

**PRELIMINARY INVENTORY OF THE  
RECORDS OF THE  
LYNDON B. JOHNSON SPACE CENTER**



**Record Group 255**

**Records of the  
National Aeronautics  
and  
Space Administration**

**National Archives-Southwest Region**

**Fort Worth, Texas**

**Compiled by Kent Carter  
December 15, 2018**

# CONTENTS

<b>RECORDS OF THE LYNDON B. JOHNSON SPACE CENTER.....</b>	<b>1</b>
<b>RECORDS OF THE SPACE TASK GROUP.....</b>	<b>2</b>
<b>RECORDS OF THE OFFICE OF THE DIRECTOR.....</b>	<b>3</b>
<b>RECORDS OF THE PUBLIC AFFAIRS OFFICE.....</b>	<b>7</b>
<b>RECORDS OF THE HISTORY OFFICE.....</b>	<b>8</b>
<b>RECORDS OF THE ADVANCED MISSIONS PROGRAM OFFICE (HA).....</b>	<b>11</b>
<b>TECHNICAL PLANNING OFFICE (AT).....</b>	<b>12</b>
<b>NEW INITIATIVES OFFICE (IA).....</b>	<b>13</b>
<b>RECORDS OF THE ADMINISTRATION DIRECTORATE.....</b>	<b>14</b>
Procurement Division (BD).....	14
Program Procurement Division (BC).....	15
Space Station Procurement Division (BF).....	15
Administrative Services Division.....	15
Management Services Division.....	16
Publications Branch.....	16
Communications Services Branch.....	16
Facilities Division.....	17
Program Control Office.....	17
Management Analysis Office (BE).....	17
Personnel Division (BP).....	19
Program Support Division (BT).....	19
Photographic Technology Lab.....	20
Program Operations Office (Wa).....	20
Safety, Reliability And Quality Assurance Office.....	21
<b>FLIGHT CREW OPERATIONS DIRECTORATE.....</b>	<b>23</b>
Crew Support Division.....	26
Crew Training And Procedures Division (CG).....	28
<b>FLIGHT/MISSION OPERATIONS DIRECTORATE (CA).....</b>	<b>30</b>
<b>RECORDS OF THE ENGINEERING AND DEVELOPMENT DIRECTORATE (EA).....</b>	<b>35</b>
Assistant Director For Advanced Planning And Design (EA).....	35
Director Of Engineering (EA).....	36
Advanced Spacecraft Technology Division.....	37
Crew Systems Division.....	37
Laboratory Operations Office.....	44
Experiment Systems Division.....	44
Chemical and Mechanical Systems Division.....	49
Landing Technology Branch.....	50
Computation and Analysis Division.....	50
Engineering and Analysis Division (EX).....	51
Advanced Programs Office (ED).....	53
Instrumentation And Electronic Systems Division (EE).....	54
Structures And Mechanics Division (ES).....	54
Systems Engineering Division (ET).....	55
Spacecraft Design Division (EW).....	55

Energy Systems Division (EP).....	56
Thermochemical Test Branch.....	56
Battery and Pyrotechnics Branch.....	57
Project Support Branch (EP2).....	57
<b>EARTH RESOURCES PROGRAM OFFICE (HA).....</b>	<b>58</b>
<b>RECORDS OF THE DATA SYSTEMS AND ANALYSIS DIRECTORATE (FA).....</b>	<b>59</b>
Mission Planning and Analysis Division.....	59
<b>SCIENCE AND APPLICATIONS DIRECTORATE (TA).....</b>	<b>60</b>
<b>LUNAR RECEIVING LABORATORY PROGRAM OFFICE.....</b>	<b>62</b>
<b>LIFE SCIENCES DIRECTORATE (DA).....</b>	<b>63</b>
<b>MERCURY PROJECT OFFICE.....</b>	<b>64</b>
<b>GEMINI PROGRAM OFFICE.....</b>	<b>67</b>
<b>APOLLO SPACECRAFT PROGRAM OFFICE (PA).....</b>	<b>73</b>
<b>APOLLO-SOYUZ TEST PROJECT OFFICE.....</b>	<b>85</b>
<b>APOLLO APPLICATIONS (SKYLAB) PROGRAM OFFICE (KA).....</b>	<b>88</b>
<b>SPACE SHUTTLE PROGRAM OFFICE.....</b>	<b>92</b>
Orbiter Project Office (MA).....	96
Space Station Program Office (KA).....	99
<b>MARSHALL SPACE FLIGHT CENTER.....</b>	<b>101</b>
<b>JOHN F. KENNEDY SPACE CENTER.....</b>	<b>102</b>
<b>LANGLEY RESEARCH CENTER.....</b>	<b>102</b>
Records Relating to Tracking and Ground Instrumentation.....	102
<b>APPENDIX A.....</b>	<b>104</b>
<b>APPENDIX B.....</b>	<b>105</b>
<b>APPENDIX C.....</b>	<b>107</b>
<b>APPENDIX C-1.....</b>	<b>123</b>
<b>APPENDIX C-2.....</b>	<b>126</b>
<b>APPENDIX D.....</b>	<b>127</b>
<b>APPENDIX E.....</b>	<b>128</b>
<b>INDEX.....</b>	<b>129</b>

## RECORDS OF THE LYNDON B. JOHNSON SPACE CENTER

On November 5, 1958, a Space Task Group (STG) under Robert R. Gilruth was formed at NASA's Langley Research Center in Virginia to plan and implement a project to put a man in space (Project Mercury). In September 1961, NASA selected Houston as the site for a new facility and the STG was redesignated the Manned Spacecraft Center in November. The staff began moving into rented space in the Houston area in October 1962 and occupied the first permanent facilities at the Clear Lake site in February 1964. The Manned Spacecraft Center was renamed the Lyndon B. Johnson Space Center (JSC) in February 1973.<sup>1</sup>

The Johnson Space Center is one of nine major NASA field installations. It has been responsible for developing the Gemini spacecraft, the Apollo command and service module, the lunar excursion module, the modified command and service modules used in Skylab and the Apollo-Soyuz Test Project, and the Space Shuttle Orbiter. It has also been responsible for the selection and training of astronauts, the operation of manned flights, the development and integration of space flight experiments, studies of applications of space technology, and research in medical and space science.

The organizational structure of the Johnson Space Center has undergone numerous changes since 1961, but the basic pattern of offices responsible for specific projects supported by technical offices and administrative support offices remained fairly constant. Dr. Gilruth described the first organization as a “hardware development team ... responsible for conceiving the plan (for Project Mercury), writing the specifications for it, and conducting the exercise with industry to get bids and select contractors ...the operations team which set up the method of operation and implemented it ...(and) the crew systems element responsible for selecting and training astronauts.”<sup>2</sup> When President Kennedy announced the decision to undertake a moon-landing program, “the organization went from a single project organization for Mercury to a multiple project organization... We organized in the usual straightforward fashion. We simply instituted project offices and we tried to keep the project offices small, and drawing needed institutional support from other elements of the Center such as in the flight crew area, flight operations, basic engineering and science.”

The official history of JSC notes that “office designations and work assignments tended to be very fluid and amorphous during the early years.”<sup>3</sup> The following inventory attempts to describe the records by the basic organizational unit that created them and notes changes of official title or major responsibilities in brief unit descriptions. The official issuances of JSC

---

<sup>1</sup> See Henry C. Dethloff, Suddenly Tomorrow Came...A History of the Johnson Space Center, NASA SP-4307, Washington, 1993. The best source for administrative history is the "Issuance Case Files" (entry 135 in this inventory) which include organization charts and functional statements.

<sup>2</sup> See Entry 69B “project Files” of the JSC History Office which contains interviews with Gilruth and a draft history of the Manned Spacecraft Center.

<sup>3</sup> Dethloff, p.61

contain detailed functional descriptions and organizational charts and they are the best source of information about any specific unit.<sup>4</sup>

This inventory describes more than 8,600 cubic feet of records transferred to the legal custody of the National Archives-Southwest Region by NASA. Frustrated NASA employees allegedly complained that no booster rocket could be launched until the weight of the paper documentation equaled the weight of the machine and the NASA would reach the moon by stacking paper. The 8,600 cubic feet of records described in this inventory only weighs approximately 430,000 pounds which is much less than the weight of the Saturn V (6,487,354), but the 730 feet of Apollo Spacecraft Program Office files is approximately twice the height of the 363 foot rocket stack. It should also be noted that the volume of records expanded significantly with each new program. There are approximately 67 feet for Mercury, 201 feet for Gemini, 730 feet for Apollo, with a yet to be determined amount for the Shuttle.

## RECORDS OF THE SPACE TASK GROUP

In November 1958, a Space Task Group (STG) was established at the Langley Research Center in Virginia to work on the manned satellite plan that became known as Project Mercury. The STG was restructured and re-designated the Manned Spacecraft Center (MSC) in November 1961 and began moving to a new site at Clear Lake, Texas. By July 1962, all MSC activities had relocated to temporary sites in the Houston area. The move to permanent facilities in Clear Lake was completed by February 1964.

*NOTE: Unused E#'s have been reserved for future use.*

### **E.5. TECHNICAL DRAWINGS.**

#### **1959-1963. Approx. 1,000 items**

Arranged numerically 510005 to 540025 and 100000 to 101396 with gaps). No list of drawings has been located.

Originals and copies of drawings prepared by the Space Task Group in various sizes and scales. The drawings are of various test, training, and flight hardware assemblies and sub-assemblies. Some of the drawings are labeled "Man in Space" or "Apollo R&D." (Old acc# 67A292 and 71A211) **ARC ID 559940**

**B-35-28 1 to 6**

### **E.10. RECORDS CONCERNING RELOCATION.**

#### **1961-1962. .25 in.**

Arranged chronologically.

Memorandums, studies, reports, guides and press releases that document planning for the move of the STG to Clear Lake. The records include an undated proposed plan for the new facility, a relocation plan, a press release about the move, a staffing pattern for Project Mercury, a home purchase guide for the Houston area, a study on relocation costs, and several memorandums written by STG Director Robert R. Gilruth. The Manned Space Flight Laboratory

---

<sup>4</sup> See entry 135.

and the Manned Space Exploration Center were designations for the facility that were used during the move planning. (Transferred from DC under NN3-255-89-1) **ARC ID 559941**

**A-31-84-1**

## **RECORDS OF THE OFFICE OF THE DIRECTOR**

### **E.15. SUBJECT FILES.**

**1958-78. 32 ft.**

Arranged in chronological segments (1958-1962 and thereafter yearly). Prior to 1965, the records are arranged within each segment by subject in accordance with a numerical filing plan (SP1 to SP40, see Appendix A). Beginning in 1965, the records are arranged alphabetically by subject.

Correspondence, memoranda, telegrams, minutes of committee meetings and conferences, technical reports and studies, test results, public relations issuances, and various narrative and statistical reports relating to the planning and conduct of manned space flight operations including projects Mercury, Gemini, Apollo, Skylab, and the Space Shuttle. The records also relate to administrative operations including budgets, construction and repair of buildings, procurement, personnel, and public relations. There is a great deal of material about the establishment of NASA and the move of the Space Task Group from Langley, Virginia to the Manned Spacecraft Center in Houston, Texas and the planning for early manned space flight programs and the selection and training of astronauts. Much of the correspondence is between Dr. Robert Gilruth and various NASA officials and business executives. (Old acc#71ABCD990, 72A1364, 75A891, 75A1282, 84-1, and 87-12) **ARC ID 559934**

**A-31-084-1**

### **E.15A. CENTRAL PROGRAM SUBJECT FILES.**

**1973-76. 6 ft.**

Arranged in yearly segments and thereunder by the following subject headings: Communications & Instrumentation, Change Control Board, Crew Systems, Electrical Power Systems, Environmental Control Systems, Experiments, Flight Operations, Ground Support Equipment, Launch and Landing Operations, Logistics, Navigation & Guidance, Program Management, Propulsion Systems, Reliability, Research, Reviews, Stabilization and Control, Structural Systems, Systems Engineering, Tests, Training and Trainers, Technical Information, and Working Groups.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, management plans, technical studies and reports, activity and progress reports, surveys, audits, specifications, requirements, engineering studies, proposals, cost reports, schedules, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to Management Council activity, contract negotiation and administration, budgets and funding, design and development of hardware, testing and acceptance of equipment, mission planning, facilities, property, equipment, and general administrative matters. The records relate to all flight programs. There are numerous annotated drafts of procedures and other mission documents. This appears to be a continuation of the files described in entry 205T5 for material that was not placed in specific project correspondence files. (Old acc# 76A275, 77A43, and 79A26) **ARC ID 559938**

**A-31-78-5**

### **E.16. CENTRAL CORRESPONDENCE FILES.**

**1977-1986. 60 ft.**

Arranged in yearly segments and then in groups: General, Headquarters, Incoming, and Outgoing. Within the General group, records are arranged alphabetically by subject and thereunder chronologically. With the other groups, records are arranged by the organizational unit or external group that generated the correspondence and thereunder chronologically.

