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EXPLORING THE UNKNOWN

*Selected Documents in the History of the
U.S. Civilian Space Program
Volume II: External Relationships*

John M. Logsdon, Editor
with Dwayne A. Day and Roger D. Launius

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*To the Memory of T. Keith Glennan (1905–1995),
James E. Webb (1906–1992),
and Hugh L. Dryden (1898–1965)*

Whose Early Vision of External Relationships
Helped Shape the Direction of Space Exploration

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Acknowledgments

This volume is the second in a series that had its origins almost a decade ago. The initial idea for creating a set of reference works that would include documents seminal to the evolution of the U.S. civilian space program came from then-NASA Chief Historian Sylvia K. Kraemer. She recognized that while there were substantial primary resources for future historians and others interested in the early years and evolution of the U.S. civilian space program available in many archives, and particularly in the NASA Historical Reference Collection of the History Office at NASA Headquarters in Washington, D.C., this material was widely scattered and contained a mixture of the significant and the routine. It was her sense that it was important to bring together the “best” of this documentary material in a widely accessible form. The several volumes of this collection, and any long-term value it may have, are the result of that vision. Once Dr. Kraemer left her position as NASA Chief Historian in 1990 to assume broader responsibilities within the agency, the project was guided with a gentle but firm hand by her successor, Roger D. Launius. His contributions have been so substantial that he fully deserves being listed as one of the primary collaborators on this volume.

Jannelle Warren-Findley, an independent intellectual/cultural historian, and Linda J. Lear, an adjunct professor of environmental history at George Washington University, approached the Space Policy Institute of George Washington University’s Elliott School of International Affairs with the suggestion that it might serve as the institutional base for a proposal to NASA to undertake the documentary history project. This suggestion found a positive response. The Space Policy Institute was created in 1987 as a center of scholarly research and graduate education regarding space issues—and as a resource for those interested in a knowledgeable but independent perspective on past and current space activities. Having the kind of historical base that would have to be created to carry out the documentary history project would certainly enhance the Space Policy Institute’s capabilities, and so the Director of the Institute, John M. Logsdon, joined with Warren-Findley, Lear, and Ray A. Williamson of the congressional Office of Technology Assessment in preparing a proposal to NASA. Much to our delight, we were awarded the contract for the project in late 1988, and the enterprise was officially under way in May 1989.

The undertaking proved more challenging than anyone had anticipated. The combination of getting ourselves started in the right direction, canvassing and selecting from the immense documentary resources available, commissioning essays to introduce the various sections of the work from external authors and writing several essays ourselves, and dealing with conflicting demands on the time of the four principals in the project has led to a delay in publishing the initial volume far beyond what we anticipated when first undertaking the project. The final pieces of the manuscript for Volume I were not delivered to NASA until the end of 1993, and the published volume itself did not appear until late 1995. By that time, both Jannelle Warren-Findley and Linda Lear had long ago moved on to the next steps in their careers, and Ray Williamson, who had taken a nine-month leave from the Office of Technology Assessment in 1990 to work on the project, had returned to his primary job. (However, after the Office of Technology Assessment in 1995 was closed by congressional decision, he returned to the staff of the Space Policy Institute, and he will be deeply involved in preparing subsequent volumes in this series.) This meant that Warren-Findley and Lear did not have the opportunity to make the kinds of contribution to the overall series that they had anticipated; nevertheless, without their initiative, the effort would not have been located at George Washington University, and they both

made crucial contributions to conceptualizing and organizing the work in its early stages and to gathering the material from which the documents to be included in the collection have been selected. For all of that, they deserve high credit.

In its start-up phase, the project profited from the advice of a distinguished advisory panel that met twice formally; members of the panel were always available for individual consultation. Included on this panel were: Carroll W. Pursell, Jr., Case Western University (chair); Charlene Bickford, First Congress Project; Herbert Friedman, Naval Research Laboratory; Richard P. Hallion, Air Force Historian; John Hodge, NASA (retired); Sally Gregory Kohlstedt, University of Minnesota; W. Henry Lambright, Syracuse University; Sharon Thibodeau, National Archives and Records Administration; and John Townsend, NASA (retired). Certainly, none of these individuals bear responsibility for the final content or style of this series, but their advice along the way was invaluable.

