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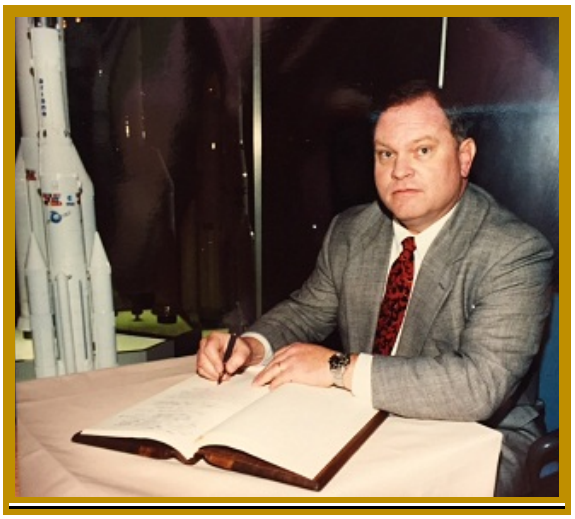

FINDING AID TO
THE MARK K. CRAIG PAPERS, 1917-2019

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Revised 2018 in consultation with donor Mark Craig

Descriptive Summary

Creator Information	Craig, Mark, 1948-
Title	Mark K. Craig papers
Collection Identifier	MSA 81
Date Span	1917-2019, predominant 1969-2019
Abstract	The Mark K. Craig papers include papers, artifacts, memorabilia, and oral history interviews that chronicle the many and varied contributions to space exploration of this Purdue alumnus (BSAE 1971). Craig's contributions stem from his work for NASA from 1967 to 2005, for Science Applications International Corporation (SAIC) supporting NASA from 2005 to 2015, as a space themed attraction consultant since 1997, and as a pro-bono enterprise strategy consultant and mentor since 2016. The collection documents technical, programmatic, strategy/policy, institutional, and public engagement contributions to NASA and its Apollo, Apollo-Soyuz, Space Shuttle, Space Station, Mars Rover Sample Return, and Lunar-Mars exploration programs, and to its development of space. It reflects Craig's responsibilities as a NASA engineer, program manager, and senior executive at Johnson Space Center, Stennis Space Center, and NASA Headquarters; and as Vice President and NASA Account Manager at SAIC. .
Extent	42.1 cubic feet and flat file items (94 mss boxes, 3 flat boxes and flat file items)
Finding Aid Author	Mary A. Sego
Languages	English, Russian
Repository	Virginia Kelly Karnes Archives and Special Collections Research Center, Purdue University Libraries

Administrative Information

Location Information:	ASC-R

Access Restrictions: Collection is open for research. Please give 24 hour's notice.

Acquisition Information: Donated by Mark K. Craig, 2007-2019, with bulk of the material arriving in 2016.

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Purdue University School of Aeronautics and Astronautics 2002 AAE Distinguished Engineering Alumnus:
https://engineering.purdue.edu/AAE/AboutUs/Alumni/Distinguished/DEA/2002craig

Larry Gee papers:
https://apps.lib.purdue.edu/archon/index.php?p=collections/controlcard&id=1616&q=shuttle

Jerry L. Ross papers:
https://apps.lib.purdue.edu/archon/index.php?p=collections/controlcard&id=1629&q=shuttle

Mark N. Brown papers:
https://apps.lib.purdue.edu/archon/index.php?p=collections/controlcard&id=1720&q=shuttle

Mark Geyer papers:
https://apps.lib.purdue.edu/archon/index.php?p=collections/controlcard&id=1632&q=space+station

Subjects and Genres

Persons
Craig, Mark K., 1948-

Organizations
United States. National Aeronautics and Space Administration

National Space Council
NASA Headquarters
Stennis Space Center
Johnson Space Center
Flight Archives at Purdue University

Topics
Space Shuttle Program (U.S.)
Skunk Works
International Space Station
NASA Exploration Team
Apollo Soyuz Test Project
Lunar Exploration
Mars Exploration
Mars (Rover)
Space Exploration Initiative (U.S.)
President G.H.W. Bush Space Exploration Initiative
Human Exploration and Development of Space
Civil space policy
Space commerce
Space tourism
Space themed attraction design
Purdue University--Alumni and alumnae

Form and Genre Types
Charts
Correspondence
Graphs
Market research
Presentations

Occupations
Astronautical engineering
Aeronautical engineering
Aerospace engineering
Engineers

Biographical Information

Having seen Sputnik as a child and been awakened by his father to watch Mercury and Gemini launches, Mark aspired to work for NASA. Raised in Midland, Texas he began his NASA career in Houston as a Purdue co-op student on the Apollo program in 1967. An expert in spacecraft engineering and analysis, in Houston he subsequently contributed to the Apollo-Soyuz, Space Shuttle, Space Station, Mars Rover Sample Return, and Lunar-Mars Exploration programs in positions progressing from engineer to program manager. At NASA Headquarters in Washington Mark was Acting Assistant Administrator, Exploration and architect of the NASA Strategic Plan. He was Deputy Director and Acting Director of the Stennis Space Center and Associate Director of the Johnson Space Center. After retiring from a 38 year career with NASA, Mark supported NASA as Vice President of SAIC from which he retired in 2015. At that time he was presented an American flag flown over the U.S. Capitol at the request of Congressman Joe Kennedy III to honor his 48 years of service to the Nation's space program. He is now a space themed attraction consultant and a pro bono enterprise strategy advisor and mentor.

Mark earned a B.S. in Astronautical Engineering from Purdue University in 1971, pursued engineering graduate study at Rice University, and completed MIT's Sloan Program for Senior Executives in 1992. He has received many awards including NASA medals for Distinguished Service and Outstanding Leadership, the Rotary National Award for Space Achievement Stellar Award, and the NSPE Federal Engineer of the Year Award. Mark is a Distinguished Engineering Alumnus of Purdue, a Fellow of the American Astronautical Society, and a member of the International Academy of Astronautics. He was elected President of the American Astronautical Society in 2005.

He is an Elder of the Presbyterian Church and a member of the National Eagle Scout and College Art Associations. He collects old, original prints and volunteers research on prints and drawings for the Museum of Fine Arts, Houston

Source:

Biographical Information written and provided by Mark Craig, October, 2019.

Biographical Data sheet for Mark K. Craig, Lyndon B. Johnson Space Center, NASA, provided by Mark Craig July 17, 2017.

Please see additional career details outlined below to assist with understanding the many sections of Craig's collection. For more detailed information on Craig's career please see resumes and additional biographical documents in the collection.

Detailed outline of Mark K. Craig's NASA Career

2002-2005 Associate Center Director, Space Development and Commerce, Johnson Space Center; for the Center Director, responsible for identifying and enabling strategic investments in space development and commerce; for HQ led integration of the Space Shuttle Service Life Extension Program (SLEP) investment plan and led integration of Agency Strategic Roadmaps.

2001-2002 Director (Acting), Stennis Space Center.
1995-2002 Deputy Director, Stennis Space Center; responsible for management of the Center's rocket propulsion test, Earth science, and commercial remote sensing programs and for management of its multi-Agency federal, state, academic, and commercial resident environment; founding Chairman of the National Rocket Propulsion Test Alliance with the Dept. of Defense; for HQ supported development of human space exploration strategy.

1993-1995 Architect, NASA Strategic Plan (NASA HQ); on the Administrator's staff, facilitated Agency senior leadership in creation of and architected the NASA Strategic Plan and Strategic Management Handbook; creator of the Strategic Enterprise concept and the Human Exploration and Development of Space (HEDS) Enterprise; architect of the HEDS strategy.

1991-1993 Manager for Space Station Technical Projects (NASA JSC); led integrated Long Duration Orbiter/Space Station study to increase early on-orbit capability; led assessment of JSC program control capability; served on Administrator's "Red Teams" for assessing NASA strategy, human spaceflight programs and NASA Center roles and missions.

1990-1991 Director for Space Exploration (Acting) (NASA HQ).
1989-1990 Assistant Administrator, Exploration (Acting) (NASA HQ); led NASA's planning and research in response to President George H. W. Bush's Space Exploration Initiative (SEI) to establish a lunar base and to send humans to Mars; served as NASA's SEI liaison with the White House Space Council and its Synthesis Group chaired by Gen. Tom Stafford; led NASA's coordination on SEI with the Dept. of Defense, Dept. of Energy, National Science Foundation, and National Institutes of Health; created initial draft of the Space Council's multi-agency policy on the Space Exploration Initiative.

1989-1990 Manager, Lunar and Mars Exploration Program (NASA JSC).
1987-1989 Manager, Lunar and Mars Exploration (NASA JSC); led development of NASA's integrated strategy for exploration of the Moon and Mars and for enabling research, technology, and infrastructure; led NASA technical support to White House staff in developing the Space Exploration Initiative (SEI) announced by President George H. W. Bush on the Apollo 11 20th anniversary in 1989; for the NASA Administrator and JSC Director led the Agency integration and writing of NASA's internal "90 Day Study" as NASA's response to that announcement.

1987-1989 Deputy Manager, Mars Rover Sample Return Project (NASA JSC/JPL); led JSC concept development, technology, and science efforts; with the Jet Propulsion Lab (JPL) project manager, responsible for project management and technical negotiations with Europe and the Soviet Union on project participation.

1987 Special Assistant for Shuttle to the Director of Engineering (NASA JSC); Directorate focal point for support to both the Space Shuttle program and Orbiter project, and was Engineering Directorate representative on their respective management boards; after Challenger created for and presented to the Administrator a history of crew escape design.

1986-1987 Manager, Space Station Program System Engineering and Integration (Acting) (NASA JSC); led SE&I of the integrated Space Station system, including international partners; chaired the Space Station Systems Integration Board; supported Program Office transition to Reston, VA.

1985-1986 Assistant Manager (Engineering), Space Station Program System Engineering and Integration (NASA JSC); principal advisor to the SE&I Manager on engineering issues; engineering representative in negotiations to create partnerships with Europe, Japan and Canada.

1984-1985 Space Station "Skunk Works" (NASA JSC); supported formation of the Space Station Level B Program Office at JSC and its transition from the HQ Space Station Task Force.

1983-1984 Space Station Task Force Concept Development Group (CDG) (NASA HQ); led a multi-Center and contractor team exploring Space Station configuration options, and led 11 other teams performing various technical and programmatic analyses.

1981-1984 Head, Space Shuttle Flight Debris Team (NASA JSC); formed and led the Space Shuttle program debris team created by the Shuttle Program Manager after STS-1 to identify sources of and eliminate damage caused by launch, flight, and landing debris; led its pre-launch Red Team and post-landing vehicle inspection teams.

1978-1983 Integration Manager, Space Shuttle Solid Rocket Booster (SRB) Separation System (NASA JSC);
1976-1978 Subsystem Manager, Space Shuttle Solid Rocket Booster (SRB) Separation System (NASA JSC); led the design, development, test, and evaluation (DDT&E) of the integrated Space Shuttle SRB staging system which worked successfully on each of its 134 flights; staging flight software principal function manager; formulated and sponsored the state-of-the-art supersonic wind tunnel test campaign at the Air Force's Arnold Engineering Development Center (AEDC) that involved three bodies and active gas plumes to create the SRB separation aerodynamic database.

1973-1983 Aerospace Engineer, Engineering Directorate (NASA JSC); developed and executed Shuttle performance/sizing math models to support vehicle concept studies; supported analysis of Space Shuttle Solid Rocket Booster (SRB) separation dynamics and aerodynamics; invented and implemented the "hypercube" technique to efficiently acquire and access 8-dimensional Shuttle SRB separation aerodynamic data; led math modelling and a "zero-g" aircraft test campaign of Space Shuttle External Tank large amplitude propellant dynamics to support analysis of Return to Launch Site (RTLS) aborts.

1972-1973 Apollo-Soyuz Docking Working Group, Engineering Directorate (NASA MSC then JSC); as a member of U.S./Soviet Working Group #3 performed docking dynamics simulations and mechanism capture boundary analyses; developed initial Russian to English translations of Working Group documents.

1971-1972 Space Shuttle Phase B Concept Definition Team, Engineering Directorate (NASA MSC); developed and executed integrated vehicle performance/sizing math models to support Space Shuttle Phase B vehicle concept studies.

1967-1971 Co-op student (NASA MSC); supported Astronaut training equipment redesign after the Apollo 1 fire; performed parametric Venus entry trajectory study with recent Mariner V and Soviet Venera IV spacecraft atmosphere data; youngest member of Max Faget's 1969 Space Shuttle Phase A concept development "skunk works."

Mark K. Craig NASA Position History

Position Description (PD) Date	Dates Active	Position
6/67	6/67 - 8/69	Co-operative education student (MSC/BN,EX)
1/71	1/71 - 11/83	Aerospace Engineer, Engineering Directorate (JSC)
No PD	1972 - 1973	• ASTP Working Group 3 (Docking) (JSC/EW)
11/77	1976 - 8/78	• SRB Separation Subsystem Manager (JSC/EX)
8/78	8/78 - 7/83	• SRB Separation Integration Manager (JSC/EX)
No PD	7/83 - 3/84	Lead Engineer, Space Station Task Force, Concept Development Group (HQ)
No PD	3/84 - 4/85	Lead Engineer, Space Station "Skunk Works" (JSC/PB)
5/85	4/85 - <9/86	Asst. Manager (Engineering), Space Station Program Systems Engineering & Integration Office (JSC/PB)
No PD	<9/86 - 3/87	Acting Manager, Space Station Program Systems Engineering & Integration Office (JSC/PB)
4/87	3/87 - 8/87	Special Asst. for Space Shuttle to the Director of Engineering (JSC/EA)
No PD	8/87 - ~4/88	Manager, Lunar and Mars Exploration Office (JSC)
No PD	8/87 - 8/89	Deputy Manager, Mars Rover Sample Return Project (JSC)
7/89	~4/88 - 8/89	Manager, Lunar and Mars Exploration Office, New Initiatives Office (JSC/IZ)
8/89	8/89 - 2/90	Manager, Lunar & Mars Exploration Program Office (JSC/XA)
No PD	~9/89 - 2/90	Acting Asst. Administrator, Exploration (HQ)
No PD	2/90 - 9/91	Director, Space Exploration (Special Asst. for Exploration), Office of Aeronautics, Exploration and Technology (HQ/RZ)
12/91	9/91 - 1/93	Manager for Technical Projects, Space Station Project Office (JSC/KA)
No PD	1/93 - 2/95	Staff, NASA Administrator (HQ/AD)
2/95	2/95 - 10/02	Deputy Center Director (SSC/AA)
No PD	2/01 - 3/02	Acting Center Director (SSC/AA)
9/02	10/02 - 4/05	Assoc. Center Director, Space Development & Commerce (JSC/AC)

Detailed Outline of Mark K. Craig's Post- NASA Career

2016- *Pro-bono Strategy Consultant and Mentor;* provides consultation and mentoring service to enterprises that advance the exploration and commercial development of space. To date enterprises include the Astronaut Scholarship Foundation, Space Angels, the Mars Affordability & Sustainability Workshops, the Lunar Exploration Analysis Group, and the International Space Medicine Summit.

2008-2015 *NASA Account Manager* (Science Applications International Corporation, SAIC); managed SAIC's relationship with NASA; worked to increase NASA human space exploration's value to the Nation and sustainability by helping to shape and socialize the bi-partisan NASA Authorization Act of 2010 and its mandated National Academies study; also by helping to organize the 2014 Atlantic Council/SAIC Final Frontier event, the 2015 Pioneering Space National Summit, and various conferences including the TED-like AAS Imagine'09; led rebranding of the Mars Affordability Workshop as the Mars Affordability and Sustainability Workshop.

2005-2008 *Vice President, Manager of Space and Ocean Systems Solutions Operation* (Science Applications International Corporation, SAIC); managed SAIC's civil space and Earth science business with NASA and other federal agencies.

1997- *Museum & Themed Attraction Space Exploration Consultant*; as member of the creative team, provides space exploration expertise to museums and themed attractions developing space projects. Clients to date include Chicago's Museum of Science and Industry, Space Centre Bremen (Germany), and the NASA Kennedy Space Center Visitor Complex.

Select Career Mountaintop Experiences

- A one-on-one meeting with Neil Armstrong the day he was named commander of Apollo 11;
- Conversations over years with Gene Cernan about his thoughts and feelings while on the Moon;
- Being detained at Apollo 11's launch pad for an hour at T-9 hours, and experiencing its launch;
- Inspecting the Space Shuttle fueled on its launch pad at T-3 hours and again just after it landed from orbit, and then sitting in its cockpit;
- In the White House, conversations with the Vice President about Lunar-Mars exploration;
- Being on management console in KSC's Launch Control Firing Room, and experiencing 30 Shuttle launches;
- Keynoting the 3rd UN Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) in Vienna;
- Experiencing weightlessness on NASA's "zero-g" aircraft leading a Space Shuttle test campaign.

Select Career Contributions

- Helping to create policy and strategy to sustain NASA human space exploration based on its value to America so that, unlike Apollo, reaching a destination does not result in program termination;
- Leading NASA's first Agency-wide, integrated study of Lunar and Mars exploration;
- Leading negotiations that resulted in Space Station partnerships with Europe, Japan, and Canada;
- Being on the startup teams for Space Shuttle in 1969, Space Station in 1983, and the Lunar-Mars Space Exploration Initiative in 1988;
- Leading the design, development, and test of the Space Shuttle booster staging system;
- Founding, as Chairman, the National Rocket Propulsion Test Alliance with the Dept. of Defense;
- Negotiating and signing for NASA an agreement with the National Science Foundation on Antarctic analogs for Lunar-Mars exploration;
- Being on the creative teams for the Kennedy Space Center (KSC) Visitor Complex's *Shuttle Launch Experience* attraction, its *Space Shuttle Atlantis Exhibit*, and its *Explorers Wanted* campaign.

Select Honors & Awards

- Rotary National Award for Space Achievement Stellar Award (2016)
- American flag flown over the U.S. Capitol at the request of Congressman Joseph P. Kennedy III of MA to honor Mark's 48 years of service to the Nation's space program (2015)
- President's Recognition Award, American Astronautical Society (AAS) (2015)
- World Space Week Pioneer Award (2008)
- Fellow, American Astronautical Society (AAS) (2006)
- NASA Distinguished Service Medal (2005)
- Distinguished Engineering Alumnus, Purdue University (2002)
- Outstanding Aerospace Engineer, Purdue University (2000)
- Presidential Meritorious Executive Rank Award (1994, 1999)
- NASA Outstanding Leadership Medal (1992)
- Elected to the International Academy of Astronautics (IAA) (1992)
- Federal Engineer of the Year Award, National Society of Professional Engineers (NSPE) (1991)
- Midland High School (Texas) Hall of Honor Distinguished Alumni (1991)
- NASA Exceptional Service Medal (1981, 1990)
- Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA) (1981)
- Professional Service Award, Houston Section of the American Institute of Aeronautics and Astronautics (AIAA) (1978)
- Community Service Award, Houston Section of the American Institute of Aeronautics and Astronautics (AIAA) (1976)
- Neil Armstrong Literary Award, Purdue University (1970)
- U.S. Navy Science Cruiser Award (1966)
- Freedoms Foundation at Valley Forge Medal honoring Mark K. Craig (1965)
- Vigil Honor, Order of the Arrow, Boy Scouts of America (1965)
- Eagle Scout, Boy Scouts of America (1964)

Collection Description

Scope

The Mark K. Craig papers (1917-2017; 42.1 cubic feet and flat file items) document Purdue alumnus (BSAE 1971) Mark Craig's 50+ year career of contributions to NASA and to NASA human space exploration in its Apollo, Apollo-Soyuz, Space Shuttle, Space Station, and Lunar-Mars Exploration programs, and in its development of space ... technical, programmatic, strategy/policy, institutional, and public engagement contributions.

Enterprise/Effort	Engineering	Program Management	Strategy/ Policy	Institutional Management
Space Shuttle	1969-1971 1973-1984 1991-1992	1976-1984 1987 1995-2002	2002-2004	1987 1995-2002
Apollo-Soyuz	1971-1973	---	---	---
Space Station	1983-1984 1991-1992	1985-1987	1984-1987	---
Mars Rover Sample Return	---	1987-1989	---	---
Lunar-Mars Exploration	---	1987-1990	1989-1990	---
Space Exploration Initiative (SEI)	---	1988-1990	1989-1991	---
Administrator Redirection Initiatives	---	1992	1992 2002	1994
NASA Strategy & Strategic Management	---	---	1993-1995 2004-2005	1993-1995
Human Exploration & Development of Space	---	---	1993-2002	1993-1995
Sustainability of NASA Human Exploration	---	---	1990 -	---
Stennis Space Center Management	---	---	1997-2002	1995-2002
Johnson Space Center Management	---	---	2002-2005	1993 2003-2005

In summary, the collection holds key working papers that focus on the engineering, program management, strategy/policy, and institutional management aspects of key NASA human space exploration activities in the period 1969-2019.

Types of materials include: artifacts, awards, books, certificates, charts, correspondence, designs, DVD-Video discs, films, graphs, market research, memorabilia, memoranda, negatives, notebooks, notes, opinion polls, papers, photographs, posters, presentations, publications, reference materials, reports, slides, spreadsheets, textbooks, and VHS tapes.

The papers are organized into 18 Series and follow the path of Craig's career, with the exception of material from his work on space themed attractions and from his tenure as AAS President, reference materials, education material, and career hallmarks which appear at the end of his papers.

The many publication documents and presentation slide decks created by Craig directly express his thoughts and ideas on key subjects to a variety of audiences.

They are distributed throughout the papers, with subsets collected in Series 10.9 on Enterprise Sustainability and in Series 16.2 on select subjects from Series 1-14 that may or may not be found in those Series.

Arrangement

1. Space Shuttle Program, 1963-2015 (5.5 cubic feet).

This series is divided into 8 subseries and follows the course of his career: 1. Vehicle Concept Skunkworks, 2. Vehicle Concept Exploration and definition, 3. Solid Rocket Booster (SRB) Staging System Development, 4. Return-To-Launch-Site Abort Propellant Dynamics Math Model Development, 5. Debris Mitigation and Launch/Landing Inspection Red Team, 6. Post-Challenger Abort/Crew Escape Design History Reconstruction, 7. Long Duration Orbiter Concept Development, 8. Service Life Extension Program (SLEP).

Series description: This series contains key documents stemming from Craig's work in the following areas:

Engineering

- Shuttle concept development (1969-1971) - developed and executed integrated vehicle performance/sizing math models to support Space Shuttle Phase A and B vehicle concept studies. As a co-op student, youngest member of Max Faget's 1969 Space Shuttle Phase A concept development "skunk works" in 1969.
- Solid rocket booster (SRB) separation (1974-1983) - supported analysis of separation dynamics and aerodynamics; invented and implemented the "hypercube" technique to efficiently acquire and access 8-dimensional separation aerodynamic data.
- Flight debris (1981-1984) - performed debris transport and damage analysis/mapping.
- Propellant dynamics (1978-1981) - led math modelling and a "zero-g" aircraft test campaign of Space Shuttle External Tank large amplitude propellant dynamics to support analysis of Return to Launch Site (RTLS) aborts.
- Long Duration Orbiter (1991-1992) - led integrated Long Duration Orbiter/Space Station study to increase early on-orbit capability.

Program Management

- Solid rocket booster (SRB) separation Integration Manager (1976-1983) - led the design, development, test, and evaluation (DDT&E) of the integrated Space Shuttle SRB staging system which performed successfully on each of its 134 flights; staging flight software principal function manager; formulated and sponsored the state-of-the-art supersonic wind tunnel test campaign at AEDC that involved three bodies and active gas plumes to create the SRB separation aerodynamic database.

- Debris team lead (1981-1984) - formed and led the Space Shuttle program debris team created by the Shuttle Program Manager after STS-1 to identify sources of and eliminate damage caused by launch, flight, and landing debris; led its pre-launch Red Team and post-landing vehicle inspection teams.
- Crew escape design history (1987) - after the Challenger accident, created for and presented to the NASA Administrator a history of crew escape design
- Launch Mission Management Team (1995-2002) - member of the MMT at KSC.

Strategy/Policy

- Service Life Extension Program (SLEP) (2002-2004) - for NASA HQ led integration of the SLEP investment plan.

Institutional Management

- Engineering Directorate representative (1987) - focal point for support to both the Space Shuttle program and Orbiter project, and was Directorate representative on their respective management boards;
- Stennis Space Center (1995-2002) - responsible for management of the Center's rocket propulsion test support of the Space Shuttle Main Engine (SSME).

2. Apollo-Soyuz Test Project (ASTP) Docking Working Group, 1971-1978 (0.2 cubic feet).

Series description: This series focuses on Craig's work as a member of the U.S./Soviet Working Group #3 (docking) in 1972-1973. He performed docking dynamics simulations and mechanism capture boundary analyses, and developed initial Russian to English translations of Working Group documents. Found within the series are English translations of five papers concerning compatible rendezvous and docking systems received from USSR delegation in Moscow on November 29, 1971; Apollo Soyuz Test Project, "The Apollo Soyuz Docking Sequence of Operations for Docking and Undocking," March 21, 1973; and the document, "The Partnership: A History of the Apollo-Soyuz Test Project," by Edward Clinton Ezell and Linda Neuman Ezell, NASA Scientific and Technical Information Office, 1978.

3. Space Station Program, 1974-2001 (4.4 cubic feet).

This series is comprised of 6 sub-series and reflects the ever-changing roles he took on during this time period: 1. HQ Task Force Concept Development Group (CDG), Skunkworks for Phase B Preparation, 3. Concept Definition Phase B, 4. Program Transition to Reston, Virginia, 5. Critical Evaluation Task Force (CETF), and 6. Space Station Freedom Redirection.

Series description: This series contains key documents from Craig's work for the Space Station Program in the following areas:

Engineering

- HQ Space Station Task Force Concept Development Group (CDG) (1983-1984) - led a multi-Center and contractor team exploring Space Station configuration options, and led 11 other teams performing various technical and programmatic analyses.
- Long Duration Orbiter (1991-1992) - led integrated Long Duration Orbiter/Space Station study to increase early on-orbit capability.
- Redesign (1992) - served on Administrator's "Red Teams" for assessing NASA human spaceflight programs, including redesign of the Space Station.

Program Management

- System Engineering & Integration management (1984-1987) - supported formation of the Space Station Level B Program Office at JSC and its transition from the HQ Space Station Task Force; led SE&I of the integrated Space Station system, including international partners; chaired the Space Station Systems Integration Board; supported Program Office transition to Reston, VA., including the Critical Evaluation Task Force (CETF).

Strategy/Policy

- International negotiations (1984-1987) - engineering representative in negotiations that resulted in partnerships with Europe, Japan and Canada.

Some of the key documents include: Conceptual Design and Evaluation of Selected Space Station Concepts, Executive Summary, December 1983; Space Station Program Description Document, Space Station System Requirements Document Prepared by the Space Station Task Force Concept Development Group, December 25, 1983; Presentation, "Space Station Definition Work Package," by Ray Hook, December 1983; Conceptual Design and Evaluation of Selected Space Station Concepts, December 1983; NASA Space Station Task Force Concept Development Group, Workshop Briefing Charts; Presentations, Space Station Design-to-Cost, July 9, 1984 and revised July 19, 1984; and Craig's presentation to the National Commission on Space in 1985.

4. Mars Rover Sample Return (MRSR) Project, 1988-1990 (0.2.).

Series description: This series contains three documents related the Mars Rover Sample Return Project. From 1987-1989 Craig was *Deputy Manager, Mars Rover Sample Return Project* to the NASA JPL Project Manager. He led the Johnson Space Center concept development, technology, and science efforts with the Jet Propulsion Laboratory and was responsible for project management and technical negotiations with Europe and the Soviet Union on project participation. This series contains the key study, *Johnson Space Center Pre-Phase A Study, Mars Rover Sample Return Mission, Aerocapture, Entry, and Landing Element*, May 1, 1989.

5. Lunar and Mars Exploration Program, 1987-1990 (0.6).

Series description: Found within this series are various Lunar/Mar Studies, PowerPoint presentations (copies of slides), and publications and documents related

to Soviet considerations. Craig's work with the Lunar and Mars Exploration Program included:

Program Management

- NASA Lunar and Mars Exploration studies (1987-1990) - led the first Agency-wide development and integration of NASA's program for exploration of the Moon and Mars and for enabling research, technology, and infrastructure. Much of this work predated and formed the foundation for NASA's support to the G.H.W. Bush Administration as it considered creating the Space Exploration Initiative (SEI) and then as it pursued its definition and support.

6. President G.H.W. Bush Space Exploration Initiative (SEI), 1976-2011, (4.0 cubic feet).

Series description: This series relates to Craig's work on the Space Exploration Initiative (SEI). His work included:

Program Management

- White House support (1988-1990) - led NASA technical and programmatic support to the White House as it considered creating and then formulated the SEI, and led NASA planning and research in response to President Bush's announcement.
- 90 Day Study (1989-1990) - for the NASA Administrator and JSC Director led the Agency integration and writing of NASA's internal "90 Day Study" as NASA's response to SEI.

Strategy/Policy

- White House SEI Liaison (1989-1991) - served as NASA's SEI liaison with the White House National Space Council and its Synthesis Group chaired by Gen. Tom Stafford.
- Interagency coordination (1989-1991) - led NASA's coordination on SEI with the Dept. of Defense, Dept. of Energy, National Science Foundation, and National Institutes of Health; created initial draft of the Space Council's multi-agency policy on the Space Exploration Initiative.

Per Craig, "My involvement in the leadership of NASA's formulation of, and response to, President George H. W. Bush's Space Exploration Initiative (SEI) was seminal in the arc of my career. Having been in senior leadership positions for system engineering and integration during the early phases of Space Station, I had been exposed to the challenges inherent at the intersection of the political and the technical, at the intersection of the "why" and the "how." The challenges at that intersection for SEI were at least an order of magnitude greater. Dealing with those challenges on SEI led me to conclude that the technical challenges, although significant, of "returning to the Moon, this time to stay, and then going on to Mars" were dwarfed by the political and policy challenges. How does one design a NASA human space exploration program to be politically sustainable and to deliver the

maximum value to the Nation? How does one design a program so that once Mars is ultimately reached the program isn't canceled after several landings like Apollo?

Since 1993, the pursuit of answers to those questions and their implementation have motivated and shaped my involvement in:

- Creation of the NASA and the Human Exploration & Development of Space (HEDS) strategic plans
- Customer and stakeholder engagement
- Value management and public engagement
- Creation and promotion of the NASA 2010 Authorization Act and the 2014 National Research Council report on human space exploration
- Enterprise sustainability

7. NASA Administrator Agency Redirection Initiatives, 1992-2002 (0.4 cubic feet).

This series is arranged into 4 subseries to reflect Craig's work on various teams during this time: 1. Dan Goldin Human Presence in Space Red Team, 2. Dan Goldin Strategic Planning Red Team, 3. Dan Goldin NASA Organization Working Group, and 4. Sean O'Keefe Vision Exercise.

Series description: Dan Goldin became NASA Administrator in 1992, having been an executive at TRW. His approach to understanding issues and options in a complex enterprise like NASA was to create two employee teams, a Blue Team to advocate the status quo and a Red Team to challenge it. Sean O'Keefe as Administrator used a Visioning approach to develop strategy. This series captures Craig's contributions to each.

Some of the key documents as indicated by Craig include: Memo HQ, RE: Red Team Rosters and Proposed Generic Draft Charter for NASA Review Red Teams, To: Distribution, From: AE/Assistant Deputy Administrator (Charles Bolden), May 26, 1992; Presentation, Human Presence in Space, Red Team, Report to the Administrator, August 20, 1992 (original document); NASA Organization Working Group Report to the Senior Management Group, October 12, 1994 (presentation); Considerations for the NASA Exploration Vision/Strategy briefing by Mark Craig to NASA Senior Management Retreat, March 5, 2000; and A NASA Role in Space charts by Craig.

8. NASA Strategic Plan and Strategic Management, circa 1980s-2000s (2.2 cubic feet).

This series is arranged into 3 subseries: 1. NASA Strategy, 2. NASA Strategic Management, and 3. HQ Advanced Planning and Integration Office (APIO).

Series description: Documents in this series stem from Craig's roles when he served as *NASA Strategic Plan Architect, Administrator's Staff* (NASA Headquarters); architect of the NASA Strategic Plan and Strategic Management System; creator of

the Strategic Enterprise concept; and as advisor to the HQ Advanced Planning and Integration Office (APIO) in 2004-2005.

Key documents include, but are not limited to: NASA Strategic Plan, May, 1994 (Original, signed by Strategic Plan Team and NASA Administrator, Dan Goldin, and Deputy Administrator General Jack Dailey); Presentation, Strategic Enterprise Selection Criteria, presented by Mark Craig, August 17, 1993; Presentation, NASA's Vision and Mission Statement "What We Do" The Strategic Enterprises by Mark Craig, August 17, 1993; Strategic Management Concept and Senior Management Retreat Results by Mark Craig, September 15, 1993; and proposed NASA Management Model, by Mark Craig, Mike Mann, Richard Reeves, Dick Wisniewski, March 4, 1996.

9. Human Exploration and Development of Space (HEDS) Strategic Enterprise, 1967-2002 (3.0 cubic feet).
This series consists of 3 subseries: 1. HEDS Strategic Plan, 2. HEDS Management, and 3. HEDS Customer and Stakeholder Engagement.

Series description: This series includes documents resulting from Craig's role as NASA Strategic Plan architect and creator of the Strategic Enterprise concept to more effectively focus NASA on its value to external customers. To that end, what had been called the Office of Space Flight (OSF) was rebranded as the Human Exploration and Development of Space (HEDS) Strategic Enterprise to more effectively state its intent. To implement this transformation in 1993-1995 Craig led the creation of the HEDS Strategic Plan and the HEDS Management Plan and initiated a HEDS customer and stakeholder engagement activity.

The key documents identified by Craig are the HEDS Strategic Plan folder containing various documents; a presentation, "NASA Strategic Management Concept and Strategic Framework for Human Exploration and Development of Space," by Mark Craig, November 8, 1993; HEDS Customer Strategy Workshop material, October 18, 1994; and Mars Architecture Committee, Bob Rogers, Public Engagement folder. Please see the detailed listing for all items.

10. Sustainability, Stability, and Value of NASA Human Space Flight, 1995-2019 (3.2 cubic feet).
This series consists of 9 subseries: 1. Various Topics, 1995-2013, 2. Market Research and Opinion Polls, 1991-2013, 3. Value Management, 1994-2011, 4. Rationale, 1963-2012, 5. Rogers, Flowers, and Rohde Thought Leadership, 6. NASA 2010 Authorization Act Support, 2010-2015, 7. National Academies' Human Space Exploration Study, 1958-2016, 8. Strategy and Messaging, 2015-2016, and 9. Enterprise Sustainability, 1996-2019.

Series description: Documents in this series reflect Craig's continuing emphasis and work on NASA human space flight sustainability, stability, and value motivated, ultimately, by his experience of being terminated upon the cancellation of Apollo. Per

Craig, “These publications and presentations created over 20+ years display the evolution of my thinking and insights in the critical area of NASA human space flight enterprise sustainability, an area that has received far too little attention and meaningful action by our community. Items 16-18 in Folder 5 accurately express my best thoughts, are actionable, and are the basis of my advice to and advocacy of the enterprise.”

11. Stennis Space Center (SSC) Management, 1962-2005 (0.2 cubic feet).
This series is arranged into two sub-series: 1. Various Topics and 2. Rocket Propulsion Test.

Series description: This series contains documents stemming from Craig’s activities as *Deputy Center Director at Stennis* from February 1995-September 2002 and as *Acting Center Director* from February 2001-March 2002. He was Founding Chair of the National Rocket Propulsion Test Alliance (NRPTA) with the Dept. of Defense;. Series 1 includes a history, organization missions and responsibilities, implementation plan and other material. Series 2 includes a pamphlet, pocket data book, booklet of Space Shuttle schedules, a draft, memorandum of agreement between NASA Propulsion Test Centers and Department of Defense (DoD) Propulsion Test Organizations, Space Shuttle Privatization Attributes, Concepts and Issues, and a few miscellaneous items.

12. Johnson Space Center (JSC) Management, 1983-2011 (0.6 cubic feet).
This series contains 4 subseries: 1.Various Topics, 2.Program Control Study, 3.Strategy and Metrics, and 4.Bioastronautics Collaboration Initiative.

Series description: This series contains materials resulting primarily from Craig’s role as the *Associate Director (Space Development and Commerce) at Johnson Space Center* from September 2002 until April 2005. The various topics include: Systems Engineering, Agency System Management, Astrobiology and Extraterrestrial Materials, Station and Shuttle Reinvention Team, and Commercialization and Tech Transfer Assessment.

13. Space Themed Attraction Design, 2003-2013 (0.2 cubic feet).
This series is arranged into 4 subseries: 1. Chicago Museum of Science and Industry, 2. Shuttle Launch Experience and Exploration Space at the Kennedy Space Center Visitor Center, 3. Shuttle Atlantis Exhibit at the Kennedy Space Center Visitor Center and 4. Moon Resort.

Series description: This series reflects Craig’s work as a *Themed Attraction Consultant*. He has provided technical expertise to museums and themed attractions developing space-related projects. Clients have included Chicago's Museum of Science and Industry, Space Centre Bremen (Germany), and the NASA Kennedy Space Center *Shuttle Launch Experience* and Space *Shuttle Atlantis Exhibit*.

14. President, American Astronautical Society (AAS), 1990-2014 (0.1).

Series description: This series contains materials resulting from Craig's service to the American Astronautical Society as President (2005-2007), Executive Vice President (2003-2005) and Vice President – Technical (2002-2003). Included are a roster and Board of Directors listing, strategic plan, goal lead assignments, an American Astronautical Society handbook, and reflections from past AAS presidents written in an article in *Space Times.*

15. Reference Material, 1917-2015 (2.80 cubic feet + flat file items).
This series contains 8 subseries: 1. Various Topics, 2. Space Exploration History, 3. Space Exploration Policy and Reviews, 4. NASA Plans, 5. Exploration Beyond Low Earth Orbit, 6. Access to Space, 7. Space Commerce, and 8. Posters and Graphics located in Oversized Box 70.

Series description: The Reference Material captures a wide range of material from throughout Craig's career. Some of the key items in this series include: Report of the Presidential Commission on the Space Shuttle Challenger Accident, and Columbia Accident Investigation Board Report; Post-Apollo Planning of the Space Task Group, September 1969; Apollo 11 Mission Report, prepared by Mission Evaluation Team, NASA Manned Spacecraft Center, 1971; The Vision for Space Exploration, 2004; the book, *Mars and Its Mysteries*, (Instructor Literature Series) by Latimer J. Wilson, 1917; NASA's Journey to Mars – Pioneering Next Steps in Space Exploration, 2015; and Apollo 15 [Lunar] Descent – Ascent Summary, and NASA Mission Support graphic, July 9, 1971.

16. Career Hallmarks and Memorabilia, 1927-2019 (6.9 cubic feet + flat file items).
Within this series are 9 subseries : 1. Letters, Clippings, and Events, 2. Select Presentations and Publications by Mark Craig, 3. Awards and Recognition, (Some of these are in OS Box 99 and are listed in the finding aid) 4. People Photographs, 5. Recognition Photographs, 6. Oral History, 7. Eric Peters Painting Donation, 8. Autographed and/or Important Space Books, and 9. Artifacts.

Series description: Importantly, series includes select copies of Craig's Presentations and Publications, some of which are not found in other sections of the Archive. Other items of note include, but are not limited to: Photographs of Cap Sur L'Espace French Television Panel, 1991 (includes 6 photographs with other participants, Cosmonaut Vitaly Sevastyanov, Cosmonaut Vladimir Solovyev, and French astronaut Patrick Baudry; Craig's NASA Oral History (2006); *Handbook of Astronautical Engineering* (Astronaut Jim McDivitt's personal copy, his name in pencil on the inside cover. Signed by its Editor Dr. Hermann Koelle with a personal note to Mark Craig); Shuttle Launch/Landing Access badges; flight qualified Space Shuttle thermal protection system (TPS) tile; A Soviet map of the Moon [labeled in Russian] presented by Academician Slava Shevchenko and signed by him: "To dear Mark Craig with best wishes, Slava Shevchenko, April, 1988 Houston;" and BRC Imagination Arts Shuttle Launch Experience poster signed by astronauts Charlie Bolden and Rick Searfoss. The poster identifies Mark Craig as the NASA Laureate

contributor to the project, 2007. Includes material related to Craig's participation in donating the painting by German artist Eric Peters which hangs in the lobby of the Neil Armstrong Hall of Engineering. Craig helped donate a similar painting by Peters to the Johnson Space Center where it hangs in the lobby of the Teaque Auditorium. This is a small sampling of items please refer to the detailed listing below for complete information.

17. Career Miscellaneous, 1962-2015 (5.9 cubic feet).
This series is comprised of 4 subseries: 1.Notebooks, 2.Calendars, 3.Administrative Records, and 4.Slides, Photos and Films, Audio Tapes, and CDS/DVDs.

Series description: The Notebooks contain detailed notations made by Craig, especially during his early career – Solid Rocket Boosters, Space Station Task Force, Skunkworks, and Space Exploration Initiative (1973-1990). The calendars detail Craig's work schedule and provide one with a glimpse into the life of a NASA Engineer. The Administrative Records focus on his career; listing of papers, articles and publication written, activity history, position history, grade level history, Space Shuttle experience, and key correspondence received throughout his career, such as a letter of congratulations from President Obama upon Craig's retirement on July 17, 2015. Lastly, there are slides, photographs and films, audio tapes, and CDS/DVDs from throughout his career, and also includes space flight history and key figures, such as Alan Shepard, Cosmonaut Vitaly Sevastyanov, Maurice J. Zucrow from Purdue's Zucrow Laboratories, and President John F. Kennedy.

18. Personal Album, 1956-2005 (1.7 cubic feet).
This series is divided into 3 subseries: 1. Youth, 2.High School, and 3.College and Grad School.

Series description: Contained within this album are items from Craig's activities in Boy Scouts and at Jean Gordon Elementary School in New Orleans, including two reports written by Craig in his youth. There are items from his attendance at Midland High School, Midland, Texas, including the following awards: Permian Basin Geophysical Society Scholarship, National Honor Society, Bell Labs Tour, and Navy Science Cruiser Award and his diploma. Lastly, there are items from Purdue University, including an extensive textbook collection and his diploma, along with items from his post-graduate studies at Rice University, and various training activities, including the MIT Senior Executive Program.

Descriptive Rules

Describing Archives: A Content Standard

Processing Information

Whenever possible and appropriate, original order of the materials has been retained. Most of these items appear in reverse chronological order. All materials

have been housed in polyester sleeves as necessary, acid-free folders, and acid-free boxes. Oversized artifacts, awards, certificates, posters, and other printed material have been separated and grouped into individual series for preservation purposes.

Donor Mark K.Craig provided much of the descriptive content of the material in the form of an extensive inventory, and this was retained in the Finding Aid's Detailed Description of the Collection. Craig also assisted with and contributed significantly to the Finding Aid descriptive elements including a "key document," "key artifact," and "original" notations he provided in the detailed description.

DETAILED DESCRIPTION OF THE COLLECTION

Series 1. Space Shuttle Program, 1963-2015
(5.5 cubic feet)

Box 1 *Space Shuttle Missions Summary and Significant Incidents and Close Calls in Human Spaceflight, 2011-2012*

Folder
1. Space Shuttle Missions Summary, NASA TM -2011-216142, by Robert Legler and Floyd Bennett, September 2011
2. *Significant Incidents and Close Calls in Human Spaceflight*, Johnson Space Center, Safety & Mission Assurance Directorate, Spring 2012 (Z card, pocket media, (key document)

Subseries 1. Vehicle Concept Skunkworks, 1969-2015

Box 1 continued *Skunkworks and Building 36 Shuttle Sizing, 1969-2015*

Folder
3. *After Apollo?* John Logsdon's book (2015) that describes Space Shuttle development from the Nixon Administration and NASA Headquarters perspective to complement and provide context for this archive material from deep inside the Shuttle development effort in Houston. *(*signed by author, "For Mark Craig, Let's go explore," includes program from presentation by author at Rice University's Baker Institute for Public Policy Space Policy Program, April 27, 2015)
4. Shuttle Concept "Skunkworks," Houston, 1969
   Item
   1. Drawing by Cal Perrine commissioned by Dr. Faget to explain the scale of his shuttle concepts (key document)
   2. Picture of a flying shuttle model built by Dr. Faget to explain his

straight wing concept to the “skunkworks.” (key document)

3. DVD of early shuttle documents scanned to support creation of the Kennedy Space Center orbiter Atlantis installation

5. Building 36 Shuttle Sizing, 1969 (folder 1 of 2)

Item

1. NASA Status of Manned Spacecraft Center Shuttle Study, May 21, 1969 (key document)
2. Drawings, Vehicle Size Comparison, 1969
3. Notes, Parametric Sizing Analysis, July 3, 1969
4. Memo #EX23/6908-163C, RE: Manned Spacecraft Center Shuttle Vehicle Weight and Staging Characteristic Velocity Analysis, To: EX2/Chief, Flight Technology Branch, From: EX23/Head, Flight Performance Section (Paul Thomas), August 4, 1969,
5. Memo # EX23/6907-160C, RE: Reference Launch Trajectory for MSC Shuttle Vehicle with a 12,500 Pound Payload Capability, To: EX2/Chief, Flight Technology Branch, From: EX23/Head, Flight Performance Section (Paul Thomas), July 29, 1969,
6. Miscellaneous documents with equations, 1969
7. Graph, Launch Propellant Ratios, July 14, 1969 (***ORIGINAL***)
8. Table, Spacecraft Summary Weight Statement (Preliminary)

6. Building 36 Shuttle Sizing, 1969 (folder 2 of 2)

Item

1. Table, K Vehicle Weight Statement, 1969
2. Table, Modification of Bellcom Analysis of Stage Plus One-half, May 29, 1969 (***ORIGINAL***)
3. Graph, Triamese System Elements, Propellant Weight Fractions, 1969 (***ORIGINAL***)
4. Spreadsheets, 1969 (***ORIGINAL***)
5. Table, M E 550 Available Launch, Vehicle Engines and Their Unclassified Specifications (***ORIGINAL***)
6. Graphs, 1969
7. Table, Booster (***ORIGINAL***)
8. Table, Weight Breakdown of 50K Vehicle (***ORIGINAL***)
9. Graphs, Booster
10. Equations, Generalized Shuttle Sizing, June 17, 1969 (***ORIGINAL***)
11. Study Items (document, ***ORIGINAL***)
12. Table, 12.4K Vehicle Weight Statement, June 21, 1969
13. Graph, Modification of Structural Ratio
14. Equations, Orbiter Weight Model #2, June 19, 1969
15. Table, Orbiter (***ORIGINAL***)
16. Spreadsheet (***ORIGINAL***)
17. Handwritten Notes, Parametric Weight Study (***ORIGINAL***)
18. Table, Graphs, Comparison of Weight Fractions (***ORIGINAL***)
19. Notes, Graphs, Obsolete Analysis Using WOST = WBST = .08 (handwritten, ***ORIGINAL***)

Subseries 2. Vehicle Concept Exploration and Definition, 1963-2000

Box 2 *Early Shuttle Work, 1969-1974*

Folder

1. Binder, NASA Summary of Manned Spacecraft Center Shuttle Configurations (External H 0 Tanks), NASA-MSC Spacecraft Design Division, Revised March 10, 1972, Revised June 30, 1972, Manned Spacecraft Center, Houston, TX. (key document)
2. Original folder with numerous handwritten tables, charts, notes, circa 1973
3. Landing Penalty Study, 1971-1974
   Item
   1. Landing Subsystem Analysis Notes, October 12, 1971
   2. Landing Subsystem Analysis Notes, handwritten, October 13, 1971 (***ORIGINAL***)
   3. Spreadsheet (***ORIGINAL***)
   4. Table 7-1 Canopy Design Factors
   5. Graph, Figure 2-13, Equilibrium Velocity as a Function of C_DS, Altitude and Weight (***ORIGINAL***)
   6. Handwritten notes, Tank Reentry, February 14, 1974
   7. Spreadsheet (***ORIGINAL***)
   8. Aircraft Landing System (charts, graphs) (***ORIGINAL***)
   9. Graph, 040A – Class Orbiter, December 13, 1971 (***ORIGINAL***)
   10. Spreadsheet (***ORIGINAL***)
   11. Graphs, Landing
   12. Chart, Aircraft Landing System
   13. Notes, Landing Weight, October 18, 1971
   14. Notes, Parachute Landing System (***ORIGINAL***)
   15. Notes, Weight to be Landed (***ORIGINAL***)
   16. Graph, 040C Class Orbiters (15x60 Payload Bay), February 28, 1972
   17. Handwritten Notes, Engine Sizing Perturbations, December 9, 1971 (***ORIGINAL***)
   18. Graphs, Weight, October 19, 1971
   19. Graphs on viewgraph paper
4. Early Shuttle Concepts, 1969-1971
   Item
   1. Proposal for Space Shuttle Carrier Aircraft Study (presentation)
   2. C-5A Space Shuttle Carrier Aircraft Concept Drawings
   3. Manned Space Center Orbiter – 040A, System Definition and Analysis, September 13, 1971 (presentation)
   4. Manned Space Center Orbiter – 040A, Subsystem Definition and Analysis, NASA-MSC, September 13, 1971
   5. Copy of an Article: The Shuttle—A Balancing of Design and Politics by Dale Myers
   6. *Alternate Shuttle Configurations, NASA-MSC, Spacecraft Design*

Division, June 18, 1971, Revised June 23, 1971. (key document)

7. Memo # EX23/6910-252C, October 3, 1969, RE: Reference Launch Trajectory for MSC Shuttle Vehicle with a 3,000,000 Pound Lift-off Weight, To: EX2/Chief, Flight Technology Branch, From: EX23/Head, Flight Performance Section (Paul Thomas)
8. Memo #EX23/6907-1600, RE: Reference Launch Trajectory for MSC Shuttle Vehicle With a 12,500 Pound Payload Capability, To: EX2/Chief, Flight Technology Branch, From: EX23/Head, Flight Performance Section, July 29, 1969
9. Memo #EX23/6909-245C, RE: Performance Study for the 3,500,000 Pound MSC Shuttle Vehicle, To: EX2/Chief, Flight Technology Branch, From: EX23/Head, Flight Performance Section (Paul Thomas), September 30, 1969
10. Memo #EX23/6910-254C, RE: Reference Launch Trajectory for the 3,500,000 Pound MSC Shuttle Vehicle, To: EX2/Chief, Flight Technology Branch, From: EX23/Head, Flight Performance Section (Paul Thomas), October 6, 1969
11. Drawing, Orbiter (***ORIGINAL***)
12. Photo of Shuttle Concept
13. Tables, Structure & Landing Gear, May 7, 1969 (***ORIGINAL***)
14. Tables, System Design Comparison (***ORIGINAL***)
15. Abstract, Bellcom, Inc., TM-69-1013-3, RE: Effects of SOH Sizing on Payload/Gross Weight, and Performance Sensitivity to Core Inert Weights, March 13, 1969
16. Stage & ½, 8MX Weight Statement (***ORIGINAL***)
17. Graph, Effect of Non-Optimum Staging on Payload Capability of Fully Reusable Shuttle Vehicles
18. Technology Influence on the Space Shuttle Development, June 8, 1986 (presentation)
19. Evolution of the Shuttle Design Presentation by Joseph Loftus, March 6, 1986
20. Photocopies of design (2 sheets), undated

5. 040 Series Orbiter – Mark I and II, 1971-1972

<u>Item</u>

1. Geometric Data List, September 13, 1971 (***ORIGINAL***)
2. Memo #EX23/7209-195C, RE: 049 Shuttle Vehicle Performance for Alternate Moment Balance Trajectory Profiles, To: EX2/Chief, Flight Technology Branch, From: EX23/Head, Flight Performance Section (Paul Thomas), September 21, 1972
3. Memo #EW6/71-655, RE: Space Shuttle Vehicle Status – Phase B Extension, To: EK/Manager, Space Shuttle Engineering Office and EX2/Chief, Flight Technology Branch, From: EW/Assistant Chief, Spacecraft Design Division (W. Petynia), January 10, 1972
4. Graph, 040C Class Vehicles (***ORIGINAL***)
5. Table, Series and Parallel Burn Pressure Fed Booster/40C 15 x 60 Payload Bay, February 15, 1972 (***ORIGINAL***)

6. Table, General Dynamics
7. Drawing, Orbiter Configuration (***ORIGINAL***)
8. Table, Contractor. . .(***ORIGINAL***)
9. Pressure FED LOX/Propane Booster/040A Orbiter With HPC Engines
10. Parametric Sizing Approach
11. Tables
12. Engineering Memorandum, Lockheed Missiles & Space Company, #L4-01-01-03-M1-10, RE: Weights Determination for the 040A Mark I and Mark II Vehicles, From: M.L. Vaughn, October 20, 1971
13. Graph, 040A Class Orbiter, December 13, 1971
14. Mark II Systems Matrix
15. Drawing, Orbiter Configuration 040C, January 26, 1972
16. Table, Polar Mission Pressure Fed Booster (***ORIGINAL***)
17. Table, Polar Mission Reusable S-1C (***ORIGINAL***)
18. Table, Polar Mission Pressure Fed Booster (***ORIGINAL***)
19. Table, Polar Mission Reusable S-1C (***ORIGINAL***)
20. Spreadsheet (***ORIGINAL***)

6. Launch Vehicle Development Study (7.71), 1971-2000 – (key documents)

Item

1. Fax, Message # 202, To: MSC/M. Faget and MSFC/ J. Murphy, From HQ/P. Culbertson, July 14, 1971
2. Letter HQ #MT, To: Dr. Maxime Faget, From: Philip Culbertson RE: Copy of Material used to Brief Dr. Fletcher on Space Shuttle Capability/Weight Assessment, August 3, 1971,
3. Space Shuttle Capability/Weight Assessment, presentation by Phil Culbertson to Dr. Fletcher on August 1, 1971 (key document)
4. Memo, To MSC/EA-DIR/Dr. M. Faget, From: MT/Director, Advanced Missions Program (Phil Culbertson), August 3, 1971, (key document)
5. Letter from Phil Culbertson to Mark Craig, RE: Thank you note for copy of his request and Mark's response, May 29, 2000 (***ORIGINAL***)
6. Memo #EX2/7107-228B, RE: Shuttle Capability Buildup Characteristic, To: Distribution, From: EX2/Chief, Flight Technology Branch (Bass Redd), July 26, 1971
7. Charts, Stage Requirements Considered
8. Charts, Issues to be Treated
9. Table, Mission Weight Summary (handwritten, ***ORIGINAL***)
10. Notes, Launch Vehicle Capability/Weight Assessment, August 11, 1971 (***ORIGINAL***)
11. Handwritten Notes, August 3, 1971 (***ORIGINAL***)
12. Graphs
13. Graph, Mark Craig, May 16, 1978 (handwritten, ***ORIGINAL***)
14. Miscellaneous notes and spreadsheets (***ORIGINAL***)
15. Tables, July 23, 1971 (***ORIGINAL***)
16. Chart, Space Shuttle Comparison
17. Magazine article, *Aerospace America*, SSTO Rockets: A Practical Possibility by Ivan Bekey, July 1994

18. Handwritten table, notes, Culbertson, August 10, 1971 (***ORIGINAL***)
19. Numerous tables (***ORIGINAL***)
20. Notes, 2 Stage H202 System (***ORIGINAL***)
21. Table, Matrix of Data Out Put
22. Numerous graphs (***ORIGINAL***)
23. Numerous viewgraphs
24. Handwritten sizing equations derivation
25. Handwritten notes, Booster, Orbiter, and Data Sheet for 1st and 2nd Stage/Injected Wt., undated

7. Binder, NASA Space Shuttle Program Request for Proposal, No. 9-BC421-67-2-40P *(key document)*

Box 3 *Trajectory/Sizing Models (includes Numerical Techniques), 1963-1973*

Folder

1. Binder, Space Shuttle Synthesis Program (SSSP), Volume I, Part I, Engineering and Programming Discussion (w/mods) Final Report, Part 2 – Program Operating Instructions (w/mods) and Part 3 – Program Output (w/mods), General Dynamics, Report No. GDC-DBB70-002, Contract NAS 9-11193, 1970 *(key document)*
2. Aerospace Vehicle Synthesis Program, The Aerospace Corporation Report No. ATR-73(7313-01)-5, September 1972
3. Marshall Space Flight Center, A Study on Optimal Trajectory Programming, by Rowland Burns, MTP-P&VE-F-63-2, January 2, 1963
4. Summary Report No. MSC-01261, Weight Estimating and Forecasting of Manned Space Systems During Conceptual Design, November 1970, Marietta Corporation, Denver, CO, November 1970
5. Space Shuttle Sizing Synthesis Program (SSSP)
   Item
   1. Current Inventory of Fluids and Propellants Table (***ORIGINAL***)
   2. Propulsion Parameters, January 16, 1973 (outline, handwritten, ***ORIGINAL***)
   3. Table, SSSP Common Block Allocation (***ORIGINAL***)
   4. Spreadsheets (***ORIGINAL***)
   5. Letter from Langley Research Center, RE: Correction to SSSP Program, To: Mark Craig, From: 152A/Aero-Space Technologist, Dynamic Analysis Section, Theoretical Mechanics Branch, FDCD (Timothy Rau), April 4, 1972, (***ORIGINAL***)
   6. Document, Launch Vehicles and Launch Vehicle Interfaces
   7. Graphs, Tables (***ORIGINAL***)
6. Report, Grumman Weight Control, No. WT-996R-106, February 16, 1970
7. Report, Grumman Aerospace Corp., No. WT-996R-105, Earth Orbital Wing Weight Study, February 16, 1970
8. General Formulation of the Iterative Guidance Mode, by I. E. Smith, NASA TM X-53414, March 22, 1966

