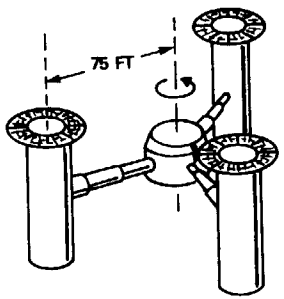

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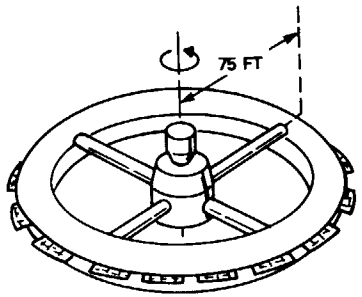

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SOURCE: LANGLEY RESEARCH CENTER, *A REPORT ON THE RESEARCH AND TECHNOLOGICAL PROBLEMS OF MANNED ROTATING SPACECRAFT.* NASA TN D-1504 (WASHINGTON,D.C., AUGUST, 1962)

1

Introduction

For participants and observers alike, unraveling the history of one of the major enterprises of the twentieth century—man's flight from the earth and the human exploration of space—presents a formidable challenge. This booklet describes the efforts of the National Aeronautics and Space Administration to capture and record the events of its past, and to make that past accessible to the many individuals who are NASA, to the history community, and to all researchers interested in how and why the U.S. space program came to be and how it carried out its missions in aeronautical research and development and the exploration of space.

History at NASA replaces the *Guide to Research in NASA History*, first issued in 1976 and written by Alex Roland (2nd though 7th eds.). *History at NASA* describes the research accomplishments and opportunities of NASA's agencywide history program. It also offers a concise guide to the historical research resources available at NASA Headquarters in Washington, D.C., at NASA facilities located around the country, and through the federal records systems. In addition to portions of its predecessor publication, *History at NASA* contains contributions by Lee D. Saegesser of the NASA Headquarters History Office and by those responsible for historical documents and records at some NASA centers.

The student of modern public history, especially when that history is of large-scale and complex organizations, confronts a labyrinthine passage through documents, organizations, politics, and the triumphs and disappointments of innumerable scientists and engineers. If this publication can ease that passage, it will have served its purpose.

Sylvia D. Fries
Director
NASA History Office
June 1986

2

The NASA History Program

First established in 1959, NASA's History Program is one of more than thirty public history programs in the federal government. Its threefold mission is to assure that the documentary foundation of the agency's history is captured and preserved for current and future generations, to stimulate historical research in areas of inquiry that may broaden our understanding of the modern age of aerospace research and development, and to disseminate the results of NASA's historical documentation and research activities.

The History Office at NASA Headquarters in Washington, D.C., which administers the agency's history program, carries out its mission by maintaining a historical reference collection at NASA Headquarters and encouraging the development of similar collections at NASA installations or "centers." It fosters historical research through an annual research fellowship competition conducted by the American Historical Association, as well as through a program of NASA-funded research by university and independent scholars resulting in a series of monograph studies as well as journal articles. And it disseminates the results of NASA-sponsored historical research through published historical volumes and reference works. Each of these activities is described in subsequent sections of this publication.

The visitors' log at the NASA Headquarters History Office is evidence of the hundreds of persons inside and outside the agency who visit the office to make use of the NASA history program's considerable documentary resources. As numerous authors have graciously acknowledged, NASA's history program has provided the indispensable starting point for research in the history of federally sponsored aerospace research and development. From school youngsters preparing a class report to busy NASA managers, from Congressional staffers and foreign journalists to dissertation writers, all kinds of researchers have come to rely on NASA's agencywide history program for help in their work.

Independent Inquiry and NASA History

The strength and reach of NASA's history program is attributable to the established institutional commitments and practices of the larger organization it serves. Paramount among these is that NASA is primarily a research community; thus it appreciates the importance to any understanding of human events of independent inquiry and a continuing dialogue among many researchers. NASA does not intend the publications in its professionally recognized History Series to be "definitive" accounts; nor has their original designation as "official" histories ever implied bureaucratic censorship or constraint of their authors. NASA history publications occasionally stimulate controversy both inside and outside the agency; this is as it should be, and testifies to the freedom given NASA-sponsored historians to interpret historical evidence in the light of their own best professional judgment.

NASA's contractual agreement with scholars for historical research and writing contain an "academic freedom" clause that assures each scholar "full academic freedom of research and expression. He [or she] shall observe the highest professional standards in achieving historical accuracy in the representation of facts and events. Interpretations shall be based on evidence, and speculations noted as such." In turn, NASA-sponsored researchers are assured access to all relevant documents and data, "subject only to proprietary and national security restrictions."

The NASA History Advisory Committee

Another long-standing NASA practice that has contributed to the strength and independence of NASA's history program is the use of an advisory committee of distinguished non-NASA scholars to provide impartial guidance on policy and program issues. As one of several standing subcommittees of the NASA Advisory Council, the History Advisory Committee reports directly to the Council and the NASA Administrator. The chairman of the History Advisory Committee, as a member of the Council, also brings to the Council's deliberations the knowledge and insights of a professional historian.

Appointment to NASA's History Advisory Committee is a mark of distinction, made partly in recognition of an individual's accomplishments in historical scholarship. Committee (and Council) members serve without compensation to assure that their advice will be

unaffected by any conflict of interest. (Past and present members of the NASA History Advisory Committee are listed in Appendix M).

During 1985, the NASA History Advisory Committee assisted the agency in developing a Five-Year Plan to shape history program activities for the remainder of the 1980s. This plan affirmed the preeminence of documentation as a goal of NASA's history program, and the importance of narrative histories and reference works as a foundation for advanced research in aerospace history. In addition, the Five-Year Plan envisions the introduction of a New Series of NASA historical publications to place NASA's programs in the larger context of the modern history of science, technology, and research and development management and policy; the publication of the New Series by a distinguished university press; and increased opportunities for scholars to enter the field of aerospace history, through a program of fellowships and funding for studies smaller in scope than the usual book-length research and writing effort.

Historical Research through Contracts

A third characteristic of NASA is that many of its research and development programs are carried out by the university and industrial communities on the basis of contracts with the agency. As a result, aerospace research opportunities are not confined to the agency, but are available to innumerable researchers in the private sector and in the academic community. Similarly, NASA typically extends its opportunities for agency-sponsored historical research to university-affiliated and independent scholars throughout the country. The entire scholarly community may thus benefit from NASA's history program, while NASA in turn benefits from the knowledge and research talents of an ever-widening circle of professional historians.

Historical research and writing on the basis of a contract award differs from the research grant more familiar to academic scholars, in that contract historians are obligated to produce a specified "product" as a result of their work. Depending upon the contract—and each contract is unique—a "product" might be a publishable manuscript, a research report, a collection of documents, finding aids, or a combination of all four.

To the uninitiated, contracting with any agency of the federal government might appear complicated, time-consuming, and otherwise intimidating. The NASA History Office has, however, tried to simplify the process of contracting with NASA for historical research and writing, while honoring the requirements of federal procurement policy. That policy is to make all awards competitively and on the basis of an impartial assessment of individuals' qualifications and the intrinsic quality and promise of their proposed work. Opportunities for historical research and writing contracts with NASA are widely advertised and each proposal receives a careful "peer review," the primary basis for awarding a contract. (Section 5, "Historical Research under NASA Sponsorship," tells how to compete for a NASA history contract.)

3

NASA Historical Publications

NASA's history program has contributed more than fifty professionally recognized historical studies and reference works to the literature of aeronautics and space science, technology, and management. Published in NASA's distinguished "Special Publications" (SP-) series, individual volumes are available from the U.S. Superintendent of Documents, Washington, DC, 20402 or, when out of print, from the National Technical Information Service, Springfield, VA 22161.

In addition, the NASA history program has inaugurated a New Series of historical publications to be published by The Johns Hopkins University Press. The New Series, intended for both university and general readers, is designed to complement the traditional NASA History Series by examining NASA's many programs from broad historical perspectives of interest to a wide range of readers.

Appendix I is a complete list of individual volumes in the NASA History Series. It includes:

Alex Roland, *Model Research: The National Advisory Committee for Aeronautics, 1915-1958*, 2 vols. (NASA SP-4103, xx + 769 pp.).

> Alex Roland . . . has ostensibly written within the conventional bounds of agency history the nearly definitive account of the organization that provided aeronautics with government support from its infancy to the dawn of orbital space flight after Sputnik. In actuality he has done much more. By focusing not on the agency itself but on the intersection of the interests of the universities, industry, the military services, and the research facilities under the committee, Roland can emphasize the function of research and its impact on the evolution of aircraft of all kinds. . . . A measure of the level of independence achieved by Roland and the NASA History Series is found in his ability to make candid judgments on individuals. . . .
>
> Review, *The Public Historian*, Spring, 1986

Edward Clinton Ezell and Linda Neuman Ezell, *On Mars: Exploration of the Red Planet* (NASA SP-4212, 1984, xvi + 535 pp.).

> *On Mars*, an especially good example of the important NASA history series, chronicles in detail the exploration of the planet by space probes between the years 1958 to 1978 . . . real value of this work is contained in the author's ability to relay the complexity of the enterprise, as well as its flavor. Their ability to do this, beyond thorough research and decent writing, has derived from the support shown by NASA to place historians on site during the execution of a major mission.
>
> Review, *Aerospace Historian* September, 1985

W. David Compton and Charles D. Benson, *Living and Working in Space: A History of Skylab* (NASA SP-4208, 1983, xiii + 449 pp.).

> W. David Compton and Charles D. Benson have provided a model for the historical treatment of large-scale government-sponsored ventures in technology . . . *Living and Working* in space is a valuable case study illuminating major questions of interest to historians of twentieth-century science and technology. . . . In their detailed presentation of the planning, promotion and execution of the Skylab program, the authors provide much useful insight into the wide variety of problems faced by the managers of such an enterprise. . . . The volume is not only a welcome addition to the literature of space flight but also a genuine contribution that will be appreciated by all students of the history of science, technology, and public policy.
>
> Review, *Journal of American History*, September, 1985

Homer E. Newell, *Beyond the Atmosphere: Early Years of Space Science* (NASA SP-4211, 1980, xviii + 497 pp.)

Through the continuing publication of its History Series, the National Aeronautics and Space Administration has led the scientific and technical agencies of the U.S. Government in providing the public with professional historical review and analysis of their major programs. . . . Newell provides a thoughtful, wide-ranging overview of the development of American space science under NASA's leadership. He elucidates complex scientific and tangled administrative topics without retreat to either technical or managerial jargon.

Review, *Science*
23 October 1981

Roger E. Bilstein, *Stages to Saturn: A Technological History of Apollo/Saturn Launch Vehicles* (NASA SP-4206, 1980, xx + 511 pp.).

This volume is just one of many excellent histories produced by government and contract historians for the NASA History Office. . . . The book is enhanced by many excellent appendixes and charts, and it has a thorough essay on sources and documentation, including exhaustive references and notes. . . . Author Roger Bilstein . . . gracefully wends his way through a maze of technical documentation to reveal the important themes of his story; rarely has such a nuts-and-bolts tale been so gracefully told.

Review, *Air University Review*,
March-April, 1983

Courtney G. Brooks, James M. Grimwood, and Loyd S. Swenson, Jr., *Chariots for Apollo: A History of Manned Lunar Spacecraft* (NASA SP-4205, 1979, xvii + 538 pp.).

Chariots for Apollo is certain to become a standard reference for all who examine the American manned space program. . . . As historians have come to expect from the NASA history program, the book is meticulously researched in primary and secondary sources. The source notes are a quite useful guide in themselves to available Apollo material, and the authors completed over 340 interviews of key program personnel to give their book added insight and perspective. A useful bibliographical note and index, together with over a hundred illustrations (both drawings and photographs), enhance the book's reference value.

Review, *Technology and Culture*, July, 1980

Charles D. Benson and William Barnaby Faherty, *Moonport: A History of Apollo Launch Facilities and Operations* (NASA SP-4204, 1978, xx + 636 pp.). and Edward Clinton Ezell and Linda Neuman Ezell, *The Partnership: A History of the Apollo-Soyuz Test Project* (NASA SP-4209, 1979, xx + 560 pp.).

Moonport and *The Partnership*. . . . present solid historical analyses of two of the twentieth century's most impressive technological achievements: man's first trip to the moon in 1969 and the joint space venture of the United States and the Soviet Union in 1975. . . . The authors had access to official documents, letters, and memoranda, and they have apparently consulted all the relevant historical, technological, and scientific secondary materials . . . all the involved historians obviously spent considerable time studying and intellectually digesting technical reports and manuals in order to give their lay readers such lucid accounts of highly complex procedures and operations . . . . it is important to public knowledge to have professionally trained historians employ historical methods to explain significant events and place them in a meaningful historical context. Here is a broad lesson from these two books that contemporary society can ill afford to ignore.

Review, *Journal of American History*,
December, 1979

John L. Sloop, *Liquid Hydrogen as a Propulsion Fuel, 1945-1959* (NASA SP-4404, 1978, xiv + 325 pp.).

[The author] has written eloquently, often with delicate wit, and always with scholarly concern for the niceties of careful research and citation, about a number of important events inadequately treated in the history of recent technology. . . Sloop has a rare talent for characterization, is (obviously) a determined and skillful researcher, and has his share of the luck he deems essential to success in research enterprises of this sort.

Review, *Technology and Culture*, January, 1980

Barton C. Hacker and James M. Grimwood, *On the Shoulders of Titans: A History of Project Gemini* (NASA SP-4203, 1977, xx + 625 pp.).

The Gemini spacecraft (launched by the Titan missile, hence the title) was needed to prove that men could endure in space and perform the

tasks necessary for later travel to the moon. . . . The story [of Project Gemini] is told in terms of men, money, and materials and the effort made to keep them balanced as the program progressed along its bumpy path. . . . The trials as well as the triumphs of the Gemini program are dealt with. . . . Indeed, this book is refreshingly free of the 'court history' one so often finds in official histories. . . .

Review, *Technology and Culture*, January, 1979

Robert L. Rosholt, *An Administrative History of NASA, 1958-1963* (NASA SP-4101, 1966, xviii + 381 pp.).

Rosholt's volume . . . is substantial and critical . . . [a] provocative survey of the organizational structure, administrative procedures, and procurement administration of a momentous public endeavor. . . .

Review, *Science*
15 September 1967

Loyd S. Swenson, Jr., James M. Grimwood, and Charles C. Alexander, *This New Ocean: A History of Project Mercury* (NASA SP-4201, 1966, xv + 681 pp.).

. . . in this volume the authors have succeeded remarkably well in achieving three different and rather difficult ends. First, they have provided a readable narrative of the first essay by the United States into manned space flight . . . they have managed to do so in a way that is comprehensible to the layman without being negligible to the specialist. Second, they have crammed their narrative with observations and insights that offer food for thought . . . for the treatment offered here thrusts far beyond the particulars of Project Mercury to illuminate many of the enduring problems of our technological society as a whole. And finally, they have avoided . . . the pitfalls of official history . . . they have been able to retain a high degree of objectivity and freedom to criticize even while accepting official support for a volume that almost certainly would not and could not have been written without heavy subsidy and the fullest access to records.

Review, *Aerospace Historian*
Autumn, 1967

R. Cargill Hall, *Lunar Impact: A History of Project Ranger* (NASA SP-4210, 1977, xvii + 450 pp.).

The first close-up photographs of the lunar surface, obtained in mid-1964, opened a new era by bringing the moon into the purview of experimental science. . . . Many advanced machines had to be designed to provide them, and the difficulties encountered in the task were not only ones of engineering, but ones of management as well. This is the theme of Hall's well-researched and excitingly written history of Project Ranger, conducted by NASA and the Jet Propulsion Laboratory (JPL) of the California Institute of Technology in the years 1959 to 1965.