We owe thanks to the individuals and organizations that have searched their files for potentially useful materials, as well as to the staffs at various archives and collections who have helped us locate documents. Without question, first among them is Lee D. Saegesser of the History Office at NASA Headquarters, who has helped compile the NASA Historical Reference Collection that contains many of the documents selected for inclusion in this work. All those who in the future will write on the history of the U.S. space program will owe a debt of thanks to Lee; those who have already worked in this area realize his tireless contributions.

Among those who have been particularly helpful in identifying documents for inclusion in this volume are: Lorenza Sebesta, European Space Agency History Project, European University Institute; R. Cargill Hall, Air Force History Office; Mark Erikson, Air Force Academy; Roy Houchin, Air Staff History Office; and Bill Burr, National Security Archive. L. Parker Temple III and Charles Cook deserve particular thanks for their work on an earlier overview of civil-military relations that served as a basis for the essay by Dwayne A. Day that appears in this volume.

Essential to the project was a system for archiving the documents collected. Charlene Bickford, on the basis of her experience with the First Congress Project, advised on our approach to archiving and to developing document headnotes. The archiving system was developed by graduate student John Morris, who also assisted with initial document collection. The documentary archive has been nurtured with fervor by Space Policy Institute research associate Dwayne Day; Dwayne has made many major contributions to all aspects of the project, including the essay on NASA-Department of Defense relations in this volume. Other students who worked on the project in its early years include Max Nelson, Jordan Katz, Stewart Money, Michelle Heskett, Robin Auger, and Heather Young. All were a great help.

Beginning with Linda Lear, a series of individuals struggled to bring editorial consistency to the essays and headnotes introducing the documents included in Volume I, thereby setting the standard for that and subsequent volumes. They included Erica Aungst, Kathie Pett Keel, and Kimberly Carter. Their contributions were essential to the lasting quality of the end product. Alita Black also helped set up the initial indexing system.

John M. Logsdon, George Washington University

There are numerous people at NASA associated with historical study, technical information, and the mechanics of publishing who helped in myriad ways in the preparation of this documentary history. J.D. Hunley, of the NASA History Office, edited and critiqued the text before he departed to take over the History Program at the Dryden Flight Research Center; his replacement, Stephen J. Garber, prepared the biographical appendix and helped in the final proofing of the work. Nadine Andreassen of the NASA History Office performed editorial and proofreading work on the project; the staffs of the NASA Headquarters Library, the Scientific and Technical Information Program, and the NASA Document Services Center provided assistance in locating and preparing for publication the documentary materials in this work. The NASA Headquarters Communications Management Division, under the leadership of Y. Diane Powell, developed the layout and handled printing. Specifically, we wish to acknowledge the work of Jane E. Penn, Patricia Lutkenhouse Talbert, Jonathan L. Friedman, and Kelly L. Rindfusz for their design and editorial work. In addition, Michael Crnkovic and Craig A. Larsen saw the book through the publication process. Thanks are due to all of them.

Roger D. Launius, NASA

Introduction

One of the most important developments of the twentieth century has been the movement of humanity into space with machines and people. The underpinnings of that movement—why it took the shape it did; which individuals and organizations were involved; what factors drove a particular choice of scientific objectives and technologies to be used; and the political, economic, managerial, and international contexts in which the events of the space age unfolded—are all important ingredients of this epoch transition from an Earth-bound to a spacefaring people. The desire to understand the development of spaceflight in the United States sparked this documentary history series.

The extension of human activity into outer space has been accompanied by a high degree of self-awareness of its historical significance. Few large-scale activities have been as extensively chronicled so closely to the time they actually occurred. Many of those who were directly involved were quite conscious that they were making history, and they kept full records of their activities. Because most of the activity in outer space was carried out under government sponsorship, it was accompanied by the documentary record required of public institutions, and there has been a spate of official and privately written histories of most major aspects of space achievement to date. When top leaders considered what course of action to pursue in space, their deliberations and decisions often were carefully put on the record. There is, accordingly, no lack of material for those who aspire to understand the origins and evolution of U.S. space policies and programs.