Box 4 Trajectory/Sizing Models (includes Numerical Techniques), 1971-1986

Folder
1. Industry Experience as Considered by NASA in Shuttle Program Definition, 1971
2. Space Shuttle Program Integration Meeting, February 6, 1974 ("presentation made by Shuttle Program Manager, Bob Thompson to explain the program's management approach to his management team")
3. Evolution of Shuttle Design and Technology Influence, 1986
   Item
   1. Evolution of the Shuttle Design, by Joseph P. Loftus, Jr., March 6, 1986
   2. Technology Influence on the Space Shuttle Development, June 8, 1986
4. Blue folder, "Numerical Methods," graphs and tests ("FMFP Test on Rosenbrock's Valley," "Hooke and Jeeves Test," and "Golden and Aitken," circa 1971

Subseries 3. Solid Rocket Booster (SRB) Staging System Development, 1971-2014

Box 5 *Manned Spacecraft Criteria and Standards, 1971-1980*

Folder
1. Manned Spacecraft Criteria and Standards (JSCM 8080) April 26, 1971 Change 9, February 1, 1980
2. Space Shuttle Separation System Data Book, SDM Baseline, SD73-SH-0180H, Part 1 of 2, September 1980 (key document)
3. Binder, SEP Test Scaling, Technology Studies (key document)

Box 5a *Space Shuttle Program Overview, Three Body SRB Staging Math Model Formulation and Staging Support, 1974-2014*

Folder
1. Brochure, NASA, Space Shuttle Program Overview, June 1974; 2 small posters; "A Promising New Ear for Earth: Space Shuttle Transportation System," Rockwell International, Space Systems Group, and unmarked Shuttle poster, undated
2. Three Body SRB Staging Math Model Formulation, undated
   Item
   1. Binder marked, "Staging 3 Body SRB Separation Program – Formulation, M.K. Craig," includes notation, undated
   2. Small blue folder, includes notes, "Main Engine Servo Actuator Model

(GMDACT)" information, and "Simulation of three Rigid Bodies as one in the SVDS" information, undated

3. Binder, SRB Staging Math Model – Input Data and Coordinate Systems, binder also includes notations; MSC Internal Note No. 70-FM-121, Trajectory Prediction Parameters for Skylab, Space Station/Space Shuttle, and Interplanetary Missions, Revision 1, Revised by Ronnie R. Lanier; and JSC Internal Note – Quaternions for Control of the Space Shuttle, April 1976
4. Final SRB Separation Panel Meeting, (DDT&E) includes 2 memos and a small NASA card with an image of the Space Shuttle (U.S. Government Printing Office, 1975), folder dated 1982
5. SRB Staging Support to SLS Launch Vehicle, includes correspondence with Bandu N. Pamadi, and a diagram, 2013-2014

Box 6 *Software and I-load Changes, Equations and Supporting Material, 1977-1982*

Folder

1. Software and I-load Changes, 1983

   Item

   1. Internal Letter, Rockwell International No. AS-GN&C/83-269, RE: Final Recommended Values of the Solid Rocket Booster Separation Sequence I-loads, To: J. Almanza, ST&S Group Engineering, From: K. Elchert, March 21, 1983
   2. Internal Letter, Rockwell International No. AS-GN&C/83-293, RE: CR's to Change Solid Rocket Booster Separation Sequence I-loads Values, To: J. Almanza, ST&S Group Engineering, From: K. Elchert, June 24, 1983
   3. Memo #FR42-83-97, RE: BFS I-Load Version Definitions for STS-8, STS-9, STS-10, and STS-12, To: Distribution, From: FR/Chief, Spacecraft Software Division (John Aaron), July 26, 1983
   4. Memo #FR24-83-60, RE: I-Load Version Definitions for STS-8, STS-9, STS-10, and STS-11, To: Distribution, From: FR/Chief, Spacecraft Software Division (John Aaron), June 27, 1983
   5. Memo #FR24-83-53, RE: JSC Owner Audit of STS-10 Primary I-loads, To: Distribution, From: FR/Chief, Spacecraft Software Division (John Aaron), May 20, 1983
   6. Memo #FR24-83-56, RE: BFS I-load Version Definitions for STS-7, STS-8, STS-9, and STS-10, To: Distribution, From: FR/Chief, Spacecraft Software Division (John Aaron), May 27, 1983
   7. Orbiter Software Change Request, CR # 59832 RE: Backup Solid Rocket Booster Separation Time Values, Mark Craig, June 9, 1983
   8. Memo #FR24-83-54, RE: I-load Version Definitions for STS-7, STS-8, STS-9, and STS-10, To: Distribution, From: FR/Chief, Spacecraft Software Division (John Aaron), May 20, 1983
   9. Article: Getting the Job Done Right by Hyman G. Rickover
   10. Internal Letter, Rockwell International No. AS-GN&C/83-269, RE: Final Recommended Values of the SRB Separation Sequence I-loads, To: J. Almanza, From: K. Elchert, March 21, 1983

2. Rate Inhibit, 1977-1982

Item

1. Draft letter to Reid
2. Memo # CB-77-067, RE: A Discussion of Crew Responsibilities and Concerns Regarding SRB Staging, To: Distribution, From: CB/Don Peterson, June 10, 1977
3. SRB Separation Inhibit Plan, SRB Separation Panel, November 30 and December 1, 1982 presented by D. E. Denison, Rockwell International (presentation)
4. Body Rate Inhibit Notes/Diagrams (handwritten, ***ORIGINAL***)
5. Bar Graph, Inhibit Box Evaluation, AFT Bottom Strut SEPDST (handwritten, ***ORIGINAL***)
6. Nominal SEP Systems Table
7. Table, STS-2 Gimbal Study, September 24, 1981
8. Internal Letter, Rockwell International No. AS-GN&C/82-257, RE: Preliminary Investigation of SSME Gimbal and FCS Filter Initialization Methods for SRB Separation Simulations, To: D. Denison, From: K. Elchert, February 9, 1982
9. Graphs, SSME Gimbal Envelopes
10. Graphs, Solid Rocket Booster Separation Inhibit Study, September 17, 1979 (handwritten, ***ORIGINAL***)
11. Tables, Gimbal Initialization Study
12. Internal Letter, Rockwell International No. IGNCV/79-345, RE: Off-line Verification of Proposed SRM Separation Inhibit Body Rate Limits for STS-1, To: R. Lyford, From: K. Elchert, October 18, 1979
13. Internal Letter, Rockwell International No. IGNCV/79-346, RE: Body Rate Limits for Solid Rocket Booster Separation Inhibit on STS-1, To: R. Lyford, From: K. Elchert, October 18, 1979
14. Solid Rocket Booster Separation Inhibit Issues/Concerns, Task No. SRB-004, March 8, 1982 (document)
15. Solid Rocket Booster Separation Inhibit presentation by Mark Craig, March 17, 1981 *(key document)*
16. STS-1 I-Load Determination Procedure and Status presentation by Mark Craig, July 21, 1980
17. Issues Notes (***ORIGINAL***)
18. Internal Letter, Rockwell International No. IGNCV/80-294, RE: Solid Rocket Booster Separation Performance Results for Honeywell Case, To: R. Epple, From R. Lyford, May 2, 1980
19. Modified FCS-10 at Solid Rocket Booster Separation for Computation of Initial SSME Positions, June 18, 1979
20. Table, Sensitivity of SSME Gimbal Angles to Attitude Errors
21. Table, SSME Gimbal Angles as Function of Body Rate (Zero Attitude Errors)
22. Internal Letter, Rockwell International No. AS-GN&C/82-320, RE: Final Investigation of SSME Gimbal Initialization Method for SRB Separation Simulations, To: D. Denison, From: K. Elchert, July 14,

1982

23. Graph, Solid Rocket Booster Separation Inhibit Study, Inhibit Box Evaluation, Yaw Rate = 2 DEG/SEC, Right SRB, September 21, 1979 (***ORIGINAL***)
24. Graph, Solid Rocket Booster Separation Inhibit Study, Inhibit Box Evaluation, Yaw Rate = 0 DEG/SEC, Right SRB, September 21, 1979 (***ORIGINAL***)
25. Graphs, SRM Thrust Mismatch Before SRB Separation, STS-1 thru STS-4
26. Table, RGA Errors Near Separation
27. Body Rate Inhibit Charts/Graphs (***ORIGINAL***)
28. Internal Letter, Rockwell International No. AS-GN&C/82-346, RE: SRM Chamber Pressure (Pc) and P,Q,R Time Histories, To: D. Denison, From A. Aliakbarzadeh, September 20, 1982
29. Internal Letter, Rockwell International No. AS-GN&C/82-075, RE: Stressed Solid Rocket Booster Separation Conditions, To: D. Denison, From: D. Waldron, June 10, 1982
30. Internal Letter, Rockwell International No. AS-GN&C/82-253, RE: Request for Stressed Solid Rocket Booster Separation Conditions, To: G. Carlson, From: D. Denison, January 26, 1982
31. Internal Letter, Rockwell International No. IGNCV/78-252, RE: Preliminary Slid Rocket Booster Separation Inhibit Analysis Results, To: R. Lyford, From: K. Elchert, January 31, 1978

3. Relative Motion Equations, 1980 (4 pages)

Item

1. Solid Rocket Booster Separation Relative Motion Data Reduction, November 5, 1980 (handwritten, ***ORIGINAL***)
2. Solid Rocket Booster Separation DFI Data (handwritten, ***ORIGINAL***)
3. Solid Rocket Booster Relative Motion Data Reduction Equations (Sample), April 30, 1980 (handwritten, ***ORIGINAL***)

4. Binder, STS-1 Final Mission Report Executive Summary, August 7, 1981

Box 7 *Solid Rocket Booster Separation Information, 1978-2000*

Folder

1. IA193 Solid Rocket Booster Separation Aerodynamics Hypercube Interpolator, 1978-2000 (key documents)

Item

1. Envelope with graphs
2. Final Hypercube Interpolator Data Printout, January 4, 1983 (***ORIGINAL***)
3. STS Solid Rocket Booster Separation Aero Data Base, Hypercube Approach, July 18, 2000
4. Solid Rocket Booster Separation Aero Data Base Status, Mark Craig, December 1982 (presentation)

5. Solid Rocket Booster Separation Aero Hypercube Interpolator, presentation, Mark Craig, December 1982 (key document)
6. Alpha/Beta Summation Loop and Hypercube Summation Loop Data Spreadsheet (***ORIGINAL***)
7. Notes
8. Graphs
9. Table (handwritten, ***ORIGINAL***)
10. Conversion of a Point (X*Y*) in Global Coordinates to Local Coordinates, June 12, 1982 (handwritten, ***ORIGINAL***)
11. Generalized Equations (5-D, 32 Corners) (handwritten, ***ORIGINAL***)
12. Equations, June 22, 1982
13. Center Point Back-Solve From Interior Pint (handwritten, ***ORIGINAL***)
14. Finite Element Method in Engineering Science, copy from book
15. AIAA-82-0028, Numerical Solution of Space Shuttle Orbiter Flow Field, AIAA 20th Aerospace Sciences Meeting, Orlando, Florida, January 11-14, 1982
16. Solid Rocket Booster Separation Test IA193 (handwritten, ***ORIGINAL***)
17. Internal Letter, Rockwell International No. AS-GN&C/83-276, RE: IA193 SRB Separation Aerodynamic Data Base Validation, To: J. Almanza, From: H. Morgan, April 4, 1983
18. Functions, Limits, Calculus Equations
19. Internal Letter, Rockwell International No. SAS/AERO/83-113, RE: Substantiation of New Hypercube Interpolator (EMS 290-200-434), To: W. Bornemann, From: H. Dresser, March 9, 1983 (key document)
20. Several loose pages of equations (handwritten, ***ORIGINAL***)
21. Memo # EX32/7807-109, RE: Transmittal of Solid Rocket Booster Separation Aerodynamic Data Base, To: MSFC/SA21/Manager, Engineering Management Office, From: LA2/Manager for Systems Integration, July 21, 1978 (key document)

2. Solid Rocket Booster Separation Summary paper, undated (**ORIGINAL** presentation and photographs (key document)
3. Q̄ Placard and Inhibit, 1978-1983

Item

1. Solid Rocket Booster Separation Inhibit Strategy, Mark Craig, 1983 (handwritten, ***ORIGINAL***)
2. NASA Johnson Space Center Flight Rules Request/Revision, August 27, 1982
3. Solid Rocket Booster Separation Design Criteria Review, Monte Carlo Analysis, D. Gilbert, May 20, 1982 (presentation)
4. Dynamic Pressure Inhibit, Mark Craig, July 21, 1980 (presentation)
5. STS-1 Dynamic Pressure Inhibit, Mark Craig, March 17, 1981 (presentation, **ORIGINAL** – key document)
6. Numerous handwritten notes/equations (***ORIGINAL***)
7. Table, Inhibit Summary, Cycle 2 (handwritten (***ORIGINAL***)

8. Table, q̄ uncertain As A Function of h & V (***ORIGINAL***)
9. Graph, SRB Separation Altitude/Velocity, STS-1 (Cycle 3)
10. Graph, 1963 Patrick AFB Ref. Atmosphere
11. Graph, Atmospheric Density vs Altitude
12. Graph, Density Computation Error, STS-1 h-V Dispersions
13. Article, Atmospheric Density at Altitude
14. Table (***ORIGINAL***)
15. SD72-SH-0105, Volume I, Br 4A, NAV Subsystem, Rockwell International RE: Error Analysis Methods for Ascent Navigation System, March 1979
16. Accuracy of Nav-Derived Dynamic Pressure for the Exponential Atmosphere, May 1, 1980 (document)
17. Dynamic Pressure Uncertainty at Solid Rocket Booster Separation, February 13, 1978 (handwritten equations, ***ORIGINAL***)
18. Graph, Actual Dynamic Pressure (***ORIGINAL***)
19. Internal Letter, Rockwell International No. IGNCV/78-259, RE: Dynamic Pressure Limit for SRB Separation Inhibit, To: R. Lyford, From: K. Elchert, February 15, 1978
20. Table 1, Dynamic Pressure at SRB Separation
21. Figure 1, Atmospheric Density Profiles
22. Figure 2, Atmospheric Characteristics—1962 Standard, February 11, 1978
23. Figure 3, Density Departures from On Board Exponential Model
24. Figure 4, On Board Indicated vs Actual Dynamic Pressure, February 11, 1978
25. Figure 5, Minimum Actual Dynamic Pressure at Which SRB Separation May Be Inhibited for Indicated Dynamic Pressure Limit of 63 PSF and –3T Density Departure from On Board Model vs h
26. Appendix I, Derivation of Equations for the Exponential Atmosphere
27. Appendix II, On-Board Density Calculations Approximating The Exponential Atmosphere
28. Appendix III, Dynamic Pressure Uncertainty, February 8, 1978
29. Appendix IV, Indicated vs Actual q̄
30. Internal Letter, Rockwell International No. IGNCV/78-257, RE: Revision to I-Load Values for the Solid Rocket Booster Sequence (4.115), To: J. Kluth, From: R. Lyford
31. Graph, Staging Dynamic Pressure (handwritten, ***ORIGINAL***)
32. Internal Letter, Rockwell International No. FSD&P/MAI-82-038, RE: Reduced Dispersed Dynamic Pressure at SRB Staging – Corrected Data, To: B. Bejmuk, From: P. Harding, January 13, 1982
33. Orbiter Software Change Request # 59151A, RE: Solid Rocket Booster Separation QBAK Inhibit Limit, June 3, 1982
34. Nav-Derived q̄ Error Expansion (equations, graphs)
35. Table, Nav-Derived q̄ Uncertainty Data (VAFB) (handwritten, ***ORIGINAL***)
36. Internal Letter, Rockwell International No. AS-GN&C/81-277, RE:

Dispersed Dynamic Pressure at Solid Rocket Booster Separation, To: W. Norton, From: D. Denison, August 13, 1981

37. Graph (handwritten, ***ORIGINAL***)
38. Internal Letter, Rockwell International No. AS-GN&C/81-277, RE: Dispersed Dynamic Pressure at SRB Separation, To: W. Norton, From: D. Denison, August 13, 1981
39. Internal Letter, Rockwell International No. AS-GN&C/82-304, RE: SRB Separation Dynamic Pressure Inhibit Limit Change Request, June 22, 1982
40. Solid Rocket Booster Separation Dispersed Dynamic Pressure, SIR Walk-on No. 2, Rockwell International, June 10, 1982, (presentation)
41. Table, QSTG (***ORIGINAL***)
42. Graph, STS-1, 2, 3, 4, 9
43. NASA JSC Flight Rules Request/Revision, December 14, 1981
44. Internal Letter, Rockwell International No. FSD&P/MAI-81-905, RE: Reduced Dispersed Dynamic Pressure at SRB Staging, To: B. Bejmuk, From: P. Harding, September 23, 1981
45. RD 1898 SRB SEP QBAR Inhibit Limit, Rockwell International (presentation)
46. Memo # LA2-82-116 with Enclosures, August 20, 1982, RE: Contract NAS 9-14000, Minutes of August 11, 1982, SIR
47. Presentation, SRB Separation Dynamic Pressure Constraints, Mark Craig, December 9, 1980

4. Solid Rocket Booster Separation Schlierens and Oil Flows (41 photographs and negatives)
5. Solid Rocket Booster Shadowgraph
6. Separation Shadowgraph
7. Jet Scaling Parameter Verification (PCIN 21237), 1982

Item

1. Abstract: Evolution of the Wind Tunnel Test Program for Space Shuttle Orbiter Jet Interaction Upon Entry and Comparison of Predictions With Flight Test Results. A paper by David Kanipe and Barney Roberts
2. Document, Effects of Model Scale and Jet Gas Properties on Jet Integration Simulation
3. Graphs, Charts, Definition of SRB Plume Simulation Error
4. Charts, Increase Dynamic Pressure at Solid Rocket Booster Separation on STS-8, PRCB, September 24, 1982 (handwritten, ***ORIGINAL***)
5. Internal Letter, Rockwell International No. AS-GN&C/82-305, RE: Assessment of Proposed SRB Separation Dynamic Pressure for STS-6 (PCIN 21237), To: D. Denison, From: K. Elchert, June 22, 1982
6. Space Shuttle Program Level II Change Request, PCIN # 21237 RE: Increase Dynamic Pressure at SRB Separation on STS-6
7. Chart, Uncertainties Associated with Aero Extracted From Flight

Measurements, April 29, 1982
8. Graphs (handwritten, ***ORIGINAL***)
9. SRB Separation Cases Description, Increased Staging $\bar{q}$ Assessment (presentation)
10. Internal Letter, Rockwell International No. AS-GN&C/82-362, RE: Effects of Aerodynamic Uncertainties on Vehicle Dynamics During SRB Separation, To: D. Denison, From: H. Morgan, October 26, 1982
11. Graph (handwritten, ***ORIGINAL***)
12. Table, SRB SEP $\bar{q}$ (handwritten, ***ORIGINAL***)
13. Presentation, Adaptive First Stage Engine Out Pitch Biasing Improves RTLS Staging Conditions (***ORIGINAL***)
14. Table, STS-4 O/ET Aero Extraction
15. Internal Letter, Rockwell International No. AS-GN&C/82-298, RE: Evaluation of PCIN 21237, To: R. Thiel, From: D. Denison, June 17, 1982
16. SIR Action S-06-10, PCIN 21237A, Increase STS-8 Staging $\bar{q}$ to 45 PSF (charts, ***ORIGINAL***)
17. Propulsion Forces at SRB Separation, April 27, 1982 (document)

8. Solid Rocket Booster Separation Tasks and Issues, circa 1981

Item

1. Presentation by Mark Craig, Integration SRB Separation System, March 3, 1981
2. Presentation, Shuttle Separation System Tasks/Issues in the Transition to OPS (handwritten, ***ORIGINAL***)
3. Remaining Solid Rocket Booster Separation tasks (document, handwritten, ***ORIGINAL***)
4. Separation Issues (tables)
5. Table, SRB Separation Tasks Remaining (Other Than Those in FY 83 Fact Finding) (handwritten, ***ORIGINAL***)
6. Separation Issues (document, handwritten, ***ORIGINAL***)
7. Separation Subsystem Manager Responsibilities (handwritten, ***ORIGINAL***)
8. Outline, Remaining Solid Rocket Booster Separation Tasks
9. Numerous charts, tables (handwritten, ***ORIGINAL***)
10. Table, Fact Finding Separation Tasks (***ORIGINAL***)

9. Sequence Timing, 1980-1983

Item

1. Memo Marshall Space Flight Center # EL24 (82-96), RE: SRM Tailoff Characteristics Update w/Enclosures, To: EL24/J. Redus, From: EL24/W. Bailey, June 21, 1982
2. Graphs, ETR Worst Case Cold 3 Sigma Thrust Differential Curve
3. Internal Letter, Rockwell International No. AS-GN&C/83-269, RE: Final Recommended Values of the SRB Separation Sequence I-Loads, To: J. Almanza, From: K. Elchert, March 21, 1983
4. Internal Letter, Rockwell International No. FSD&P/MAI-80-950, RE: Recommended SRB Backup Timer Settings, To: Reid Lyford, From:

B. Hardy, November 19, 1980

5. STS-1 I-Load Determination Procedure and Status Presentation by Mark Craig, July 21, 1980 (ORIGINAL) – (key document)
6. Internal Letter, Rockwell International No. AS-GN&C/82-361, RE: Recommended Values for Maximym SRM Thrust at SRB Separation and Separation Sequence I-Loads, To: D. Denison, From: K. Elchert, October 22, 1982
7. Internal Letter, Rockwell International No. AS-GN&C/82-316, RE: End-to-End SRB Separation Time Delay, To: D. Denison, From: C. Pittman, July 2, 1982
8. Chart, Proposed Solid Rocket Booster Separation Sequence Timing
9. Internal Letter, Rockwell International No. AS-GN&C/82-325, RE: Final Re-Evaluation of Maximum SRM Thrust at SRB Separation, To: D. Denison, From: H. Morgan, July 19, 1982
10. Internal Letter, Rockwell International No. AS-GN&C/82-276, RE: Preliminary Re-Evaluation of Maximum SRM Thrust at SRB Separation, To: D. Denison, From: H. Morgan, April 16, 1982
11. Graphs, Relative Thrust-to-Weight Ration vs Residual SRB Thrust, March 25, 1982

10. Space Shuttle Clip Art, circa 1982
11. Solid Rocket Booster Separation System Photographs, Pre-flight, 1982 (3 photographs, key documents)
12. Solid Rocket Booster Separation System Photographs, Post-flight, 1982 (4 photographs, key documents)

Box 8 *Space Shuttle Solid Rocket Booster (SRB) Separation Aerodynamic Database Print Outs, circa 1982 (key documents)*

Item

1. Space Shuttle Solid Rocket Booster (SRB) Separation Aerodynamic database print out (key document)
2. Space Shuttle Solid Rocket Booster (SRB) Separation Aerodynamics Uncertainty database print out (key document)

Subseries 4. Return-to-Launch-Site Abort Propellant Dynamics Math Model Development, 1978-1979

Box 9 *Analysis and Test for Space Shuttle Propellant Dynamics Information, 1978-1979*

Folder

1. Interim Report, Analysis and Test for Space Shuttle Propellant Dynamics (1/60th Scale Model Test Results), Martin Marietta, March 1978
2. Interim Report, Analysis and Test for Space Shuttle Propellant Dynamics

(1/10th Scale Model Test Results), Volume II, May 1979

3. Interim Report, Analysis and Test for Space Shuttle Propellant Dynamics (1/10th Scale Model Test Results), Volume I, May 1979
4. Binder, Orbiter/ET OFT-1 RTLS Separation Boundaries, et al (includes photographs)
5. Reel of film and slides containing: 2 analytical simulations, drop tower in operation, KC-135 hand-held, Comparisons (5 10% bare DT, 1.2 10% bare KC-135, 7 10% baffled DT, and 2.7 10% baffled KC-135), 1.2 10% bare KC-135, 5 10% bare DT, 22 15% bare DT, 9 2% bare DT, 21 5% bare DT with finite element simulations, AIAA SDM Conference, NAS9-15302, Mark Craig, 1981
6. KC-135 0-g test photographs, 1978 (10 photographs)

Subseries 5. Debris Mitigation and Launch/Landing Inspection Red Team, 1981-1987

Box 10 *Debris Mitigation and Launch/Landing Inspection Red Team Information, 1981-1987*

Folder

1. Debris Summary paper, circa 1983-1987
   Item
   1. Numerous NASA photographs
   2. Evaluation of SRB Separation Motor Cover Anomaly Relative to TPS Tile Damage, STS-9, December 7, 1983, Revised January 24, 1984, Rockwell International, prepared by A. Richardson and J. Chou
   3. Shuttle Launch Debris Sources, Consequences, Solutions, Mark Craig (presentation, **ORIGINAL**, key document)
   4. Shuttle Debris Requirements and Control Procedures, S.I.M.R. June 3, 1987, Jack McClymonds and Al Richardson with Rockwell International (presentation)
2. Photographs (7) of general launch pad layout
3. Photographs (16) making up panorama of Shuttle on the launch pad
4. Photographs (52) of pre-launch inspection of tanked Shuttle launch vehicle (key documents)
5. Red Team photographs (40)
6. Photographs (6) of post-launch inspection (key documents)
7. Landing inspection photographs (23) and President Reagan itinerary
8. Debris Team people and action photographs (9)
9. STS-1 Debris
   Item
   1. STS-1 Damage Experience, Engineering Analysis Division, Mark Craig, June 25, 1981 (presentation)
   2. STS-1 Assessment of TPS Tile Damage Caused by Launch/Ascent Debris, Engineering Analysis Division, Mark Craig, May 20, 1981 (key document)

3. STS-1 Thermal Protection System Post-Flight Assessment (presentation)
4. Preliminary TPS Damage Summary, May 14, 1981 (table, ***ORIGINAL***)
5. STS-1 Impact Debris Assessment (presentation)
6. Internal Letter, No. 399-WHF-81-019, RE: STS-1 TPS Debris Damage Team Inspection of OV-102 at DFRC, To: Distribution, From: W.H. Frohoff, STS Development & Production Division, April 21, 1981
7. OV-102 Post FRF TPS Inspection Summary (presentation)
8. Cridell's Meeting with Team, handwritten notes (***ORIGINAL***)
9. Listing of Tiles, name and location
10. Observations, Rockwell International (presentation)
11. Drawing (hand-drawn, ***ORIGINAL***)
12. Tile Damage Data – Flight STS-1, Rockwell International, April 27, 1981, (document)
13. Body Flap Tile Drawing
14. Index to TPS Drawing Showing STS-1 Debris Damage, May 7, 1981
15. TPS OV-102 STS-1 Flight Related Tile Damage, Rockwell International (***ORIGINAL***)
16. Damage Data – OV-102 TPS Tile, A. Richardson, April 17, 1981
17. STS-1 Tile Debris Damage Issues DDT&E, Rockwell International (chart)
18. Tile Damage Drawings (several, ***ORIGINALS***)
19. Columbia STS-1 Postflight TPS Contamination/Damage Chemical Findings, Rockwell International Laboratories and Test, Eric Peterson (presentation)
20. Internal Letter, No. 098-424-0017, RE: STS-1 Postflight Analysis, To: W. Frohoff, STS Development & Production Division, From: S. Kritzer, STS Development & Production Division, May 7, 1981 (***ORIGINAL***)
21. STS-1 Post Flight Samples – Spectrographic Analysis, Rockwell International (presentation)
22. Internal Letter, No. 070-SYY-81-034, RE: STS-1 TPS Laboratory Samples, To: Distribution, From: S.Y. Yoshino, STS Development & Production Division, April 27, 1981
23. Space Shuttle Program Requirements Control Board Directive-Level II, No. S00868C RE: Provide SOFI Ice/Frost Protection to LO_2 and LH_2 Intertank Splices
24. Space Shuttle Program Requirements Control Board Directive-Level II, No. S42877C, RE: STS-1 Assessment of TPS Tile Damage Caused by Launch/Ascent Debris
25. STS-1 Ice/Frost and Debris From ET, MSFC/Farouk Huneidi, May 1981 (presentation, ***ORIGINAL***)
26. Table 7 Evaluation – Crater Damage Candidates Based On Impact Velocity (table)

27. Orbiter Tile Damage – Zone 1 SOFI Debris, Rockwell International (table)
28. Evaluation – Impact Damage to TPS OV-102, STS-1, by A. Richardson, L. Santo, Rockwell International, May 7, 1981
29. TPS Damage Summary Notes and Rationale (document, ***ORIGINAL***)
30. STS-1 Aeroheating ET DFI Island Locations, Rockwell International (presentation)
31. Table, Damage and Potential Damage Agents, Handwritten (***ORIGINAL***)
32. STS-1 TPS Ding/Gouge Candidate Debris Sources (diagrams)
33. Impact Damage Summary Table (***ORIGINAL***)
34. "Significant" Ascent Debris Damage Map, hand-drawn documents (***ORIGINAL***)
35. Proposed Debris Team Recommendations, May 14, 1981 (presentation, ***ORIGINAL***)
36. Table, Preliminary TPS Damage Summary, May 14, 1981 (***ORIGINAL***)
37. Table, Preliminary TPS Damage Summary (***ORIGINAL***)
38. Spreadsheet (***ORIGINAL***)
39. Miscellaneous photographs
40. STS-1 Debris Transport Parameters (document, ***ORIGINAL***)
41. NASA/DFRC Report Data on STS-1 Landing/Rollout advance copy from Bill Frohoff, April 24, 1981
42. Table, Velocity at Window, Distance Travelled, Rel. Acc. (***ORIGINAL***)
43. Summary, STS-1 Debris & Tile Damage Evaluation, Rockwell International, Prepared by H. Dresser, J. McClymonds, A. Richardson and L. Santo, May 1981
44. Debris Photos listing (***ORIGINAL***)
45. STS-1 Orbiter TPS Damage Launch and Ascent Debris Assessment, KSC, R. Rhodes, May 15, 1981 (presentation)
46. Memo # EX, RE: Launch debris Analysis, To: LA/Manager, Space Shuttle Program Office, From: EX/Technical Manager for Shuttle Flight Performance (Bass Redd), April 16, 1981
47. STS-1 Debris Assessment Team Presentation by Mark Craig, April 28, 1981 (***ORIGINAL***)
48. Level II STS-2 Problems and Concerns, June 3, 1981 (***ORIGINAL***)
49. Summary of STS-1 debris damage, film

Box 11 *Debris Mitigation and Launch/Landing Inspection Red Team Information, 1982*

Folder
1. External Tank Separation Photographs (45) and Slides (6) in Orbit

2. Laboratory Test Report, LTR 23363-4592, Orbiter STS-2 Thermal Protection System Postflight Analysis, March 1982 (photos bound with binder content and not sleeved)
3. Binder, STS-4, June 27 – July 4, 1982, to include Preflight, Postflight Pad, and Orbiter Damage, photographs (photos bound with binder content and not sleeved)
4. Binder, STS-4 Ice Inspection "Red Team," June 27, 1982, to include Nosecap, LOX Tank, Intertank, LH2 Tank ET, SRB Struts, Orbiter, Pad, (photos bound with binder content and not sleeved)

Subseries 6. Post-Challenger Abort/Crew Escape Design History Reconstruction, 1985-1989

Box 12 *Post-Challenger Abort/Crew Escape Design History Reconstruction, 1985-1989*

Folder

1. Challenger Accident
   Item
   1. Article from *Aerospace America*, by Jesse Moore, Associate Administrator for Space Flight, NASA Headquarters, "Grooming the Shuttle for Cost-Effective Access to Space," May 1985
   2. Telegraphic Message from NASA Headquarters, Richard Truly, Associate Administrator for Space Flight, to Distribution, RE: Presidential Commission Recommendations, June 13, 1986
   3. STS-51L Press Release, Statement by RADM Richard Truly with enclosures (memos) by Captain Young, Chief, Astronaut Office
   4. Distribution to Space Station Program Office, June 12, 1986, RE: Caltech News Bureau, Statement by Dr. Richard Feynman, June 10, 1986
   5. GAO Briefing Report to the Chairman, Committee on Science, Space, and Technology, House of Representatives, Space Shuttle Accident, NASA's Actions to Address the Presidential Commission Report, October 1987
   6. Memo HQ# M, RE: Strategy for Safely Returning the Space Shuttle to Flight Status, To: Distribution, From: M/Associate Administrator for Space Flight (Richard Truly), March 24, 1986
   7. Report to the President by the Presidential Commission on the Space Shuttle Challenger Accident, Report at a Glance, June 6, 1986
   8. Report to the President, Actions to Implement the Recommendations of the Presidential Commission on the Space Shuttle Challenger Accident, Executive Summary, July 14, 1986
2. Ascent Abort & Crew Escape History, 1986-1987
   Item
   1. NSTS Ascent Abort and Crew Escape Capabilities, presented by Craig at request of: Administrator Jim Fletcher and Department

Administrator Dale Myers, after Challenger Accident, March 16, 1987 (2 copies)

2. Crew Escape Activities, April 1986 – Present by Steve Nagel, March 6, 1987
3. Memo # GA-87-023, RE: Crew Escape Briefing, To: Distribution, From: GA/Deputy Director, National STS Program (Richard Kohrs), February 19, 1987
4. Presentation by Barney Roberts, April 13, 1986, Report of the First Stage Abort Options History Task Group Chartered by The Mission Planning and Operations Team
5. E-mail note from James Bevis to Marina Benigno, RE: Visitor Center and Prop Test BLI
6. Informal Note to Arnie Aldrich and Don Puddy, RE: Crew Escape Briefing (***ORIGINAL***), February 15, 1987
7. NSTS Ascent Abort and Crew Escape Capabilities presentation by Mark Craig to Administrator James Fletcher, March 16, 1987. Results of a study initiated at his request. (**ORIGINAL**, key document)

3. Extended Duration Orbiter and Shuttle Evolution – Astronaut Office (Frank Culbertson), 1988-1989

Item

1. Preliminary STS Flight Delay Data, September 2, 1988
2. STS Launch Delays by System
3. STS Evolution Goals
4. Crew Escape Options for a Block II Orbiter, Kevin Templin, Advanced Programs Office and Bill Petynia, Eagle Engineering, July 11, 1988
5. Shuttle Evolution, Briefing to Dr. Fletcher (Draft), Johnson Space Center, August, 1988
6. EDO Update, July 28, 1988
7. Shuttle Evolution Status and Plans, Briefing to the NASA Administrator, by Charles Teixeira, Chief, Systems Definition Branch, NASA Johnson Space Center, September 8, 1988
8. Memo #DF6/89-12, RE: Trip Report – Shuttle Evolution Meeting, To: DF 6/Chief, Guidance and Propulsion Systems Branch, From: DF65/M. A. Coil and M. R. Jenkins, February 24, 1989
9. Shuttle Evolution Crew Cabin/Escape Vehicle, Davis Aerospace Company, Drawn By: Solar Smith, October 26, 1988
10. Shuttle Evolution Study Meeting at Marshall Space Flight Center
11. Evolution Strategy, Avionics Systems Division, Kenneth J. Cox, August 1988
12. Memo #IA-88-29, RE: Human Spaceflight Evolution Study, To: Distribution, From: IA/Manager, New Initiatives Office, August 12, 1988

Subseries 7. Long Duration Orbiter Concept Development Team, 1992-1994

Box 12 continued *Long Duration Orbiter Concept Development Team Information, 1992-1994*

Folder
4. Presentation, Feasibility Assessment of Orbiter-Enhanced Space Station Freedom Man-Tended Capability, February 10, 1992 (***ORIGINAL***)
5. Presentation, Space Station Freedom Technical Description, by Larry Crawford, May 27, 1992
6. Presentation, Options for SSF/Mir Programmatic Combinations by Gregg Swietek, Team J, June 8, 1992 (***SENSITIVE***)
7. Color Viewgraphs (3), January 31, 1992
8. "90-Day Orbiter" Assessment Status (***ORGINAL***)
9. Presentation, Long Duration Orbiter Assessment of Options for Space Station Freedom Program, January 21, 1992
10. Presentation, Extended Mission Duration, January 6, 1994
11. Presentation, Feasibility Assessment of Orbiter-Enhanced Space Station Freedom Man-Tended Capability, May 27, 1992 (key document)

Subseries 8. Service Life Extension Program (SLEP), 2003-2004

Box 13 *Service Life Extension Program Documents, 2003*

Folder
1. Shuttle Service Life Extension Program (SLEP) brochures and Integration Panel, 2003
2. Shuttle Service Life Extension Program (SLEP) Management Plan, March 2003
3. Prioritization Tools (SLEP Project Prioritization and Ranking Process), 2003
4. SLEP System Engineering/Integration, October 2003
5. SLEP/ISTP (Integrated Space Transportation Plan), April/May 2003
6. SLEP Tiger Team Final Recommendations, May 29, 2003

Box 14 *Service Life Extension Program, Assessment and Planning, 2003-2004*

Folder
1. SLEP Summit Readiness Assessment, February 12, 2003
   Item
   1. SLEP Panels
   2. Integration Panel
   3. Integration Schedule
   4. Guidance to Panels
   5. Paned Products
   6. New Requirements
   7. Integrated Plan

8. 2020

2. 2004 SLEP Planning

Item

1. Integration Process
2. Guidance/Allocation to Panels
3. Mission Models
4. Safety Panel
5. Sustainability Panel
6. Infrastructure Panel
7. Strategy Panel
8. Integration Panel

Series 2. Apollo-Soyuz Test Project (ASTP) Docking Working Group, 1971-1978

(0.2 cubic feet)

Box 15 *Apollo – Soyuz Test Project*, *1971-1978*

Folder

1. Apollo – Soyuz Test Project, 1971-1978

Item

1. "The Partnership: A History of the Apollo-Soyus Test Project," by Edward Clinton Ezell and Linda Neuman Ezell, NASA Scientific and Technical Information Office, 1978
2. Apollo/Soyuz Test Project, Project Technical Proposal, ASTP 10000, July 4, 1972
3. English Translation of Five Papers Concerning Compatible Rendezvous and Docking Systems Received From USSR Delegation in Moscow on November 29, 1971 (key documents)
4. Apollo/Soyuz Test Project, Technical Requirements for Compatible Docking Systems for the Apollo/Soyuz Test Project, IED 50001.1, January 24, 1973
5. Apollo Soyuz Test Project, The Apollo Soyuz Docking Sequence of Operations for Docking and Undocking, IED 50016, March 21, 1973
6. Document in Cyrillic, Results of Apollo/Soyuz Docking Systems Scale Model Tests, # IED50012, March 19, 1973
7. Apollo Soyuz Test Project Results of Apollo/Soyuz Docking Systems Scale Model Tests, IED 50012, March 19, 1973

Series 3. Space Station Program, 1974-2001

(4.4 cubic feet)

Subseries 1. HQ Task Force Concept Development Group (CDG), 1983-1985

Box 16 Space Station Task Force, 1984-1985

Folder

1. Photograph, Space Station Task Force, NASA Headquarters, Washington, DC, December 1, 1983
2. Program Planning Review with Phil Culbertson, October 14, 1983 (presentation)
3. Johnson Space Center Document #19521, Conceptual Design and Evaluation of Selected Space Station Concepts, Executive Summary, December 1983 (key document)
4. Space Station Program Briefing at Johnson Space Center, January 20, 1984 (presentation)
5. Memo HQ # MFA-13 (JWJ), March 18, 1983, RE: Level A Requirements Revision Date March 10, 1983, To: Distribution, From: MFA-13/Director, Space Station Task Force (John Hodge)
6. Space Station Program Description Document, Space Station System Requirements Document Prepared by the Space Station Task Force Concept Development Group, December 25, 1983 (key document)
7. Task Force Early SSF Policy and Testimony, 1983-1984

   Item

   1. Newspaper clipping, "Freedom's Next Step: Four Great Goals" (no publication information available)
   2. Subcommittee on Science, Technology and Space, Committee on Commerce, Science and Transportation, United States Senate, Statement by John D. Hodge, Director, Space Station Task Force, November 15, 1983
   3. John Hodge's White House Press Conference Statement, January 26, 1984
   4. Presidential Radio Address: Space, Saturday, January 28, 1984
   5. The President's Plan for Space, A Partnership for Progress, Statement for Press Briefing, James M. Beggs, NASA Administrator January 26, 1984
   6. Letter from NASA Administrator James Beggs to Mr. Robert McFarlane, Assistant to the President, National Security Affairs, White House, October 31, 1983 (***SENSITIVE***)
   7. Note to Space Station Task Force Members from Terence T. Finn RE: Draft of Mr. Beggs' Space Station testimony to be given on November 15, 1983 (document)
8. Task Force, 1983-1984

   Item

   1. NASA Headquarters Pictorial Chart, February 1984
   2. Abstract: Historical Review and Current Plans by W. Ray Hook, Head, Systems and Experiments Branch, Space Systems Division, Langley Research Center, Virginia
   3. List of names, addresses, and telephone numbers of fellow CDG'ers,

July 17, 1984

4. *Space News Roundup*, “Reagan gives Space Station go ahead.” Volume 23, Number 3, February 10, 1984
5. Space Station briefing to Diana Hoyt, National Space Caucus and Marsha Smith, Congressional Research Service by Captain Robert Freitag, Deputy Director, Space Station Task Force, November 16, 1983 (presentation)
6. Space Station, February 1984 (presentation)

9. Concept Development Group (CDG) Configuration, 1983

Item

1. CDG Configuration No. 1, View normal to the orbit plane (***ORIGINAL***)
2. Space Station Evolution (***ORIGINAL***)
3. Space Station System Requirements, Section 2.4 Growth Sequence, August 18, 1983 (document, ***ORIGINAL***)
4. Space Station G-Levels, Crew motion is dominant disturbance source, July 11, 1983 (drawing)
5. DRAB Force VS Altitude and Solar Activity (75 KW Station Requirement), Lewis Research Center, September 20, 1983 (graph)
6. Meeting Review, Controllability (#7), July 12, 1983 (document, ***ORIGINAL***)
7. Space Station System Concept, August 1983 (document, ***ORIGINAL***)
8. CDG Concept – Proposed 2 – Segment Module (chart)
9. Memo HQ, July 18, 1983, RE: Briefing to John Hodge on July 15, 1983
10. NASA photographs (35) of Space Station

10. Work Packages/Management, 1983

Item

1. Space Station Definition Work Package, Ray Hook, December 1983 (presentation, key document)
2. Center Director’s Meeting, Space Station Discussion, Goddard Space Flight Center, December 12, 1983 (presentation)
3. Space Station Work Package Development (presentation)
4. Space Station Work Package Development, October 18, 1983, by W. Ray Hook (presentation)
5. Space Station Program Planning Discussions, McDonnell Douglas, September 1983 (presentation)
6. Space Station Procurement Strategies Discussions, Boeing Aerospace, September 30, 1983 (presentation)
7. Considerations on Conduct of Space Station Phase B Definition, General Dynamics Convair, September 28, 1983 (presentation)
8. Space Station Procurement Options, Functional Element Approach Concepts for Discussion, Lockheed, September 29, 1983, (presentation)
9. NASA Procurement Options Briefing to NASA Program Planning Working Group, Rockwell International, September 28, 1983, (presentation)

10. Space Station Management Colloquium White Paper, Space Station Task Force, August 1983 (document)

11. Concept Development Group (CDG) Weights and Cost, 1983-1985

Item

1. Space Station Weight Statement (table), July 15, 1983
2. Informal note from Philip Culbertson to Norm Terrell, September 16, 1983 RE: Memo from Peggy Finarelli on Space Station Funding written September 8, 1983 (document)
3. Handwritten notes/drawing (***ORIGINAL***)
4. Space Station Complexity Factors, Phase 1 deltas, (table) June 29, 1983
5. Phase 0-IV tables, June 29, 1983 (***ORIGINAL***)
6. Space Station Resource Module (1984 dollars in millions), September 15, 1983 (table, ***ORIGINAL***)
7. Chart
8. Ground Rules, Prototype vs Prototype, and Space Station Cost Estimates Summary presentation
9. Space Station FY 1985 Budget, Questions from Senator Garn (document)
10. Status, Space Station Cost Estimate, July 1, 1983 (presentation)

Box 17 *Concept Development Group, 1983-1985*

Folder

1. Concept Development Group (CDG) Weights and Cost, 1983-1985

Item

1. Space Station Weight Statement (table), July 15, 1983
2. Informal note from Philip Culbertson to Norm Terrell, September 16, 1983 RE: Memo from Peggy Finarelli on Space Station Funding written September 8, 1983 (document)
3. Handwritten notes/drawing (***ORIGINAL***)
4. Space Station Complexity Factors, Phase 1 deltas, (table) June 29, 1983
5. Phase 0-IV tables, June 29, 1983 (***ORIGINAL***)
6. Space Station Resource Module (1984 dollars in millions), September 15, 1983 (table, ***ORIGINAL***)
7. Chart
8. Ground Rules, Prototype vs Prototype, and Space Station Cost Estimates Summary presentation
9. Space Station FY 1985 Budget, Questions from Senator Garn (document)
10. Status, Space Station Cost Estimate, July 1, 1983 (presentation)

2. Grumman Configuration, 1983

Item

1. Presentation to Concept Development Group on

Architectural/Configuration Issues, Grumman Aerospace, Ron McCaffrey and Joe Goodwin, August 26, 1983
2. Gravity Gradient Concept IOC, Grumman (presentation, charts)
3. Gravity Gradient Concept – Flight Mode, Grumman (presentation, charts)

3. Boeing, 1983
Item
1. Space Station Architectural and Configuration Evolution, September 14, 1983 (presentation)
2. Space Station CDG Support, September 21, 1983 (presentation)

4. Johnson Space Center Document 19521, Conceptual Design and Evaluation of Selected Space Station Concepts, December 1983 (key document)

5. Concept Development Group (CDG) Configuration Study, 1983-1984
Item
1. Space Station Review to Mr. Culbertson, Associate Deputy Administrator by the Space Station Task Force – NASA Headquarters Concept Development Group, December 1983 – January 1984 (presentation)
2. Space Station Configuration Analysis Summary presentation to Program Manager recommending configuration selection, by Mark Craig, June 12, 1984 (presentation, key document)
3. Fax Cover Sheet to Contractor Offices RE: Memo HQ # MFA, on Configuration Task Ground Rules, To: Distribution, From: Space Station Concept Development Group (Mark Craig), February 14, 1984
4. Power Tower Configuration Features, etc., presented to CDG, Grumman, February 29, 1984, (presentation)
5. CDG Space Station Configuration Workshop, A.A. Sorensen at TRW, February 28-19, 1984
6. Basic Space Station Geometries Charts
7. CDG Configuration Workshop, January 31 – February 2 (presentation, ORIGINAL)
8. Rockwell Critique of NASA Concept Development Group Initial Concept, September 7, 1983
9. Task No. 11 – Configuration and Controllability Status, Mark Craig, December 7, 1983 (presentation)

Box 18 *Concept Development Group (CDG) Configuration Study, Workshop Briefing Charts, Volumes 1, 3, 4, December 5-9, 1983*

Folder
1. NASA Space Station Task Force Concept Development Group, Workshop Briefing Charts, December 5-9, 1983, Volume I (key document)
2. NASA Space Station Task Force Concept Development Group, Workshop Briefing Charts, December 5-9, 1983, Volume III (key document)
3. NASA Space Station Task Force Concept Development Group, Workshop

Briefing Charts, December 5-9, 1983, Volume IV (key document)

Subseries 2. Skunkworks for Phase B Preparation, 1984-1987

Box 19 *Skunkworks and Review of Space Station History, 1984-1987*

Folder

1. Skunkworks Cost, 1984
   Item
   1. Work Package Distribution Summary, July 12, 1984 (presentation)
   2. Comparison of Space Station Cost Estimates to Program Commitment, June 4, 1984 (charts)
   3. Basic Rules of Thumb for Scaling Space Station Costs, 1984 $ in Millions, January 23, 1985 (document)
   4. Space Station Cost Sensitivities (1984 $ in B) (document)
   5. Space Station Cost Analysis Status, June 27, 1984 (presentation, charts)
   6. Enforced Reductions to Obtain an 8.0 B Program, July 26, 1984 (table, ***ORIGINAL***)
   7. Space Station Cost Analysis Baseline, June 27, 1984 (document)
   8. Space Station Design-to-Cost, July 9, 1984 and revised July 19, 1984 (presentation, key document)
2. Review of Space Station History, 1984-1987
   Item
   1. Level B SE&I Presentation to Level A, April 27, 1984
   2. Memo # BY, May 4, 1987, RE: Request for Technical Review of Draft Manuscript – Space Station Monograph and Chronology, To: Distribution, From: BA/Director, Administration (W.R. Kelly) (***ORIGINAL***) Skunk Works
   3. Space Station Engineering Approach Presentation to the Aeronautics and Space Engineering Board, NASA Johnson Space Center, by A.J. Louviere, May 10-11, 1984 (key document)
   4. Lead Engineers Document (***ORIGINAL***)
   5. Interim Systems Engineering Organization Names and Extensions, August 28, 1984 (document)
   6. IOC Space Station, Final, July 13, 1984 (chart)
   7. Space Station Reference Configuration for RFP, Level B Presentation to Level A, by Bass Redd at Johnson Space Center, May 17, 1984, (key document)
   8. Space Station Program Systems Engineering and Integration Plan and Configuration Status, Mark Craig (presentation, key document)

Subseries 3. Concept Definition Phase B, 1974-1986

Box 19 *continued* *ØB Readiness Review, Space Station Program Phase B, 1984-1986*

Folder

3. ØB Readiness Review, 1985 (key documents)
   Item
   1. Space Station Program Office SE&I Phase B Kick-Off, April 22, 1985 (presentation)
   2. Space Station Program Phase B Readiness Review (presentation)
   3. Space Station Configuration Analysis Summary, presentation by Craig to Program Manager, recommending configuration selection, June 12, 1984 (key document)
4. Space Station, November 1984 (presentation)
5. Space Station Configurations and Phase B Studies at Johnson Space Center (1984-1986), Administrative Directorate, JSC-32079, December 1988 (document)
6. Staffing and Organization, 1984-1986
   Item
   1. Staff breakdown by mail code, December 12, 1985
   2. Space Station Level B – SE&I Personnel and Resources Status, November 1984 (presentation, ***ORIGINAL***)
   3. Space Station Program Office Level B SE&I Organizational Concept, September 19, 1984 (key document)
   4. Systems Engineering and Integration Office Organization Chart (presentation)
   5. SE&I Personnel Staffing Status/Requirements, March 1985 (presentation)
   6. Staff breakdown by mail code, September 18, 1986 (document)
   7. Space Station SE&I Operating Approach, Personnel, and Supporting Resources Status, November 28, 1984 (presentation, ***ORIGINAL***)
   8. Space Station Program Office SE&I Organizational Concept, July 1, 1984 (presentation, ***ORIGINAL***)
   9. Memo # PB-84-21M, RE: Systems Engineering and Integration Office Organizational Structure. To: PA/Deputy Manager, Space Station Program, From: PB/Assistant Management for Integration (Norman Chaffee), December 18, 1984
   10. Level B Space Station Office SE&I Staffing Plan, November 12, 1984 (document)
   11. Johnson Space Center Announcement # 85-52, RE: Establishment of New Organizational Elements for Space Station Program Office, April 24, 1985
   12. Memo # PB, RE: SE&I Staff Buildup Plan, To: PB/ Manager, SE&I, From: PB/Assistant Manager, Integration (Norman Chaffee), November 5, 1984
   13. Johnson Space Center Announcement # 85-107, RE: Establishment of New Organizational Elements for Space Station, August 17, 1984

14. Johnson Space Center Announcement #85-111, RE: Establishment of New Organizational Elements for Space Station Projects Office August 17, 1984
15. Systems Engineering & Integration Office Detailee Assignment Dates (document)
16. SE&I Office Staffing for Phase C/D, May 30, 1986 (presentation, ***ORIGINAL***)
17. Level B SE&I Resources (Phase B) (presentation)
18. Memo # PB1-85-034M, RE: Systems Engineering & Integration Staffing Plan, To: PA/Deputy Manager, Space Station Program, From: PB/Manager, SE&I Office (Allen Louviere, signed by Norman Chaffee), April 5, 1985
19. Memo # PB1-85-078M, RE: Putting Two Quarts in a One Quart Container, To: Distribution, From: PB1/Assistant Manager for Integration (Norman Chaffee), July 17, 1985

7. ØB SE&I Process, 1984-1985

Item

1. Space Station Program Level B System Engineering and Integration Plan, March 1, 1985 (presentation, key document)
2. Space Station Program Level B System Engineering and Integration Plan, Space Station Management Council, December 18, 1984 (presentation)
3. System Engineering & Integration Flow Chart (***ORIGINAL*** Hand-written document)
4. Milestone Review Considerations for Space Station Program, JSC 20181, November 1984
5. Level B SE&I Products (presentation, ***ORIGINAL***)
6. Space Station Program/Project Manager's Review, January 25, 1985 (presentation)
7. Space Station Management Council, October 30, 1984 (presentation)
8. ***SEB SENSITIVE***: Level A Review of Space Station SE&I Planning, October 3, 1984 (presentation)
9. SE&I Information Flow Chart
10. Level B/Level C Operating Concept Flow Chart (***ORIGINAL*** hand-written document)
11. Level B/Level C Relationship on SE&I Tasks (presentation)
12. SE&I Tasks Not Identified in RFP (presentation, ***ORIGINAL***)
13. Scope of Systems Engineering and Integration (presentation)
14. Space Station Program SE&I Convergence Process (presentation)

Box 20 *Space Station Mission Requirements and Additional Information, 1985-1987*

Folder

1. User Requirements, 1985-1987

Item

1. Space Station Mission Requirements Report, Station Accommodation Test Sets, September 25, 1985 (document, KSC)
2. Memo HQ # SU, May 1, 1985 RE: Functional Requirements Envelope and Utilization Data Base Release, To: JSC/PA/Manager, Space Station Program, From: S/Associate Administrator for Space Station (Philip Culbertson)
3. Memo HQ, RE: Space Station Utilization, Science and Applications, To: S/Associate Administrator for Space Station, From: E/Associate Administrator for Space Science and Applications, July 9, 1985
4. Status of Micro-g Requirements, August 13, 1985 (presentation, ***ORIGINAL***)
5. Gravity Level Estimates and Effects, Robert Naumann, MSFC Space Station Project Scientist, August 14, 1985 (presentation)
6. JPL D-3891, Lessons for the Space Station: JPL's Perspective on the Shuttle Payload Process, March 1, 1987

2. ISR, July 1986

   Item

   1. SE&I and ISR Planning, Space Station Program / Project Review, May 29, 1986 (presentation)
   2. Major SE&I ISR/RFP Activities, June 23, 1986 (timeline, ***ORIGINAL***)
   3. Memo, RE: Space Station Design Option List (for Level B SE&I) (document, ***ORIGINAL***)
   4. Timeline Spreadsheet, May 21, 1986 (***ORIGINAL***)
   5. Timeline Spreadsheet, April 22, 1986 (***ORIGINAL***)

3. Reference Configuration Updates, December 10, 1985
4. Cycle Zero, 1985

   Item

   1. Space Station Program Level B System Engineering and Integration Plan, January 1985 (presentation)
   2. Cycle Zero Objectives (presentation)
   3. Cycle Zero Kick-Off Roster, January 8, 1985 (document)
   4. Cycle Zero Summary and Assessment, March 25, 1985 (presentation)
   5. Cycle Zero (presentation, ***ORIGINAL***)
   6. Level B Board and Panel Structure (presentation)

5. Interface Req'ts Review (IRR)/Systems Reqt's Review (SRR), 1985-1986

   Item

   1. Space Station Program Systems Engineering and Integration SRR Results and Summary, March 1986 (presentation - key document)
   2. SRR Review – Baseline System (document)
   3. Systems Requirements Review (SRR) SSCB, March 26-27, 1986 (presentation)
   4. Whereda Heckawe?, March 1986 (presentation, ***ORIGINAL***)
   5. Memo # PE3-85-L157, RE: Interface Requirements Review/Systems Requirements Review Plan, To: Distribution, From: PA/Manager, Space Station Program, Neil Hutchinson, December 23, 1985

(document)
6. Systems Requirements Review (SRR) Plan (document, ***ORIGINAL***)
7. Systems Requirements Review (SRR) Plan, February 28, 1986 (presentation, ***ORIGINAL***)
8. Timeline Spreadsheet, May 21, 1986 (2)
9. Scrub Mother Groundrules, March 21, 1986 (document)
10. Representative IRR/SRR Decision Content (presentation, ***ORIGINAL***)
11. IRR/SRR Decision Plan, Timeline, December 1, 1985 (***ORIGINAL***)
12. Revised IRR/SRR Schedule, November 13, 1985 (presentation, ***ORIGINAL***)
13. IRR/SRR Plan, December 3, 1985 (presentation, ***ORIGINAL***)
14. Tuesday Updates to IRR/SRR Plan, December 3, 1985 (presentation)