Copies of letters sent and some letters received that were maintained by the Correspondence Control Section in accordance with JSCI 1551. The correspondence relates to all phases of Center activities including administration, congressional relations, personnel, procurement, and manned space flight programs including the Space Shuttle (see also E.315) and Space Station. (Old acc# 81-51, 87-12, 89-21, 89-28, 89-42, 93-69, 93-70, and 93-71, and 97-41) **ARC ID 559939**

**A-31-86-1 and A-29-98-1**

**E.16A. CENTRAL CORRESPONDENCE FILES.**

**1987-1991. 184 ft.**

Arranged in yearly segments, thereunder in two groups (to and from the JSC Director and JSC organizations and to and from Space Station and Space Shuttle Program Offices), and thereunder by a document control number (D for Directors and P for Program Offices) assigned in roughly chronologically order by date of receipt of the incoming letter. Beginning in 1991, the Director's files (D documents) are arranged by Primary Subject Management Codes (1000=Organization and Administrative, 2000=Legal and Technical, 3000=Personnel, 4000=Property and Supply, 5000=Industry Relations and Procurement, 6000=Transportation, 7000=Program Formulation, 8000=Program Management, 9000=Financial Management, 9900=Audits and Investigations) and thereunder by document control number.

Copies of incoming and outgoing correspondence to and from the JSC Center Director, Senior Staff Offices, the Space Shuttle Program Office, and the Space Station Program Office. The Director's correspondence relates to general administration, budget and financial administration, public affairs, legal affairs, Congressional relations, business management, human resources and education, hardware design and development, mission operations, flight crew operations, and seminars and meetings hosted by NASA or private industry. The Shuttle/Space Station correspondence relates to Rockwell and McDonnell Douglas operations, communications and instruments, Configuration Control Boards, flight operations, launch and landing operations, logistics, mission information subsystems, payloads, program management, propulsion, reliability, reviews, the Space Transportation System, training and trainers, technical information, and Program Review Control Boards. The records for 1991 include General Management Status Reviews, Weekly Activity Reports, Month-in-Review, Legislative Activities Reports, Space Shuttle Weekly Reports, Safety Certification Memos, and Program Review Change Board reports. These records were maintained by the Correspondence Section (BT55) of the Information Systems Directorate (BA/GA). It appears that the Correspondence Section maintained a database for this correspondence. Similar records for the period prior to 1987 are described in entry 16, 310, and 400. (Old acc# 98-1, 98-10, 98-24, 98-35, 98-43, 98-70, 99-6, 99-18, 99-25, 99-30) **ARC ID 559929**

**A-29-100-1 (boxes 1-179) and A-30-86-2-4 (boxes 180-end)**

**E.20. REFERENCE FILES OF THE SPECIAL ASSISTANT.**

**1958-1964. 15 ft.**

Arranged in chronological segments (1958-62, 1963, and 1964). Within each segment the records are arranged by subject in accordance with a numerical system (SS1 to SS56, see Appendix B).

Correspondence, memoranda, telegrams, technical narrative reports, technical studies and test reports, plans and proposals, submissions by contractors, data presented to Congressional hearings, and press releases. The bulk of the records relate to Project Mercury but include material on Gemini, Apollo, Dyna-Soar, the Manned Orbiting Lab, and various space stations. The records include material about astronaut selection and training (SS6.3). It appears that Paul E. Purser, Special Assistant to the Director, maintained the records. (Old acc# 71ABCD990)

**ARC ID 559943**

**A-31-92-1**

**E.25. SECURITY CLASSIFIED REFERENCE FILES.**

**1958-1963. 13 ft.**

Arranged by subject in accordance with a numerical filing system (SO, SS, SP, AO, AP and AS designations-See Appendix A and B).

Correspondence, memoranda, telegrams, minutes of committee meetings and conferences, technical reports and studies, briefing papers, public relations issuances, and various narrative and statistical reports relating to the operation of the Center and the planning and conduct of manned space flight missions. The SS-42 files contain information about the Redstone, Atlas, and Saturn boosters and some records on the Polaris program, the Dyna-Soar program, and the X-15. These records are similar in content to the records described above but were maintained separately because they were security classified at the Confidential level (Almost all documents have been declassified by NND958312). (72B174) **ARC ID 559944**

**A-31-92-4 and V-02-016-7**

**E.30. MONTHLY ACTIVITY REPORTS.**

**Nov.1961- Jan.1965. 8 IN.**

Arranged chronologically.

Copies of narrative reports submitted to the Office of Manned Space Flight covering all Center activities and organizational units. (Old acc # 71A1237 and 73A768) **ARC ID 559945**

**A-31-76-2**

**E.35. WEEKLY ACTIVITY REPORTS TO THE OFFICE OF MANNED SPACE FLIGHT. 1962-1965. 1 ft.**

Arranged chronologically.

Copies of narrative reports on accomplishments and problems with projects Mercury, Gemini, and Apollo. The reports include information about significant meetings. (Old acc# 71A1237 and 73A768) **ARC ID 559925**

**A-31-76-2**

**E.37. QUARTERLY ACTIVITY REPORTS TO THE OFFICE OF MANNED SPACE FLIGHT. Jan. 1965 – April 1968**

Arranged chronologically.

Narrative copies of reports on all Center activities relating to manned space flight activities. (Old acc# 73A768) **ARC ID 559928**

**A-31-76-2**



**E.40. WEEKLY ACTIVITY REPORTS TO THE NASA ADMINISTRATOR.**

**1967-1970. 8 in.**

Arranged chronologically.

Copies of narrative reports on accomplishments, problems, and significant activities and meetings submitted to the Administrator through Brig. Gen. Julian H. Bowman (organizational code M-1). (Old acc# 73A768 and 74A1715) **ARC ID 559922**

**A-31-76-2**

**E.45. WEEKLY ACTIVITY REPORTS OF SUBORDINATE OFFICES**

**1967-1975. 9 ft.**

Arranged chronologically by date submitted and thereunder by office of origin.

Original signed narrative reports made to the Director by Program Office Managers, Directorates, and Staff Offices about activities and problems of "major significance". The reports relate to both general administrative matters and the planning and conduct of manned space flights including projects Apollo, Skylab, Apollo-Soyuz, and the Space Shuttle. There are generally reports by the Manager of the White Sands Test Facility in New Mexico and the Special Assistant for Engineering for the Manned Orbiting Laboratory (MOL). The requirement for the reports was issued on May 16, 1967. (Old ACC# 74A1715+75A891+75A1281+76A155) **ARC ID 559923**

**A-31-76-3**

**E.50. REFERENCE COPIES OF REPORTS.**

**1967-1971. 3 ft.**

Arranged in roughly chronological order by date of issue.

Copies of various management and technical reports issued by NASA for internal information or for presentation to Congress. The reports relate to general administration and manned space flight programs including projects Apollo, Skylab, and the Space Shuttle. (Old ACC# 75A891) **ARC ID 559924**

**A-31-76-5**

## **RECORDS OF THE PUBLIC AFFAIRS OFFICE**

Col. John "Shorty" Powers served as the first Public Affairs Officer for STG and then MSC. He was replaced in September 1963 by Paul Haney who was subsequently replaced by Brian Duff. The Public Affairs Office (AP) was established on November 28, 1966 (MSCI 1132.1) with responsibility for planning, directing, organizing, and coordinating all public affairs activities. Howard Gibbons became head of Public Affairs on June 15, 1971 (MSCA 71-31 and 71-95).

**E.55. INDUSTRIAL INFORMATION RELEASE CLEARANCES.**

**1962-66. 13 ft**

Arranged in chronological segments and thereunder alphabetically by the first letter of the name of the company requesting the clearance.

Original correspondence and TWX's received from companies requesting permission to use information about NASA programs in advertising, press releases, or articles for publication. The records include copies of NASA's response and various internal forms documenting review, concurrence, and approval. The records relate primarily to projects Mercury and Gemini but include material on most activities of the manned space program. Many of the submissions include photographs produced either by the private companies or NASA. (Old acc# 71A1310 and 71B1176) **ARC ID 559942**

**A-31-094-4**

**E.60. REFERENCE FILES ON PROJECT MERCURY PRESS OPERATIONS.**

**1962-65. 2 ft.**

Arranged by flight and thereunder by type of document.

Original news releases, fact sheets, transcripts of pre and post-flight press conferences, pilot reports, public information operating plans, press releases issued by both private companies and NASA, releases issued to pool reporters, and some final mission reports ("Blue Books"). The records include some official NASA photos and photos submitted by private companies. The records were maintained by the Public Affairs Officer and cover every Mercury flight and the Little Joe and Big Joe launches. (Old acc# 71A1310) **ARC ID 559998**

**A-31-094-6**

**E.65. MOTION PICTURE PRODUCTION CASE FILES.**

**1961-1973. 18 Ft.**

Arranged in two segments (MSC and CL) and thereunder by fiscal year and thereunder numerically by project number.

Written scripts, cost estimates, film specifications, production schedules, work requests, and correspondence relating to the production of films on various missions including projects Mercury, Gemini, and Apollo. There are some brief biographical sketches of astronauts. (Old acc# 71A993, 72AB852, 73A1241, 75A896, and 75A1642) **ARC ID 559999**

**A-26-004-5**

**E. 66. POSTERS.**

**1994-2000. 2 in.**

Arranged by poster number. Listing of the posters is available in Appendix F.

Color posters produced internally by the Johnson Space Center or for NASA by United States Geological Survey, ATK Aliant Techsystems/Thikol Propulsion, or United Features Syndicate. **ARC ID 560000**

**A-35-2-11**

## **RECORDS OF THE HISTORY OFFICE**

The History Office was established to collect, maintain, and describe materials generated by the Johnson Space Center; to conduct research for NASA civil servants and contractors; and to support the writing of histories of NASA and the space program.

**E.69A. CORRESPONDENCE FILES.**

**1962-1987. 1 ft.**

Arranged chronologically.

Original letters received and copies of letters sent relating to various History Office projects. (Old acc# 94-0002) **ARC ID 560001**

**A-20-76-6**

**E.69B. PROJECT FILES.**

**1959-1989. 5 ft.**

Arranged by subject. There is a list of folder titles in box 1.

Correspondence, memoranda, project proposals, plans, contracts, drafts, comments on drafts, progress reports, reviews, and other material related to the preparation of project histories and chronologies. The projects relate to Mercury, Gemini, Apollo, the Apollo-Soyuz Test Project, the Space Shuttle, the Space Station, and the Manned Spacecraft Center. There are some interviews with Dr. Robert Gilruth, photographs used as illustrations, and a draft of a history of MSC by Robert B. Merrifield. (Old acc# 94-0002) **ARC ID 560016**

**A-20-76-6**

**E.69C. OFFICE FILES OF EUGENE M. EMME.**

**1962-1979. 1 ft.**

Arranged by subject in accordance with a numerical file plan (10.1 to 11.1).

Correspondence, reports, drafts of publications, schedules of visits, minutes of NASA Historical Advisory Committee Meetings, outlines, project plans, and comments on drafts. Dr. Emme served as the first NASA Historian. (Old acc# 94-0002) **ARC ID 559946**

**A-20-76-7**

**E.69E. NACA TECHNICAL NOTES. 1924-1958. 34 ft.**

Arranged by publication number (189 to 4399 with gaps) assigned in roughly chronological order by date of publication.

Copies of published Technical Notes resulting from research conducted by NACA labs and universities. The topics covered by the notes include aircraft stability, aerodynamics, air foils, aircraft heaters, aircraft engines, icing and de-icing, airboats, autopilots, wind tunnels, fuels, alloys, wings, airplane stress and fatigue, nozzles, mach speeds, effects of changing temperatures, blades, propellers, turbulence, missiles and rockets. The records were maintained by the Technical Library and include 16-millimeter microfilm camera negatives. (Direct offer). **ARC ID 562750**

**B-19-36-5**

**E.69E1. NASA TECHNICAL NOTES. 1959-1963. 6 ft.**

Arranged by publication number (D6 to D1203 with gaps) assigned in roughly chronological order by date of publication.

Copies of published Technical Notes resulting from research conducted by NASA labs and universities. The topics covered by the notes include aircraft stability, aerodynamics, air foils, aircraft engines, wind tunnels, fuels, alloys, wings, metal stress and fatigue, rocket nozzles, mach speeds, effects of changing temperatures, blades, propellers, turbulence, missiles and rockets. The records were maintained by the Technical Library and include 16-millimeter microfilm camera negatives. (Direct offer). **ARC ID 562774**

**B-19-32-7**

**E.69H. NACA TECHNICAL MEMOS. 1921-1958. 10 ft.**

Arranged by memo number (44 to 1441 with gaps).

Copies of published reprints or translations of foreign aeronautical research reports. These Technical Memos were printed as a means of further disseminating aeronautical research information. Subjects covered by the memos include airfoils, aircraft engines, propellers, air flow, lift, aerodynamics, wind tunnels, turbulence, and aerial navigation. The records were maintained

by the Technical Library and include 16-millimeter microfilm camera negatives. (Direct offer)  
**ARC ID 562777**  
**B-19-32-5**

**E.69H1. NASA TECHNICAL TRANSLATIONS. 1959-1962. 1 ft.**

Arranged by report number (F1 to F102 with gaps).