This reality forms the rationale for this series. Precisely because there is so much historical material available on space matters, the National Aeronautics and Space Administration (NASA) decided in 1988 that it would be extremely useful to have a selective collection of many of the seminal documents related to the evolution of the U.S. civilian space program that was easily available to scholars and the interested public. While recognizing that much of the space activity has taken place under the sponsorship of the Department of Defense and other national security organizations, for the U.S. private sector, and in other countries around the world, NASA felt that there would be lasting value in a collection of documentary material primarily focused on the evolution of the U.S. government's civilian space program. Most of this activity has been carried out under the NASA's auspices since its creation in 1958. As a result, the NASA History Office contracted with the Space Policy Institute of George Washington University's Elliott School of International Affairs to prepare such a collection. This is the second volume in the documentary history series; at least two additional ones detailing programmatic developments will follow.

The documents collected during this research project were assembled from a diverse number of both public and private sources. A major repository of primary source materials relative to the history of the civilian space program is the NASA Historical Reference Collection of the NASA History Office, located at the agency's headquarters in Washington, D.C. Project assistants combed this collection for the "cream" of the wealth of material housed there. Indeed, one purpose of this series from the start was to capture some of the highlights of the holdings at headquarters. Historical materials housed at the other NASA installations—as well as at institutions of higher learning, such as Rice University, Rensselaer Polytechnic Institute, and Virginia Polytechnic Institute and State University (Virginia Tech)—were also "mined" for their most significant materials. Other collections from which documents have been drawn include the Eisenhower, Kennedy, Johnson, and Carter Presidential Libraries; the papers of T. Keith Glennan, Thomas O.

Paine, James C. Fletcher, George M. Low, and John A. Simpson; and the archives of the National Academy of Sciences, the Rand Corporation, AT&T, the Communications Satellite Corporation, INTELSAT, the Jet Propulsion Laboratory of the California Institute of Technology, and the National Archives and Records Administration.

Copies of more than 2,000 documents in their original form collected during this project (not just the documents selected for inclusion), as well as a database that provides a guide to their contents, will be deposited in the NASA Historical Reference Collection. Another complete set of project materials is located at the Space Policy Institute at George Washington University. These materials in their original form are available for use by researchers seeking additional information about the evolution of the U.S. civilian space program or wishing to consult the documents reprinted herein in their original form.

The documents selected for inclusion in this volume are presented in three chapters, each covering a particular aspect of the evolution of U.S. space exploration. These chapters address (1) the relations between the civilian space program of the United States and the space activities of other countries, (2) the relations between the U.S. civilian space program and the space efforts of national security organizations and the military, and (3) NASA's relations with industry and academic institutions. Volume I of this series covered the antecedents to the U.S. space program, the origins and evolution of U.S. space policy, and NASA as an organizational institution. Future volumes will address space science activities, space application programs, human spaceflight, and space transportation activities.

Each chapter in this volume is introduced by an overview essay, prepared either by a member of the project team or by an individual particularly well-qualified to write on the topic. In the main, these essays are intended to introduce and complement the documents in the section and to place them in a chronological and substantive context. In certain instances, the essays go beyond this basic goal to reinterpret specific aspects of the history of the civilian space program and to offer historiographical commentary or inquiry about the space program. Each essay contains references to the documents in the section it introduces, and many also contain references to documents in other sections of the collection. These introductory essays were the responsibility of their individual authors, and the views and conclusions contained therein do not necessarily represent the opinions of either George Washington University or NASA.

The documents appended to each chapter were chosen by the essay writer in concert with the project team from the more than 2,000 assembled by the research staff for the overall project. The contents of this volume emphasize primary documents or long-out-of-print essays or articles and material from the private recollections of important actors in shaping space affairs. The contents of this volume thus do not comprise in themselves a comprehensive historical account; they must be supplemented by other sources, those both already available and to become available in the future. Indeed, a few of the documents included in this collection, particularly in the chapter on civilian-military relations, are not complete; some portions of them were still subject to security classification. As this collection was being prepared, the U.S. government was involved in declassifying and releasing to the public a number of formerly highly classified documents. As this declassification process continues, increasingly more information on the early history of NASA and the civilian space program will come to light.