6. RUR-Z, 1985
   Item
   1. Space Station Program Systems Engineering and Integration RUR-2 Results and Summary, November 1985 (presentation)
   2. Reference Update Number 2, November 21, 1985 (presentation)
   3. RUR-2 Decisions and Process (Revision 1), September 10, 1985 (presentation, ORIGINAL)
   4. Backup, A. Louviere (presentation)
7. NASA Contractor Report 4272, Keeping the Dream Alive: Managing the Space Station Program, 1982-1986. Thomas Lewin and V.K. Narayanan, Contract NASW-4248, July 1990
8. Interface Development, 1986
   Item
   1. Handling Interfaces in an End-To-End System Program, April 1986 (presentation)
   2. Interface Development Approach, February 6-7, 1986 (presentation, ORIGINAL)
   3. Considerations in a Psuedo End-To-End System Program, August 15, 1986 (presentation)
   4. Previous Programs (Space Shuttle Example) (presentation)

Box 21 *Space Station, ØB Photos, Space Station Control Board, 1984-1987*

Folder
1. Space Station, July 1987 (NASA overview of program)
2. ØB Photos - Miscellaneous photographs (30), artist conceptions, and drawings of Space Station, 1984 (folder 1 of 2)
3. ØB Photos - Miscellaneous photographs (28), artist conceptions, and drawings of Space Station, 1984 (folder 2 of 2)
4. Space Station Definition and Preliminary Design, Request for Proposal, September 15, 1984
5. Space Station Control Board (SSCB), November 12-14, 1986
   Item

1. Space Station Program Update, Presentation to Committee on Science and Technology, U.S. House of Representatives, February 10, 1986. Presented by John Aaron, Deputy Manager, Space Station Program Office, Johnson Space Center (key document)
2. Space Station Status to Senate Commerce Committee Staff, presented by John Aaron, November 28, 1984 (presentation)
3. Space Station Status for Richard N. Malow, Chief Clerk, Subcommittee on HUD – Independent Agencies, House of Representatives, August 31, 1984 (presentation)
4. Space Station Program Update, presented by Neil Hutchinson, Manager, Space Station Program, Johnson Space Center, April 15, 1985 (presentation)

Box 22 *Configuration Viewgraphs/Pictures, Line Support to SE&I, Program Plans, and Congressional Relations, 1974-1987*

Folder

1. Configuration Viewgraphs/Pictures – Miscellaneous photographs, artist conceptions, drawings of Space Station
2. Line Support to SE&I, 1985-1986
   Item
   1. Memo # PB4-86-076M, RE: Summary of the Conclusions Drawn from the SE&I Coordination Meeting Between Level B and the Engineering Directorate, To: EZ/Manager, Space Station Engineering Directorate, From: PB4/Manager, Advanced Development Office (Mark Nolan) October 10, 1986
   2. Memo # AA, RE: JSC Policy on Space Station Program/Project Interface with the Line Organizations, To: Distribution, From: AA/Director (Gerald Griffin), May 20, 1985
   3. Memo # KC-85M-62, RE: Plan for the Evaluation and Synthesis of Phase B Contractor Products, To: Distribution, From: KA/Manager, Space Station Projects (Clarke Covington), August 23, 1985
3. TAIM's/TIP's, 1974-1985
   Item
   1. Space Station Control Board Directive – Level B, SSCBD Number BB000022
   2. Memo # PB-85-012M, RE: Technical Area Integration Managers and Panels Directives, To: Distribution, From: PB/Assistant Manager for Integration (Norman Chaffee), February 6, 1985
   3. Space Shuttle Program Directive # 14A, RE: Space Shuttle Systems Integration Reviews, To: Distribution, From: Manager, Space Shuttle Program (Robert Thompson), October 21, 1975
   4. Space Shuttle Program Directive # 28, RE: Guidelines for Space Shuttle Program Panel/Working Group Activities, To: Distribution, From: Manager, Space Shuttle Program (Robert Thompson),

September 10, 1974

4. Documentation Tree, 1986

Item

1. SSCB ISR ACD Ground Rules and Contents, July 15, 1986 (presentation)
2. Space Station Control Board Directive – Level B, SSCBD # BB000074A
3. RFP Applicability, November 11, 1986 (document, ***ORIGINAL***)
4. BCD Groundrules (presentation)
5. SE&I Document Summary, November 20, 1986 (document)
6. Memo HQ, SE, RE: International Program Management and Documentation Interfaces, To: JSC/PA/Acting Manager, Space Station Program Office, From: S/Associate Administrator for Space Station, October 27, 1986
7. Proposed Level B Document Hierarchy (document, ***ORIGINAL***)
8. Space Station Level-B Program Documentation (Candidates for RFP Applicable and Reference Documents), November 8, 1986 (document)

5. Work Package Definition, 1986

Item

1. Space Station Work Package and Systems Integration "CETF Compatible" Option, September 17, 1986, Rev B. (presentation)
2. Presentation to Space Station Management Council, Space Station Work Package Analysis Summary. Presented by John Aaron, April 3, 1986, Rev B.
3. Post D-Day Plan for RFP Products (presentation)
4. Memo, RE: Work Package Directive Update – Rev B, November 11, 1986, (***ORIGINAL***)
5. Memo, RE: Work Package Overlap Dispositions, September 25, 1986
6. Amendment to Work Package Overlap Dispositions, Rev A, July 8, 1986 (document, ***ORIGINAL***)
7. Work Package Overlap Dispositions, Rev C, April 26, 1986 (document, ***ORIGINAL***)
8. Work Package Overlap Dispositions, April 16, 1986 (document)
9. Generic Work Package Overlap Clarifications, April 16, 1986 (document, ***ORIGINAL***)
10. Space Station Program Analysis of Work Package Options Presentation to: Staff, Subcommittee on Space Science and Applications, U.S. House of Representatives, October 30, 1986

6. Program Plans, 1984-1987

Item

1. Program Directive Document # SS-A-PD 2A, RE: Space Station Program Level A Controlled Milestones, From: SB/Business Management Division, October 31, 1984
2. A Space Station Program Plan for Selected Design Parameters, Submitted to the Committees on Appropriations, U.S. House of

Representatives, U.S. Senate, in response to Committee Report language in House Report #99-731, April 1987

3. Space Station Management Plan and Procurement Strategy, Prepared by: Office of Space Station, NASA Headquarters, Washington, DC, December 14, 1984 (key document)

7. Congressional Relations, 1986-1987

Item

1. Memo from Headquarters Newsroom, RE: Release #86-98, Space Station will Increase JSC Manpower Level, July 24, 1986
2. Space Station, July 31, 1986 (document)
3. 99th Congress, 2nd Session, House of Representatives Report. Department of Housing and Urban Development-Independent Agencies Appropriations Bill, 1987, Page 40 referring to NASA
4. Letter to James Fletcher, NASA Administrator from Congressman Michael A. Andrews, July 14, 1986
5. DRAFT- Subcommittee on Space Science and Applications, Committee on Science and Technology, House of Representatives, Statement by Andrew Stofan, Office of Space Station, August 5, 1986 (document, hand-written remarks)
6. Letter to James Fletcher, NASA Administrator from U.S. House of Representatives Committee on Science and Technology Bill Nelson and Robert Walker, October 10, 1986
7. Memo for the Record, NASA Headquarters, October 31, 1986 RE: R. Malow European Trip to Review Space Station International Negotiations, October 20-28, 1986
8. Statements of Andrew J. Stofan, Office of Space Station, NASA, James C. Fletcher NASA Administrator, General Samuel Phillips, USAF, Retired, Congressman Jack Brooks before the Subcommittee on Space Science and Applications Committee on Science and Technology, U.S. House of Representatives, August 5, 1986. Testimony of the Honorable Bill Archer, Subcommittee on Space Science and Applications, Committee on Science and Technology.
9. Statement of Philip E. Culbertson, Associate Administrator, Office of Space Station, NASA, before the Subcommittee on Space Science and Applications Committee on Science and Technology, House of Representatives

8. National Commission on Space, 1985

Item

1. Space Station Reference Configuration Presentation to the National Commission on Space, July 25, 1985, Mark Craig (key document)

9. International Function Allocation, 1985-1986

Item

1. Space Station International Participation Scenarios, Strawman Activity, Executive Summary, Interim Presentation to Phil Culbertson by John Aaron, Deputy Manager, Space Station Program Office, fall 1985

2. NASA photograph, 1986

10. Design to Cost, 1986

Item

1. Space Station Cost Management Process (Design to Cost), PM**2 Meeting, Memphis, TN, by Norman Chaffee, September 2, 1986 (presentation)

11. STS Performance, 1983-1986

Item

1. Memo # PB3-85-034L, RE: NSTS Launch Performance Specifications for Use in the Space Station Program, Phase B, To: Distribution, From: PA/Manager, Space Station Program (Neil Hutchinson), June 4, 1985 (***ORIGINAL***)
2. Memo #TA-86-039, RE: STS Commitment for Space Station Flights, To: NASA Headquarters, M/Associate Administrator for Space Flight, From: GA/Manager, National Space Transportation System (Arnold Aldrich), August 4, 1986
3. Memo #PB2-86-041, RE: NSTS Support of the Space Station Program, To: GA/Manager, National Space Transportation System, From: PA/Acting Manager, Space Station Program (John Aaron), March 25, 1986
4. Memo # LA6-84-L061, RE: STS Performance Commitment, Cargo Restrictions, To: NASA Headquarters, M/Associate Administrator for Space Flight and MS/Director of Space Transportation Support, From: LA/Manager, National Program Office (Glynn Lunney), October 23, 1984
5. STS Performance for Space Station, May 23, 1985 (presentation, ***ORIGINAL***)
6. Memo # ET4/8306-46, RE: Updated Projected STS Lift Capability, To: ET/Chief, Systems Engineering Division, From: ET4/Chief, Systems Integration Branch (Charles Teixeira), June 23, 1983
7. Memo HQ #MFA-13, RE: Direct Insertion Concept, To: Concept Development Group, From: MFA-13/Member, CDG (Jerome Bell), October 12, 1983

Box 23 *ØB Cost Scrub, Level B Study, Ross Committee, and Phillips Committee, 1985-1986*

Folder

1. ØB Cost Scrub, 1985-1986

Item

1. Space Station IOC Development Program Cost and Content Presentation to Level A by John Aaron, February 13, 1986
2. Memo HQ, RE: Space Station Program Cost Estimates, To: JSC, PA/Manager, Space Station Program, From: S/Associate Administrator for Space Station (Philip Culbertson), August 14, 1985

3. Space Station Program Cost Deferral/Reduction Options ("Scrub Mother") Activity presented by John Aaron, November 22, 1985 (presentation, key document)
4. SE&I Non-Prime Cost Estimates, by N.H. Chaffee (presentation), July 24, 1986
5. Informal Memo, RE: Recommended Space Station Program Content, To: J. Aaron, From: J. Hodge, April 15, 1986
6. Memo # PE2-86-L12, RE: Scrub Cycle Two Review, To: Distribution, From: PA/Acting Manager, Space Station Program (John Aaron), April 28, 1986
7. SE&I Non-Prime Costs, by N.H. Chaffee (presentation), July 18, 1986

2. Level B Study, 1986

Item

1. Assembly Sequence Optimization Study Presentation by Mark Craig, Space Station Program Office, August 6, 1986
2. Space Station Program Concerns Presentation by Gordon Fullerton, June 20, 1986 (presentation, ***ORIGINAL***)

3. Ross Committee, 1986

Item

1. Space Station & SE&I Task Force Report To Mr. Andrew J. Stofan, Associate Administrator by L.J. Ross, Chairman, October 14, 1986
2. Letter to Dr. William Graham from Jesse Moore, Director, Johnson Space Center, RE: Realigning Management Responsibilities in the Space Station Program, April 21, 1986
3. Quo Vadis Level B?, August 7, 1986 (presentation, ***ORIGINAL***)
4. Evaluation of Level A' Organizational Options by John Aaron, September 3, 1986 (presentation)
5. Space Station Program Systems Engineering and Systems Integration Contracting and Management Options by John Aaron, September 12, 1986 (presentation)
6. Distribution of Functional Responsibilities and Definition of Staffing Requirements for Systems Engineering and Systems Integration Contracting and Management Options, by John Aaron, September 16, 1986
7. Space Station Program Integration Strawman Task Layout, John Aaron, October 22, 1986
8. Space Station Program Integration Strawman Task Layout, Rev B, John Aaron, November 4, 1986

4. Phillips Committee, 1986

Item

1. Management Review of Space Station Program by General Sam Phillips, June 26, 1986 (presentation, key document)
2. Space Station Program Office Presentation to Phillips Review Committee on May 27, 1986 by John Aaron, Acting Program Manager, (key document)
3. Space Station Program System Engineering and Integration Office

Presentation to Jesse Moore by Mark Craig on May 13, 1986, (key document)

4. Presentation to Space Station Management Review Committee, by Clarke Covington, Manager, Space Station Projects Office, Johnson Space Center, May 27, 1986

Subseries 4. Program Transition to Reston, Virginia, 1986-1987

Box 24 *Transition to Reston, 1986-1987*

Folder

1. Drive to Finish ØB and Transition to Reston, 1986-1987

   Item

   1. Space Station Program Office Systems Engineering and Integration Group presentation by Ray Roberts, February 4, 1987
   2. Space Station Level B Status as of January 29, 1987 (table)
   3. SE&I Transition Activities (table)
   4. Office of Space Station Organization and Program Management, Presented to the Space Station Management Council, January 13, 1987
   5. Memo HQ, RE: Space Station Program Office Staffing, To: Directors of Field Installations, From: A/Administrator (James Fletcher), May 5, 1987
   6. Space Station Program Office Organization Chart, January 12, 1987
   7. Memo HQ #S, RE: Reorganization of the Office of Space Station, To: A/Administrator, Thru: AD/Deputy Administrator, From: S/ Associate Administrator for Space Station (Andrew Stofan), no legible date
   8. Letter to Dr. Aaron Cohen, Director, JSC, from HQ/S/Thomas Moser, Program Director, Space Station Program Office, RE: Transition, January 7, 1987
   9. Space Station Transition Project Status Report, NASA Headquarters, September 12, 1986 (presentation)
   10. Baseline Configuration Document
   11. ACD Responsibilities Document
   12. SE&I Preliminary Design Process Document (***ORIGINAL***)
   13. Level B Priority Activities Document (***ORIGINAL***)
   14. RFP Applicable Documents Table
   15. Performance of the Space Station SE&I Function, by Norman Chaffee, July 14, 1986
   16. Post D-Day Plan for RFP Products (presentation)
   17. Transition Strategy (presentation)
   18. Amendment to Work Package Overlap Dispositions, July 8, 1986, Rev A (document)
   19. Reorganization Effects on Phase B Activities, July 1, 1986 (document, ***ORIGINAL***)

20. Memo HQ# SEG, RE: Work Package Overlay Disposition, To: JSC/PA/Manager for Space Station Program, From: S/Acting Associate Administrator for Space Station (John Hodge), May 13, 1986
21. Memo HQ #SS, RE: Work Package Disposition, To: JSC/PA/Manager, Space Station Program Office, From: S/Acting Associate Administrator for Space Station (John Hodge), June 30, 1986, (fax)
22. Outline, System Engineering and Integration (***ORIGINAL***)
23. Space Station/Transportation Systems Perspectives, by John Aaron, Acting Manager, Space Station Program Office, Johnson Space Center, July 3, 1986 (presentation)
24. Information Memo, RE: SS Cost Management Process, To: N. Chaffee, From: R. Thorson, July 7, 1986
25. Management Review of Space Station Program, presented by General Sam Phillips, June 26, 1986 (presentation, ORIGINAL)

2. National Research Council, Committee on Space Station, 1987

Item

1. Space Station Configuration Chronology (1983-1987), presentation to National Research Council by Mark Craig, July 14, 1987 (key document)
2. Committee on Space Station Members
3. Information Memo, July 8, 1987, RE: NRC Meeting on July 14, To: M. Craig, From: J. Ambrus
4. Letter, National Research Council, Committee on Space Station, to the Honorables Frank Carlucci, William Graham, James Miller, Executive Office of the President, White House, From: Robert Seamans, Chairman RE: June 30 Report of the National Research Council Committee on Space Station, June 30, 1987
5. Memo HQ #SE, RE: NASA Briefing to the NRC, To: Distribution, From: Senior Engineer, Office of Space Station (Dan Herman), April 28, 1987 (fax)
6. National Academy of Sciences – National Academy of Engineering, National Research Council, Committee on Space Station, First Meeting, May 4-5, 1987, Agenda
7. NSTS Upweight Capability and Enhancements, Mark Craig, July 21, 1987 (presentation)
8. Manned Space Station Studies (timeline)
9. MSFC Contracts, MDAC Phase 3 Space Station Studies, Contract No. NAS8-25140 (document)
10. Previous Space Station Studies (Johnson Space Center contracts) (table)
11. Previous Space Station Studies (LRC, KSC, LeRC) (table)
12. Memo HQ #SS, RE: NRC Committee on Space Station Meeting for June 18, 1987, To: Distribution, From: SS/Director, Space Station Program (Thomas Moser), June 11, 1987

13. NASA photographs, transparencies, and negatives (12)
14. Phased Program Task Force Revised Baseline Assembly Sequence Summary (table)
15. Space Station Presentation to The National Research Council's Committee on Space Station by Andrew Stofan, Associate Administrator, Office of Space Station, May 4, 1987
16. Space Station Program Management Presentation to the National Research Council Committee on Space Station by Thomas Moser, Program Director, July 14, 1987
17. NSTS/SS Transportation Study Planning/Status Presentation, July 14, 1987
18. Presentation to National Research Council Committee on Space Station by Thomas Moser, Program Director, May 4, 1987
19. Space Station Study Background (presentation)

3. Post ØB Cost Options, 1986-1987

Item

1. Newspaper Article, San Jose, CA paper, "NASA Chief Says Staff Concealed Space Lab Costs," March 7, 1987
2. Memorandum for the President, from James Miller, Director, Executive Office of the President, Office of Management and Budget, RE: Revised Cost Estimates for the Space Station, February 10, 1987
3. Cost Options Study Presentation from D. Cooke, Level B/SE&I, December 16, 1986
4. Memorandum for the President, From Frank Carlucci, James Fletcher, William Graham, and James Miller, RE: Space Station Cost Estimates
5. Space Station Cost Assessment, presented by Moser to the White House, February 12, 1987 (key document)
6. Space Station Cost Assessment presented by Moser to Graham, February 13, 1987
7. Space Station: Reduced Hardware Options Presentation by John Aaron, Level B, January 22, 1987
8. Growth Path and Cost Considerations for the December 2, 1986, Level B Cost Options Study by D. Weary, Level B/SE&I, January 9, 1987 (presentation)
9. Potential Deletions from the $20.5B Station, December 10, 1986, D. Cooke (document)
10. PMC & International with Phases of BLK 1, 2, & 3 ("Tuesday Option"), January 28, 1987 (presentation)

Subseries 5. Critical Evaluation Task Force (CETF), 1986-1987

Box 25 *Critical Evaluation Task Force, 1986-1987*

Folder

1. Critical Evaluation Task Force photograph, 1986
2. CETF Status
   Item
   1. Critical Evaluation Task Force CETF Charter Presentation
   2. Critical Evaluation Task Force Final Presentation to the NASA Executive Technical Committee by W. Ray Hook, Chairman, September 15, 1986
   3. Findings of the Critical Evaluation Task Force (CETF), September 17, 1986 (presentation)
3. CETF Resource Node Option Engineering Data Book, undated
4. Systems Engineering and Integration Office White Papers, January 30, 1987

Subseries 6. Space Station Freedom Redirection, 1989-2001

Box 26 *Space Station Freedom Redirection, 1989-2001*

Folder

1. SSF Management Options, 1989-1992 (key documents)
   Item
   1. SSP Core Problems
   2. Presentation, Level O-Priorities (option 1)
   3. Administrator Statement (***ORIGINAL***)
   4. Presentation, Option 2 Definition by Doug Cooke, David Brannon, Mark Craig, September 24, 1992 (***ORIGINAL***)
   5. Fax from John Aaron to Mark Craig, Presentation, Space Station Freedom Options for System Integration at MSFC and JSC by John Aaron and George Hopson, August 10, 1989
   6. Outline, Space Station Freedom Program, Alternate Number Four, Retain Reston
   7. Outline, Options III
   8. Notes, Recommended Policy Framework from Administrator (***ORIGINAL***)
   9. Notes, Rationale
   10. Letter to Mr. Aaron Cohen, from Owen G. Morris, September 15, 1992
   11. Outline, Recommended Policy Framework for Administrator
   12. Presentation, Where: Lead Center-Johnson Space Center
   13. Presentation, When: By CDR, but after the November election
2. Roles and Missions Team (SSF Management), 1992 (key documents)
   Item
   1. Handwritten Notes (***ORIGINAL***)
   2. Presentation, Original Level II Planning
   3. Presentation, Space Station Management Option 2 Definition by Doug Cooke, David Brannon, Mark Craig, September 24, 1992
   4. Presentation, Similarities Among Team Approaches (***ORIGINAL***)

5. Distribution list with names and phone numbers
6. Notes, Management Plan Contents
7. Notes, Summary Recommendations
8. Notes, Policy Statement Summary
9. Table, Red Team Activities
10. Article, Senate Appropriations. SSF
11. Outline, SSF Core Problems
12. Outline, The Problem, October 15, 1992
13. Outline, A Fundamental Problem (***ORIGINAL***)
14. Memo HQ # DS (92-040A), RE: Presentation to JSC Management Station Review, To: JSC/KA/Manager, Space Station Projects Office, From: DS/ Deputy Director, Space Station Freedom Program and Operations (Robert Moorehead), October 13, 1992
15. Informal letter to Aaron Cohen from Mark Craig, October 18, 1992
16. Fax to Red/Roles & Missions Team/Mark Craig, from Roy Estess, Director, SSC, RE: Space Station Management Review, October 5, 1992
17. HQ Press Release # 92-214 RE: Management Changes Made to Space Station Program
18. Memo HQ, RE: Phase Two Review of Permanent Presence and Access to Space Issues with an Integrated Team—Amended Charter for Institutional Team on Roles and Missions, To: NASA Review Team Participants, From: AD/Acting Deputy Administrator (Aaron Cohen), August 13, 1992
19. Letter HQ, To: Honorable Bob Traxler, Chairman, Subcommittee on VA-HUD Independent Agencies, Committee on Appropriations, House of Representatives, From: Dan Goldin (NASA Administrator) December 2, 1992
20. Memo HQ# D, RE: Space Station Freedom Management, To: AD/Acting Deputy Administrator, From: D/Deputy Associate Administrator for Space Systems Development (Space Station Freedom) (Richard Kohrs) (***SENSITIVE***), October 13, 1992
21. Proposed Administrator's Policy Statement on Space Station Freedom Management, October 17, 1992
22. Graph, Contract Changes Issued – Cumulative
23. Graph, SSFP Personnel Distribution by Organizational Level (***SENSITIVE***, ***ORIGINAL***)
24. Outline, Need to Clarify The Subject
25. Color Timeline, Space Station Programmatic Events
26. Presentation to Administrator, SSF Management Review Team Results, SSF Management Review Team, October 17, 1992 #4 (**ORIGINAL**, **SENSITIVE**, key document)
27. Backup Charts (***SENSITIVE***)
28. Presentation to Aaron Cohen, Deputy Administrator, SSF Management Review Team Results, #3, October 2, 1992, (***SENSITIVE***, ***ORIGINAL***)

29. Outline, SSF Foundation Plan
30. Presentation, Observations from SSF Data, September 10, 1992
31. Interoffice Memorandum to Claude Graves from Lauri Hansen, RE: Effectiveness of SSF Meetings, May 8, 1992
32. Informal Memo, SSFP Forums
33. Informal Note to Arnie Aldrich from John Aaron RE: Follow Up to Question from last Week
34. Memo HQ, RE: Closeout Activities for NASA Review, Phase II, To: Program Associate Administrators, Mission Review Red Team Leaders, and Institutional and Special Initiatives Team Leaders, From: AD/Special Assistant to the Administrator (Paul Holloway), December 7, 1992
35. Correspondence Regarding WP-02
36. Notes, Management Council at Washington, DC
37. Presentation, Grumman Recommendations for Space Station Freedom Program by T. J. Kelly, October 21, 1992
38. Notes, The Problem, October 15, 1992
39. Notes, Proposed SSF Program Strengthening Actions (***SENSITIVE***)
40. Notes, Space Station Work Package 2 Assessment
41. Notes, Top 25 Program Cost Items Based on POP 92-1 OSSD Recommendation, RY $ in Missions (***NASA SENSITIVE***)
42. Space Station Level I/II Change Request Distribution, CR# BE40677, RE: EPS Operation After Loss of Tier I Communication, May 15, 1992

3. Metrics and Data (SSF Management), 1992-2001

Item

1. E-mail note from Mark Craig to Jerome Bell, RE: Last Minute Changes Dramatically Increased Space Station Costs, August 19, 2001
2. Charts, SSF Management Assessment (***ORIGINAL***)
3. Tables, Space Station Freedom Intersite Deliverables (From July 1992, IDL/S)
4. Graph, Programmatic Metrics
5. Presentation, TBD Resolution Review, July 28, 1992
6. Presentation, Space Station Freedom, LeRC Viewpoint on SSF Program Management, September 1, 1992
7. Outline, “Weight Scrub”
8. Chart, Analytical Integration Structure
9. Charts, Metrics for Management and Integration (***ORIGINAL***)
10. Informal Memo to Mark Craig from Wayne Whittington RE: Metrics for Management and Integration
11. Presentation, Utilization, Interface with Users, Codes C, R, S, and External Process
12. Tables, Historical Program Structures
13. Outline, Meaning of Split System and Element Responsibilities
14. McDonnell Douglas Space Systems Company Organization Chart, September 23, 1992

15. WP-04 Space Station Freedom Directorate Organizational Chart
16. Space Station Projects Organization, August 24, 1992
17. Graph, Space Station Program NASA Directed Contract Milestone Impacts
18. Fax, Space Station Programmatic Events
19. Table, Board Hierarchy, Space Station Freedom, July 17, 1992
20. Chart, The Complexity Exceeds Our Shuttle Experience

Series 4. Mars Rover Sample Return (MRSR) Project, 1988-1990
(0.2 cubic feet)

Box 26 continued *Mars Rover Sample Return Results, 1988-1990*

Folder
4. Committee on Cooperative Mars Exploration and Sample Return Space Studies Board Commission on Physical Sciences, Mathematics, and Resources. (1990). International Cooperation for Mars Exploration and Sample Return, Washington, DC: National Academy Press.
5. Mars Rover Sample Return Results of Pre-Phase A Study, October 4, 1988
6. JSC Document 23230, JSC Pre-Phase A Study, Mars Rover Sample Return Mission, Aerocapture, Entry, and Landing Element, May 1, 1989 (key document)

Series 5. Lunar and Mars Exploration Program, 1987-1990
(0.6 cubic feet)

Box 27 *Lunar and Mars Exploration Program, 1987-1990*

Folder
1. Code Z Folder: Office of Exploration Overview, FY89 Budget Plan, Lunar & Mars Exploration Office presentation cue cards
2. Exploration Task Force of the NASA Advisory Council list of members, April 7, 1989
3. White House press release on fact sheet: Presidential Directive on National Space Policy, Feb. 11, 1988
4. Lunar/Mars Studies, 1988-1990
   Item
   1. Note To: MASE (Craig, Lyneberry), RE: An Informal Note on Aerobraking at Mars, From: Barney Roberts, July 19, 1989
   2. Gateway Options, NASA Office of Exploration, December 7, 1988
   3. Memo ZM-88-1, To: MD/Director, Advanced Program Development, From: Z/Acting Assistant Administrator for Exploration, Subject: Projected Earth-to-Orbit Transportation Support Requirements for Human Exploration Programs, 1988

4. Human Exploration Programs Activities and Status, NASA Johnson Space Center, Office of Exploration, Mark Craig, July 11, 1988
5. NASA Technical Memorandum 4075, Office of Exploration, Exploration Studies Technical Report, Volume 1: Technical Summary, Fiscal Year 1988 Status
6. NASA Office of Exploration, Document No. Z-89-1.0-001, Exploration Management Plan (EMP), Draft Version 1.0, NASA Headquarters, February 7, 1989
7. NASA Johnson Space Center, Office of Exploration, Document No. Z-2.1-002, Study Requirements Document, Fiscal Year 1989 Studies, March 3, 1989

5. Various Power Point presentations: Office of Exploration, 1989 Annual Report Overview, Exploration Planning Status Report, OEXP Management Plan (folder 1 of 2)

Item

1. Mission Analysis System Engineering and Integration (MASE) Fiscal Year 1989 Process Update, Mark Craig, October 14, 1988
2. NASA Office of Exploration, FY88 Exploration Studies Technical Presentation to the Administrator, July 25, 1988
3. NASA Office of Exploration Workshop, Denver, Colorado, Mark K. Craig, Johnson Space Center, October 6-8, 1987
4. NASA Office of Exploration FY90 Budget Presentation to the Administrator, August 17, 1988
5. Memo, To: Distribution, From: IZ/Manager, Exploration Mission Analysis and System Engineering (Mark Craig), Subject: Study Requirements Document (SRD) Release, March 13, 1989, includes Document No. Z-2.1-002, Office of Exploration Study Requirements Document, FY 1989 Studies, March 3, 1989

6. Various Power Point presentations: Office of Exploration, 1989 Annual Report Overview, Exploration Planning Status Report, OEXP Management Plan (folder 2 of 2)

6. NASA Office of Exploration Document No. Z-1.0-002, Exploration Requirements Document (ERD), Version 1.0, March 27, 1989
7. Document No. Z-MAS-ESP-OO2, Exploration Study Plan, First Draft, Version 2.0, Lunar and Mars Exploration Office, NASA, Johnson Space Center, May 13, 1988
8. NASA Office of Exploration, Document No. Z-1.0-001, Exploration Management Plan (EMP), Version 1.0, May 12, 1989
9. Research on the Origin of MACA/NASA Lunar/Mars Exploration Studies, “Birth of the Future,” included timeline and bibliography, circa 1988
10. Lunar Evolution Strawman Science Payload Phasing, July 21, 1989 (projected timeline)
11. “Beyond Earth’s Boundaries: Human exploration of the solar system in the 21st century,” 1988 annual report to the Administrator, Office of Exploration, NASA

7. Various Power Point presentations: MASE FY89 Process Update, 88 Exploration Studies, Exploration Management Plan, Exploration Requirements Document, 1990 Budget
   Item
   1. NASA, Office of Exploration, Overview Presentation to Dr. William R. Graham. Science Advisor to the President, Director, Office of Science and Technology Policy, by John Aaron, Assistant Administrator, August 13, 1988
   2. NASA, Office of Exploration, 1988 Annual Report Overview, prepared by the NASA Exploration Team, December 1988
   3. NASA, Office of Exploration, Exploration Planning Status Report, by the Exploration Management Group (M,E,R,T,S,Z), presentation to Dr. Fletcher, April 22, 1988
   4. Memo IC-88-80, To: NASA Headquarters, Attn: Z/Assistant Administrator for Office of Exploration, From: IA/Manager, New Initiatives Office, Subject: Workshop on Radiation Constraints for Exploration Class Missions, February 15, 1988
   5. Statement of John W. Aaron, Assistant administrator, NASA, before the Subcommittee on Space Science and Applications Committee on Science, Space and Technology, House of Representatives, 100th Congress, March 22, 1988
   6. OEXP Management Plan, Draft (vu-graph) Version 0.0, Office of Exploration, NASA Headquarters, October 14, 1988

Box 27a *Publications and Soviet Considerations, 1986-1989*

Folder
1. NASA 1989 Long-Range Program Plan
2. Lunar Outpost, Systems Definition Branch, Advanced Programs Office, Johnson Space Center, 1989
3. Leadership and America's Future in Space, A Report to the Administrator, by Dr. Sally K. Ride, August, 1987
4. Pioneering the Space Frontier: An Exciting Vision of Our Next Fifty Years in Space, the Report of the National Commission on Space, New York: Bantam Books, 1986
5. Soviet Considerations, circa late 1980s
   Item
   1. Correspondence and document, "Possibilities of the Universal Space Transport System (USTS) "Energiya" to Deliver Heavy Automatic Equipment for Complex Research of Space, Moon, Mars, and Sun in the Interest of Science and National Economy, translated by N. Timacheff, July 1989 (2 copies)
   2. Soviet Manned Mission to Mars – A Bioastronautics Perspective (U), Supplement 1, A Defense S&T Intelligence Study, February 24, 1988
   3. A Preliminary Assessment of the "Energia" Soviet Space Launch

Vehicle, by Hubert P. Davis, P.E., Chairman, Davis Aerospace Company, September 11, 1987
4. Soviet Launch Capabilities to Support Lunar and Mars Exploration, by Anton J. Dorr, undated
5. Article, The USSR in Outer Space. The Year 2005, publication information unavailable
6. Capabilities Summary of the Energiya Family of Launchers (as provided by the Soviets), undated
7. Various articles, circa late 1980s

Series 6. President G.H.W. Bush Space Exploration Initiative (SEI), 1976-2011

(4 cubic feet)

Subseries 1. Pre-Announcement Support to the White House, 1988-2011. "To complement and provide context for this SEI archive material, several publications relevant to the Space Exploration Initiative are included."

Box 28 *Publications Relevant to Space Exploration Initiative, 1992-2011*

Folder

1. Albrecht, Mark. (2011). Falling Back to Earth: A firsthand account of the great space race and the end of the cold war. Lexington, Kentucky: New Media Books. (Mark was the Executive Secretary of the National Space Council under President George H. W. Bush) (Signed to Mark Craig)
2. Hogan, Thor. (2007). Mars Wars: The rise and fall of the space exploration initiative. Washington, DC: National Aeronautics and Space Administration, NASA History Division, Office of External Relations.
3. McCurdy, Howard. (1992, NASA HHR-56). The Decision to Send Humans Back to the Moon and On to Mars. Washington, D.C.: NASA History Division, NASA Headquarters. (interviews of Frank Martin and Mark Craig)
4. Broad, Bill. (1992). Teller's War: The top-secret story behind the Star Wars deception. New York: Simon & Schuster.
5. Blue Folder - key documents

   Items

   1. Civil Space Exploration Lunar Base 2000, Human to Mars Presentation
   2. A Scenario for Human Exploration of the Moon and Mars, by Mark Craig, June 13, 1989 (**ORIGINAL**) presented to NASA Administrator Richard Truly (RHT) with his comments
   3. Presentation, Purposes of Briefing, June 13 (**ORIGINAL**) presented to NASA Administrator Richard Truly (RHT) with his comments
   4. Presentation, Long-Range Exploration Goals for the U. S. Civil Space Program, June 16, 1989, presented to NASA Administrator Richard Truly (RHT) with his comments

5. Draft Briefing Package, June 15, 1989 (**ORIGINAL**)
6. Chronology of Preparation for President's Speech, May-July 1989

6. Blue Folder, Pitch A to "space experts" [space, science, aerospace industry] - key documents

Item

1. Presentation, Human Exploration (Mark Albrecht pitch, June 5-7, 1989)
2. Presentation, Civil Space Exploration, Lunar Base then to Mars, Direct to Mars, and Robots Only (key document)
3. Document, listing of attendees for July 5-6 meeting
4. Newspaper article from Washington Times, Space Council urges manned lunar base, July 11, 1989
5. Calendar, Revised Action Schedule, June 1989
6. Presentation, U.S. National Space Goals Toward the Next Millennium
7. Outline Template
8. Document, A Space Exploration Initiative
9. Handwritten notes (**ORIGINAL**)
10. Article, The Nina: A vessel fit for an admiral
11. Graph, Science and Engineering Doctorates
12. Letter to Vice President Quayle from NASA Administrator Richard Truly, September 5, 1989, RE: President's speech July 20, 1989
13. The White House, Office of the Press Secretary, Remarks by the President at 20th Anniversary of the Apollo Moon Landing, July 20, 1989
14. Handwritten notes, FRASS [Jack Frassanito] Comments (**ORIGINAL**)
15. Why A Lunar Base?
16. Document, The Message, President Bush July 20, 1989
17. Letter to Aaron Cohen, Director, Johnson Space Center, from Larry Haskin, Washington University, RE: Importance of the Moon to our future, May 31, 1989
18. Handwritten notes, R.M.W.H. Pitch (**ORIGINAL**)
19. Chart, Space Science Program
20. Calendar
21. Science Opportunities
22. Presentation Template

7. Blue Folder, Pitch B, 1989

Item

1. Origin and History of the Lunar Initiative
2. Remarks by the President at the 20th Anniversary of Apollo Moon Landing, July 20, 1989
3. Presentation, A Scenario for Human Exploration of the Moon and Mars by Mark Craig, June 13, 1989
4. Civil Space Exploration, Lunar Outpost, then to Mars, Direct to Mars, Robots Only, presentation to V.P. Quayle

5. Project Involvement Personnel
6. Questions (ORIGINAL)
7. Chart, Lunar Mapping Program
8. Chart, Mars Mapping Program
9. Schedules Timeline
10. Presentation, Exploration Scenario, Exploration Objective

Box 29 *Pitch A to "space experts," 1989*

Folder

1. Blue Folder, Pitch A to "space experts" [space, science, aerospace industry] - key documents

   Item

   1. Presentation, Human Exploration (Mark Albrecht pitch, June 5-7, 1989)
   2. Presentation, Civil Space Exploration, Lunar Base then to Mars, Direct to Mars, and Robots Only (key document)
   3. Document, listing of attendees for July 5-6 meeting
   4. Newspaper article from Washington Times, Space Council urges manned lunar base, July 11, 1989
   5. Calendar, Revised Action Schedule, June 1989
   6. Presentation, U.S. National Space Goals Toward the Next Millennium
   7. Outline Template
   8. Document, A Space Exploration Initiative
   9. Handwritten notes (**ORIGINAL**)
   10. Article, The Nina: A vessel fit for an admiral
   11. Graph, Science and Engineering Doctorates
   12. Letter to Vice President Quayle from NASA Administrator Richard Truly, September 5, 1989, RE: President's speech July 20, 1989
   13. The White House, Office of the Press Secretary, Remarks by the President at 20th Anniversary of the Apollo Moon Landing, July 20, 1989
   14. Handwritten notes, FRASS [Jack Frassanito] Comments (**ORIGINAL**)
   15. Why A Lunar Base?
   16. Document, The Message, President Bush July 20, 1989
   17. Letter to Aaron Cohen, Director, Johnson Space Center, from Larry Haskin, Washington University, RE: Importance of the Moon to our future, May 31, 1989
   18. Handwritten notes, R.M.W.H. Pitch (**ORIGINAL**)
   19. Chart, Space Science Program
   20. Calendar
   21. Science Opportunities
   22. Presentation Template

2. Blue Folder, Pitch B, 1989
   Item
   1. Origin and History of the Lunar Initiative
   2. Remarks by the President at the 20th Anniversary of Apollo Moon Landing, July 20, 1989
   3. Presentation, A Scenario for Human Exploration of the Moon and Mars by Mark Craig, June 13, 1989
   4. Civil Space Exploration, Lunar Outpost, then to Mars, Direct to Mars, Robots Only, presentation to V.P. Quayle
   5. Project Involvement Personnel
   6. Questions (ORIGINAL)
   7. Chart, Lunar Mapping Program
   8. Chart, Mars Mapping Program
   9. Schedules Timeline
   10. Presentation, Exploration Scenario, Exploration Objective
3. Civil Space Exploration Lunar Base 2000, Human to Mars
   Charts, Civil Space Exploration
4. Charts, Lunar Outpost, Then to Mars (***ORIGINAL***)
5. Exploration Scenario Folder, 1989
   Item
   1. Notes, Ground Rules (***ORIGINAL***)
   2. Timeline, Lunar Base Mission Sequence (***ORIGINAL***)
   3. Presentation, Exploration Scenario by MASE Team, June 8, 1989
6. Photographs, circa 1989
   Item
   1. Ships of Exploration
   2. Science and Engineering Doctorates
   3. Mars Transportation Sequence
   4. Others Can Join Us On The Moon
   5. Lunar Base
   6. Mars Robotic Exploration
   7. Ships of Exploration – Moon
   8. Ships of Exploration – Mars
   9. Ships of Exploration (Lunar)
   10. Human Exploration of Mars
   11. Lunar Transportation Sequence
   12. Mars Base (2017)
   13. Mars Base (2008)

Subseries 2. Post-Announcement Studies, Reviews, and Activities, 1989-1992

Sub-subseries 1. White House and Space Council, 1989-1991

Box 30 *Blue Ribbon Pitch, 1989-1991*

Folder

1. Blue Ribbon Pitch, 1989-1990

   Item

   1. Roster, Blue Ribbon Panel, November 29, 1989
   2. An Exploration Initiative Briefing to the National Space Council's Blue Ribbon Panel by ADM Truly, NASA Administrator, November 29, 1989 (key document)
   3. Fax to Mark Craig, Aaron Cohen. Wayne Young, From: Franklin Martin, HQ, RE: Program Options for Manned Exploration Initiative, November 29, 1989 (***SENSITIVE***)
   4. The White House Office of the Press Secretary, Statement by the Press Secretary, March 8, 1990
   5. National Space Council, Executive Office of the President, Memorandum for Don Rice and Steve Hadley From Mark Albrecht, RE: DOD Reviews of NASA Exploration Study, November 20, 1989
   6. Fax to Ken Pedersen from Pete Worden, RE: Program Options for Manned Exploration Initiative Analysis Plan, undated
   7. Newspaper article from *Space News*, interview with September 18, 1989, Dan Quayle, September 18, 1989
   8. Memorandum for Mr. Stapleton Roy, Executive Secretary, Department of State, Ms. Emily Walker, Executive Secretary, Department of Treasury, Colonel George Cole, Executive Secretary, Department of Defense, Mr. Thomas Murrin, Deputy Secretary Department of Commerce, Ms. Ruth Knouse, Director, Executive Secretariat, Department of Transportation, Governor John Sununu, Chief of Staff to the President, Mr. Robert Mathias, Executive Assistant to the Secretary Department of Energy, Mr. Philip Hughes, Executive Secretary, National Security Council, Mr. Frank Hodsoll, Associate Director, Office of Management and Budget, Dr. Allan Bromley, Director, Office of Science and Technology Policy, BG Thomas White, Executive Assistant to the Chairman, Joint Chiefs of Staff, Ms. Jessie Harris, Executive Officer, NASA, and Mr. Lawrence Sandall, Executive Secretary, Central Intelligence Agency, From: Mark Albrecht, National Space Council, RE: Presidential Decision on the Space Exploration Initiative, February 21, 1990
   9. Presentation, Synthesis Report Summary by Mark Craig, July 10, 1991
   10. Informal note to Peggy, undated
   11. Document, Possible Actions by the Space Council, What can the Vice President do that will help SEI?, June 25, 1991, Version II
   12. Document, Towards a Revitalized Space Program for the 21st Century, 1st draft, July 10, 1991
   13. Memo from Mark Albrecht, RE: Space Exploration Initiative with Mark Craig notes, September 9, 1991

2. Drafts (11), July 19 – September 3, 1991, The White House Statement by the Press Secretary, Guidance on the Implementation of the Space

Exploration Initiative (**ORIGINAL**)

Sub-subseries 2. Policy and Political, 1990-1991

Box 30 continued *Policy and Political Information/Documents, 1990-1991*

Folder

3. Notes to prepare for a conversation with NASA Administrator Dick Truly on the opportunity and challenges of the Space Exploration Initiative for NASA, 1990 (key document)
4. Notes on meeting with previous NASA Administrator Jim Fletcher on the start-up of the Strategic Defense Initiative Organization (SDIO) (key document)
5. Memo HQ #RZ, RE: Comments on Draft National Space Launch Policy, To: R/Associate Administrator for Aeronautics, Exploration and Technology, From: RZ/Special Assistant for Exploration (Mark Craig), March 29, 1991
6. Report of the Advisory Committee on the Future of the U.S. Space Program, December 1990
7. Testimony, Congress, 1990-1991

   Item

   1. Letter to Norman Augustine, Chairman and CEO, Martin Marietta Corporation, from Dick Malow, Congress of the U.S., House of Representatives, Committee on Appropriations, August 19, 1991
   2. Letter to ADM Truly, NASA Administrator, from George E. Brown, Jr., U.S. House of Representatives, Committee on Science, Space, & Technology RE: Elimination of funding for Space Station Freedom, May 20, 1991
   3. Copy from House of Representatives Report, NASA Multiyear Authorization Act of 1991
   4. Letter to Honorable Robert Roe, House Committee on Science, Space & Technology, U.S. House of Representatives, from Jack Brooks, Congress of the U.S., House of Representatives, May 22, 1990
   5. The White House Office of the Press Secretary, Press Release: Text of Remarks by the President at the Marshall Space Flight Center, Huntsville, Alabama, June 20, 1990
   6. Letter to Honorable J. Danforth Quayle, Vice President of the United States, from ADM Richard Truly, NASA Administrator RE: Progress Report on President's Space Exploration Initiative, July 19, 1990
   7. Letter to Honorable Richard Truly, NASA Administrator, from Newt Gingrich and Robert Walker, Congress of the United States, House of Representatives RE: President's Space Exploration Initiative, May 3, 1990
   8. Memo HQ #R, RE: Final Agreement with Congress Regarding Exploration "Outreach," To: AD/Deputy Administrator, From:

R/Associate Administrator for Aeronautics, Exploration, and Technology (Arnold Aldrich), May 18, 1990

9. Fax copy of Letter to Honorable Bob Traxler, Chairman, Subcommittee on VA-HUD Independent Agencies, Committee on Appropriations, United States Senate, from ADM Richard Truly, NASA Administrator, RE: FY 1990 NASA Mission Studies/Outreach Activities, May 16, 1990
10. Letter to Honorable James Watkins, Secretary of Energy, From Robert Grady, Associate Director for Natural Resources, Energy and Science, Executive Office of the President, Office of Management and Budget RE: Briefing on Potential for using Helium as a fuel in fusion reactors, May 7, 1990
11. Copy of Letter to Honorable Barbara Mikulski, Chair, Subcommittee on VA-HUD Independent Agencies, Committee on Appropriations, United States Senate, from Richard Truly, NASA Administrator RE: Proposed FY1990 NASA Mission Studies/Outreach Activities
12. Informal note to A. Aldrich, M. Kress, A. Cohen, from Mark Craig, RE: Request for a copy of a letter to Rep. Roe, April 30, 1990
13. Letter to Honorable Robert Roe, Committee on Science, Space and Technology, U.S. House of Representatives, from Ralph Hall and Lamar Smith both Members of Congress, April 25, 1990
14. NASA Document, Subcommittee on Space Science and Applications Committee on Science, Space, and Technology, House of Representatives, February 27, 1990, Statement by Arnold Aldrich, Associate Administrator, Office of Aeronautics and Space Technology, 101st Congress
15. Informal note to Mr. Aldrich, from Terence Finn RE: Legislative Affairs and Exploration Initiative, February 27, 1990
16. Presentation, Hearing Preparation, Some “Dirty Questions” and Suggested Answers on Exploration, February 23, 1990

Sub-subseries 3. Management, 1989-1991

Box 31 *SEI Management, 1989-1991*

Folder

1. SEI Management, 1990-1991 (folder 1 of 2)

   Item

   1. Presentation, SEI Strategy and Integration Plan, Mark Craig, July 1, 1991 (key document)
   2. Presentation, Architecture Analysis Phase Engineering Master Schedule by Delores Moorehead, September 5, 1991
   3. Draft Presentation, Proposed Integrated Plan Philosophy and Implementation by Doug Cooke, August 29, 1991
   4. Presentation, 1991-1992, Near Term Plan, August 29, 1991

5. Presentation, PSS Plans, Products and Study Environment presented at M^3 Meeting, by Barney Roberts, August 29-30, 1991
6. Letter from Craig to Admiral Truly, includes Craig's Space Exploration Initiative Management Structure Proposal, June 7, 1991
7. Presentation, Design of Exploration Initiative Management by Humboldt Mandell, Program Development and Control, May 14, 1990 (key document)
8. Strategic Management of the Space Exploration Initiative, Initial Steps, undated

2. SEI Management, 1989-1991 (folder 2 of 2)
   1. Presentation, Human Exploration Scenario, Mark Craig, August 19, 1989
   2. Presentation, Human Exploration of the Moon and Mars by Mark Craig, August 21, 1989
   3. Memo #XA, March 14, 1990, RE: Development of a Study Requirements Reference for Human Exploration Initiative Study, Option 5, To: Distribution, From: XA/Acting Manager, Lunar Mars Exploration Program Office (Douglas Cooke)
   4. Presentation, Exploration Studies, Level II, Operating Concept and Management Plan, February 28, 1990
   5. Chart, Findings of the Columbus Proposal Review Commission (1490) – a parody, undated
   6. Document, Johnson Space Center Organization Chart and Telephone Listing, April 1991
   7. Document, Civil Service Personnel Assigned to the Lunar and Mars Exploration Program Office, undated
3. SEI NASA Management Studies, 1989-1992

   Item
   1. Memo, To: Distribution, From: ADB/Assistant Deputy Administrator, Subject: Internal Impediments; Lunar/Mars Initiative, October 31, 1989
   2. Impediment Study, directed by Jack O'Brien, September 4, 1990
   3. Initial Analysis of Management Options for SEI, September 11, 1990
   4. Management Studies Action Plan, Beth Beck, November 1990
   5. A Review of NASA Management During the Apollo, Space Shuttle and Space Station Freedom Development Plans, (Draft Version 3.0) NASA Headquarters, Office of Exploration, Jeffrey F. Volosin, November 27, 1989
   6. Management Considerations for the Space Exploration Initiative, NASA Office of Aeronautics, Exploration and Technology, December 3, 1990
   7. Space Exploration Initiative Lessons Learned Data Package, compiled and prepared by Richard Fox, Manager, Program Development and Project Control, and Katie Spray, PMI, June 22, 1992
4. Space Exploration Directorate – Business Plan, September 16,1991

Sub-subseries 4. Architecture, 1989-1991

Box 32 *Architecture, 1990-1991*

Folder

1. Architecture, 1989-1991 (folder 1 of 2)
   Item
   1. Memo, To: Distribution, From: Manager System Engineering and Integration Office, From: Norman H. Chaffee, Subject: Final Versions of the Systems Engineering and Integration (SE&I) Office Trade Studies and Assessments, April 18, 1990
   2. Memo, To: Distribution, From: XM/Manager, Mission Development and Operations, Subject: Final Version of the Mission Development and Operations (MDO) Office Trade Studies and Assessments, April 20, 1990
   3. Presentation, A Methodology for Generating and Assessing Architectural Alternatives for the Space Exploration Initiative by Dr. Jeffrey D. Rosendhal, May 1990
   4. Presentation, Exploration Architecture Studies—Policy, Strategy and Challenges—by Mark Craig, August 29, 1991 (key document)
   5. Presentation, Architecture Framing and Implementation Program Review Board, June 7, 1990
   6. Presentation, Architecture Discussion Program Review Board, April 13, 1990
2. Architecture, 1990-1991 (folder 2 of 2)
   1. Presentation, Strategy, Schedule and Milestones to provide a NASA Recommendation for Candidate Mission Architectures by July 2, 1990 (Strawman for discussion) by N.H. Chaffee, April 4, 1990
   2. Presentation, Architecture Evolution Strategy by Doug Cooke, Lunar and Mars Exploration Program Office, July 13, 1990
   3. Presentation, Architecture Evolution Strategy by Doug Cooke, Lunar and Mars Exploration Program Office, July 27, 1990
   4. Case for Mars IV, June 4-8, 1990, Boulder, Colorado, A Goal and Strategy for Human Settlement of the Moon and Mars: Part Two, Donna Shirley Pivirotto, Manager, Planetary Surface Vehicle Studies, JPL
   5. Memo, To: Distribution, From: XM/Dean Eppler, Subject: Apollo Experience Reports, December 6, 1990
   6. Fax, To: National Space Council, Subject: Space Exploration Initiative, Proposed Policy Guidelines on the Implementation of U.S. Space Exploration Initiative, From: Mark J. Albrecht, Executive Secretary, September 9, 1991

Sub-subseries 5. Cost and Budgeting, 1989-1991

Box 32 continued *SEI Cost and Budgeting, 1989-1991*

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3. SEI Cost and Budgeting, 1989-1991 (folder 1 of 3)
   Item
   1. Presentation, Space Exploration Initiative FY1992 Budget Preview, May 21, 1990
   2. Presentation, SEI Budget Consolidation, FY92 Budget Preview Briefing to OAET Management Council, by Mark Craig, May 8, 1990
   3. SEI Budget Consolidation Status Briefing to Associate Administrator, OAET, by Mark Craig, May 15, 1990 (***ORIGINAL***)
   4. OAET Briefing to Congressman Alan B. Mollohan, by Arnold D. Aldrich, Associate Administrator for Aeronautics, Exploration and Technology, March 26, 1991
   5. Proposed FY93 Exploration Budget Strategy, July 18, 1991, (ORIGINAL)
   6. Fiscal Year 1993 Space Exploration Budget, Office of Aeronautics, Exploration and Technology, August 15, 1991
   7. Presentation, Lunar Mars Cost Review, October 27, 1989
4. SEI Cost and Budgeting, 1989-1991 (folder 2 of 3)
   Item
   1. An Exploration Initiative “Program Review” with the staff of the Committee on Science, Space and Technology, by Frank Martin and Mark Craig, February 2, 1990
   2. Memo, To: Johnson Space Center, Attn: AA/ Director, From: R/Associate Administrator for Aeronautics, Exploration and Technology, Subject: Call for Space Exploration Initiative (SEI) FY 1992, Preview Budget Data, March 27, 1990
   3. Space Exploration Initiative Budget Review Schedule, Office of Aeronautics, Exploration and Technology, Glen Fuller, April 19, 1990
   4. Office of Aeronautics, Exploration and Technology, FY 1992 Budget Preview, Arnold D. Aldrich, Associate Administrator, May 22, 1990
   5. Agenda, Meeting with Admiral Watkins, May 18, 1990
   6. Space Exploration Initiative (SEI) FY 1992 Budget Preview, Mark Craig, May 22, 1990
   7. Memo, To: B/Comptroller, From: R/Associate Administrator for Aeronautics, Exploration and Technology, Subject: FY 1992 Integrated SEI Preview Budget, June 1, 1990
   8. To: R/Associate Administrator for Aeronautics, Exploration and Technology, From: A/Administrator, Subject: FY 1992 Guidelines, June 12, 1990
   9. Apollo Budget Data, memo from August 8, 1990 (President’s budget requests versus Congressional appropriations for the first few years of Apollo)

10. SEI POP 90-2 Budget Briefing to Associate Administrators, Mark Craig, September 12, 1990

5. SEI Cost and Budgeting, 1989-1991 (folder 3 of 3)
    1. Exploration Initiative Mid-Term Briefing, Budget/Institutional Resources, September 11, 1989
    2. Funding Options for SEI Mission Studies, R.G. Minor, May 14, 1990
    3. SEI Budget Decisions Made by NASA Administrator, June 28, 1990
    4. Memo, To: B/Comptroller, From: R/Associate Administrator for Aeronautics, exploration and Technology, Subject: FY 1992 SEI Budget Submission, September 20, 1990
    5. FY 1992 SEI Budget Presentation, Mark K. Craig, Special Assistant for Exploration, October 2, 1990
    6. Space Exploration Initiative Management Structure Proposal, Mark Craig, January 30, 1991
    7. Flow-Chart, Current Staffing, Space Exploration Directorate, February 13, 1991
    8. Note to Mark Craig, From: Terence T. Finn, Subject: RZ Directorate Briefings, July 24, 1991
    9. A Space Exploration Initiative Update to the Exploration Task Force, Mark K. Craig, Director, Space Exploration, September 17, 1991
    10. Exploration Program Plan, Michael D. Griffin, Associate Administrator for Exploration, December 12, 1991
    11. “Mars on $300K A Day”: The Mars Exploration Program, Second IAA International Conference on Low-Cost Planetary Missions, by Donna L. Shirley, Manager, Mars Exploration Program, Jet Propulsion Laboratory, California Institute of Technology, undated

Sub-subseries 6. Internal Review, 1989-1991

Box 33 *Internal Review Information, Notes and Presentations, 1989-1991*

Folder

1. Internal Review, 1989-1991

    Item

    1. SEI Integrated Plan Status Report, Inputs by John Niehoff, Doug Cooke, and Others, September 13, 1991
    2. Notes, Major Issues, September 7, 1989 (***ORIGINAL***)
    3. Presentation, Moon/Mars Initiative, Mid-Term Review, September 14, 1989 by Aaron Cohen
    4. Presentation, Exploration Initiative Mid-Term Status—Technical Study Group, September 14, 1989
    5. Office of Exploration (OEXP) Administrator’s GMSR, Franklin D. Martin, Assistant Administrator, October 19, 1989
    6. OAET GMSR Presentation—Exploration, Dr. Terence T. Finn, July 9, 1990