Copies of published reprints or translations of foreign aeronautical and aerospace research reports. These translations were printed as a means of further disseminating aeronautical research information. The majority of the articles were translated from Russian and were written from 1954 to 1961. There is a translation of one German article, "The Attainability of Heavenly Bodies" written by Walter Hohmann in 1925. Subjects covered by the memos include spacecraft design and propulsion, aerodynamics, cosmic rays, meteor and meteorites, upper atmosphere, hypersonic speeds, Mars, orbital mechanics, ramjet engines, satellites, wind tunnels, and astronomical experiments and observations. The records were maintained by the Technical Library and include 16-millimeter microfilm camera negatives. (Direct offer) **ARC ID 562779**

**B-19-34-2**

**E.69K. NACA RESEARCH MEMORANDUM. 1946-1958. 35 ft.**

Arranged by an alpha-numeric control number which indicates the laboratory of origin, year of publication, and report number (A6G22 to L58K19 with gaps).

Published research memorandums prepared by Ames Laboratory (A and SA), Lewis Flight Propulsion Laboratory (E), Langley Memorial Aeronautical Laboratory (L and SL), the High Speed Flight Station at Edwards Air Force Base (H), and various universities and contractors (W). Subjects covered by the memorandum include wings, airfoils, tails, longitudinal and lateral stability, wind tunnels, engines, jet propulsion, exhaust nozzles, mach speeds, experimental aircraft in the X series and the Douglas D-558-II, propellers, simulated airplane skins, after burners, rotor blades, supersonic speeds, fuselage, rolling performance, lateral motion, flight measurements, delta wings, ram jets, missiles, vertical lift, vibration, spins, and stalls. Contractors and universities preparing memorandum include Lockheed Aircraft Corporation, United Aircraft Corporation, Hamilton Standard Propeller Division, Aluminum Company of America, the U.S. Forest Products Laboratory, the National Bureau of Standards, Johns Hopkins, Purdue, Massachusetts Institute of Technology, and the University of Michigan. Many of these memorandum were originally security classified but were subsequently declassified. The records were maintained by the Technical Library and include 16-millimeter microfilm camera negatives. (Direct offer). **ARC ID 562780**

**B-19-30-1**

**E.69K1. NASA RESEARCH MEMORANDUM. 1958-1960. 3 ft.**

Arranged by an alphanumeric control number which indicates the laboratory of origin, year of publication, and report number (1-3-59L to 12-30-58L with gaps).

Published research memorandums prepared by Ames Laboratory (A), Lewis Flight Propulsion Laboratory (E), Langley Memorial Aeronautical Laboratory (L), the High Speed Flight Station at Edwards Air Force Base (H), and various universities and contractors (W). Subjects covered by the memorandum include wings, airfoils, longitudinal and lateral stability, wind tunnels, engines, jet propulsion, exhaust nozzles, mach speeds, supersonic speeds, fuselage design, flight measurements, ram jets, missiles, vibration, spins, and stalls. Contractors and universities preparing memorandum include Convair, Johns Hopkins, and the Massachusetts

Institute of Technology. Some of these memorandums were originally security classified but were subsequently declassified. The records were maintained by the Technical Library and include 16-millimeter microfilm camera negatives. (Direct offer). **ARC ID 562791**

**B-19-34-2**

**E.69M. NACA TECHNICAL REPORTS. 1919-1958. 8 ft.**

Arranged by report number (48 to 1392 with gaps).

Copies of published reports on aeronautical research printed by the Government Printing Office and sold to the public in an effort to disseminate research information. Subjects covered include meteorology, air speed, nozzles, airplane wing beams, aluminum alloys, airplane performance, propellers, wind tunnels, speed instruments, landing gear, supersonic and subsonic air flow, airfoils, and rotors. The records were maintained by the Technical Library and include 16-millimeter microfilm camera negatives. (Direct offer). **ARC ID 562792**

**B-19-32-3**

**E.69M1. NASA TECHNICAL REPORTS. 1959-1961. 1 ft.**

Arranged by report number (R1 to R98 with gaps).

Copies of published reports on aeronautical and aerospace research prepared by the Lewis, Langley, and Ames NASA Labs and universities. Subjects covered include meteorology, air speed, nozzles, airplane wing beams, aluminum alloys, airplane performance, propellers, wind tunnels, speed instruments, landing gear, supersonic and subsonic air flow, airfoils, and rotors. The records were maintained by the Technical Library and include 16 millimeter microfilm camera negatives. (Direct offer). **ARC ID 562793**

**B-19-34-2**

**E.70. SOURCE FILES ON PROJECT MERCURY.  
1952-1968. 39 ft.**

Arranged by "sub-series" established by the History Office and thereunder chronologically or by subject. See Appendix D for a detailed list of folder titles. The bulk of the records cover the period 1960-1963.

Correspondence, memoranda, TWX's, minutes, reports, drawings, draft and final versions of publications, procedures, press releases, reports on press conferences, photographic prints and slides, and audio tapes. This material was collected by the History Office for researching and writing the Mercury chronology and history and includes records from various sources including the Public Affairs Office. These records were formerly deposited with Rice University. (7NS94-27) **ARC ID 559948**

**A-20-62-1 and B-35-41-17 for drawings**

**E.75. SOURCE FILES ON PROJECT GEMINI.  
1958-1974. 94 ft.**

Arranged by "sub-series" established by the History Office and thereunder generally chronologically or by subject. See Appendix E for a detailed list of folder titles. The bulk of the records cover the period 1962-1966.

Correspondence, memoranda, TWX's, minutes, reports, drawings, design notes, draft and final versions of publications, flight plans and other mission documents flown on missions, records of press conferences, air-to-ground transcripts, crew debriefing transcripts, photographic prints and slides, movie film, audio tapes. This material was collected by the History Office from numerous sources for researching and writing the Gemini chronology and history and includes

records of the Gemini Program Office, the Experiments Program Office, and various contractors. These records were formerly deposited with Rice University. (7NS94-28) **ARC ID 559951**  
**A-20-64-3**

## **RECORDS OF THE ADVANCED MISSIONS PROGRAM OFFICE (HA)**

This office was established on April 10, 1969 (MSCI 1136.1 and MSCA 69-57) with responsibility for planning, coordination, and direction of all aspects of advanced programs beyond Apollo and Apollo Applications including the direction and/or coordination with other elements of the MSC, other NASA Centers, NASA Headquarters, Department of Defense, and contractors. The advanced missions study included the Lunar Exploration Program, Earth Orbital Space Station and Logistics Systems, and unmanned planetary programs. John D. Hodge was the Program Office Manager.

In 1973 the office was renamed the Program Planning Office and transferred to a new Future Programs Division, under Jerome B. Hammack, in the Engineering and Development Directorate (MSC Announcement 72-25). It was subsequently transferred to the Technical Planning Office (AT) renamed the Advanced Programs Office. Advanced planning was eventually elevated to program office level with the creation of a New Initiatives Office in 1986. It was headed by William Huffstetler, who reported directly to the JSC Director. The New Initiatives Office was abolished in 1993.

### **E.80. PRESENTATIONS AND BRIEFINGS.**

**1969-1970. 1 ft.**

Arranged by subject. There is a list of folder titles.

Copies of briefings and presentations made to MSC and NASA Headquarters management on mission plans, advanced operating plan budget requirements, space station program plans, MSC integrated technology and applied system development plans, and Space Shuttle Program strategy planning. There are also some presentations on the Space Technology Planning Panel, long range Lunar Program Plans, the Space Tug, the Supersonic Transport, and the roles and missions of the MSC. R. Wayne Young, manager of Program Control and Contracts, maintained these copies. (75A910). **ARC ID 559952**

**A-30-04-5**

### **E.85. SUBJECT FILES OF JOSEPH P. LOFTUS, JR.**

**1968-1969. 1 ft.**

Arranged by subject.

Correspondence, memoranda, narrative reports, and originals of handouts and charts used at various presentations and program reviews given for upper level management. The records were maintained primarily by John D. Hodge and J. P. Loftus and relate to post-Apollo programs and the Lunar Exploration Program. There are some handwritten notes about the design of the Apollo Command Module which appear to have been generated as part of the investigation of the Apollo 204 fire in 1967. (Old ACC# 73A739) **ARC ID 559955**

**A-31-090-1**

## TECHNICAL PLANNING OFFICE (AT)

The Technical Planning Office was abolished April 13, 1983 (see announcement 1130.1Y).

### **E.90. SUBJECT FILES.**

**1970-1982. 19 ft.**

Arranged in yearly segments and thereunder by subject.

Correspondence, memoranda, technical and project reports and studies, project proposals, technical manuals, budget and funding data, and internal NASA and Congressional program reviews. There are briefings and presentations made to the American Institute for Aeronautics and Astronautics and the Management Council of the Office of Aeronautics and Space Technology (OAST). There are some photographs primarily of hardware. The records relate primarily to space shuttle, life sciences, space stations and other earth orbital activities, and Skylab, space lab, and space tug. There is some material on Project Cyclops (search for extraterrestrial intelligent life). There are also records relating to JSC goals, objectives, organization and manpower and the use of NASA technology for non-space activities like power generation. The records also include material on the Space Advanced Research and Technology (SPART) study, Research and Technology Plans (RTOPS), Salyut, and Spacelab. The bulk of the correspondence is between Joseph P. Loftus (Manager, Technical Planning Office) and other NASA officials. (ACC#75A1457, 75A1638, 76A827, 77A66, 78A23, 78A72, 79A58, 81A38, and 85-34) **ARC ID 559933**

**A-31-90-1**

### **E.95. CORRESPONDENCE FILES ("READING FILE").**

**1972-1982. 8 in.**

Arranged chronologically.

Copies of letters and memos sent and copies of some memos received relating primarily to planning activities and the completion of research reports and studies. (81A38 and 85-34) **ARC ID 559935**

**A-31-90-4**

## NEW INITIATIVES OFFICE (IA)

The New Initiatives Office was established in 1986 under the direction of William Huffstetler. It was responsible for providing funding for studies of new ideas that were determined to have possible future use, either as a new program or as an improvement to an existing program, operation, and/or equipment. The studies were conducted by JSC employees or contractors. The office was abolished in 1993.

### **E.97. LIBRARY REFERENCE FILES.**

**1970-1986. 17 ft.**

Arranged by document control number. There is a list of document titles in box 1.

Printed reports, proposals, studies, and plans relating to cost histories of solar power satellites, Shuttle program, synthetic technology for avionics (ACESTA), satellite service systems, Orbiter vehicle production, Orbiter transfer vehicle, power extension packages, geosynchronous platform definition, solid rocket motors, external tank, and manned maneuvering units. Many of the documents were generated by contractors including Rockwell, General Dynamics, Boeing,

Grumman, Lockheed, Thiokol, Martin Marietta, and McDonnell Douglas. When the New Initiatives Office Library served as a cost history database for all manned space flight programs. When it was closed in 1993, these documents were selected for preservation by the Library staff as historically significant. (Old acc# 95-28). **ARC ID 559936**

**A-19-10-5**

## **RECORDS OF THE ADMINISTRATION DIRECTORATE**

Wesley J. Hjernevik joined the STG at Langley in March 1961 and was given control over administration and budget affairs. Dave Lang was recruited from the Air Force to handle procurement. After the move to Houston Hjernevik was designated Assistant Director for Administration with responsibility for a number of units working on personnel, procurement, safety, facilities, logistics, and technical and administrative services. The general practice was to assign administrative support people for budget and personnel activities to work directly for each of the Program Offices.

An Office of Assistant Director for Administration (BA) was established on November 1, 1963 as part of a major MSC reorganization. Hjernevik continued as Director and reported to the MSC Deputy Director, James C. Elms. The Office was designated the Administration Directorate on August 17, 1966 (MSCI 1146.1), with responsibility for planning, implementation, and continuing evaluation of the Center's financial, managerial, administrative, and technical support programs and services.

In 1973 the directorate was split into an Administration and Program Support Directorate (BA) under Philip H. Whitbeck responsible for business management in support of program offices and a Center Operations Directorate (WA) under Joseph V. Piland responsible for facilities and center support services MSC Announcement 71-18 and 71-21). From 1977 to 1983 it was designated the Administration and Program Support Directorate. On April 13, 1983 a Center Support Directorate (AG), a Directorate of Administrative Program Support (BA), and a Directorate of Center Operations (JA) were established (JSCI 1130.1Y).

### **Procurement Division (BD)**

The Procurement Division (BD) was established by MSCI 1146.3.

#### **E.100. CONTRACT ADMINISTRATION FILES.**

**1959-1974. 620 ft.**

Arranged by contract number and thereunder by type of document.