The documents included in each chapter are for the most part arranged chronologically, although some thematic organization is used when appropriate. Each document is

assigned its own number in terms of the chapter in which it is placed. As a result, the first document in the third chapter of this volume is designated "Document III-1." Each document is accompanied by a headnote setting out its context and providing a background narrative. These headnotes also provide specific information about the people and events discussed. We have avoided the inclusion of explanatory notes in the documents themselves and have confined such material to the headnotes.

The editorial method we adopted for dealing with these documents seeks to preserve spelling, grammar, paragraphing, and use of language as in the original. We have sometimes changed punctuation where it enhances readability. We have used ellipses to note sections of a document not included in this publication, and we have avoided including words and phrases that had been deleted in the original document unless they contribute to an understanding of what was going on in the mind of the writer in making the record. Marginal notations on the original documents are inserted into the text of the documents in brackets, each clearly marked as a marginal comment. When deletions to the original document have been made in the process of declassification, we have noted this with a parenthetical statement in brackets. Except insofar as illustrations and figures are necessary to understanding the text, those items have been omitted from this printed version. Page numbers in the original document are noted in brackets internal to the document text. Copies of all documents in their original form, however, are available for research by anyone interested at the NASA History Office or the Space Policy Institute of George Washington University.

We recognize that there are significant documents left out of this compilation. No two individuals would totally agree on all documents to be included from the more than 2,000 that we collected, and surely we have not been totally successful in locating all relevant records. As a result, this documentary history can raise an immediate question from its users: Why were some documents included while others of seemingly equal importance were omitted? There can never be a fully satisfactory answer to this question. Our own criteria for choosing particular documents and omitting others rested on three interrelated factors:

- Is the document the best available, most expressive, most representative reflection of a particular event or development important to the evolution of the space program?
- Is the document not easily accessible except in one or a few locations, or is it included (for example, in published compilations of presidential statements) in reference sources that are widely available and thus not a candidate for inclusion in this collection?
- Is the document protected by copyright, security classification, or some other form of proprietary right and thus unavailable for publication?

As editor of this volume, I was ultimately responsible for the decisions about which documents to include and for the accuracy of the headnotes accompanying them. It has been an occasionally frustrating but consistently exciting experience to be involved with this undertaking. My associates and I hope that those who consult it in the future will find our efforts worthwhile.

John M. Logsdon
Director
Space Policy Institute
Elliott School of International Affairs
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Biographies of Volume II Essay Authors

Dwayne A. Day is a Guggenheim Fellow at the National Air and Space Museum of the Smithsonian Institution and a staff member of George Washington University's Space Policy Institute in Washington, D.C. He is the author of numerous articles on the development of space policy in the United States in such periodicals as *Space Policy*, *Spaceflight*, and *Quest: The Magazine of Spaceflight History*. He also was a co-editor of Volume I of *Exploring the Unknown*.

W. Henry Lambright is professor of political science and public administration at the Maxwell School at Syracuse University in Syracuse, New York. A premier scholar of the management of high technology in the federal government, he is the author of *Governing Science and Technology* (Oxford University Press, 1976), *Shooting Down the Nuclear Plane* (Bobbs-Merrill, 1976), *Technology Transfer to Cities* (Westview Press, 1979), *Presidential Management of Science and Technology: The Johnson Presidency* (University of Texas Press, 1985), and *Powering Apollo: James E. Webb of NASA* (Johns Hopkins University Press, 1995).