Review, *Science*
May 12, 1978

4

Current Historical Research and Documentation

In selecting subjects for historical research and documentation, the NASA History Office attempts to fulfill the needs of the agency, to anticipate questions most likely to be of historical interest, and to provide a balanced coverage of NASA's programs in aerospace science and technology. Many projects are initiated with the encouragement of, and jointly funded by, individual NASA program offices or centers. Occasionally a project will be suggested to NASA by an outside researcher; such projects receive the same careful consideration and peer evaluation as those proposed from inside the agency. All NASA's history projects depend, of course, on the availability of qualified historians to carry them out and on limited resources.

During more than a quarter-century of historical scholarship, NASA's history program has produced well documented, professionally recognized histories of NASA's Mercury, Gemini, Apollo, Apollo-Soyuz, and Skylab programs. Space science has been treated in NASA-sponsored histories of the Ranger and Viking projects, and a personal history by a former NASA chief scientist. Meanwhile, aeronautical research has been the subject of a history of NASA's predecessor, the National Advisory Committee for Aeronautics and a historical account of high-speed flight research at NASA's Dryden Flight Research Center.

Current historical research at NASA reflects and contributes to the growing interest in historical analysis as a source of greater understanding of a modern research and development organization's management, dynamics, and relationship with its political and technological milieu: hence the "thematic" or interpretive approach of recent and planned sponsored historical work. This approach was signaled with the publication in 1982 of Arnold S. Levine's *Managing NASA in the Apollo Era* (NASA SP-4102) and appears in *The Human Factor: Biomedicine in the Manned Space Program to 1980* (NASA SP-4213, 1985) by John A. Pitts.

Understanding the culture, processes, and critical environment of successful research and development institutions is a predominant theme in several current NASA history projects. These include a study of NASA's first generation of engineers; a history of the Lewis Research Center, site of much of NASA's work in propulsion systems; and a history of Langley Research Center, NASA's oldest aeronautical research facility. A newly initiated historical study of Goddard Space Flight Center is also designed to surpass conventional "institutional histories" by analyzing such aspects as the convergence of internal research strategies with the constraints and opportunities presented by a research laboratory's external environment.

In addition, the NASA history program has inaugurated a New Series of historical studies that will place NASA's programs in wide-reaching historical contexts; the New Series will begin with an interpretive history of the exploration of the Sun from Galileo through the Space Age. Additional studies planned for the Series will investigate NASA's relations with the industrial, military, and university communities during the Apollo era; explore popular perceptions of manned space travel as revealed in fiction and film; and assemble a collective biography of NASA's first generation of engineers.

Finally, historical research at NASA recognizes the need to document large-scale and complex technological enterprise as it happens. NASA's two major manned spaceflight projects since the Apollo program—the Shuttle and the Space Station—are both being documented by NASA historians on site. The success of these documentation efforts is partly attributable to support received from NASA's Johnson Space Center and the Space Station program office. Similarly, a NASA-sponsored historian is working alongside scientists and engineers at the Jet Propulsion Laboratory to document and record NASA's Galileo Project to explore the planet Jupiter. Documentation is, as well, an objective of current NASA history projects at Langley Research Center and Goddard Space Flight Center.

5

Opportunities for Research and Writing Support

NASA supports historical research and writing in NASA-related history by both academically affiliated and independent scholars. Support may be in the form of a competitive fellowship for pre-doctoral or post-doctoral research awarded annually by the American Historical Association, or in the form of a contract for a specific research, writing and/or documentation effort in a subject of particular interest to the agency at a given time.

Fellowship Program

In cooperation with the Society for the History of Technology, the History of Science Society, and the Economic History Association, the American Historical Association administers annually, on behalf of NASA, a fellowship competition for pre-doctoral or post-doctoral research in any area of NASA-related history. The fellowship program is publicized regularly in the newsletter of the cooperating societies and of the American Historical Association. For further information, interested persons should contact the American Historical Association directly at 400 A Street, SE, Washington, DC 20003.

Contract Opportunities for Sponsored Research

Periodically the NASA History Office invites scholars to submit proposals for research, writing, and/or documentation projects on subjects of current interest to the agency. These invitations are publicized in the newsletter of the Society for the History of Technology, the History of Science Society, and the American Historical Association.

Preparing Proposals

In preparing a proposal, one should keep in mind that both the content and the presentation will be the primary basis upon which NASA reviewers will attempt to predict the quality of the proposed work, which typically results in a book-length or shorter manuscript. Proposals should, therefore, be clearly organized and neatly typed, double spaced. The narrative portion (not including "F" below) should not be more than 15 pages long. All proposals should include:

A. A dated and signed cover sheet.

B. An abstract not more than 250 words long.

C. A discussion of the topic's significance to the understanding of those scientific, engineering, managerial, policy, or developments most pertinent to the subject of the proposed research.

D. A discussion of the relationship of the proposed research and writing to relevant current scholarship. This discussion should incorporate specific citiations. A brief annotated bibliography is recommended.

E. A discussion of the questions to be explored by the proposed work. These questions should not be merely listed, but should be integrated into a discussion of the proposed work as a whole in terms of its principal topical or thematic aspects.

F. A budget, including:
   - proposed starting time and duration
   - personnel costs
   - travel (including destinations and durations in sufficient detail to permit calculation of cost)
   - overhead (for institutional proposals; the principal investigator must be named in all institutional proposals)
   - a statement of other major duties the principal investigator will have during the period of the contract, if other than essentially full time is to be devoted to the work being proposed

NASA's policy is to use substantive material contained in proposals for evaluation purposes only. In rare instances when such material constitutes a "trade secret" under the law and the proposer wishes to maintain trade secret rights in any technical data, the following "notice" should be incorporated into the

proposal's cover page. (Thereafter, it is NASA policy to protect this technical data as a trade secret. NASA assumes no liability for use or disclosure of any technical data to which such a notice has not been applied.)

NOTICE

Data on pages __ of this proposal constitute a trade secret. It is furnished to the Government in confidence with the understanding that it will not, without the permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, in the event a contract is awarded on this proposal, the Government may obtain in the contract additional rights to use and disclose these data.

Evaluation Criteria

Proposals submitted to the NASA History Office will be carefully evaluated by historians and NASA personnel familiar with the subject and (as relevant) with the methods and procedures required to successfully complete the proposed project. Evaluations are based on the following criteria:

(1) whether the proposer is adequately prepared, by training and/or experience, to successfully complete the proposed project (all proposals should be accompanied by a curriculum vitae);

(2) the degree to which the proposer has identified the essential questions germane to an understanding of the subject to be researched; how well these questions have been integrated into the proposal's discussion of the scope and substance of the proposed work, and generally how well the project has been conceptualized;

(3) whether the proposal demonstrates an adequate familiarity with its subject, as well as the relevant scholarly literature; how well the proposal relates the expected results of the project to current relevant scholarship;

(4) the probable effectiveness of the proposal's work plan and/or methodology;

(5) and whether the budget is realistic and reasonable.

Proposals should include a realistic appraisal of the research required and the nature and location of pertinent primary resources.

For proposals to research and write volumes for the New Series in NASA history, special attention will be given to whether the proponent offers a promising analytic or interpretative framework, and the degree to which the proposal and supporting materials indicate that the author is capable of writing effectively for non-specialist audiences.

Researching and Writing Under Contract

Once NASA has notified a candidate that a proposal has been accepted for sponsored historical research and writing, the History Office works closely with the selected historian to develop a "statement of work" which best reflects the content and methodology of the historian's proposed research as accepted by NASA. Typically, evaluators suggest ways in which a proposed plan of research might be strengthened; these suggestions are discussed with the selected historian, and most historians welcome this constructive feedback from their peers. The "statement of work" is the heart of NASA's contract for historical research and is approached as the creative, rather than restrictive, aspect of the contracting process.

As its names implies, a contract is a firm statement of mutual obligations to be met by both the historian and NASA. At the same time, NASA recognizes that art and science—which are interwoven in all historical work—are inherently unpredictable and, as a result, modifications in both the scope and schedule of a contract may be made if justified.

Schedule

Researchers expecting to submit a proposal under the NASA history program for sponsored research, writing, and/or documentation activities should allow ample time for the evaluation and contracting process. Normally, evaluation of competitive proposals requires one month from the deadline for submission of proposals. Development of contracts for an award over $10,000 can require as much as an additional five months, and the procedure for securing awards for less than $10,000 may require as much as five weeks after proposal evaluation is completed.

6

Documentary Research in NASA History

Research conducted through, or under the auspices of, the NASA History Office adheres to traditional professional standards, including free access to materials to the extent permitted by law, use of best evidence, free rein of independent judgment, and judicious pursuit of truth and objectivity. The work of NASA-sponsored historians, whether NASA employees or researchers working on contract, is submitted for independent review to participants and professional peers both inside and outside NASA. The purpose of this review is to check for factual accuracy and soundness of argument, to give a fair hearing to conflicting interpretations, and to assure insofar as possible that the author has adhered to scholarly standards in gathering and presenting evidence. The NASA History Office endeavors to apply the same criteria of publication employed by scholarly journals and presses. *Neither NASA nor the History Office necessarily endorses the views expressed in its history publications or derived from research in its records; those remain the responsibility of the author.*

A substantial historical reference file in the NASA History Office at NASA Headquarters in Washington, D.C. contains copies of many historically valuable official records, newspapers clippings, and other documentary materials; it provides a good starting point for any research undertaking in NASA-related history. The resources of the office, as well as those to be found elsewhere at NASA Headquarters and in the Washington area, are described in Appendixes A-C. Documentary resources located at various NASA centers are described in Appendixes D-H.

Secondary Sources and Reference Guides

The most useful secondary sources for NASA-related history are the traditional background literature that any scholar would normally consult in researching a historical topic. These include NASA's own History Series, available from the U.S. Superintendent of Documents (see Appendix I) and the NASA History Office at NASA Headquarters. Other studies can be identified through bibliographic guides and will be found at any good public or university library. A few specialized bibliographies, like NASA HHR-29 and -51, cited in full in Appendix I, are available in the NASA History Office at NASA Headquarters. The U.S. government publishes a number of directories, reference works, and finding aids for research in subjects involving the legislative and executive branches; these are described below. The more specialized aerospace technical literature is best approached through the computerized retrieval system maintained by NASA's Scientific and Technical Information Branch, described in Appendix A.

Current Published Records of the U.S. Government

The *United States Government Manual,* published annually since 1935 by the National Archives and Records Administration, is the best concise guide to government organizations and the staffing of key positions. Before 1973 it was called the *United States Government Organization Manual.* The *Congressional Directory*, published for each session of Congress, provides more detailed information on the legislative branch and its staffs, but must be used with caution: the congressmen write their own biographies.

The best introduction to available government publications and how to locate them is still A. M. Boyd and R. E. Rips, *United States Government Publications* (1949). L. F. Schmeckebier and R. B. Eastin, *Government Publications and Their Use* (2d ed., 1969), supplements Boyd and Rips. While both of these volumes contain sections on the legislative process, a more concise guide to contemporary procedures is U.S. Congress, House, *How Our Laws Are Made*, by Charles J. Zinn, revised and updated by Joseph Fisher, H. Doc. 92-323 (Washington, 1972).

General Guides

The basic finding aid for all twentieth-century U.S. Government publications is U.S. Superintendent of

Documents, *United States Government Publications Monthly Catalogue*, collected in an indexed, annual volume since 1895. This may now be supplemented by the *Cumulative Subject Index to the Monthly Catalogue of United States Government Publications, 1900-1971* (1972-). This multivolume set is as yet incomplete, but it already covers NACA and NASA. The Monthly Catalogue contains numerous citations of congressional reports and documents. To find these in the serial file, use U.S. Superintendent of Documents, *Numerical Lists and Schedule of Volumes*, published annually since 1897 (title varies).

The Library of Congress, *A Directory of Information Resources in the United States Federal Government* (rev. ed., 1974), goes beyond official documents to include government-sponsored information resources, museums, historical societies, etc. J. L. Andriot's *Guide to U.S. Government Serials and Periodicals* (annual, 1959-1972) and *Guide to U.S. Government Publications* (annual, 1973-1976; irregularly thereafter) are indexed by agency and subject.

Legislative Documents

The *Congressional Record* (1873-) is the basic source on the activities of the U.S. Congress. Users are cautioned that the *Record* will contain not only an account of actual proceedings, but material inserted by the President of the Senate or the Speaker of the House. It is published daily and bound at the end of each legislative session with a comprehensive index in the last volume. In addition to a subject index and a numerical list of bills and resolutions, this volume traces the history of bills—an indispensable guide to the legislative process. Both houses of Congress also publish a *Journal*, which is the official record of their respective proceedings. Committee hearings can be located with F. M. Johnston, *Cumulative Index of Congressional Committee Hearings* (to 1959), with supplements (to 1966).

Enacted federal legislation can be found in *United States Code (USC)*, published every six years (with annual supplements), which lists the laws of the United States by subject. One should also consult the *United States Code Annotated*, which is published annually; its annotations provide judicial opinions bearing on sections of the Code. Since 1964 the *USC* has been indexed as well. The *United States Statutes at Large* lists public laws and concurrent resolutions by date; the series is published annually in separate, indexed volumes. The *Tables of Laws Affected* are published as supplemental volumes to the *Statutes*. These publications can be found in any university library as well as law libraries. For recently passed federal legislation, researchers should consult the *Slip Laws*, which reproduce the laws themselves, with notes; these can be found in any law library and can also be obtained from the U.S. Superintendent of Documents, Government Printing Office.

Executive Branch

The National Archives has published the *Code of Federal Regulations (CFR)* annually since 1938. This compilation of executive orders, proclamations, and rules and regulations for departments and agencies does for administrative law what the *USC* does for statute law. The material for the *CFR* is drawn from the calendar year entries in the *Federal Register*, a daily publication of Executive Branch documents and notices of public applicability and legal effect.

Both the *CFR* and the *USC* are divided into 50 titles. Many, but not all, of the titles are identical in the two publications. For example, in the *USC*, the "National Space Program" is chapter 26, Title 42, "The Public Health and Welfare." In the *CFR*, "Aeronautics and Space" covers all of Title 14, of which chapter V is devoted exclusively to NASA.

The *Weekly Compilation of Presidential Documents* publishes on each Monday all public presidential statements and materials released before 5:00 p.m. on the previous Friday. Since 1945 the National Archives has published in bound volumes the *Public Papers of the Presidents of the United States*, including all public statements and messages and verbatim transcripts of news conferences.

"Archival" and Primary Sources: Federal Records

The "archival" or primary sources for resources in NASA history are known by the rubric, "records." Mastering the procedures and terminology by which the U.S. government—of which NASA is an agency—documents the public business is a formidable challenge to even the most determined researcher. Fortunately, NASA Headquarters and each NASA center have on their staff records management officers willing to help researchers with questions we may not be able to anticipate here.

By federal law, government "records" are defined as:

> ". . . all books, papers, maps, photographs, machine-readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal Law or in connection with the transaction of public business

and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the informational value of the data in them. Library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and of processed documents are not included."

The historian will, properly, want to examine evidence to be found in both the official record and nonrecord documents. As with all archival research, depending on each researcher's interest, there will either be a shortage or an abundance of both categories of documents; pursuing a line of inquiry through the thickets of documentary evidence is, however, at the heart of historical investigation and constitutes its chief challenge and its own reward.

When examining federal records, care must be taken to avoid disrupting file continuity and contributing to the loss of records. Records may be copied with permission and should be returned to their original location within a folder.