7. NASA Space Exploration Initiative Work Plan, Doug Cooke, Acting Manager, Lunar and Mars Exploration Program Office, April 15, 1991

Sub-subseries 7. International Cooperation, 1989-1991

Box 33 continued *International Cooperation, 1989-1991*

Folder
2. International Cooperation, 1989-1991
   Item
   1. IAA-91-707, Paper, An Assessment of Prospects for International Cooperation on the Space Exploration Initiative by Lynn F. H. Cline and Jeffrey D. Rosendhal, NASA Washington, DC, 42nd Congress of the International Astronautical Federation, October 5-11, 1991, Montreal, Canada
   2. Memo, To: Z/Special Assistant for Exploration, From: XID/Deputy Chief, International Planning and Programs, Subject: Visit of Shimizu Corporation Representatives, April 13, 1990
   3. Memo, To: Z/Special Assistant for Exploration, From: XID/Deputy Chief, International Planning and Programs. Subject: Visit of Alain Dupas, April 13, 1990
   4. Initial Definition of International Cooperative Opportunities for the Lunar/Mars New Initiative Program presented by John Niehoff, Science Applications International Corporation to The Code Z Assessment Team, JSC, September 6, 1989

Sub-subseries 8. Technical and Science, 1990-1991

Box 33 continued *Technical and Science Information, 1990-1991*

Folder
3. Memos and Technical Requirement Table, 1991
   Item
   1. Memo #XE, RE: Preliminary Heavy Life Launch Vehicle Requirements for the Space Exploration Initiative, To: RZ/Special Assistant for Exploration, From: XA/Acting Manager, Lunar and Mars Exploration Program Office (Norman Chaffee), January 11, 1991
   2. Table, Technology Requirements/Prioritization
   3. Memo HQ #RZ, RE: Lunar and Mars Mission Requirements on the National Launch System, To: M/Associate Administrator for Space Flight, From: R/Associate Administrator for Aeronautics, Exploration and Technology (Arnold Aldrich), January 30, 1991
4. Nuclear Propulsion, 1990-1991
   Item

1. Presentation from Lewis Research Center, Nuclear Propulsion Program Status (***ORIGINAL***)
2. Newspaper article, Rocket Run by Nuclear Power Being Development for 'Star Wars', The New York Times, April 3, 1991
3. Memo #XE, RE: Mars Quick Trip Analyses, To: Distribution, From: XA/Acting Manager, Lunar and Mars Exploration Program Office (Norman Chaffee), November 14, 1990
4. Nuclear Thermal Propulsion for Mars Missions presented to ADM Truly by Mark Craig, March 19, 1991 (***ORIGINAL***)
5. Office of Aeronautics, Exploration and Technology Status Report on Nuclear Propulsion presentation to Administrator and Deputy Administrator by Arnold Aldrich, Associate Administrator, Office of Aeronautics, Exploration and Technology, March 19, 1991
6. Presentation, Nuclear Thermal Propulsion for Mars Missions—Mission Design Options—by the Lunar and Mars Exploration Program Office at Johnson Space Center, January 22, 1991

5. Presentation, F-1A, The Cost Effective Choice for Heavy Lift Launch Vehicles, Rocketdyne
6. Technical and Science information, 1989-1992

Item

1. A Planetary Science Strategy for the Moon, Lunar Exploration Science Working Group (LExSWG), July 1992
2. Faxed Memo HQ #EB, RE: Life Sciences Requirements for Human Exploration Initiative, To: Distribution, From: EB/Deputy Director, Life Sciences Division (Stephen Fogleman), September 8, 1989
3. Presentation, HLLV Rationale by Doug Cooke, September 6, 1991
4. Presentation, Space Transportation IA Plan, Support of Architecture Analysis, June-December 1991 by Bill Huber, MSFC, July 30, 1991
5. Memo, To: RZ/Special Assistant for Exploration, From: XA/Acting Manager, Lunar and Mars Exploration Program, Subject: Preliminary Heavy Lift Launch Vehicle (HLLV) Requirements for the Space Exploration Initiative, January 11, 1991
6. A Strategy for the Scientific Exploration of Mars, a report by the Mars Science Working Group, February 1991
7. 1990 Update to Strategy for Exploration of the Inner Planets, National Research Council
8. Presentation, Space Station Freedom Accommodation of the Human Exploration Initiative, Final Package, October 1989

Box 34 *Technical and Science Information, 1989-1990*

Folder

1. Technical and Science information, 1989-1990

Item

1. Exploration Technology Development/Advanced Development Plan

Status Report presented to TAD Working Group Meeting, by Jimmy Underwood, Technology/Advanced Development Group, Level II Technical Study Group, September 6, 1989

2. Technology for Human Exploration, Mid-Term Review, September 14, 1989
3. Final Report to the Office of Aeronautics, Exploration and Technology. National Aeronautics and Space Administration on Assessment of Technologies for the Space Exploration Initiative (SEI). Washington, DC: American Institute of Aeronautics and Astronautics, December 31, 1990
4. Space Exploration Initiative Technology Needs and Plans, A Report to the United States Senate, Committee on Appropriations, Subcommittee on the Veteran's Administration, Housing and Urban Development, and Independent Agencies, Summer 1990

Sub-subseries 9. External Communications, 1990-1991

Box 34 continued *External Communication, 1990-1991*

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2. External Communication, 1990-1991

Item

1. Letter to Mark Craig from Donald Lesh, President, Global Tomorrow Coalition, October 2, 1991
2. Space Exploration Initiative Discussion Points, circa 1989
3. A Space Exploration Initiative Package for the 28th Goddard Memorial Symposium, March 14-16, 1990
4. Document, Public Policy Forum: The Space Exploration Initiative
5. Document, The Space Exploration Initiative, March 21, 1991
6. Document, NASA Headquarters Letterhead, The Space Exploration Initiative (***ORIGINAL***)
7. Charts, Definitions, SEI Related Programs
8. Document, Key Phrases
9. University of Southern California School of Public Administration, Communication Workshop, June 28, 1990 - *key document*
10. Presentation, Space Exploration Initiative: Enhancing America's Quality of Life
11. Document, A Political Strategy For SEI, Observations on the Space Exploration Initiative, November 30, 1990
12. Document, Economic Overview of the Space Exploration Initiative, Draft, September 1990
13. Booklet, The Space Exploration Initiative and NASA folder (key document)
14. Letter to Vice President Dan Quayle, From: Charles D. Walker, President, National Space Society, Subject: Public Outreach

Initiative, January 16, 1990
15. Letter to Mark Craig, From: Louis Friedman, The Planetary Society, May 8, 1990
16. Speech, American Association for the Advancement of Science and Technology Colloquium, by Jeffrey D. Rosendhal, June 29, 1990
17. Comic book type publication, "Adventures on Santa Maria and Other Ships Sailing the Oceans of Space," Official Project of the Christopher Columbus Quincentenary Jubilee Commission, 1992

Sub-subseries 10. 90-Day Study, 1989-1990

Box 34 continued *90-Day Study, 1989-1990*

Folder
3. 90-Day Study, 1989-1990
Item
1. NASA News Release "NASA Moon/Mars Database Report," November 20, 1989
2. Report of the 90-Day Study on Human Exploration of the Moon and Mars, November, 1989 (key document)
3. The Human Exploration Initiative: Recently completed 90-study not the final word on subject. (1990). Washington, DC: U.S. Government Printing Office.
4. Report of the 90-Day Study on Human Exploration of the Moon and Mars, includes cost summary, November 1989
5. Memorandum for Ken Pederson, From: Mark J. Albrecht, Subject: Reviews of the NASA 90-Day Study on Space Exploration, November 27, 1989

Sub-subseries 11. External Reviews, 1976-1991

Box 35 *External Reviews Information/Background, 1976-1991*

Folder
1. Booklet, Space Exploration Initiative Technology Needs and Plans, A Report to the United States Senate Committee on Appropriations, Subcommittee on the Veteran's Administration, Housing and Urban Development, and Independent Agencies, Summer 1990
2. Booklet, New Directions in Space, A Report on the Lunar and Mars Initiatives, George C. Marshall Institute, Washington, DC, 1990
3. Committee on Human Exploration of Space, National Research Council. (1990). Human Exploration of Space: A review of NASA's 90-day study and alternatives. Washington, DC: National Academy Press.
4. Document, April 30, 1990, Department of Commerce Response to the NASA

90-day Moon-Mars Study

5. A Space Exploration Initiative Briefing to the Aeronautics and Space Engineering Board, Mark K. Craig, June 12, 1990 and Quick Scan Summary of the Report of the Advisory Committee on the Future of the U.S. Space Program, 1990
6. NRC Committee on Human Exploration of Space Agenda, as of January 16, 1990, Presentation, An American-Traditional Space Exploration Program: Quick, Inexpensive, Daring, and Tenacious, September 1989, by Rod Hyde, Yuki Ishikawa and Lowell Wood, Space Studies Program, LLNL Doc. No. PHYS.BRIEF 89-403
7. Booklet, New Directions in Space, A Report on the Lunar and Mars Initiatives, George C. Marshall Institute, Washington, DC (***ORIGINAL***)
8. Booklet, Space Exploration Initiative, AIA Task Force Study, Interim Report, April 1990
9. Informal Note to Admiral Truly from Frank Martin, RE: Members of Initiative Studies, December 29, 1989; and Letter to Mark Craig from Robert Jastrow, George C. Marshall Institute, Washington, DC, December 2, 1989, RE: Mark Craig's presentation on December 14, 1989 (***ORIGINAL***)
10. Fax Presentation, DOD Review of NASA Space Exploration Initiative, Initial "Quick Look" Review by LGEN Donald Cromer, Commander, Space Systems Division, January 22, 1990
11. Presentation, Review of the NASA 90-day Human Exploration Study by Victor J. Anselmo, December 22, 1989
12. Letter to Admiral Truly from John Tuck, Under Secretary, Department of Energy, Washington, DC, January 25, 1990, RE: Review of the NASA "Report of the 90-Day Study on Human Exploration of the Moon and Mars"
13. OTA Report, Exploring the Moon and Mars: Choices for the Nation, July 1991
14. "SEI Monograph – Back to the Moon…on to MARS: A dream, a goal, an investment," Draft, August 1991
15. Exploring the Moon and Mars: Choices for the Nation, U.S. Congress, Office of Technology Assessment, July 1991
16. Planets and Politics: Reflections on the Presidential Moon-Mars Initiative, by Carl Sagan, 1989
17. Binder, "SEI Rationale," and "Why Man Explores," A symposium held at Beckman auditorium California Institute of Technology, Pasadena, CA, July 2, 1976

Sub-subseries 12. Inter-Agency Coordination, 1988-1991

Box 36 Inter-Agency Coordination, 1988-1991

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1. Inter-Agency Coordination,1988-1991
   Item

1. Letter to Admiral Richard Truly, from Manuel Lujan Jr., Secretary of the Interior, offering the support of the Department of the Interior of the President's commitment to expand human presence beyond Earth's orbit, September 6, 1990
2. Department of Energy—Complete set of presentations from the March 19th meeting on the DOE portion of the SEI Program, March 22, 1991
3. Document and correspondence related to, Use of Antarctic Analogs to Support The Space Exploration Initiative, signed by Peter Wilkness for the National Science Foundation and Mark Craig for NASA, December 1990 (key document)
4. "Memorandum of Understanding between the National Aeronautics and Space Administration and the National Institute of Health," June 1988 (includes revisions and correspondence)

2. Department of Defense folder, 1990
   Item
   1. Letter and attached documents to Admiral Richard Truly, From: Don Atwood, RE: Space Exploration Initiative, August 8, 1990
   2. Memorandum of Understanding Between the National Aeronautics and Space Administration and the Department of Defense, revisions, June – October, 1990
   3. Fax to Mark Craig, From Dennis Granato, Re: Memorandum of Understanding Between the National Aeronautics and Space Administration and the Department of Defense, November 20, 1990
3. Department of Energy folder, 1990-1991 (folder 1 of 2)
   Item
   1. Administrative flow chart, Department of Energy, April, 1990
   2. Agenda, meeting with Admiral Watkins, June 18, 1990
   3. Memorandum of Agreement Among The National Science Foundation, The National Aeronautics and Space Administration and The Department of Energy, Draft copy, July 3, 1990 and final version
   4. Proposed Description of $50 Million Budget Item for the Space Exploration Initiative, August 17, 1990
   5. Presentation, "DOE/NASA Radiation Ground Facility," January 10, 1991
   6. Letter and attached document, To: Arnold Aldrich, From: Fenton Carey, Special Assistant to the Secretary of Space, RE: Department of Energy's FY 1992 plans for the Space Exploration Initiative, April 4, 1991
4. Department of Energy folder, complete set of presentations from the March 19, 1991 meeting on the Department of Defense portion of the Space Exploration Initiative, 1991 (folder 2 of 2)
5. Lawrence Livermore National Laboratory, 1989
   Item
   1. Letter and briefing aids, To: Admiral Richard H. Truly, From: Lowell Wood, Special Studies Program Leader, Lawrence Livermore

National Laboratory, December 15, 1989

2. An American-Traditional Space Exploration Program: Quick, Inexpensive, Daring and Tenacious, (LLNL Doc. No. PHYS. BRIEF 89-403), By Rod Hyde, Yuki Ishikawa, and Lowell Wood, Special Studies Program, U.C.L.L.N.L., September 1989
3. Correspondence and documents, To: Dr. Mark Albrecht, Executive Director, National Space Council, From: Lowell Wood, Lawrence Livermore National Laboratory, RE: Review and Assessment of the LLNL Space Exploration Proposal, September 1989

Sub-subseries 13. Synthesis Group, 1987-1991

Box 37 Synthesis Group, 1987-1991

Folder

1. Presentation, Department of Defense Input to the Space Exploration Initiative Synthesis Group, presented by Lt. General Donald Cromer, October 16, 1990
2. Presentation, Summary, Department of Energy Input to NASA Space Exploration Initiative Synthesis Group, October 16, 1990
3. Presentation, Summary of the NASA Presentation to Space Exploration Initiative Synthesis Group, by Mark Craig, Special Assistant for Exploration, October 16, 1990
4. NASA Presentation to Space Exploration Initiative Synthesis Group by Mark Craig, September 25, 1990
5. Blue “Synthesis” folder, 1987-1990

   Item

   1. Memo RZ, To: R/Associate Administrator for Aeronautics, Exploration and Technology, From: RZ/Special Assistant for Exploration, Subject: Thoughts on Synthesis, July 5, 1990
   2. NASA Routing slip, Admiral Truly, From, Arnold Aldrich, Potential NASA Candidates for Synthesis Group, July 5, 1990
   3. Biography, Lieutenant General Spence M. Armstrong, United States Air Force, circa 1987
   4. NASA Input to Synthesis Proposed Outline, July 25, 1990
   5. Presentation to Senior Managers, by Arnold D. Aldrich, Associate Administrator for Aeronautics, Exploration and Technology, September 7, 1990
   6. Calendar of Activities, September 1990
   7. Roster, Synthesis Team, August 30, 1990
   8. Press Release, Synthesis Group, Stafford Group Membership Announced, August 29, 1990
   9. Chart, SEI 6 Year Cycle Plan, 1990
   10. Programmatic Hierarchies for Space Exploration, by Brent Sherwood, The Boeing Company, © 1990

11. Rationale-Constituency-Architecture Analysis (RCA), July 12, 1990
12. Synthesis Status Review with Lt. General T. Stafford, July 10, 1990
13. Synthesis Planning Review with Lt. General T. Stafford, June 20, 1990
14. Notes, 4 pages
15. Fax to Mark Craig, From: Robin Borden, RE: General Stafford's preliminary cut for the senior advisory group, June 5, 1990
16. Synthesis Schedule, June 13, 1990
17. Memo EPS, To: NA/Advisory Committee Management Officer, From: E/Associate Administrator for Space Science and Applications, Subject: 1989 Annual Report on Management Operations Working Groups (MOWG's), February 7, 1990

6. Black, "Synthesis Group" folder, 1989-1991

Item

1. NASA News release, Statement of NASA Administrator Richard H. Truly, June 11, 1991
2. Press release, Synthesis Group Recommends America's Space Exploration Leadership, June 11, 1991
3. Statement, Lieutenant General Thomas P. Stafford, United States Air Force (RET), Chairman, The Synthesis Group, 1991
4. Synthesis Group Fact Sheet, May 1991
5. Roster, Synthesis Group Members, May 1991
6. Synthesis Group, Background, May 1991
7. Press Release, The White House, Office of the Press Secretary, Remarks by the President at the 20th Anniversary of Apollo Moon Landing, the Steps of the Air and Space Museum, Washington, DC, July 20, 1989

7. "Synthesis Report," 1991

Item

1. Exploration Synthesis Report Distillation, by Richard Reeves, July 1, 1991 (Craig's notations on cover)
2. Synthesis Report Summary, by Mark Craig, July 10, 1991
3. Exploration Synthesis Report Response Planning, by Mark Craig, June 20, 1991
4. Distillation of Recommendations from the Synthesis Group Report, June 18, 1991
5. SEI Budget, June 17, 1991
6. Memo, To: Jessie Harris, From: D. Lee, Subject: Synthesis Group Report Distribution, June 14, 1991

8. Folder containing copies of major documents and correspondence related to the work of the Synthesis Group, 1990-1991
9. America at the Threshold: Report of the Synthesis Group on America's Space Exploration Initiative, (includes notations), May 3, 1991

Box 38 Synthesis Outreach, 1990

Folder

1. Outreach Mailings (total distribution, 27,604)
2. Synthesis Outreach Folder, 1990

   Item

   1. Letter to Honorable Bob Traxler, Chairman, Subcommittee on VA-HUD Independent Agencies, Committee on Appropriations, United States Senate, Washington, DC, From Richard Truly NASA Administrator RE: FY 1990 NASA Mission Studies/Outreach Activities, May 16, 1990
   2. Outreach and Synthesis Schedule Summary
   3. Informal Note to Kevin Kelly from Marty Kress, RE: FY90/FY91 Outreach Program, May 16, 1990
   4. SEI Outreach Plan, May 15, 1990 (***ORIGINAL***)
   5. SEI Program Plan Timeline
   6. Notes, SEI Major Points (***ORIGINAL***)
   7. Notes, Outputs Required from Outreach/Synthesis Process
   8. Presentation, Exploration Outreach/Synthesis Planning, April 5, 1990
   9. Informal Memo to Z/Richard Reeves, From LM/Vera Hirschberg, RE: Plan for Press Conference to Announcement Exploration Outreach Effort, March 29, 1990
   10. Presentation, Exploration Outreach/Synthesis Status, by Mark Craig, April 4, 1990

3. "Outreach and Synthesis" folder, 1990

   Item

   1. Notes on NASA Office of Exploration notepad (8 sheets), undated
   2. List of potential candidates for synthesis activity, undated
   3. Transcript, Press Conference Outreach Program, May 31, 1990
   4. Exploration Outreach/Synthesis Status, by Mark Craig, April 4, 1990
   5. Outreach meeting notes, March 1990
   6. Actions and NASA Response to NASA/NSCO Meeting of February 5, 1990 – Moon/Mars Initiative
   7. Exploration Technology Program, Innovation Integration Approach (1 sheet) and "additional meeting notes," February 15, 1990
   8. Synthesis Activity for Exploration Outreach – Topics, undated
   9. Letter to Jerry Grey, Director, Science and Technology Policy, American Institute of Aeronautics and Astronautics, From: Franklin D. Martin, Assistant Administrator for Exploration, February 23, 1990
   10. Draft, Human Exploration Initiative AIA Task Force Study, Interim Briefing, by James C. Harrington, Chairman, March 12, 1990
   11. Exploration Outreach, Response to the Vice President's Letter of December 19, 1989, January 31, 1990
   12. Exploration Outreach Plan, March 23, 1990 (some notations)
   13. Draft, Exploration Outreach, by Mark Craig, March 20, 1990 (some notations)
   14. Space Exploration Initiative Outreach and Synthesis Plan, March 28,

1990

15. Outreach/Synthesis Status, March 28, 1990
16. Exploration Outreach and Synthesis Status, by Mark Craig, April 3, 1990 (includes notations)
17. AIAA Assessment of Innovative Technologies for the Exploration of Space, List of Ideas, July 12, 1990
18. Administration's Draft Talking Points: Outreach Press Conference, and "Dirty Questions" for Press Conference
19. Review Package; draft letter, draft CBD announcement, Solicitation package, outreach schedule, press briefing, 1990
20. Characteristics of a Desirable Outreach Plan, Ivan Bekey, January 29, 1990
21. Letter from Vice President Dan Quayle, To: Richard H. Truly, December 19, 1989
22. Letter from Richard H. Truly, To: Honorable J. Danforth Quayle, January 31, 1990
23. Material for Review in answering the Vice President's Dec. 19 letter, Office of Exploration, January 11, 1990

4. "Outreach" folder, 1990-1991

Item

1. Exploration Speech at the AIAA Annual Meeting, by Arnold D. Aldrich, May 1, 1990
2. Space Exploration Initiative Communications Plan, 1990
3. The Myth and the Reality: NASA and the Space Exploration Initiative, Arnold D. Aldrich, October 30, 1990
4. "The Space Exploration Initiative," AAAS Symposium on the Human Exploration of Space, Arnold D. Aldrich, February 17, 1991
5. Public Policy Forum: The Space Exploration Initiative, by Dr. Terence T. Finn (publication information and date unavailable)
6. Morrison, D.C. (1990, May 12). Space Focus: Eclipsing NASA. *National Journal,* p. 1191.
7. Logsdon, J.M. (1990, December). Taking the Pulse of SEI: The pathway to the Moon and Mars leads straight through Capitol Hill. *Ad Astra*, pp. 38-40.
8. Brochure, America at the Threshold: America's Space Exploration Initiative, undated
9. Small spiral bound binder, "A Journey to Tomorrow…The Space Exploration Initiative, undated
10. NASA press releases, 1990-1991
11. "Responding to President Bush's Moon Mars Initiative from the Perspective of the Apollo Program," outline of the remarks by Dr. Thomas O. Paine, Conference on Space Station Evolution Beyond the Baseline, February 6, 1990
12. Brochure/Poster, The Space Exploration Initiative, President's Office, circa 1990
13. NASA Educational Activities Related to the Space Exploration

Initiative, A Report to the Committee on science, Space, and Technology, U.S. House of Representatives and the Committee on Commerce, Science, and Technology, U.S. Senate, May 1991

Series 7. NASA Administrator Agency Redirection Initiatives, 1992-2002

(0.4 cubic feet)

Subseries 1. Dan Goldin Human Presence in Space Red Team, 1992

Box 39 *Human Presence in Space Red Team, 1992*

Folder

1. Human Presence in Space Red Team, 1992

   Item

   1. Memo HQ, RE: Review of NASA, To: Officials-in-Charge of Headquarters Offices, Directors, NASA Field Installations, and Director, Jet Propulsion Laboratory, From: AE/Assistant Deputy Administrator (Charles Bolden), May 7, 1992
   2. Memo HQ, RE: Red Team Rosters and Proposed Generic Draft Charter for NASA Review Red Teams, To: Distribution, From: AE/Assistant Deputy Administrator (Charles Bolden), May 26, 1992 (key document)
   3. Memo HQ, RE: Process Milestones, To: Red Team Leaders, From: AD/Chairman, Integration Team (Aaron Cohen), May 19, 1992
   4. Review Teams
   5. Outline, Proposed NASA Budget Review, May 18, 1992
   6. The New NASA—Faster, Better, Cheaper, Without Compromising Safety by NASA Administrator Dan Goldin, May 18, 1992
   7. Calendar for June 1992
   8. Outline, Objectives
   9. Viewgraphs, Brain drain (3 transparencies, ***ORIGINAL***)
   10. Red Team for Human Presence in Space, Draft, May 23, 1992
   11. Notes, Human Presence in Space Charter
   12. Notes, Preliminary Human Presence in Space Charter (HPSRT) Program Options
   13. Notes, Preliminary HPSRT Program Options
   14. Presentation, Human Presence in Space, Red Team, Report to the Administrator, August 20, 1992 (**ORIGINAL,** key document)
   15. Report, Human Presence in Space, Red Team Report, Preliminary Draft, July 2, 1992
   16. Presentation, Human Presence in Space, Red Team, Status Report to the Integration Team, June 15, 1992
   17. Presentation, Human Presence in Space, Red Team Presentation to

Integration Team, June 19, 1992
18. Informal Letter to Steve, from Mark Craig, June 29, 1992
19. Presentation, HPIS Red Team, Key Framing Considerations
20. Johnson Space Center Management Document, Human Presence in Space, Red Team Phase 1 Report, Preliminary Draft, July 17, 1992 (***SENSITIVE—NASA INTERNAL USE ONLY***)
21. Charts in Russian

Subseries 2. Dan Goldin Strategic Planning Red Team, 1992

Box 39 continued *Dan Goldin Strategic Planning Red Team, 1992*

Folder
2. NASA Strategic Red Team folder, 1992
Item
1. Mark Craig Red Team Involvement notes (***ORIGINAL***)
2. Fax from Dryden, Kenneth Szalai to Headquarters, Dr. Charles Pellerin on November 30, 1992 RE: Reducing burdens on your position due to family illness
3. Moon Mars Mission Review Team, October 9, 1992
4. Presentation, Program Planning Red Team, Stennis Space Center, November 23-24, 1992 (***ORIGINAL***)
5. Special Red Team on Strategic Planning Presentation to Dr. Charles Pellerin, Associate Deputy Administrator for Strategic Planning, December 14, 1992
6. Presentation, Program Planning Team Data Pack, October 6-8, 1992 (***ORIGINAL***)
7. Presentation, Technological Benefits Team presented by Dr. S. Paddack, November 23, 1992
8. Presentation, Commercial Earth Observations Program by Chuck Hill, Stennis Space Center
9. Document, Council on Competitiveness, Industry as a Customer of the Federal Laboratories
10. Memo, HQ # L:MPK:ss, RE: Technology Report Cards, To: Distribution, From: NASA Transition Team (Aaron Cohen, Darleen Druyun, Tom Campbell, Ed Frankle, Marty Kress), November 13, 1992
11. Document, NASA Mission To America, Benefits from Space, Partial Draft, November 4, 1992 (***ORIGINAL***)

Subseries 3. Dan Goldin NASA Organization Working Group, 1994

Box 39 continued *Dan Goldin NASA Organization Working Group, 1994*

Folder

3. NASA Organization Working Group (NOWG)/HQ/Roles/Mission, 1994

Item

1. NASA Organization Working Group Report to the Senior Management Group, October 12, 1994 (presentation, key document)
2. The Fundamental Questions (presentation)
3. Informal Memo from Mark Craig to Larry Ross, RE: Assignment from Friday's NOWG, October 2, 1994
4. NOWG Working Material, August 27, 1994 (presentation, ***ORIGINAL***)
5. Enterprise-Focused Management Concept, Preliminary Draft, August 26, 1994 (presentation)
6. Generic Headquarters Roles (charts, ***ORIGINAL***)
7. NASA KSC Presentation by Robert Crippen, NASA Organization, Present Organization, Strategic Enterprises, and Strategic Functions, Proposal and Analysis, August 26, 1994 (***ORIGINAL***)
8. Charts, Deputies Focus Group—Mann Lead, August 26, 1994 (***ORIGINAL***)
9. Presentation, Report to the NASA Organization Working Group, Deputies Focus Group B, August 12, 1994
10. Organizational Concept, September 13, 1994 (document, ***ORIGINAL***)
11. Feedback from a Deputy Group, August 12, 1994 (document)
12. NASA Organization Review Working Group Membership, July 18, 1994 (document)
13. Informal note to Members of the NASA Organization Working Group, July 26, 1994 (document)
14. NOWG Agreements, Conclusions – Organizational Structure, September 20 (document)
15. Presentation, NOWG Report To The SMG (***ORIGINAL***)
16. Memo HQ, June 9, 1994, RE: Strawman Draft of the NASA Strategic Management Plan; Retreat Logistics, To: Officials-in-Charge of Headquarters Offices, Directors, NASA Field Installations, and Director, Jet Propulsion Laboratory, From: AI/Associate Deputy Administrator (J.R. Dailey), June 22-23, 1994 (key document)
17. Background, NASA Organization Working Group Senior Management Meeting, August 11, 1994 (document)
18. Chart, SBU's and Organization
19. Notes from Brainstorming Session During August 12, 1994, NOWG Meeting (document, ***ORIGINAL***)
20. Informal note from Mark Craig to Larry Ross, RE: Thoughts on organizational concept based on Strategic Enterprises, August 19, 1994

Subseries 4. Sean O'Keefe Vision Exercise, 2002

Box 39 continued *Sean O'Keefe Vision Exercise, 2002*

Folder

4. Sean O'Keefe Vision Exercise, 2002
   Item
   1. Administrator's Vision Activity Objectives pitch, April 12, 2002
   2. Craig's notes from Agency senior management retreat at the Airlie Center, March. 5, 2002
   3. NASA Exploration Team (NEXT) briefing to the Administrator, February 2002
   4. Proposed NASA Vision and a Strategy for Implementation by the NEXT, March 5-6, 2002
   5. Considerations for the NASA Exploration Vision/Strategy briefing by Mark Craig to NASA Senior Management Retreat, March 5, 2000 (key document)
   6. A Vision for NASA by Ghassem Asrar, AA for Earth Science, March 5, 2002
   7. A NASA Role in Space charts by Mark Craig, (key document)
   8. A plan to re-invent NASA … by Bran Ferren of the National Exploration Organization (NEO), November 23, 2001

Series 8. NASA Strategic Plan and Strategic Management, circa 1980s-2000s

(2.2 cubic feet)

Subseries 1. NASA Strategic Plan, 1986-1994

Box 40 NASA Strategic Plan, 1986-1994

Folder

1. Correspondence, From: Mark Craig, To: General Jack Dailey, and Ms. Peggy Finarelli, Subject: Strategic Plan Template, August 26, 1993
2. NASA Strategic Plan, May, 1994 (Original, signed by Strategic Plan Team and NASA Administrator, Dan Goldin, and Administrator General Jack Dailey, 4 copies) (key document)
3. Original Master of first version of 1994 NASA Strategic Plan
4. NASA Strategic Planning, Status Report – Core Presentation, by Dr. Charles Pellerin, Associate Deputy Administrator for Strategic Planning, April 30, 1993
5. Customer/Business Segmentation (document, ***ORIGINAL***)
6. Informal note to Peggy Finarelli, February 10, 1994 (document)
7. Issues from the Strategic Planning Meeting, October 12-13, 1994

(document, includes notations, ***ORIGINAL***)

8. Presentation, Strategic Mission "Advance," Mark Craig, July 26-28, 1993
9. Memo, RE: Final Team Report, To: NASA Employees, From: Vision Team Subgroup, April 13, 1993 (includes Vision Team final report)
10. Strategic Management Concept and Senior Management Retreat Results, Mark Craig, September 15, 1993 (key document)
11. Strategic Plan (blue folder), 1991
    Item
    1. Memo HQ #RZ, Note to Mark Craig, From Terence Finn, July 26, 1991
    2. Presentation, PSS Observations Regarding the SEI Strategic Plan
    3. Charts, SEI Integrated Plan, July 1991
12. NASA Strategic Plan, 1993-1994
    Item
    1. Presentation, Strategic Enterprise Selection Criteria, presented by Mark Craig, August 17, 1993 (key document)
    2. Presentation, NASA Strategic Management Concept and Status Presentation to Quality Steering Team by Mark Craig, June 25, 1993
    3. Presentation, NASA Strategic Management Status Presentation to National Performance Review Working Group by Mark Craig, June 10, 1993
    4. Presentation, NASA Strategic Management Approach Presentation to Strategic Planning Retreat by Mark Craig, August 17, 1993 (key document)
    5. Presentation, NASA's Vision and Mission Statement "What We Do" The Strategic Enterprises by Mark Craig, August 17, 1993 (key document)
    6. Presentation, NASA's Strategic Plan Presentation to the Continuous Improvement External Assessment Team by Mark Craig, August 10, 1994
    7. Presentation, NASA Strategic Management Concept and Plan by Mark Craig, October 12, 1993
13. Draft of NASA Strategic Plan, Vision 21, December 6, 1991
14. Strategic Planning Documents, 1992 (key documents)
    Item
    1. Calendar, December 1992
    2. Worksheet 1
    3. Strategic Planning Guiding Principles, Mark Craig version D
    4. NASA Strategic Plan Objectives, Mark Craig version D
    5. Strategy Management Plan Contents, Mark Craig version D
    6. Strategic Plan Contents, Mark Craig version D
    7. Strategic Management Template, Mark Craig version C
    8. Strategic WBS Line Item Criteria, Mark Craig version C

9. Strategic WBS Line Item Samples, Mark Craig version C
10. Strategic Planning Template, version B (***ORIGINAL***)
11. The NASA Vision (working version), October 29, 1992
12. Presentation, Strategic Planning Guiding Principles (***ORIGINAL***)
13. Strategic Planning Guiding Principles, Version C
14. Flow chart, NASA Strategic Plan Milestones, K. Poniatowski, December 7, 1992
15. Strategic Plan Writing Assignments for Storyboards, December 10, 1992
16. Outline, Thinking about how to do this
17. Flowchart, NASA Strategic Plan Development Process, December 6, 1992
18. Near-Term Activities, November 19, 1992
19. Note from NASA HQ Code IP, October 21, 1992, RE: People to Visit on Strategic Planning, To: Q/Dr. Pellerin, From: Terence Finn
20. Notes, Strategic Issues/Contacts (***ORIGINAL***)
21. NASA Strategic Planning Approach, Mark Craig, October 6, 1992
22. Outline, Strategy Management Plan, Version A
23. Charts, NASA Strategic Management Approach, Office of the Associate Deputy Administrator for Strategic Planning, December 21, 1992
24. Plan Outline, December 16, 1992 (***ORIGINAL***)
25. Outline, Draft, NASA Strategic Plan
26. Outline, Strategic Planning
27. Strategic Plan Issues
28. Strategic Issues
29. Chart, NASA Vision (***ORIGINAL***)
30. Informal Memo to Distribution from Associate Administrator for Space Science and Applications, RE: The NASA Strategic Plan
31. Memo HQ # IP, Note to AP/Dr. Pellerin from Terence Finn RE: Pitch to Advisory Council, November 16, 1992
32. NASA Agency-Wide Continuous Improvement Initiatives
33. Memo to Dr. Howard Robins from Mark Craig, RE: Program Excellence Team, October 28,1992
34. Memo HQ, RE: Program Commitment Agreement, To: Distribution, From: AD/Special Assistant to the Administrator (Paul Holloway), December 15, 1992 (***ORIGINAL***)
35. Notes, IV. Program and Budget Options
36. Copy of article, National Academy Press
37. TRW Space & Technology Group, Highlights of the Strategic Plan 1992-1996 (***TRW PROPRIETARY***)

15. Red folder containing the NASA Strategic Plan Presentation to the

Crossing Department Lines Workshop, by Mark Craig, December 7, 1994 (17 viewgraphs, ***ORIGINAL***)

16. Various Strategic Plans, 1986-1993
    Item
    1. Document, Office of Space Flight Strategic Plan, 1993
    2. Document, Office of Space Science and Applications Strategic Plan, 1991
    3. Notes on Long Range Planning
    4. Document Control No. 26, NASA Strategic Planning Workbook, as of May 5, 1986
    5. Document, Johnson Space Center's Strategic Game Plan, Charting a Course of the Year 2000 and Beyond, October 1987

Box 41 *NASA Strategic Plan, 1991-1994*

Folder

1. NASA Strategic Planning Status Report to the Aeronautics and Space Engineering Board National Research Council, by Mark Craig, May 8, 1993 (***ORIGINAL***)
2. Document, Comparative Strategic Planning in Two Sea-Faring Civilizations, undated
3. Document, Potential Strategic Considerations/Issues/Questions—A Representative List, February 25, 1993
4. Letter to Dr. Charles Pellerin from Hans Mark, Department of Aerospace Engineering and Engineering Mechanics, The University of Texas at Austin, RE: Strategic Planning for NASA, March 12, 1993
5. First draft of NASA Strategic Plan, September 1, 1993
6. NASA Strategic Plan (SP) Documents, 1991-1994
   Item
   1. Memo HQ, RE: NASA Town Meetings, To: All NASA Employees, From: A/Administrator (Dan Goldin), January 14, 1993
   2. Vision Team Final Report, April 1993
   3. Letter to Vice Admiral Truly, NASA Administrator, September 16, 1991, RE: To provide you and Vice President the views of the members of the Advisory Committee on the Future of the U.S. Space Program based on session at KSC September 12-14, 1991.
   4. Informal Memo, To: HQ/AA/Mr. Goldin, AB/Mr. Cohen, AB/Colonel Bolden, from: JSC/KA/Mark Craig, RE: Visit with Mr. Goldin at JSC Reception, May 12, 1992
   5. Memo HQ, RE: Memorandum for all NASA and JPL Employees from NASA Administrator, Dan Goldin, June 5, 1992
   6. Informal letter to Charlie from Mark Craig, May 14, 1992

7. Newspaper article: Lost In Space: NASA's Slow Mid-course Corrections, August 18, 1991
8. Informal note to Peggy from Mark Craig, December 15
9. The NASA Strategic Plan Presentation to the Headquarters Directives Reengineering Team by Mark Craig, September 27, 1994
10. NASA Strategic Plan (1995 Update, Draft #1), November 15, 1994
11. NASA's Strategic Plan Presentation to the NAC by John Dailey, Acting Deputy Administrator, April 13, 1994
12. Presentation, NASA Vision Team Report, by Shannon Bartell, KSC, April 13, 1993
13. Office of the Associate Deputy Administrator for Strategic Planning (Draft), March 25, 1993
14. The NASA Strategic Plan, Rough Working Draft, Preliminary Draft A, August 24, 1993
15 The NASA Track Record: Some Performance Measures of the First 35 Years and Strategic Implications for the Next 35, Presented by Greg Davidson, January 6, 1993
16. Memo HQ, RE: Comments on NASA Streamlining Plan Revision, To: FM/Director, Management Systems Division, From: AIP/Assistant for Strategic Planning (Mark Craig), October 3, 1994, (***ORIGINAL***)
17. Memo, RE: NASA Strategic Planning, To: Dr. Charles Pellerin From: Mark Craig, October 28, 1992
18. Strategic Management Planning Presentation to General Jack Dailey by Mark Craig, May 6, 1993. This pitch convinced General Dailey that a new direction was required in NASA strategic planning. Strategy WBS elements eventually became strategic enterprises (key document)
19. NASA's Strategic Business Units presentation by Mark Craig, July 16, 1993
20. Plan for the Strategic Planning Retreat, August 10, 1993 (key document)
21. Strategic Management Concept and Senior Management Retreat Results by Mark Craig, September 15, 1993 (key document)
22. NASA Strategic Management Concept and Plan Presentation to Program/Project Management Initiative by Mark Craig, October 27, 1993 (key document)
23. Document, NASA Strategic Management Plan, Draft #2, October 5, 1994
27. Document, Printout of Drives
28. Outline, The NASA Strategic Plan
29. Document, Strategy Framework (***ORIGINAL***)
30. Document, Strategic Enterprise Leads

7. Booklet, BP International Culture Change Team, Change Process Benchmarking, June 15, 1992
8. NASA Strategic Planning Status Report by Dr. Charles Pellerin, Associate Deputy Administrator for Strategic Planning, undated
9. Statement of General John Dailey, Acting Deputy Administrator before the Subcommittee on Legislation and National Security, Committee on Government Operations, U.S. House of Representatives, October 6, 1993
10. Letter to Margaret Finarelli, NASA Headquarters, from Clay Jones, Rockwell International, RE: Opportunity to comment on NASA's draft Strategic Plan, March 18, 1994
11. Comments on NASA Proposed Strategic Plan, Draft #6, February 15, 1994 (***ORIGINAL***)
12. Informal note to Jack Dailey from Peggy Finarelli, with enclosure: Johnson Controls comments on Strategic Plan, April 21, 1994
13. Strategic Planning Status (June 15 Meeting with General Dailey)
14. Presentation, Section 1, Introduction, January 6, 1992 (includes notations)
15. Presentation, Briefings Around Town, February 17, 1993
16. Notes from Presentation on Strategic Planning at the Senior Management Meeting, February 17, 1993
17. NASA Strategic Planning, A Status Report as presented to the Senior Management Group, by Dr. Charles Pellerin, April 13, 1993
18. Memo HQ, RE: Strategic Enterprise Product Schedule, To: Strategic Enterprise Leads, From: AF/Mark Craig, September 16, 1993 (***ORIGINAL***)
19. Document, Senior Management Meeting (Rev. 2), December 1, 1994

Box 41a *NASA Strategic Plan, circa 1980s-1990s*

Folder
1. Various articles related to Strategic Planning, circa 1980s-1990s

Subseries 2. NASA Strategic Management, 1993-1996

Box 42 *NASA Strategic Management, 1993-1996*

Folder
1. NASA Roles and Missions Report from Deputy Administrator J.R. Thompson to Administrator Admiral Dick Truly, November 8, 1991 (key document)
2. Letter from Administrator Admiral Dick Truly to Vice President Dan Quayle transmitting the Roles and Missions Report, November 13, 1991

3. NASA Strategic Management Plan, 1994

Item

1. NASA Strategic Management Plan, Draft #3, November 15, 1994
2. NASA Strategic Plan, 1995 Update, Draft #1, November 15, 1994
3. Memo HQ, RE: Strawman Draft of the NASA Strategic Management Plan; June 22-23, 1994, with SMG comments and Mark Craig notes, (5 items), June 9, 1994 (key document)

4. Strategic Management Plan (blue folder), 1994-1995

Item

1. Article, Uses and Misuses of Strategic Planning, by Daniel H. Gray
2. NASA Strategic Plan, 1995 Update, Draft #1, November 15, 1994, Marked-up version
3. Handwritten notes, Bausridge Feedback, October 27, 1994 (***ORIGINAL***)
4. Table, Strategic Management Working Group, October 21, 1994
5. Outline, Space Inc. Strategy
6. Presentation, Management of Corporate NASA
7. Flowchart, Strategic Management Cycle
8. Comments for Senior Management Meeting, January 6, 1995
9. Informal Memo, Code Y, RE: Functional Management, To: J/Associate Administrator for Management Systems and Facilities, From: Y/Deputy Associate Administrator for Mission to Planet Earth
10. Figure 2 Strategic Management Cycle Chart with Viewgraph
11. Flowchart, NASA Strategic Management, November 14, 1994
12. NASA's Enabling Processes (document, ***ORIGINAL***)
13. Appendix A, Functional Management Listing (document)
14. Informal Note, November 27, 1994, RE: Processes and Strategic Functions, To: Doug Norton, From: Mark Craig
15. Flow chart, Integrated Strategy and Budget Development (***ORIGINAL***)
16. Memo HQ, RE: NASA Strategic Plan and Strategic Management Plan, To: Officials-in-Charge of Headquarters Offices, Directors, NASA Field Installations, and Director, Jet Propulsion Laboratory, From: Z/Associate Administrator-Office of Policy and Plans (Alan Ludwig), November 16, 1994
17. Flowchart, Figure 2. Strategic Management Cycle, November 11, 1994 (***ORIGINAL***)

5. NASA Strategic Management Status Presentation to National Performance Review Working Group, by Mark Craig, June 10, 1993 (key document)

6. Memo from Headquarters, RE: Strategic Management Plan Retreat, To: Officials-in-Charge of Headquarters Offices, Directors, NASA Field Installations, and Director, Jet Propulsion Laboratory, From: AI/Associate Deputy Administrator (J.R. Dailey), September 23, 1994
7. Memo from Headquarters Code Z, RE: Strategic Management Meeting, January 10-11, 1995, To: Officials-in-Charge of Headquarters, Directors of NASA Field Installations, and Director, Jet Propulsion Laboratory, From: Z/Associate Administrator for Policy and Plans (Alan Ladwig), January 5, 1995
8. Presentation, Status of NASA Strategic Management and Mission for Space Development, Presented to MFPE Study Office Retreat, Mark Craig, June 28, 1993
9. Informal Memo, RE: Completion of Enterprise and Function Strategic Plans, To: Strategic Enterprise and Function Team Leaders, From: Mark Craig, November 16, 1994
10. Presentation, NASA Strategic Management Status—Significance for JSC—by Mark Craig, September 27, 1993
11. NASA Strategic Management System Handbook, Draft #1, January 5, 1995
13. NASA Strategic Management Concept and Plan, Presentation to Program/Project Management Initiative, Mark Craig, October 27, 1993
14. NASA Functional Management – Report of the Functional Management Review Task Team, April 13, 1993
15. Proposed NASA Management Concept – Presentation to Wayne Littles and Roy Estess, by Mark Craig, October 4, 1995 (with meeting notes)
16. In Search of a Management Theory, by Richard Reeves, October 1995
17. Proposed NASA Management Model, by Mark Craig, Mike Mann, Richard Reeves, Dick Wisniewski, March 4, 1996, (key document)
18. Presentation to NASA Senior Management Strategic Planning Retreat – NASA Functional Management Structure and Process Study, by Roy Estess, April 2, 1996 (includes associated paperwork, correspondence and documents)

Box 42a *NASA Strategic Plans and Strategic Management Handbooks, 1981-2000*

Folder
1. The Planning and Control of NASA Programs and Resources, NASA Technical Memorandum 83090, January 1981 (includes a flowchart for the Federal Budget Process, circa early 1980s)
2. NASA Strategic Plan, February 1995
3. NASA Strategic Plan, February 1996
4. NASA Strategic Management Handbook, and related planning/draft

documents, October 1996
5. NASA Memo, To: Officials-in-Charge of Headquarters Offices; Directors, NASA Field Installations; and Director, Jet Propulsion Laboratory, Subject: Successful Completion of Strategic Plan, June 26, 1997, and 1997 Strategic Plan
6. NASA Strategic Plan, 1998, with 1999 Interim Adjustments, NASA Policy Directive (NPD)-1000.1a
7. NASA Strategic Management Handbook, "The Red Book," NPG 1000.2, and related planning/draft documents, February 2000

Subseries 3. HQ Advanced Planning and Integration Office (APIO), 2004-2005

Box 43 *HQ Advanced Planning and Integration Office (APIO), 2004-2005*

Folder
1. Requirements Offsite, October 14-15, 2004
2. Integration at NASA Jet Propulsion Laboratory, November 16-17, 2004
3. Integration Meetings at NASA Jet Propulsion Laboratory, 2004
4. Aspen Institute, Aspen WYE River Retreat, September 16-17
5. Dependency Structure Matrix (DSM), 2005
6. ADASS – Structured Decision Analysis Tool, 2004
7. Integration Planning, 2005
8. APIO Retreats, 2005

Box 44 *HQ Advanced Planning and Integration Office (APIO), 2004-2005*

Folder
1. Sustainability (includes a DVD, "Deliverables, Massachusetts Institute of Technology, November 2004")
2. Key Decisions, 2004
3. Strategy Configuration Management (CM), "Agency Reporting and Requirements Traceability, by Michael D. Tanner, Program Integration Office of Systems Integration, Operations Council, November 9, 2004
4. Director's Review and Discussion (DRD), September 2, 2004
5. Advanced Planning and Integration Office (APIO), DocuShare Site, Notebook

Series 9. Human Exploration and Development of Space (HEDS) Strategic Enterprise, 1967-2002

(3.0 cubic feet)

Subseries 1. Human Exploration and Development of Space Strategic Plan, 1967-2002

Box 45 *HEDS Strategic Plans, 1993-circa 2000*

Folder

1. HEDS Strategic Plans Folder (key documents)

   Item

   1. Presentation, Strategic Plan for the Human Exploration and Development of Space, Rough Draft, by Mark Craig, October 4, 1993
   2. Presentation, Proposed Strategy for the Human Exploration and Development of Space
   3. Presentation, Draft Strategy for the Human Exploration and Development of Space (HEDS) Strategic Enterprise, by Mark Craig, February 25, 1994
   4. Presentation, Draft Strategy for the Human Exploration and Development of Space (HEDS) Strategic Enterprise, by Mark Craig, March 10, 1994
   5. Presentation, Human Exploration and Development of Space (HEDS) Strategic Enterprise, Draft Strategy, April 15, 1994 (with notes by unknown individual)
   6. Presentation, Human Exploration and Development of Space (HEDS) Strategic Enterprise, Draft Strategy, with notes by Mark Craig on NASA Advisory Committee (NAC) comments, April 18, 1994 (**ORIGINAL**)
   7. Presentation, Human Exploration and Development of Space Strategy Status, Presentation to the HEDS Management Council by Mark Craig, with notes by Mark Craig, May 19, 1994 (**ORIGINAL**)
   8. Presentation charts on Vision, Mission Goals, etc. to the HEDS Management Council (MC), by Mark Craig, with notes by Mark Craig, August 12, 1994 (**ORIGINAL**)
   9. Document, Draft Strategic Plan, The NASA Enterprise for the Human Exploration and Development of Space (HEDS) 1995, Rev 0, with notes by Mark Craig, December 1, 1994 (**ORIGINAL**)
   10. Document, Human Exploration and Development of Space, the Strategic Plan, Draft 0, December 14, 1994
   11. Document, Human Exploration and Development of Space, the Strategic Plan, Draft 2. Cover sheet a hand markup of Draft 1, dated January 23, 1995
   12. Document, Human Exploration and Development of Space the Strategic Plan, Draft 2a, February 1995
   13. Document, NASA's Enterprise for the Human Exploration and Development of Space, the Strategic Plan, January, 1996

14. Document, The Next Giant Leap, HEDS Strategic Enterprise Initiative, undated (1997?)
15. Document, Human Exploration and Development of Space, Strategic Plan, undated (1998?)
16. Document, Goals and Objectives for the Human Exploration and Development of Space Strategic Plan, draft #2 in pencil, undated
17. Document mock-up Human Exploration and Development of Space Strategic Plan, includes documents related to NASA approved programs, by Enterprise, circa 1999
18. Document Human Exploration and Development of Space Strategic Plan, undated (2000?)

