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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

The NASA History Series



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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early years and evolution of the U.S. civilian space program available in many archives, and particularly in the NASA Historical Reference Collection of the History Office at NASA Headquarters in Washington, D.C., this material was widely scattered and contained a mixture of the significant and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.

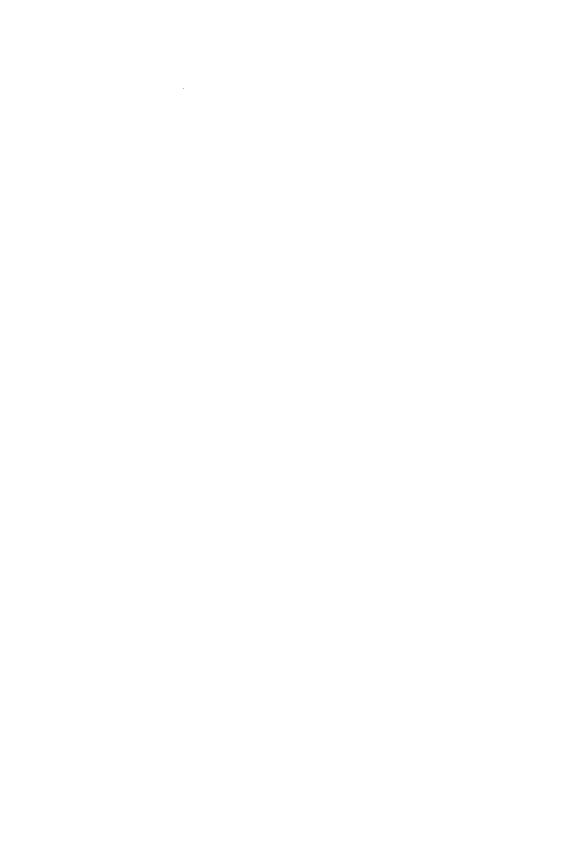
The editorial method we adopted for dealing with these documents seeks to preserve spelling, grammar, paragraphing, and use of language as in the original. We have sometimes changed punctuation where it enhances readability. We have used ellipses to note sections of a document not included in this publication, 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 George Washington University



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 Interna-tional 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

AACBAeronautics and Astronautics Coordinating Board AAS American Astronomical Society ABMA Army Ballistic Missile Agency ACD Architectural Control Document AD/DADeputy Administrator ADCA Arms Control and Disarmament Agency ACJP Air Corps Jet Propulsion AEC Atomic Energy Commission AEDCArnold Engineering Development Center AFBAir Force Base AFBMDAir Force Ballistic Missile Division AMamplitude modulation AMC Air Materiels Command AOMC Army Ordnance Missile Command APMAttached Pressurized Module ARDCAir Research and Development Command ARPAAdvanced Research Projects Agency ASPA Armed Services Procurement Act (of 1947) ASTP Advanced Space Technology Program or Apollo-Soyuz Test **Project** ATS Applications Technology Satellite AUastronomical unit (International Radio Consultive Committee) CCSDS Consultative Committee for Space Data Systems CCZCommand and Control Zone CG commanding general CIACentral Intelligence Agency CNES Centre Nationale des Etudes Spatiales (French Space Agency) COBECosmic Background Explorer Committee on the Peaceful Uses of Outer Space (United **COPUOS** Nations)

COSPARCommittee on Space Research

CSMCommand and Service Module CSOCConsolidated Space Operations Center CUP Composite Utilization Plan DDTEdesign, development, test, and evaluation DMSPDefense Meteorological Satellite Program DOD/DoDDepartment of Defense DOTDepartment of Transportation DSOCDefense Space Operations Committee ECS Environment Control System EDT Eastern Daylight Time ELDO European Launcher Development Organization ELV Expendable Launch Vehicle EML European Microgravity Laboratory E.O./EOExecutive Order EOMend of mission EOS earth orbital shuttle ESA European Space Agency ESC European Space Conference ESF European Space Foundation ESROEuropean Space Research Organization ESTEC European Space & Technology Centre ET External Tank EVAextravehicular activity FCDAFederal Civil Defense Authority FPRFederal Procurement Regulations F.R.Federal Register FSEflight support equipment FTSFlight Telerobotic System FYfiscal year Institute of Technology GAOGeneral Accounting Office GEOgeosynchronous equatorial orbit GMSGeostationary Meteorological Satellite GNP gross national product GOESGeostationary Operational Environmental Satellite GOJGovernment of Japan GPSGlobal Positioning System GROGamma Ray Observatory GSAGeneral Services Administration GSEground support equipment