By law, each federal agency is required to retain or dispose of certain records according to a "schedule" (list of categories) approved by the Archivist of the United States (National Archives and Records Administration). The NASA Records Disposition Handbook (NHB 1441.1A) lists all categories of NASA records and indicates whether they may be destroyed or must be retained, for how long, and whether particular records will ultimately be transferred to the National Archives, where they will be appraised for their historic value and retained or destroyed. Records no longer in frequent use by a given NASA office will normally be transferred to Federal Records Centers located around the country to await eventual destruction or transfer to the National Archives.

Using Current Records

NASA's current files—or records still retained for "current business"—may be examined by bona fide researchers, subject to restrictions imposed by law, such as control of security-classified information, proprietary information, and personnel data. The most efficient way for a researcher to see such information is to examine the NASA or field installation organization chart (available in the NASA History Office at NASA Headquarters) for the period being investigated, or otherwise determine which organizational unit administered the particular program or activity. Then the researcher should contact that office or its successor, either directly or through the History Office, identify the files or information sought, and make arrangements to examine the materials that are available and accessible.

Under the provisions of the Freedom of Information Act and Executive Order 12065, it is the responsibility of the government to make nonexempt documents available to all citizens expeditiously on request. Nevertheless, past experience suggests that the most successful researchers in NASA records and files are those who appreciate the added burden they are imposing on officials and their staffs and who make reasonable arrangements as to time, place, and method of examining documents. After all, the personnel controlling the files are themselves invaluable research aids who harbor a wealth of information that never finds its way onto a printed page. Courteous and cooperative conduct toward a staff member may make of him or her an important ally. Where problems of scheduling or access do arise, the History Office will try to be helpful.

Using "Retired" Records

Retired records fall into two different categories, those that have been permanently accessioned by the National Archives and Records Administration (NARA) and those still controlled by NASA but stored at Federal Archives and Record Centers. The former are in the permanent custody of the NARA and, though NASA may assist the researcher in identifying which records he may want to see, arrangements for using the documents must be made directly between the researcher and NARA. Records still under NASA control but stored in Federal Archives and Records Centers may be recalled to the NASA History Office (as well as other NASA offices).

The records of NASA and its predecessor agency, the National Advisory Committee for Aeronautics (NACA), constitute Record Group 255 within the National Archives and Records Administration (NARA). A selection of NACA records (60 cubic feet) is stored at the NARA Main Building, two blocks from NASA Headquarters. The remainder (some 4,000 cubic feet) is stored at the Washington National Records Center, Suitland, Maryland—about 20 minutes' ride by NARA shuttle bus from the Main Building. Also stored at Suitland are the retired records of NASA Headquarters, Goddard Space Flight Center, and Langley Research Center. These records now occupy more than 100,000 cubic feet.

Each office in NASA Headquarters and the agency's centers retires its own records to a regional Federal Archives and Record Center at its own pace, using Stand-

ard Form 135, "Records Transmittal and Receipt." (See Appendix J. A chronological file of copies of all Standard Form 135s is maintained by NASA records management officers.) The accuracy and completeness with which these forms are prepared vary greatly over time, and from office to office. Since the "Records Transmittal and Receipt" tends to reflect the filing system of the retiring office, these forms can be difficult to use as guides to research. The responsible office can usually assist in locating specific materials.

Approval for access to the records must always be obtained from the individual responsible for the records. NASA Management Instruction 1382.2C, Availability of Agency Records to Members of the Public, may apply. NMI 1382.2C is published in the Code of Federal Regulations, Title 14, Chapter V. Retired Headquarters records can be viewed at Suitland or recalled to Headquarters. To see the records at Suitland, prior arrangements must be made, including a letter to the Records Center from NASA. Often a security clearance is necessary. Records may be recalled to the retiring office or to the History Office with the approval of the retiring office. In either case an Optional Form 11 is submitted (Appendix K). Allow at least two weeks for delivery.

Retired records recalled to the History Office at NASA Headquarters will remain in the custody of the office, which maintains a running file of all records on loan. Permission of the director of the History Office is required to retain recalled records for more than 60 days.

NASA administrators and deputy administrators are presidential appointees; copies of most of their personal papers are available in the NASA History Office or in the retired records. The papers of three former administrators have been donated to public repositories: James E. Webb's (1961-1968) to the Harry S. Truman Library, Thomas O. Paine's (1968-1970) to the Library of Congress, and James C. Fletcher's (1971-1977) to the University of Utah. The papers of Dr. Hugh L. Dryden, NASA's first deputy administrator (1958-1965), have been donated to The Johns Hopkins University.

Some general caveats should be kept in mind when doing research in retired records. The Records Transmittal and Receipt Form, still the best inventory of most retired records of the NACA and NASA, is an imperfect document that often masks or confuses as much as it reveals. Seldom can the researcher expect to go directly from the forms to the desired records box or file. More often one will find in these forms a number of references to boxes that might contain useful information. It is then often best to go to the appropriate regional Federal Archives and Records Center (see Appendix L) to examine in situ all the boxes that might prove useful. Many leads will turn out to be disappointing, but boxes worthy of closer scrutiny may be recalled to NASA, at least for the records still under NASA control. Not only does this procedure minimize the time and expense wasted in recalling a large number of boxes, it also helps to ensure the researcher at least a brief look at all the possible sources of material.

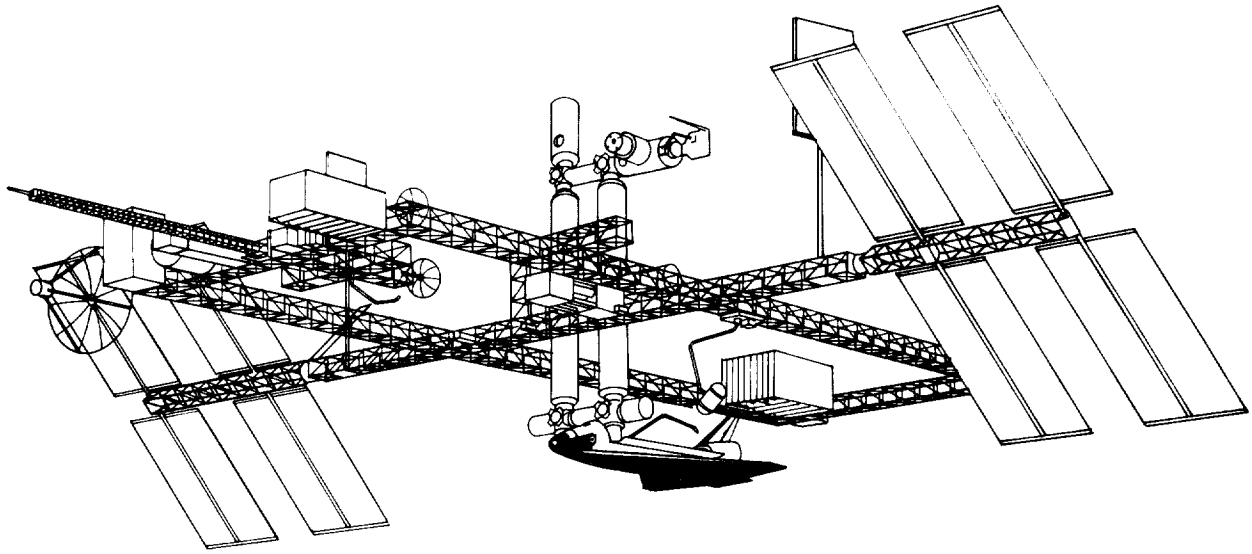
Oral History

Personal interviews can be an important source of historical evidence when studying recent events. Of course the testimony of participants must be weighed judiciously against other evidence, but in a time when the telephone is eliminating many written communications and concern about public disclosure through the Freedom of Information Act is preempting still others, scholars are coming to rely more heavily than ever on participants' recollections. Thorough preparation before the interview and independent verification of the testimony of the interviewee can go a long way toward reducing the hazards traditionally associated with this research technique.

NASA's enabling legislation, the National Aeronautics and Space Act of 1958, requires the agency to "provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof." This statutory obligation and NASA's civilian character have resulted in an agency commitment to "openness." In keeping with this commitment, the NASA history program supports the position of the American Historical Association, which opposes any restrictions on open access to federal documents and information, *including* oral interviews, subject only to national security and Privacy Act exemptions to the Freedom of Information Act. Neither NASA employees, nor historians working under NASA sponsorship, may legally, or as a matter of policy, restrict access to an oral interview tape or transcript as a condition of conducting an interview.

PART II

Appendixes



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APPENDIX A

Documentary Resources at NASA Headquarters

NASA History Office

The NASA History Office is located at NASA Headquarters in Washington, DC., in the Reporters Building at 300 7th Street, Southwest. The Reporters Building is close to L'Enfant Plaza, and can be reached by the Metro subway system (use L'Enfant Plaza stop). The mail address is: NASA History Office, NASA Headquarters, Washington, DC, 20546. Tel: (202) 453-8300. The office is open from 8:00 a.m. to 4:30 p.m., Monday through Friday, except federal holidays.

The History Office staff consists of:

Sylvia D. Fries, Director
Lee D. Saegesser, Technical Information Specialist
Eleanor H. Ritchie, Writer-Editor
James P. Delaney, Historian
Marion A. Davis, Program Support Assistant

Each can provide guidance and assistance. For general historical queries, it is usually best to start with Mr. Saegesser or Mr. Delaney.

The principal holdings of the History Office are the historical documents collections, approximately 500 cubic feet of primary and secondary materials. (Another 400 cu. ft. have been retired; see Section B, below). Included are periodical clippings, press releases, reports, correspondence, and oral-history interview transcripts. Like most NASA records, almost all of this material is unclassified. NASA's retired records and their use for historical research are described in Part I.

Approximately 200 unpublished historical studies prepared under the auspices of the NASA History Office are kept on file in the history office and classified in three series: NASA Historical Monographs (HHM), Reports (HHR), and Notes (HHN). Some of these have subsequently appeared as published histories.

Also on file are copies of most post-1958 congressional publications dealing with aeronautics, astronautics, and related fields. These are filed chronologically according to an assigned code number. The date of publication or the date on which hearings began is used as the basis of a six-digit code for the year, month, and day, in that order. A suffix denotes a House or Senate document. For example, 68-0312H identifies a House document of 12 March 1968. Congressional publications not available in the History Office may be obtained through the NASA Office of Legislative Affairs.

Scientific and Technical Information

The Scientific and Technical Information Branch (STIB) oversees the largest known system of aerospace-information acquisition, indexing, announcing, and retrieval. At the heart of the system is a computer bank at NASA's Scientific and Technical Information Facility in Linthicum Heights, Maryland, near the Baltimore-Washington International Airport. The computer bank stores more than 2 million citations to journal, report, and related aerospace literature from around the world. This bank is part of an on-line, time-shared system connected to more than 30 RECON (REmote CONsole) computer terminals around the United States—two at NASA Headquarters and at least one at each NASA center. Using one of these terminals a researcher can query the computer by date, subject, author, contract number, etc., to find specific citations or bibliographies for a whole field. Only a brief introduction to the system is required; the inexperienced user can neither disrupt the system nor interfere with users at other terminals.

For most citations in the computer, a printed abstract is published in one of two semimonthly NASA journals: STAR (Scientific and Technical Aerospace Reports) and IAA (International Aerospace Abstracts). STAR covers worldwide report literature on space and aeronautics, and IAA provides similar coverage of scientific and trade journals, books, and papers presented at conferences. Using the computer to search and locate, and the published abstracts to evaluate the potential usefulness of a document, a researcher can select those items he wants to examine in full. Abstracts for 1971

and subsequent years are available through RECON, along with document citations. Approximately 15% of NASA-generated scientific and technical information is printed and may be ordered from the Government Printing Office or the National Technical Information Service. The remaining 85% is available on microfiche or as blow-back from fiche at NTIS, all NASA libraries, and selected public and special libraries. A listing of these libraries appears in STAR.

In addition to this major data base, maintained by NASA since 1961, several others can be accessed. Banks such as that of the Defense Documentation Center and the MAchine Readable Catalogue (MARC) collection of scientific and technical books at the Library of Congress are available to RECON users. And on trial or exchange basis, information from other agencies (e.g., NOAA and DOE) and numerous private organizations is available to users of the system.

Most of the literature in the Scientific and Technical Information System is just that: scientific and technical. However, it includes occasional surveys, reports, and even histories that can be useful to historians. This is especially true, of course, of preliminary studies of scientific and technical projects, as well as summaries of results achieved. But even in such areas as management and international space law, much is available.

Libraries

Numerous specialized libraries exist in or near NASA Headquarters. Their aggregate resources are equal to almost any research need related to NASA.

The Headquarters Scientific and Technical Library, while primarily an arm of STIB, nonetheless carries a wide range of other material. It has a small sampling of newspapers and general magazines and a much larger selection of specialized periodicals in the fields of science, technology, and management. Most periodical runs begin in the late 1950s or early 1960s, but some from the NACA's library stretch further back. The reference section is strongest on government publications and general guides to materials in aerospace and related fields. The shelved volumes are few and from restricted fields—but there are still many of interest to historians. Interlibrary loan provides access to other NASA libraries, the Library of Congress, and the libraries of other federal agencies. NASA employees may check out books from the NASA library and keep them until someone else requests them. Books on loan from another library are subject to the lending policy of that institution.

The library at Goddard Space Flight Center, just outside Washington, is one of the best center libraries in NASA. A shuttle bus from Headquarters makes the half-hour trip several times each working day; a schedule appears in the current NASA Headquarters telephone directory.

The Law Library is part of the Office of the General Counsel, but it is available to all NASA employees. A simple checkout system facilitates use of the volumes outside the library. Most of the holdings are specialized and of interest principally to lawyers. However, many are of use to historians: *Federal Register, Code of Federal Regulations, U.S. Code* and *U.S. Code Annotated, U.S. Statutes at Large, Congressional Record, U.S. Treaties and Other International Agreements, Papers of the Presidents*, NASA budget submissions, various congressional documents, runs of selected law journals, etc.

The Library of Congress is of course open to all researchers. Its resources are unparalleled, but for outsiders often difficult to use. Delivery of volumes to the main reading room is slow (45 minutes or more after request is submitted); stack passes are hard to come by. In general the library is best for those items such as manuscripts or rare books that cannot be reached through other sources. For some specialized topics, the staff can be helpful. The Science and Technology Reading Room in the Jefferson Annex has its own card catalogue, reference section, and experienced staff.

The library of the National Air and Space Museum, across Independence Avenue from NASA Headquarters, is strong on the artifacts of aerospace—and their documentation. The NASA History Office cooperates closely with NASA and can direct researchers to the proper staff member there.

The library of the Department of Transportation is one block from the NASA History Office. With open stacks, it is in many respects the most useful general library in the area. It consists of the former libraries of the Coast Guard and the Bureau of Public Roads, but it has wider holdings than that heritage would suggest. It has been a national depository library since 1968.

The library of the Federal Aviation Administration is administratively an annex to the DOT library, but operates separately. The FAA library has a much better collection of aviation literature than NASA. Also located one block from the NASA History Office, the FAA library has open shelves and a few unreserved desks for the use of researchers.

Two other national depository libraries are contiguous to NASA Headquarters. The library of the Department of Health and Human Services (1954) is in the HHS Main Building, just across 4th Street. The library of the Department of Housing and Urban

Development (1969) is diagonally opposite the Reporters Building, in which the NASA History Office is located. And there are 23 other federal depository libraries within the District of Columbia.

Individual NASA Offices

The Office of Public Affairs regularly prepares press releases, press kits, and public information brochures. Of course, such documents must be used circumspectly by the historian; their purpose, after all, includes public relations as well as dissemination of information. But with this caveat in mind, they can be a useful source. The releases, for example, often serve as the official public announcement of a program, decision, or international agreement. The Audio Visual Section also maintains files of still photographs, motion pictures, and tape recordings.