2. Mission for Space Development, 1993

Item

1. The Development of Space Strategic Enterprise Status Presentation to NASA Strategic Planning Retreat, by Mark Craig, August 17, 1993
2. Presentation, "Content"
3. Presentation, Mission for Space Development (***ORIGINAL***)
4. Table, Selecting a Vision Statement
5. Table, US Economic Strategy
6. Charts, Can Human Exploration be Commercialized?
7. Document on the Development of a Vision for the Human Exploration Program
8. Viewgraph, Within the Generations (***ORIGINAL***)
9. Handwritten Outline, March 3, 1993 (***ORIGINAL***)
10. Presentation, Human Exploration Strategy, Assumptions and Constraints
11. Presentation, Human Exploration Goals
12. Charts, Human Exploration Goals
13. Document, 10, 20, 30 Year Goals for Human Exploration
14. Document, Humans in Space Mission Team
15. Presentation, NASA Strategic Plan, Mission for Human Exploration Working Charts "Wo Tsubusu Iuuga," March 15, 1993

3. Human Exploration and Development of Space, 1993-1995

Item

1. HEDS Strategy Development Schedule, January 13, 1995
2. HEDS Working Group, October 24, 1994
3. Chart, Jet Propulsion Laboratory, comments (***ORIGINAL***)
4. Handwritten Notes (***ORIGINAL***)
5. Presentation, Status of the HEDS Strategic Enterprise to Dr. Wayne Littles, by Mark Craig, December 19, 1994
6. Informal Memo, RE: Background Material for HEDS Meeting, To: General Pearson, Dr. Holoway, Wes Huntress, Jack Mansfield, From: Mark Craig, November 14

7. Document, HEDS Meeting Agendas
8. Document, HEDS Roadmap for 2020
9. AIAA 93-4212 Paper, Mars Exploration Strategies: A Reference Program and Comparison of Alternative Architectures by David Weaver, Michael Duke, AIAA Space Programs and Technologies Conference and Exhibit, Huntsville, AL, September 21-23, 1993
10. Handwritten Notes – Wendell 's Paper (***ORIGINAL***)
11. IAA Paper, IAA-94-IAA.3.1.634, The Need for a New Political Covenant on Human Spaceflight by Wendell Mendell, JSC, 45th Congress of the International Astronautical Federation, Jerusalem, Israel, October 9-14, 1994
12. Paper, NASA's Future in Educational Technology, A Vision and a Demonstration, A report by Dan Goldin by Larry Berger, November 14, 1994
13. Document, HEDS, The Strategic Plan, Draft 2a, February 1995
14. Document, HEDS, The Strategic Plan, Draft 2, January 23, 1995
15. HEDS Working Group Agenda, January 12-13, 1995
16. Barron's Magazine article, Editorial Commentary from Thomas G. Donlan, "Flying High"
17. NASA Strategic Plan, HEDS Section
18. Memo HQ #Z, RE: Strategic Management System Requirements, To: Officials-in-Charge of Headquarters, Directors, NASA Field Installations, Director JPL, From: Z/Associate Administrator for Policy and Plans (Alan Ludwig), December 20, 1994 (***ORIGINAL***)
19. Document, Mission To Planet Earth, Strategic Enterprise Plan, 1995-2000, Review Draft #2, December 9, 1994
20. Handwritten charts (***ORIGINAL***)
21. Document, Goals and Objectives Section of latest HEDS Draft, January 11, 1995
22. Document, HEDS Steering Group Personnel, December 16
23. HEDS Steering Group Meeting, December 16, 1994
24. Document, HEDS
25. Table, Office of Space Flight Budget Structure Comparison, Previous Budget vs FY 95 Congressional Budget, February 2, 1994
26. Notes, December 5, 1994, JPL Input (***ORIGINAL***)
27. Handwritten notes, JSC comments (***ORIGINAL***)
28. HEDS Status to Senior Management Group, January 10, 1995
29. Presentation, HEDS Management Council Agenda

4. Memo HQ, RE: Mission from Planet Earth Studies, To: S/Associate Administrator for Space Science, From: A/Administrator (Dan

Goldin), July 9, 1993

5. Memos and Newsletter, July – September, 1993

   Item

   1. Memo HQ, RE: Mission from Planet Earth Studies, To: S/Associate Administrator for Space Science, From: A/Administrator (Dan Goldin), July 9, 1993
   2. Newsletter, The Human Exploration and Development of Space Enterprise
   3. Memo HQ, RE: Human Space Flight Strategy Retreat, To: Distribution, From: Mark Craig, September 8, 1993
   4. Memo HQ, RE: Human Space Flight Strategy, To: Distribution, From: Mark Craig, September 2, 1993
   5. Memo HQ #M-2, RE: Human Exploration and Development of Space Strategy Meeting—Document Follow-Up, To: Distribution, From: M-2/Deputy Associate Administrator for Space Flight (Management) (Michael Mann), September 21, 1993
   6. Memo HQ, September 21, 1993, RE: Human Exploration and Development of Space Strategic Enterprise Retreat Charts, To: Distribution, From: AF/Mark Craig

6. Memo HQ # SX, RE: White Paper on the Use of Extraterrestrial Resources, To: Distribution, From: SX/Acting Chief, Mission From Planet Earth Study Office (Carl Pilcher), August 18, 1994
7. Human Exploration and Development of Space Strategic Enterprise Status to the NASA Advisory Council, by General J.W. Pearson, April 13, 1994

Box 46 *Human Exploration and Development of Space Strategic Enterprise (vision, mission, goals, etc.), 1967-1999*

Folder

1. Handwritten Notes, Enhance Life (***ORIGINAL***)
2. Human Exploration and Development of Space Strategic Enterprise (vision, mission, goals, etc.), June 9, 1994
3. Memo, To: Officials-in-Charge of Headquarters; Directors, NASA Field Installations; Director, Jet Propulsion Laboratory, From: Z/Associate Administrator for Policy and Plans, Subject: Strategic Management System Requirements, and related documents, December 20, 1994
4. Working Group Agenda, January 12-13, 1995
5. Presentation, NASA's Bridge to Future Markets: the Human Exploration and Development of Space (HEDS) Strategic Plan, presentation, by Mark Craig to the International Space University, Vienna Austria, August 21, 1996
6. "Space Futures: An Emerging Forum," An Unfolding Story of

Transformation and Interweaving, by Dr. Kenneth J. Cox, November 1997

7. HEDS Strategy Meeting correspondence and documents, January – March, 1998
8. Human Exploration and Development of Space Strategic Enterprise, Senior Management Council, Joseph H. Rothenberg, Associate Administrator, April 6, 1998 (includes 2 related memos)
9. Memo to the HEDS Strategy Steering Committee from Mark Craig, August 12, 1998
10. HEDS "Grand Challenges" for the NASA Institute for Advanced Concepts (first revised draft), April 15, 1998
11. Presentation, Human Exploration and Development of Space Strategic Planning to the Office of Space Flight (OSF) Management Board, by Mark Craig, May 14, 1998 (and supporting material)
12. Document, Initial Lessons Learned from Feedback on Planning Process and the HEDS Strategic Plan Itself, by Joe Nieberding [LeRC], 1998
13. Developing a Strategic Vision: Summary of Phase One, Toffler and Associates, 1998
14. Human Exploration and Development of Space Strategic Enterprise, presentation to the NASA Advisory Council, by Joseph H. Rothenberg, Associate Administrator, Office of Space Flight, June 17, 1998
15. e-mail message, From: Janet Austill, To: Mark Craig, Re: HEDS Draft – Strategic Plan, December 17, 1998 (includes notations and highlights)
16. e-mail message, From: Jenny Lyons, To: Mark Craig, Re: KSC Inputs to HEDS Strategic Plan, January 6, 1999 (includes feedback)
17. "Doug Cooke's List," Objectives, January 13, 1999
18. Presentation, NASA Human Space Flight – A Context, by Mark Craig to the Johnson Space Center Co-op Student Forum, May 4, 1999
19. Human Exploration and Development of Space Strategic Planning Overview, by Joseph H. Rothenberg, Associate Administrator, Human Exploration and Development of Space Enterprise, and Arnauld E. Nicogossian, Associate Administrator, Life and Microgravity Sciences and Applications, February 1999
20. Memo, To: NASA Headquarters, Attn: M-2/Deputy Associate Director for Space Flight (Enterprise Development), From: AA00/Director, Subject: Draft HEDS Strategic Plan Comments, signed Roy S. Estess, September 10, 1999
21. HEDS Goals and Objectives documents, drafts and related correspondence, October 1996 – November 1998
22. HEDS Roadmap for 2020 and HEDS Roadmap for 2005
23. An Assessment of HEDS, includes hand-written notes, undated
24. HEDS Strategy Thought Pieces folder (includes various articles), 1994-2003

25. Lunar Studies, 1967-1996

Item

1. Lunar Landing Site Chart, Lunar and Planetary Institute, Houston, Texas, 3rd edition, July 1967
2. NASA photograph, Potential Lunar Base Sites, S84-31673
3. The Case for an International Lunar Base (IAA Ad Hoc Committee "Return to the Moon,") *Acta Astronautica,* Vol. 17, No. 5, pp. 463-489, 1988
4. Lunar Science Strategy Workshop, Science Strategy for the Exploration and Development of a Lunar Outpost and the Moon, NASA, Johnson Space Center, Houston, Texas, August 15-16, 1989
5. Space Exploration Technology and Society, presented by, Mark R. Oderman, Managing Director, CSP Associates, Cambridge, Massachusetts, presented to, AIAA/NASA/OAI Conference on Advanced SEI Technologies, Cleveland, Ohio, September 6, 1991
6. International Lunar Resources Exploration Concept, by Kent Joosten, February 1993
7. Resources Exploration: Industry Perspective: The Franchise Model, by W. David Carrier, III, Lunar Geotechnical Institute, LGI TR93-01, April 1993
8. Using the Space Shuttle Columbia to Begin Bringing the Moon to America, Thirty-Third Space Congress, Cocoa Beach, Florida, February 25, 1996
9. Return to the Moon: A commercial program to benefit Earth, Presented to 10th International Space Plans and Policies Symposium, presented by W. H. Siegfried, Space Exploration and Development – International Aspects, Beijing, China, October 7-11, 1996
10. An International Lunar Farside Observatory and Science Station (IAF-93-Q.2.389), by Wendell W. Mendell, 1993 ISU Design Project Director, NASA Johnson Space Center, Houston, Texas (From the 1993 International Space University Design Project), 44th Congress of the International Astronautical Federation, Graz, Austria, October 16-22, 1993
11. Burns, J.; Duric, N.; Taylor, G. J., et. al. (1990). Observatories on the Moon. *Scientific American*. 262 (3), pp. 42-49.
12. Strategic Considerations for Cislunar Space Infrastructure (IAF-93-Q.5.416), by Wendell W. Mendell and Steven Hoffman, 44th Congress of the International Astronautical Federation, Graz, Austria, October 16-22, 1993
13. Lunar Impact Basins and Crustal Heterogeneity: A View of the Western Limb and Farside from the First Galileo Earth-Moon Encounter. Jim Head, et. al., 1991
14. Lunar Base as a Precursor to Mars Exploration and

Settlement (IAA-91-704), by Wendell W. Mendell, 44th Congress of the International Astronautical Federation, Graz, Austria, October 16-22, 1993

Box 47 *Space Power Studies/Mars Studies, 1990-1999*

Folder

1. Space Power Studies, 1991-1993 (folder 1 of 2)

   Item

   1. Criswell, D.R.; Waldron, R.D. (1993). International Lunar Base and Lunar-Based Power System to Supply Earth with Electric Power. *Acta Astronautica*, Vol. 29, No. 6, pp. 469-480.
   2. Criswell, D.R. (1993). Lunar Solar Power System: Options and Beaming Characteristics. Paris, France: International Astronautics Federation.
   3. Summary, Solar Energy and Space Session, UNESCO World Solar Summit, July 1993
   4. Lunar Solar Power System and World Economic Development, by Dr. David R. Criswell, presented to Solar Energy and Space Group, Chapter 2.5.2 at the World Solar Summit UNESCO and Uno, Paris, July 8, 1993
   5. Power From Space: Expected Role and Influence on Energy System Development, by L.S. Belyaev; A.S. Koroteev; Yu. N. Rudenko, 44th Congress of the International Astronautical Federation, Graz, Austria, October 16-22, 1993
   6. Chaikin, A. (1992). Shoot for the Moon. *Air & Space,* December 1991/January 1992
   7. Decision Envelopment Analysis of Space and Terrestrially-Based Large Scale Commercial Power systems for Earth, by Dr. David R. Criswell and Dr. Russell G. Thompson, 43rd Congress of the International Astronautical Federation, Washington, DC, August 28 – September 5, 1992
   8. System Requirements/Constraints and Design Options for a Global Lunar Power System, R.D. Waldon and D. R. Criswell, IECEC-91
   9. A Statement from the "Workshop on D-^{3}He Based Reactor Studies," Kurchatov IAE, Moscow USSR, September 25 – October 2, 1991
   10. Results of Analysis of a Lunar-based Power System to Supply Earth with 20,000 GW of Electric Power, Dr. David R. Criswell and Dr. Robert D. Waldron, 1991

2. Space Power Studies, 1989-1990 (folder 2 of 2)

   1. Lunar System to Supply Solar Electric Power to Earth, Dr. David R. Criswell and Dr. Robert D. Waldron, Intersociety Energy Conversion Engineering Conference, Reno, NV,

August 12-17, 1990

2. Report on the Lunar Energy Enterprise Case Study, by E.J. Conway, NASA Langley Research Center, March 6, 1990
3. Report of NASA Lunar Energy Enterprise Case Study Task Force, NASA Technical Memorandum 101652, July 1989
4. Astrofuel for the 21st Century, the College of Engineering, University of Wisconsin-Madison, March 1988
5. Power from Space: A Global Option for the 21st Century, Dr. Peter E. Glaser, Vice President, Arthur D. Little, Inc., undated
6. On Economics of Lunar Resources for SPS, by Gordon R. Woodcock, Boeing Defense and Space Group, Huntsville, Alabama, undated
7. Human Exploration of Space and Power Development, Aaron Cohen, Director, Johnson Space Center, undated
8. Terrestrial and space Power systems: Life-cycle energy considerations, D.R. Criswell, University of Houston, undated
9. Bartlett, A.A. (1978). Forgotten fundamentals of the energy crisis. *American Journal of Physics*, 46(9), pp. 876-888

3. Mars Studies, 1990-1998 (folder 1 of 2)

Item

1. Mars Field Geology, Biology, and Paleontology Workshop: Summary and Recommendations, edited by Nancy Ann Budden, Space Center Houston, November 18-19, 1998
2. Shriley, D. L. (1996). "Mar on $300K A Day": The Mars Exploration Program. *Acta Astronautica,* Vol. 30, No. 1-4, pp. 101-110
3. Mars Symposium, remarks prepared for delivery by Daniel S. Goldin, Administrator, NASA, November 22, 1996
4. Cooper, H. S.F., Jr. (1996). The Loneliness of the Long-Duration Astronaut. *Air & Space*, June/July, pp. 37-45
5. Mars Exploration Road Map, Exploration of Mars 2001-2020, August 1995
6. Achieving a Balance: Science and Human Exploration, by Michael B. Duke, Lunar and Mars Exploration Program Office, Houston, TX (AIAA 91-2999). Mars Exploration Past, Present and Future, Williamsburg, VA, July 17-19, 1991
7. Andersen, D.T.; McKay, C.P.; Wharton, R.A.; Rummel, J.D. (1991). Testing a Mars Science Outpost in the Antarctic Dry Valleys. *Advanced Space Research*.
8. A Goal and Strategy for Human Settlement of the Moon and Mars: Part Two, by Donna Shirley Pivirotto, Case for Mars IV, Boulder, CO, June 4-8, 1990

4. Mars Studies, 1987-1993 (folder 2 of 2)

Item

1. Bourke, R.D.; Dias, W.C.; Golombek, M.P., et. al. (1993). Status of Robotic Mission Studies for the Space Exploration

Initiative-1991. *Acta Astronautica*, Vol. 29, No. 9, pp. 691-699.

2. Pivirotto, D. S. (1990). A goal and strategy for human exploration of the Moon and Mars. *Space Policy*, August.
3. The Long-Term Habitation of Mars, by Martyn J. Fogg (submission to Case for Mars V, first draft), circa 1990
4. History of Water on Mars, by Mark Craig, November 15, 1989
5. Environment of Mars, 1988 (NASA Technical Memorandum 100470) by David Kaplan, Compiler, Johnson Space Center, Houston, Texas, October 1988
6. The Planetary Society Spacebridge Meeting; "Together to Mars?" (a transcript of the discussions) July 18, 1987
7. Humans to Mars: A Space Leadership Initiative," presented by John Niehoff, NASA Headquarters, March 18, 1987
8. Brochure, Mar Surveyor: A program for Mars exploration, undated
9. Booklet, Viking: The Exploration of Mars, (NASA EP-208) Jet Propulsion Laboratory, 1984

5. International Folder, 1988-1999

Item

1. Article on lunar resources, in Russian, by Academician Slava Shevchenko, signed by the author. [To Mr. Mark Craig with best wishes from author Slava Shevchenko, April, 1988 Houston]
2. The Difficult Road to Mars – A Brief History of Mars Exploration in the Soviet Union by V. G. Perminov, July, 1999
3. Various papers from the U.S. and Soviet Union Joint Working Group on Solar System Exploration, Washington DC, November, 1988
4. Mission to Mars - Report of the Mars Exploration Study Team, European Space Agency, 1990. signed by the study manager, George Scoon. [Mark, Mars bound George 14/05/91]
5. Vision 2020, An International View of the Future, Executive Summary, International Space university Summer Session, Stockholm Sweden, 1995
6. To Mars Together, Proceedings of the 8th Planetary Congress of the Association of Space Explorers, Washington DC, August, 1992
7. Various lunar exploration papers by the National Space Development Agency of Japan (NASDA), 1989
8. Article on the Russian RD-0401 nuclear rocket engine, June, 1996

Box 47a *History of Mars Mission Planning, 2001*

Folder

1. History of Mars Mission Planning, 2001
   Item
   1. Eyes on the Red Planet: Human Mars Mission Planning, 1952-1970, by Annie Platoff, Lyndon B. Johnson Space Center, NASA/CR-2001-208928, July 2001
   2. Humans to Mars: Fifty Years of Mission Planning, 1950-2000, by David S.F. Portree, Monographs in Aerospace History #21, NASA SP-2001-4521, February 2001
2. Mars Exploration Folder, 1997-1999 (folder 1 of 2)
   Item
   1. NASA – History: A Chronology of Mars Exploration, (various documents) September 1997
   2. The Cost of Sending Humans to Mars, Humboldt C. Mandell, Jr., Ph.D., Deputy Manager, Exploration Programs Office, NASA Johnson Space Center, undated
   3. Minutes of the First Meeting of the Integrated Mars Mission Team, Denver, Colorado, April 30-May 1, 1997
   4. Mars Exploration Program, Architecture Team Report. Presented to NASA Headquarters by Charles Elachi, Chair, September 24, 1998
   5. Portree, David S.F. (1999, November/December). Feature Article: NASA's Mars Design Reference Mission: It Originated with Mars Direct—But Where did Mars Direct Come From? *Space Times*, pp. 5-9.
   6. A Combined Solar Electric and Storable Chemical Propulsion Vehicle for Piloted Mars Missions, by Carolyn R. Mercer, Steven R. Oleson, and Bret Drake (AIAA, publication information unknown)
3. Mars Exploration Folder, 1996-1999 (folder 2 of 2)
   Item
   1. Operations Concept Definition for the Human Exploration of Mars, Human Exploration Operations Team, 1st edition, April 8, 1999
   2. Reference Mission Version 3.0, Addendum to the Human Exploration of Mars: The Reference Mission of the NASA Mars Exploration Study Team, Exploration Office, Advanced Development Office, June 1998
   3. Road to Mars Exploration by Humans – Early Leveraging of the Code S Mission, By Doug Cooke, Johnson Space Center, April 21, 2000
   4. Proposed Codes M, U Participation in the 2001 Mars Surveyor Mission, by Doug Cooke, Johnson Space Center, Exploration Office / EX, February 13, 1997
   5. AIAA 96-0333, Mars Exploration Program Strategy: 1995-2020, by Donna L. Shirley, Manager, Mars Exploration

Program and Dr. Daniel J. McCleese, Jet Propulsion Laboratory, 34th Aerospace Sciences Meeting and Exhibit, Reno, NV, January 15-18, 1996

6. NASA Special Publication 6107, Human Exploration of Mars: The Reference Mission of the NASA Mars Exploration Study Team, Stephen J. Hoffman and David I. Kaplan (eds.), Lyndon B. Johnson Space Center, July 1997

4. "Beyond LEO – Plans, 2002" blue folder

Item

1. Exploration Blueprints Briefing Outline, November 24, 2002
2. Strategic Planning, Dan Mulville, NASA Enterprise Council Retreat, October 18, 2002
3. Notations per Craig
4. NASA's Grand Vision for the 21st Century: The Exploration of Life in the Universe…and sharing the adventure of discovery with all humanity
5. Architecture Level Requirements, undated
6. Interim Response to Action, Doug Cooke, October 9, 2002
7. Global Architecture-level Requirement Examples, undated

5. Strategic Enterprise Documents, 1994-1997

Item

1. Human Exploration and Development of Space (HEDS) – Enabling Tomorrow's Programs – Today, presentation by Mark Craig to the HEDS Management Boars, April 21, 1997
2. The Strategic Plan – NASA's Enterprise for the Human Exploration and Development of Space, January 1996
3. Human Exploration and Development of Space (HEDS) Strategic Enterprise, Status to the NASA Advisory Council, General J.W. Pearson, April 13, 1994

6. Human Exploration Initiative (HEI) folder, 1996-1999

Item

1. NASA picks landing sites for next mission to Mars, by Andrew Bridges, publication information unknown
2. Mankins, J.C. (1999, November). Commentary: Exploration and development: A marriage made in space. *Aerospace America*, Vol. 37, No. 11, p.1.
3. Human Exploration Initiative: Assumptions for Core Assessment Activity, Doug Cooke, December 8, 1998
4. Exploration: The Vision, Doug Cooke, Exploration Office, May 4, 1998
5. Mars: An Integrated Exploration Strategy, Doug Cooke, undated
6. Reference Mission Cost – Issues of Affordability, Credibility, and Acceptability, Humboldt Mandell, June 19, 1997
7. Roadmap to Mars Funding Options, May 2, 1997
8. Mars/Moon Management: The Necessity for Change and

Issues to be Addressed, David Bates, Roger Bourke, Mark Craig, Joseph Hamaker, Humboldt Mandell, Malcolm Peterson, and Donna Shirley, using the past work of Richard Fox, updated September 1996

9. Various articles and correspondence, circa 1970s-2000s

Box 48 *Beyond International Space Station (ISS), 2002*

Folder

1. Beyond International Space Station (ISS), 2002

Item

1. A Sustainable Basis for NASA Space Flight, presentation to the International Space University's 7th Annual Symposium "Beyond the International Space Station: The Future of Human Spaceflight," by Mark K. Craig, June 4, 2002
2. Report on Group 1 discussion (and related documents), "Learning from the Past, planning for the future, June 6, 2002
3. Handwritten notes, circa 2002
4. "Beyond the International Space Station: The Future of Human Spaceflight," List of Participants, 7th ISU Annual International Symposium, Strasbourg, France, June 4-7, 2002
5. "The Future of Human Space Flight as a Planning Challenge," by Andrew J. Aldrin, Director, Strategic Analysis, The Boeing Company, Human Space Flight and Exploration, undated
6. "Below the Surface, Life Among the Stars," by R. Grymes. NASA Astrobiology Institute, NASA Ames Research Center, revised from 1998 document
7. "Future Trends in Human Spaceflight: A Global Survey," by O. Gurtuna and S. Garneau, circa 2002
8. ISU Symposium, Beyond the ISS: The Future of Human Spaceflight – "Structuring Future International Cooperation: Learning from the ISS," presented by Lynn Cline, Margaret Finarelli, Graham Gibbs and Ian Pryke (includes notations)
9. "The Next Century of Human Space Flight," Russ Turner, United Space Alliance and Mike Mott, The Boeing Company, June 2002
10. "Structuring Future International Cooperation: Learning from the ISS," by L. Cline, P. Finarelli, G. Gibbs, and I. Pryke, undated
11. "Public Outreach: Garnering Support for Future Human Exploration," by N. Colleton and P. Dasch, undated
12. "Future Trends in Human Spaceflight: A Global Survey, by Simone Garneau, Co-founder and Consultant, Futuraspace LLC, 2002
13. "Commercial Manned Space Mission to the ISS, Commercial

Astronaut Image Assessment, intospace, (final presentation) May 5, 2002 (includes company brochure)

14. "Commercial Astronaut Missions to the ISS: from concepts to implementation," by C. Mirra and M. Belingheri, undated (includes notations from presentation)

2. International Space Station (ISS) Planning & Policy Report, 1996

Item

1. ISS Strategic Planning and Policy Deployment Report, NASA, October 1996
2. International Space Station…The Next Logical Step, undated

Subseries 2. HEDS Management, 1993-2002

Box 48 continued *Human Exploration and Development of Space, 1993-2002*

Folder

3. "Red Folder," Strategic Plan Information, 1994

Item

1. HEDS Strategic Plan Schedule
2. Timeline, HEDS Strategy Development Plan, June 20, 1994
3. Document, HEDS Strategic Plan

4. HEDS Management, 1993-1997 (folder 1 of 2)

Item

1. Presentation, NASA Strategic Management Concept and Strategic Framework for Human Exploration and Development of Space, by Mark Craig, November 8, 1993 (key document)
2. Document, charts, HEDS Working Group Participants, RE: Next HEDS Working Group Meeting (***ORIGINAL***)
3. Document, HEDS Strategic Enterprise Steering Group/Working Group Personnel
4. Human Exploration and Development of Space Strategic Enterprise, Proposed Code M Management Model, presentation to Wil Trafton, by Mark Craig, March 5, 1996
5. Correspondence, 1996-1997
6. Flowchart, Strategic Management Cycle
7. Mission for the Development of Space, presentation to the Mission Review "Advance," by Mark Crag, July 26, 1993
8. Advanced Projects, Recommended FY01 Budget Formulation Strategy
9. Memo, To: Strategic Enterprise and Function Team Leaders, From: Mark Craig, Re: Completion of Enterprise and Function Strategic Plans, November 16, 1994
10. Working Group Agenda, January 12-13, 1995
11. HEDS Working Group Status (with notations),

12. HEDS Metrics
13. HEDS Content and Management
14. Correspondence, 1993-1994
15. Roster for Implementation Plan Working Committee
16. Human Exploration and Development of Space Strategic Enterprise Retreat, September 15, 1993

5. HEDS Management, 1993-1999 (folder 2 of 2)

Item

1. Handwritten notes, 1997
2. Human Exploration and Development of Space, HEDS Technology/Commercialization Initiative Draft FY'01 Budget Proposal to Office of Management and Budget, July 14, 1999
3. NASA Human Exploration and Development of Space (HEDS) Enterprise Strategic Management Status, July 21, 1997
4. An Overall Context for the HEDS Technology/Commercialization Budget Initiative, presentation to the HEDS Next Decade Planning Team, by Mark Craig, NASA Stennis, April 16, 1999
5. HEDS Strategic Framework Discussion Draft. Dick Wisniewski, April 8, 1997
6. Exploration Strategic Roadmap and additional documents, circa 1997
7. The Human Exploration and Development of Space (HEDS) Strategic Enterprise – Background Material from HEDS Working Group, Mark Craig, September 15, 1993
8. A Framework for Mars Exploration (Mankins chart), August 29, 1996
9. Correspondence, documents and notes from "Next Decade Planning Workshop," March 1999
10. Analysis and Options: Additional Hiring across the Office of Space Flight, May 1997

6. Human/Robotic Exploration Team (HRET), 1996-1998

Item

1. Roster, JPL/JSC Integrated Mars Exploration Study and Planning, circa 1996
2. Proposed Charter Revisions for the Human/Robotic Exploration Team, April 30, 1998
3. Draft, Proposed JPL/JSC Integrated Team Changes, March 11, 1998
4. NASA Memo, To: Jet Propulsion Laboratory, Attn: 100/Director, From: M/Associate Administrator for Space Flight, Subject: JPL Involvement in Future Office of Space Flight (Code M) Activities, June 4, 1997
5. Mars/Moon Management – The Necessity for Change and Issues to be Addressed, David Bates, Roger Bourke, Mark

Craig, Joseph Hamaker, Humboldt Mandell, Malcolm Peterson, Donna Shirley (Using the past work of Richard Fox), Updated September 1996 (key document)

7. Office of Space Flight Reorganization Package, June 12, 2002

Box 49 HEDS Pillars, 1997

Folder

1. HEDS Pillars, 1997
   Item
   1. Brochure, Aeronautics and Space Transportation Technology: Three Pillars for Success, NASA, March 1997
   2. HEDS Pillars Working Group, handwritten notes, August 6-7, 1997
   3. Pillars Working Group correspondence and documents, 1997
2. HEDS Challenges – New Technology Initiative, July 1, 1998

Subseries 3. HEDS Customer and Stakeholder Engagement, 1993-2010

Box 49 continued *HEDS Customer and Stakeholder Engagement, 1993-2001*

Folder

3. HEDS Customer Strategy Workshop, October 18, 1994 (key documents)
4. Customer Engagement, 1993-1999
   Item
   1. Handwritten notes, June 25, 1999
   2. HEDS Customer Engagement Plan, "Significantly increasing our value, to significantly more people," Presentation to the HEDS Integrated Communication Team, Mark Craig, NASA Stennis, August 31, 1999
   3. NASA's Strategic Business Units (the Strategic Enterprises), undated
   4. Areas in Which NASA Delivers Value* to External Customers, (includes correspondence and additional documents), undated
   5. Improving Life on Earth and in Space: The NASA Research Plan, Executive Summary – The International Space Station, circa 1999
   6. Press release, NASA Headquarters, Release: 92-40, NASA Administrator Supports Teaching from Space, August 5, 1996
   7. Marketing Human Exploration and Development of Space, Mary Margaret Lobb / Jean West Rudnicki, December 14, 1993

8. KSC Customer Agreements Team, Annual Report to Senior Management Council, February 26, 1998 (includes notations)
9. HEDS Engagement Workshop Proposal
10. Stennis Space Center, e-Space Collaboratory, undated
11. Draft 6 Month HEDS Time Line: SSRC Evaluation & Research Team Component, December 18, 1998
12. NASA Human Exploration and Development of Space Enterprise, A Concept Papers on "An Over-Arching Enabling Process for the Development of an Engagement Plan," (draft) by Dr. David Powe, Liesel A. Ritchie, Deborah L. Jackson, and John Wilson, December 17, 1998
13. HEDS Engagement Plan Meeting, Pre-planning Questions Matrix, SSC Electronic Facilitation Center, January 1999
14. John S. Stennis Space Center, Education and University Affairs – Experience with Success: SSC's Strategic Planning Consensus Engagement Team, December 15, 1998 (includes notations)
15. Bound document, NASA HEDS Engagement Plan Development Process, 1999

5. Stakeholder Engagement, 1993-2001

Item

1. JFK tapes show fight over moon landing, by Jay Lindsay, August 23, 2001 (publication unknown)
2. Lovell, Jim. (1998). Spacetalk: Early warnings from space aid in the fight against El Nino destruction. *Spacewatch*, July/August, pp. 45-46
3. Strategic Planning, External Assessment Working Group, March 22, 1993
4. McCutcheon, C. (1998). Lost in Space: NASA's Quest for a New Direction. *CQ Weekly: Congressional Quarterly*. June, 6.
5. e-mail, To: Mark Craig, From: Dr. H.H. Koelle, Subject: Stakeholder (Stakeholders of Space Development), February 21, 2000

6. Ladwig Actions – Vision Team, 1996-1999

Item

1. Enabling the Future of Space Exploration, Presentation to the Administrator's Vision Integration Team, Mark Craig, NASA Stennis, March 11, 1999
2. Handwritten notes from meetings, January 11, & 14, 1999
3. The Economic Myth, by Betty S. Flowers, English Department, University of Texas at Austin, undated
4. Linking Thematic Questions and Astrobiology Goals, undated
5. The LunaCorp Team, undated
6. HEDS Customer and Stakeholder Engagement Map, circa 1996
7. HEDS Customer Engagement Plan (Resource Material), Mark

Craig, November 20, 1996 (includes notations)

8. e-mails, From: Mark Craig, To: Dr. H. H. Koelle, Subject: Traps, April – June, 1999 (includes notations)
9. "Increasing Support for HEDS – Delivering More Value to More People," undated
10. Greer, J. (1999). Postcards From the Edgy: Great space you got here. *Gear Magazine*, March/April, p. 152
11. Annan, K. (1999). Commentary: Keep Space Peaceful. *Space News*, August 23, p. 14.
12. Maintain Fiscal Responsibility, by Senators John McCain and Bill Frist, February 8, 1999 (publication information unavailable)
13. Hickam, H.H. Jr. (1999, May 21). Bring Back the Rocket Boys. *The Wall-Street Journal*, p. unknown

7. HEDS Public Engagement, 1993-2000

Item

1. NASA Memo, To: NASA Headquarters, Attn: Scott Hubbard, From: AA00/Mark Craig, Subject: Mars Public Engagement, September 18, 2000
2. Mars Architecture Definition Team, September Meeting, Task Group 10 – Public Engagement, September 4, 1998
3. Correspondence, From: Betty Shultz, Public Affairs Outreach Specialist, Jet Propulsion Laboratory, To: Mark Craig, Deputy Director, Stennis Space Center, Re: Marketing Consultants, November 14, 1996
4. Children's Express news service, December 1998
5. "Take Up Space" folder, Mission Home Space Awareness Alliance, 1997
6. e-mail, From: Terri Hudkins, To: SDS-Primary, Re: Lyn Spigel, Professor, USC, article written about cultural role and function of space exploration, October 21, 1996
7. Resource Manual for Customer Surveys, Statistical Policy Office, Office of Management and Budget, Executive Office of the President, October 1993

8. HEDS Support, 1996-1999

Item

1. Enabling the Future of Space Exploration, presentation to the Administrator's Vision Integration Team, Mark Craig, NASA Stennis, March 11, 1999
2. Strengthening Support for the Human Exploration and Development of Space (HEDS), Customer and Stakeholder Engagement, Mark Craig, Stennis Space Center, November 18, 1997
3. Strengthening Support for the Human Exploration and Development of Space, presentation to the HEDS Pillars Working Group, Mark Craig, Stennis Space Center, August 6,

1997

4. An Action Plan to Gain and Maintain Support for the Human Mars Exploration Effort, presentation to the Integrated Mars Exploration Study and Planning Team, Mark Craig, Stennis Space Center, June 17, 1997
5. Enabling Tomorrow's Programs – Today, (A Framework to Assess the HEDS Strategic Plan; An Integrated Blueprint for Action), presentation to the HEDS Management Board, Mark Craig, Stennis Space Center, April 21, 1997
6. Enabling Tomorrow's Programs – Today: An Integrated Blueprint for Action, presentation to the Strategic Avionics Technology Working Group, Mark Craig, Stennis Space Center, April 8, 1997 (includes notations)
7. Strengthening Support for Human Exploration and Development of Space: A Blueprint for Action, Mark Craig, Stennis Space Center, February 27, 1997
8. Strengthening Support for Human Exploration and Development of Space, presentation to Office of Space Flight, Management Council, Mark Craig, Stennis Space Center, January 9, 1997 (includes notations)
9. Memo, To: Mark Craig, From: Doug Peterson, Re: Input of the "Customer Engagement" package, December 16, 1996
10. Why and How to Obtain Public Approval for a Moon-Mars Human Exploration and Settlement Program – A New Way of Justifying Such a Program and Paying for It, by T.F. Rogers, President, The Space Transportation Association, Chairman, The Sophron Foundation, April 11, 1997

Box 50 Strategic Communication and Outreach, circa 1990-2003

Folder

1. Communication (articles and correspondence) circa 1990-1997
2. Strategic Communication, 2002
   Item
   1. Paul Pastorek Vision Team, March 29, 2002
   2. Public Engagement (Strategy Concept) undated
   3. Research in Public Relations: A review of the use of evaluation and formative research, by Jim Macnamara, CARMA International, Asia Pacific, undated
   4. Considerations for the NASA Exploration Vision/Strategy, Mark Craig, NASA Stennis, March 5, 2002
3. Outreach, 1996-2000
   Item
   1. Enabling Tomorrow's Human Spaceflight Programs – Today (HEDS Outreach Retreat) Mark Craig, November 6, 1996

2. Outreach Task Group Report to the Advisory Committee on the International Space Station, Dr. Eric Haseltine, May 12, 1997 (includes notations)
3. Awareness – Information – Product sheet, undated
4. Mars Education and Outreach: How to Get Young People and Adolescents Interested, a summer research assignment, by Mike Taubman, August 14, 1997
5. NASA, HEDS for Outreach Retreat, Washington, DC, November 6-7, 1996 (marked draft)
6. Mission from Planet Earth, Education and Public Outreach Plan: A Strategy for Public Outreach and Education in Space Exploration and Development, February 20, 1996
7. Mars Millennium Project documents, circa 1998
8. Correspondence, 1999-2000

4. National Deliberative Poll on Space Exploration, 1995-2003

Item

1. Customer Engagement – NEE: "Roger's Action," Hum Mandell, January 22, 1998
2. Mars Exploration – Actions to Strengthen Support
3. Space Exploration – Is It What the Nation Wants? The National Deliberative Poll on Space Exploration, 1998
4. The National Deliberative Poll on Space Exploration, A Pre-Proposal, submitted to Mark Craig by Stanford University Center for Deliberative Democracy and The Foundation for Space Exploration, July 22, 2003 (key document)
5. Ely, J. (1995, June 28). The idea is to poll thoughtful people. *Houston Chronicle,* p. 17.
6. Democracy in Texas: The frontier spirit. *The Economist*, May 16, 1998, p. 31.
7. Kerr, K. (1996, November 8). UT Austin establishes Center for Deliberative Polling. p. 2. (publication title unavailable)
8. Numerous articles, 1995-1996
9. Newsletter, *ARK-LA-TEX Town Meeting*, August 23-25, 1996
10. Issues '96: A Guide to Public Deliberation, prepared by Public Agenda for the National Issues Convention
11. The Voice of the People: Public Opinion and Democracy, by James S. Fishkin, New Hacen, CT: Yale University Press, pp. 205-225.
12. Deliberative Poll Issues and Questions – Important Topics, undated
13. The Use of a Deliberative Poll to Assist in Determining Future Space Exploration Policy, March 1997 (second draft)
14. 1999 NASA Means Business Student Competition, Competition Guidelines
15. Deliberative Polling Telecon, April 15, 2003

5. Why Space Station Freedom (SSF), 1991-1993

Item

1. Toward the Next Frontier: Space Station Freedom and America's Commitment to the Future, opening statement by Richard Darman, Director, Office of Management and Budget, presented before The House Committee on Science, Space, and Technology, June 4, 1991
2. Congressional Record, Proceedings and Debates of the 102nd Congress, First Session, June 6, 1991
3. The Case for Space Station Freedom, draft, July 1991
4. Comments on July 3 draft of SSF Rationale
5. Wassersug, R. (1993, October). Tadpoles from Heaven. *Scientific American*, p. 120
6. DeBakey, Dr. M. E.; Cohen, Aaron. (1991, November 3). America in space – literally a lifeline. *Houston Chronicle*, Section F. pp. unknown
7. NASA Talking Points for Congressional Visits, circa 1992
8. Memo and document, NASA, Office of Public Affairs, To: Officials-in-Charge of Headquarters Offices, Talking Points, Space Station Freedom, The Critical Next Step in America's Space Program, May 24, 1991
9. Cramer, J. (1991, July 1). The $40 Billion Controversy. *Time*, pp. unknown
10. Various Space Station articles, circa 1991
11. Special Issue Report, NASA, Office of Legislative Affairs, House Again Rejects Attempt to Terminate Space Station Freedom, May 11, 1992

6. Steckler Trust, 1997-1999

Item

1. NASA/Steckler Space Colonization Trust, presented to the NASA Space Grant Consortium, National Council of Space Grant Director's Meeting, March 12, 1999
2. Draft, The NASA Space Grant Ralph Steckler Space Colonization Research and Development Fund, February 2, 1999
3. What is Space Colonization? January 29, 1999
4. HEDS-IDE Integrated Design Center, meeting attendees list, January 22, 1999
5. The National Space Grant College and Fellowship Program, undated
6. Steckler Trust Discussions with Code F, revised January 20, 1999
7. Correspondence, To: Dr. Louis D. Friedman, From: Edward A. Frankle, Re: Ralph Steckler Trust, July 29, 1998
8. Space Grants for Space Colonization, undated
9. Steckler Trust, January 30, 1999
10. Steckler Trust Workshop, January 22, 1999

11. Fact Sheet, NASA Space Grant College and Fellowship Program, Fiscal Year 1997
12. NASA Experimental Program to Stimulate Competitive Research (EPCoR) 1998 Results
13. NASA Space Grant, EPSCoR Programs, 1998-1999 Contact Information
14. Draft, Ralph Steckler Trust Planning Workshop, January 22, 1999
15. The National Space Grant College and Fellowship Program Space Colonization: Summary Report of Activities, June 29, 1998

7. X-Prize Folder, contains information about X Prize to Spur International Space Race – *New Spirit of St. Louis to Create Space Tourism Industry*, circa 1996

Box 51 *Customer Engagement Group and Mars Architecture Committee, 1993-2010*

Folder

1. Customer Engagement Group, 1997-1998

Item

1. Human/Robotic Exploration Team, Management and Customer Engagement Sub-Team Proposal, Mark Craig, November 17, 1998
2. Exhibits Benchmark, Disney, undated
3. Correspondence, November-December, 1998
4. Sharing the Experience of Human Space Flight – The Foundation, undated
5. Correspondence, in regards to Engagement Plan Resources and HRET Engagement Workshop, November 1998
6. Draft, Proposal to Create a HEDS Integrated Engagement Plan, November 6, 1998
7. Correspondence, From: Mark Craig, To: HRET Group, Re: Mars Theme and notes/results from KSC meeting, 1998
8. Guidelines for Proposal, includes handwritten notes, undated
9. Draft, Trip Report, Customer Engagement Group Meeting at KSC, October 22 and 23, 1998
10. Engagement Framework, undated
11. Proposal for CE Team, includes handwritten notes
12. Market Base, handwritten notations, undated
13. NASA Memo, To: AB-F2/Larry Mauk, DNPS/Daniel Gruenbaum, From: AB-F2/Jim Ball, Subject: Preliminary ideas regarding Mars Exhibit development, September 21, 1998
14. Establishing a NASA Visitor Center Consortium, prepared by Jim Ball, Chief, Visitor Center Branch, John F. Kennedy Space Center, February 1997
15. KSC Visitor Complex Engagement Tools and Plans, Customer Engagement Team Briefing, October 23, 1998

16. The Use of a Deliberative Poll to Assist in Determining Future Space Exploration Policy, fifth draft, October 1998
17. 1999 NASA Means Business Student Competition, Competition Guidelines, October 13, 1998
18. Common Themes to be Used by NASA Speakers Relating to Mars Missions, includes notations, undated
19. Correspondence, From: Humboldt Mandell, Re: Customer Engagement Action Items from meeting, January 22, 1998
20. Customer Engagement Group, minutes of the May 5, 1998 meeting
21. Customer Engagement Action Items from January 22, 1998 meeting
22. Status of Customer Engagement Action Items, undated
23. Deliberative Poll Issues and Questions – Important Topics, undated
24. Customer Engagement Team Meeting, presentation, Humboldt Mandell, April 5, 1998
25. Stakeholder Engagement Mini-Plan for the Mars Integrated Team Customer Engagement Group, Humboldt C. Mandell, Jr., April 6, 1998
26. Mars Exploration – Actions to Strengthen Support, includes notations, undated
27. Management and Customer Engagement: Should the Teams be Combined? May 6, 1998

2. Engagement Presentations to Various Groups, 1996-1998 (folder 1 of 2)

Item

1. Human Exploration and development of Space (HEDS), Customer Engagement – Grow Support for HEDS – Framework for Effective Program Effort, Mark Craig, December 18, 1996 (includes notations)
2. Copies of PowerPoint slides, Strengthening Support for Human Exploration and Development of Space, undated
3. Strengthening Support for Human Exploration and Development of Space, presentation to Office of Space Flight, Management Council, Mark Craig, Stennis Space Center, January 9, 1997
4. Strengthening Support for Human Exploration and Development of Space, Mark Craig, Stennis Space Center, December 26, 1996
5. Human Exploration and Development of Space (HEDS), Enabling Tomorrow's Programs – Today, presentation to the Integrated Mars Mission Planning Team, Mark Craig, NASA Stennis Space Center, May 1, 1997
6. Human Exploration and Development of Space (HEDS), Enabling Tomorrow's Programs – Today, presentation to the

HEDS Management Board, Mark Craig, Stennis Space Center, April 21, 1997

7. An Action Plan to Gain and Maintain Support for the Human Mars Exploration Effort, presentation to the Integrated Mars Exploration Study and Planning Team, Mark Craig, Stennis Space Center, June 19, 1997
8. Strengthening Support for the Human Exploration and Development of Space (HEDS), presentation to the HEDS Pillars Working Group, Mark Craig, Stennis Space Center, August 6, 1997
9. Strengthening Support for the Human Exploration and Development of Space (HEDS), presentation to the International Space University, Mark Craig, Stennis Space Center, July 31, 1997
10. Thoughts on the Context for Communication, presentation to the Communicate Knowledge Team, Mark Craig, Stennis Space Center, August 19, 1997

3. Engagement Presentations to Various Groups, 1993-1998 (folder 2 of 2)

Item

1. Grouped documents; Joe Rothenberg Talking Points, Strengthen Support, Enable Future Programs, HEDS Strategy, OSF Organization, HEDS Concept, 1993-1998

4. Customer Engagement Original Drawings (2), undated
5. Mars Architecture Committee, Bob Rogers, Public Engagement Folder, 1998-2010 (key documents)

Item

1. Levin, G. (1999, May 10). Shed Light, Not Heat, on Mars. *Space News*, p. 23.
2. Johnson, R. D. (1999, May 10). Letters; Minimize Sample Damage. *Space News*, p. 22.
3. Correspondence, To: Dr. Charles Elachi, From: Bob Rogers, Re: Final thoughts regarding Public Engagement – Mars Architecture Committee, March 16, 1999
4. Fax, To: Mark Craig, From: Bob Rogers, Re: *USA Today* article; Hoversten, P. (1999, January 18). U.S. plans to contain space 'bugs'. *USA Today,* p. 1A., and Hoversten, P. (1999, January 18). Search for life goes high-tech: First mission of its kind set to blast off next month. *USA Today,* p. 12A.
5. Handwritten notes, Subject: Massive Public Engagement, undated
6. Public Engagement Approaches and Opportunities, Mars Architecture Study, September 1998 (includes handwritten notes)
7. Fax, To: Mark Craig, From: Bob Rogers, Subject: Book and

Speech, September 10, 1998
8. Public Engagement, Mars Architecture Definition Team, September Meeting, Task Group 10, © Bob Rogers, September 4, 1998

6. NASA Communicate, Engage, Inspire Process NPD 1090.1, circa 2002
7. References in Culture (various articles, advertisements, poetry, editorial cartoons, and Purdue *Alumnus*, special issue; Heroes on Hold: Human Space Flight Placed on Standby) 2002-2010

Series 10. Sustainability, Stability, and Value of NASA Human Space Flight, 1995-2016

(3.2 cubic feet)

Subseries 1. Various Topics, 1995-2013

Box 52 *Space Science Education and Outreach Strategy*, *and Developing Sustainable Human Space Exploration Policy Workshop, 1995-2013*

Folder

1. Space Science Education and Outreach Strategy, 1995-1996
   Item
   1. Booklet, Space Science for the 21st Century: The Space Science Enterprise Strategic Plan, NASA, August 1995
   2. Booklet, Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy, October 15, 1996
2. Agency Communication Team, 2004
   Item
   1. Correspondence, To: Agency Communications Team (ACT), From: Dean Acosta, Re: Agency Wide Communications Strategy for NASA, February 25, 2004
   2. Position the Agency to Sustain the Vision
   3. Sustaining the Vision, undated (includes notations)
   4. Vision Strategy, draft, May 4, 2004
   5. Communicating the Vision for Space Exploration, Meeting NASA's Obligation to the Public, draft, June 14, 2004
   6. NASA Explores…Humanity Benefits, For Less Than 1%, June 14, 2004
   7. Correspondence To: Fred Gregory, Re: Sustainability, 2004
   8. NASA Messaging; effective ways to inform the public about the President's Vision, draft, April 30, 2004
   9. Handwritten notes, Recommended Actions, undated
   10. The Basis of Sustainability, April 20, 2004 (includes notations)
   11. Making the Vision for Space Exploration Sustainable, April 13, 2004 (includes notations)
   12. McKnight, J.C. (2001, September-October). We Can't Get

There From Here. *Space Times,* p. 23

13. Hall, R. M. (2001, September-October). Communicating the Benefits of Space Activities. *Space Times,* p. 13 (portion of article)
14. Creating Sustainability for the President's Vision for Space Exploration, March 7, 2004
15. Making the Vision for Space Exploration Sustainable, April 14, 2004
16. Transformation Roll-out Shaped by Vision Sustainability, undated
17. Paul Pastorek Vision Team, March 29, 2002
18. The Basis of Sustainability, April 20, 2004
19. Creating Sustainability for the President's Space Exploration Vision, presentation to NASA Deputy Administrator and Space Architect, Mark Craig, February 25, 2004
20. Considerations for the NASA Exploration Vision/Strategy, Make Craig, NASA Stennis, March 5, 2002
21. Sustaining the Vision for Space Exploration June 23, 2004
22. Creating Sustainability for the President's Space Exploration Vision: Part 2: Human Experience Value > Engagement Mark Craig, February 26, 2004

3. Office of Strategic Communication (Neal Burns), 2004

Item

1. A Proposed System for Building a NASA Strategic Communication Process: 8 Steps, early draft, Neal M. Burns, NASA HQ Project, 2004
2. The Basis of Sustainability, June 8, 2004
3. Notes, Building a NASA Strategic Communication Process, July 2004
4. Report of the President's Commission on Implementation of United States Space Exploration Policy, June 8, 2004
5. Some Ideas for NASA About Jump Starting and Owning "Exploration" Offered by Professor Neal M. Burns, Center for Brand Research, April 25, 2004
6. Questions/Talking Points for Neal Burns, July 8, 2004
7. Office of Strategic Communications, missions and responsibilities, undated
8. Memo, To: Fred Gregory, From: Dr. Neal Burns, Subject: Recommended Improvements to Transformation Documentation, July 28, 2004
9. Strategic Communication at NASA HQ: Main Tasks, undated
10. Report of the Roles, Responsibilities and Structures ("Clarity") Team, June 24, 2004
11. Transformed Structure, June 24, 2004
12. Administrator Unveils Next Steps of NASA Transformation, June 24, 2004

4. Developing Sustainable Human Space Exploration Policy Workshop, University of Alabama Huntsville, 2009
   Item
   1. Notes, 2009
   2. Workshop Summary, Developing Sustainable Human Space Exploration Policy Workshop, University of Alabama Huntsville Center for System Studies, December 8-9, 2009
   3. Above the Fray: Time to Take the Chaos Out of Space Policy, by Chuck Atkins and Dr. Elizabeth Newton, undated
   4. Break-out Group material, 2009
   5. Binder with Developing Sustainable Human Space Exploration Policy Workshop material, including Craig's workshop summary contributions, 2009
5. NASA Strategy Subject Matter Expert, 2013
   Item
   1. Mission and Vision Statements: Update to the SMEC, Rebecca Keiser, OSF, August 20, 2013 (includes notations)
   2. Copies of PowerPoint presentation, The 2011 NASA Mission and Vision statements: Assessment and Recommendations – A briefing to the Subject Matter Experts Committee (SMEC), Rebecca Spyke Keiser, Office of Strategy Formulation, February 8, 2013
6. Pioneering: Sustaining U.S. Leadership in Space, A Space Foundation Report, 2012
7. Cartoons and Humor, undated

Subseries 2. Market Research and Opinion Polls, 1991-2013

Box 53 *Market Research, 1991-2013*

Folder
1. Market Research, 2001-2009
   Item
   1. American's Views on NASA and the Space Program, submitted to the *Houston Chronicle*, by Zogby International, John Zogby, President and CEO, July 3, 2003
   2. Public Views of Space Exploration, an Independent National Survey, The Everett Group, February 2009
   3. Harmonic International, Message Resonance Research, March 19, 2004
   4. The Market Study for Space Exploration, Dittmar Associates, undated (includes notations)
   5. American Values Relating to Space and Undersea Programs: Phase I: Results of a Literature Review Pilot Study, by Willett Kempton, Steve Rayner, Jennifer Harris and Anahita T.

Marker March 22, 2001

6. Deliberative Polling®: Toward a Better-Informed Democracy, Center for Deliberative Democracy, Professor James S. Fishkin, Director, Stanford University, circa 2002

2. Americans' Views on NASA/Opinion Polls, 1992-2001 (folder 1 of 2)
Item

1. "Is NASA the Key to the American Dream or Just Another Government Agency Facing Budget Cuts and Restructuring?" Results of a Kennedy Space Center Study: Loyalty and Quality of Relationships, April 1996
2. Article, The Public's Perception of Space Flight, *Space Times,* September-October, 2001
3. Harris Poll on Space (Part One) – Strong Public Support for Many Different Space Projects – But Not for Spending More to Do Them, by Humphrey Taylor, July 25, 1997
4. Public Opinion on the United States Civilian Space Program, prepared for Rockwell International, prepared by Yankelovich, Skelly and White/Clancy Shulman, March 5, 1992
5. Public Attitudes About Space As Surveyed by the National Commission on Space, by Leonard W. David, undated
6. Opinion Polls and the U.S. Civil Space Program, Sylvia Doughty Fries, April 29, 1992
7. Tucci, L. (1993, June 14-20). Surveys Give Varying Results on Popularity of Space. *Space News,* p. 22
8. Public Opinion Issues, no publication information available
9. Taylor, H. (1997, November-December). The Harris Poll on Space: Stronger Public Support but not for Spending More. *Space Times,* p. 15
10. Evolving Public Perception of NASA, by Roger D. Launius, NASA Chief Historian, NASA Headquarters, February 7, 2002
11. Public Support for the U.S. Space Program, Yankelovich Partners, 1993
12. Press Release, Yankelovich Partners, Support for Space Program Remains Strong, National Survey Shows, 1994
13. Press Release, Yankelovich Partners, Increasing Percentage Support U.S. Space Station, 1994

3. Americans' Views on NASA/Opinion Polls, 1991-1994 (folder 2 of 2)
Item

1. CRS Report for Congress: American Public Opinion on the Space Program, Rosita M. Thomas, Analyst in American National Government, Government Division, January 17, 1991
2. Space Exploration – Public Opinion Surveys – EPCOT, Roper, Gallup, presented to Mark Craig by United Technologies, March 20, 1991
3. Public Support for the United States Space Program: Results

From a National Tracking Study of Registered Voters, prepared for Rockwell International, prepared by Yankelovich Partners Inc., May 1993

4. The Information Needs of the Public Concerning Space Exploration, A Special Report to NASA, Jon D. Miller, June 1, 1994

4. Space Focus Groups, 2013

Item

1. Coalition for Space Exploration, America's Space Program/Why Space Matters, bulletin board focus group summary report, July 2013

5. National Issues Convention Deliberative Poll Wrap-up – VHS Video Tape, January 26, 1996 (key artifact)
6. Space Walking: Baltimore, Maryland, Public Views on Space, NASA, September 22, 2006 (DVD, 5 minutes)
7. Space Walking: Orlando, Florida, Public Views on Space, NASA, November 6, 2006 (DVD, 6 minutes)

Subseries 3. Value Management, 1994-2011

Box 54 *Value Management, 1994-2011*

Folder

1. Value Management, 1994-2009 (folder 1 of 2)

Item

1. Notes, Deputy Administrator, Lori Garver presentation to AIA, October 9, 2009
2. What is the Value of Space Exploration? A Symposium, Sponsored by the Mission From Planet Earth Study Office, Office of Space Science, NASA Headquarters and University of Maryland at College Park, National Geographic Society, Washington, DC, July 18-19, 1994
3. Handwritten graphs and notes, NASA Human Space Flight Sustainability, October 18, 2006
4. NASA Human Space Flight (HSF) Sustainability, Mark Craig, November 3, 2006
5. Transparency, NASA's Role – The Exploration/Development "Engine," Mark Craig, November 12, 2002
6. Transparency, Human Space Flight Value to America, Mark Craig, October 15, 2002
7. "We Just Need to Communicate Better"…Not, undated
8. Vandermerwe, S. (2004). Achieving Deep Customer Focus. *MIT Sloan Management Review*, Spring, pp. 26-34.
9. Beyond LEO – Management, Political, Technical – Value to America, Mark Craig, October 2002

10. Change Management: Striving for Customer Value, by Kathryn Troy, Report Number 1167-96-RR, The Conference Board™, Inc., 1996
11. Carraeu, M. NASA's Teachable Moments: As 17 astronauts are remembered, one educator focuses on resilience. *Houston Chronicle*, A1, A6.
12. Various copies of PowerPoint slides, 1999-2004 Creating Sustainability for the President's Vision for Space Exploration, MKC, March 17, 2004
13. Correspondence, To: Eileen Walsh, Tessada Associates, From: ?, Subject: Parting Comments/Observations (work on behalf of Constellation and NASA) February 27, 2007
14 Managing NASA's Value to the Nation, MKC, December 16, 2003

2 Value Management, 2001-2003 (folder 2 of 2)

Item

1. reINventures Executive Seminar: Delivering Superior Value: Creating a Market Focus Across the Organization, Presented by Dr. Lynn W. Philips, seminar notebook, 2001 (2 copies)
2. Handwritten notes, December 2002
3. Applications Demonstration Program, EA/John F. Muratore, December 3, 2002
4. Value Management, R.W. Bobst, Holland and Davis, April 9, 2003
5. Correspondence, To: Mark Craig, From: Larry Dyer, Subject: Board of Directors/Management Forum, December 18, 2002
6. "Generation Y Perspectives," OnOrbit.com – Source: NASA Generation Y, presentation, undated

2. Value Proposition, 1996-2011

Item

1. An enduring value proposition for NASA human spaceflight (part 1 and part 2), by Mary Lynne Dittmar, August 2011
2. Reed, D; De Lollis, B. (2007, September 20). Southwest tweaks boarding pattern. *USA Today*, Money, Section B, p. 1.
3. reINventures, Seminar Reading: The Market-Centric Mindset: Foundational Principles, presented by Dr. Lynn W. Phillips, ©2001
4. reINventures, Seminar Reading: Five Steps to Business Reinvention, presented by Dr. Lynn W. Phillips, ©2001
5. Handwritten notes, September 10, 2003
6. Correspondence, To: Mark Craig, From: Robert W. Bobst, Re: Definition for "Value to the Nation," September 12, 2003
7. Change Management: Striving for Customer Value, A Research Report (1167-96-RR), The Conference Board™, ©1996
8. Central Concepts of Delivering Winning Value Propositions,

3. Brand Management, 2000-2004

Item

1. Program, Branding & Rebranding in the Twenty-First Century: A Transdisciplinary Approach, Center for Brand Research, University of Texas at Austin, May 2003 (includes CD-RW copy and notes)
2. Notes and documents from Branding and Rebranding in the 21st Century, University of Texas Center for Brand Research, May 8-10, 2003
3. ISS/NASA Branding Meeting Notes, Boston, MA, November 6, 2003
4. Outline of NASA speech, The Economic Myth, Betty S. Flowers, Center for International Business Education and Research, University of Texas at Austin, March 2004
5. Brandchannel.com, brand features – profile: An ongoing series of the history behind selected brands, "NASA lost in space," by Abram Sauer, May 12, 2003
6. Handwritten notes from Harmonic International – Overview of Implications for NASA Communication Strategy, 2004
7. American Perception of Space Exploration, A Cultural Analysis for NASA, The Center for Cultural Studies and Analysis, 2004
8. Notes and documents from Branding/Positioning Conference, February 4-5, 2004
9. Branding Mars, research report prepared for, Mr. Burke Fort, Texas Space Consortium; Dr. Humboldt Mandell, Jr. Ph.D., NASA, Johnson Space Center, provided by Texas Space Grant Consortium Fellowship, prepared by Janet Osimo, Graduate Candidate, Department of Advertising, University of Texas at Austin, January 28, 2000
10. Brandchannel.com, brandspeak, Understanding the purpose of a corporate branding strategy, by Martin Roll, April 13, 2004
11. Communication and Planning Proposal for NASA, presented by Brandsoup, 2004
12. NASA/ISS Branding presentation, Boston, MA, November 6, 2003
13. Berthon, P.; Holbrook, M.B.; Hulbert, J.M. (2003). Understanding and Managing the Brand Space. *MIT Sloan Management Review*, Winter, pp. 49-54.
14. Demanding answers on shuttle decision: No credible reason for leaving Houston off list, by U.S. Representatives, Gene Green and John Culberson, (publication information unknown)

4. AIAA Space 2007 Value Panel, 2006-2007

Item

1. Copies of PowerPoint slides, NASA's Value to the Nation: 50 Years of Lessons on Sustainability, Mark Craig, September 19, 2007
2. Copies of PowerPoint slides, Sustainability, Strategic Communications, and Relevance: Why YouTube Won't Get Us to Mars, Mary Lynne Dittmar, Ph.D., Dittmar Associates, Inc., Houston, Texas, September 10, 2007
3. Copies of PowerPoint slides, Sustaining Exploration Panel, Architecture Value: The Implications of Benefit Network Models for NASA Exploration, Bruce Cameron, September 19, 2007
4. Copies of PowerPoint slides, Managing Customer Value When Your Program's Survival Depends On It, Dr. Lynn W. Phillips, Reinventures, September 19, 2007
5. Craig, M.K. (2007). NASA's Value to the Nation: 50 Years of Lessons on Sustainability. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California AIAA paper No. 2007-9931
6. Craig, M.K. (2005). Achieving Profound *Public Engagement*— The Ultimate Source of Exploration Vision Sustainability. 1st Space Exploration Conference: Continuing the Voyage of Discovery; Orlando, FL; USA; 30 Jan.-1 Feb. 2005, pp.1-6.
7. Phillips, L.W. (2007). Managing Customer Value When Your Program's Survival Depends on It. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.
8. Cameron, Bruce. (2007). Architecting Value: The Implications of Benefit Network Models for NASA Exploration. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.
9. Vedda, J.A. (2007). Humans to Mars: Logical Step or Dangerous Distraction? Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.
10. Wooster, P.D.; Simmons, W.L.; Hofstetter, W.K. (2007). Opening Space for Humanity – Applying Open Source Concepts to Human Space Activities. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.
11. Dittmar, M.L. (2007). Sustainability, Strategic Communications, and Relevance: Why YouTube Won't Get Us to Mars. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.
12. Phillips, L.W. (2007). Managing Customers Value When Your

Program's Survival Depends on It. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.