Correspondence, reports, pre-award data, basic contracts, supplemental agreements, revisions, Contract Change Amendments (CCA), Contract Change Proposals (CCP), program management plans, Contract Change Items (CI), Configuration Control Board Directives (CCBD), Technical Directives, and related documents created to award and administer contracts. The bulk of the records relate to NASA Contract 5-59 for Project Mercury with some for NAS 9-150 and NAS 9-170 which relate to Project Apollo and Skylab. There are also some records for contracts NAS9-6100, NAS9-10975 and NAS9-11275. NASA selected them for retention because they are precedent or unusual contracts. (Old ACC# 66A621, 68A1289, 70A225,



71A276, 71AB1328, 72A792, 73A760, 74A1734, 74A1735, 74A1737, 74B1737, 74D791, 75A19, 75A912, 76A801, 76A1398, 76A1416, 76A1443, 76A1464, 76AB1839, 77A16, 77A28, 79-12, 80-14, 84-22, 84-32, 84-43, 85-4, 87-50, 88-70, 88-71, 90-29, 90-30, 92-11, 98-52) **ARC ID 559759**

**B-17-69-7, B-20-28-6, B-25-68-5, B-27-66-1**

### **Program Procurement Division (BC)**

#### **E.101. ENGINEERING CHANGE CASE FILES.**

**1972-1975. 1 FT.**

Arranged by Change Control Board Directive number.

Correspondence, memoranda, change control staff summary reports, and other documents relating to changes to the Command and Service Module for Apollo, Skylab, and ASTP missions. The bulk of the correspondence is with contractors and relates to contract administration, payments, and acceptance of hardware. (Old acc# 76A2036) **ARC 562620**

**A-26-4-4**

### **Space Station Procurement Division (BF)**

This Division was responsible for Space Station Design, Development, Testing, and Evaluation (DDT&E).

#### **E.101S. PHASE B CONTRACT ADMINISTRATION FILES.**

**1984-1985. 3 ft.**

Arranged by contract number and thereunder by volume number. There is a list of folder titles in box 1.

Proposals, presentations, minutes, and contracts maintained on contracts with Rockwell (NAS9-17365), Lockheed (NAS9-17366), and McDonnell-Douglas (NAS9-17367) for Phase B definition and preliminary design work on the space station. (Old acc# 97-28). **ARC 562624**

**A-24-84-6**

### **Administrative Services Division**

#### **E.102. REFERENCE FILES.**

**1963. 1 FT.**

Arranged by subject.

Correspondence, reports, and operating instructions, maintained primarily by Roy C. Aldridge that relate to facilities, telephone service, and mail and files management. There is a copy of the master move plan to the Clear Lake site. (76A1519) **ARC 562653**

**A-26-4-1**

### **Management Services Division**

The Management Services Division was established by MSCI 1146.5.

## **Publications Branch**

### **E.105. PUBLICATIONS CASE FILES.**

**1962-70. 16 ft.**

Arranged by case number (S29 to S269 with gaps and TMX 58000 to TMX 58049).

Drafts, corrected copies, and final copies of NASA Technical Notes (TN D#), Technical Memoranda (TM X#), and Technical Reports (TR R#). These were published as part of the NASA Formal Series. The records include correspondence with various offices about review and approval, comments and replies, release approval forms, routing cards, and printing orders. (Old acc# 71A995 and 73A751) **ARC 562654**

**A-30-012-1**

### **E.106. NASA GENERAL WORKING PAPERS.**

**1962-1969. 2 ft.**

Arranged numerically (10,001 to 10,084) by a control number assigned in roughly chronological order by date of publication.

Copies of papers on a variety of technical subjects that relate to Mercury, Gemini, Apollo, Space Station, and general research. (Old acc# 72A781) **ARC 562655**

**A-30-12-3**

### **E.110. ARTICLES AND PRESENTATIONS.**

**1962-69. 13 ft.**

Arranged in yearly segments by date written and thereunder alphabetically by title.

Drafts and final copies of articles written by NASA staff for publication in technical journals or for presentation at meetings of various professional societies. The records include correspondence relating to the review and approval of the article, corrections, and routing cards documenting approval for release. Most of these articles are very technical in nature but there are some which discuss various space programs in general terms. (Old acc# 71A985, 72A193, 72A770) **ARC 562657**

**A-30-012-4**

## **Communications Services Branch**

### **E.115. RECORD SET OF FORMS.**

**1962-1987. 14 ft.**

Arranged in yearly segments and there under numerically by form number.

Printed copies of STG and MSC Forms. Most of the forms are annotated with the date they were superseded or became obsolete. There are some review and approval forms. (Old acc# 71A992, 71A1513, 73A752, 75A897, 77-38, 87-31, and 88-73) **ARC ID 562659**

**A-26-4-1**

## **Facilities Division**

### **E.120. CASE FILES ON LEASED SPACE.**

**1962-64. 4 FT.**

Arranged by building name.

Correspondence, copies of leases, exterior and interior photographs of buildings. NASA leased this space while the facilities at the Manned Spacecraft Center were being constructed. (Old acc# 71A1239)

**A-30-004-1**

### **Program Control Office**

#### **E.125. MANAGEMENT INFORMATION STUDY.**

**1965-68. 2 ft.**

Arranged by type of document.

Documents related to the award and execution of a contract with Lifson, Wilson, Ferguson, and Winick, Inc. to conduct a study to develop a system for evaluating the effectiveness of the operations of the Administrative Directorate. The study resulted in the establishment of the Administrative Management Performance Analysis Technique (AMPAT) System. The records include technical proposals, contract documents, narrative progress reports by the contractor, data collection forms, statistical reports about productivity, narrative studies of the work done by each component of the Administrative Directorate, and various charts, graphs, and computer printouts relating to the development of work standards and the measurement of performance. The AMPAT System was suspended on July 1, 1968. (Old acc# 71A1270)

**A-26-4-1**

### **Management Analysis Office (BE)**

This office (BE) was established by MSC1 1146.10 with responsibility for performance of organizational analyses, methods and procedures reviews, and various special studies for Center management. It administered the management issuance system, coordinated directives development, prepared and published manned space flight histories, and maintained historical archives.

#### **E.130. ANNOUNCEMENT CASE FILES.**

**1964-1988. 10 ft.**

Arranged numerically by announcement number (MSCA or JSCA) assigned chronologically by date issued. Most announcements for 1976-77 are missing.

Printed announcements that provide management information of a temporary or one-time nature. There is also some correspondence relating to the clearance and printing of the announcements. Announcements issued from 1961 to 1966 are included in entry 137. (76A1857, 78A38, 79A35, 83A33, 85A35, 86A12, 88A33, 89A32, 89A55, 90A11, 91A13)

**A-26-6-2**

**E.135. ISSUANCE CASE FILES.**

**1964-1988. 31 ft.**

Arranged numerically in accordance with the NASA directives system (MSCI and JSCI with some MSCM and JSCM). There is an index to the issuances.

Issuances and manuals that provide information of a general center wide interest and prescribe, establish, or define policy, organization, methods, procedures, or guidelines. The records include organizational charts, functional statements, and procedures. The records include correspondence and other documents relating to the approval and printing of the issuances. It appears that some of the records were microfilmed in 1982 and NASA retained the film. (76A1857, 78A38, 79A35, 83A33, 85A35, 86A12, 88A33, 89A32, 89A55, 90A11, 91A13)

**B-19-50-6-3**

**E.137. ISSUANCES.**

**1961-1966. 3 ft.**

Arranged by type of issuance and thereunder numerically.

Original Manned Spacecraft Center Management Manual Transmittals (1-359), one copy of the Management Manual Parts 1-42, MSC Announcements (1 to 66-190), and MSC Circulars (1-174). The manual issuances relate to administrative topics such travel, records management, data processing, procurement policies and functions. The announcements relate to very routine things such as United Fund Campaign, mail and messenger services, use of Christmas decorations, etc. (76A19)

**A-26-106-2**

**E.138. TELEPHONE DIRECTORIES.**

**1962-1996. 1 ft.**

Arranged chronologically.

Printed telephone directories. Names are arranged both by organizational unit and alphabetically. The directories were collected for reference purposes by the Information Services Division. (Old acc# 96-52).

**A-26-6-5**

**E.140. MANAGEMENT ANALYSIS STUDIES.**

**1961-1973. 14 ft.**

Arranged in yearly segments and thereunder numerically by case number assigned in chronological order by date study was started (61-1 to 73-9).

Original studies and supporting documents conducted on administrative topics such as personnel procedures, security, contracting, economic impact of Apollo programs, budget and procurement procedures, Gemini Summary Conference, and a study of the need for a Lunar Receiving Lab. There are also some studies on the management of science experiments and facilities, the Apollo Lunar Science Experiments Package (ALSEP), earth resources experiments, the management of Skylab, and the designation of the MSC as a historic site (72-17). Management Intern Thomas J. Hall may have used these files. (Old acc# 5A1383, 5A1384, 74A20).

**A-30-006-7**

**E.145. RECORDS RELATING TO UNIVERSITY RESEARCH PROGRAMS.**

**1967-1975. 6 ft.**

Arranged by subject.

Correspondence, memoranda, lists of participants, memoranda of agreement or understanding, and copies of research papers prepared under cooperative programs with universities administered by the staff of the Management Analysis Office. The records relate to the Visiting Faculty Appointments Program, the Resident Research Fellowship Program, and the NASA-ASEE (American Society for Engineering Education) Summer Faculty Program. There are studies of various management topics prepared by the Center for Management Studies and Analyses (CEMSA) of the University of Houston College of Business Administration. The bulk of the research papers relates to topics in public administration and management and includes budgeting, contracting, and personnel administration. (Old acc# 74A20, 75A1383, and 76A1713)

**A-30-008-4**

### **Personnel Division (BP)**

The Personnel Division (BP) was established by MSC1 1146.4B and later modified by JSCI 1133.1.

#### **E.150. RECORDS RELATING TO STUDIES OF PERSONNEL ADMINISTRATION.**

**1962-1969. 1 ft.**

Arranged by subject.

Copies of memoranda and narrative and statistical reports relating to various phases of personnel administration including position classification, Equal Employment Opportunities programs, Grievance programs, Merit Pay Plan, and Reductions in Force. There are also copies of briefing material prepared for various inspections by NASA Headquarters and the Civil Service Commission with follow up reports. There are copies of articles about personnel administration that appeared in "The Roundup" newspaper and some records relating to manpower projections. It appears that the Director of Personnel maintained the records for reference. (76A865)

**A-26-6-1**

### **Program Support Division (BT)**

#### **E.151. REFERENCE SUBJECT FILES.**

**1972-1979. 4 ft.**

Arranged by subject.

Correspondence, memoranda, and briefing materials prepared for presentations to Headquarters and JSC management. The presentations include Program Operating Plan Reviews, Obligation and Cost Plan reviews, STS Resources Reviews, and other reviews relating to ASTP Contingency Plans, Space Shuttle operations, payload integration, Shuttle user charges, and Spacelab. The records include budget and cost estimates and reports, schedules, and narrative reports and provide information about early Space Shuttle planning. (Old acc# 88-3)

**A-22-72-5**

#### **E.151E. REFERENCE COPIES OF PUBLISHED REPORTS.**

**1961-1973. 13 ft.**

Arranged by subject.

Copies of reports prepared by NASA and contractors relating to general program and resource management, cost estimating, and the status of Apollo, Shuttle, and other projects. The records include study guides and training materials for various Apollo systems and subsystems,

schedule and program reviews, performance and configuration specifications, contract effectiveness reviews, Lunar Module Performance and Interface Specifications, Reliability Program Plans, science experiment plans and briefings, Apollo Experience Reports, Saturn V Vehicle Systems Studies, Mars-Venus Manned Mission Studies, a study of unmanned docking in Mars orbit, and Earth Resources Program Reviews. There are a few items that relate to Mercury, Gemini, a Space Tug, and space stations. The reports were prepared by offices within the Manned Spacecraft Center, the Marshall Space Flight Center, the Kennedy Space Center, McDonnell-Douglas, Rocketdyne, North American Aviation, TRW, Boeing, Thiokol, Martin-Marietta, the Lockheed Missiles and Space Company, the Rand Corporation, and Booz-Allen Applied Research. It appears that the reports were maintained in the Technical Library and could be checked out by NASA staff. (78-18).

**A-26-5-5**

### **Photographic Technology Lab**

#### **E.153. SKYLAB IV ONBOARD MOTION PICTURE FILM OF EXPERIMENTS.**

##### **1973. 31 Cans.**

Arranged by magazine number.

Onboard 35mm 2nd generation master color positive transparencies of experiment A11; 16mm DAC film distribution of experiment A11; 16mm 2nd generation positive master EREP film of experiment S191; 35mm 2nd generation positive contact master black and white film of experiment A11; 2nd generation copy of Special Experiment Film of S056; 70mm Hasselblad 2nd generation positive master color film; and 16mm DAC motion picture contact master of experiment A11. (75A895).