Since the founding of NASA, the Office of the General Counsel has selected important documents for retention and indexing. These are coded by key word and placed in the Legal Information Retrieval Systems (LIRS), a computer bank at Ames Research Center with outlets at Headquarters and at other NASA centers. Though primarily intended for legal research, the collection contains much useful historical documentation. The system is available to researchers with the permission of the assistant general counsel for patent matters. Copies of the documents are available in the General Counsel's Office and the Law Library.

The Graphics and Management Presentations Branch of the Headquarters Administration Division maintains a file of photographs, charts, drawings, and other visual aids used in Headquarters.

Research on specific topics often can best be pursued in the responsible Headquarters office. Each office maintains inventories of its retired records; often the person who initially retired the records is still on the job and can expand upon the information on the inventory forms. Moreover, many offices keep files on a project until it is completed. This means that active files may go back for years and contain material one would expect to find among the retired records. Policy varies from office to office, and the only sure way is to check. Lastly, the researcher may want to interview participants.

APPENDIX B

NASA Headquarters History Office Documents Collection

by

Lee D. Saegesser

The NASA History Office documents collection originated shortly after the creation of the NASA History Office. The various series described below were originally designed to facilitate research for the major serial publication, *Astronautics and Aeronautics*, but have since evolved into a functional system. The total volume of material amounts to more than 532 cubic feet (not counting books), plus some 395 cubic feet stored in the Federal Archives and Records Center, Suitland.

White House and Presidential Papers
10 feet (1958) to date)

Includes documents pertaining to Presidents Hoover through Reagan, the Executive Offices, and various commissions and councils that serve the president; selected papers from the *Weekly Compilation of Presidential Documents*; newspaper and *Congressional Record* clippings; magazine articles; photographs; and NASA correspondence. Arranged by organization or president and thereunder chronologically. Listed below are the amounts of material under each president, with inclusive dates. A general grouping of non-White House material, 6 feet, includes such organizations as the President's Science Advisory Committee (PSAC) and the National Aeronautics and Space Council (NASC).

Hoover, negligible amount (1963 to date)
Roosevelt, negligible amount (1942 to date)
Truman, 2 inches (1952 to date)
Eisenhower, 1 foot (1947 to date)
Kennedy, 2 feet (1957 to date)
Johnson, 3 feet (1957 to date)
Nixon, 3 feet (1957 to date)
Ford, 8 inches (1963 to date)
Carter, 1 foot (1976 to date)
Reagan, 3 feet to date

Aeronautics and Space Report of the President (1958 to date).

These yearly reports submitted by the president to the Congress are arranged chronologically. From 1976 to 1983 the History Office was responsible for preparing this report.

Congressional Documents 25 feet (1918 to date)

Arranged by committee and thereunder chronologically. The loose documents are newspaper clippings, magazine articles, *Congressional Record* clippings, brochures, photographs, correspondence, and the *NASA Legislative Activity Reports* 1962 to date). Most of the material is bound committee reports, hearings, special studies, etc., covering the period 1957 to date. These hearings and reports are shelved separately in chronological order.

NASA Seminannual Report to Congress (1958 to 1969).

These reports and related materials are arranged chronologically. The requirement for this report was deleted from the original National Aeronautics and Space Act of 1958 by Public Law 92-68 (85 Stat. 174, 6 Aug. 1971).

Federal Agencies 26 feet (1950 to date)

Arranged alphabetically by name of federal agency, and thereunder chronologically. It consists of photographs, newspaper clippings, magazine articles, reports, correspondence, news releases, brochures, *Congressional Record* clippings, and agreements between NASA and other federal agencies.

National Academy of Sciences, Space Science Board, and National Academy of Engineering 3 feet (1957 to date)

Arranged chronologically. Consists of news releases, newspaper clippings, magazine articles, reports, brochures, pamphlets, correspondence, and the NAS *Newsreport* (a monthly newsletter).

Organizations, National and International 4 feet (1955 to date)

Arranged alphabetically by name of organization and thereunder chronologically. Consists of booklets,

brochures, news releases, magazine articles, newspaper clippings, photographs, speeches, and monographs. Included under the international organizations are subseries pertaining to international law, agreements, treaties, and conventions.

Foreign Countries 26 feet (1800 to date)

Divided into two subseries: U.S. cooperation with other countries, and the countries themselves. Alphabetical by name of country and thereunder chronological. The series consists of newspaper and magazine articles, speeches, news releases, translations, brochures, pamphlets, correspondence photographs, and *Congressional Record* clippings.

One of the large groupings consists of material pertaining to the USSR and its space activities, with heavy emphasis on translations. This grouping includes a general subject file of 9 feet on Soviet manned and unmanned satellites, arranged alphabetically. Topics: Sputnik, Lunik, Venera, Molniya, Soyuz, Voskhod, space station, launching facilities, etc.

Industry 9 feet (1945 to date)

Alphabetically by name of company and thereunder chronologically. Consists of news releases, magazine articles, newspaper clippings, speeches, photographs, correspondence, brochures, annual reports, and *Congressional Record* clippings. Such classic industry reports as the RAND satellite and High Altitude Test Vehicle (HATV) studies are to be found in this series.

Organization and Management 75 feet (1910 to date)

Includes organization charts, briefing memorandums, correspondence, internal and external studies, photographs, NASA insignias, newspaper clippings, magazine articles, news releases, speeches, brochures, telephone books, congressional testimony, *Congressional Record* clippings, *ProgramReviews* and *General Management Reviews* (1961 to date), *Calendar of Appointments* (1969 to date), and NASA Headquarters Weekly Bulletin (1965 to date).

A large subseries in this grouping consists of papers of the NASA administrators and deputy administrators. They are listed below chronologically with the dates of their service. The parentheses enclose the dates of the papers on file. Also listed is the amount of material.

Administrators:

Glennan, Dr. T. Keith, 1958-1961 (1954 to date) 7 feet
Webb, James E., 1961-1968 (1952 to date) 6 feet
Paine, Dr. Thomas O., 1968-1970 (1966 to date) 3 feet
Fletcher, Dr. James C., 1971-1977 (1969 to date) 3 feet
Frosch, Dr. Robert A., 1977-1981 (1977 to date), 1 foot
Beggs, James M., 1981-1986 (1968 to date), 1 foot

Deputy Administrators:

Dryden, Dr. Hugh L., 1958-1965 (1910 to date) 6 feet
Seamans, Dr. Robert C., 1965-1968 (1960 to date) 3 feet
Low, Dr. George M., 1969-1976 (1958 to date) 10 feet
Lovelace, Dr. Alan M., 1976-1981 (1965 to date) 2 inches
Mark, Dr. Hans M., 1981-1984 (1970 to date) 6 inches
Graham, Dr. William R. (1985 to date) 1 inch

Budget Documentation 17 feet (1958 to date)

Arranged chronologically. Consists of budget briefings, newspaper clippings, magazine articles, correspondence, news releases, speeches, *Congressional Record* clippings, *NASA Budget Estimates*, chronologies of NASA budget submissions, and *The Budget of the United States Government*. A complementary source for budgetary materials will be found under *Congressional Documents*.

NASA Headquarters 65 feet (1958 to date)

Arranged by major office within NASA Headquarters and thereunder chronologically. Consists of office publications, brochures, news releases, magazine articles, newspaper clippings, speeches, photographs, external and internal studies, correspondence, and organizational charts. Listed below are the organizations for which there is documentation. Some of these offices are no longer in existence.

Legislative Affairs
International Affairs
General Counsel
Policy
Applications
Public Affairs
Administration
Techology Utilization
Space Sciences
External Affairs
Center Operations
Space Transportation Operations
Space Transportation Systems
External Relations
Aeronautics and Space Technology

Procurement
Industry Affairs
Comptroller
University Affairs
Special Contracts Negotiations and Review
DoD and Interagency Affairs
Program Plans and Analysis
Space Flight
Tracking and Data Acquisition
Inspector General
Management
Chief Engineer
Chief Scientist

The bulk of the material is to be found under Public Affairs, which issues news releases and a newspaper clipping collection, "Current News."

NASA Centers 29 feet (1958 to date)

Arranged alphabetically by name and thereunder by subseries and chronologically. Consists of photographs, organization charts, newspaper clippings, magazine articles, correspondence, brochures, news releases, center newspapers, and telephone books.

Some installations have been renamed, disestablished, reorganized, or separated from NASA. Listed below are the installations for which there is documentation.

Ames Research Center
Dryden Flight Research Facility
Electronics Research Center
Goddard Space Flight Center
Jet Propulsion Laboratory
Johnson Space Center
Kennedy Space Center
Langley Research Center
Lewis Research Center
Marshall Space Flight Center
Michoud Assembly Facility
National Space Technology Laboratories
Wallops Flight Center
Western Operations Office

Unmanned Programs, Projects, and Satellites 50 feet (1945 to date)

Arranged in three major subseries, each of which is arranged alphabetically and thereunder chronologically. Consists of photographs, correspondence, news releases, newspaper and *Congressional Record* clippings, magazine articles, brochures, mission operation reports, and translations.

The first subseries consists of programs and activities such as communications, meteorology, lunar and interplanetary contamination, balloons, zeppelins, sounding rockets (arranged alphabetically by name), flight schedules, and the Goddard Space Flight Center *Spacewarn Bulletin*.

The second subseries pertains to lunar and interplanetary flight. Listed below are the spacecraft to be found in this grouping.

Galileo
Grand Tour
Lunar Orbiter
Mariner
Out of the Ecliptic
Pioneer
Ranger
Sunblazer
Surveyor
Viking
Voyager

The third subseries is made up of earth-orbiting satellites.

Able
Aeronautical satellite
Aeros
Alouette
Anik (Telesat-Canada)
ANS (Astronomical Netherlands Satellite)
Ariel
ATS (Applications Technology Satellite)
Azur
Beacon
Biosatellite
CAS-C (Cooperative Applications Satellite—Canada)
Comstar
Direct Broadcast
Earth Resources Satellite
Echo
Explorer
GEOS
GOES
G Star
HEAO
Helios
HEOS
Injun
IntaSat
Intelsat
ISIS
Landsat
Marisat
NATO

Nimbus
NOAA
OAO
OGO
OSO
Pageos
Pegasus
RCA
Rebound
Relay
San Marco
Satellite Power System
Satellite Repair Satellite
Search and Rescue Satellite
Seasat
Skynet
Small Observatory Satellite
Snapshot
Solar Powered Satellite
Solar Radiation Satellite
Space Telescope
Sphinx
Sunflower
Symphonie
Synchronous Meteorological Satellite
Syncom
TD-1A
Telstar
Tethered Satellite
Tiros
Tracking and Data Relay Satellite
United Kingdom
Vanguard
Westar

Manned Spaceflight 85 feet (1953 to date)

Arranged chronologically by project and thereunder topically and chronologically. Composed of news releases, speeches, newspaper and *Congressional Record* clippings, magazine articles, photographs, correspondence, reports, brochures, pamphlets, translations, and mission operation reports. (15 cubic feet, pertaining to Skylab, retired to the Federal Records Center, Suitland.) Other topics: Mercury, Gemini, Apollo, Apollo-Soyuz Test Project (ASTP), Shuttle, Lunar Stations, Space Stations, Planetary Flight, and Space Colonization.

Space Station

Materials documenting the history of the U.S. Space Station program are collected as part of the Space Station History Project. Located in an annex to the NASA History Office, the collection is divided by subject and organized chronologically. Because the Space Station History Project is an on-going documentation effort, the number of documents and subject classifications is continuously expanding. The principal files of the collection contain approximately 6 cubic feet of documents on space station history. These documents include photos, selected correspondence and reports dating from 1958 to the present, as well as a number of articles and reports concerning the history of the space station concept. A list of the contents of the Space Station Historical Documents Collection is available for use in the History Office.

Launch Vehicles 26 feet (1945 to date)

Arranged alphabetically by name of vehicle and thereunder chronologically. Consists of correspondence, reports, brochures, news releases, speeches, magazine articles, newspaper clippings, *Congressional Record* clippings, studies, and photographs. Such reports as the 1959 National Space Vehicle Program, 1960 Long Range Plan, and 1962 Golovin Report (Large Launch Vehicle Planning Group) are included. Files exist for the following launch vehicles:

Agena
Atlas
Atlas-Able
Atlas-Agena
Atlas-Centaur
Blue Scout
Centaur
Delta
Hermes
Iris
Juno II
Little Joe
Nova
Saturn I
Saturn IB
Saturn V
Scout
Shuttle
Thor
Titan
V-1
V-2
Vega

Space Sciences 9 feet (1851 to date)

Arranged topically and thereunder chronologically, with such folders as astronomy, pulsars, radio astronomy, x-ray, radar, quasar, black holes, comets, meteors, the sun, the planets, planetary satellites, geodesy, oceanography, physics, aurora borealis, air pollution, and energy. Series consists of monographs, brochures, news releases, newspaper and *Congressional Record* clippings, magazine articles, translations, photographs, correspondence, and studies.

Life Sciences 3 feet (1958 to date)

Material pertaining to exobiology, space medicine, extraterrestrial life, and various NASA studies on life sciences arranged topically and thereunder chronologically. Series consists of newspaper clippings, magazine articles, correspondence, photographs, studies, brochures, pamphlets, news releases, and NASA special publications.

General Space Research, Propulsion, and Reentry 8 feet (1956 to date)

Arranged topically and thereunder chronologically. Consists of news releases, photographs, correspondence, newspaper and *Congressional Record* clippings, magazine articles, speeches, brochures, pamphlets, and special studies. Included are such topics as avionics; guidance; materials; space processing; chemical, liquid, solid, and nuclear propulsion; the various reentry projects; and orbital debris.

Tracking and Data Acquisition 3 feet (1957 to date)

Arranged topically and thereunder chronologically. Series consists of correspondence, photographs, newspaper and *Congressional Record* clippings, magazine articles, news releases, brochures, and pamphlets.

Biography File 86 feet (1800s to date)

Arranged alphabetically by name of person and thereunder chronologically. Series is composed of photographs, correspondence, news releases, magazine articles, newspaper clippings, and speeches. Included are U.S. and foreign space personalities, both living and dead. For related material see the subseries NASA Administrators and Deputy Administrators, under *Organization and Management.*

Aeronautics 20 feet (1945 to date)

Arranged by topic and thereunder chronologically. Composed of photographs, newspaper and *Congressional Record* clippings, magazine articles, news releases, reports, studies, correspondence, brochures, and pamphlets. Included are such topics as transportation, statistics, firsts, wind tunnels, B-70, helicopters, NASA aircraft, remotely piloted vehicles, fly-by-wire, supercritical wing, Agplane, vertical- and short-take-off-and landing, supersonic transport, Concorde, X-1 through X-29, lifting bodies, hydroplaning, aircushion vehicles, and hydrofoils.

Miscellaneous material 70 feet (1825 to date)

Arranged topically and thereunder chronologically. Includes news releases, reports, newspaper clippings, cartoons, magazine articles, NASA issuances, photographs, correspondence, studies, reports, brochures, and pamphlets. Listed below are some of the topics together with the dates covered and the amount of material available.