John M. Logsdon is Director of both the Center for International Science and Technology Policy and the Space Policy Institute of George Washington University's Elliott School of International Affairs, where he is also a professor of political science and international affairs. He holds a B.S. in physics from Xavier University and a Ph.D. in political science from New York University. He has been at George Washington University since 1970; he previously taught at The Catholic University of America. Dr. Logsdon's research interests include space policy, the history of the U.S. space program, the structure and process of government decision-making for research and development programs, and international science and technology policy. He is author of *The Decision to Go to the Moon: Project Apollo and the National Interest* (MIT Press, 1970) and has written numerous articles and reports on space policy and science and technology policy. In January 1992, Dr. Logsdon was appointed to Vice President Dan Quayle's Space Policy Advisory Board and served through January 1993. He is a member of the International Academy of Astronautics, of the Board of Advisors of The Planetary Society, of the Board of Directors of the National Space Society, and of the Aeronautics and Space Engineering Board of the National Research Council. In past years, he was a member of the National Academy of Sciences's National Academy of Engineering Committee on Space Policy and the National Research Council Committee on a Commercially Developed Space Facility, NASA's Space and Earth Science Advisory Committee and History Advisory Committee, and the Research Advisory Committee of the National Air and Space Museum. He also is a former chair of the Committee on Science and Public Policy of the American Association for the Advancement of Science (AAAS) and of the Education Committee of the International Astronautical Federation. He is a fellow of the AAAS and the Explorers Club and an associate fellow of the American Institute of Aeronautics and Astronautics. In addition, he is North American editor for the journal *Space Policy*.

Glossary

AA	Associate Administrator
AACB	Aeronautics and Astronautics Coordinating Board
AAS	American Astronomical Society
ABA	American Bar Association
ABMA	Army Ballistic Missile Agency
ACD	Architectural Control Document
AD/DA	Deputy Administrator
ADCA	Arms Control and Disarmament Agency
ACJP	Air Corps Jet Propulsion
AEC	Atomic Energy Commission
AEDC	Arnold Engineering Development Center
AF	Air Force
AFB	Air Force Base
AFBMD	Air Force Ballistic Missile Division
AFSC	Air Force Space Center
AIAA	American Institute of Aeronautics and Astronautics
AM	amplitude modulation
AMC	Air Materiel Command
AMR	Atlantic Missile Range
AO	Announcement of Opportunity
AOMC	Army Ordnance Missile Command
APM	Attached Pressurized Module
ARDC	Air Research and Development Command
ARPA	Advanced Research Projects Agency
ASEE	American Society of Electrical Engineers
ASPA	Armed Services Procurement Act (of 1947)
ASPR	Armed Services Procurement Regulation
ASTP	Advanced Space Technology Program <i>or</i> Apollo-Soyuz Test Project
ATS	Applications Technology Satellite
AU	astronomical unit
BCD	Baseline Configuration Document
Caltech	California Institute of Technology
CCIR	Comite Consultatif International des Radiocommunications (International Radio Consultive Committee)
CCSDS	Consultative Committee for Space Data Systems
CCZ	Command and Control Zone
CG	commanding general
CIA	Central Intelligence Agency
CIT	California Institute of Technology
CNES	Centre Nationale des Etudes Spatiales (French Space Agency)
COBE	Cosmic Background Explorer
COP	Composite Operations Plan
COPUOS	Committee on the Peaceful Uses of Outer Space (United Nations)
COSPAR	Committee on Space Research
COUP	Consolidated Operations and Utilization Plan
CRAF	Civil Reserve Air Fleet

CSM	.Command and Service Module
CSOC	.Consolidated Space Operations Center
CSTI	.Civil Space Technology Initiative
CUP	.Composite Utilization Plan
CY	.calendar year
DD	.Defense Directive
DDE	.Dwight D. Eisenhower
DDTE	.design, development, test, and evaluation
DEW	.Defense Early Warning (Line)
DMSP	.Defense Meteorological Satellite Program
DOD/DoD	.Department of Defense
DOT	.Department of Transportation
DSOC	.Defense Space Operations Committee
ECS	.Environment Control System
EDRS	.ESA's Data Relay Satellite (system)
EDT	.Eastern Daylight Time
ELDO	.European Launcher Development Organization
ELV	.Expendable Launch Vehicle
EML	.European Microgravity Laboratory
E.O./EO	.Executive Order
EOM	.end of mission
EOS	.earth orbital shuttle
ESA	.European Space Agency
ESC	.European Space Conference
ESF	.European Space Foundation
ESRO	.European Space Research Organization
ESTEC	.European Space & Technology Centre
ET	.External Tank
ETR	.Eastern Test Range
EVA	.extravehicular activity
FCDA	.Federal Civil Defense Authority
FPR	.Federal Procurement Regulations
F.R.	.Federal Register
FSE	.flight support equipment
FTS	.Flight Telerobotic System
FY	.fiscal year
GALCIT	.Guggenheim Aeronautical Laboratory at the California Institute of Technology
GAO	.General Accounting Office
GEO	.geosynchronous equatorial orbit
GLOW	.gross liftoff weight
GMS	.Geostationary Meteorological Satellite
GNP	.gross national product
GOES	.Geostationary Operational Environmental Satellite
GOJ	.Government of Japan
GPS	.Global Positioning System
GRO	.Gamma Ray Observatory
GSA	.General Services Administration
GSE	.ground support equipment
GSFC	.Goddard Space Flight Center