**A-26-8-4**

### **Program Operations Office (Wa)**

The Program Operations Office was established on March 29, 1973 (JSCA 73-59) and Donald D. Arabian, formerly with PT, was designated to head it. The office included a Program Administrative Office (WB), an Integration Division (WC), and a Test Division (WT). The office was abolished April 13, 1983, and its functions were reassigned to program/project offices or line organizations.

#### **E.153F. INTEGRATION DIVISION PROJECT CASE FILES.**

##### **1973-1981. 40 ft.**

Arranged by project and thereunder chronologically.

Correspondence, memoranda, minutes and agenda, technical reports, Review Item Dispositions (RID), and briefing materials maintained by the Engineering Branch (WC2). The records relate to Preliminary Requirements Reviews, Preliminary Design Reviews, Critical Design Reviews, Configuration and Acceptance Reviews, Ascent System Design Reviews, Certification Reviews, Operations Conferences, Operations Planning Reviews, Systems Requirements Reviews (SRR), Review Item Dispositions (RID), and Flight Readiness Reviews for the Apollo-Soyuz Test Project (ASTP), Shuttle Training Aircraft, Shuttle Approach and Landing Tests, Orbiter Flight Testing, Return to Landing Site (RTL) studies, Orbiter Vehicle 101 and 102, an Orbiter Delta Design, the Shuttle Wide Body Advisory Group, and various Shuttle systems including the Shuttle Main Engine (SSME), External Tank, and Remote Manipulator System (RMS). Many of the documents are originals with signatures. (Old acc# 76A1715, 81-33).

**B-8-6-5**

**E.153H. MINUTES OF THE SPACELAB INTERFACE WORKING GROUP.**

**1977-1981. 8 in.**

Arranged chronologically.

Original signed agenda, minutes, Interface Revision Notices, and exhibits from meetings of the Spacelab committee and related sub-committees. The meetings relate primarily to Shuttle avionics, thermal protection, and integration management. It appears the records were maintained by L. Arnim (WC2). (old acc# 85-13).

**B-8-66-5**

**Safety, Reliability And Quality Assurance Office**

A Reliability and Quality Assurance Office (NA) was established at MSC in 1964 to provide support to Program Offices to assure that all spacecraft systems, parts, components, and related equipment could meet all mission objectives under mission conditions (MSCI 1134.1B). It initially included a Reliability Division (NB), a Quality Division (ND), a Standards Engineering Office (NS), and Field Offices at Downey (NE), Bethpage (NF), Boston (for MIT), Milwaukee (for A.C. Sparkplug), and the White Sands Test Facility (NH). The office was involved in design review, parts and materials control, and testing for qualification and acceptance. It established inspection and receiving policies and procedures and reviewed documents relating to all items furnished by more than 20,000 contractors, sub-contractors, and suppliers. An internal report notes that there were 780 Command and Service Module and 555 Lunar Module parts and assemblies tested and qualified (TRIS #168218).

The office was involved in programs for test and inspection of equipment, tractability of parts, analysis of previous discrepancies and failures, and the reuse of flight hardware. The Office conducted development testing to demonstrate and certify that a design was proper and would perform in all environments and acceptance testing to assure that there were no manufacturing errors. A Lunar Module Certification Program was established in 1965 (LTS 560-1, TRIS document #150600) to establish Certification Test Requirements (CTRs) to ensure the qualification of all elements of the system.

All NASA centers and major contractors were required to establish Data Centers to accumulate and store documents relating to the design, testing, and certification of spacecraft components. The MSC/JSC Data Center was operated by Boeing which maintained a computer index and the microfilm copies of documents. The present location of this microfilm is not known but may be in the JSC Technical Library.

**E.154C. TEST AND RELIABILITY INFORMATION SYSTEM (TRIS) DOCUMENTS.**

**1964-1974. 33 ft.**

Arranged by a six digit document control number (000451 to 185903 with numerous gaps). There is a partial Documentation List in box 1.

Copies of reports, Installation Procedures, Integrated Procedures, Standard Specifications, Manufacturing Process Procedures, Test Requests, Test Plans, Test Procedures, Interim and Final Test Reports, Inspection Plans, Reliability Models, Pre-Mate Readiness Reviews, Customer Acceptance Readiness Reviews, Flight Readiness Reviews, Flight Readiness Reports, Engineering

Analysis Reports, Failure Mode Analysis Reports, non-metallic materials data, Safety Manuals, Technical Status Reviews, Mission Rules, Mission Operational Plans, Mission Reports, Operational Procedures, procedural issuances, Apollo Experience Reports, and briefings for NASA Headquarters. The documents were prepared by contractors and the Marshall Space Flight Center and relate to design, testing, and flight certification of all spacecraft components and crew equipment. Testing included flammability, thermal, pressure, vibration, static loads, electromagnetic interference, design limits and endurance, calibration, compatibility, integration, and configuration. There are some documents pertaining to the ALSEP and other lunar experiments, the CSM-012 fire investigation, the Apollo 13 investigation, a Lunar Flying Vehicle, and Skylab. Some of the documents can also be found in entry 209D. The documents were microfilmed and the film may be in the JSC Technical Library. For some documents, there is only a TRIS Supplementary Data Sheet (ASD 4226) that gives the document title, contractor number, JSC Library Accession Number, and a reference to the microfilm. The files were "purged" by SR7QA in 1972 and 1974 to remove "junk data" (see TRIS #167731). (Old acc# 71A1242, 71A1309, 72A789, 72A1119, 73A773, 77-49, 78-35, 78-48, 78-51, 78-55, 78-56, 81-32, 81-49, 82-43, 83-71, 84-28).

**B-28-30-5**

#### **E.154D. FAILURE REPORTS.**

**1968-1975. 3 ft.**

Arranged by Problem Report number (with numerous gaps).

Narrative Failure Reports, Discrepancy and Trouble Reports, Problem Control Sheets, Corrective Action Records, Problem Closeout Review Forms, and related documents submitted by contractors working on Apollo hardware. The reports include the part name and number, subsystem, history and analysis of the problem, and summary of corrective actions take. The reports were maintained by the Problem Assessment Engineering Office of Boeing and may be the basis for the statistical reports described in entry 209P. (acc# 80-33).

**B-28-30-1**

#### **E.154E. COMMAND AND SERVICE MODULE HARDWARE REFURBISHMENT PACKAGES. 1973-1975. 11 ft.**

Arranged by control number (NR1738-2173)

Hardware Reuse Evaluations (MSC 1200), Apollo Spacecraft Hardware Utilization Reports (ASHURs), Acceptance Test Data Sheets, Component History Records, Configuration Records, End-Item Historical Report, flight anomaly reports, and related documents pertaining to hardware proposed for reuse. The various forms generally provide the part description, vendor, serial and part number, previous flight, and a complete history of the manufacture, testing, acceptance, and use of the item. The records document the certification/verification, refurbishment, and testing of switches, valves, clamps, ampules, instruments, indicators, panels, and entire panel assemblies. These packages were maintained by the Reliability, Quality Assurance and Safety Data Center and some also have TRIS control numbers (see entry 154C). (Old acc# 81-49)

**B-28-30-2**

### **FLIGHT CREW OPERATIONS DIRECTORATE**

The original seven Mercury astronauts reported directly to STG/MSC Director Gilruth. In the spring of 1962 a Flight Crew Operations Division was established and Warren J. North, a



former test pilot for the Langley Research Center was appointed as Division Chief. The Division included an Astronaut Office headed by Donald K. “Deke” Slayton.<sup>5</sup> In November 1963 Slayton was named Assistant Director for Flight Crew Operations. He also continued as head of the Astronaut Office until Alan Shepard was appointed to that position. Slayton’s Flight Crew Operations Directorate (CA) also included an Aircraft Operations Group under Joseph Algranti (sometime called the Flight Support Division) which operated the NASA’s aircraft used by astronauts to maintain flight proficiency and travel to contractor sites around the country. There was also a Flight Crew Support Division (CF) under North which concentrated on crew stations, crew safety, simulators, mission operations, and flight planning. The Directorate had responsibility for the overall program of flight crew selection, training, and mission performance (see MSC I 1143.1). Its functions included development of flight hardware, trainers, and scientific space experiments.

The Flight Crew Support Division was abolished on February 16, 1971 (MSCA 71-23) and a Flight Crew Integration Division (CD), a Crew Training and Simulation Division (CE), and a Crew Procedures Division (CG) were established. In 1974, the Flight Crew Operations Directorate was abolished and its functions transferred to a reorganized Flight Operations Directorate (MSCA 74-8 and 74-43).

**E.154G. OUTGOING CORRESPONDENCE. 1984-1985. 4 in.**

Arranged chronologically.

Copies of memos sent to other JSC offices and to other NASA Centers by the Director of Flight Crew Operations. (89-0003).

**A-33-100-4**

**E.154H. DIRECTOR’S SUBJECT FILES. 1964-1970. 2 ft.**

Arranged by subject (there is a list of folder titles in box 1).

Correspondence, memoranda, and TWX messages and related enclosures such as draft procedures, reports, and studies. The records relate to Gemini and Apollo mission plans and results, Apollo Applications plans, astronaut training and equipment, approval of mission patches, qualifications and professional activities of scientist-astronauts, field geology and scientific experiments training, lunar surface operations, life support equipment, and medical requirements for pre-flight isolation of crews. There are many original signed memos to the record and memos from the Apollo Spacecraft Program Office to Deke Slayton, Director of Flight Crew Operations. (Direct offer NRF-255-02-0004).

**A-23-22-5**

**E.154H5. DIRECTOR’S REFERENCE FILES. 1976-1986. 15 ft.**

Arranged by subject. There is a list of folder titles in box 1.

Correspondence, memoranda, weekly activity reports, flight requirements documents, presentation and briefing materials, and notes relating to mission planning, crew training, aircraft operations, Orbital Flight Test, Extra Vehicular Activities (EVA), reboost and reactivation of Skylab, Spacelab requirements, Space Station crew requirements and safety procedures, future programs with the Russians, selection and qualifications for Civilian Flight Participants and Payload Specialists, and Adaptation Syndrome (Space Sickness). There is a file for each Space Shuttle Mission from STS-1 to STS-51L that generally includes a Press Kit, mission badging

<sup>5</sup> See Donald K. “Deke” Slayton with Michael Cassutt, *Deke! U.S. Manned Space: From Mercury to the Shuttle* (New York, 1994).

requirements, lists of persons invited to view the launch, family itineraries, Astronaut Office support plans for the crew families, security procedures, Public Affairs Office support plans, debriefing plans, and post-landing support plans. There are several files relating to memorial activities for the crew of STS-51L (Challenger) and "Challenger Issues" that include press clippings, technical reports, minutes of Level II Program Requirements Control Board meetings, and lists of action items. There are many hand-written notes to and from George W. S. Abbey who served as Director of Flight Crew Operations from 1976 to 1988. (89-0003).

**A-33-100-4**

### **ASTRONAUT OFFICE (CB)**

#### **E.154H10. CENTRAL REFERENCE FILES. 1977-1997. 7 ft.**

Arranged by subject (Organization, Policy, Position Memos, Memos/Presentations, Testing/Evaluations, Incidents/Mishaps, Flight Specific) and thereunder chronologically. There is a list of each document in box 1.

Originals and copies of correspondence, memoranda, presentation materials, technical reports and studies, and policy directives. The records relate to crew selection and training, operational procedures, mission planning, spacecraft systems development, flight safety, public appearances, flight software, landing sites, solid rocket boosters, Spacelab, cooperation with Russia, medical testing and evaluations, and mission operations. There are many hand-written notes to and from John Young who served head of the Astronaut Office. There is also a 1966 Gemini status report presented by John Young. The records also include proposals, technical studies, reports, photographs and related material maintained by William Lenoir from 1966-1976 on the Skylab 4 Visual Observation Project, Satellite Power systems, Nimbus E, and meteorology experiments for manned space stations. (02-89).

**A-33-100-5**

#### **154J. CAPCOM MISSION LOGS. 1973-1975. 2 ft.**

**Arranged by mission (there are no logs for Skylab 4 Mission Days 27 to 51).**

Original Flight Director's Mission Logs (JSC Form 1441), Mission Notes (FEC/TSG 378), Maneuver Update forms, and Crew News Summaries maintained by astronauts who served as Capsule Communicator (Capcom) for Skylab 2, 3, and 4, and the Apollo-Soyuz Test Project (ASTP) flight. The entries in the logs are hand-written and provide a detailed account of communications between Mission Control in Houston and the spacecraft. There are also copies of Crew Daily Transcripts for Skylab 4 that were distributed to staff involved with the mission by Verl R. Wilmarth, Program Scientist for Earth Observations. (Direct Offer NRF 255-02-0004).

**A-23-22-6**

**154K. REFERENCE FILES OF ROBERT A. R. PARKER.**

**1962-1988. 17 ft.**

Arranged by subject. There is a partial list of folder titles in box 1.