NASA Management Issuances, microfiche (1958 to date)
Space-related cartoons, more than 4800; 3 feet (1825 to date)
NACA correspondence collection, 8 feet (1915 to 1958)
Transition papers, 1 foot (1958 to date)
Other histories, arranged alphabetically by name of author, 7 feet (1958 to date)
USAF, Navy, Army, FAA monographs, brochures; 2 feet (1945 to date)
Chronologies, 2 feet (1945 to date)
Bibliographies, 3 feet (1958 to date)
Awards, NASA and others, 3 feet (1909 to date)
Museums, 2 feet (1958 to date)
Apollo documentation collected by Robert Sherrod, 36 feet (1960-1978)
Early history of NASA, documentation collected by Eugene Emme, 7 feet (1950s-1978)
Newspaper clipping collection, 4 feet (1948-1959). (This series separate from *Current News.*)

Impact file, consisting of such topics as criticism of space activities and influence of the space program on economics, humor, military, movies, music, philately, public opinion, religion, technology, television, toys, etc., 7 feet (1950 to date)
Interviews. Most have been transcribed and will be found in the *Bibliography File.*
Satellite Situation Report, prepared by Goddard Space Flight Center, 3 feet (1959 to date)
Conferences, 1 foot (1961 to date)
Incomplete collection of NASA Special Publications, 6 feet (1961 to date)
Naval Research Laboratory reports, 1 foot (1947-1959)
Papers of Dr. John E. Naugle, NASA associate administrator for space science, 14 feet; microfiched in 1986 (1960-1977)
Management studies done by NASA, 5 feet (various dates)

Other Headquarters History Office documents have been retired to the Federal Records Center, Suitland, Maryland. This material can be recalled by the History Office for use by researchers. Listed below are some of the more important series.

Papers of Dr. Homer E. Newell, NASA associate administrator, 43 feet (1942 to 1978)

Papers of Dr. Alfred J. Eggers, assistant administrator for policy, 20 feet (1957 to 1967)

Papers of Dr. George M. Low, deputy administrator, 5 feet (1958 to 1961). For additional material see *Organization and Management.*

Selected chronological reading files of many NASA Headquarters offices

Life sciences papers collected by Dr. Mae M. Link, 6 feet (1958 to 1970)

Electronics Research Center files, 18 feet (1963 to 1969)

Vanguard Division of the Naval Research Laboratory and subsequently of NASA, 8 feet (1955-1959). This material comprises the only known records of this division, and therefore has been permanently accessioned by the National Archives and Records Service. To obtain access to these documents, consult the National Archives and Records Administration.

Space Task Group (post Apollo), 1 foot (1969)

Viking history collection, 26 feet (1960 to date)

APPENDIX C

Research Locations in the District of Columbia

NASA Headquarters offices are in three adjacent buildings in the southwest section of Washington:

Building	*Location*	*Symbol*
Federal Building (FB) 10B	600 Independence Ave., SW	B
Federal Building (FB) 6 (floors, 5, 6, 7)	400 Maryland Ave., SW	F
Reporters Building (floors 7,8)	300 7th Street, SW	R

NOTE: Do not use street address for mail. Simply write office name and mail code, NASA, Washington, DC 20546.

Locations of pertinent offices are as follows:

Office	*Mail Code*	*Location*	*Telephone*
History Office	LBH	R-714	(202) 453-8300
Scientific & Technical Information Branch (Publications Section)	NIT	R-824	(202) 453-2906
Scientific and Technical Library	NHS-4	B-A39	(202) 453-8545
Law Library	GL	F-7062	(202) 453-2458
Records Management Br. (agencywide)	NIM	R-828	(202) 453-2918
Hq. Records Officer	NHS	B-A56	(202) 453-8532
Information Center, Hq.	NHS-2	B-126	(202) 453-1000
Public Affairs	LFD-2	F-6043	(202) 453-8400
News & Information Br.	LFD-1	F-6035	(202) 453-8594
Broadcast and Audiovisual Branch	NHG	B-146	(202) 453-2682
Graphics	G	F-7065	(202) 453-2450
General Counsel			

Other offices in the District of Columbia area:

Federal Aviation Administration Library
FAA Building
Room 930
800 Independence Ave., SW 20553

Department of Transportation Library
DOT Building
Room 2200
400 7th Street, SW 20590

National Air and Space Museum Library
Independence Ave. at 6th St., SW 20560

Health and Human Services Library	
HHS Building Room 1436	300 Independence Ave., SW 20201
Housing and Urban Development Library	
HUD Building Room 8141	451 7th St., SW 20410
Library of Congress	
	1st St. between East Capitol & Independence Ave., SE 20540
Washington National Records Center	
	4205 Suitland Road Suitland, MD 20409
National Archives and Records Administration	
Main Building	Pennsylvania Ave at. 8th St., NW 20408
Goddard Space Flight Center	
Homer Newell Memorial Library Bldg. 21, L 105	Greenbelt, Md. 20771 (accessible by NASA Hq. Shuttle bus)

APPENDIX D

NASA Centers

Records retirement at the NASA centers follows the same procedure as at Headquarters. The major difference is that the federal records centers are seldom as close to the NASA centers as Suitland is to Headquarters. While centers can recall their records from the records center, it is often better for the researcher to visit the records center himself, especially if he needs to examine a large volume of material. The records management officer at the NASA center can make the arrangements.

NASA's field centers have historical monitors who supervise the administration of historical resources and assist researchers. The names, addresses, and phone numbers of contacts at the respective centers are in Appendix L.

The organization of historical resources varies from center to center. Some require special comment.

Johnson Space Center, Houston, has extensive archives, strongest on the history of manned spaceflight. A significant portion is at the Woodson Research Center, Rice University Library (Houston). Working documents related to more recent programs are in the JSC History Office. Appendix E briefly describes holdings at each location.

Jet Propulsion Laboratory, Pasadena, is a unique organization. It is staffed and operated under contract to NASA by the California Institute of Technology. The lab has an extensive historical archive (described in Appendix F) which has been inventoried and coded. The index has been programmed on a laboratory computer and may be searched using a research guide available at the library. Since the departure of the JPL historian, the library has retained the archives, but new material is not being added.

Kennedy Space Center, Florida, historical "archives" (described in Appendix G) are maintained by an archivist in the center library.

The records of *Lewis Research Center* in Cleveland are kept at the center's subsidiary Plum Brook Station, located on Lake Erie near Sandusky, Ohio. The only guide to this material is the set of shelf lists maintained by the Records Management Office at Lewis.

Langley Research Center in Hampton, Virginia, oldest in the history of the NACA and NASA, has some unparalleled resources (described in Appendix H) for historical research. Its library still maintains, for example, the same card index to aeronautical literature that was begun by the NACA more than half a century ago. This is the only extant set.

Historical resources at *other centers* vary. Unless a researcher knows the specific office that controls the material desired, he or she should contact the Headquarters History Office or the center history monitor listed in Appendix L.

NASA Visitor Information Centers, Museums

Most NASA installations have visitor information centers on site. Holdings may vary from a few illustrative murals to a large artifact and document collection. These are usually administered by the local Public Affairs Office and are readily accessible to the public. Provision can sometimes be made to examine historical documents at these information centers.

APPENDIX E

Lyndon B. Johnson Space Center
History Office Documents Collection

The History Office at Johnson Space Center is located in Building 420. Access is by appointment only. Mail address: BY/History Office, Johnson Space Center, Houston, TX 77058. Telephone: (713) 483-3111, or FTS (Federal Telecommunications System): access code + 525-3111.

A substantial number of Johnson Space Center's historical documents are housed at the Woodson Research Center at Rice University (see below). The Center is located on the first floor of Fondren Library at Rice University. Office hours are 9:00 a.m. to 5:00 p.m., Central Time Zone, Monday through Friday. Mail address: Woodson Research Center, Rice University, Houston, TX 77251. Telephone: (713) 527-8101.

General

The Johnson Space Center history office documents collection covers more than 20 years of documentation related to manned spaceflight and comprises approximately 2000 linear feet of material from government, industry, and other sources. This collection is predominantly arranged in chronological order by project—Mercury, Gemini, Apollo, Skylab, Apollo-Soyuz Test Project, and Shuttle. There are, however, some special subject files—the lunar receiving laboratory, Gemini and Apollo spacesuits, science and medicine, and parachutes, for example—that could serve as a foundation for focused studies. The collection also includes files of presentations, speeches, and papers and other categories covering a range of topics related to manned spaceflight.

A Memorandum of Understanding between Johnson Space Center and Rice University permits the transfer on indefinite loan of selected documents to the Woodson Research Center, Rice University Library. The Woodson Center administers some 500 linear feet of Johnson Space Center's historical documents, including holdings related to Mercury, Gemini, Skylab, and Apollo-Soyuz, as well as some material related to Apollo. The Woodson staff has prepared finding aids for these materials and is prepared to assist researchers visiting Rice and to answer queries by phone or mail.

Remaining in the Johnson Space Center History Office are working documents on the Apollo and Shuttle programs and certain institutional nonrecord material and special subject files. Inquiries regarding this material should be addressed to the Johnson Space Center History Office.

Project Mercury

At Rice University (46 linear feet)

Chronological files—correspondence, project reports, minutes, and publications from NACA and NASA offices, 1952-1966.

Working papers, numbered 100 through 234. For complete listing of authors and titles, see *This New Ocean: A History of Project Mercury*, NASA SP-4201, pp. 610-17.

Quarterly status reports, 1959-1963, filed sequentially.

Flight-related documents, including postlaunch memorandum reports, beginning with Mercury-Atlas 1.

Contractor reports and documents, including reports, flight plans and other documents produced by NASA contractors.

Familiarization manuals, compiled during 1959-1963, describing capsule systems and major components.

Reel-to-reel tapes and videotapes, covering such subjects as astronaut debriefings, air-to-ground communications, mission simulations, and interviews.

Photographs and drawings, including those used to illustrated *This New Ocean*.

Project Gemini

At Rice University (104 linear feet)

Chronological files, 1958-1971. Includes Gemini Project Office outgoing correspondence regarding technical contractor activities, 1962-1966.

Gemini general subject files, including files on Department of Defense (DoD) support, extravehicular

activity, food and waste management, POGO problem, Titan II status summaries, tracking network, space docking, and rendezvous radar.

McDonnell Aircraft Corporation design notes, including aerodynamics, crew compartment, electrical, electronic, guidance and control, mechanics, instrumentation, propulsion, reliability, spacecraft weight and balance, spacecraft strength design, structural loads, and thermodynamics, 1963-1966. Also NASA-McDonnell correspondence, technical reports, and press information, 1963-1967.

Gemini Management Panel meetings: discussions that set policy, reviewed progress, and resolved problems; filed chronologically, 1962-1965.

Gemini missions filed sequentially, 1 through 12; flight plans, directives, public affairs material, air-to-ground transcripts, mission evaluation reports, crew technical debriefings, 1964-1966.

Quarterly Status Reports generated by Manned Spacecraft Center (MSC, now JSC), 1962-1966.

Launch vehicle documents produced by Martin Corporation (Titan launch), Lockheed Corporation (Agenda launch) and other contractors, 1961-1967.

Spaceflight experiment documents; documentation on the development of the Gemini fuel cell and the paraglider landing system.

Tape recordings and transcripts of 261 oral history interviews, 1966-1970; audio tapes of Gemini postflight conferences and television interviews, 1963-1966.

Glass slides, organized by spacecraft number, largely concerning spacecraft assembly; photographs of the Gemini flights, organized in binders by flight.

Onboard, air-to-ground, and ground-to-air transcripts. Also technical debriefings at NASA, MSC, and by McDonnell Aircraft Corporation, 1965-1966.

Gemini working papers, 1963-1967, covering data and mission analyses, system studies, operational methods and requirements, etc.

Project Apollo

At Rice University (51 linear feet)

Contractor reports and feasibility studies for Project Apollo (1960-1961).

Quarterly status reports for the Manned Lunar Landing program, 1962-1968 (incomplete); Manned Spacecraft Center (MSC) reports, 1967-1970.

North American Rockwell reports on its responsibility for the command and service module; MIT guidance and navigation reports; Grumman reports on the lunar module; television contractor documents produced by Fairchild and other corporations; Northrup Ventura's parachute reports (1962-1970).

Apollo working papers (1000 + series): many aspects of Apollo planning and operations, 1960-1968.

Correspondence and reports on the Integrated Medical and Behavioral Measurement System (IMBMS) program, 1959-1970 (largely 1968).

Apollo Applications Program chronological files, containing documents from various JSC offices and contractors (largely 1968-1972).

Post-Apollo planning documents, including space station concepts. Information on the Manned Orbital Laboratory program, Boeing's Extended Apollo Laboratory Module Study, and Lockheed's Large Orbital Research Laboratory Study (mostly 1962-1965).

Tape recordings of 341 oral history interviews, 1961-1976; miscellaneous tape recordings of interviews and speeches by astronauts, 1963-1973; five 16mm films, including the *Apollo 16* water landing and astronaut recovery, 1963-1972.

At Johnson Space Center History Office (600 linear feet)

This is the collection on which *Chariots for Apollo* (NASA SP-4205), a history of the development of manned lunar spacecraft, was based. It includes about 100 linear feet of photographs. Other components of this collection are:

Correspondence arranged in chronological order, 1957-1972, from the reading files of the Apollo spacecraft program office in Houston, to which past researchers have added selected documents from the Office of Manned Space Flight in Washington, files from system and subsystem offices in Houston, and materials from the Apollo prime contractors.

Apollo program office weekly and monthly status reports from 1963 until discontinued in 1966.

Reports and studies by committees, groups, and panels: Hornig Panel, Research Steering Committee

(Goett committee), New Projects Panel, Manned Lunar Landing Working Group, Lunar Mission Planning Board, Large Launch Vehicle Planning Group (Golovin committee), Manned Space Flight Management Council, Apollo Technical Liaison Groups, Apollo Mission Planning Task Force, NASA Staff Conferences 1, 3, 4 and 5 (2 has never been located), and weekly reports of the NASA Office of Manned Space Flight.

Experience reports by program participants on such subjects as the docking system, LM ascent propulsion system, mission planning for lunar-module descent and ascent, stress corrosion, simulations for crew training, aerothermodynamics evaluation, and others.

Apollo mission documents, filed sequentially beginning with AS-001 in December 1964 and ending with *Apollo 17* in December 1972. This collection includes flight plans, mission requirements documents, public affairs materials, air-to-ground and onboard voice transcriptions, mission reports, crew technical debriefings, and flight directors' logs. (Not all documents are on file for every mission.)

Contractor reports from numerous firms on numerous topics: Bellcomm, Garrett AiResearch, Grumman, North American, AC Spark Plug, AVCO, Chance Vought, Kollsman, Martin, MIT, General Dynamics/Astronautics, Northrop, Rand, Raytheon, and others. Of particular interest are the feasibility studies that led to the final contract proposals for the Apollo spacecraft.

Special subject collections: lunar science, lunar receiving laboratory, lunar-landing research and training vehicles, and spacesuits.

Oral-history interviews: transcripts of some 200 interviews with program participants covering all aspects of the program. (The interview tapes are housed at Rice.) An index filed with the transcripts indicates which tapes have and which have not been transcribed.

Indexes

The Apollo collection is being indexed document by document, so that files may be systemically searched by computer. Indexing should be complete by mid-1984. A user's guide to the Johnson Space Center Historical Documents Collection and the indexing system may be available by early 1986. As indexing progresses, hard-copy indexes are being produced for manual search; computer searches on indexed sections can also be conducted. For more information, contact the JSC History Office.

Skylab

At Rice University (104 linear feet)

Chronological files including correspondence, meeting minutes and agenda, and memoranda from JSC project managers, contractors, MSFC officials, and NASA Headquarters, 1970-1979.

Mission directives and management documents, from the Skylab program director's office, 1966-1972, and other management documents, including annotated correspondence and notes from the Skylab program manager, flight directors' handover notes, documentation on reviews and presentations by system managers, program review and assessment documents, and statements on mission requirements, 1970-1974.

Flight-related documents, including flight plans, operations handbooks and manuals, debriefings, and mission reports, 1971-1974.

Minutes, reports, etc., regarding the Apollo Telescope Mount, the Earth Resources Experiments Package, and other experiment programs.

Contractors' documents and correspondence, including representative material issued by McDonnell Douglas, North American Rockwell, and Martin Marietta.

Configuration Control Board meeting minutes, 1970-1971.

Daily mission reports and transcripts from JSC Flight Operations Management Room, 1973-1974.

General subject files, on diverse topics ranging from the project budget to the Crew Health Stabilization Program, 1971-1974.