13. Cameron, B.; Crawley, E.F. (2007). Architecting Value: The Implications of Benefit Network Models for NASA Exploration. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.
14. Cook, S.A.; Armstrong, R.C., Jr. (2007). Why We Explore: The Value of Space Exploration for Future Generations. Paper presented at AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, California.
15. Harwood, W. (2007, August 8). A wide-ranging interview with the leader of NASA. CBS News, NASA Administrator Mike Griffin interview
16. Original ink drawings and editorial cartoon about unidentifiable machine, 2006
17. Griffin, M. (2007). The Real Reasons We Explore Space. *Air and Space Smithsonian*, June-July 2007, Vol.22 (2), pp.48-49.
18. Dittmar, M.L. (2007, November 12). Sustaining exploration: communications, relevance, and value. *The Space Review*, pp. unknown
19. Public Engagement, Mars Architecture Definition Team, September Meeting, Task Group 10, September 4, 1998

5. Johnson Space Center Human Space Flight Value Strategy, 1998-2004

Item

1. Creating a Robust Future for NASA Human Space Flight, undated
2. Discussion draft – Space Flight Enterprise (SFE) Integrated Portfolio Management, March 24 and April 25, 2003 (includes Craig's comments)
3. Correspondence, From: Vickie Smith, Subject: Telecon, and Agenda with attachments, April 11, 2003
4. Walton, M.; Hastings, D. (2002). Managing Space System Design Uncertainty Using Portfolio Theory, presented at the 53rd International Astronautical Congress, 10-19 October 2002, Houston, Texas
5. Luehrman, T.A. (1998, September-October). Strategy as a Portfolio of Real Options. *Harvard Business Review*, pp. 89-99.
6. Human Space Flight – Strategic Considerations at JSC, Mark Craig, July 31, 2003
7. Human Space Flight Strategy, Mark Craig, September 4, 2003
8. Value to the Nation – High Level Project Outline, undated

9. Value Management, Mark Craig, May 30, 2003
10. Value Management – How do we increase support for Human Space Flight? undated
11. Project Steps, undated
12. Value Management Team, June 18, 2003
13. Correspondence and notes, 2003
14. Sawhney, M.; Balasubramanian, S.; Krishnan, V.V. (2004, Winter). Creating Growth with Services. *MIT Sloan Management Review*, pp. 34-43.
15. Dahisten, F. (2003, Summer). Avoiding the Customer Satisfaction Rut. *MIT Sloan Management Review*, pp. 73-77.
16. Unland Hayes Group material and correspondence, 2003

Box 55 *Human Experience Value, 1988-2003*

Folder

1. Human Experience Value, 1988-2002

Item

1. "Space and People," by astronaut John Blaha ("Mark from John" written on the front, coffee stain on first page)
2. "Shannon Lucid writes a letter home," (copy of online letter written about her Mir experience), circa 1996
3. "Getting into Space: The Real Star Wars," by Elliott G. Pulham, op ed released by Space Foundation, June 1999
4. "Disney exec gives entertainment spin to commercial space," © 1999 McGraw-Hill Companies, Inc.
5. The ShareSpace Foundation, founded by Dr. Buzz Aldrin, presentation material, January 2000
6. Handwritten notes, "GSD & M Meeting," undated
7. Internet print-out, Molecular Expressions™ - Images from the Microscope, Michael W. Davidson, circa 2002
8. Pine II, B. J.; Gilmore, J. H. (1998, July-August). Welcome to the Experience Economy. *Harvard Business Review*, pp. 97-105.
9. Bringing Space Home to the American People, by Peter Clarke, presented at the Seventh Annual National Space Symposium, Colorado Springs, April 10, 1991
10. Gunther, M.; Carter, N. (1988). Monday night mayhem: the inside story of ABC's Monday night football. New York: Beech Tree Books, pp. 11-22. (text highlighted in regards to marketing ideas)
11. "Space Exploration: Is It what the Nation wants?" The National Deliberative Poll™ on Space Exploration, (includes some correspondence), circa 1998

Ariane Launch Coverage, "Bringing people into the mission,

not just giving them data about it" MKC, October 7, 1996
12. NASA negatives, AS15-88-11864 (image on moon) and S88-53404 (rover on Mars ?)
13. Ariane Launch Coverage, "Bringing people into the mission, not just giving them data about it" MKC, October 7, 1996
14. Various article and clippings, 1995-2002

2. Search for Life Value, 1998-2003 (folder 1 of 2)

Item

1. Biocentrism and Solar System Exploration, by Carl B. Pilcher, Special Assistant for Astrobiology, Office of Space Science, NASA Headquarters, circa 2001
2. Flinn, E. D. (2003, March). Geysers spawn hot new nanotechnology. *Aerospace America*, pp. 24-25.
3. Life on Mars: What are the Implications? John M. Logsdon, Bridget R. Ziegelaar, Anne Marie Burns, editors, Space Policy Institute, Elliott School of International Affairs, Washington, DC, June 1997
4. Prokaryote Diversity, by Mortimer P. Starr and Jean M. Schmidt (publication information unknown)
5. Giovannoni, S. (1998, July 22). Antarctic life may give clues to life on Mars. *ENN Daily News,* pp. unknown
6. *Mars Global Surveyor* – MGS Ground Track for July 6 and July 7, 1998
7. Harrison, A. A. (2002, January-February). Rethinking our Place in the Universe: Exploring the Societal Implications of NASA's Astrobiology Program. *Space Times*, pp. 4-9
8. Nealson, K. H.; Stahl, D.A. (1997). Microorganisms and Biogeochemical Cycles: What Can We Learn From Layered Microbial Communities? *Geomicrobiology: Interactions Between Microbes And Minerals*, Vol.35, pp.5-34.
9. Correspondence, 1998-2003
10. Clippings, 1999-2002
11. Folder and brochure, Astrobiology: Life in the Universe, NASA Ames Research Center, undated

3. Search for Life Value, 1989-1997 (folder 2 of 2)

Item

1. Life on Mars: What are the Implications? John M. Logsdon, Bridget R. Ziegelaar, Anne Marie Burns, editors, Space Policy Institute, Elliott School of International Affairs, Washington, DC, June 1997
2. The Search for Origins: Findings of a Space Science Workshop, October 28-30, 1996
3. An Exobiological Strategy for Mar Exploration, prepared by Exobiology Program Office, NASA Headquarters, April 1995
4. The Search for Life's Origins: Progress and Future Directions in Planetary Biology and Chemical Evolution, Space Studies

Board. Washington Academy Press: Washington, DC, 1990

5. Exobiology in Earth Orbit: The Results of Science Workshops Held at NASA Ames Research Center, edited by D. DeFrees, D. Brownlee, J. Tarter, et. al., Washington, DC: NASA, Office of Management, Scientific and Technical Information Division, 1989
6. Gott, J. R., III. (1993, May). Implications of the Copernican principle for our future prospects. *Nature*, Vol. 363, pp. 315-319.
7. Below the Surface, Lie Among the Stars, by R. Grymes, rev., undated

4. Branding – NASA Sponsorship Policy Folder, Status of Sponsorship Policy Development, March 30, 2001
5. MIT Space, Policy, and Society Research Group Workshop, The Future of Human Spaceflight, 2007-2009

Item

1. Programs, Workshop, The Future of Human Spaceflight, Center for Strategic and International Studies, MIT Space, Policy, and Society research group and GW Space Policy Institute, May 8, 2009 (2 copies)
2. Why NASA Human Spaceflight, Mark Craig, September 1, 2009
3. Forum on the Future of Human Spaceflight, Center for Strategic and International Studies, Mark Craig, May 8, 2009
4. Creating Relevance – Key to Sustainability, Mark K. Craig
5. Creating Relevance – Key to Human Spaceflight Sustainability, Mark Craig, August 30, 2009
6. Architecting Value: The Implications of Benefit Network Models for NASA Exploration, by Bruce Cameron and Edward F. Crawley, AIAA Space 2007 Conference & Exposition, 18-20 September 2007, Long Beach, CA
7. Value Based Architecture Selection, by Bruce G. Cameron, Sandro N. Catanzaro and Prof. Edward F. Crawley (IAC-06 – D.3.1.3 (includes notations)
8. Mindell, D.A.; Uebelhart, S. A.; Siddiqi, A. A.; Gerovitch, S. (2009). The Future of Human Spaceflight: Objectives and Policy Implications in a Global Context. Cambridge, MA: American Academy of Arts & Sciences.
9. Drafts, The Future of Human Spaceflight Space, Policy, and Society Research Group, Massachusetts Institute of Technology, 2008-2009

Box 56 *Global Space Exploration (GLEX), 2003-2014*

Folder

1. Global Space Exploration (GLEX) Conference +, 2003-2014
   Item
   1. Final Program, Global Space Exploration Conference, May 22-24, 2014, Washington, DC
   2. Mars – On the Path or in the Way?, by Brent Sherwood, Jet propulsion Laboratory, 2012
   3. GLEX 2012 – Session 07: The Human Space Exploration Value Proposition, presentation status, April 27, 2012
   4. The Human Space Exploration Value Proposition: A Customer-Centric Approach, presented by Dr. Lynn W. Phillips, Managing Director, Reinventures, LLC, GLEX Global Space Exploration Conference, Washington, DC, May 22, 2012
   5. The Global Exploration Roadmap, International Space Exploration Coordination Group, August 2003
   6. The Global Exploration Roadmap, International Space Exploration Coordination Group, September 2011
2. George Mason University Space Exploration Constituency Workshop, (results document), 2006
3. SystemsGO Student Rocket Program, 2009-2011
   Item
   1. IGNITE's *SystemsGo* Student Rocket Program, history, mission statement, etc., 2011
   2. *SystemsGo* promotional folder, 2011
   3. Correspondence, 2009-2011
   4. Newsletter, The Longhorn Liftoff, Spring 2010 (women in aerospace leadership)
4. University of Texas UTEACH Advisory Board (meeting information), May 10-11, 2011

Subseries 4. Rationale, 1963-2012

Box 56 continued *Articles, 1963-2012*

Folder
5. Rationale, 1976-2006 (folder 1 of 3)
   Item
   1. Why Man Explores, A Symposium held at Beckman Auditorium, California Institute of Technology, Pasadena, California, July 2, 1976
   2. Toffler, A. (1991, May-June). The Space Program's Impact on Society. *Space Times,* Volume 30, No. 3, pp. 3-9.
   3. National Aeronautics and Space Administration, Website Feature, President Bush Honors the Columbia Crew, February 4, 2003

4. Handwritten notes, February 5, 2003
5. Engines of Our Ingenuity, No. 1774: Reckless and Careful, by John H. Lienhard, ©1988-2000s
6. Pianin, E. (2003, February 19). In Congress, Support Grows for Unmanned Space Flight, Some NASA Backers See Science Gains and Reduced Risks. *Washington Post*, p. A4 (sent in email by Jerome A. Bell)
7. Murray, B. (2003, February 9). The Columbia Disaster and the American Journey Into Space. *San Jose Mercury*, pp. unknown (sent in e-mail from Gary Martin)
8. Wilford, J. N. (2003). Our Future in Space is History. *New York Times*, pp. unknown (sent in e-mail by Ben Y, Mason)
9. Handwritten notes, "Columbia Hearing," February 12, 2003
10. Human Advantage: Partnering with Robotics "On Site," October 29, 2002
11. Krugman, P. (2003, February 4). A Failed Mission. *New York Times*, p. unknown. (sent in email from Jerome A. Bell)
12. Glanz, J.; Oppel, R. A., Jr. (2003, February 24). Scientists Question the Value of Shuttle Flights. *New York Times*, pp. unknown. (sent in e-mail from Eileen M. Hawley)
13. Gugliotta, G.; Pianin, E. (2003, February 27). Spaceflight Debate Pits Man vs. Machine. *Washington Post,* p. A6.
14. "Raised on Technology, They Shrug at Space," *New York Times,* (publication information unavailable)
15. Larsen, L. (1996, May 5). Is NASA worth it? *Houston Chronicle*. Section C, pp. C1, C5.
16. Nelson, G.D. (1996, May 5). Yes, but it will take courage, vision. *Houston Chronicle*. Section C, pp. C1, C5.
17. "Planetary Science: Human Space Exploration Is About More Than Just Science," by Wesley T. Huntress Jr., 2003 (sent in e-mail from Jerome A. Bell)
18. Keynote Address, by John Marburger, Director, Office of Science and Technology Policy, Executive Office of the President, 44th Robert H. Goddard Memorial Symposium, Greenbelt, Maryland, 2006
19. *Space News* editorial, June 10, 1991
20. Abstract, The Rationale Against Human Exploration of Space, by M. Thierschmann, 45th International Astronautical Congress, October 9-14, 1994
21. "SEI op-ed piece for *Washington Post Outlook*, June 10, 1991
22. NASA and National Needs, January 1994 (update to "NASA & National Needs," version 5, January 1993)
23. Remarks by the Honorable George E. Brown, Jr. at the National Space Club, "A National Space Program: Redefining the Future," January 26, 1993
24. "Lunar Base – Why ask "Why"? by Wendell W. Mendell,

NASA Johnson Space Center, Houston, TX, presented at AIAA Space Programs and Technologies Conference and Exhibit, Huntsville, AL, September 21-23, 1993

25. Correspondence, To: Daniel S. Goldin, Administrator, NASA, From: E.J. (Jake) Garn, United States Senate, October 9, 1992
26. e-mail, From: Victoria Friedensen, To: Mark Craig (and others), Subject: Engaging the Public, January 1, 2003
27. Sagan, C. (1991, January/February). Humans to Mars: Can We Justify the Cost? *Planetary Report* - Member's Dialogue*,* pp. 4-7.
28. Gelbein, J.R. (1996, July-August). The Value of Space Exploration and Discovery: A Religious Perspective. *Space Times,* pp. 11-14.
29. Why Space Exploration by Michael D. Griffin, April 2, 1990
30. Historical Rationales for Investing in Space, ("AML: 8-29-09 Rev 5")
31. Rationales of space exploration, by Julien Torte, Programme specialist of the Division of Ethics of Science and Technology of UNECSO, paper proposed to the Ethical Working Group on Planetary Protection and Exobiology of the European Space Agency, April 21, 2005
32. Concept Proposal: Generation Mars – A campaign for Exploration Beyond LEO with coordinated components of supporting technology development, research, demonstrations on ISS, Mars robotic missions, human preparatory missions with enabling commercial and international collaboration for the benefit of the "Mars Generation" (includes notations, undated)
33. Ehricke, K.A. (1971, November). Extraterrestrial Imperative. *Bulletin of the Atomic Scientists*, pp. 18-26
34. NPR Segment, "Clinton's Comparisons," January 23, 1997
35. Handwritten notes, undated
36. Zubrin, R. (1997). Set a Course to Mars. *Space News*, p. unknown
37. The U.S. Human Space Flight Program and the Space Shuttle Columbia Accident, testimony before the Subcommittee on Science, Technology and Space, Committee on Commerce, Science and Transportation, United States Senate, Marcia S. Smith, Resources, Science and Industry Division, Congressional Research Service, April 2, 2003

6. Rationale, 1963-2009 (folder 2 of 3)

<u>Item</u>

1. Pulham, E.G. (2002, June 24). The Impact of Exploration. *Space News*, p. 13.

2. Robertson, D.F. (2002, June 24). The Mars Train Wreck. The Impact of Exploration. *Space News*, p. 13.
3. e-mail, From: Ray Erikson, To: Mark Craig (and list), Subject: Economic Imperative, April 17, 2002
4. Correspondence and documents, From: John Logsdon, Re: History of Rationales for Humans Beyond Earth Orbit ("selectively chosen copies of original documents from the past forty years offering arguments in support of presence of humans beyond the immediate vicinity of Earth") February 16, 1999
5. Redefine Space Exploration, by Edward Hujsak, publication information unavailable
6. Why Explore Space? By Robert P. Kleinberger, publication information unavailable
7. Kleinberger, R.P. (1999, March 1). Creating a Lunar Outpost. *Space News*, p. 13.
8. Wagner, R. (1999, January/February). Report from the Mars Society Founding Convention: Society Forms Chapters in the U.S. and Abroad, Plans to Establish Martian Research Base in the Arctic. *Final Frontier*, pp. 13-14.
9. Roberts, L.D. (1998, July 6-12). Commentary – Human Spaceflight Does Matter. *Space News,* p. 14.
10. The Next Frontier: To Mars and Back, by Donna Shirley, 1998
11. The Mars Society. (1998, August 31-September 6). Mars: Its Time has Come. *Space News*, p. 19.
12. Krauthammer, C. (1998, November 9). What Happened to Destiny? John Glenn's flight shows how modest our ambitions in space have become. *Time,* p. 130
13. Why Mars? by Carl Sagan, publication information unknown
14. NPR Segment, "Last Time on the Moon," Bob Edwards, host, December 12, 1997
15. "Mir, Mir on the wall…" publication information unknown
16. e-mail, From: Dan Culbertson, To: John Dumoulin, Mark Craig, et al, Re: HEDS Outreach SBIR Subtopic, December 1, 1997
17. "Our Views." (1997, September 21). On unchartered seas or in space, humanity must dare to explore. *Florida Today*, p. 14A.
18. Sagan, C. (1991, Spring). Why Send Humans to Mars? Is the ticket worth the price? Perhaps, but only if nations pool their resources. *Issues in Science and Technology*, pp. 80-85
19. Robots Versus Humans: The Next Space Race? By Louis D. Friedman, publication information unknown
20. *Space Times,* "In This Issue: Mars Beckons," Volume 37, No. 6, November-December 1998
21. The Role of Space in Addressing America's National

Priorities, A Special Report, *Aerospace Industries Association*, January 2009

22. Correspondence (NASA HQ/Code-Z), From: Jeff Volosin, Subject: Key Phrases and Quotes Related to Exploration, May 18, 1990
23. Why Should we go to Mars? by Loretta Hidalgo, August 16, 1996
24. The Space Exploration Initiative – Why We Are Doing This, by Dr. Terence T. Finn, The Space Summit, von Braun Civic Center, Huntsville, AL, June 4, 1990
25. "To the Stars Through Difficulties," by Jeffrey D. Rosendhal, NASA, Commencement Address, West Potomac High School, June 10, 1986
26. "Mr. Aldrich's Exploration Speech (LA Version), undated
27. "The Weight of this Sad Tome:" Reflections on Unity Within the Space Shuttle Tragedy," By Sybil Pittman Estess, 1986
28. Public Policy Forum – Who Will Do the Space Program of the Future," by Jeffrey D. Rosendhal, Assistant Director for Space Exploration (International) NASA Headquarters, undated
29. SEI as a National Priority: Responding to National Policies and Needs," by Richard A. Reeves, NASA, Washington, DC, 1991
30. Jastrow, R.; Newell, H.E. (1963, August). Why Land on the Moon? *The Atlantic*, Vol. 212, no. 2, pp. unknown
31. "Mars: Destination and Challenge," by Arnold D. Aldrich, an address at the Mars Exploration: Past, Present, and Future Conference, Williamsburg, Virginia, July 17, 1991

7. Rationale, 1987-2012 (folder 3 of 3)

Item

1. The Romantic Age of Interplanetary Travel Research: Birth of the Space Age Exploration Initiative, by Jeffrey F. Volosin, December 6, 1990
2. "The Crisis in Exploration," by Michael B. Duke, Deputy for Science Exploration Programs Office, Johnson Space Center, a commencement address delivered to the College of Engineering, Rutgers University, May 20, 1993
3. Booklet, U.S. Presidents and Astronomical Discovery, by Robert A. Brown and Jeanette C. Ishee, Baltimore, MD: Space Telescope Science Institute, January 1991
4. NASA, Office of Exploration Review Comments on Columbus' Proposal, July 6, 1989
5. "The Case for an International Lunar Base," IAA Ad Hoc Committee, "Return to the Moon," Aerospace Institute, Technical University of Berlin, November 1987
6. Public hearing on the rationale for human missions to Mars sponsored by the Federation of American Scientists, October

3, 1990
7. Remarks of Senator Al Gore, American Astronautical Society, Washington, DC, March 15, 1990
8. Dooling, D. (1991, July 8-14). Commentary – Just Another Space Voyage: Public Apathy Could Thwart Future Missions. *Space News*, p. 20
9. The Importance of "Failior," by Jeffrey D. Rosendhal, NASA Headquarters, 1992
10. The New Sputnik Challenge, by Daniel N. Baker, Chief, Laboratory for Extraterrestrial Physics, November 16, 1992
11. "Going to Bethesda," by Jeffrey D. Rosendhal, Office of Space Science and Applications, NASA Headquarters, *Public Policy Forum,* undated
12. "Through a Looking Glass," by Dr. Terence T. Finn, NASA Headquarters, *Public Policy Forum,* undated
13. NASA Memorandum for the Record, Subject: Biomedical Research and Technology Benefits of the Space Program, hearing Chaired by Congressman Ralph Hall, Subcommittee on Space, Committee on Science, Space and Technology, June 17, 1992
14. "Building a House—Government-Style," by Jeffrey D. Rosendhal, Office of Space Science and Applications, NASA Headquarters, July 16, 1992
15. Imagined Frontiers: Westward Expansion and the Future of the Space Program, by Patricia Nelson Limerick, draft, undated
16. "R. Reeves, op-ed," August 12, 1991
17. German Firms Divided on Value of Manned Space Flight, *Bild Der Wissenschaft,* November, 1991, pp. 75-77.
18. "The Light of a New Age," Remarks by NASA Administrator, Daniel S. Goldin, to the Association of Space Explorers, Washington, DC, August 24, 1992
19. First draft of Space Exploration document, no author noted, December 15, 1990
20. "America is About Eagles," Rick Chappell, Marshall Space Flight Center, March 23, 1992
21. Booklet, Space in Our World, *Aerospace Industries Association,* November 2012
22. Booklet and copies of PowerPoint presentation, "Space for the World," An Initiative of the American Astronautical Society in collaboration with the International Astronautical Federation, July 21, 1999

Box 57 Aerospace Industries Association Lobbying Material, *Beyond LEO "Rationale," and National Geographic Society Symposium on the Value of Space Exploration, 1994-2003*

Folder

1. Second to None: Preserving American Leadership in Aerospace and Defense - Aerospace Industries Association lobbying material, 2012
2. Beyond LEO "Rationale," 2002-2003
   Item
   1. Interconnectivity of Justification, includes notations, undated
   2. NASA's Role in Human Space Flight, October 15, 2002
   3. Correspondence, 2002-2003
   4. *Houston Chronicle*, editorial, The Rewards of Space Exploration are as High as Ever, September 17, 2002
   5. NASA National Education Challenge: The U.S. Engineering and Physical Sciences *People* "Crises," circa 2002
   6. Science-Driven Exploration, by Marc Allen, Exploration Science Working Group, October 2002
   7. Handwritten notes, circa 2002
   8. Human Advantage: Partnering with Robotics "On Site," October 29, 2002
   9. e-mail, From: Paul Spudis, To: Mark Criag, Re: Spudis Presentation to JSC Senior Management, August 2002
   10. Handwritten notes, Rationale, undated
3. National Geographic Society Symposium on the Value of Space Exploration, July 18-19, 1994

Subseries 5. Rogers, Flowers, and Rohde Thought Leadership

Box 57 continued *AAS Imagine '09 Conference,* Bob Rogers, Betty Sue Flowers, and Joe Rohde folders, 1998-2016

Folder

4. AAS Imagine '09 Conference folder, 2009-2010 (key documents)
   Item
   1. DVDs (3), Imagine '09: Ideas at Work: Game-Changing Ideas for NASA Human Spaceflight (Bob Rogers, Betty Sue Flowers, Joe Rohde)
   2. Program, The AAS Imagine '09 Conference, Johnson Space Center – Gilruth Center, Houston, Texas, December 2-3, 2009
   3. Documents and copies of PowerPoint slides, 2009
   4. AAS Image '09 – An Assessment, Mark Craig, Imagine '09 Chair, January 15, 2010
   5. AAS Imagine '09 Lessons & Ideas, Comments and

Observations, January 13, 2010

6. AAS Leadership Offsite, President's Welcome and Opening Remarks, January 16, 2009
7. Various conference documents, 2009
8. The Power Experience, presented by Armen Berjikly, experience project, founder and CEO, 2009 (copies, PowerPoint slides)
9. "Narrative and Organization," 2009 (copies, PowerPoint slides)
10. TEDx NASA, November 20, 2009
11. American Astronautical Society Offsite, Agenda, and notes, January 16, 2010

5. Bob Rogers folder, 1998-2016 (key documents)

Item

1. CD-R, "Public Engagement," Bob Rogers, 2009
2. Thompson, B. (2005, February 27). High-tech history finds home in museum. *Houston Chronicle*, p. G12
3. Thompson, B. (2005, February 15, 2005). Histrionics and History: Lincoln Library's High-Tech Exhibits Have Scholars Choosing Sides. *The Washington Post,* pp. C1-2.
4. Correspondence, February 2016
5. Correspondence and article, "Concepts & Prototypes - Zero-Gravity Roller Coaster: A $50-million plan to make riders weightless, for eight long seconds," by Ben Austen (includes notes and calculations by Craig), May 2001
6. Memo and Document, To: NASA Headquarters, From: AA00/Mark Craig, Subject: Massive Public Engagement in Space Exploration, includes 3 copies of Mars Architecture Definition Team, September Meeting, Task Group 10, Public Engagement, © Bob Rogers, 1998

6. Betty Sue Flowers folder, 1985-2007 (key documents)

Item

1. Handwritten notes, March 24, 1998
2. Buchholz, B. (2002, April 7). The poet and the president: Betty Sue Flowers reimagines the LBJ Library as a place where politics and history meet dream and stories. *Austin American-Statesman*, pp. K1, K10, K11.
3. Chart, "The Myths That Have Made Us," circa 1997
4. Space Exploration within the Economic Myth: A Provocation, presentation by Betty Sue Flowers, ©2007
5. The Economic Myth, by Betty S. Flowers, English Department, The University of Texas at Austin, Center for International Business Education and Research (2 copies, undated)
6. Storying Corporate Futures: The Shell Scenarios, an interview with Betty Sue Flowers, this chapter appeared in Corporate

Futures, Volume V of the Late Editions Series, George Marcus, ed. Chicago: University of Chicago Press, 1998
7. Notes from above interview, undated
8. Cornelius, P.; Van de Putte, A.; Romani, M. (2005, Fall). Three Decades of Scenario Planning in Shell. *California Management Review*, Vol. 48, No. 1, pp. 92-109.
9. Wack, P. (1985, September-October). Scenarios uncharted waters ahead. *Harvard Business Review*, Vol. 63, pp. 72-89.
10. De Geus, A. (1988, March-April). Planning as Learning: At Shell, planning means changing minds, not making plans. *Harvard Business Review*, pp. 70-74.

7. Joe Rohde folder, 2009 (key document)
   Item
   1. Narrative and Organization, presentation by Joe Rohde, December 17, 2009

Subseries 6. NASA 2010 Authorization Act Support, 2010-2015

Box 58 *NASA 2010 Authorization Act, Conferences, Workshops, Summits and Miscellaneous Material, 2010-2015*

Folder
1. Creation of the Act Support folder, 2010 (key documents)
   Item
   1. NASA Human Spaceflight Sustainability, Recommended Actions, Mark Craig, April 9, 2010
   2. Listening to the System, Mark Craig, May 23, 2010
   3. "Listen to the System," June 10, 2010
   4. A Mechanism to Provide Long-Term Strategic Guidance for NASA Human Spaceflight, Mark Craig, June 23, 2010
   5. "Recommended ACTION to champion a robust HSF policy," August 31, 2010
2. Promotion and Implementation of the Act Support, 2010-2012 (key documents)
   Item
   1. Roop, L. (2011, May 20). International Space Conference - NASA law called 'actionable' blueprint for space program: Expert sees 2010 act as way forward; others not so optimistic on future. *The Hunstville Times,* pp. B1-B2.
   2. How to Reduce Churn in NASA Human Space Exploration, Mark Craig, Space News Op/Ed, December 14, 2011
   3. Building Long-Term Support for Space Exploration, International Space Development Conference, Mark Craig, May 19, 2011
   4. NASA Authorization Act of 2010 – Sec. 202: Human Space Flight and Exploration Goals & Objectives

5. Handwritten notes
6. Correspondence with Erim Sarinoglu, June 29, 2011
7. NASA Human Spaceflight 3.0, and Beyond, June 3, 2012

3. Global Exploration Roadmap Conference Value Session 7, 2011-2012

Item

1. DVD, Proceedings of the Global Space Exploration Conference, Washington, DC, May 22-24, 2012
2. Session 7 Description, 2012
3. GLEX 2012 – Session 07: The Human Space Exploration Value Proposition, Presentation Status, April 27, 2012
4. e-mail, From: Scott Pace, To: Mark Craig and Scott Becker, Re: For GLEX Telecon Today – Session 7 Input, December 2011
5. Report on the session 07.1 – The Human Space Exploration Value Proposition, undated

4. IAA Space Exploration Conference, 2014

Item

1. Program, Heads of Space Agencies Summit, International Academy of Astronautics, Ronald Reagan Building and International Trade Center, Washington, DC, January 10, 2014
2. Program, International Academy of Astronautics, IAA Space Exploration Conference, Planetary Robotic and Human Spaceflight Exploration, Washington, DC, January 9, 2014
3. IAA Space Exploration Conference, Planetary Robotic and Human Spaceflight Exploration, a pre-Summit Conference of the Heads of Space Agencies Summit on Exploration, January 9, 2014
4. The Exploration ←→ Development of Space "Engine," presentation by, Mark Craig SAIC, undated
5. Conference Program, IAA Space Exploration Conference, Planetary Robotic and Human Spaceflight Exploration, Washington, DC, January 9, 2014

5. Affordable Mars II (AMII) Workshop, 2004-2014

Item

1. Workshop Description and Agenda, Continuing to Build a Community Consensus – The Second Affording Mars Workshop, The Keck Institute for Space Studies, The California Institute of Technology, hosted by the NASA Jet Propulsion Laboratory, Organized by Explore Mars, Inc. and the American Astronautical Society, October 14-16, 2014
2. Handwritten notes, 2014
3. Logistics, The Second Affording Mars Workshop, The Keck Institute for Space Studies, The California Institute of Technology, October 14-16, 2014

4. Goldstein, E. (2014, March). Mars or bust: The case for optimism. *Aerospace America,* pp. 38-45
5. Report in Brief – Pathways to Exploration—Rationales and Approaches for a U.S. Program of Human Space Exploration, Aeronautics and Space Engineering Board & Space Studies Board – Division of Engineering & Physical Sciences – Committee on National Statistics – Division of Behavioral and Social Sciences and Education, June 2014
6. Roster, Second Affording Mars Workshop, October 14-16, 2014
7. NASA Principles for Sustainability and NRC Pathway Principles, circa 2004
8. The Global Exploration Roadmap, presented to the Second Affording Mars Workshop, NASA/Kathy Laurini, Co-Chair, ISECG Exploration Roadmap Working Group, October 2014
9. Mars Mission Design and Maximizing Performance Utilization, by Kevin E. Post, Edward Belbruno, and Ulhas Kamath, © 2014 Boeing
10. Telepresence and the Purpose of Human Spaceflight, by Dan Lester, submitted to the NRC Committee on Human Spaceflight by invitation for input papers, June 14, 2013
11. International Industry Concepts for an Outpost at the Earth-Moon L2 Region, by Joshua B. Hopkins, Matthew Duggan, Rodrigo da Costa, et al. Presented at International Astronautical Congress, Toronto, Canada, ©2014 by Lockheed Martin Corporation.
12. ESA's Space Exploration Strategy, by B. Hufenbach, presented at FISO Colloquium, June 18, 2014 (copies of PowerPoint slides)

6. Next Giant Leap Lunar Conference, 2014 (Craig was a speaker)
   <u>Item</u>
   1. "The Next Giant Leap: Leveraging Lunar Assets for Sustainable Pathways to Space," Marriott Waikoloa, South Kohala-Island of Hawaii, November 9-13, 2014 (includes conference folder, agenda, working group notes, correspondence, and miscellaneous items)
   2. "Draft – for discussion at plenary 8:30 – Declaration for an International Lunar Decade, 2014
   3. Lunar Station: The Next Logical Step in Space Development, by Robert Bruce Pittman, Lynn Harper, Mark Newfield, Dr. Daniel J. Rasky, September 2014
   4. The International Lunar Research Park Concept, by Stephen M.D. Day, 2014
   5. Keravala, J; Tietz, D.; Stone, B. (2013). Shackleton Energy Company's Propellant Depot and Space Transportation Architecture. *New Space*, Vol. 1, No. 2, pp. 91-100.

6. Brochures, PISCES, Pacific International Space Center for Exploration Systems, circa 2014

7. Pioneering Space National Summit, February 2015

Item

1. Conference folder and related conference correspondence, 2015
2. Working Group notes, 2015
3. Statement of the Participants of the 2015 Pioneering Space National Summit, and associated documents
4. HEOMD Strategic Principles for Sustainable Exploration (Pioneering Space 2015 and Evolvable Mars Campaign)

8. Affordable & Sustainable Mars III (AMIII) Workshop, 2015

Item

1. Issues and Challenges in Sustainability, The Third Community Workshop on Affording and Sustaining Human Mars Exploration (AM III), Mark Craig, Mary Lynne Dittmar, Dan Dumbacher, Ann Zulkosky, December 2, 2015
2. General Observations and Proposed Actions Identified by Sustainability Panel at AM III Workshop on December 2-4, 2015 (also includes handwritten notes)
3. Bases for NASA Human Space Exploration Sustainability, Common Bases, June 30, 2015
4. Journey to Mars/Evolvable Mars Campaign/Strategic Principles for Sustainable Exploration/Pioneering Space – Goals, circa 2015

9. Strategy and Messaging, 2015

Item

1. NASA Human Space Exploration – Strategy and Messaging, Mark Craig, December 14, 2015
2. NASA Human Space Exploration – Strategy and Messaging, Mark Craig, December 16, 2015
3. Note to NASA – Bill Gerstenmaier, From: Mark Craig, 2015

Subseries 7. National Academies' Human Space Exploration Study, 1958-2016

Box 58 continued National Research Council *(Background and Input),* Atlantic Council, *Promotion and Implementation Support, 1958-2015*

Folder

10. The National Research Council Report Pathways to Exploration, paper copy and CD, 2014 (signed by NRC staff Michael Moloney and Sandra Graham with a personal note from each to Mark Craig, key document)
11. NRC Study, Background and Input, 1958-2013 (key documents)

Item

1. DVD, The Space Studies Board, Compilation of Reports, 1958-2011
2. National Research Council (2009). America's Future in Space: Aligning the Civil Space Program with National Needs. Washington, DC: The National Academies Press.
3. Notes to Various Stakeholders as National Research Council Committee being assembled
4. Human Space studies since Apollo, circa 2009
5. Von Braun Integrated Space Program, 1970-1990
6. Historical Rationales for Investing in Space, AML: August 29, 2009 (Rev 5)
7. Dobbs, D. (2013, January). Restless Genes. *National Geographic*, pp. 44-57.
8. Telepresence and the Purpose of Human Spaceflight, by Dan Lester, June 14, 2013
9. Independent Study on the Human Exploration of Space by the National Academies, "The Generational," Ed Crawley, April 6, 2011
10. Vedda, J. A. (2012, September/October). Finding the Right Roadmap: The space development path may not go through Mars. *Space Times*, pp. 13-16.
11. To boldly go…where others have gone before, by Edward Ellegood, July 13, 2009
12. Comparing Future Options for Human Space Flight, by Brent Sherwood, 61st International Astronautical Congress 2010, IAC 2010, 2010, Vol.7, pp.5206-5213
13. Moon, Mars, or Asteroids, Which is the Best Destination for Solar System Development? *Space REF*, posted by Dennis Wingo, June 19, 2013
14. Reports/Studies/Reviews of the Optimal/Preferred Direction of Human Space Exploration, circa 2009
15. NASA Cocks Snooks at Academy Advice, by Washington correspondent, *Nature*, Vol. 230, March 19, 1971, pp. 142-143.
16. Note from Purdue President Mitch Daniels, thanking Craig for his service on the Human Spaceflight Committee, signed "Mitch," undated
17. NASA's Strategic Direction and the Need for a National Consensus, Committee on NASA's Strategic Direction, Division on Engineering and Physical Sciences, National Research Council of the National Academies, © 2012 by the National Academy of Sciences

12. "NRC Study Blue Folder," 2010-2014 (key documents)

Item

1. Committee membership information and notes, 2013
2. Draft agenda, Committee on Human Spaceflight Meeting,

April 22, 2013

3. The Role of International Partnerships in Sustainability of Human Space Exploration: Some Results from the NRC Human Spaceflight Committee "Pathways to Exploration" Report, Dr. Mary Lynne Dittmar, circa 2014
4. NASA Authorization Act of 2010
5. Report in Brief – Pathways to Exploration-Rationales and Approaches for a U.S. Program of Human Space Exploration, Aeronautics and Space Engineering Board and Space Studies Board, Division on Engineering & Physical Sciences Committee on National Statistics, Division of Behavioral and Social Sciences and Education, June 2014
6. NRC Independent Study on Human Exploration of Space, undated

13. Promotion and Implementation Support, 2011-2015 (key documents)

Item

1. Bases for NASA Human Space Flight Exploration Sustainability – Common Bases, June 30, 2015 (2 copies)
2. Sustainability of NASA Human Space Exploration – Key Points from the NRC Report Pathways to Exploration, June 2014
3. The Exploration <-> Development of Space "Engine" – A Maturing Policy Framework, undated
4. How to Reduce Churn in NASA Human Space Exploration, by Mark Craig, *Space News*, December 14, 2011

14. Atlantic Council Events Folder, 2013-2015 (key documents)

Item

1. SAIC – Atlantic Council Brent Scowcroft Center on International Security, member roster, miscellaneous documents, 2015
2. Exploration and the private sector, by Jeff Foust, July 28, 2014 (background information)
3. Humans in Space: US Leadership and International Partnerships – Atlantic Council Concept Paper for SAIC, August 2013
4. NRC Report Reviews, circa 2015
5. Planning Meeting, agendas, minutes, notes, etc., 2013-2014

Subseries 8. Strategy and Messaging, 2015-2016

Box 59 *NASA 4.0 Folder, and Strategy and Messaging, 2015-2016*

Folder

1. NASA 4.0 Folder, (key documents)

Item

1. 50 Years of Accomplishment and Evolution – NASA Human Space Exploration, March 1, 2016
2. NASA 4.0, Human Space Exploration – A Personal View, by Mark Craig, March 1, 2016

2. Strategy and Messaging, 2015 (key documents)

Item

1. NASA Human Space Exploration – Strategy and Messaging, Mark Craig, December 14, 2015
2. NASA Human Space Exploration – Strategy and Messaging, Mark Craig, October 21, 2015

Subseries 9. Enterprise Sustainability, 1996-2019. Per Craig, **"**These publications and presentations created over 20+ years display the evolution of my thinking and insights in the critical area of enterprise sustainability, an area that has received far too little attention and meaningful action by our community. Items 16-18 in Folder 5 accurately express my best thoughts, are actionable, and are the basis of my advice to and advocacy for the enterprise."

Box 59 continued Publications and select presentations by Mark Craig, 1996-2019

Folder

3. Documents and slide decks by Mark Craig, 1996-2002 (folder 1 of 3, key documents)

Item

1. **A Framework to Shape and Articulate Human Space Flight to Assure a Sustainable Foundation**; presentation, October 6, 1996
2. **Strengthening Support for Human Exploration and Development of Space**, presentation to the Office of Space Flight Management Council, January 9, 1997
3. **Human Exploration and Development of Space (HEDS), Enabling Tomorrow's Programs – Today**, April 21, 1997
4. **Strengthening Support for the Human Exploration and Development of Space (HEDS)**; presentation to the CalTech Management Association, Pasadena CA, July 1997.
5. **Enabling the Future of Space Exploration**, presentation to the Administrator's Vision Integration Team, March 11, 1999
6. **NASA Human Space Flight - A Context**; presentation to the Johnson Space Center Co-op Forum, May 1999.
7. **Living on Planet Earth**; keynote address at the IAF Forum on Space Activity in the 21st Century; 3rd United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), Vienna Austria, July 1999. (one paper copy and one CD-R copy)
8. **A Sustainable Basis for NASA Human Space Flight**; presentation to the International Space University (ISU)

Master's Program, Strasbourg France, February 2002.

4. Documents and slide decks by Mark Craig, 2002-2004 (folder 2 of 3, key documents)

Item

1. **A Sustainable Basis for NASA Human Space Flight**, ISU, February 2002 (CD-RW)
2. **Considerations for the NASA Exploration Vision/Strategy**, presentation to NASA Management at Sean O'Keefe's first retreat, March 5, 2002.
3. **Building Sustainability of Human Space Flight**, presentation to NASA Deputy Administrator Fred Gregory, March 2002.
4. **NASA Exploration and Discovery for the New World**; presentation to the Branding and Re-branding for the 21st Century Conference, University of Texas at Austin, May 2003. (paper and CD-R copy)
5. **Human Space Flight – Strategic Considerations at JSC**, July 31, 2003
6. **Managing NASA's Value to the Nation**, December 16, 2003
7. **Creating Sustainability for the President's Space Exploration Vision**, presentation to NASA's Deputy Administrator and Space Architect, February 25, 2004
8. **Creating Sustainability for the President's Space Exploration Vision**, Part 2: Human Experience Value > Engagement, presentation to NASA Deputy Administrator and Space Architect, February 26, 2004
9. **Creating Sustainability for the President's Vision for Space Exploration**, March 17, 2004

5. Documents and slide decks by Mark Craig, 2004-2019 (folder 3 of 3, key documents)

Item

1. **Making the Vision for Space Exploration Sustainable**, April 14, 2004
2. **The Basis of Sustainability**, April 20, 2004
3. **The Basis of Sustainability**, June 8, 2004
4. **Transformation Roll-out Shaped by Vision Sustainability**, June 14, 2004
5. **Sustaining the Vision for Space Exploration**, June 23, 2004
6. **Achieving Profound Public Engagement - The Ultimate Source of Exploration Vision Sustainability**; AIAA paper No. 2005-2568, 1st Space Exploration Conference, January 2005.
7. **NASA's Value to the Nation: 50 years of Lessons on Sustainability**; AIAA paper No. 2007-9931, AIAA SPACE 2007 Conference, Long Beach CA, September 2007.

8. **The Future of Human Spaceflight**; presentation to the Center for Strategic and International Studies, Washington DC, May 2009.
9. **Creating Relevance - Key to Human Spaceflight Sustainability**, presentation to the MIT Space, Policy, and Society Research Group "The Future of Human Spaceflight" Workshop, August 2009.
10. Flyer, "The Chief Knowledge Officer invites you to a Storytelling Event, Sustaining NASA Human Spaceflight Beyond Dogma and Jobs, Beyond Outreach, May 5, 2010
11. **NASA Human Spaceflight Sustainability - Beyond Dogma and Jobs, Beyond Outreach**, presentation to the Johnson Space Center Story Telling Event, Houston TX, May 2010.
12. **Improving Human Space Exploration Sustainability**, lecture, University of Alabama in Huntsville, Huntsville AL, November 2011.
13. **The Exploration <-> Development of Space "Engine";** IAA Paper No. IAA - WAS0401, International Academy of Astronautics Space Exploration Conference (a pre-Summit Conference of the Heads of Space Agencies Summit on Exploration), Washington DC, January 2014.
14. ***Issues and Challenges in Sustainability***, Third Community Workshop on Mars Affordability and Sustainability AMIII), Washington DC, December 2015 (with M. L. Dittmar, D. Dumbacher, and A. Zulkosky)
15. **NASA Human Space Exploration – Strategy and Messaging**, December 14, 2015
16. **Beware … Mars AND Bust**; *The Space Review*, June 26, 2017. (key document)
17. **Settling Space: Building Multinational and Public-Private Partnerships**; presentation to The International MoonBase Summit, Kohala Coast Island of Hawaii, October 1-5, 2017. (key document)
18. **NASA's Human Exploration and Development of Space**; keynote at the Students for the Exploration and Development of Space (SEDS) Owls In Space Symposium, Rice University, Houston TX, April 13, 2019. (key document)

Series 11. Stennis Space Center (SSC) Management, 1962-2005
(0.2 cubic feet)

Subseries 1. Various Topics, 1962-1999

Box 59 continued *Stennis Management, Various Topics, 1962-1999 (many undated)*

Folder

6. Stennis Management, Various Topics, 1962-1999 (many undated)

Item

1. CD, Mississippi Test Facility, Site Development Plan, December 1962
2. Stennis Space Center Organization Missions and Responsibilities, undated
3. "SSC Attraction X," undated
4. "Data is Nice, But in Plain English…," undated
5. KSC Launch Control Complex, roster, duties, etc., undated
6. Stennis Implementation Plan, July 23, 1999
7. Stennis Space Center, summary of history, undated
8. N2Y Projects, undated

Subseries 2. Rocket Propulsion Test, 1991-2005

Box 59 continued *Stennis Management, Rocket Test, 1991-2005*

Folder

7. Stennis Management, Rocket Test, 1991-2005

Item

1. Pamphlet, NASA, National Rocket Propulsion Test Alliance, (2 copies, includes small CD-Rom inside, undated)
2. Pocket Data Book, Space Shuttle Main Engine, Part Number RS007001, prepared by Rockwell International, Rocketdyne Division, June 1, 1991
3. Booklet, Space Shuttle Program Schedules, May 2001
4. NASA Lead Center, September 2002
5. Draft, Memorandum of agreement between NASA Propulsion Test Centers and Department of Defense (DoD) Propulsion Test Organizations, December 18, 1995
6. Large Liquid Rocket Testing – Strategies and Challenges, by Shami, A. Rahman and Bartt J. Hebert, Joint Propulsion Conference & Exhibit, Tuscon, Arizona, July 10-13, 2005 (AIAA-2005-3564
7. Stennis Space Center, Space Shuttle Privatization Attributes, Concepts and Issues, October 25, 2001

Series 12. Johnson Space Center (JSC) Management, 1983-2011

(0.6 cubic feet)

Subseries 1. Various Topics, 1983-2011

Box 60 *Johnson Space Center Management, Various Topics, 1983-2011*

Folder

1. Johnson Space Center Management, Various Topics, 2005-2011
   Item
   1. Correspondence, From: Daniel Carpenter, Subject: HQ Vits, April 18, 2005
   2. Space City 2020 – Space Strategy Workshop, BioScience Research Collaborative, Rice University, September 9, 2011 (includes agenda, flyer, correspondence, notes, and moderator questions)
   3. "NASA People at Work," DVD+R, undated
   4. Shuttle and Apollo Generation Expert Services (SAGES) Status Review, prepared for Constellation Program Office NASA/JSC by Science Applications International Corporation, February 27, 2007
2. System Engineering, 1989-2009
   Item
   1. Principles of Engineering Excellence: Space Launch and Transportation Systems, Disk 1 of 2, September 2006 (CD, 56 minutes)
   2. Principles of Engineering Excellence: Space Launch and Transportation Systems, Disk 2 of 2, September 2006 (CD, 70 minutes)
   3. Dealing with Uncertainty in Systems Engineering, Tutorial T2 European Systems Engineering Conference 2006, September 18, 2006 (CD, © Mark A. Powell 2000-2006)
   4. Space Lessons Learned Workshop, December 13, 2006 (CD-R)
   5. NASA, Program and Project Management Processes and Requirements and Development Resources, undated (CD-Rom)
   6. System Engineering, What It Is, What It Is Not, Its Products, Impediments, January 24, 1989
   7. Perspectives in Program and Project Management: Setting Requirements, Mark Craig, April 21, 1993
   8. NASA Correspondence, To: Johnson Space Center, Attn: KA/Manager, Administrator for Space Systems, From: D/Deputy Associate Administrator for Space Systems Development, Subject: Program Excellence Team, November 13, 1992
   9. Correspondence, To: AE/Dan Mulville, From: SSC/Mark Craig, Subject: System Engineering and Requirements Development, May 21, 1996
   10. "The Political Process and Systems Architecting," by Brenda Forman, Chapter 13, from "The Art of Systems Engineering," 3rd ed., by Mark Maier and Eberhardt Rechtin, © 2009
   11. Requirements Tools, Glenn E. Cunningham, Manager, Mars Observer Project, Jet Propulsion Laboratory, April 20, 1993

12. Some Considerations on Organising Requirements for Systems Management, by R.J. Stevens, Information Systems Division, ESRIN, Frascati, Italy, January 1991
13. Systems Engineering Standards, Who Needs Them? NASA!! By Barney B. Roberts, NASA Johnson Space Center, undated
14. NASA Systems Engineering Handbook, by Robert Shishko and Robert G. Chamberlain, Draft, September 1992
15. Readings in Systems Engineering, edited by Francis T. Hoban and William M. Lawbaugh, Washington, DC: NASA, Scientific and Technical Information Program, 1993
16. Transparencies, Dream Airplanes and The Ideal Space Station, and a Dilbert comic strip, undated

3. Agency System Management, 1999-2000

Item

1. Systems Management Office (SMO), presentation to the SMO Directors, by Orlando Figueroa, April 13, 2000
2. Draft, SSC System Management Panel Charter, undated
3. Memo/Document, To: Administrator, From: Estess, Subject: System Engineering at Stennis, undated
4. NASA Memo, To: Distribution, From: A/Administrator (Daniel S. Goldin), Subject: Systems Engineering, October 15, 1999
5. Draft, SSC System Management Panel Charter, undated
6. Agency Process for Systems Management, presented to the Senior Management Council by Danile R. Mulville, June 23, 1999
7. Agency Process for Systems Management, presented to the Engineering Management Council by Keith Hudkins, August 4, 1999
8. NASA Memo, To: Institutional Program Office Associate Administrators/Directors, NASA Centers/Director, Jet Propulsion Laboratory, From: AE/Chief Engineer, Subject: Center Systems Management Office and Organization, May 28, 1999
9. NASA Memo: To: Directors, NASA Centers, From: AE/Chief Engineer, Subject: Systems Management Office, August 31, 1999
10. Faxed Document, To: Distribution, From: AE/Daniel Mulville, Subject: Center Systems Management Office and Organization, June 2, 1999
11. Agency Process for Systems Management, presented to the Senior Management Council by Daniel R. Mulville, June 23, 1999

4. JSC Astrobiology & Extraterrestrial Materials, 2003

Item

1. Brief History of Extraterrestrial Curation & Analysis at JSC,

2003
2. Why does JSC need a core science group? 2003 (copies of PowerPoint slides)
3. Bioastronautics Strategy, January 27, 2003

5. Station and Shuttle Utilization Reinvention Team, 2003
Item
1. Station and Shuttle Utilization Reinvention (SSUR) Team, Briefing to JSC Management, April 8, 2003
2. 2nd Briefing to Enterprise Council, May 5, 2003
3. Memorandum, Subject: Joint Manifest Working Group (JMWG) Charter, May 5, 2003
4. Briefing to OBPR and OSF, June 6, 2003
5. Station and Shuttle Utilization Reinvention (SSUR) Team, Recommendations approved by Executive Council, August 19, 2003 (includes NASA memo)

6. JSC Commercialization and Tech Transfer Assessment, 1983-2004
Item
1. NASA Commercialization and Technology Transfer Assessment (Purchase Order No. T-9003W), Robert W. Bobst, Holland & Davis, LLC, March 28, 2003
2. Value-Driven Technology Transfer, Focused and Effective, Charlene E. Gilbert, August 7, 2003
3. Correspondence, To: Cheryl D. Bass, From: C. William Nash, President Holland & Davis, LLC, Subject: Statement of Work and Quote, January 20, 2003
4. Reitzig, M. (2004, Spring). Strategic Management of Intellectual Property. *MIT Sloan Management Review).* Pp. 35-40.
5. NASA-JSC Technology Transfer Improvement Program Charter, June 27, 2003
6. NASA Order for Supplies of Services, January 28, 2003

7. NASA Lyndon B. Johnson Space Center, *Space News Roundup*, 25th Anniversary Issue, Vol. 22, No. 17, September 30, 1983

Subseries 2. Program Control Study, 1992-1993

Box 61 *JSC Program Control Study, 1992-1993 (key documents)*

Folder
1. JSC Program Control Study, 1992-1993 (key documents)
Item
1. Program Control Functions (includes a handwritten chart), circa 1993
2. A Statement of the Problem and Corrective Actions, circa 1993

3. An Assessment of Program Control at the Johnson Space Center, Findings and Recommendations of the Program Control Assessment Team, February 1993
4. Institutional Team on Program/Project Planning, presentation to the Senior Review Group on Findings and Recommendations, by T.J. Lee, November 25, 1992
5. Implementing the Findings and Recommendations of the Program Control Assessment Team, May 3, 1993 (Craig part of team)
6. An Assessment of Program Control at the Johnson Space Center, Findings and Recommendations of the Program Control Assessment (PCA) Team, March 30, 1993
7. A Statement of the Problem and Probable Root Causes of Real or Perceived Program Management Issues at JSC, April 22, 1993

Subseries 3. Johnson Space Center Strategy and Metrics, 2003-2004

Box 61 continued *Johnson Space Center Strategy and Metrics, 2003*

Folder
2. JSC Strategy and Metrics, 2003
   Item
   1. Managing NASA's Value to the Nation, Mark Craig, December 13, 2003
   2. Goals Description, Mark Craig, circa 2003 (includes notations)
   3. JSC Policy Directive, Subject: Quality Policy, January 23, 2003
   4. JSC Goals, as agreed upon by the Center Director and Senior Staff on January 22, 2003
   5. Goal 8 Metrics, undated
   6. 4th Annual Performance Report Scorecard: Which Federal Agencies Inform the Public? By Maurice P. McTigue, Sarah E. Nutter, Jennifer Zambone, Mercatus Center, George Mason University, April 30, 2003
   7. JSC Metrics Development Team, March 26, 2003
   8. JSC Metrics Development Team, June 20, 2003

Subseries 4. Bioastronautics Collaboration Initiative, 2004

Box 61 continued *Johnson Space Center Collaboration Initiative, 2004*

Folder
3. JSC Bioastronautics Collaboration Initiative, 2004
   Item
   1. A Bioastronautics Collaborative Initiative at JSC, Craig,

Goodwin, Kelso, Pellis, and Smith, circa 2004 (includes notations)
2. Bioastronautics Collaborative Initiative, circa 2004 (includes notations)
3. A Concept Paper – A Research Center for the Commercialization of Bioastronautics Discoveries… A Bold Vision…Implemented Conservatively, circa 2004 (publication information unknown)

Series 13. Space Themed Attraction Design, circa 2003-2013
(0.2 cubic feet)

Subseries 1. Chicago Museum of Science and Industry, 2004-2009

Box 61 continued *Chicago Museum of Science and Industry, 2004-2009*

Folder
4. Chicago Museum of Science and Industry, 2004-2009
Item
1. CD-R, Museum of Science and Industry Exploration, David McKay materials – Mars, undated
2. Siegel, E.; Baker, G.; Martin, T. (2008, Fall). Too Big, Too Small, Too Slow, Too Abstract: Exhibiting Modern Science. *Exhibitionist,* pp. 22-28.
3. Correspondence, To: Mark Craig, From: Kurt Haunfelner, Vice President, Exhibits and Collections, Museum of Science and Industry, December 10, 2004
4. Final Agenda, Museum of Science and Industry, Blue Planet/Red Planet, 90% Schematic Design Review, March 18, 2008
5. EXPLORE – Blue Planet – Red Planet, Content Outlines, 60% Design Development, September 1, 2008
6. Correspondence, To: Mark Craig, From: David R. Mosena, Museum of Science and Industry, Re: Thank you for participation in Museum of Science and Industry's 21st Century Initiative Exploration Task Force, February 18, 2004
7. Various Documents from Craig's work with Museum of Science and Industry, circa 2006-2009
8. Photographs (26), Cite de l'Espace, Toulouse France, visit with Museum of Science and Industry, Chicago, undated

Subseries 2. Shuttle Launch Experience & Exploration Space at Kennedy Space Center Visitor Center, 2005-2013

Box 61 continued *Shuttle Launch Experience, etc., 2005-2013 (key documents)*

Folder
5. Shuttle Launch Experience, etc., 2005-2013 (key documents)
   Item
   1. Handwritten note From: Bob Rogers, To: Mark Craig, Subject: Shuttle Launch Experience, undated
   2. CD-Rom, BRC Exploration Space, "CMTC Your Itinerary 090805"
   3. Invitation, Grand Opening of the New Shuttle Launch Experience, at Kennedy Space Center Visitor Complex, May 25, 2007
   4. Save the date invitation, From: BRC, Bob Rogers, Chairman, To: Mark Craig, dated April 26, 2007
   5. DVD, BRC, Battle Stations 21, Commissioning Video, undated
   6. Production Phase, Story Treatment, Shuttle Launch Experience at the Kennedy Space Complex Visitor Center, Preliminary v.8.3, November 11, 2005 (includes Craig's notations)
   7. Images (11) copied onto a 8 ½ x 11 paper, undated
   8. Correspondence, To: Mark Craig, From: Bob Rogers and Donna Davidson, Re: Swansea meeting, August 2013

Subseries 3. Space Shuttle Atlantis Exhibit at Kennedy Space Center Visitor Center, 2013

Box 61 continued Orbiter Atlantis at Kennedy Space Center Visitor Center, 2013

Folder
6. Orbiter Atlantis at KSC Visitor Center, 2013
   Item
   1. DVD, Early Shuttle Documents copied for KSC Atlantis Attraction, Mark Craig, February 13, 2013
   2. Program, Atlantis Celebration, June 28-29, 2013 (includes a few miscellaneous documents and notations)

Subseries 4. Moon Resort, circa 2003

Box 61 continued *Moon Resort, circa 2003*

Folder
7. Moon Resort, circa 2003

Item
1. DVD, “Moon,” undated
2. Handwritten notes, Moon Resort,” Michael Henderson, January 27, 2003

Series 14. President, American Astronautical Society (AAS), 1990-2014

(0.1 cubic feet)

Box 62 *President, American Astronautical Society (AAS), 1990-2014*

Folder
1. President, American Astronautical Society (AAS), 1990-2014
   Item
   1. Various Documents, 2006-2007
   2. Officer Roster and Board of Directors, 2003-2006
   3. American Astronautical Society – “AAS-Advancing All Space,” Strategic Plan, November 2004
   4. 2004 AAS Strategic Plan, Goal Lead Assignments for Implementation, November 5, 2004
   5. AAS Handbook, Strategy Development and Implementation, November 5, 2004
   6. American Astronautical Society Handbook: Guidelines for Arranging AAS Symposia and Conferences and for Organizing New Local and Student Sections, © 1990, American Astronautical Society
   7. Meeting Notes, AAS “Strategic Communication Workshop,” February 21-22, 2009
   8. American Astronautical Society – Reflections of Past Presidents, *Space Times,* November/December 2014
   9. Correspondence, From: Robert E. Lindberg, Eng.Sc.D., President, American Astronautical Society, To: Mark Craig, Subject: Congratulations on election as Vice President-Technical of the American Astronautical Society, December 9, 2002