Correspondence, copies of articles published in various scientific journals, NASA technical reports and studies, experiment proposals, minutes of science and mission planning working groups, documents prepared for design and program reviews, flight data files and training manuals for Spacelab I, ALSEP handbooks, photographs of flight hardware, and maps of the lunar surface prepared by the U.S. Geological Survey. The articles relate primarily to astronomy, geology, the Large Space Telescope, and Earth Observations and Resource Surveys. The records include material on Apollo 15 and 17 field geology training and traverse planning, Apollo-Soyuz and Skylab science experiments, and Spacelab I flown on STS-9. The records also include correspondence on scientist astronaut selection, duties of mission and payload specialists, Parker's handwritten notebooks from Spacelab I, and personal correspondence from 1962-1967. Parker received a PhD in Astronomy from California Institute of Technology in 1962, was selected as an astronaut in 1967, served on the astronaut support crew for Apollo 15 and 17, was Program Scientist for Skylab, and flew as a mission specialist on STS-9/Spacelab I (November 28 to December 8, 1983) and STS-35 (December 2-10, 1990). (88-30).

**A-23-92-4**

**154L. SPACE STATION BRANCH (CA3) ACTION ITEM REPORTS. 1989-1992. 2 ft.**

**Arranged by item number (1-154). There is a partial list of items in box 1.**

Original Action Item Reports relating primarily to requests for comments or development of policy and procedures for Space Station Freedom (SSF). The report contains the item number, date assigned, name of assignee, action required, date due, references, and comments. Most of the reports include the item requiring action such as drafts of briefing papers, training procedures, crew interface requirements, crew quarters and habitability requirements, drafts of White Papers and studies, Interface Control Documents, and Review Item Disposition forms. Many of the documents contain hand-written annotations. It appears these reports were maintained by J. Mike Lounge and Claude Nicollier. (Direct Offer NRF 255-02-0004).

**A-23-22-7**

**Crew Support Division**

See MSCA 70-115 for a detailed list of functions. Responsibility for crew station and crew related equipment was transferred to the Engineering and Development Directorate in January 1974 (JSCA 74-8).

**E.154W. DIVISION CORRESPONDENCE FILES.**

**1962-1971. 6 ft.**

Arranged chronologically.

Official copies of letters and memoranda sent to other MSC units, NASA Headquarters, other NASA Centers, and contractors. The correspondence relates to crew training and equipment, spacecraft hardware, simulations and training plans and schedules, flight procedures, flight experiments, contractor support, and general administrative matters. (Old acc# 72A797 and 89-57)

**A-23-10-2**

**E.154W5. FLIGHT PLANNING BRANCH CORRESPONDENCE.**

**1967-1970. 2 ft.**

Arranged chronologically.

Official copies of letters and memoranda sent to other MSC units, NASA Headquarters, other NASA Centers, and contractors. The correspondence relates to crew training and equipment, spacecraft hardware, simulations and training plans and schedules, flight procedures, flight experiments, contractor support, and general administrative matters. (Old acc# 72A797 and 89-57).

**A-23-10-4**

**E.155. REFERENCE FILES ON PROJECTS MERCURY AND GEMINI.**

**1961-1967. 7 ft.**

Arranged by mission or subject. There is a list of file folder titles in box 1.

Memoranda on technical aspects of flights, status reviews, flight plans, various MSC Working Papers and Internal Notes on flight plans and operations, photographs taken during flights and issued as part of the NASA "S" series, and publications of the NASA Historical Office about Projects Mercury and Gemini. There are also some technical proposals and reports on the paraglider recovery program for spacecraft. It appears that Warren North maintained these files for reference. (76A1494)

**A-23-10-1**

**E.155B. REFERENCE FILES ON THE LUNAR LANDING TRAINING VEHICLE.**

**1962-1973. 20 FT. 200 drawings 8 tapes**

Arranged by subject.

Correspondence, memoranda, design reports and specifications, procurement and program plans, schedules, Flight Readiness Review Board minutes, flight test programs and plans, flight checklists, flight/pilot notes, procedures manuals, and accident investigation reports. There are photos of the vehicle, drawings, mission tapes, and a 5 minute 16mm film of produced in 1969 of the Langley Lunar Landing Research Facility. There are technical reports prepared by Bell Aerosystems, Ryan Aeronautical Company, and Weber Aircraft Company. There is also some material relating to the Lunar Landing Research Vehicle and the Mission Effects Projector (MEP) and External Visual Display Equipment (EVDE) of the Lunar Module mission simulator. The LLTV was designed to enable astronauts to receive actual flight training for the terminal phase of the lunar landing mission and was first flown on October 30, 1964 at Edwards Flight Research Center. It appears these files were maintained for reference by Warren North and the Aircraft Operations Office for reference. (Old acc# 72A797, 73ABC1675)

**B-28-34-2 and B-35-28-12 and B-35-29-2, 4-7 and V-10-6-6**

**E.155B1. PROJECT FILES ON THE LUNAR MODULE SIMULATOR.**

**1968-1970. 2 ft.**

Arranged by subject.

Correspondence, memoranda, statement of work, program and procurement plans, acceptance test plans and procedures, progress and technical reports, operations manuals, photographs of surface models, and copies of drawings. Most of the correspondence is with the Kollsman Instrument Corporation and relates to the administration of contract NAS9-8634 for the construction of LM simulators at both MSC and KSC. (Old acc# 72A794.

**A-23-16-6**

## **FLIGHT CREW INTEGRATION DIVISION (CD)**

The division was responsible for coordinating the design, development, and operations of crew station and crew-related interfaces. It also coordinated crew input into flight hardware development. It was abolished in January 1974.

### **E.155B5. DIVISION CORRESPONDENCE FILES.**

**1971-1974. 2 ft.**

Arranged in yearly segments and thereunder by unit.

Official yellow copies of correspondence and related documents from the Division and its various branches and sections. The correspondence includes activity reports, memoranda of meetings, and travel reports and relates to Apollo, Skylab, and Shuttle operations. (Old acc# 76A350).

**A-23-10-4**

### **E.155B10. REFERENCE FILES ON APOLLO CAMERAS.**

**1966-1973. 12 ft.**

Arranged by serial number.

Copies of printed manuals and procedures prepared by the J.A. Maurer Company for Apollo flight cameras, canisters, drive units, and film magazines. The manuals provide the item name, part number and serial number and include Inspection Test Procedures. There are also some original Parts Tags and calibration photos. The records were maintained by the Crew Equipment and Design Branch. (Old acc# 73A1682).

**B-21-16-5**

## **Crew Training And Procedures Division (CG)**

The Division was established on February 16, 1971, with responsibility for pre-flight and real-time flight planning and flight data file change control.

### **E.155C. FLIGHT PLANNING BRANCH CORRESPONDENCE.**

**1971-1983. 9 ft.**

Arranged in yearly segments, thereunder by organizational unit, and thereunder chronologically.

Official files copies of memoranda sent or written by the units within the division (CG) to other MSC/JSC units and to contractors. The memoranda relate to all phases of flight planning and often include attachments such as minutes of meetings or drafts of mission documents. (Old acc#76A959 and 89-57).

**A-23-6-5**

### **E.155D. CREW TRAINING REPORTS.**

**1967-1975. 2 ft.**

Arranged by type of simulation and thereunder chronologically.

Copies of printed Crew Training Reports (MSC Form 1935) annotated with the names of crew members, instructors, training tasks, times, and a summary of activities. There are reports for simulations of Apollo and Skylab missions conducted in Command Module Simulators 2 and 3 and Lunar Module Simulators 2 and 3. (acc# 77-54).

**A-23-94-5**

**E.155E. APOLLO CREW PROCEDURE CHANGE BOARD RECORDS.**

**1968-1971. 2 ft.**

Arranged chronologically by date of meeting.

Originals and some copies of agenda, minutes, lists of attendees, and enclosures from meetings of the Board. The enclosures often consist of technical reports on proposed procedures and correspondence relating to the issues involved. (Old acc# 76A959)

**A-23-10-5**

**E.155F. APOLLO FLIGHT DATA FILE CHANGE CONTROL RECORDS.**

**1969-1972. 6 ft.**

Arranged by mission (Apollo 12 to 16) and thereunder by subject.

Original memoranda, notes, annotated draft pages from Flight Data Files, Crew Procedures Change Requests (MSC 482), Change Summary, Change Record, Change Work Log, and technical reports on issues involved with proposed changes. Tom Holloway, Flight Data File Manager, maintained the records. Final versions of the Flight Data Files are contained in entry 159. (Old acc#76A959)

**A-23-10-5**

**E.155G. SKYLAB FLIGHT DATA FILE CHANGE CONTROL RECORDS.**

**1972-1973. 11 ft.**

Arranged by type of document and thereunder primarily by spacecraft system.

Original memoranda, notes, annotated draft pages from Flight Data Files, annotated cue cards and checklists, Crew Procedures Change Requests (MSC 482), Crew Procedure Change Board minutes, Change Summary, Change Record, Change Work Log, and technical reports on issues involved with proposed changes. There are records relating to "real-time" changes for Skylab 3 and 4. Tom Holloway, Flight Data File Manager, maintained the records. Final versions of the Flight Data Files are contained in entry 160. (Old acc#76A959)

**A-23-10-7**

**FLIGHT/MISSION OPERATIONS DIRECTORATE (CA)**

Christopher C. Kraft, Jr. joined the Langley Aeronautical Laboratory in 1945, became one of the original members of the STG, and served as the Director of Flight Operations for the Mercury Project Office. In 1962, a Flight Operations Division was established as part of the MSC and Kraft was named as its Director. The Flight Operations Division was responsible not only for the control of missions being flown but for mission planning and analysis and the development, and implementation of equipment and procedures for communications, data transmission, telemetry and analysis, simulation and flight software, and landing and recovery.

An Office of Assistant Director for Flight Operations was established on November 1, 1963 as part of a major MSC reorganization. It included a Flight Support Division, a Flight Control Division, a Mission Planning and Analysis Division, and a Landing and Recovery Division. The Gemini 4 mission in June 1965 was the first flight controlled from Houston's Mission Control Center. The Office was designated the Flight Operations Directorate in 1968 (see MSC1 1143.1).

On January 28, 1974, there was a major reorganization and realignment of functions and responsibilities at JSC. The Flight Crew Operations Directorate was abolished and most of its functions were transferred to a reorganized Flight Operations Directorate (CA) responsible for operational planning and overall direction and management of both flight crew and flight control activities (JSCA 74-8). Responsibilities also included direction of the JSC aircraft program and the planning and conduct of earth resources missions.

The Flight Operations Directorate was re-designated the Mission Operations Directorate (DA) on April 13, 1983. See Gene Kranz, *Failure is Not an Option* (New York, 2000).

#### **E.156F. FLIGHT OPERATIONS DIVISION CORRESPONDENCE.**

**1973-1976. 4 ft.**

Arranged chronologically.

Copies of memoranda to all Center organizations, NASA Headquarters and other centers, and some contractors. There are some original letters received by the Division. The correspondence relates to both administrative matters and mission planning and operations. (Old acc#83-36)

**A-30-78-5**

#### **E.156H. CORRESPONDENCE RELATING TO ACTION ITEMS.**

**1974-1976. 1 ft.**

Arranged numerically by a number assigned in roughly chronological order by the date received.

Copies of memoranda and faxes that required some action by the Flight Operations Division. Each item is annotated with the date due, the office responsible, and the disposition of the request. The actions relate to both administrative matters and mission requirements. (Old acc# 83-36)

**A-30-78-7**

#### **E.156L. FLIGHT OPERATIONS HANDBOOKS.**

**1968-1975. 8 ft.**

Arranged by subject (there is a list of titles in box 1.)

Console and systems handbooks and related material prepared by various units within the Flight Operations Division. The records relate to Apollo, Skylab, and the Apollo-Soyuz Test Project (ASTP) activities including Command and Service Module and Lunar Module systems design and operation, Saturn Launch Vehicle systems, lunar surface experiments (ALSEP and geology), Lunar Roving Vehicle systems, Skylab systems and experiments packages, and landing and recovery. There are some mission rules and Flight Controllers handbooks. (Old acc# 76A874)

**A-30-78-2**

#### **E.156N. FLIGHT OPERATIONS APOLLO MISSION DOCUMENTS.**

**1965-1972. 82 ft.**

Arranged by mission (there is a list of document titles in box 1).

Various technical documents prepared by units within the Flight Operations Division for Apollo missions. The records include Mission Rules, Mission Requirements, Flight Operations Plans, Launch Mission Rules, Baseline Data Packages, Anomaly Reports, Recovery Requirements

Operations Manuals, Flight Readiness Reviews, Recovery and Deactivation Procedures, Test and Checkout Plans, Support Plans, Data Acquisition Requirements, Simulation Plans, Flight Controllers Operations Handbooks, and Systems Handbooks for the Saturn Launch Vehicle, the Command/Service Module, and the Lunar Module. There are handwritten Mission Evaluation Room Action Item Logs, Action Requests (“Chits”), Daily Operations and Status Reports, and Spacecraft Analysis Team (SPAN) Daily and Hourly reports. There are PAO commentary and Technical Air-to-Ground transcripts for Apollo 9-17. There are closeout photographs for Apollo 11-17. Many of these documents are designated “launch data” and were maintained in the Data Library and the Mission Evaluation Room. (Old acc#71A1179, 72A1114, 72A1116, 73A1245, 73A1683, and 75B900)

**A-31-28-2**

**E.156R. FLIGHT OPERATIONS SKYLAB MISSION DOCUMENTS.**

**1972-1974. 16 ft.**

Arranged by mission and thereunder by day.