Oral-history interviews (both tapes and transcripts), 1974-1977.

Videotapes of earth views, documenting tropical storms, volcanic landforms and processes, and other subjects; an extensive series of photograph albums, documenting Skylab systems, experiments, EVA activities, etc.

Apollo-Soyuz Test Project

At Rice University (70 linear feet)

Chronological file (largely 1973-1975), including documents, letters, memorandum, etc., from

numerous JSC offices. Files from the Apollo Spacecraft Program Office, largely containing correspondence with or concerning the USSR space program, are included in this series.

General subject files, 1969-1975; experiment documents files; planning documents, assessment reports, scheduling documents, etc., in numbered sequence; flight-related procedure handbooks, checklists; mission reports, North American Rockwell documents on the command and service module, the docking module, and mockups.

Working group documents, which contain considerable information on the activities of various U.S.-Soviet working groups as they discussed, negotiated, and agreed on technical specifications for the ASTP mission.

Public affairs press releases, reports, and correspondence generated at the JSC Public Affairs Office (and at NASA Headquarters); American and Russian newsclippings on ASTP; and flight transcripts, 1972-1976.

Oral-history tapes, 1974-76; training and orientation tapes for Soviet and U.S. personnel; a photograph file, including photos from several meetings of U.S. and Soviet personnel in Houston and Moscow.

Space Shuttle

At Johnson Space Center (500 linear feet to date)

In cooperation with Rice University, the History Office at Johnson Space Center is collecting and indexing historical documents of the Space Shuttle program. To date, this collection includes the following materials.

Correspondence, 1959 to present. Most of this material came from the office of the Shuttle manager in Houston. Other key participants have contributed documentary holdings. Arranged chronologically through 1982.

Presentations and briefings, 1970-1981. A complete file of Shuttle presentations and briefings made by the Shuttle program manager and subordinate organizations at JSC.

Weekly reports, 1970 to present.

Contractor proposals for a Shuttle development program—Rockwell, McDonnell Douglas, Lockheed, Grumman, etc.

Selected engineering drawings, photographs, and other graphic materials.

Reports, press kits, flight plans, operating plans, etc. for each Shuttle mission. Filed chronologically by mission.

Apollo and Skylab chronological reading files also contain Shuttle information from 1969 to the close of these programs.

Earth Resources

At Johnson Space Center (50 linear feet)

Correspondence gathered from the program office and other organizations. Not yet organized.

Manned Space Center/Johnson Space Center General Studies

At Rice University (44 linear feet)

Research material in this series does not readily fall into the project-specific series listed above. The documents contain general information about NASA and about activities that are common to several projects (e.g., splashdown recoveries). Also included are oral interviews regarding the development of JSC, and media information (news releases, clippings) about the NASA program.

Johnson Space Center Institutional (30 linear feet)

Correspondence covering evolution and organizational changes from 1958 to present.

Logs of special assistant to the director of the Space Task Group (later Manned Spacecraft Center and then Johnson Space Center)—brief accounts of daily events, 1958-1961.

Activity reports on progress or events of Mercury, Gemini, Apollo (1962-1968).

Abstracted minutes of senior staff meetings, 1961-1967.

Announcements, 1962 to present, informing center employees of organizational changes, institutional rulings, etc.

Management instructions governing policy, procedures, and charters of individual elements of the center from 1961 to present.

Space News Roundup, official center house organ issued biweekly from 1961 to present (not complete).

JSC news releases including relevant Headquarters releases (1969 to present).

Special subject files: MSC Operations at Atlantic Missile Range; Engineering and Development Directorate Facilities and Activity Reports; Environment and Energy; Reliability and Quality Assurance; Trainers and Simulators; Technology Utilization; Annual Procurement Report; etc. Collected in one area, but not chronologically arranged for the most part.

General Collection (15 linear feet)

Newsclipping services files, 1969 to present (not complete).

Congressional hearings, studies, reports relating to program of NASA, 1954-1979, 1981-present.

Small collection of NASA papers from the 1950s.

NASA Headquarters and field-element telephone books, 1961 to present (not complete).

NASA Special Publications series on assorted subjects related to NASA space programs (not complete).

Space and aviation directories, 1962-1969.

Public affairs information on the NASA field centers.

Speeches and papers related to aerospace and kindred fields, filed by name of author.

Slides and photographs related to manned spaceflight and other programs (not organized).

Space Business Daily, 1963-1967 (not complete); *Aviation Daily*, 1962-1964 (not complete).

APPENDIX F

Jet Propulsion Laboratory
California Institute of Technology
Historical Documents Collection

Mail: Library (Mail Stop 111-113), Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109

Location: Library, Building 111, Room 113

Office Hours: 7:30 a.m. to 4:45 p.m., Pacific Time Zone, M-F

Telephone: (818) 354-4321 or FTS access number plus 792-4321

Contact: Reference Librarian

An extensive collection of historically important documents pertaining to the development of Jet Propulsion Laboratory and its program was compiled by the facility's historian while its History Office was in operation. The collection has been retained in the Jet Propulsion Laboratory Library. Its approximately 4500 documents include material on the V-2 rocket, Corporal missile, Army ordnance, and other aspects of the early years of the space program, as well as such NASA programs as Ranger, Surveyor, Mariner, and Apollo. No additions have been made since 1975.

The collection has been inventoried and coded and an index has been programmed on a Jet Propulsion Laboratory computer. The documents may be searched using a research guide available in the library; a copy of the guide is also available for reference in the History Office at NASA Headquarters, Washington, D.C.

APPENDIX G

Kennedy Space Center Library: Historical Documents Collection

Mail: Kennedy Space Center Library, NWSI-E, Kennedy Space Center, Florida 32899

Location: Kennedy Space Center Headquarters Building, Room 1533

Office Hours: 7:30 a.m. to 4:00 p.m., Eastern Time Zone, Monday through Friday

Telephone: (305) 867-2407 or FTS access number plus 823-2407

Contact: Ken Nail or Harriet Brown, (305) 867-4540 or FTS access number plus 823-4540

General

The KSC Library historical documents collection, with holdings of nearly half a million pages of documents and more than 21,000 photographs, contains historical evidence of the center's growth and development. A large part of the holdings is organized in 73 guides and 24 container lists that range in subject from construction of the Vehicle Assembly Building and Launch Complex 39 to the launch of each manned spaceflight. The collection documents significant parts of the history of the Skylab, Apollo-Soyuz Test Project, and Space Transportation System (Shuttle) programs. Notable among the holdings are Dr. Kurt H. Debus's personal photograph collection, 1945-1962; documents related to the V-2 rocket work at Peenemunde during World War II; and a large number of photographs of the visits to Kennedy Space Center by Presidents Kennedy, Johnson, Nixon, and Carter. Recently completed are container lists on missiles, the autoignition test, the Missile Firing Laboratory, and propellants. Guides completed include the subjects: energy, mission operation reports (MORs), air-to-ground transcripts (on microfiche), the Florida East Coast Railway photograph collection, and the Office of Manned Space Flight. A guide to the collection of Agreements (1958-1976) is nearing completion. A collection of reference books is available for researchers; research and reference service is available. The Kennedy Space Center Library Archives is also responsible for compiling and publishing the illustrated Chronology of KSC and KSC-Related Events; chronologies have been published for 1980-1984 and the 1985 chronology is about to be published.

Army Ordinance Missile Command Reports, 1958-1960 (1 cubic foot)

These documents were published by the U.S. Army Ordnance Missile Command (AOMC) from May 15, 1958 through July 6, 1960, and reflect work done for the Advanced Research Projects Agency of the Department of Defense and for the National Aeronautics and Space Administration.

Apollo Era (3½ cubic feet)

The guide to Apollo Era documents comprises ten series, an arrangement of 245 folders over 53 pages of description. The bulk of the collection is made up of Daily Status Reports dating from January 3, 1966, through November 30, 1972; these make up 83 folders. The remainder of the documents are test reports, summaries, letters, memoranda, operations plans, portions of the Review Board findings concerning the AS-204 accident, and launch documents from the beginning of the Apollo program through Apollo 12 and for Apollo 17. The collection does not include documentary materials for Apollo 13-16.

Apollo 204 Accident (2½ cubic feet)

The Apollo 204 Accident Guide is a description of documents relating to the accident which took place on January 27, 1967, at Kennedy Space Center. The various evidentiary materials described in the 29 pages are arranged in eight series and contained in five folders.

The documents include Congressional hearings, statements concerning the accident by NASA Administrator James M. Webb, the "Phillips Reports," regular press releases, a special series of "AS-204 Releases" running from January 27 through February 2, 1967, NASA's official accident report, newspaper articles, wireservice reports, chronologies, biographies of Roger B. Chaffee and Edward H. White, II, memoran-

da and letters, and the four volumes of the *AS-204 Technical Information Handbook.*

Baron Report (¼ cubic feet)

This guide identifies the two central documents in what might be termed the "Baron report controversy." Neither document is original.

Wernher von Braun (⅔ cubic feet)

This collection of documents covers the career of Dr. Wernher von Braun from 1945 through August 1970. Among other documents, the collection includes Dr. von Braun's rocketry predictions made in 1945, a selection of his speeches, and several documents concerning his tenure as Director of the Development Operations Division. The collection consists of twenty folders in two archives boxes.

Congressional Series, 1949-1975 (6 cubic feet)

The Congressional material is arranged alphabetically by record type/agency, thereunder chronologically. Speeches are arranged alphabetically by speaker, thereunder chronologically. Miscellany is arranged similarly. In addition, the collection contains a number of Congressional Prints from 1962 to the present; most concern NASA appropriations.

Crawler-Transporter, 1962-1967 (1½ cubic feet)

This material consists of blueprints, drawings, technical reports, proposals, feasibility studies, modification reports, and design and production criteria. It is arranged chronologically. Two files, "Crawler Analysis from Design Analysis" and "Transporter Mode Comparison Evaluation Study," are arranged chronologically within each file. Undated material can be found at the end of the guide.

Dr. Kurt H. Debus (40 cubic feet)

The guide to this material has been compiled for use as a general reference tool for researchers. The information found here is the result of a survey of 40 boxes of official records from the office of the Center Director, Dr. Kurt H. Debus. Temporarily housed in the Center's records staging area, the director's records discussed herein were retired into the records management system of the National Archives.

Deputy Director

This material comprises the non-current official records of the office of Deputy Director of Kennedy Space Center. These records, dating from 1963 through 1972, are in the custody of the records management system of Kennedy Space Center; they are housed in the records staging area at Cape Canaveral Air Force Station. Descriptions of the records were derived both from folder titles and from records transmittal forms.

Department of Defense (2 cubic feet)

The Air Force subseries consists of chronologies, handbooks, histories, and technical reports. They are arranged chronologically under the following headings: Air Force Eastern Test Range, Air Force Missile Test Center, Office of Aerospace Research, and Western Test Range. The Army subseries consists of a circular, documents, histories, pamphlets, plans, proposals, regulations, reports, specifications, technical memoranda, technical reports, and a file of miscellany; it is arranged chronologically thereunder. The Navy subseries consists of histories and reports, arranged chronologically.

Project Gemini, 1962-1966 (3 cubic feet)

This material is arranged sequentially by the number of the mission. In addition to technical material, there are records from the Public Affairs Office. The records for each mission include: a launch facilities plan; contractor reports; fact sheets; test summaries; mission summaries; program review documents; a press handbook; project histories; and extravehicular activities; mission reports; a mission commentary transcript; data summaries; illustrated mission summaries; operations orders; mission recovery requirements; and files pertaining to protocol for the invitees and attendees, their schedules, and accomodations involved with the launches.

Hovair 1965 (⅓ cubic foot)

This collection contains documents concerned with the Hovair transporter as a load-carrying device as described in Martin Company reports of May 1965.

Jetstar/Executive Transporter, 1962-1965 (1 cubic foot)

This material contains trip diaries, itineraries, manifests, operational data, and other information on the Kennedy Space Center Jetstar, a Lockheed executive aircraft used by the center to transport visiting dignitaries and other personnel. The series is arranged chronologically, with undated documents at the end of the file. The undated file is arranged alphabetically by title of the document.

Kennedy Space Center Bulletin, 1974-1978 (½ cubic feet)

The *Kennedy Space Center Bulletin* is the official weekly publication for civil-service and contractor employees at the Kennedy Space Center.

Kennedy Space Center Design Engineering Project Status Reports, 1974-1976 (1 cubic foot)

These reports (TR-1033) are arranged chronologically.

Launch Umbilical Tower (LUT), 1960-1971 (1 cubic foot)

This material consists of design proposals and configurations, drawings, review data, an engineering study, a technical report and test and analysis documents. It is arranged chronologically with undated material at the end, arranged alphabetically by title or topic.

Marshall Space Flight Center Historical Monographs, 1960-1967 (1 cubic foot)

This material contains historical monographs and chronologies of Marshall Space Flight Center (MSFC). It includes twenty volumes, eleven of which, Marshall Historical Monographs MHM 1-11, contain supporting documents. Two chronologies appear as Marshall Historical Reports (MHR 6 & 7). This guide is arranged chronologically.

Marshall Star, 1960-1978 (1 cubic foot)

The *Marshall Star* is a weekly newspaper published weekly for the employees of the Marshall Space Flight Center by the Public Information Office. The series begins with the first issue in 1960, but has many gaps. Articles of interest concerning the Launch Operations Directorate and the Launch Operations Center may be found in its pages. Items dealing with the Kennedy Space Center and its programs are also included. Special editions of the *Marshall Star* titled "Space Information Digest" were published from December 11, 1963 through March 25, 1964.

Mercury Program, 1959-1965 (3 cubic feet)

The material is divided into suborbital and orbital missions and arranged chronologically thereunder. In addition to technical material, there are records from the Public Affairs Office. The records consist of the following: quarterly project status reports; a contractor siting team report; a report on range support; monthly reports on Department of Defense support; transcripts of press conferences; documents relating to flight results; news releases; illustrated commemorative brochures; fact sheets; illustrated brochures describing mission personnel and post-launch ceremonies; conference proceedings; transcripts of communications from spacecraft; transcript of a public address announcement from Mission Control Center; and a document giving test philosophy and proceedings as applied to Mercury spacecraft and planned application to future projects.

NASA Activities, 1973-1985 (1 cubic foot)

This material is made up of an incomplete run of *NASA Activities*, an agency-wide newsmagazine.

NASA Current News, 1963-1975 (3 cubic feet)

Current News is an internal NASA publication reproducing clippings of news stories related to NASA or the space program. This incomplete run is arranged chronologically.

NASA Pocket Statistics, 1962-1974 (½ cubic foot)

Intended as a handy reference for NASA managers, *Pocket Statistics* contains data on the agency's history and accomplishments. This incomplete run is arranged chronologically.

NASA-KSC Real Property Quarterly Inventory, 1965-1975 (1 cubic foot)

This material is arranged chronologically. For the years 1974-1975, the title changes from Inventory to Report. The guide is incomplete for 1966, 1969, and 1970.

News Releases, 1959-1976, Manned Spacecraft Center Fact Sheets, 1962-1964 (3 cubic feet)

This material contains news releases from Marshall Space Flight Center (MSFC), Manned Spacecraft Center/Johnson Space Center (MSC/JSC), Kennedy Space Center (KSC), and NASA Headquarters. Fact Sheets from the Manned Spacecraft Center are included. No series is complete; each has a table of contents. The series covers the times indicated:

Kennedy Space Center	1962-1975
Manned Spacecraft Center and Johnson Space Center	1963-1964
Marshall Space Flight Center	1961-1965
NASA Headquarters	1959-1976
Manned Spacecraft Center Fact Sheets	1963-1964

The subject matter varies from biographical announcements and photographs of those appointed or promoted, to summaries of speeches, congressional hearings, announcements of contracts, mission activities, and visits by world leaders to the various centers. The releases and fact sheets are arranged chronologically. All but those from the Marshall Space Flight Center are numbered sequentially. Fact Sheets from the Kennedy Space Center are not included in this guide. Kennedy Space Center Fact Sheets are filed with guides to which they pertain, i.e., by topic or in the speech guide.