HEAO	.High Energy Astronomy Observatory
H.R.	.House Resolution
HQ	.headquarters
HUD	.(Department of) Housing and Urban Development
ICBM	.intercontinental ballistic missile
ICD	.Interface Control Document
ICSU	.International Council of Scientific Unions
IEWG	.International Evolution Working Group
IGY	.International Geophysical Year
IMP	.Interplanetary Monitoring Platform
INMARSAT	.International Mobil (formerly Maritime) Satellite (organization)
INTELSAT	.International Telecommunications Satellite (consortium)
IOCWG	.International Operational Concepts Working Group
IP	.Increment Plan
IPL	.integrated payload
IRAS	.Infrared Astronomical Satellite
IRBM	.intermediate range missile
ISAS	.Institute of Space and Astronautical Science (Japan)
ISEE	.International Society of Electrical Engineers
ISO	.Infrared Space Observatory
ISPM	.International Solar Polar Mission
ITL	.Integrate-Transfer-Launch (complex)
ITU	.International Telecommunications Union
IUCWG	.International Utilization Coordination Working Group
IUE	.International Ultraviolet Explorer
IUS	.Interim <i>or</i> Inertial Upper Stage
IVA	.intravehicular activity
JATO	.jet-assisted takeoff
JCS	.Joint Chiefs of Staff
JEM	.Japanese Experiment Module
JPDRD	.Joint Program Definition and Requirements Document
JPL	.Jet Propulsion Laboratory
JPP	.Joint Program Plan
JPRD	.Joint Program Requirements Document
JSC	.Johnson Space Center
JWG	.joint working group
KSC	.Kennedy Space Center
KW	.kilowatt
LEM	.Lunar Excursion Module
LH	.liquid hydrogen
LLVPG	.Large Launch Vehicle Planning Group
LM	.Lunar Module
LOX	.liquid oxygen
LPMB	.Lunar and Planetary Missions Board
LST	.Large Space Telescope
MCB	.Multilateral Coordination Board
MCC	.Mission Control Center
MGCO	.Mars Geoscience-Climatology Orbiter
MIT	.Massachusetts Institute of Technology
MMD	.MSC Maintenance Depot