Series 15. Reference Material, 1917-2015

(2.80 cubic feet)

Subseries 1. Various Topics, 1961-2013

Box 62 continued *Report of the Presidential Commission on the Space Shuttle Challenger Accident, Columbia Accident Investigation Board Report, (key documents), and Various Topics, 1961-2013*

Folder

2. Report of the Presidential Commission on the Space Shuttle Challenger Accident, 1986 (key document)
3. Report of the Presidential Commission on the Space Shuttle Challenger Accident, 1986 (key document)
4. NASA Pocket Statistics, 1997 edition
5. Columbia Accident Investigation Board Report, Vol. 1, (CD in back of volume) August 2003 (key document)
6. A Renewed Commitment to Excellence – An Assessment of the NASA Agency-wide Applicability of the Columbia Accident Investigation Board Report, January 30, 2004
7. The Implementation of the NASA Agency-wide Applicability of the Columbia Accident Investigation Board Report, March 30, 2004
8. Columbia, 2003-2004

   Item

   1. Program, STS-107 Memorial, NASA, Lyndon B. Johnson Space Center, Houston, Texas, February 4, 2003
   2. A Renewed Commitment to Excellence: An Assessment of the NASA Agency-Wide Applicability of the Columbia Accident Investigation Board Report, January 30, 2004
   3. SAIC SR&QA EOC Debris Hotline Volunteer Schedule, February 5-7, 2003
   4. Fran Mahan, NASA SR&QA Contract Specialist, February 10, 2003
   5. How Managers Can Help Employees Cope with Trauma, undated
9. International Space Medicine Summit, May 16-19, 2013, Rice University's Baker Institute, Houston Texas
10. International Space Station Facilities Research in Space 2013 and Beyond
11. Research in Space: Facilities on the International Space Station, undated
12. NASA Reference Guide to the International Space Station, Assembly Complete edition, November 2010
13. NASA Reference Guide to the International Space Station, August 2006
14. NASA Constellation Program Overview, 1996
15. Brochure, The Super Guppy, undated
16. NASA folder with various "Vision for Space Exploration" materials, circa 2004
17. Small fold-out poster, "Space Shuttle Transportation System: A promising new era for Earth," Rockwell International Space Systems

Group, undated
18. NASA, Orion: America's Next Generation Spacecraft, 1996
19. "Unique and Insightful Articles" 1961-1991
    Item
    1. Toffler, A. (1991, May/June). The Space Program's Impact on Society. *Space Times,* Vol. 30, No. 3, pp. 3-9.
    2. NASA Memorandum, To: CB/Chief, Astronaut Office, From: Donald K. Slayton, Subject: Memorandum for Record, January 29, 1980
    3. Keeping America First: American Romanticism and the Global Economy, The Second Annual Albert H. Gordon Lecture, Harvard University, Delivered by Richard Darman, Director, Office of Management and Budget, May 1990
    4. Cordiner, R.J. (1961). Competitive Private Enterprise in Space. In Ramo, S. (editor). Peacetime Uses of Outer Space (pp. 213-240). New York: McGraw Hill Book Company, Inc.
    5. Leadership as Related to Astronaut Corps, by Terence F. McGuire, M.D., Consultant in Psychiatry, undated

Subseries 2. Space Exploration History, 1917-2015

Box 63 *Space Exploration History Publications, 1952-2015*

Folder
1. Copies of *Colliers* Magazine articles on space exploration, 1952-1954 (key artifacts)
2. Apollo 11 Mission Report, prepared by Mission Evaluation Team, NASA Manned Spacecraft Center, 1971 (key document)
3. Post-Apollo Planning of the Space Task Group, September 1969 (key documents)
   Item
   1. The Post-Apollo Space Program: Directions for the Future, Space Task Group Report to the President, September 1969
   2. Briefing Charts on Integrated Space Program: 1970-1990, October 17, 1969
   3. Von Braun Integrated Space Program: 1970-1990, October 17, 1969
   4. Manned Mars Landing, Presentation to the Space Task Group, by Dr. Wernher von Braun, August 4, 1969
4. The Difficult Road to Mars – A Brief History of Mars Exploration in the Soviet Union, by V.G. Perminov (monographs in Aerospace History, Number 15), 1999
5. Apollo by the Numbers: A Statistical Reference, by Richard W. Orloff, 2000
6. NASA's Manned Space Program – Drawing, by Dennis Webb, 1988

(includes 2 charts, NASA's Manned Space Programs: A Planner's Review)
7. Saturn V drawing (2), undated
8. Evolution of Human Space Flight Schematic, 1998, and Evolution from Apollo to Space Shuttle Schematic, April 15, 2007, both by Mark Craig
9. NASA Information Summaries, The Early Years: Mercury to Apollo-Soyuz, November 1985
10. The NASA Track Record: Some Performance Measures of the First 35 Years and Strategic Implications for the Next 35, by Greg Davidson, January 6, 1993
11. Legislative Origins of the National Aeronautics and Space Act of 1958 – Proceedings of the Oral History Workshop Conducted April 3, 1992
12. NASA's Origins and the Dawn of the Space Age, by David S.F. Portree, (Monographs in Aerospace History, Number 10) September 1998
13. Managing the Moon Program: Lessons Learned from Project Apollo – Proceedings of an Oral History Workshop conducted July 21, 1989 (Monographs in Aerospace History, Number 14) July 1999

Box 64 *Space Exploration History Publications, 1917-2015*

Folder
1. NACA NASA: Celebrating a Century of Innovation, Exploration, and Discovery in Flight and Space 1915-2015
2. The Eisenhower Centennial Space Roundtable: A Look to the Future 1890-1990, sponsored by The Eisenhower Institute and National Air and Space Museum, October 4, 1990
3. Apollo in Its Historical Context, by John M. Logsdon, Walter A. McDougall, Daniel L. Boorstin and Frank White, Space Policy Institute, Center for International Science and Technology Policy, Elliott School of International Affairs, The George Washington University, April 1990
4. Apollo: A Retrospective Analysis, by Roger D. Launius, NASA History Office (Monographs in Aerospace History, Number 3) July 1994
5. NASA Astronauts Fact Sheet, October 1976
6. The Railroad and the Space Program: An Exploration in Historical Analogy, edited by Bruce Mazlish, Cambridge, Massachusetts: M.I.T. Press, 1965
7. Mars and Its Mysteries, (Instructor Literature Series) by Latimer J. Wilson, Dansville, New York: F.A. Owen Publishing Company, 1917
8. 2 Special Issues of *Time* Magazine; "Here Comes Skylab! Ten Years After the Moon Walk," July 16, 1979, and "Right On! Winging into a

New Era," April 27, 1981

9. 2 Special Issues of *National Geographic*; "America's First Manned Venture Into Space," – The Flight of Freedom 7, by Carmault B. Jackson, Jr., M.D., and The Pilot's Story: a Personal Report, by Alan B. Shepard, Jr. and Dean Conger, (Reprints from the September 1961 magazine, 2 copies); and "Space Rendezvous, Milestone on the Way to the Moon, by Kenneth F. Weaver, Vol. 129, No. 4, April 1966
10. 2 Special Issues of *National Geographic*; 1st includes Special Wall Map Supplement: The Earth's Moon; "The Moon: Man's First Goal in Space, by Kenneth F. Weaver," "Awesome Views of the Forbidding Moonscape," and "How We Mapped the Moon," by David W. Cook, Vol. 135, No. 2, February 1969; 2nd Issue; "Apollo 8: "A Most Fantastic Voyage," by Lt. Gen. Sam C. Phillips, USAF, Apollo Program Director, NASA; "And Now to Touch the Moon's Forbidding Face," by Kenneth F. Weaver, Vol. 135, No. 5, May 1969

Subseries 3. Space Exploration Policy and Reviews, 1986-2014

Box 65 *Space Policy, Assessments, and Education, 1986-2014*

Folder

1. Space Policy, 1988-1994

   Item

   1. Presidential Decision Directive/NSTC-4, August 3, 1994
   2. Remarks by the Vice President in Signing Ceremony with Prime Minister Chernomyrdin of Russia, September 2, 1993
   3. Technology for America's Economic Growth, A New Direction to Build Economic Strength, President William J. Clinton and Vice President Albert Gore, Jr., February 22, 1993
   4. NASA Transition Book, December 8, 1992
   5. Legislative Origins of the National Aeronautics And Space Act of 1958, Proceedings of an Oral History Workshop conducted April 3, 1992
   6. National Space Launch Strategy, July 24, 1991
   7. Press Release, The White House, Office of the Press Secretary, President Approves U.S. Commercial Space Policy, February 12, 1991
   8. National Aeronautics and Space Act of 1958, As Amended, printed for the use of the National Aeronautics and Space administration, January 1990
   9. Press Release, The White House, Office of the Press Secretary, Fact Sheet – Presidential Directive on National Space Policy, November 16, 1989
   10. Press Release, The White House, Office of the Press

Secretary, Fact Sheet – U.S. National Space Policy, November 16, 1989

11. House Resolution 197, 20th Anniversary of Lunar Landing, July 19, 1989

12 Press Release, The White House, Office of the Press Secretary, Fact Sheet – Presidential Directive on National Space Policy, February 11, 1988

2. Space Policy and Assessments, 1986-1994 (folder 1 of 2)

Item

1. Reinventing NASA, Congress of the United States Congressional Budget Office, A CBO Study, March 1994
2. A More Effective Civil Space Program, Cochairmen, John H. McElroy and Brent Scowcroft, The Final Report of the CSIS Study of Civil Space Policy, The Center for Strategic and International Studies, Washington, DC, May 1989
3. A Post Cold War Assessment of U.S. Space Policy, A Task Group Report, Vice President's Space Policy Advisory Board, December 1992
4. A Reappraisal of the Space Shuttle Program, by Roger A. Pielke, Jr. Center for Public Policy Research, University of Colorado, October 8, 1992
5. Lost in Space – What Went Wrong with NASA? By T.A. Heppenheimer, *American Heritage,* November 1992
6. Over commitment in NASA, by Ronald D. Brunner, Center for Public Policy Research, University of Colorado, November 20, 1992
7. Congressman Toby Roth's Space and Space Technology Advisory Committee Report, April 1991 (miscellaneous documents within bound report retained as found)
8. Conclusions and Recommendation of NRC/NAS/NAE Committees Regarding the Civil Space Program (1986-1990)
9. What Future for the United States in Space? By Erasmus H. Kloman, National Academy of Public Administration (An Occasional papers for the National Aeronautics Space Administration) September 1987

3. Space Policy and Assessments, 1988-2014 (folder 2 of 2)

Item

1. Policy Challenges Facing the US Space Research Program – The realization of the US scientific community's aspirations for research in space will likely depend on how several critical policy issues are resolved, by Louis J. Lanzerotti and Jeffrey D. Rosendhal (reprinted from *Physics Today*, May 1988 © American Institute of Physics)
2. The NASA Program in the 1990s and Beyond, Congress of the United States, Congressional Budget Office, May 1988
3. Performance as promised: Restructuring the US civil space

programme, by Ronald D. Brunner, © 1992 Butterworth-Heinemann Ltd
4. Moving the Horse in Front of the Cart: How Science and Exploration Should Lead NASA, remarks by NASA Administrator Daniel S. Goldin American Astronomical Society, January 5, 1993
5. *The Economist*, Special Issue, A Survey of Space – The uses of heaven, June 15th 1991
6. The Case Against NASA, by Gregg Easterbrook, *The New Republic*, July 8, 1991 (cover story, Space Lemons: How a great adventure became a great fiasco)
7. Barriers to America's Future in Space, and Some Possible Remedies, by Humboldt C. Mandell, Jr., April 22, 1988
8. U.S. Space Policies and Priorities, by Jeffrey D. Rosendhal, (Science and Technology and the Changing World Order, Colloquium Proceedings, April 12-13, 1990)
9. Grounded: How NASA went from boldness and a can-do spirit to ineptitude and irrelevance, An autopsy of the American space program, by Charles Fishman, Cover Story Part 1, *Florida Trend Magazine,* Special Issue, Who Killed the American Space Program?, February 1991
10. America's Space Policy: Countdown to Major Reforms, by Edward L. Hudgins, Ph.D., Walker Senior Policy Analyst in Economics, Deputy Director for Economic Policy Studies. *Backgrounder*, Newsletter of the Heritage Foundation, No. 826, pp. 1-17, April 25, 1991
11. National Space Transportation Policy, November 21, 2013
12. The Future of NASA: Space Policy Issues Facing Congress, by Daniel Morgan, Specialist in Science and Technology Policy, Congressional Research Service, January 27, 2011
13. "Human Space Flight – In a Whole New Context for a Whole New World," by Bill Gerstenmaier and Tom Cremins, NASA, undated
14. Launching a New Mission: Michael Griffin and NASA's Return to the Moon, by W. Henry Lambright, Professor of Public Administration and Political Science, The Maxwell School of Citizenship and Public Affairs, Syracuse University, IBM Center for The Business of Government, 2009
15. Maximizing NASA's Potential in Flight and on Ground: Recommendations for the Next Administration, by George Abbey, Neal Lane, and John Muratore, James A. Baker III Institute for Public Policy, Rice University, January 20, 2009
16. Launius, R.D. (2013, November/December). Have We Exhausted What We Can Do with the International Space Station? *Space Times,* pp. 10-16.
17. Hard Choices for Manned Spaceflight: America as Icarus, by

James Andrew Lewis, Strategic Technologies Program, Center for Strategic and International Studies, May 2014

18. Launius, R.D. (2014). Opposing Apollo: Political Resistance to the Moon Landings. *New Space*, Vol. XX, No. XX, pp. 1-7.

4. Space Policy Education, 1999

Item

1. Vedda, J.A. (1999, July-August). Perspectives on Space Education: Making the Case to Reach out Across Disciplines. *Space Times*, pp. 5-9.

5. A Post Cold War Assessment of U.S. Space Policy, Vice President's Space Policy Advisory Board, December 1992
6. Final Report to the President on the U.S. Space Program, January 1993
7. Scientific Prerequisites for the Human Exploration of Space, Space Studies Board, National Research Council, 1993
8. International Exploration of Mars, IAA Report, 1996
9. The Human Exploration of Space, Space Studies Board, National Research Council, 1997
10. A Journey to Inspire, Innovate, and Discover – Report of the President's Commission on Implementation of United States Space Exploration Policy, 2004
11. Summary Report of the Review of U.S. Human Space Flight Plan Committee, 2009 (includes personal notes)

Subseries 4. NASA Plans 2002-2015

Box 66 Integrated Space Plan, 2002-2015

Folder

1. Integrated Space Plan, 2002-2003

Item

1. Integrated Space Plan and Space Architecture Team Overview, Center Director Briefing, by Gary L. Martin, Space Architect, February 2003
2. Correspondence, From: Melvin Ferebee, Subject: ISP Status and Revised Outline, February 14, 2003
3. Integrated Space Plan, Foreword, Deputy Administrator, 2003
4. Correspondence, From: Richard Fullerton, Subject: Actions and Notes from Space Architect Meeting, January 29, 2003
5. Integrated Space Plan and Space Architecture Team Overview, by Gary L. Martin, Space Architect, December 16, 2002
6. "A Practical Approach," by Gary Martin, NASA Space Architect, *Space News,* December 16, 2002

2. Space Flight Enterprise Strategy, 2003

3. The Vision for Space Exploration, 2004 (key document)
4. Exploration Systems Interim Strategy, 2004
5. Voyages – Charting the Course for Sustainable Space Exploration, 2011
6. NASA's Journey to Mars – Pioneering Next Steps in Space Exploration, 2015 (key document)
7. Evolvable Mars Campaign Overview to FISO Telecon, by Douglas Craig, Strategic Analysis Manager, Advanced Exploration Systems, Human Exploration And Operations Mission Directorate, NASA Headquarters, June 10, 2015
8. 2010 Science Plan for NASA's Science Mission Directorate
9. Exploration Architecture Requirements Document (EARD), prepared by Barry Epstein, Geoffrey Yoder, and Richard J. Gilbrech, September 2008
10. Johnson Space Center 20 Year Vision, April 2008
11. Constellation Operations, Production and Sustaining Study Team, draft, October 20, 2007
12. Exploration Systems Research and Technology Overview, by John C. Mankins, Manager, Exploration Systems, Research & Technology, January 2005
13. Johnson Space Center 2004 Implementation Plan
14. Pioneering Space: NASA's Next Steps on the Path to Mars, May 29, 2014 (author unknown)
15. CD-Rom, NASA Exploration Vision; Blue Team Book, Blue Team Photos, Red Team Book, Red Team Book Schedules, Red Team JSAC Brief-Final 11, March 2004
16. National Aeronautics and Space Administration Strategic Human Capital Plan, 2003
17. CD-Rom, Space Resources Development Task Scenario 1.2: An Architecture to Provide Transfer Services in Earth Orbit using Lunar-based Propellant, (NASA/JPL) 2002

Subseries 5. Exploration Beyond Low Earth Orbit, 2001-2015

Box 67 *Analysis and Recommendations, Lunar and Mars folders, 2001-2015*

Folder Analysis and Recommendations, 2001-2014
1. Unlimited Horizons, Recommendations of the National Society of Black Engineers Visions for Human Space Flight Working Group, April 2014
2. The Budgetary Implications of NASA's Current Plans for Space Exploration, Congressional Budget Office, April 2009
3. Clipping, The Bush Timetable for the Moon and Beyond, *Space News,* p. 3, January 19, 2004
4. Clippings, "Beyond Columbia: A Six-Part Series," *Houston Chronicle,*

July 20-25, 2003

5. The National Exploration Organization (NEO) – A plan to reinvent NASA and to reclaim the high ground of exploration, broaden knowledge of our World and Universe – and help mankind, by Bran Ferren, November 23, 2001 (first draft)
6. Lunar folder, 2002-2015
   Item
   1. Planning the proving ground of cislunar space, by Jeff Foust, June 8, 2015
   2. Lunar Objectives, Benefits, Pathways, Strategy, by Michael B. Duke, October 21, 2013
   3. NASA Memo, To: Group, From: AC5/Associate Director (Technical), Subject: The Moon Will Save Us #2, January 3, 2003
   4. CD-RW, Spudis Moon Presentation August 2002
7. Mars folder, 2012-2015
   Item
   1. Orbiting first: A reasonable strategy for a sustainable Mars program, by Casey Dreier and Jason Callahan, October 5, 2015
   2. Price, H; Baker, J.; Naderi, Firouz. (2015). A Minimal Architecture for Human Journeys to Mars. *New Space*, Vol. 3, No. 2, pp. 73-81.
   3. The Evolvable Mars Campaign – The Moons of Mars as a Destination, by Pat Troutman, July 30, 2014
   4. Mars Mission Studies: Mission to Mars in Six (not so easy) Pieces, May 14, 2014
   5. Salotti, J.M. (2012, December). Revised scenario for human missions to Mars. *Acta Astronautica*, Volume 81, pp. 273-287.
   6. "H2M35," sending humans to Mars by 2035 (no publication information available)

Subseries 6. Access to Space, 1989-2011

Box 67 continued *Launch Vehicle Past and Future, NASA Space Access Studies, Space Transportation Council/Programs, 1989-2011*

Folder

8. Launch Vehicle Past and Future, 1989-2010
   Item
   1. Ancestry of Current Space Launch Vehicles, by Nicholas S. Keim; Peter E. Zeender, Shamin A. Rahman, The Chemical Propulsion Information Analysis Center, Johns Hopkins University, © 2010
   2. NASA, Future Heavy Lift Vehicle Evolution, November 2,

2004

3. *Space News* graphic, Heavy Life Options, April 12, 2004
4. CD-Rom, NASA, Revolutionizing Space Transportation for the 21st Century, June 2001
5. De Seldong, P.B. (1999, May 10). Launch Vehicles of the Future: Europe Looks for Alternatives to Ariane. *Space News*, pp. 8, 12.
6. Round Trip to Orbit: Human Spaceflight Alternatives, August 1989 (copies of initial pages)
7. Miscellaneous charts, undated

9. NASA Space Access Studies, 1992-1999

Item

1. Nelson, D.A. (1999, April). Who will fly the next-generation launch vehicle? *Aerospace America*, pp. 30-38.
2. Fax, NASA Headquarters, Office of the Chief Engineer, To: Space Transportation Council, Subject: :Review of the Performance Transportation Architecture Study Performance, June 18, 1998
3. "OTA says government will dominate space launch market for a decade," June 15, 1995
4. Access to Space Study: Synopsis, January 27, 1994
5. NASA Technical Memorandum 104780, Human Transportation System (HTS) Study, Executive Summary, by N. Lance, M.S. Geyer, M.T. Gaunce, October 1993
6. NASA Management Briefing Book, Topic: Quantified Architectural Implications of Shuttle Replacement, finding of the Manned Transportation System Study, NASA Industry Team, June 1992

10. STS/Space Transport, 1997-2011

Item

1. Space Shuttle Program's Technology Applications Assessment Team, February 16, 2011
2. Correspondence, To: Art, From: Mark Craig, Re: Charts that outline the top-level shuttle phase A/B trade space and the path that emerged through it, February 3, 1999
3. Chart, Significant STS Streamlining Options, undated (2 copies)
4. NASA Memo, To: Johnson Space Center, Attn: AA/Director, From: M/Associate Administrator for Space Flight, Subject: Office of Space Flight (OSF) Requirements for Space Shuttle System Upgrades, June 6, 1997
5. Space Transportation Council Working Group Meeting, Marshall Space Flight Center, presentation by William Readdy, Manager, Space Shuttle Program Development, NASA Johnson Space Center, September 3, 1997
6. Space Transportation Investment Strategy, Draft, Version 5,

1997
7. Space Transportation Programs, presentation to Mr. Art Stephenson, Director, Marshall Space Flight Center, undated

11. Space Shuttle Heavy Lift Launch Vehicle Frequently Asked Questions Binder, 2009

Subseries 7. Space Commerce, 1986-2003

Box 68 *Space Commerce/Tourism, 1986-2003*

Folder

1. Space Commerce, 1986-2000 (folder 1 of 2)

Item

1. e-mail, To: Mark Craig, From: David R. Criswell, Re: Virtual Conference on Global Energy Needs, May 18, 2000
2. "NASA sets price tag for Station racks; NRC questions biotech uses," March 3, 2000 (publication information unknown)
3. State of the Space Industry, prepared by *Space Publications*, in collaboration with International Space Business Council, 1999
4. Conference on Moving Toward the Development of a Large Space Tourism Business, by Alan Ladwig, Senior Advisor to the Administrator, NASA, June 24, 1999
5. e-mail, From: Jerome Bell, To: Mark Craig, Subject: Space Station Points Up NASA's Weaknesses, April 7, 1998
6. Fink, D. (1997/1998, December/January). Company Profile: Lockheed Martin. *Launchspace Magazine,* pp. 44-46.
7. Hearing Summary – Hearing on "Space Solar Power: A Fresh Look," before the Subcommittee on Space and Aeronautics of the House Committee on Science, October 24, 1997
8. Tierney, J. (1996, May 26). How to Get to Mars (And Make Millions). *New York Times Magazine*, pp. 21-25.
9. Commercial Space Transportation Study, Executive Summary, February 1994
10. Program, "Awe, Wonder, and Profit: The Value of the Space Program," American Astronautical Society, 34th Goddard Memorial Symposium, March 6-7, 1996
11. Seitz, P. (1996, January 15-12). Demand for Radiation Shielding Benefits Space Electronics. *Space News,* Business Section, p. 16.
12. Nicogossian, A. (1995, November-December). American Astronautical Society Position Paper on Space Exploration and Economic Development. *Space Times*, pp. 14-17.
13. Evolution of the Space Business Park Concept: 1991-1996,

by Brent Sherwood, Boeing Defense & Space Group, November 1995
14. “The Lunar Games,” sheet, November 28, 1995
15. A Reference Design of a Near Term Low Earth Orbit Commercial Business Park, by Charles J. Lauer, Joseph P. Hopkins, Dana Andrews, and Hugh Kelso, © 1995 by Charles J. Lauer, published by the AIAA Inc. with permission.
16. Commercial Space Transportation Study, Report on Study Results to The National Aeronautics and Space Administration, March 1994
17. Dickey, B. (1999, August). Everything Must Go! *Government Executive*, pp. 20-24
18. Force, C.T. (1999, May 3). Road to Commercialization. *Space News,* p. 13.
19. Commercial Space Transport Study Final Report – 2.0 Study Methodology and Approach, undated
20. AIAA/NASA SATWG/SHG Joint National Workshop on A Team U.S.A. Approach to Global Space Commerce – Commercial Space & the Government, November 2-4, 1993 (listing of members and sessions)
21. What the United States Must Do to Realize the Economic Promise of Space: Who Would Build a Second Space Station? A Report of the Aerospace Research and Development Policy Committee of The Institute of Electrical and Electronics Engineers, Inc. – United States Activities, December 17, 1993
22. A Long-Term Financial-Economic-Institutional Strategy for Solar System Exploration and Settlement, by T.F. Rogers, The Sophron Foundation, McLean, Virginia, September 1, 1992
23. Booklet, The Commercial Development of Space, Series on Public Issues, No. 27, Center for Education and Research in Free Enterprise, Texas A&M University, College Station, Texas, © 1987
24. Space: America’s New Competitive Frontier, A Report by the Business-Higher Education Forum, April 1986
25. Mixed-Use Business Park Developments in Space: A Real-Estate Paradigm, by Charles J. Lauer, Joseph P. Hopkins, Hugh M. Kelso, et. al., undated
26. Spacelab Comes to Rest After 22 Shuttle Flights (publication information unavailable)
27. Developing Markets, Space Business and Management, undated sheets
28. Potential step toward a space hotel, by Alan Boyle, MSNBC, undated
29. The Role of Lunar Development in Human Exploration of the

Solar System, by Wendell W. Mendell, undated

2. Space Commerce, 2002-2003 (folder 2 of 2)

Item

1. Space Commercialization in the Life Science, by Kelso, Smith, and Pellis, October 17, 2003
2. NASA Memo, To: Distribution, From: MA/Manager, Space Shuttle Program, OA/Manager, International Space Station Program, Subject: Flight Commercialization Office Name Change, May 22, 2003
3. e-mail, From: Mark Nall, To: Mark Craig, Subject: Proposal Scoring, January 30, 2003
4. e-mail, From: Jerome Bell, To: Mark Craig, Subject: NASA Privatize the Space Shuttles? No So Fast, February 5, 2003
5. e-mail, From: Charlene Gilbert, To: Mark Craig, Subject: Industry Views, December 17, 2002
6. Commercial Space Center (CSCs), (includes various "Enclosures," undated)
7. Draft, Space Commerce Workshop Group (SCWG), Charter, December 17, 2002 (includes handwritten notations)
8. Path to Space Commerce: An Analysis of 4 Models, undated
9. Space Station Enables an American Space Industrial Park, by J.M. Smith, November 16, 2002
10. e-mail and document from Phil Sunshine, "A Vector for Space Commercialization," November 26, 2002
11. Lessons Learned from NASA's Recent Experiences in Space Commerce, by Beth Diane Caplan, NASA Johnson Space Center, 53rd International Astronautical Congress, The World Space Congress, 2002
12. Handwritten notes, Flight Commercialization Office (Brain Kelly), undated
13. ISS Commercial Marketing Outreach Plan Summary, February 2002
14. Vedda, J. (2002, November/December). Redefining the Government's Role: Human Settlement of Space. *Space Times*, pp. 22-23.
15. Commercialization at Johnson Space Center, July 2002
16. NASA's Commercialization Activities and the NEXT, by Beth D. Caplan, February 27, 2002
17. Commercialization of the ISS: An Industry Perspective, 2001
18. NASA Flight Programs Commercialization: Building Partnerships in the Dynamic Business Environment, presented by Stacie L.L. Morgan, Ph.D., © Balanced Management, Inc.
19. Aeronautics and Space Engineering Board, Proposal No. 02-DEPS-103-01 – Technology for Commercialization and Human/Robotic Exploration and Development of Space, 2002

20. A Strategy to Stimulate Space Commerce, by Doris Hamill, circa 2002

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1. Poole, R.W., Jr. (2001, May 4). The Final Frontier of Tourism. (publication information unavailable)
2. Jacobs, J. (2000, January). Out of This World: Space Travel is Not Only Coming, It's Already Lifting Off. *Asta Agency Management*, pp. 26-28, 30.
3. e-mail, To: Mark Craig, From: Lanee Cooksey, Subject, Today's AP – Hilton Hotels studies feasibility of building hotel in space, September 27, 1999
4. David, L. (1999, July 19). Advocates of Space Tourism Say Market Will Develop Slowly. *Space News,* p. 34.
5. Bennett, G. L. (1998, August 3-9). Commentary: Columbus Meets the Anti-Cassini Crowd. *Space News*, p. 22.
6. Lockheed Martin sees commercial space market doubling by '05, July 31m 1998 (publication information unknown)
7. Forman, B. (1997, November 17-23). *Space News*, p. 13
8. Butterworth-Hayes, P. (1996, November). Japan plans day trips to space. *Aerospace America*, pp. 4-5.
9. Documents – Establishing a U.S. Space Tourism Business, Summary of the Space Tourism Steering Group Meeting, September 26-27, 1996
10. Space Tourism Study Final Report – Volume 1, May 16, 1996
11. Space Adventure Travel, A Working Paper, by Gordon R. Woodcock, April 1996 (review draft)
12. An Initial Basic Space Tourism Business Development Scenario, prepared for consideration by the "Steering Group" of the STA-NASA Cooperative Space Tourism Business Development Study, by T.F. Rogers, The Space Transportation Association, June 12, 1995 (fifth draft)
13. "Space Tourism and the X Prize: A Vision for the Future…" (author and date unavailable)
14. Space Commercialization: "Perspective of a Private Company," by Peter H. Diamandis, August 19, 1996
15. Lauer, C.J. (1996, March/April). Places in Space. *Ad Astra*, pp. 24-28.
16. e-mail in regards to Walt Disney Institute, March 5, 1996
17. Handwritten notes, undated
18. Ashford, D. (1996, March). Space Tourism: An Update. *Spaceflight*, Vol. 38, pp. 80-81.
19. Fax, To: Mark Craig, From: Bob Rogers, BRC Imagination Arts, Subject: Space Tourism Notes, February 8, 1996
20. Program/Registration form, Resort Forum: Orlando, the 6th Annual Interactive Conference on Development, Operations,

Marketing and Finance, February 18-20, 1996
21. e-mail, To: Steve Brody, Subject: Hilton quote? (hotels in space) January 31, 1996
22. NASA fax transmission, To: Mark Craig, From: Bill Claybaugh, Re: Commercial Space Transport Study Final Report, April 1994
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24. David, L. (1995, September 18-24). NASA Begins Space Tourism Enterprise Assessment: Findings Could Influence the Future of X-33. *Space News*, p. 14.
25. Holthaus, M.J. (1995, August/September). Space Forum: Japan and Space Tourism. *Spacefaring Gazette*, p. 3.
26. David, Leonard. (1995, July 3-9). "X" Prize Seeks $10 Million to Jump-Start Space Tourism. *Space News*, p. 19.
27. "Attention CEOs," by Dr. Peter H. Diamandis, (publication information unavailable)
28. Simberg, R. E. (1994, March 6). Commentary: Leap of Faith. *Space News,* p. 15
29. Government Facilitation of a Commercially Viable American Launch Service, by Dr. Charles W. Polk, Research Fellow in Economics, California Institute of Technology, December 9, 1993
30. Tourism May Offer a Vast Source of Untapped Revenue for Space Systems (additional information unavailable)
31. Establishing a U.S. Space Tourism Business, 1995
32. David, L. (1994, May/June). Next Stop: Escape Velocity Vacations? *Final Frontier* (pages unavailable)
33. Space Tourism: A Flight of Fantasy or the Next Major Space Product? By Barbara A. Stone, Ph.D., 31st Space Congress, April 26-29, 1994
34. Feasibility of Commercial Resort Hotels in Low Earth Orbit, by Brent Sherwood and C. Rob Fowler, © 1991, The Boeing Company
35. Space Tourism, The Unbelievable Market, by G. Harry Stine, 1990
36. Richard, J. (1989, June). The Ultimate Vacation. *Final Frontier*, pp. 20, 22-24, 26-27.
37. Price, J. (1987, July 9). Vacations to be 'out of this world' by year 2000, market trends show. *The Washington Times,* p. 6.
38. Preprint, IAF' 86, 37th Congress of the International Astronautical Federation, Innsbruck, Austria, October 4-11, 1986, "Potential Economic Implications of the Development of Space Tourism," by P.Q. Collins and D.M. Ashford,
39. Welcome to Space Resort, (publication information

unavailable)

40. "Commercialization," (additional information unavailable, handwritten notes on back of material)
41. Miscellaneous documents and notations, undated

4. Commercial Launch, 1993-1999

Item

1. McKinney, Col. R. W.; Portanova, P.L.; Blaylock, Maj. A. L. (1999, May). EELV meets CAIV. *Aerospace America*, pp. 68-70, 73-74.
2. Dickey, B. (1997, March). The Final Frontier. *Government Executive,* pp. 12-14, 16, 18, 20-21.
3. Launch Vehicles of the World, prepared by the Teal Group, *Aerospace America*, February 1998, pp. 36-37
4. NASA-STA Steering Group, meeting of September 26-27, 1996 – agenda, summary of discussions, issues raised, and assigned action items stemming from meeting
5. Demand for Space Tourism in America and Japan, and Its Implications for Future Space Activities, by P. Collins, R. Stockmans and M. Maita, undated
6. Evolution of the Modern Cruise Trade and Its Application to Space Tourism, by Robert L. Haltermann, November 1996
7. Space Tourism Society (STA) information, November 30, 1996
8. X Prize Information, May 1996
9. Statement of Gary E. Payton, Director, Space Transportation Division, Office of Space Access and Technology before the Subcommittee on Space and Aeronautics Committee on Science, House of Representatives, April 17, 1996
10. Interim Review with the NASA Administrator, Commercial Space Transportation Study. November 1993
11. Investment Dossier for Ascension Enterprises, Inc., April 9, 1993
12. Commercialization of Heavy-Lift Launch Services: A Proposal for Private Investment in America's Space Exploration Infrastructure, March 9, 1993
13. The Use of the Energia Booster in a Commercial Launch Service: A Technical, Economic, and Political Prospectus, prepared by Ascension Enterprises, Inc., December 30, 1992, revised March 9, 1993
14. Historical Perspectives and Comparisons: Issues for the Future of Space Transportation, by Joey V. Kirkpatrick, (Report for Access to Space Group Vision 2020 Project, International Space University

Box 69 *Space Commerce Working Group and Related Material, 1997-2015*

Folder

1. Space Commerce Working Group, draft copies of charter, notations, and correspondence, December 2002
2. Measuring the Return of NASA Life Science Research and Development, by Dr. Henry R. Hertzfeld, Space Policy Institute, George Washington University, September 30, 1998
3. The International Space Station Commercialization Study, Potomac Institute for Policy Studies, Arlington, VA, March 20, 1997
4. Commercial Development Plan for the International Space Station, November 16, 1998
5. Tapping the Wealth of the Moon, by Klaus P. Heiss, Philosophical Society of Washington and Director, High Frontier, Inc., 2004
6. Hubbard, S. (2013). Editorial: Why a *New Space* Journal? Why Now? *New Space*, Vol. 1, No. 1, pp. 1-2.
7. Roundtable Discussion: Growing the Future of Commercial Space, *New Space*, Vol, 1, No. 1, pp. 3-9, undated
8. Emerging Space – The Evolving Landscape of 21st Century American Spaceflight, NASA Headquarters, 2014
9. Getting the rules right: LEO as an economic development region, by Mary Lynn Dittmar, September 15, 2014
10. Economic Assessment and Systems Analysis of an Evolvable Lunar Architecture that Leverages Commercial Space Capabilities and Public-Private Partnerships, July 13, 2015

Subseries 8. Posters and Graphics, 1971-2010

OS Box 70 *Posters and Graphics, 1971-2010 (Flat File #2, Drawer 9)*

Item

1. Apollo 15 [Lunar] Descent – Ascent Summary, NASA Mission Support graphic, July 9, 1971 (key artifact)
2. NASA Mapping the Solar System poster, 1994
3. NASA People at Work poster series: “Sleeping Beauty” Saturn V from JSC series, by French photographer Guy-Christophe Coppel, 2002
4. 25 Years of Space Shuttle Flight poster, 2005
5. Evolution of Heavy Lift as Part of a Mixed Manifest National Vision for Space Exploration poster, 2005
6. Evolved Shuttle Heavy Lift Configuration with Orion Capsule payload - large graphic, 2005
7. Viking 1 & 2, 30 Years on Mars poster, 2006
8. World Space Week poster – 50 years in Space, 2007
9. World Space Week poster – Exploring the Universe, 2008 (signed by the artist, Pat Rawlings)

10. World Space Week poster – Space for Education, 2009 (signed by the artist, Pat Rawlings)
11. World Space Week poster – Mysteries of the Cosmos, 2010 (signed by the artist, Pat Rawlings)
12. NASA Human Research Program poster, undated

Series 16. Career Hallmarks and Memorabilia, 1927-2019
(6.9 cubic feet and flat file items)

Subseries 1. Letters, Clippings, Events, and Miscellaneous Material, 1969-2015

Box 71 *Letters, Clippings, and Events, 1969-2015*

Folder
1. Letters and Notes, 1969-2015
2. Clippings, 1975-2012 (articles about Craig)
3. Events, 2000-2015 (folder 1 of 2)
   Item
   1. Directory, Space Applications Are Fueling Business Innovation, Show Directory, 2015
   2. Ticket, The Martian Screening, September 15, 2015
   3. Scott Carpenter Memorial and Tree Planting Ceremony, May 1, 2015
   4. Apollo, Conception et re´allisation, Bruno Meyssat, November 14-21, 2014
   5. Program, International Space Medicine Summit, Rice University's Baker Institute, June 5-8, 2014 (includes notes)
   6. Program, IAA Space Exploration Conference, Planetary Robotic and Human Spaceflight Exploration, January 9, 2014
   7. Neil Armstrong Memorial and Tree Dedication Ceremony, June 20, 2013
   8. Program and bookmark, John F. Kennedy Space Center 50th Anniversary Gala, "Celebrating the Past and Preparing for the Future," Apollo/Saturn V Center, September 22, 2012
   9. Program, International Space Medicine Summit, James A. Baker III Institute for Public Policy, Rice University, May 17-2-, 2012 (includes notes)
   10. Invitation Flyer, Engineering Directorate's Shuttle-Era Celebration, August 1, 2011
   11. Invitation, STS-135 Launch Guest Reception, July 7, 2011
   12. Invitation, STS-133 Launch, window of opportunity begins February 24, 2011
   13. Program, Apollo 11 40th Anniversary Splashdown Celebration, Community and Employee Event, Space Center Houston, July 24, 2009

14. Program, Celebrating the 40th Anniversary of the first lunar landing as NASA Johnson Space Center presents: "Telling the Stories of Apollo: A Conversation with Apollo Managers," July 20, 2009
15. Flyer, The Chief Knowledge Officer invites you to a Storytelling Event, May 5, 2015 (2 copies)
16. Program, Saturn V Facility Grand Opening, July 20, 2007
Invitation, Mark Craig – A "Classic" Retiring after 37 years of service, April 22, 2005
17. Invitation and Program, National Air and Space Museum, Awards Ceremony, December 7, 2004 (Astronaut John Young, along with others who have helped shape his legacy)
18. Pages from Course Catalog, Rice University, School of Continuing Studies, Spring 2004 (Craig taught, The Future of Space Exploration and Development)
19. Program, American Astronautical Society, National Conference and 50th Annual Meeting, "The Dream is Alive," November 18-19, 2003
20. Memorial Program, Rick D. Husband, William C. McCool, Michael P. Anderson, Kalpana Chawla, David M. Brown, Laurel Blair Salton Clark, and Han Ramon, April 16, 2003
21. Program, Heritage Academy presents The Hazard Lecture Series, "The Voyage of the Mind," 100 Years of Flight, October 28, 2002
22. STS-1 20th Anniversary and Space Flight Awareness Honoree Reception, April 13, 2001 (includes invitation, ticket and pin)
23. Program, Purdue University, Outstanding Aerospace Engineer, presented by the Faculty of the School of Aeronautics and Astronautics, October 26, 2000 (Craig was an honoree)
24. Executive Summary, 43rd Annual Executive Congress, Dublin Ireland, May 31-June 2, 2000
25. Flyer, Houston Spaceport, Frontier Lectures, Rice University, NASA 4.0: The Evolution of America's Human Space Exploration Program, February 5, 2014

4. Events, 1981-1998 (folder 2 of 2)

Item

1. Ticket, USNS Henson, Dedication Ceremony, Spring 1998
2. Invitation and Program, Dining Out, Naval Meteorology and Oceanography Command, June 20, 1998
3. Invitation STS-77 Launch, May 19, 1996
4. Program, ISU, Rice University, Design Project: Strategies for the Exploration of Mars, 1997
5. Invitation and Program, Apollo/Saturn V Center Gala, John F. Kennedy Space Center, January 8, 1997
6. Program Handbook, International Space University, Vienna

Summer Session, 1996 (Craig was lecturer)

7. Program, The X Prize, May 18, 1996
8. Program, NASA Honor Awards Ceremony, May 19, 1994 (Craig, Group Achievement Award, Strategic Planning Team)
9. Invitation and NASA Causeway Pass, STS-62 Launch, March 4, 1994
10. Program, Midland High School Alumni Association presents its 1991 Hall of Honor Distinguished Alumni, October 11, 1991 (Craig was a honoree)
11. Invitation, STS-54 Launch and Landing, January 13, 1993
12. Flyer, "The Path to Mars," a lecture by Dr. Mark Craig, Deputy Director of NASA Stennis Space Center, undated
13. Invitation, Launch of STS-45, March 24, 1992
14. Invitation, AIAA Wisconsin Section Dinner Meeting, January 24, 1989 (Craig speaker, "Lunar and Mars Exploration Alternatives")
15. Program, Second Symposium on Lunar Bases & Space Activities of the 21st Century, Houston, Texas, April 5-7, 1988
16. Invitation, The Greater Houston Chamber of Commerce, Speaker, Mark Craig, "NASA's Exploration Initiatives – The Lunar Base," February 4, 1988
17. Flyer, American Institute of Aeronautics and Astronautics, Presentation by Mark Craig, "NASA Exploration Initiatives Status," January 28, 1988
18. Program, 1982 Space Shuttle Symposium, Rawhide, Scottsdale, Arizona, May 15, 1982
19. Program, STS-1 Honors Awards Ceremony, September 11, 1981 (2 copies, Craig awarded NASA Exceptional Service Medal)
20. Program, American Institute of Aeronautics and Astronautics 50th Anniversary Celebration, May 22, 1981
21. NASA Memorandum, To: Senior Staff, From: AC/Technical Assistant to the Director, Subject: Luncheon with Dr. Mark, Deputy Administrator, September 4, 1981 (Craig one of the individuals selected)
22. STS-1 Pin Party, April 1981
23. Ticket, "O Columbia," Houston Grand Opera, September 18, year not available
24. Invitation to screening of "The Dream is Alive," from the Director of the National Air and Space Museum and the Associate Administrator for the Office of Space Science and Applications, NASA, November 7, year unavailable

5. Mr. & Mrs. C.W. Craig at STS-1 Launch, 1981

<u>Item</u>

1. Pamphlet, STS-1 (Young-Crippen) the Launch of Columbia, 1981

2. Nametag, Wally Craig
3. STS-1 Flight Schedule, April 1981
4. Bus arrangements, Mr. and Mrs. C. Wallace Craig, April 10, 1981
5. 2, 8”x10”, color photographs of STS-1 launch, April 12, 1981
6. Quote on a notecard, undated

6. Association of Space Explorers 7th Planetary Conference Folder, September 30 – October 5, 1991 (key artifacts, some dated post-conference 1994-1995)

Item

1. Program, 1991
2. Correspondence, From: John Fabian, Co-President and Alexei Leonov, Co-President, Association of Space Explorers, invitation to Mark Craig to attend the 7th ASE Planetary Congress in Berlin, April 12, 1991
3. Correspondence, From: Ernst W. Messerschmid To: Dr. Mark Craig, Re: Craig’s “excellent presentation,” “The Outbound Trail – Human Exploration of the Moon and Mars,” to the Association of Space Explorers 7th Planetary Congress in Berlin, May 28, 1995
4. “A European Perspective: International Cooperation for Future Space Missions,” by Ernst W. Messerschmid, Professor at Stuttgart University, Director of Space Systems Institute, 1994
5. General Statement, Association of Space Explorers 7th Planetary Congress, Berlin, Germany, October 4, 1991
6. Lists of delegates, 1991
7. Handwritten notes, 1991
8. Biography of Musa Manerov, dated October 31, 1991
9. Correspondence, in regards to Craig visiting Moscow, November 1991
10. NASA Correspondence, To: CB/All Astronauts, From: CB/John Blaha and CB/Dick Richards, Subject: Association of Space Explorers & observations from 7th Planetary Congress, October 18, 1991
11. Nadler, B.G. (1991, October 20). “Space Endurance Records;” “Kings of the Cosmos: Soviet Space Firsts;” “Cosmonauts try capitalism: Soviets look to sell, rent space gear.” *The Washington Times,* pp. 15-16.
12. 3 Photographs from ASE 7th Planetary Congress, 2, Craig with Cosmonauts Alexei Leonov and Valentina Tereshkova (first woman in space) and 3rd Craig with Bertalan Farkas, 1991
13. Annual Report, 7th Planetary Congress Association of Space Explorers, Berlin, Germany, September/October, 1991

7. Cap Sur L’Espace French Television Panel, 1991 (includes

photographs (6) with other participants, Cosmonaut Vitaly Sevastyanov, Cosmonaut Vladimir Solovyev, and French astronaut Patrick Baudry (key artifacts)

8. Space Policy Summit, 2002 (includes planning documents, planning meeting minutes, correspondence, and notes)

Subseries 2. Select Publications and Presentations by Mark Craig, 1967-2019. Per Craig, these Publications and Presentations by him augment those found elsewhere in the Archive.

Box 72 *Documents and Slide Decks by Mark K. Craig 1967-2019*

Item

1. **NASA's Human Exploration and Development of Space**; keynote at the Students for the Exploration and Development of Space (SEDS) Owls In Space Symposium, Rice University, Houston TX, April 13, 2019. (key document)
2. **Settling Space: Building Multinational and Public-Private Partnerships**; presentation to The International MoonBase Summit, Kohala Coast Island of Hawaii, October 1-5, 2017. (key document)
3. **Beware … Mars AND Bust**; *The Space Review*, June 26, 2017. (key document)
4. ***Report of The Fourth Community Workshop on Achievability and Sustainability of Human Exploration of Mars (AM IV),*** Monrovia CA, December 6-8, 2016, April 2017 (with Senior Editor H. Thronson et al).
5. **Why Space?;** lecture, Professional Science Master's Program, Rice University, Houston TX, August 2016.
6. **Making NASA Human Space Exploration Sustainable**; presentation to the S&MA Technical Speaker Forum, NASA Johnson Space Center, Houston TX, May 2016.
7. ***Report of The Third Mars Affordability and Sustainability Workshop***, The Space Policy Institute, George Washington University, Washington DC, December 2-4, 2015, March 2016 (with Senior Editors H. Thronson, C. Carberry, and R. Zucker et al).
8. ***Issues and Challenges in Sustainability***; Third Community Workshop on Mars Affordability and Sustainability, Washington DC, December 2015 (with M. L. Dittmar, D. Dumbacher, and A. Zulkosky)
9. **From Apollo to Mars: Letters Home .. What I've Learned**; presentation to Abel Design Group, Houston, TX, November 2015.
10. **Scene Setter: Assessing the Challenge**; presentation to

The Promise of Human Space Exploration Advisory Session, The Atlantic Council, Washington DC, April 2014.

11 **NASA 4.0: The Evolution of America's Human Space Exploration Program**; lecture, Houston Spaceport Frontier Lecture Series, Rice University, Houston TX, February 2014.

12. **The Exploration <-> Development of Space "Engine"**; Paper No. IAA - WAS0401 and presentation to the International Academy of Astronautics (IAA) Space Exploration Conference (a pre-Summit Conference of the Heads of Space Agencies Summit on Exploration), Washington DC, January 2014.

13. **NASA Human Spaceflight 3.0**; *Space Times*, Vol. 51, No. 3, May/June 2012, p. 7-9.

14. **How to Reduce Churn in NASA Human Space Exploration**; *Space News*, Dec. 14, 2011.

15. **Improving Human Space Exploration Sustainability**; lecture, The University of Alabama in Huntsville, Huntsville AL, November 2011.

16. **Building Long-Term Support for Space Exploration;** presentation to the International Space Development Conference (ISDC) of the National Space Society, Huntsville AL, May 2011.

17. **A Tale of Two Planets … and a Moon**; lecture, Rice University, March 2011.

18. **Sustainability - Beyond Dogma and Jobs, Beyond Outreach**; presentation to the Johnson Space Center Story Telling Event, Houston TX, May 2010.

19. **1964 - 1974: Race to the Moon, and Beyond**; presentation to First Presbyterian Church, Houston TX, October 2009.

20. **Creating Relevance - Key to Human Spaceflight Sustainability:** presentation to the MIT Space, Policy, and Society Research Group Workshop "The Future of Human Spaceflight", August 2009.

21. **The Future of Human Spaceflight**; presentation to the Center for Strategic and International Studies, Washington DC, May 2009.

22 **NASA's Value to the Nation: 50 years of Lessons on Sustainability**; AIAA paper No. 2007-9931, AIAA SPACE 2007 Conference, Long Beach CA, September 2007.

23 **Road Trip From Apollo to Mars: Selected Postcards**; presentation to the Students for the Exploration and Development of Space (SEDS) SpaceVision Conference, University of Central Florida, Orlando FL, November 2006.

24 **The Future of Space Exploration and Development**; presentation to the Le Petite Salon, New Orleans LA, July 2005.

25 **Integration of Quality in Design: Value - The Foundation of Quality**; presentation to the Conference on Quality in the Space and Defense Industries, Cocoa Beach FL, March 2005.

26 **Achieving Profound Public Engagement - The Ultimate Source of Exploration Vision Sustainability**; AIAA paper No. 2005-2568, 1st Space Exploration Conference, January 2005

27. ***Re-Energizing Relevance: Building the Psychological Highway to Space****;* IAA/ESA Workshop on Next Steps in Exploring Deep Space, Noordwijk Netherlands, October 2003 (with R. Rogers).

28. **NASA Exploration and Discovery for the New World**; presentation to the Branding and Re-branding for the 21st Century Conference, University of Texas at Austin, May 2003.

29. **A Sustainable Basis for NASA Human Space Flight**; presentation to the International Space University's 7th Annual Symposium "Beyond the International Space Station: The Future of Human Spaceflight," Strasbourg France, June 2002 and to the ISU Master's Program, Strasbourg France, February 2002.

30. **Idea Generation and NASA Strategy: Approaches, Technologies, Results**; CIES Annual Executive Congress, Dublin Ireland, June 2000 and CIES MDP Annual Congress, Edinburgh Scotland, October 2000.

31. **Living on Planet Earth**; keynote address at the IAF Forum on Space Activity in the 21st Century; 3rd United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), Vienna Austria, July 1999.

32. **NASA's Bridge to Future Markets: The Human Exploration and Development of Space (HEDS) Strategic Plan**; lecture, International Space University, Vienna Austria, August 1996.

33. **Setting Program Requirements**; *NASA Program/Project Management Conference Report*,NASA SP-6101-07, 1993, p. 13.

34. **The Space Exploration Initiative**; Paper No. 91-428, 42nd IAF International Congress, Montreal Canada, October 1991 (with A. D. Aldrich and D. A. O'Handley).

35. **The Outbound Trail - Human Exploration of the Moon and Mars**; presentation to the Association of Space Explorers, 7th Planetary Congress, Berlin Germany, October 1991.

36. **Technology Needs of the Exploration Initiative**; Paper No. 90-032, 41st IAF International Congress, Dresden Germany, October 1990 (with A. D. Aldrich, R. Rosen, and J.C. Mankins).

37. **Exploration Technology Program Plans and Directions**; Paper No. 90-033, 41st IAF International Congress, Dresden Germany, October 1990 (with A.D. Aldrich, R. Rosen, and J.C. Mankins).
38. **A Vision for Space**; *Bicentennial Celebration of U.S. Patent and Copyright Laws - Proceedings, Events and Addresses*, Port City Press, 1990, p. 685-693.
39 **An International Mars Exploration Program**; Paper No. 89-493, 40th IAF International Congress, Malaga Spain, October 1989 (with D. G. Rea, G. E. Cunningham, and H. L. Conway).
40. **The Diverse Role of Unmanned Precursors in Supporting Manned Missions to Mars**; Paper No. 89 496, 40th IAF International Congress, Malaga Spain, October 1989.
41. **The Case for a Multinational Mars Surveyor Program**; *The Planetary Report*, Vol. IX, No.5, 1989, p. 12-15 (with D. G. Rea and M. H. Carr).
42. **Integrated Strategies for the Exploration of Mars**; Paper No. 88-391, 39th IAF International Congress, Bangalore India, October 1988.
43. **Mars Rover Sample Return Missions**; Paper No. 88-398, 39th IAF International Congress, Bangalore India, October 1988 (with G.E. Cunningham, D.G. Rea, D.S. Pivirotto, J. Kwok, and M.H. Carr)
44. **Strategic Options for a Lunar Base**; Paper No. 88 615, 39th IAF International Congress, Bangalore India, October 1988 (with B.B. Roberts).
45. **Mars Rover Sample Return Mission**; presentation to the 27th General Assembly of the Committee on Space Research (COSPAR), Helsinki Finland, July 1988 (with D. G. Rea, M. H. Carr, and J. Martin).
46. **Exploration of the Solar System: Opportunities and Pathways**; American Astronautical Society 21st Century in Space Symposium, St. Louis MO, October 1988.
47. **Space Station Overview**; *Proceedings, Canadian Engineering Centennial Convention*, The Canadian Society for Mechanical Engineering, Montreal Canada, 1987.
48. **Definition Status of the U.S. Space Station System**; Paper No. 86-32, 37th IAF International Congress, Innsbruck Austria, October 1986.
49. **Space Station Design - Innovation and Compromise**; *Aerospace America*, Vol. 22, No. 9, September 1984, p. 70-72 (with L. E. Powell and A. Cohen).
50. **Problems and Concepts of Space Station Guidance, Navigation and Control**; Paper No. 84 1139, AIAA Space Systems Technology Conference, Costa Mesa CA, June 1984 (with A. Guha).

51. **Rocket Exhaust Plume Induced Flowfield Interaction Experiences with the Space Shuttle**; Paper No. 83 1549, AIAA Thermophysics Conference, Montreal Canada, June 1983 (with B. B. Roberts, R. O. Wallace, and D. B. Kanipe).
52. **Shuttle Booster Separation Aerodynamics**; *Space Shuttle Performance Lessons Learned Conference Report*, NASA CP 2283, 1983, p. 139-157 (with H. S. Dresser).
53. **Shuttle Launch Debris - Sources, Consequences, Solutions**; *Space Shuttle Performance Lessons Learned Conference Report*, NASA CP 2283, 1983, p. 159-185.
54. **The Space Shuttle Vehicle Ascent Aerodynamic Challenges - Configuration Design and Data Base Development**; *Space Shuttle Technical Conference Report*, NASA CP-2342, 1983, p. 151-176 (with C.C. Dill, J.C. Young, B.B. Roberts, J.T. Hamilton, and W.W. Boyle).
55. **An Analytical Tool for Simulating Large Amplitude Propellant Slosh**; Paper No. 81 0500, AIAA Dynamics Specialists Conference, Atlanta GA, April 1981 (with R. L. Berry, L.J. Demchek, and J.R. Tegart).
56. **Measurement of Forces Due to Liquid Motion in a Propellant Tank**; Paper No. 81-0566, AIAA Dynamics Specialists Conference, Atlanta GA, April 1981 (with J.R. Tegart, R.L. Berry, and L.J. Demchek).
57. **Shuttle Small Self-Contained Payloads: "Getaway" to the Educational Opportunities of Space**; Paper No. 78-135, AAS Future of the United States Space Program Conference, Houston, TX, October 1978 (with T. B. Murtagh and C. A. Jacobson).
58. **An Analysis of Atmospheric Entry Trajectories for Manned and Unmanned Missions to the Planet Venus**; NASA TN D 7316, 1973 (with R. G. Gonzales).
59. **Vehicle Performance Impact on Space Shuttle Design and Concept Evaluation**; *Space Shuttle Aerothermodynamics Technology Conference Report*, NASA TM X 2509, 1971
60. **A Design Parameter Synthesis Derived from a Mathematical Analysis of a Hypothetical Lunar Flying Vehicle**; NASA GWP 10084, 1969 (with W. L. Jacqmein and D. L. Hall).
61. **Apollo Spacecraft 105 Testing**; *Purdue Engineer*, Vol. 64, No. 1, October 1967, p. 52-56.