Original hand-written mission logs and notes, flight plans, daily mission reports, status reports, Mission Action Requests, Teleprinter Load Tables, Voice Pads, flight management team minutes, Air to Ground transcripts, and Console logs. The records include original signed Shift Reports. The records were maintained by Mission Control personnel. (Old acc# 77-39).

**A-31-32-6**

**E.157E. FLIGHT CONTROL DIVISION FILES ON GEMINI MISSION**

**SIMULATIONS. 1964-1966. 3 ft.**

Arranged by mission.

Various instructions and procedures for flight controllers engaged in simulations of Gemini missions. The records include Operating Instructions, Exercise Outlines, Display Requirements, Mission Resumes, Data Acquisition Requirements, reports, lesson plans, and handwritten notes on meetings. There are also copies of the Mission Control Center (MCC) Operations Procedures, Operations Handbooks, Rendezvous Handbook, and Remote Site Operations Procedures. C. B. Shelley maintained most of these documents. (Old acc# 72A198)

**A-31-66-3**

**E.157G. MISSION PLANNING AND ANALYSIS INTERNAL NOTES.**

**1964-1971. 21 ft.**

Arranged in yearly segments and thereunder by controls number (64OM-02 to 71FM384). There are numerous gaps.

Copies of technical reports on highly technical topics such as guidance and trajectory, tracking, data acquisition, on-board and ground software, hardware design and operation, mission parameters, and abort procedures. Some of the documents were created by TRW (see also E.209H). The notes were widely distributed and relate to Gemini, Apollo, Skylab, and ASTP. See also E.194T and E.209B (Old Acc# 76A1724).

**B-20-62-5**

**E.157M. FLIGHT SUPPORT DIVISION CORRESPONDENCE.**

**1968-1971. 4 FT.**

Arranged in yearly segments and thereunder by the organization that produced the correspondence.



Memoranda, faxes, and TWXs received by the Flight Support Division and copies of some memoranda sent. The correspondence is with other JSC units, NASA Headquarters, other NASA centers, the Department of Defense, Patrick Air Force Base, and Philco-Ford. The correspondence relates to both administrative matters and flight planning and operations. (Old acc# 76A1363, 76A1364, 76A1365, 76A1366, 76A1367, 76A1368, and 76A1369)

**A-31-28-1**

**E.157R. CORRESPONDENCE ON SHUTTLE LANDING AND APPROACH TESTS.**

**1974-1976. 7 in.**

Arranged chronologically.

Originals and copies of memoranda sent and received by the Orbiter Atmospheric Flight Test Office (CT) relating to the Approach and Landing Test Project (also called the Horizontal Flight Test Project). The correspondence is with other NASA units (especially the Orbiter Office/MA), NASA Headquarters, the Department of Defense, and various contractors. The correspondence relates to aircraft, facilities, equipment, software, and data support requirements, budgets, and test operations and includes management plans and test plans and reports. (Old acc#78-73)

**A-22-72-2**

**E.158. SYSTEM DIVISION REFERENCE FILES.**

**1965-1975. 6 ft.**

Arranged by program and thereunder by subject.

Original Flight Control Logs with Flight Controller annotations, Mission Rules, Technical Description documents, Crew Procedure Checklists, Study Guides, Operation Handbooks, Systems Handbooks, Console Procedures Handbooks, and various technical publications. The bulk of the material relates to Skylab but there are records for Apollo 14 to 18 and the Apollo-Soyuz Test Project (ASTP). The Flight Control Logs are from the Guidance, Navigation, and Control console for Skylab Missions. It appears that Jack A. Kamman, Frank Digenova, Ron Lerdal, and other Flight Controllers in the Systems Division (DF) for reference maintained these records. (Direct offer).

**A-30-78-1**

**E.159. PRE-SHUTTLE FLIGHT DATA FILES.**

**1968-1977. 21 ft.**

Arranged by flight. For each flight there is a detailed list of items.

Original "as flown" procedural checklists, integrated timelines, flight and systems operations handbooks, cue cards, malfunction and reference data, crew activity plans, decals, photos, earth maps, star charts, and other special aids for the crew to use in flight. These records are highly technical in nature and relate to various spacecraft systems, procedures, and operations. Some of the records include handwritten annotations or additions made by the crew. These records have been microfilmed for reference use. (Old acc# 88-0009)

**A-23-60-4**

**E.159C. APOLLO CREW LOGS.**

**1967-1972. 2 ft.**

Arranged by flight.

Oversize copies of crew logs for Apollo 7-17. There are also copies of some of the checklists described in entry 159 but the copies were made from originals with different serial numbers. The location of the original crew logs is unknown. (Old acc#72A1117 and 75A900)

**A-23-22-1**

**E.160. SPACE SHUTTLE FLIGHT DATA FILES.**

**1981-1998 211 ft.**

Arranged by flight number (STS-1 through STS-95). There are no records for STS-51L. For each flight, there is a detailed list of items.

Original "as flown" procedural checklists, integrated timelines, flight and systems operations handbooks, cue cards, malfunction and reference data, crew activity plans, decals, photos, earth maps, star charts, and other special aids for the crew to use in flight. These records are highly technical in nature and relate to various Space Shuttle components, procedures, and operations. Some of the records include handwritten annotations or additions made by the crew. (Old acc# 90-46 to 56 and 90-61 to 73, 91-23,91-24, 91-25, 91-26, 91-27, 91-36, 91-37, 91-38 to 40, 91-41, 91-42, 91-43, 91-55, 91-56, 91-57,92-43, 92-45, 92-46 to 49, 93-8, 93-9, 93-10, 93-20, 93-21, 93,23, 93-24, 93-49, 93-56, 93-58, 94-13, 94-31, 94-67, 94-83, 94-95, 94-147, 94-148, 95-9, 95-61, 95-62, 95-63, 95-73, 95-88, 96-12, 96-13, 96-14, 96-15, 96-60, 96-61, 97-52, 97-53, 97-54, 97-55, 97-56, 98-18, 98-19, 98-20, 98-21, 98-46, 98-47, 98-48, 98-57, 98-62, 98-63, 99-17, 99-19, 99-20, 00-6, 00-7, 00-69, 00-70)

**A-17-28-6, A-18-78-1, A-19-012-1, A-19-20-1, A-19-28-1, and V-02-022-4, V-02-022-5**

**E.165. OFFICE FILES OF JAMES E. SAULTZ.**

**1962-1974. 2 ft.**

Arranged chronologically.

Copies of memos sent with related attachments retained by James Saultz as Chief of the Gemini Flight Systems Branch, the Experiment Systems Branch (1969-70), the Lunar/Earth Experiments Branch (FC/9 1971-73), and the Data and Sensor Operations Branch (CH3 1974). The memos and related technical data relate primarily to Gemini flight control, the Agena Target Vehicle, The Apollo Lunar Surface Experiments Package (ALSEP), the Lunar Roving Vehicle, Skylab, Earth Resources Experiments Project (EREP), cooperation with the European Space Agency on Spacelab, and other NASA scientific experiments. There are some weekly activity reports and minutes of meetings of various design and working groups. There are a few records relating to Project Mercury and the design of the Shuttle Training Aircraft. Chris Kraft signed much of the early correspondence. (Direct offer 7NC255-95-0001).

**A-26-006-1**

**E.165D. REFERENCE FILES OF CHARLES HARLAN ON SKYLAB RE-ENTRY.**

**1978-1979. 1 ft.**

Arranged by subject.

Correspondence, memoranda, hand-written notes of meetings, briefing materials, technical studies, Console Procedures Handbook, re-entry plan, and final report on Skylab operations. These records relate primarily to planning for the re-entry of Skylab and were maintained by Charles Harlan while with the Payload Operations Division (CH). (Old acc# 88-35).

**A-31-34-4**

**E.165L. SPACEFLIGHT METEOROLOGY GROUP MISSION FILES.**

**1963-1976. 1 ft. and 500 maps.**

Arranged by mission.

Narrative pre-flight and post-flight reports from sections at Miami, Houston, Cape Kennedy, Honolulu, and Suitland that summarize observed and forecast weather and activities of support ships and aircraft. There are also weather charts, photographs from weather satellites, and color photographs of most spacecraft recovery operations. There are records for all manned missions from MA9 to ASTP and for Apollo unmanned missions. The bulk of the files were maintained by J. R. Gulick, Supervisor in Charge of the Miami Section, and Richard K. Siller, Supervisor of the Group (WF122 and later ZS8). There are large maps annotated with weather data for Gemini and Apollo missions. (Old acc# 72A190, 74AB17, and 88-50).

**A-20-78-5 and B-35-28-11**

## **RECORDS OF THE ENGINEERING AND DEVELOPMENT DIRECTORATE (EA)**

An Office of Research and Development was established in the STG on January 15, 1962 and redesignated the Office of Engineering and Development in the same year. It was under the direction of Max Faget and was responsible for space research, space physics, life systems, and the conduct of tests and evaluations to support and advance manned spacecraft development. Initially, it included a Spacecraft Research Division, a Life Systems Division, and a Systems Evaluation Division, each with numerous branches and sections.

On November 1, 1963, Faget was named Assistant Director for Engineering and Development. There were some name changes for existing Divisions and an Information Systems Division was added. The Office was redesignated the Engineering and Development Directorate (EA) on September 1, 1966 by MSC 1142.1 with responsibility for technical support in depth for manned space flight programs including in-house test and evaluation programs, research technology programs, and long range planning and advanced studies.

There were a number of name changes from 1966 to the 1980's for the numerous Divisions, Branches, and Sections in response to the evolving requirements for support of Apollo, Skylab, and Space Shuttle programs. On September 25, 1968 Assistant Director positions were established for Chemical and Mechanical Systems, Spacecraft Integration, and Electronic Systems (MSC Announcement 68-7). These were slightly modified on May 10, 1971 (JSCA 71-68) and an Advanced Planning and Design Office (EA4) and a Shuttle Program Engineering Office were established. A Future Programs Division (ER) was created on February 17, 1972 (JSCA 72-21) to work on Shuttle Payloads.

Robert O. Piland was named Assistant Director for Advanced Planning and Design on June 7, 1974. A reorganization effective September 2, 1975 reduced the number of Assistant Directors from three to two with Piland continuing to serve as head of Advanced Planning and Development and Aleck Bond as Assistant Director for Program Support. A Shuttle Avionics Integration Division, SAIL (EF) was established on March 16, 1980. In 1983, it was designated the Engineering Directorate (JSCI 1142.16).

## **Assistant Director For Advanced Planning And Design (EA)**

The position was established on December 31, 1970 (MSCA 70-235) with responsibility for engineering analysis studies and engineering design of advanced spacecraft. The duties were slightly modified on May 10, 1971 (JSCA 71-68). Robert O. Piland was officially appointed to the position on June 7, 1974.

### **E.167. READING FILES OF ROBERT O. PILAND.**

**1974-1977. 2 ft.**

Arranged chronologically.

Copies of memoranda sent and received by Piland primarily to other units within the Center. The correspondence relates to the Shuttle, Earth Resources Lab, Space Station, and other projects and includes some draft technical studies. Similar records are in entry 90. (Old acc# 79-29)

**A-30-14-1**

### **E.167B. REFERENCE FILES ON SPACE STATION SYSTEMS ANALYSIS STUDIES.**

**1975-1977. 5 ft.**

Arranged by subject.

Correspondence, minutes of meetings, draft and final reports prepared by contractors, and materials prepared for briefings and reviews of study design criteria, Requests for Proposal, contractor selection and performance, study management, and project status. The study was conducted to "define objectives, system concepts, and program plans for an economically justifiable space base in the 1980's." There are copies of studies prepared by McDonnell-Douglas in 1971 (contract NAS8-25140) and 1976 (contract NAS9-14958) and Grumman in 1976 (contract NAS8-31993). The records were maintained primarily by Jerry W. Craig (EA4) and include numerous hand-written notes. (79-54).

**A-24-86-6**

## **Director Of Engineering (EA)**

### **E.167C. SUBJECT FILES OF THE DIRECTOR.**

**1980-1986. 8 ft.**

Arranged by subject.

Correspondence, memoranda, drafts and final copies of speeches and articles, agenda and minutes of staff meetings, presentation material for briefings and program reviews to JSC and NASA Headquarters management, STS marketing plans, Engineering Activity Review Board minutes, E&D Activity Reports, experiment proposals, organizational charts and functional statements, photographs of the shuttle and related hardware, and mission reports with related press handouts for STS-8 to STS 61L (with gaps). The records relate to shuttle engineering and design, payload integration, long range strategic planning, commercial space operations, the National Commission on Space, the American Institute for Aeronautics and Astronautics, cooperative programs with universities, construction of facilities at JSC, and plans for Lunar and Mars missions. Most of the records appear to have been maintained by Tom Moser (Director of Engineering from 1981-1985, see also E.192M) but there are also files relating to Robert C. Reid (Special Assistant to the Director) and Aaron Cohen (Director of Engineering and Research). (Old acc# 88-60).