NOVA—72 folders, 1961-1964 (1½ cubic feet)

NOVA was a large launch vehicle, later cancelled in favor of the smaller Saturn vehicle. The documents are arranged chronologically in 72 folders.

Photograph Collection

The 17,348 pictures which make up the photograph holdings of the Kennedy Space Center Library Archives are described by means of catalog cards. The period covered by the collection is approximately forty years.

Press Kits, 1963-1975 (3 cubic feet)

This material is divided into manned and unmanned launches. It is arranged alphabetically by the name of the mision, thereunder chronologically within these subdivisions: press kits created by NASA; those created by other government agencies; and those generated by industry.

Public Affairs (9 cubic feet)

This collection of documents is especially strong on visits by prominent public figures and on the worldwide interest in the American space program. Some significant documents are missing.

Redstone Rocket, 1959-1961 (1 cubic foot)

The *Redstone Rocket* was a privately owned newspaper published each Wednesday by Jack W. Hoffhaus. Mr. Hoffhaus published the newspaper in agreement with the Public Information Office, Army Ordinance Missile Command, Redstone Arsenal, but it was not an official Army publication. The guide begins with vol. 7, no. 43, March 4, 1959 and has many gaps. It includes articles of interest concerning the Launch Operations Directorate and the Missile Firing Laboratory.

Saturn/Apollo Launches, 1961-1972 (12 cubic feet)

Documents in this material include: mission histories, launch operations schedules, daily status reports, mission reports and evaluations, public affairs records, and miscellaneous correspondence. The material is divided into unmanned flights grouped according to launch vehicles, e.g., Saturn I tests; manned missions are listed chronologically.

Service Structure, 1958-1969 (1 cubic foot)

This chronologically arranged guide consists of technical memoranda, architectural and engineering studies, charts, contractors' reports, a design data manual, design criteria, siting and design recommendations, drawings and blueprints, and construction cost estimates. The Saturn Service Structure II Design Committee papers form a single file.

Space Shuttle (18½ cubic feet)

The development of the Space Shuttle as a reusable orbital vehicle is reflected in documentation continually being created and the Shuttle holdings of the archives of the Kennedy Space Center Library are increasing correspondingly. For this reason, Shuttle documents of historical value are being handled as though they constituted a single large documents group. The arrangement process has so far revealed ten subject areas, each of which is described in separate guides.

Spacecraft Operations, 1967-1968 (1 cubic foot)

This series consists of Spacecraft Operations, a biweekly status report at Kennedy Space Center, prepared by the Support Branch and The Boeing Company. It is arranged chronologically.

Spaceport News, 1962-1977 (1 cubic foot)

The *Spaceport News* is the official newspaper for civil-service and contractor employees at the Kennedy Space Center and is published by the Public Affairs Office, Public Information Branch. The first issue appeared December 12, 1962, approximately six months after the formal establishment of the Launch Operations Center, July 1, 1962. Between December 13, 1962 and July 1966, *Spaceport News* was issued weekly. Thereafter, it has been published on alternate Fridays. The *Spaceport News* Index, prepared by the Kennedy Space Center Library, is included in this series.

Speeches, 1959-1973 (3 cubic feet)

The material comprises 274 folders of speeches delivered by persons ranging from Ira Abbott and Aldo H. Bagnulo through James E. Webb and Eugene M. Zuckert. The guide is arranged alphabetically by speaker and chronologically thereunder.

Taylor Photograph Collection (8 cubic feet)

This collection of facility construction photographs is described in a guide; the collection originated in four large boxes from the office of Ms. Annie E. Taylor, Administrative Operations Branch of Project Management. A second photographic collection of roughly equivalent size has not yet been described but does have a useable index.

The Taylor Photograph Collection consists of some 2,461 photographs arranged in eleven series categories. The 116 folders are housed in nine archives boxes located on range G, shelves five and six. Descriptions of the photographs derived from wording found on the back of each photograph. Original order was maintained throughout. Duplicate photographs were sent to the Smithsonian Institution's National Air and Space Museum in Washington, D.C. In the relatively few instances where third copies of the photographs existed, these were sent to the Deutsches Museum in Munich, West Germany.

Telephone Directories, 1961-1975 (4 cubic feet)

This material is arranged alphabetically by NASA Center.

Unmanned Launches, 1948-1976 (9½ cubic feet)

This material consists of launch reports, field flight reports, operations summaries, flash flight analysis reports, post-launch reports, illustrated fact sheets, techical reports, and blueprints. It is arranged alphabetically by mission, thereunder chronologically.

Vehicle Assembly Building, 1962-1973 (2 cubic feet)

This material consists of engineering reports, technical studies, data manuals, design reviews, blueprints, and fact sheets pertaining to the Vehicle Assembly Building. It is arranged chronologically; miscellany consists of undated material, arranged alphabetically.

Vanguard-Martin Collection, 1949-1959 (3 cubic feet)

The documents which make up the Vanguard-Martin Collection, 78-10, include reports, studies, and analyses of prelaunch and launch activities of the Vanguard Satellite Launch Vehicle Program. The documents are arranged chronologically and cover the period September 1949 through December 1959. The researcher may find particularly useful an organization manual for Project Vanguard dated September 1958, which is found in folder 88 of box 5, and a National Aeronautics and Space Administration review dated January 1959, which is found in folder 97 of box 6. The collection is in 105 folders contained in 6 boxes.

Viewgraphs Index

The Viewgraphs Index is a descriptive list of materials designed for use with an opaque projector. They were created as a visual aid in public discussions of the American space program. Nearly all of the 972 viewgraphs are in color.

APPENDIX H

Langley Research Center
Historical Documents Collection

Mail: Historical Office, Mail Stop 123, Langley Research Center, Hampton, VA 23665

Technical Library, Mail Stop 185

Location: Building 1194, Room 200, for historical collections; Building 1194, third floor, for Technical Library's aeronautical files

Office Hours: 8:00 a.m. to 4:30 p.m., Eastern Time Zone, Monday through Friday

Telephone: (804) 875-3511 or FTS access number plus 928-3511
Technical Library: (804) 865-2634 or FTS access number plus 298-2634

Contact: Richard T. Layman, historical program coordinator
Sue K. Seward, reference librarian

Langley Research Center in Hampton, Virginia, oldest laboratory of the National Advisory Committee for Aeronautics (NACA) and its successor agency (NASA), possesses a historical documents collection which, with its technical library, constitutes a premier collection (with some documents dating from 1917) for aerospace historical research. Included are rare books and photographs, technical reports, office memoranda, flight and wind tunnel logs, programs and minutes of major technical conferences, personal papers, transcripts of interviews with key personnel, as well as scale models of aircraft and spacecraft and other significant artifacts. Besides Langley Research Center's own historical documents, the collection includes important files from the Wallops Island, Va., rocket test range, created in 1945 as an auxiliary base of Langley Laboratory and managed by Langley as part of the Pilotless Aircraft Research Division (PARD) until 1959, when Wallops became an independent NASA field installation.

The most important collections at Langley are: NACA correspondence files, NACA research authorization files, the Milton Ames Collection, and personal papers of Floyd L. Thompson and John Stack, and the books of Max Munk. These collections are described briefly below.

Correspondence Files

The correspondence files were created as the byproduct of Langley Research Center's "tight-to-the-vest" correspondence policy and a highly centralized filing system. There are two catalogues to the correspondence file codes in the Langley historical documents collection, one that is alphabetical by subject and the other that follows an alpha-numeric code; both are the products of the laboratory's mail filing operation. The contents of their respective first pages are described below.

Subject Guide, Alphabetical (Examples)

SUBJECT	CODE NUMBER
Aberdeen Proving Grounds	B10-3
Accelerometers	A18R-8A
Acoustics	A313-1
Administrative Policy and Procedure	E30-12C
Advanced Research Projects Agency (ARPA)	E20-6
Advisory Group for Aeronautical R&D (AGARD)	E2-12B
Aeroelasticity	A178-2
Aerospace Industries Association	E6-7
Aircraft Companies—General	A173-4
Alsos Mission	E2-13C
Altimeters	A184-8H
Ames Research Center	B10-6
Angle of Attack—Instruments	A184-8D

Alpha-Numeric Guide (Examples)

CODE	SUBJECT
A170-1	Aerodynamic Theory
A172-1	Aerodynamics Committee— Langley
A173-1	Airfoils
A173-1A	Wings—Swept (Back and Forward)
A173-5	Airplanes—General
A173-5A	Hypersonic Aircraft
A173-5B	Helicopters—General
A173-5E	Airplanes—Disposition
A173-5F	Windshields and Cockpit Visibility

A173-5K	Quarterly Status Reports on Projects Relating to Research Airplanes
A173-5N	NASA Aircraft Utilization Reports
A173-5P	Air Traffic Control

Research Authorization Files

Although the correspondence files are valuable, the most important source for research in aeronautical history at Langley is the NACA research authorization files. These files permit the historian to recreate the entire NACA research procedure for a given project from the raw research idea through the final polished report.

What, exactly, was a NACA research authorization? Whenever a project for research at Langley was approved by NACA Headquarters, a research authorization (or RA) was signed by the chairman of the executive committee and forwarded to the laboratory for execution. Technically Langley was supposed to have an RA for each one of its investigations, and each RA was expected to lead to the publication of a NACA report. Each RA had a title and number, and each included specific information on the how and why of the investigation.

Milton Ames Collection

In the early 1970s, Milton Ames, a former Langley engineer who had served as chief of aerodynamics at NACA Headquarters from 1949 to 1958, began research for what he hoped would be a complete and publishable history of the laboratory. Although he did not achieve his goal, Ames did pull together hundreds of significant documents. Organized into folders which he titled and deposited into seven oversized boxes, the Ames collection is stored in cabinets in the Langley archive; the original box scheme and folder titles have been preserved.

The Ames collection is especially enlightening because it was created by an "old NACA hand," a product of the institutional culture under investigation. The documents he found significant enough to include for research tell us something about both his identity as a member of the NACA "corporation" and about his approach as an engineer to historical understanding. Furthermore, since Ames was one of the NACA's most talented and forwardlooking aerodynamicists, his choice of key technical papers for historical examination is helpful to the nonspecialist. The entire collection, comprising seven boxes, is outlined below.

Contents of Box No. 1

Wright Brothers
Establishment of British Advisory Committee for Aeronautics
Need for an Aeronautical Laboratory in America
Smithsonian Advisory Committee on the Langley Aerodynamical Laboratory
Surveys of Aeronautical Laboratories in Europe, 1913-1920
Aeronautical Research in Canada
Early History of Aeronautical Research in Germany
Miscellaneous Papers on Aviation up to Establishment of NACA
Legislation Pertaining to NACA, and April 1958 Summary
Establishment of NACA
NACA Membership, Chairmen, Etc.
First Meeting of NACA
Langley Site Selection and Transfer of Land to NACA
NACA Statement of Policy, October, 1917; Executive Order Dated May 20, 1918
Memorandum of Understanding with the Army Re Use of Langley Field by NACA, 1919
Summary of Important Events in Early History of NACA, 1915-1917
NACA Paris Office (Established May 1919)
Miscellaneous Papers on Aeronautical Research in USA, 1921-1925
Early Reviews and Summaries—NACA and Langley
Miscellaneous Langley Background Information
Langley Field, Va.—History and Construction (Air Corps Views)
Langley Land Records and Deeds
Early Construction, Langley Research Station
Dedication of Langley (June 11, 1920)
Variable Density Wind Tunnel—Construction

Contents of Box No. 2

Langley Organization Charts
Langley Personnel and Personnel Activities
Estimates of Langley Plant Costs
Economic Value of NACA Research (Summary, 1937)
Preliminary (Langley) Data on NACA Budget (1915-1952)
Efforts to Transfer NACA from Independent Agency to Other Agencies
Langley Inspections (Originally called Manufacturers' Conferences)

Contents of Box No. 3

Photographic Files
Log Books of Early Exhibits
Visitors' Register, Langley, 1926-1934

Contents of Box No. 4

Wilbur Wright Memorial Lectures
Folders on Key Individuals Associated with Langley History Clippings (1925-1930)
1933 Hurricane

Special Publications—Anniversaries, Histories
Conferences, Ceremonies, Inspections, Visitors
Economic Study of 1933 and "Notes on Aviation Progress Through Research"
Langley History (Collection of Papers and Talks on Langley History)
Miscellaneous Press Releases on Langley Research Activities
Miscellaneous Correspondence Regarding Early Headquarters/Langley Relationship
Langley Telephone Directories, January 1963-May, 1971

Contents of Box No. 5

Early Engine Competition (1920)
Fatal Aircraft Accident Report, JN-6 44946, August 20, 1924
Ford Reliability Tour, 1926
Crash of the "American Legion" at Langley, April 26, 1927
Research Activities During 1920s
NACA Preparation Prior to World War II
Langley Contributions to Ames and Lewis Laboratories
Langley Activities During World War II Era
Mead Committee Investigation—Correspondence
National Aeronautical Research Policy, March 21, 1946
Post-World War II Research Activities
Government Accounting Office Survey of NACA, 1953
25th Anniversary of Langley Towing Tank and Full-Scale Wind Tunnel, 1956
National Awards to Langley
Extra Copies of *Air Scoop*
Miscellaneous Airship Photographs from Melvin N. Gough

Contents of Box No. 6

Area Rule and Richard Whitcomb
Langley Contributions to B-58
V/STOL Research
High-Speed Submarine (Albacore) Research for U.S. Navy
Research on Flexible Wings
Langley Special Group on Research for Guided Missiles
Langley Research Facilities
"NACA Research into Space," 1957
ECHO 1 and William J. O'Sullivan
Early Manned Space Flight
Project Apollo

Contents of Box No. 7

Papers and Talks relating to History of Langley
NOTE: The "box" scheme is retained through inserts, but the Ames collection is filed according to his scheme, in lateral files.

Personal Papers—The Floyd L. Thompson Collection

This collection holds more for the space historian than it does for the historian of aeronautics. Most of its contents postdate the NACA; they derive from Thompson's term as Director of the NASA Langley Research Center, 1960-1968. Box C of this collection, though, contains some important documents on NACA research dating back to the 1930s. (Thompson began working for NACA at Langley in July 1926). The following reproduces Floyd Thompson's own inventory of the subjects of the collection.

Box A

MORL (Manned Orbital Research Laboratory)
Lunar Orbiter (Historical Notes)
Apollo
Mercury
Scout
X-15
SST (Supersonic Transport)
Passive Communications Satellite
Large Boosters
Miscellaneous Technical Proposals and Memos

Box B

Early Space Program Planning: Memos and organizations—Visits and Events
Newport News Cyclotron and VARC (Virginia Associated Research Center)
Special Assignments

Box C

Old Langley Flight Research Programs
Historical Notes on Flying Qualities Work
Old Conference Memos and Historical Notes on Dynamic Loads and Structures Research
Transonic Research
Notes, Comments, Statements on Management Philosophy
Aeronautics Policy, 1970
Langley's 50th Anniversary
Rotary Club Talks
Local Affairs
University of Michigan Honorary Doctorate
William and Mary Honorary Doctorate
Retirement Party, October 17, 1968
Personal Matters, Including Correspondence Regarding Appointment as Center Director
Notes on Other Persons
Miscellaneous Technical Reports and Papers

Box D

Copies of Public Talks, Publicity Statements, Photos
Letter to National Academy of Engineering
Numerous Technical Articles and Papers, Mostly Published

The John Stack Collection

This collection of the papers of a famous Langley aerodynamicist of the 1920s through the 1950s is more valuable to the historian of aeronautics than the Thompson collection because it includes a greater number and wider chronological range of older business correspondence and research program files—many of which concern Stack's pioneering work in transonic and supersonic technology. The papers, which are in folders labeled by John Stack, have been organized into sections of file drawers according to categories.