GSFCGoddard Space Flight Center

HEAOHigh Energy Astronomy Observatory

HUD(Department of) Housing and Urban Development

ICBMintercontinental ballistic missile ICDInterface Control Document

INMARSAT International Mobil (formerly Maritime) Satellite (organization)

INTELSAT International Telecommunications Satellite (consortium) IOCWG International Operational Concepts Working Group

IRAS Infrared Astronomical Satellite IRBM intermediate range missile

ISEE International Society of Electrical Engineers

IUCWG International Utilization Coordination Working Group

IVA ...intravehicular activity
JATO ...jet-assisted takeoff
JCS ...Joint Chiefs of Staff

JEM Japanese Experiment Module

JPDRD Joint Program Definition and Requirements Document

JPRD Joint Program Requirements Document

JSC ... Johnson Space Center
JWG ... joint working group
KSC ... Kennedy Space Center

KWkilowatt

LEMLunar Excursion Module

LLVPG Large Launch Vehicle Planning Group

LPMBLunar and Planetary Missions Board

LSTLarge Space Telescope

MCBMultilateral Coordination Board

MCCMission Control Center

MMD MSC Maintenance Depot

MOAmemorandum of agreement MOSST Ministry of State for Science and Technology (Canada) MOU memorandum of understanding MRS Mobile Remote Servicer NAS National Academy of Sciences NATONorth Atlantic Treaty Organization NIH National Institutes of Health NMI NASA Management Instruction NOAANational Oceanic and Atmospheric Administration NORAD North American Air Defense NOSSNational Oceanic Satellite System NSC National Security Council NSD National Security Directive NSDMNational Security Decision Memorandum NSPD National Space Policy Directive NSSD National Security Study Directive OAOOrbiting Astronomical Observatories OARTOffice of Aeronautical Research and Technology (NASA) OMBOffice of Management and Budget OMSOrbital Maneuvering System OMSFOffice of Manned Space Flight (NASA) ONROffice of Naval Research OOSorbit-to-orbit shuttle OSDOffice of the Secretary of Defense OSFPOffice of Space Flight Programs (NASA) OSSOffice of Space Science (NASA) OSSA Office of Space Science and Applications (NASA) OSTP Office of Science and Technology Policy (White House) PDRDProgram Definition and Requirements Document PMRPacific Missile Range

PSAC President's Science Advisory Committee PVO Pioneer Venus Orbiter R&A Research and Applications (program) R&Dresearch and development R&E (Defense) Research and Engineering RCA Radio Corporation of America RCS Reaction Control System RFPrequest for proposals RMS Remote Manipulator System ROBOrocket bomber RSA Russian Space Agency RTLS return to launch site S&IDSpace and Information Systems Division (North American Aviation) SAC Strategic Air Command SAISpace Astronomy Institute SAMSOSpace and Missile Systems Organization SCA Shuttle Carrier Aircraft SCFShuttle Carrier Flight SET Science, Engineering, and Technology (OMB division) SIG Senior Interagency Group (Space) SIRTF Shuttle Infrared Telescope Facility SITE Satellite Instructional Television Experiment SLSpacelab SOHO Solar and Heliospheric Observatory Satellite SOP System Operations Panel SPSpecial Publication SPDM Special Purpose Dexterous Manipulator SRBSolid Rocket Booster SSCB Space Station Control Board SSCCSpace Station Control Center SSE Software Support Environment SSISSpace Station Information System SSME Space Shuttle Main Engine SSUSSpinning Solid Upper Stage STSpace Telescope STAScience and Technology Agency (Japan) STOCC Space Telescope Operations and Control Center STOLshort takeoff and landing STSSpace Transportation System SYGsecretary general TCP Technological Capabilities Panel

TDY tour of duty

TVtelevision

UCLAUniversity of California at Los Angeles

UOPUser Operations Panel

US/U.S......United States

USA/U.S.A. United States of America or United Space Alliance

VHF very high frequency

VOIR ... Venus Orbiting Imaging Radar
VSIA ... Vehicle System Integration Activity
VTOL ... vertical takeoff and landing
WMO ... World Meteorological Organization