MOA	.memorandum of agreement
MODS	.Manned Orbital Development System
MOL	.Manned Orbital Laboratory
MORL	.Manned Orbital Research Laboratory
MOSST	.Ministry of State for Science and Technology (Canada)
MOU	.memorandum of understanding
MOUSE	.Minimum Orbital Unmanned Satellite of the Earth
MRB	.Material Review Board
MRS	.Mobile Remote Servicer
MSC	.Manned Spacecraft Center <i>or</i> Mobile Servicing Center
MSFC	.Marshall Space Flight Center
MSFEB	.Manned Space Flight Experiments Board
MSTS	.Military Sea Transportation Service (Navy)
MTF	.Mississippi Test Facility
MTFF	.Man-Tended Free Flyer
NAA	.North American Aviation
NACA	.National Advisory Committee for Aeronautics
NAS	.National Academy of Sciences
NASA	.National Aeronautics and Space Administration
NASC	.National Aeronautics and Space Council
NATO	.North Atlantic Treaty Organization
nm	.nautical mile
NIH	.National Institutes of Health
NMI	.NASA Management Instruction
NOAA	.National Oceanic and Atmospheric Administration
NORAD	.North American Air Defense
NOSS	.National Oceanic Satellite System
NRC	.National Research Council
NSC	.National Security Council
NSD	.National Security Directive
NSDD	.National Security Decision Directive
NSDM	.National Security Decision Memorandum
NSF	.National Science Foundation
NSPD	.National Space Policy Directive
NSSD	.National Security Study Directive
NSSM	.National Security Study Memorandum
OAO	.Orbiting Astronomical Observatories
OART	.Office of Aeronautical Research and Technology (NASA)
OMB	.Office of Management and Budget
OMS	.Orbital Maneuvering System
OMSF	.Office of Manned Space Flight (NASA)
ONR	.Office of Naval Research
OOS	.orbit-to-orbit shuttle
OSD	.Office of the Secretary of Defense
OSFP	.Office of Space Flight Programs (NASA)
OSS	.Office of Space Science (NASA)
OSSA	.Office of Space Science and Applications (NASA)
OSTP	.Office of Science and Technology Policy (White House)
PCC	.Program Coordination Committee
PDRD	.Program Definition and Requirements Document
PMR	.Pacific Missile Range

POICPayload Operations Integration Center
 PRDProgram Requirements Document
 PSACPresident's Science Advisory Committee
 PVOPioneer Venus Orbiter
 R&AResearch and Applications (program)
 R&Dresearch and development
 R&E(Defense) Research and Engineering
 RAMResearch Application Module
 RCARadio Corporation of America
 RCSReaction Control System
 RFPrequest for proposals
 RMSRemote Manipulator System
 ROBOrocket bomber
 RSARussian Space Agency
 RTLSreturn to launch site
 S&IDSpace and Information Systems Division (North American
 Aviation)
 SACStrategic Air Command
 SAISpace Astronomy Institute
 SAMSOSpace and Missile Systems Organization
 SCAShuttle Carrier Aircraft
 SCFShuttle Carrier Flight
 SETScience, Engineering, and Technology (OMB division)
 SIGSenior Interagency Group (Space)
 SIRTFShuttle Infrared Telescope Facility
 SITESatellite Instructional Television Experiment
 SLSpacelab
 SOHOSolar and Heliospheric Observatory Satellite
 SOPSystem Operations Panel
 SPSpecial Publication
 SPDMSpecial Purpose Dexterous Manipulator
 SRBSolid Rocket Booster
 SSCBSpace Station Control Board
 SSCCSpace Station Control Center
 SSESoftware Support Environment
 SSISSpace Station Information System
 SSMESpace Shuttle Main Engine
 SSUSSpinning Solid Upper Stage
 STSpace Telescope
 STAScience and Technology Agency (Japan)
 STOCCSpace Telescope Operations and Control Center
 STOLshort takeoff and landing
 STSSpace Transportation System
 SYGsecretary general
 T&DATraining and Data Acquisition (NASA)
 TACTactical Air Command
 TACANTactical Air Navigation
 TCPTechnological Capabilities Panel
 TDRSSTracking and Data Relay Satellite System
 TDYtour of duty

TIROS	Television and Infrared Operational Satellite
TMIS	Technical Management Information System
TOP	Tactical Operations Plan
TPS	Thermal Protection System
TV	television
TVA	Tennessee Valley Authority
TWA	Trans World Airlines
UCLA	University of California at Los Angeles
UK/U.K.	United Kingdom
UN	United Nations
UOP	User Operations Panel
URA	Universities Research Association, Inc.
US/U.S.	United States
USA/U.S.A.	United States of America <i>or</i> United Space Alliance
USAF	U.S. Air Force
U.S.C.	U.S. Code
USRA	University Space Research Association
USSR/U.S.S.R.	Union of Soviet Socialist Republics
VAFB	Vandenberg Air Force Base
VHF	very high frequency
VOIR	Venus Orbiting Imaging Radar
VSIA	Vehicle System Integration Activity
VTOL	vertical takeoff and landing
WMO	World Meteorological Organization
WS	Weapons System
WSMR	White Sands Missile Range