Subseries 3. Awards and Recognition, 1969-2015

Box 73 *Awards and Recognition, 1969-2015*

Folder

1. Awards and Recognition, 1969-2015

Item

1. Certificate of authenticity, The Flag of the United states of America flew over the United States Capitol on December 31, 2015, at the request of Honorable Joseph P. Kennedy, III, Member of Congress, in honor of Mark Craig's 48 years of service to improving our nation's space programs
2. Certificate of Appreciation presented by Asian American Professional Association to Mark Craig for his willingness to be the speaker and present the topic "Evolution of America's Human Space Exploration Program," at the BAAPA event on April 1, 2014
3. Certificate of recognition of contributions to the Space Systems Engineering Development Program, Johnson Space Center, November 2012
4. NASA Johnson Space Center Safety and Mission Assurance Support Services Contract, September 30, 2006
5. Certificate of Mission Planning and Analysis Division (MPAD) Naturalization, July 20, 2004. Having worked extensively with JSC's MPAD, Dr. Faget and Craig were "naturalized" in a ceremony.
6. NASA, 35 Year Service Award, February 23, 2003
7. Certificate of recognition for invaluable contributions in exciting the public about the human exploration and development of space, September 24, 2002
8. Certificate, 30 Years of service in the Government of the United States of America, February 23, 1998
9. Boy Scouts of America, Cypress District, in Appreciation Recognize Mark Craig for service as District Chairman to the Scouts and Scouters of Cypress District, November 13, 1997
10. Certificate of Appreciation for leadership in systemic education reform, NASA's Tri-State Education Initiative, Mark K. Craig, NASA Stennis Space Center, June 24, 1996
11. Program, Honor Awards Ceremony, John C. Stennis Space Center, Presidential Rank Award, Meritorious Executive, April 20, 1995
12. The Institute of International Education recognizes Mark K. Craig for his outstanding contribution to international understanding and development on the occasion of the Fulbright Enrichment Seminar, May 21, 1993
13. NASA, 25 Year Service Award, February 23, 1993
14. The Lyndon B. Johnson Space Center Group Achievement Award, Strategic Planning Team, February 1992
15. Certificate of Membership, National Council on Systems Engineering, 1992

16. Williams A&M Honorary Master's Degree in Philosophy (Space) September 1991. Given as a gag gift on Craig's departure from SEI by colleagues Terry Finn and Jeff Rosendahl who were graduates of Williams College.
17. Special Achievement Award, Lyndon B. Johnson Space Center, August 6, 1990
18. Special Achievement Award, Lyndon B. Johnson Space Center, July 31, 1989
19. NASA Group Achievement Award, Lunar and Mars Exploration Initiative Team, June 1990
20. NASA, NASA Faculty Member – Systems Engineering, a course for the continuing Training, Education and Development of NASA Personnel, April 12, 1989
21. NASA 20 Year Service Award, February 23, 1988
22. Outstanding Performance Rating, NASA Johnson Space Center, December 21, 1987
23. Certificate of Appreciation, Langley Research Center, Member of Space Station Critical Evaluation Task Force, August 21 to September 17, 1986
24. NASA, Group Achievement Award, Space Station "Skunk Works," October 8, 1985
25. Listing of winners, Arthur S. Flemming Award, NASA Participation Record, Mark K. Craig/JSC, 1985
26. Outstanding Performance Rating, February 7, 1984
27. The Lyndon B. Johnson Space Center Group Achievement Award, STS-1 Mission Evaluation Team, July 1983
28. NASA, 15 Year Service Award, February 1983
29. Outstanding Performance Rating, December 24, 1982
30. NASA Group Achievement Award, Space Shuttle Debris Assessment Team, October 12, 1982
31. NASA Group Achievement Award, Space Shuttle Flight Test Program Panel, October 12, 1982
32. NASA Group Achievement Award, Space Shuttle Ascent Flight Systems Group, October 12, 1982
33. NASA Group Achievement Award, Space Shuttle Landing Operation Team, STS-3, October 12, 1982
34. Superior Performance Award, September 30, 1982
35. NASA Group Achievement Award, Space Shuttle Launch and Landing Operations Team, September 11, 1981
36. NASA Group Achievement Award, STS-1 Performance and Analysis Integration Team, September 11, 1981
37. First Shuttle Flight Achievement Award, 1981
38. NASA Outstanding Performance Rating, September 1980
39. NASA Quality Increase, February 1980
40. NASA 10 Year Service Award, February 1978
41. AIAA Houston Section Professional Service Award, 1978

42. American Institute of Aeronautics and Astronautics Certificate of Appreciation, presented to Mark K. Craig, Councilor for contributions to the Houston Section, May 10, 1977
43. NASA Lyndon B. Johnson Space Center, Outstanding Performance Rating, December 1976
44. NASA Lyndon B. Johnson Space Center, Quality Increase, March 1976
45. NASA Group Achievement Award, Space Shuttle Program Definition and Preliminary Design Team, November 1972
46. AIAA Continuous Membership Since 1971
47. NASA Group Achievement Award, Manned Spacecraft center for outstanding service in carrying out its responsibilities in the Apollo Program leading to the first manned lunar landing, September 29, 1969
48. NASA Manned Spacecraft Center, Certificate of Training, Cooperative Work-Study Program of the Manned Spacecraft Center given at Houston, Texas, September 15, 1969
49. NASA Manned Spacecraft Center, Group Achievement Award, to Mark K. Craig Aerodynamics and Flight Dynamics Engineering and Development Directorate for exceptional engineering, design, and technical support for Apollo spacecraft development programs, including test and evaluation of spacecraft systems essential to the success of man's first lunar landing on July 20, 1969

2. Plaque, World Space Week Pioneer Award for Supporting World Space Week Association, February 7, 2008
3. Plaque, NASA Retirement Plaque, 2005
4. Plaque, NASA 35 Year Service Award, 2003
5. Plaque, AIAA Houston Section Community Service Award Plaque, 1975-1976

Subseries 4. People Photographs, circa 1970s-2000s (some undated)

Box 74 *Mark K. Craig and Group Photographs, circa 1970s-2000s (some undated)*

Folder

1. Mark K. Craig and Group Photographs, 2000s

   Item

   1. Interns, 2005
   2. Craig speaking at NASA Cost Analysis Meeting; "Increasing NASA's Value to the Nation," March 2004
   3. Admiral Donaldson and others (unidentified), 2002 (3 photographs)
   4. George Schloegel, Rod Hartung, and David Dallas, October 25, 2001 (3 photographs)

5. Craig speaking at CIES – NASA Innovation speech, October 2000
6. "GSD & M," Austin Texas – "Idea City" Meeting on Human Space Flight, March 2000 (2 photographs)

2. Mark K. Craig and Group Photographs, 1990s

Item

1. 30th Anniversary of Shuttle Design Skunk Works, 1999 (9 photos)
2. Speech at University of Wisconsin, Madison, AIAA Student Officers, November 1998
2. Mars Day at Stennis Space Center; JPL/Donna Pivirotto, JPL/Roger Bourke, and JSC/Hum Mandell, 1997 (3 photographs)
3. Craig with Senator Thad Cochran, photo inscribed, "For Mark Craig, with Best Wishes," 1997
4. SSC Family Picnic, 1996 (2 photographs)
5. MIT Senior Executive Program, 1992
6. Space Exploration Initiative (SEI) Panel, 1991
7. "MKC Exit SEI Party," 1991 (8 photographs)
8. NASA Lewis Research Center, ALERT Colloquium, 1990 (7 photographs and a letter of thanks to Craig)

3. Mark K. Craig and Group Photographs, 1980s

Item

1. US/Soviet Cooperation Meeting in DC, photo with Don Rea (MKC counterpart at JPL) and 1 with Gene Giberson, JPL Deputy Director, November 1988
2. Space Station Transition Meeting in DC from Level B to Level A, February 1987 (2 photos)
3. Space Exploration Planning Meeting, Denver Fall, 1987 (2, black and white photographs)
4. Space Station Program Office – Level B Staff, Level B flat party and SE&I Office Staff photographs, 1987 (49 photos)
5. Group photograph, Space Station Phase A "Skunk Works," Houston, 1984
6. Space Shuttle Debris Team, Craig, Lead, circa 1983 (includes 6 photos from that time period, some w/ Craig by himself)

4. Mark K. Craig and Group Photographs, 1970s

Item

1. Group shot, outside "Weightless Wonder," 1978
2. Craig inside "Weightless Wonder," 1978

5. Mark K. Craig and Group Photographs, miscellaneous and undated

Item

1. Craig, 4 photographs, undated
2. Roy Estess, undated
3. Structures Division, Roy Zep (?), undated
4. Director of Starbucks/U.K., undated

5. Clipping of Craig and note, Hazard Lecturer, Heritage Academy, undated

Subseries 5. Recognition Photographs, 1978-2003

Box 74 continued *Mark K. Craig Recognition Photographs, 1978-2003*

Folder
6. Mark K. Craig Recognition Photographs, 1978-2003
   Item
   1. 35 Year Pin, Craig with General Jeff Howell, Johnson Space Center Director, May 28, 2003
   2. 30 Year Service Award, Craig with Roy Estess, Director of Stennis Space Center and Joe Rothenberg, NASA Associate Administrator for Space Flight, August 1998
   3. 25 Year Presentation, presented by JSC Director, Aaron Cohen and Carl Shelley, Space Station Director, July 1993
   4. Strategic Planning Team Award, circa 1993
   5. Federal Engineer of the Year Award, National Society of Professional Engineers, Craig with Mr. James R. Thompson, Jr., Deputy administrator, NASA, and Neil A. Norman, P.E., President, National Society of Professional Engineers, 1991
   6. Exceptional Service Medal, Craig with presenter, Aaron Cohen, JSC Director, 1990 (2 photographs)
   7. NASA Quality Increase, February 1980 (2 photographs)
   8. 3 Awards photographs, circa 1980s
   9. NASA 10 Year Service Award, February 1978
   10. Superior Accomplishment Award, undated and individual unidentified
7. Mark K. Craig Official Photographs, 1987-2003
   1. Craig, 4x6, 14 color photographs, 2003
   2. Craig, 5x7, 2 b&w, 1 color, and 1, 8x10, b&w, 2002
   3. Craig, 8x10, 3 color, and envelope of negatives, 1991
   4. Craig, 8x10, 4 color, and 5x7, 2 b&w, 1987

Subseries 6. NASA Oral History, 2006

Box 74 continued *NASA Oral History, 2006 (key documents)*

Folder
8. NASA Oral History, 2006 (key documents)
   1. NASA Johnson Space Center Oral History Project, Oral History Transcript., Mark K. Craig Interviewed by Sandra Johnson, Houston, Texas – May 2, 2006

2. NASA Johnson Space Center Oral History Project, Oral History Transcript., Mark K. Craig Interviewed by Sandra Johnson, Houston, Texas – April 11, 2006
3. NASA Johnson Space Center Oral History Project, Oral History Transcript., Mark K. Craig Interviewed by Sandra Johnson, Houston, Texas – March 24, 2006

Subseries 7. Eric Peters Painting Donation, 2015

Box 74 continued *Eric Peters Painting Donation, 2015*

Folder
9. Eric Peters Painting Donation, 2015
    1. Correspondence related to the gift to Purdue University, 2015
    2. Folder contains examples of Peters' work, 2015

Subseries 8. Autographed and/or Important Space Books, 1927-2014

Box 75 *Autographed and/or Important Space Books, 2008-2014*

Folder
1. Weir, Andy. (2014). *The Martian*. New York: Broadway Books. (signed by author)
2. Logsdon, John M. (2010). *John F. Kennedy and the Race to the Moon*. New York: Palgrave Macmillan. (signed and inscribed by author to Craig)
3. Hale, Wayne. (Ed.). (2010) Wings in Orbit – Scientific and Engineering Legacies of the Space Shuttle. Washington, DC: National Aeronautics and Space Administration. (signed by, Leroy Cain, John Shannon, John Casper, and Helen Lane. Includes an article submitted for inclusion but not used: Inspecting the Space Shuttle at Launch - Red Team Tales)
4. Fisher, Steven C.; Rahman, Shamim A. (Eds.). (2009). *Remembering the Giants - Apollo Rocket Propulsion Development.* Washington, DC: National Aeronautics and Space Administration. (Appended is a personal note to Mark Craig, signed by Shamim Rahman)
5. Manuscript draft of (working title) Datapoint: The Story of the Forgotten Texans Who Invented the PC Industry, by Lamont Wood. This study includes Austin Oliver "Gus" Roche III, a 1956 Purdue graduate.
6. Mindell, David A. (2008). *Digital Apollo - Human and Machine in Spaceflight.* Cambridge, MA: The MIT Press. (signed with a personal note to Mark Craig)

Box 76 *Autographed and/or Important Space Books, 2000-2006*

Folder

1. Dick, Stephen J. and Launius, Roger D. (Eds.) (2006). *Critical Issues in the History of Spaceflight.* Washington, DC: National Aeronautics and Space Administration.
2. Clarke, Jonathan D. A. (Ed.). (2006). *Mars Analog Research.* San Diego, CA: American Astronautical Society. (signed by AAS President, Mark Craig)
3. Dick, Stephen J. and Cowing Keith L. (Eds.). (2005). *Risk and Exploration - Earth, Sea and the Stars.* Washington, DC: National Aeronautics and Space Administration. (signed by series executive Trish Pengra with a personal note to Mark Craig)
4. Zukowsky, John (Ed.). (2001). *2001: Building for Space Travel.* New York: Henry N. Abrams and the Art Institute of Chicago. (signed by contributor Jack Frassanito, includes a letter to Mark Craig)
5. Ordway III, Frederick I. (2000). *Visions of Spaceflight – Images for the Ordway Collection*. New York: Four Walls Eight Windows. (key artifact)

Box 77 *Autographed and/or Important Space Books, 1993-1999*

Folder

1. Zukowsky, John. (1999). *Space Architecture - The Work of John Frassanito & Associates for NASA*. Stuttgart: Edition Axel Menges, (signed by John Frassanito, with a personal note to Mark Craig)
2. Harkey, Ira. (1999). *Noel Wien - Alaska Pioneer Bush Pilot*. Fairbanks: University of Alaska Press. (signed by Noel Merrill Wien, with a personal note to Mark Craig)
3. Launius, Roger D. and McCurdy, Howard E. (Eds.). (1997). *Spaceflight and the Myth of Presidential Leadership.* Urbana and Chicago: University of Illinois Press.
4. Hoban Francis T. (1997). *Where Do You Go After You've Been to the Moon?* Malabar, FL: Krieger Publishing.
5. Shevchenko, V. V. (Ed.). (1993). *Astronomical Aspects of the Development of the Moon and the Search for Extraterrestrial Resources* [in Russian]. Moscow: Moscow University Press. (signed by Slava Shevchenko, with a personal note to Mark Craig)

Box 78 *Autographed and/or Important Space Books, 1982-1999*

Folder

1. Hax, Arnoldo and Majluf, Nicolas. (1991). *The Strategy Concept and Process - A Pragmatic Approach.* Englewood Cliffs, Prentice Hall.

(signed by Arnoldo Hax, with a personal note to Mark Craig)

2. Wilford, John Noble. (1990). *Mars Beckons*. New York: Alfred A. Knopf
3. Levine, Arnold S. (1982). *Managing NASA in the Apollo Era*. Washington, DC: National Aeronautics and Space Administration.

Box 79 *Autographed and/or Important Space Books, 1966-1970*

Folder

1. Verne, Jules. (1970). *From the Earth to the Moon*. Norwalk, CT: The Heritage Press.
2. Mailer, Norman. (1970). *Of a Fire on the Moon*. Boston: Little, Brown and Company.
3. *U.S. on the Moon – What it means to us.* Washington, DC: U.S. News & World Report, 1969.
4. Hoyt, Mary Finch. (1966). *American Women of the Space Age.* New York: Ateneum. (De-accessioned for the Bellaire, MI Public Library.)

Box 80 *Autographed and/or Important Space Books, 1927-1965*

Folder

1. Ruzic, Neal P. (1965). The Case for Going to the Moon. New York, Putnam's Sons.
2. Koelle, Heinz Hermann. (Ed.) (1961). *Handbook of Astronautical Engineering*. New York: McGraw-Hill. (Astronaut Jim McDivitt's personal copy, his name in pencil on the inside cover. Signed by editor Hermann Koelle with a personal note to Mark Craig. Koelle was a key member of von Braun's Saturn V team. Craig noted this handbook was an invaluable reference during the 1960s because of its comprehensive content. De-accessioned from the NASA Marshall Space Center Technical Library. (key artifact)
3. Ley, Willy and von Braun, Werner. (1956). *The Exploration of Mars*. New York: The Viking Press. With 16 paintings in color and 5 in black and white by Chesley Bonestell. (key artifact)
4. Stefansson, Vilhjalmur. "Are Explorers to Join the Dodo?" In the *American Mercury*, Vol. XI, No. 41, pp. 13-18. May, 1927.

Subseries 9. Artifacts, circa 1969-2000s

Box 81 *Artifacts, circa 1969-2000s*

Box

1. Pins and Buttons, circa 1969-2000s

2. Commemorative Coins (14 coins) circa 1989-2012
3. Launch Firing Room Flags, 2006
   Item
   1. 2 small United States flags, undated
   2. STS-115, September 9, 2006
   3. STS-121, July 4, 2006
4. NASA Facility and Event Access badges (key artifacts) and Shuttle Launch/Landing Access badges (key artifacts) circa 1980s-2002
5. Adhesive Mission patches, circa 1980s-2000s
6. Miscellaneous Items; i.e. mission profile cards, Craig's schedule card, nameplate, Tampa Bay/Redskins game ticket, etc., circa 2000s

Box 82 *Artifacts, 1973-2000s*

Item
1. Box of name badges, circa 1980s-2000s
2. An empty bottle of Russian Vodka "Extra," signed by Vladimir Syromyatnikov and several members of the Apollo-Soyuz Test Project Working Group 3. Syromyatnikov was the Soviet co-lead of Working Group 3 on docking of which Craig was a member. It was signed at a social event following a Working Group meeting in Houston in 1973. (key artifact)
3. Not flown, flight qualified Space Shuttle thermal protection system (TPS) tile [**CAUTION**: do not remove from plastic bag; do not touch]. This tile, with its black coating, is from the Shuttle Orbiter underside. (key artifact)
4. Paperweight, NASA Space Station, Concept Development Group, Mark K. Craig, May 1983-April 1984

Box 83 *Artifacts, 1986-2009*

Item
1. Bottle of "Louisiana Hot Sauce" with a graphic of Shuttle booster separation on the label, by Lockheed Martin Michoud Operations, 2009
2. Etched crystal memento of Stennis Space Center Test Stand B. Presented by Stennis on the occasion of my retirement with the inscription "Presented to Mark K. Craig from your friends at John C. Stennis Space Center in appreciation for your dedication and support to NASA," 2005
3. Pewter memento of the 20th Anniversary of the Space Shuttle, presented by United Space Alliance. Number 112 0f 350, 2001
4. "Mars EVA Suit" action hero figure comic memento presented to me at the farewell party at the conclusion of my tenure leading the

Space Exploration Initiative (SEI) effort at NASA HQ, 1992

5. Half a toilet seat as the "John Hodge Award for Creative Program Management" at the Space Station Level B Flat party in 1987. Signed by the Level B management team. After the Challenger accident the Agency made the decision to move the Space Station Program Level B function from Johnson Space Center to Reston VA. John Hodge was the Acting Associate Administrator for Space Station at the time. This decision was universally seen by Level B as a mistake (which later events proved that it was) and a "B Flat" party was held to honor the Level B team. (key artifact)
6. Prototype aluminum Space Station truss node. A key early trade study was whether the Space Station truss should be deployable or assembled by space-walking astronauts. This node was a prototype for a truss design to be assembled, 1986

OS Artifacts – FF Drawer # (Still need to file in drawers), 1969-2014

Item

1. Shuttle Vehicle Size Comparison – An enlargement of the drawing that Dr. Max Faget had prepared to explain the scale of his two-stage reusable vehicle concepts to the Shuttle concept "skunkworks" team in May, 1969. Per Craig, "Max told me much later that he had it classified "secret" at the time to keep the Air Force from finding out about it. This enlargement was made in 1999 for the celebration of the 30th anniversary of the skunkworks." Signed by Max Faget and members of the team, with pictures of Max and some team members included. (key artifact)
2. A photograph of Midland, Texas taken from Skylab II. Signed to Craig's father Wally Craig by Skylab II astronauts Alan bean, Owen Garriott, and Jack Lousma
3. A photograph of the Approach and Landing Test (ALT) orbiter Enterprise and Shuttle Carrier Aircraft (SCA) in mated flight. Signed by ALT astronauts Fred Haise, Gordon Fullerton, Joe Engle, and Richard Truly
4. An original gouache drawing of a crew rover on Mars with two astronauts dismounted from it; done to support exploration studies about 1988. Signed by the artist: "To Mark, Best Regards John Frassanito" (key artifact)
5. A Soviet map of the Moon [labeled in Russian] presented by Academician Slava Shevchenko and signed by him: "To dear Mark Craig with best wishes, Slava Shevchenko, April, 1988 Houston," (key artifact)
6. Ships of Exploration graphic created by Jack Frassanito in 1989, Per Craig, "to support Space Exploration Initiative (SEI) presentations to and for the G.H.W. Bush Administration. We knew that the President

was a sailor and thought that he might appreciate the Nina/lunar vehicle comparison. The graphic was used both as an image in presentations and as a display poster in the presentation venue. This particular poster was used in the White House. Signed by the artist, "to Mark, Best Regards, Jack Frassanito." (key artifact)

7. Poster from the Association of Space Explorers 7th Planetary Conference - Space Has No Boundaries, Berlin Germany (1991) at which Craig was an invited speaker. Signed by the 52 astronauts and cosmonauts in attendance. Special message to Mark Craig and signed by astronaut attendee Don Williams. On verso is a Certificate of Witness signed by Don Williams stating that this is signed poster 66 of 132. Also on verso is a guide to the astronaut and cosmonaut signatures. (key artifact)
8. "Don't Get Sucked into the Heart of Darkness" original gouache drawing by Pat Rawlings. Prepared as a gift for Craig's departure from Space Exploration Initiative leadership in late 1991. Signed by the artist and by JSC SEI team that Craig had created and led. Per Craig, "The "Heart of Darkness" is what I came to call the matrix which guided our approach to distribute SEI strategic requirements across the various organizations of NASA. Levying requirements was not generally well received, hence the name." (key artifact)
9. "M. CRAIG WUZ HERE!" graffiti drawn by the artist on his Mars Viking lander print. Also signed by the artist, Pat Rawlings. On the mat the inscription "Mark K. Craig; Manager, Lunar and Mars Exploration Office; from the pros from Dover." A gift from the SEI mission design team upon Craig's departure in late 1991. Per Craig, "This team worked in the "the swamp" and liked to be known as the "Pros from Dover" in reference to the movie MASH." (key artifact)
10. Exploration Programs Office sign from JSC. This organization name was used intermittently from 1992 through 2006.
11. UNISPACE III poster from the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, July 19-30, 1999. Space benefits for humanity in the 21st Century. Craig gave a session keynote at this conference.
12. NASA Exploration Poster presented to Mark Craig with the inscription "Thank you for helping make yesterday's dream into today's vision and tomorrow's reality. Ad Lunam, Martem, et ultra!" 2006
13. BRC Imagination Arts Shuttle Launch Experience poster signed by astronauts Charlie Bolden and Rick Searfoss. The poster identifies Mark Craig as the NASA Laureate contributor to the project, 2007 (key artifact)
14. BRC Imagination Arts Exploration Space – Explorers Wanted poster with Mark Craig identified as the NASA Laureate contributor to the project. 2007
15. The Exploration <-> Development of Space "Engine" poster used to articulate the NASA human space exploration narrative and promote

enterprise sustainability, 2014

16. Envelope of spontaneous humorous art, circa 1980s-1992

Item

1. Per Craig, “Cartoon proposing a solution to the challenge that the protective garment I was to wear in leading our Red Team launch pad inspections was often a “snug” fit,” 1981
2. Envelope with doodlings of NASA legend Dr. George M. Low made in a review meeting in the early 1980’s. (key artifact)
3. Cartoon proposing a solution to Space Station “orbital decay.” Signed with a personal note by Concept Development Group (CDG) lead Luther Powell, 1984
4. Pencil drawing by an unknown team member of the King of Exploration puncturing The Heart of Darkness, 1991
5. Pencil drawing by the same unknown team member of Mark Craig talking about the brave new world of procurement strategy. “Does anyone what to disagree with this man?” 1991
6. Wanted poster for Mark Craig “the notorious leader of the Spicy Enchilada Infatida (SEI)” upon departure from Space Exploration Initiative leadership in late, 1991
7. Pen and ink drawing by Steve Paddock of Mark Craig wondering if his strategic planning steering wheel is connected to anything, November 1992
8. Pen and ink drawing by Steve Paddock proposing a WD 40 chaos lubricant to overcome the “NASA tough nut” in strategy, November 1992

Series 17. Career Miscellaneous, 1962-2015

(5.9 cubic feet)

Subseries 1. Notebooks, 1973-1990

Box 84 *Notebooks, 1973-1990*

Item

1. Solid Rocket Boosters (SRB) Separation System, December 1973 – January 1977
2. SRB Separation System, Propellant Dynamics, January 1978 – April 1981
3. SRB Separation System, Debris Assessment and Remediation, May 1981 – March 1983
4. Space Station Task Force, 1983 – 1984
5. Space Station “Skunkworks,” April – October 1984
6. Office of Exploration (Code Z), MRSR, September 1987 – April 1988
7. Space Exploration Initiative, August 1989 – March 1990
8. Address books/Phone #s, Memo books/ Space Shuttle Flight Test

STS 4-9, 1982-1983

Subseries 2. Calendars, 1981-2003

Box 84 continued *Calendars, 1981-1989*

Item
9. Calendar, 1981
10. Calendar, 1982
11. Calendar, 1983
12. Calendar, 1984
13. Calendar, 1986
14. Calendar, 1989 (2)

Box 85 *Calendars, 1990-1999*

Item
1. Calendar, 1990 (2)
2. Calendar, 1991 (2 calendars, 1 address book with phone #s)
3. Calendar, 1992
4. Calendar, 1993 (2 calendars, 1, "Phone Calls, November 1991 – September 1993")
5. Calendar, 1994
6. Calendar, 1995 (2)
7. Calendar, 1996
8. Calendar, 1997
9. Calendar, 1998
10. Calendar, 1999

Box 86 *Calendars, 2000-2003*

Item
1. Calendar, September 11, 2000 – December 31, 2000
2. Calendar, 2001
3. Calendar, 2002
4. Calendar, May-June, 2003
5. Calendar, 2002 (2)
6. Calendar, May – December, 2003

Subseries 3. Administrative Records, 1967-2015

Box 86 continued *Administrative Records, 1967-2015*

Folder

7. Administrative/Career Records, 1967-2015

Item

1. Correspondence, The White House, letter of congratulations from President Obama, to Craig, upon his retirement, July 17, 2015
2. Listing of Mark Craig Papers, Articles and Publications, 2014
3. Mark Craig Activity History, April 18, 2005
4. Mark Craig Position History, 2005 (2 copies)
5. Correspondence, From: Mark Craig, To: David S.F. Portree, Re: Exploration Organization Question and MRSR Questions, June 17, 2004
6. Mark Craig Grade Level History
7. Mark Craig Space Shuttle Experience
8. NASA Correspondence, To: DP/Director, Headquarters Human Resources Management Division, From: R/Associate Administrator for Aeronautics, Exploration and Technology, Subject: Superior Accomplishment Award for Special Act or Service (Mark Craig recommendation), August 31, 1990
9. NASA Memorandum, To: Distribution, From: PA/Acting Manager, Space Station Program, Subject: Delegation of Authority, Mark Craig Acting Manager, Space Station Program, September 15, 1986
10. NASA Memorandum, To: Distribution, From: PA/Acting Manager, Space Station Program, Subject: Delegation of Authority, Mark Craig Acting Manager for the Systems Engineering and Integration Office, April 14, 1986
11. Mark Craig Career Summary on 33rd Birthday, March 3, 1981
12. Listing of Major Activities, October 1976 – March 1977
13. Listing of Major Activities, April – September, 1976
14. Correspondence, Jack R. Lister, NASA, Chief, Personnel Office, Re: Reduction in Workforce, Manned Spacecraft Center, May 19, 1972, and cancellation of previous letter and Craig remained in position, June 22, 1972
15. Certificate of Graduation from Purdue University, granted degree of Bachelor of Science in Aeronautical and Astronautical Engineering, January 27, 1971
16. Correspondence, To: Craig, From: NASA Manned Spacecraft Center, Re: Appointment as an Aerospace Engineer, GS-7, December 29, 1970
17. Correspondence, To: Bass Redd, Chief, Flight Technology Branch, NASA, Manned Spacecraft Center, From: L.T. Cargnino, Associate Professor, Purdue University School of Aeronautics, Astronautics and Engineering Sciences, Re: Craig's termination of co-op program at end of 4th work period

in order to get married, September 23, 1969
18. Letter from Craig to “Miss Ebner,” stating his acceptance into Co-operative Education Program at NASA Manned Spacecraft Center, April 18, 1967
19. Correspondence, From: Barbara Ebner, NASA, Cooperative Education Coordinator, Employee Development Section, To: Mark Craig, Re: Tentative selection as a Student Trainee, GS-3, with the Manned Spacecraft Center, Houston, Texas, May 5, 1967

Subseries 4. Slides, Photos and Film, Audio Tapes, and CDs/DVDs, 1962-2014

Box 87 *CDs and DVDs, 2000-2014*

Item
1. Space Update: Earth Views of Space and Space Views of Earth, 2014
2. NASA 4.0, 2013
3. 2010 Goddard Presentations (2 CD-RWS)
4. Mark Craig, Storytelling Clip, pdf and PowerPoint file, May 2010
5. SAIC – JSC Storytelling Talk, M.K. Craig presentation, pdf and Rogers clip, May 2010
6. Johnson Space Center Phone Book 1, 1959-1998
7. Johnson Space Center Phone Book 2, 2001-2009
8. Apollo 40 – E&D Reunion, Apollo 11 40th Anniversary, Johnson Space Center, July 18, 2009
9. AAS 2008 Von Braun, (3 CD-RWs)
10. Animations, John Frassanito & Associates, Inc. February 25, 2008
11. Guidance and Control 2007, edited by Heidi E. Hallowell and Robert D. Culp, CD-ROM Supplement to Volume 128, Advances in Astronautical Sciences, American Astronautical Society
12. NASA: Twenty Five Years of Space Shuttle Flight, April 12, 2006
13. Stennis Space Center 40th Anniversary PIRH (?) 2006
14. Guidance and Control 2006, edited by Steven D. Jolly and Robert D. Culp, CD-ROM Supplement to Volume 125, Advances in Astronautical Sciences, American Astronautical Society (2 copies)
15. Spaceflight Mechanics 2006, edited by Srinivas Rao Vadali, L. Alberto Cangahuala, Paul W. Schumacher Jr., and Jose J. Guzman, CD-ROM Supplement to Volume 124, Advances in Astronautical Sciences, American Astronautical Society
16. The Malcolm D. Shuster Astronautics Symposium, edited by John L. Crassidis, F. Landis Markley, John L. Junkins, and Kathleen C. Howell, CD-Rom Supplement to Volume 122, Advances in Astronautical Sciences, American Astronautical Society, 2006
17. Mars Analog Research, edited by Jonathan D.A. Clarke, CD-Rom

Supplement to Volume 111, Science and Technology Series, American Astronautical Society (2 copies)

18. Astrodynamics 2005, edited by Bobby G. Williams, Louis A. D'Amrio, Kathleen C. Howell and Felix R. Hoots, CD-ROM Supplement to Volume 123, Advances in Astronautical Sciences, American Astronautical Society
19. Space Debris and Space Traffic Management Symposium 2005, edited by Joerg Bendisch, CD-ROM Supplement to 112, Science and Technology Series, American Astronautical Society
20. NASA: A Renewed Spirit of Discovery, Johnson Space Center, March 16, 2004
21. NASA Brain Bites: Munchies for your mind. NASA, March 2004
22. The Pentagon's New Map, C-SPAN, © 2004, National Cable Satellite Corporation
23. JF&A, John Frassanito & Associates, Exploration Visualization, January 18, 2004
24. Martian Expedition Planning, edited by Charles S. Cockell, CD-Rom Supplement to Volume 107, Science and Technology Series, American Astronautical Society, 2004
25. Moon Base, An Alpine Symphony Space – Creation and Enterprise, DVD MPEG 2 PCS and Video DVD, June 2004 (2)
    Mars Update: The Best of Mars, Distributed by Space Update, Inc. © Rice University 2004 (includes 3-D glasses)
26. Art and Animation, Pat Rawlings, © SAIC 2003 (2 copies)
    Proceedings of the International Lunar Conference 2003 / International Lunar Exploration Working Group 5 – ILC2003 / ILEWG 5, CD-Rom Supplement to Volume 108, Science and Technology Series, American Astronautical Society
27. United States of America Digital Landsat Mosaics, [Washington, D.C.]: National Aeronautics and Space Administration, [2003?]
28. Art for Kennedy Space Center, Pat Rawlings, © SAIC undated (2 copies)
29. Live from the Heart. Chicago: Museum of Science and Industry/Advocate Christ Medical Center, © 2003
    Earth Update and Space Update, © Rice University 2003
30. STS-107 Results, T. Goodwin, circa 2003
31. The Next Century of Human Space Flight, Russ Turner, United States Space Alliance and Mike Mott, The Boeing Company, June 2002
32. Multilingual Space Dictionary, prepared by the International Academy of Astronautics – Paris, circa 2002
33. Space Exploration Past and Future, Mark Craig, November 1, 2002
34. Beyond the International Space Station: The Future of Human Spaceflight, 7th ISU Annual International Symposium, Strasbourg, France, June 4-7, 2002
35. Miscellaneous Space Images (9) Used in Public Talks, from 35mm

slides, December 10, 2002
36. Realizing the Dream: An International Space Station Sampler, NASA, 2001
37. Starscapes: The face of human spaceflight. NASA Johnson Space Center, circa 2000
38. Mark Craig's CIES Presentation, Scotland Version, October 31, 2000
39. Dublin Presentation PowerPoint, June 1, 2000 (CD-R)
40. JF&A, John Frassanito & Associates, Strategic Visualization, NASA Exploration Image Archive, 1992-2000 (3 DVDs)

Box 88 *CDs, DVDs, and Cassettes, 1962-2000*

Item
1. Hubble Servicing Mission 4, JF&A, John Frassanito & Associates, undated
2. Space shuttle: The first 100 flights. United Space Alliance: Space Foundation, 2000
3. The Heart in Space: How microgravity affects the cardiovascular system. Moffett Field, California: NASA, Ames Research Center, [1996?]
4. 90s NASA Images, Pat Rawlings
5. President John F. Kennedy, Rice University, September 12, 1962
6. IAA/ESA – Next Steps Conference, Public Engagement, Mark Craig, NASA, and B. Rogers, BRC, undated
7. WB-57 High Altitude Research Aircraft (articles and photos), NASA, undated
8. NASA, Space Shuttle: Launching Our Dreams, undated
9. Maurice J. Zucrow Laboratories, Archival and Alumni Photos, undated
10. Purdue University Propulsion Programs, Stephen D. Heister and William E. Anderson, Purdue University, Aeronautics and Astronautics, undated

Cassettes, 1991 and undated

Item
1. Mark Craig, "More/Questions Period," April 29, 1991
2. "Mark Craig Speech," undated

Box 89 *Film, NASA Photographs, and Slides, circa 1970s-1990s*

Item
1. 35mm film reel, Cosmonaut Vitaly Sevastyanov's visit to Johnson Space Center, (12 min., 9", color, silent, undated)
2. Binder, NASA photographs, circa 1970s-1990s (binder 1 of 2)
3. Binder, NASA photographs, circa 1970s-1990s (binder 2 of 2)

4. Civil Space Exploration Initiative slides, contain budget information (SEI), 1989
5. Station Overview papers, Canada, 1987
6. LaRC Debris paper, Shuttle Conference, 1987
7. Miscellaneous Space Station, 1986-1987
8. Space Station IAF paper, 1986
9. Miscellaneous Early Space Station slides, 1985-1987
10. LaRC paper – SRB Shuttle Conference, 1983
11. Propellant Dynamics Tests, 1978
12. Advanced Launch Vehicle, undated
13. Russian Space Vehicles, undated
14. Space Shuttle, undated
15. Shuttle Debris Team, undated
16. Miscellaneous Moon/Mars, undated
17. Miscellaneous Space slides, undated
18. "Get-Away Special," undated (box 1 of 2)
19. "Get-Away Special," undated (box 2 of 2)

Subseries 5. Video Tapes, 1987-2006

Box 90 *VHS Tapes, 1987-2006 (several undated)*

Item
1. STS-1 25th Anniversary Video, April 12, 2006 (0:11:22)
2. Sustaining the Vision Long Term, September 10, 2004 (0:58:00)
3. A Renewed Spirit of Discovery, March 20, 2004 (0:06:34)
4. Benefits of Human Space Flight Briefing, Dr. Howard Ross, Office of Biological and Physical Research, September 3, 2003 (0:47:00)
5. International Space Station: Inventing the Future, March 24, 2003 (0:16:35)

Box 91 *VHS Tapes, 1996-1999*

1. WWL-TV, Channel 4, News Coverage of Mars Explorer at Stennis Space Center, November 3, 1999
2. Fox TV Channel 8, News Segment on Alan Shepard, Interviews with Mark Craig and Mack Herring at Stennis Space Center, July 22, 1998
3. WLOX-TV, Channel 13 News Coverage of Alan Shepard, Interviews with Mark Craig, Mack Herring and Mrs. Roosa, July 22, 1998
4. PBS, The News Hours with Jim Lehrer, February 18, 1997 (0:57:00)
5. Mars Life Press Conference, August 7, 1996

Box 92 *VHS Tapes, 1991-1994*

1. BRC Imagination Arts, “Rainbow War,” October 7, 1994 (0:20:00)
2. Living and Working in Space: The countdown has begun, ©1993 Fase Publications (0:60:00)
3. Mark Craig SEI Talk at University of Wisconsin, October 1991
4. Space Exploration Initiative, May 29, 1991 (0:03:50)
5. Galileo Earth/Moon Encounter, March 22, 1991

Box 93 *VHS Tapes, 1987-1989 (some undated)*

1. Mars: The Movie, Jet Propulsion Laboratory, MIPS/DIAL, January 1989 (2 copies, 00:05:02)
2. Space Symposium Discusses Future Lunar Plans; I: Buzz Aldrin, former Lunar Astronaut, I: Vladislav Shevchenko, Soviet Lunar Educator, I: Mark Craig, NASA Exploration Planner, KTRK-TV, Channel 13 (ABC), March 5, 1988 (00:02:08)
3. Level B Flat Party (demise of 1st Space Station Management Team), January 30, 1987
4. “Moon,” (no additional information available)
5. Arianspace, Volume 85, undated (1:12:16)

Box 94 *VHS Tapes, undated*

1. For All Mankind, undated (00:34:00)
2. General Howell All Hands Message, undated (0:43:00)
3. Stennis Brings Mars Down to Earth, Two Interviews: Donna Shirley and Mark Craig, undated (RT: 3:10)
4. Solid Rocket Tests at Purdue, undated
5. Return to Flight, Space City Films, undated (TRT 5:17)
6. Thermal Sciences and Propulsion Center, Volume 1: “The Zucrow Years,” narrated by Professor A.T. McDonald, undated
7. Arianspace, Vol. 85 – Version Anglaise, Duree: 72’17”

Series 18. Personal Album, 1956-2005

(1.7 cubic feet)

Subseries 1. Youth, 1956-1960

Box 95 *Youth, circa 1956-1960*

Folder

1. Youth, circa 1956-1960
   Item

1. Photographs of Craig; Philmont Scout Ranch, Cimarron, New Mexico, 1962; Pack 105, Den 3 in front of fighter jets, (1959); 2 individual shots of Craig, undated
2. Decorated scout headband circa 1956
3. Certificate, Honor Roll, Jean Gordon Elementary School, April 5 – June 10, 1960
4. Reading Certificate, New Orleans Public Library, for reading 8 library books, September 1, 1959
5. Dedication program, Jean Gordon Elementary School, December 16, 1958
6. "Science in Your Future," General Electric, Adventures in Science Series. Schenectady, New York: Educational Dept., General Electric Co., 1956
7. "The Universe," by Mark Craig, 6th grade (report with illustrations)
8. "The History of Living Things," by Mark Craig (report with illustrations)

Subseries 2. High School, circa 1965-2000

Box 95 continued *High School, circa 1965-2000*

Folder

2. High School, circa 1965-2000

Item

1. Correspondence, From: Hank Avery, Mayor, Midland, Texas, To: Craig, Re: Congratulating him on being a recipient of the Permian Basin Geophysical Society's Scholarship, May 31, 1966
2. Certificate, Texas Technological College, presented to Mark Craig in recognition of Excellent Performance in Boy's Informative – Class I, March 5, 1966
3. Membership card, National Honor Society, undated
4. Clipping, "Students, Teacher to Attend Texas Science Symposium, includes photo of Craig, June 10, 1965
5. Clipping, PBGS Awards Scholarships to Graduates (Permian Basin Geophysical Society) includes photo of Craig, circa 1966 (2 copies)
6. Clipping, news photo of "Outstanding Graduating Scholars," honored by Midland Exchange Club, undated
7. Article from *The Bull Dog,* the Midland High School newspaper, "Mark Craig Tells Experiences As Member of Archaeology Team," includes photo of Craig, October 29, 1965
8. Correspondence, From: Senator John G. Tower, To: Craig,

Re: No opening for a Senate page that Craig had inquired about, August 17, 1964

9. Photograph, 8”x10”, b&w, Craig and 2 students and man in front of a Texas Electric Service Company poster, undated
10. Photocopied photograph, Craig receiving a scout medal, undated
11. 3 Science Fair medals, undated
12. Nametag, Mark Craig, Class of 1966 reunion, June 24, 2000

3. Bell Labs Tour, February 1966

Item

1. Itinerary, Bell Telephone Laboratories, Incorporated, Murray Hill, New Jersey, High School Student-Teacher Visit, February 14, 1966 (Craig’s notations on back, ”lines composed in the lobby of the Algonquin Hotel,” February 1966
2. Clipping, “Two City Students Named for Tour of Laboratories, *The Midland Reporter-Telegram,* p. 6A, February 9, 1966
3. News photo, captioned, “Touring Science Students,” Craig in photo, publication information unknown
4. Pamphlet about the Hotel Algonquin, A Feature Story from *The New York Times*, 1964
5. Playbills, St. James Theatre, Hello, Dolly! and Golden Boy, February 1966
6. Photograph, 8x10, b&w, participants in Bell Labs tour, 1966 (includes descriptive sheet)

4. Navy Science Cruiser Award, 1966

Item

1. Correspondence, Department of the Navy, Office of Naval Research, Washington, DC; letter of congratulations, proposed schedule, final preparations, welcome/itinerary, May-July, 1966
2. Nametag, U.S. NAVY Cruise Guest
3. Card, “Navy Science Cruiser Program – Principal Winner”
4. Photograph of Craig by ship, 4x4, b&w
5. Cloth patches; U.S.S. Berkeley-Dog-15, Naval Air Station Miramar, Home of the Pacific Fleet Fighters, and 4080th Strat. Recon. Wing
6. Certificate, Navy Science Cruiser Award, for Outstanding Performance at the Permian Basin Regional Science Fair, undated
7. Group photograph of Navy Science Cruiser Program participants, 8x10, b&w
8. Photograph, 8x10, b&w, typed on back, “A Service of U.S.S. Nereus AS-17,” undated
9. Part of 3 spent bullets from a Browning Automatic Rifle (BAR) that Craig fired from the USS Berkeley guided missile

destroyer while at sea.

5. High School diploma, Midland High School, Midland, Texas, May 27, 1966

Subseries 3. College and Grad School, 1957-2005

Box 95 continued *Purdue University, 1966-1974*

Folder

6. Purdue University, 1966-1974

Item

1. Purdue IDs, 1966-1967 and 1967-68
2. Membership card, National Order of Yellow Dogs of America, undated
3. Ticket, NCAA National Basketball Finals, March 22, 1969
4. Brochure, Triangle Fraternity, Purdue University, undated
5. List of Triangle pledges, at bottom of page, “Pledge Trainer: Mark Craig,” note attached, “To the “King,” signed by pledges, undated
6. Certificate, American Institute of Aeronautics and Astronautics, Student Member, March 1968
7. Correspondence, NASA, tentative selection as a Student Trainee, GS-3, May 5, 1967
8. Information sheet about the Manned Spacecraft Center, Houston, Texas, undated
9. Correspondence, From: L.T. Cargnino, Associate Professor, Purdue University School of Aeronautics and Astronautics, To: Bass Redd, Chief, Flight Technology Branch, NASA, Manned Spacecraft Center, in regards to Craig terminating the co-op program at the end of the 4th work period in order to get married, September 23, 1969
10. Telegram, to Craig, From: Christopher Stuart Noon, “Mr. Craig, the President and I Yes the Whole Country Wish to Congratulate You as a Chief Engineer at the Space Center for a Job Well Done. Good Show.” July 21, 1969
11. Correspondence, From: Margaret Church, for the Literary Awards Committee, To: Craig, Subject: Winner in the Neil Armstrong category of the contest, April 27, 1970
12. Certificate of Life Membership, Purdue Alumni Association, February 27, 1974
13. 2 cloth patches, NASA Apollo
14. Adhesive patch, Apollo 11 Moon Launch – I Was There
15. Cloth patch, Veritas Omnia Vincit
16. Cloth patch, Purdue Pete Aeronautical Engineers
17. Purdue pennant, Rose Bowl, 1967

7. Purdue University diploma, Degree of Bachelor of Science in Aeronautical and Astronautical Engineering, January 27, 1971
8. Grad School/Training, 1970-2005
   Item
   1. Correspondence, To: Mark Craig, From: Severino L. Koh, Chairman, Graduate Committee, Purdue University School of Aeronautics and Astronautics and Engineering Sciences, Subject: Application of Admission to Graduate Program, December 15, 1970, and second letter stating admittance, Office of Dean of Graduate School, January 4, 1970
   2. Correspondence to Craig, From: John L. Margrave, Dean of Advanced Studies and Research, Rice University, Re: Admittance to graduate program in Mechanical and Aerospace Engineering and Materials Science for the academic year, 1974-75, as a part-time student, April 17, 1974
   3. Grade reports and record of training, Rice University, various covers dates, 1974-1983
   4. Certificate, University of California, Los Angeles, University Extension, Short Course on Dynamics and Control of Large Flexible Structures, July 20-24, 1981
   5. Certificate, Institute for Management Studies, attendance at six-hour IMS Course entitled: Delivering Superior Value: Creating a Market Focus Across the Organization, September 10, 2003
   6. Certificate of Completion, 13th Annual "cqsdi" - Strategies for Mission Success, Conference on Quality in the Space and Defense Industries, Cape Canaveral, Florida, 2005
9. MIT Senior Executive Program, 1991-1993
   Item
   1. Brochure, Massachusetts Institute of Technology Sloan School of Management, The MIT Program for Senior Executives, Seventy-first Session, Spring 1991
   2. Correspondence, From: Peter Gill, MIT, Alfred P. Sloan School of Management, To: Mark Craig, Manager for Technical Projects, Space Station, NASA, Johnson Space Center, Subject: Acceptance into MIT Program for Senior Executives, January 6, 1992
   3. MIT Program for Senior Executives, Program Outline, Spring 1992
   4. Binder, includes notes, schedule/course outline, administrative info, policy and strategy, etc., Spring 1992
   5. Correspondence, From: MIT Alfred P. Sloan School of Management, To: Seniors, Re: Copy of MIT's response to *Business Week* survey of executive education programs, March 25, 1992

6. Evaluation Questionnaire, MIT Program for Senior Executives, Spring 1992
7. Brochure, Endicott House, undated
8. History of MIT Endicott House, undated
9. Bills for Endicott House calls, faxes, and laundry during Craig's stay, March-April 1992
10. Transparency with names on it, undated
11. Correspondence, From: Mark Craig, NASA, Lyndon B. Johnson Space Center, To: Aaron Cohen, Subject: MIT Senior Executive Program, January 15, 1993
12. Booklet, American Indians Today: Answers to Your Questions, 3rd ed., United States Department of the Interior, Bureau of Indian Affairs, Washington, DC, 1991
13. Birthday card to Craig, can't read signature, undated
14. MIT Certificate of Completion of the Program for Senior Executives (May 1, 1992)

Box 96 *Purdue – Undergraduate Text Books, 1957-1968*

Folder

1. Foster, A.R.; Wright, R.L., Jr. (1968). Basic Nuclear Engineering. Boston: Allyn and Bacon, Inc.
2. Kacser, C. (1967). Introduction to the special theory of Relativity. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
3. Beiser, A. (1967). Concepts of Modern Physics. New York: McGraw-Hill Book Company.
4. Dommasch, D.O.; Sherby, S.S.; Connolly, T.F. (4th ed.). (1967). Airplane Aerodynamics. New York: Pitman Publishing Corporation.
5. Halliday, D.; Resnick, R. (1966). Physics: Parts I and II. New York: John Wiley & Sons, Inc.
6. Golomb, M.; Shanks, M. (2nd ed.). (1965). Elements of Ordinary Differential Equations. New York: McGraw-Hill Book Company.
7. Van Wyle, G.J.; Sonntag, R.E. (1965). Fundamentals of Classical Thermodynamics. New York: John Wiley and Sons, Inc.
8. Munkres, J.R. (1964). Elementary Linear Algebra. Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.
9. Sutton, G.P. (1963). Rocket Propulsion Elements: An introduction to the engineering of rockets. New York, London: John Wiley & Sons.
10. Taylor, A.E. (1959). Calculus with Analytic Geometry. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
11. Liepmann, H.W.; Roshko, A. (1957). Elements of Gasdynamics. New York: John Wiley & Sons, Inc.

Box 97 *Purdue – Undergraduate Text Books, 1957-1968*

Folder
1. Halliday, D.; Resnick, R. (1966). Physics: Parts I and II. New York: John Wiley & Sons, Inc.
2. Golomb, M.; Shanks, M. (2nd ed.). (1965). Elements of Ordinary Differential Equations. New York: McGraw-Hill Book Company.
3. Van Wyle, G.J.; Sonntag, R.E. (1965). Fundamentals of Classical Thermodynamics. New York: John Wiley and Sons, Inc.

Box 98 *Purdue – Undergraduate Text Books, 1957-1968*

Folder
1. Munkres, J.R. (1964). Elementary Linear Algebra. Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.
2. Sutton, G.P. (1963). Rocket Propulsion Elements: An introduction to the engineering of rockets. New York, London: John Wiley & Sons.
3. Taylor, A.E. (1959). Calculus with Analytic Geometry. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
4. Liepmann, H.W.; Roshko, A. (1957). Elements of Gasdynamics. New York: John Wiley & Sons, Inc.

Box OS 99 ***Series 15.2*** *– Space Exploration History (Newspapers and Publications), and* ***Series 16.3*** *– Oversized Awards, 1960-2011*

Series 15.2 – Space Exploration History – Special Newspapers, 1969-2011
Item
1. *Houston Chronicle* – Commemorative Section, Above & Beyond (3 decades of flying the versatile space shuttle), July 2011
2. *Houston Chronicle* – 'Mission Complete, Houston' Atlantis rolls to a stop before dawn, signaling an end to both a near-perfect mission and to America's space shuttle program, Friday, July 22, 2011
3. *Houston Chronicle* – The Final Mission, Space Coast determined to keep smiling: Many remain optimistic despite predictions of economic demise, July 10, 2011
4. *Houston Chronicle* – One Last Leap: Atlantis rose through the clouds to reach the heavens, heralding the beginning of the end of America's shuttle program, Saturday, July 9, 2011
5. *The Daily News* – Galveston County – Shuttle summit focuses on safety, Wednesday, February 18, 2004 (just headlines, not entire issue)
6. *Houston Chronicle* – We mourn again – Special Report: What Happened? Sunday, February 2, 2003
7. *Houston Chronicle* – 'The Eagle has landed' 20 years after Apollo 11, Sunday, July 16, 1989

8. *Houston Chronicle* – NASA wants to blast off on manned flights to Mars, by Jerry Laws, Tuesday, December 20, 1988
9. *The Houston Post* – Bush's directive gives officials at NASA a sense of direction, by Glenn Nolan Lewis, Sunday, July 23, 1989
10. *Houston Chronicle* – Shuttle Tragedy: A Special Report, Wednesday, January 29, 1986
11. *Houston Chronicle* – Apollo Crewmen Found Free of 'Moon Germs,' Friday, July 25, 1969
12. *The Midland Reporter-Telegram* – Apollo 11 Swings About Moon, Sunday, July 20, 1969
13. *San Angelo Standard-Times* – West Texas Laser Target Part of Moon Landing Task, by Jean Gillette, Sunday, July 13, 1969

Series 15.2 – Space Exploration History – Special Publications, 1961-1994

Item

1. One Giant Leap for Mankind: Commemorating the 25th Anniversary of the First Lunar Walk, Introduction by Eugene Cernan, 1994
2. The First Lunar Landing: As Told by The Astronauts, 20th Anniversary, 1989
3. *Space News Round-up*, Lunar Landing 20th Anniversary Edition, July 14, 1989
4. *Space News Round-up*, HAIL COLUMBIA! The Way It Was, April 14, 1991
5. "Apollo," July 1974
6. *Life* Magazine, "Russia's Feat: Where it Leaves Us in the Race to the Moon," Volume 53, No. 8, August 24, 1962
7. *Life* Magazine, "19 Pages On Space: Inside Yuri's Capsule Celebration in Moscow Impact on Washington U.S. Space Future," Volume 50, No. 16, April 21, 1961

Series 16.3 – Oversized Awards, 1960-2011

Item

1. Program Manager's Commendation, "Flown onboard STS-135, this seal represents the discipline, dedication, courage, and tenacity of the thousands who helped write the history of human spaceflight through more than 30 years of the Space Shuttle Program, from the SSP Manager, August 2011
2. Johnson Space Center, Space Systems Engineering Development Program, In Appreciation for Service in Developing Systems Engineering Leadership at JSC, May 2010
3. Certificate of Appreciation, NASA Office of Space Flight, in recognition of dedicated efforts and professionalism in developing NASA's 2001 Human Exploration and Development of Space Strategic Plan
4. "The President of the United States of America has conferred on Mark K. Craig the rank of Meritorious Executive in the Senior Executive Service for sustained superior accomplishment in management of programs of the United States of America," 1999

5. American Astronautical Society, Elected as Senior Member, July 20, 1995
6. "The President of the United States of America has conferred on Mark King Craig the rank of Meritorious Executive in the Senior Executive Service for sustained superior accomplishment in management of programs of the United States of America," 1994
7. NASA Group Achievement Award for Strategic Planning Team, May 19, 1994 (2)
8. Apollo 11 25th Anniversary flag flown aboard the Orbiter "Columbia" STS-65, July 8-23, 1994 in commemoration of America's first Lunar Landing Mission
9. NASA Medal of Outstanding Leadership, March 1992
10. NASA, Senior Executive Service of the United States of America, November 18, 1990
11. NASA Superior Accomplishment Award for Special Act or Service, October 9, 1990
12. NASA Exceptional Service Medal, June 1990
13. NASA Group achievement Award to Space Station Critical Evaluation Task Force, November 5, 1986
14. NASA Group achievement Award, Space Station Task Force, October 16, 1984
15. "In appreciation for the contributions made to the Space Station Task Force, NASA Headquarters – This flag was flown aboard the first U.S. " Station," the Skylab, launched from Kennedy Space Center on May 14, 1973," presented to Craig January 25, 1984
16. Space Station Task Force Concept Development Group, "A Moment with Kings," May 1983-April 1984
17. NASA Exceptional Service Medal, Space Shuttle Program leading the Solid Rocket Booster Separation Integration activities for the Space Shuttle vehicles, August 14, 1981
18. American Institute of Aeronautics and Astronautics, Associate Fellow, April 1981
19. Certificate to Commemorate Mankind's First Landing on the Moon, signed by President Jimmy Carter, July 17, 1979
20. Certificate of Appreciation, American Astronautical Society, for outstanding participation and support during this 25th Anniversary Meeting at Houston, Texas, November 2, 1978
21. Certificate, The Society of Interplanetary Free Floaters, Honorary Membership, August 2, 1978
22. ALT Award, in appreciation for contribution to the successful ALT flights of the space shuttle orbiter "Enterprise," 1977
23. ASTP Award, "The crews of the Apollo Soyuz Test Project are pleased to present you with this medallion in appreciation of your contribution to the success of the first international manned space mission July 15-24, 1975
24. NASA Group Achievement Award, Lyndon B. Johnson Space

Center, in support of Skylab program, April 15, 1974
25. Internationalis Astronautica Academia, MCMLX
26. Small poster of Space Shuttle, undated