Section No. 1: Wind Tunnel Design, Operation, and Test Techniques

Crocco Curve
Kochel Ultra-Supersonic Wind Tunnel Development
New Types of Tunnels
Uses of Gas other than Air in Wind Tunnels
Hodograph Report
8-Foot High-Speed Tunnel Operations
Supersonic Wind Tunnel at Wright Field
4-Foot Supersonic Tunnel
Miscellaneous Wind Tunnel Data
Special Type Tunnels—Slotted Test Sections
Repowering 16-Foot High-Speed Tunnel
Unitary Plan Wind Tunnel
Revised Unitary Program
Gas Dynamics Laboratory
Flutter Tunnel
Supersonic Compressor
Aberdeen Supersonic Wind Tunnel
Madelung High-Pressure Water Tunnel
Proposed Air Engineering Development Center
National Supersonic Research Center
Electric Power Supply
Refrigeration
Schlieren Photographs—British National Physical Laboratory
Afterglow Photographs
Sphere Photos over a Range of Mach Numbers

Section No. 2: Research Problems

Jet Analysis, Inducted
Interaction of Shock and Boundary Layer
Shrouded Propellers
Data on Various NACA Airfoil Section
Drafts of Stack's Wright Brothers Lecture, "Compressible Flows in Aeronautics," December 17, 1944
Miscellaneous Technical Reports

Section No. 3: Reports of Meetings, Conferences, and Study Groups

Gas Turbine Conference at General Electric, 1945
High-Speed Aerodynamics Conference, NACA-Navy-Army, July 13, 1945
Stack's Report on Aberdeen Conference, January 17, 1946
American Physical Society Meeting, April 25, 1946
NACA Conference on Supersonic Aerodynamics, Ames Laboratory, June 4, 1946
Langley Conference on High-Speed Aerodynamic Theory, February 3, 1947
Langley Conference on Supersonic Aerodynamics, June 19-20, 1947
Ames Conference on Supersonic Aerodynamics, August 31, 1948
American Physical Society Meeting, University of Virginia, December, 1949
Miscellaneous Conference Reports
Conferences
Minutes of Meetings
Subcommittee on High-Speed Aerodynamics
Committee on Advanced Study
Ad Hoc Panel on Long-Range Air-To-Air Guided Missiles
Draper Committee
DoD Technical Advisory Panel on Aerodynamics, Ad Hoc Group on Water-Based Aircraft

Section No. 4: Memos and Correspondence

Henry J. E. Reid's Trip to Europe, 1944
Developments in High-Speed Aeronautics During World War II
Riparbelli Report
Letters from Coleman Dupont Donaldson on German Scientists at Wright Field, 1946
Bell Telephone Lab
Personal Correspondence
Memos for Associate Director
Letters Between Professor Carlo Ferrari, University of Turin, and Antonio Ferri, NACA, 1947-1948
Memos on Airfoils
Memo from Hartley Soule, 1948
Memos for Files
Miscellaneous Correspondence

Section No. 5: Aircraft Development Projects

North American P-51
High-Speed Bomber Program, 1945
Supersonic Airplane

Project 506
Water-Based Aircraft
Republic P-47B
B-35 Elevon
Propeller for Spitfire 21
XP-69 Horizontal Tail
Eagle
Republic Aviation Corporation 5-Year Plan
Supersonic Transport (SST)
Ground Effects Machines
V/STOL
Mutual Weapons Defense Program (MWDP)
TFX Development

Section No. 6: Miscellaneous

Miscellaneous Photographs
Blueprint Drawings
"Stack's Stuff:" Miscellaneous

The Floyd L. Thompson Technical Library

What also makes Langley Research Center an outstanding location for research in aeronautical history is the Floyd L. Thompson Technical Library. Besides holding major collections (more than 3.8 million volumes) in the physical sciences and engineering—with emphasis on aerospace science and technology, aeronautics, structures, materials, acoustics, energy, electronics, and the environment, supported by additional collections in physics, chemistry, mathematics, and management—the library also preserves the complete NACA publications series of 16,263 reports in 1,057 bound and 1,818 unbound volumes—including Technical Reports (TRs), Technical Notes (TNs), Technical Memorandums (TMs), Wartime Reports (WRs), Aircraft Circulars (ACs), Research Memorandums (RMs), Advance Confidential Reports (ACRs), Advance Restricted Reports (ARRs), Confidential Bulletins (CBs), Restricted Bulletins (RBs), and Memorandum Reports (MRs). [For an analysis of the NACA publications series, see Alex Roland, *Model Research: The National Advisory Committee for Aeronautics, 1915-1958*, NASA SP-4103 (Washington, DC. 1985), appendix 7].

What gives the library its unparalleled value as a place for historical research is the fact that its staff maintains the same index to aeronautical literature that was begun by the NACA in the 1920s. Cards reference tens of thousands of aeronautical papers from all over the world by subject, author, title, and, in the case of NACA reports and research authorizations, by number. Many of these papers are unpublished or classified. This makes the NACA card file one of this country's most treasured guides to aeronautical literature. Langley's file is all the more precious because it is the only set in existence.

The library is accredited and open to the public.

Photographic Collection

Langley's NACA collection of photographs (housed separately from the library) comprises roughly 100,000 negatives, all logged by date and by subject. The current NASA collection exceeds 300,000. The motion-picture film collection is also extensive, with a subject card file to this motion-picture collection.

APPENDIX I

NASA History Publications

Most publications of the NASA History Office appear in the Special Publications (SP-4000) series and are classified in one of two categories: narrative histories, or reference works. Publications and works in progress are listed below. Books may be bought from the Superintendent of Documents, Government Printing Office, Washington, DC 20402, or, when out of print, in photocopy from the National Technical Information Service, Springfield, VA 22161. The bookstore in the National Air and Space Museum stocks many of the titles, and recent publications are available for purchase from the Information Center, NASA, Washington, DC 20546. The Information Center makes no charge for postage. Depository libraries may receive publications as they appear by asking the GPO for NAS 1.21: NASA SP-4000 830-I. Other libraries may receive them directly from NASA; write Director, NASA History Office, Washington, DC 20546. Books in the NASA History Series are cataloged in publication by the Library of Congress.

Publications

Histories

Anderson, Frank W., Jr., *Orders of Magnitude: A History of NACA* and NASA, 1915-1980 (NASA SP-4403, 2d ed., 1981), ix + 106 pp.)

Benson, Charles D., and William Barnaby Faherty, *Moonport: A History of Apollo Launch Facilities and Operations* (NASA SP-4204, 1978, xx + 636 pp.)

Bilstein, Roger E., *Stages to Saturn: A Technological History of the Apollo/*SATURN LAUNCH VEHICLES (NASA SP-4206, 1980, xx + 511 pp.)

Boone, W. Fred, *NASA Office of Defense Affairs: The First Five Years* (NASA HHR-32, 1970, multilith, viii + 333 pp.)

Brooks, Courtney G., James M. Grimwood, and Loyd S. Swenson, Jr., *Chariots for Apollo: A History of Manned Lunar Spacecraft* (NASA SP-4205, 1979, xvii + 538 pp.)

Byers, Bruce K., *Destination Moon: A History of the Lunar Orbiter Program* (NASA TM X-3487, 1977, multilith, vi + 411 pp.)

Compton, W. David, and Charles D. Benson, *Living and Working in Space: A History of Skylab* (NASA SP-4208, 1983, xiii + 449 pp.)

Corliss, William R., *Histories of the Space Tracking and Data Acquisition Network (STADAN), the Manned Space Flight Network (MSFN), and the NASA Communications Network (NASCOM)* (NASA CR-140390, 1974, multilith, viii + 353 pp.)

____, *A History of the Deep Space Network* (NASA CR-151915, 1976, multilith, ix + 229 pp.)

____, *NASA Sounding Rockets, 1958-1968: A Historical Summary* (NASA SP-4401, 1971, vii + 158 pp.)

Ezell, Edward Clinton, and Linda Neuman Ezell, *On Mars: Exploration of the Red Planet, 1958-1978* (NASA SP-4212, 1984, xvi + 535 pp.)

—, *The Partnership: A History of the Apollo-Soyuz Test Project* (NASA SP-4209, 1978, xx + 560 pp.)

Green, Constance McL., and Milton Lomask, *Vanguard: A History* (NASA SP-4202, 1970, xvi + 308 pp; also Washington: Smithsonian Institution Press, 1971)

Hacker, Barton C., and James M. Grimwood, *On the Shoulders of Titans: A History of Project Gemini* (NASA SP-4203, 1977, xx + 625 pp.)

Hall, R. Cargill, *Lunar Impact: A History of Project Ranger* (NASA SP-4210, 1977, xvii + 450 pp.)

Hallion, Richard P., *On the Frontier: Flight Research at Dryden, 1946-1981* (NASA SP-4303, 1984, xix + 385 pp.)

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APPENDIX J

Standard Form 135

All NASA records are inventoried and retired on Standard Form 135, "Records Transmittal and Receipt." (See NHB 1441.1A, the "NASA Records Disposition Handbook," for detailed information on completing this form.) The following blocks on the form are of particular interest to researchers:

Item 1	Federal Records Center where the materials are housed
Items 2	Agency official responsible for retiring records to FRC
Items 3	Recall of the records must be made through, or with the permission of, this office
Item 6	
(a) (b) and (c)	The accession number is the principal identification of the records.
(d)	Number of FRC boxes, one box equaling one cubic foot
(f)	This is the inventory. Quality and completeness vary greatly from office to office. In some cases additional information will be found appended to the form.
(g)	The highest security classification of any item in the accession. Not all the records are classified at that level.
(h) and (i)	Tells if and when the records are to be destroyed

RECORDS TRANSMITTAL AND RECEIPT

Complete and send original and two copies of this form to the appropriate Federal Records Center for approval prior to shipment of records. See specific instructions on reverse.

PAGE 1 OF PAGES

1. TO (*Complete the address for the records center serving your area as shown in 36 CFR 1228.150.*)

Federal Records Center

5. FROM (*Enter the name and complete mailing address of the office retiring the records. The signed receipt of this form will be sent to this address*)

2. AGENCY TRANSFER AUTHORIZATION	TRANSFERRING AGENCY OFFICIAL (*Signature and title*)	DATE
3. AGENCY CONTACT	TRANSFERRING AGENCY LIAISON OFFICIAL (*Name, office and telephone No.*)	
4. RECORDS CENTER RECEIPT	RECORDS RECEIVED BY (*Signature and title*)	DATE

Fold Line ◀

6. **RECORDS DATA**

ACCESSION NUMBER			VOLUME (*cu. ft.*)	AGENCY BOX NUMBERS	SERIES DESCRIPTION (*With inclusive dates of records*)	RESTRICTION	DISPOSAL AUTHORITY (*Schedule and item number*)	DISPOSAL DATE	COMPLETED BY RECORDS CENTER			
RG	FY	NUMBER							LOCATION	SHELF PLAN	CONT. TYPE	AUTO. DISP.
(*a*)	(*b*)	(*c*)	(*d*)	(*e*)	(*f*)	(*g*)	(*h*)	(*i*)	(*j*)	(*k*)	(*l*)	(*m*)

57

APPENDIX K

Optional Form 11

NASA retired records are retrieved from the Federal Records Center using Optional Form 11. NHB 1441.1A, the "NASA Records Disposition Handbook," Part IV, provides detailed instructions on completing this form. Historical researchers will want to pay particular attention to the following:

NASA's record group is 255.

The accession number is obtained from the SF 135 (see App. J).

FRC box number or location may be obtained in the Records Management Office. While not required, the number will facilitate the handling of your request.

Under "Description of Records . . . ," put "ALL" if an entire box is desired. Otherwise identify the particular file or folder completely.

Under "Remarks," enter: Access to records is approved by (appropriate person's name and phone number).

Allow two weeks for delivery from Washington National Records Center to NASA Headquarters. Delivery time to centers varies.

APPENDIX L

NASA Center, and Federal Archives and Records Centers Contacts

Addresses and phone numbers of NASA field centers and of Federal Archives and Records Centers (FARC) are given below. FARCs are described in *A Records Management Handbook: Federal Archives and Records Centers* (Washington: Office of Federal Records Centers, National Archives and Records Service, General Services Administration, 1979). FTS, the Federal Telecommunications System, may be used by NASA employees and contractors when making official long-distance telephone calls. All other calls must be made to the commercial numbers.

Ames Research Center (ARC)
Moffett Field, CA 94035
Commercial: (415) 694-5000
FTS: 8-464-5000

Dryden Flight Research Facility
P.O. Box 273
Edwards, CA 93523
Comm: (805) 258-3311
FTS: 8-961-3311

Goddard Space Flight Center (GSFC)
Greenbelt, MD 20771
Comm: (301) 344-7000
FTS: 8-344-7000

Jet Propulsion Laboratory (JPL)
4800 Oak Grove Drive
Pasadena, CA 91109
FTS: 8-792-4321

Johnson Space Centers (JSC)
Houston, TX 77058
Comm: (818) 354-4321
FTS: 8-525-3111

Kennedy Space Center (KSC)
Florida 32899
Comm: (305) 867-7110
FTS: 8-823-7110

Langley Research Center (LaRC)
Hampton, VA 23665
Comm: (804) 865-2000
FTS: 8-928-2000

FARC, San Francisco
1000 Commodore Dr.
San Bruno, CA 94066
(415) 876-9003

FARC, Los Angeles
24000 Avila Road
Laguna Niguel, CA 92677
(741) 831-4421

FARC, Washington
4205 Suitland Rd.
Suitland, MD 20409
(301) 763-7000

FARC, Los Angeles
24000 Avila Road
Laguna Niguel, CA 92677

FARC, Fort Worth
Box 6216
Fort Worth, TX 76115
(817) 334-5515

FARC, Atlanta
1557 St. Joseph Ave.
East Point, GA 30334
(404) 526-74740

FARC, Washington
4205 Suitland Rd.
Suitland, MD 20409

Lewis Research Center (LeRC)
21000 Brookpark Road
Cleveland, OH 44135
Comm: (216) 433-4000
FTS: 8-297-6000

Marshall Space Flight Center (MSFC)
Huntsville, AL 35812
Comm: (205) 453-2121
FTS: 8-872-2121

Wallops Flight Facility (WFF)
Wallops Island, VA 23337
Comm: (804) 824-4311
FTS: 8-928-5711

White Sands Test Facility (JSC/WS)
P.O. Drawer MM
Las Cruces, NM 88004
Comm: (505) 524-5011
FTS: 8-572-5011

FARC, Chicago (through 1971)
7358 S. Pulaski Rd.
Chicago, IL 60629
(312) 353-8541

FARC, Dayton (from 1972)
3150 Springboro Rd.
Dayton, OH 45439
(513) 225-2852

FARC, Atlanta
1557 St. Joseph Ave.
East Point, GA 30334
(404) 526-7474

FARC, Washington
4205 Suitland Rd.
Suitland, MD 20409

FARC, Denver
Bldg. 48
Denver Federal Center
Denver, CO 80225
(303) 234-5271

APPENDIX M

NASA History Advisory Committee
(past and current members)

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Raymond Bisplinghoff
Daniel J. Boorstin
David Bushnell
James Lea Cate
Earl DeLong
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Sally G. Kohlstedt
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Thomas K. McCraw
Marvin W. McFarland
Everett I. Mendelsohn
Elting E. Morison
Louis Morton
Robert P. Multauf
Arthur L. Norberg
Rodman Paul
Robert L. Perry
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