A-22-74-2

### Advanced Spacecraft Technology Division

#### **E.167F. STUDIES ON A MANNED ORBITAL RESEARCH LAB.**

**1965-1966. 2 ft.**

Arranged by report number.

Copies of a report prepared by the Missile and Space Systems Division of the Douglas Aircraft Company under contract NAS 1-3612 and by Boeing under contract NAS 9-3662. The Douglas study includes a Manned Orbital Research Laboratory (MORL) concept responsiveness analysis with sub-reports on Space Related Objectives, Integrated Mission Development Plan, Program Planning and Economic Analysis, and System Improvement. There is a copy of a briefing package produced by the Langley Research Center for the Phase IIB study delivered January 25, 1966. The Boeing study was completed in October 1965 and relates to a Multipurpose Mission Module. (Old acc# 71A1277)

**A-30-14-1**

### Crew Systems Division

The Crew Systems Branch (later Division-EC) was responsible for the development, qualification, and operational support of spacecraft environmental control systems, space suits, and extravehicular life support systems. See *U.S. Space Gear: Outfitting the Astronaut* by Lillian D. Kozloski (Smithsonian Institution Press, 1994).

#### **E.170. GEMINI PROJECT TECHNICAL REPORTS.**

**1959-1966. 14 ft**

Arranged numerically by report number (CSD-G-5 to 466, G-1 to 16, and STB-G-100 to 133)

Original printed technical reports issued by the Crew Systems Division or its System Tests Branch including Qualification Test Plans, Qualification Documents, Quality Assurance Plans, Acceptance Test Plans, Development Test Plans, Configuration Control Plans, and test results. The reports relate to the design, construction, testing, and qualification for flight readiness of astronaut space suits and all other life support systems, biomedical equipment, and various items used by the crew in flight. (Old ACC# 71A1238 and 73A745)

**A-31-098-1**

#### **E.170A. APOLLO PROJECT TECHNICAL REPORTS.**

**1964-1968. 4 ft.**

Arranged by document control number (CSD-A-000 to CSD-A-399).

Original signed copies of end-item and requirements specifications, statements of work, test procedures and plans, qualification test plans, development plans, reliability and quality control plans, and reports. The records relate to crew equipment (GFE), bio-instrumentation and medical equipment, survival equipment, PLSS, Block I and II equipment, and Extravehicular Mobility Units. (Old acc# 73A744).

**A-31-102-6**

**E.170B. EVA BRANCH CORRESPONDENCE FILES.**

**1971-1976. 2 ft.**

Arranged in yearly segments and thereunder chronologically.

Copies of memoranda sent by the Branch (EC6) and its various Sections. The correspondence relates to Apollo, ASTP, Skylab, the Astronaut Life Support Assembly (ALSA), and Shuttle and includes copies of technical reports and studies. The records also include copies of Skylab Lessons Learned, Skylab Experience Bulletins, and briefing materials on Skylab EVAs. There are also records relating to the design and deployment of the Skylab SAIL Assembly thermal shield for the Orbital Work Shop (OWS) that include technical reports, problem and action logs, photographs of hardware, and engineering drawings. (old acc# 79-23).

**B-11-86-1**

**E.170C. EVA BRANCH PROJECT FILES.**

**1968-1973. 2 ft.**

Arranged by subject.

Correspondence and memoranda with other NASA units and contractors, specifications, technical and narrative progress reports, and photographs. The EVA Branch was responsible for MSC and contractor theoretical and experimental research, design, development, qualification, delivery, and maintenance of extravehicular and intravehicular life support equipment, portable and emergency life support systems, pre-breathing equipment, umbilicals, tethers, maneuvering systems, ground support and checkout equipment. These files relate primarily to the Lunar Equipment Conveyor and Apollo EVA suits and equipment. (Old acc# 76A626).

**A-22-72-7**

**E.170D. EVA BRANCH REFERENCE FILES ON APOLLO LIFE SUPPORT.**

**1968-1974. 6 ft.**

Arranged by subject.

Correspondence, memoranda, technical reports and studies, agenda and minutes of meetings of technical committees, Hamilton Standard Engineering Memorandum, Acceptance and Refurbishment Plans, test and evaluation plans and reports, black and white and color photographs of suits and related hardware, schematics, and drawings. The records relate primarily to the Apollo EMU, PLSS, Buddy System, LiOH cartridges, and oxygen purge systems. There are original signed post-mission performance reports on the PLSS, reviews of consumables expended, and Lunar Surface Procedures for Apollo 11 to 17. (old acc# 76-1385A).

**B-11-84-4**

**E.171. PROJECT FILES ON PORTABLE LIFE SUPPORT SYSTEMS.**

**1964-1970. 1 ft. and 300 items.**

Arranged by subject and thereunder chronologically. Drawings are arranged numerically but no list of drawings has been located.

Originals and copies of correspondence, memoranda, contract documents, monthly progress and final reports, qualification test reports, and engineering drawings. The records were maintained by the Extravehicular Equipment Branch (EC6) and relate to development of a Portable Environmental Control System (PECS) which became the Optimized Portable Life Support System (OPLSS). The equipment was developed for use by the Apollo Applications Program by the AiResearch Manufacturing Division of the Garrett Corporation under contract NAS9-2412. The project was terminated in 1970 when it was determined that the Portable Life

Support System (PLSS) used on Apollo missions was suitable for future missions. (Old acc#74A805 and 74B805)

**B-28-28-1 and B-35-28-7**

**E.171A. GEMINI EXTRAVEHICULAR LIFE SUPPORT SYSTEM PROJECT FILES. 1963-1967. 6 ft.**

Arranged by subject in accordance with a numeric file system (1.1 to 1.61).

Correspondence, memoranda, statements of work, technical and cost proposals, engineering change proposals, contractor progress reports, studies, test plans, qualification test procedures, pre-acceptance plans and reports, operating plans, reliability and quality control program plans and reports, drawings, and photographs of hardware testing. The records relate to the design, development, qualification, and flight support of the Gemini EVA system and pack by Garrett Corporation and AiResearch Manufacturing and Gemini suits by the David Clark Company under contract NAS9-1396. There are a few records relating to development of Apollo suits and the RX5 Hardsuit. (Old acc# 73A747, 81-28)

**A-31-66-5**

**E.171A1. SYSTEMS ENGINEERING BRANCH (EC2) FILES ON THE APOLLO-SOYUZ TEST PROJECT (ASTP). 1971-1975. 3 ft.**

Arranged by subject.

Correspondence, memoranda, drafts and final versions of technical studies and reports, minutes and transcripts of meetings of Work Group 5, briefing materials, mission reports, annotated project histories, and hand-written notes, graphs, and diagrams of hardware relating to the docking module used in ASTP. The records were maintained by Jim R. Jaax who was a member of the US-USSR Working Group 5 that was responsible for life support systems and crew transfer issues. See also E.267D. (Old acc# 79-23).

**B-11-84-7**

**E.171A2. SYSTEMS ENGINEERING BRANCH (EC2) COPIES OF SPACE STATION STUDIES. 1969-1972. 2 ft.**

Arranged by contractor.

Annotated copies of Space Station Phase B studies prepared by McDonnell-Douglas (NAS8-25140) and North American Rockwell (NAS9-9953) on environmental control and life support subsystems. There are concept definitions, technical summaries, and cost and schedules studies for radioisotope-powered, nuclear reactor powered and shuttle-launched modular space stations. There is also a copy of the 1969 MSC "In-House Study of a Space Base Progress Review" and preliminary design studies prepared by Hamilton Standard for Rockwell. These copies were maintained by Jim R. Jaxx for the Systems Engineering Branch which was responsible for space station environmental and thermal control design studies. (old acc# 79-23).

**B-11-86-1**

### **E.171B. PROJECT CONTROL FILES.**

**1963-1970. 11 ft.**

Arranged in chronological segments (FY1962-64, 1965, 1966, 1969, and 1970) and there under by subject in accordance with a numerical file plan.

Correspondence, memoranda, technical reports and studies, minutes of meetings, and briefing materials maintained by the Life Systems Division (EC). The records relate primarily to Apollo Block I and II space suits, the Apollo Portable Life Support System (PLSS), and the Extravehicular Mobility Unit. There are also records relating to environmental control systems used in Mercury, Gemini, the Apollo Command Module, and the Lunar Module. There is material relating to a space station, bio-instrumentation systems, survival equipment, medical experiments conducted in flight, a lunar base, and Extended Apollo missions. There is a 1963 contractor study (NAS 9-1701) of an environmental control system for a manned Mars Landing and Reconnaissance Mission. Much of the correspondence is with Hamilton Standard, ILC Industries, and other contractors working on the development, testing, and delivery of hardware. (Old acc# 71A1241, 73A747, 74A23, and 75B899).

**A-31-98-4**

### **E.171B1. PROTECTIVE EQUIPMENT BRANCH (EC9) CORRESPONDENCE FILES.**

**1970-1976. 3 ft.**

Arranged in yearly segments and thereunder by subject. There is a list of folder titles in box 1.

Correspondence and copies of internal JSC memoranda relating to Apollo Block II, Skylab, ASTP, and Shuttle space suits. There are also technical reports relating to the Advanced Space Suit, the Emergency Intravehicular Suit, the Orbital RVA Suit, firefighters' protective clothing, and some crew equipment. The records include Incentive Evaluation Committee reports from 1968 to 1975 and material about a proposal for space suit procurement from Save Our Aerospace Program (SOAP), Inc. (old acc# 79-23).

**B-11-84-7**

### **E.171C. SPACE SUIT BRANCH (EC9) PROJECT FILES.**

**1962-1975. 17 ft.**

Arranged by subject.

Correspondence, memoranda, minutes of design reviews and other meetings, qualification test plans, engineering memoranda, progress reports, statements of work, specifications, interface specifications and control documents, Customer Acceptance Review Data Packages, logic diagrams, copies of drawings, and acceptance test plans and test data. The records relate primarily to the administration of contracts NAS9-723 and NAS9-3535 with Hamilton Standard for design, development, qualification, and flight support of Gemini and Apollo Block I space suits. The records include a 1965 Briefing on Apollo Extra-Vehicular Mobility Unit, technical proposals by Garrett Inc, and a proposal by the David Clark Co. for an Extravehicular Mobility Unit (EMU). The technical reports are designated CSD-A, STB-A, and SVHSER. There are records from the Space Sciences Lab of Litton Systems relating to work done on the RX2, RX-3, and RX-4 suits under contracts NAS9-1278, NAS9-4941, and NAS9-5577. Many of the records were formerly classified as *Confidential* but were declassified by NASA under BM41 memo of 12-8-68. (Old acc# 72A776, 73A746, 73A1669, 76A1442, 81-28, 84-38).

**B-28-28-1**



**E.171D. INTRA-EXTRAVEHICULAR BRANCH (EC5) REFERENCE FILES ON  
ADVANCED SUITS. 1962-1976. 8 ft.**

Arranged by drawing number or subject.

Original drawings with some test results, correspondence, end item test and inspection procedures, failure reports, photographs of hardware, and handwritten notes relating to the RX-2A, RX-3, RX-4, RX5, and RX-5a hard suits developed by Litton Systems, Inc.. There are also records relating to the Articulated Anthropometric Dummy Development Program (contract NAS 9-1370) and the AiResearch Company's Advanced Extravehicular Space Suit (AES). The records appear to have been maintained by Joseph J. Kosmo. The Branch (EC5) was responsible for the design, development, fabrication, testing and delivery of space suits, life support equipment, and related hardware. (old acc#79-23).

**B-11-84-5**

**E.171E. EXTRAVEHICULAR EQUIPMENT BRANCH (EC6) PROJECT FILES.**

**1967-1973. 14 ft.**

Arranged by subject.

Correspondence, memoranda, specifications, technical and cost proposals, progress and financial reports, schedules, engineering memos, minutes of meetings and reviews, hand-written notes on design reviews, configuration management plans, pre-qualification test plans and data, acceptance test plans and data, failure mode analysis, maintenance manuals, parts lists, documentation lists, Reliability Data Reports (RDRs), Engineering Change Proposals (ECPs), photographs of equipment, and drawings. The bulk of the records relate to design, development, testing, and operation of the Apollo Portable Life Support System (PLSS) built by Hamilton Standard, Advanced Extravehicular Suit (AES) built by Litton, an Intravehicular Suit built by the David Clark Company, a Constant Volume Suit Project, and the Astronaut Life Support Assembly for Skylab missions. The bulk of the records relate to work done by Litton Systems under NAS9-7533, NAS9-7949, and NAS9-9158; and by AiResearch Manufacturing under NAS9-10465. There is a copy of the Apollo 13 Subsystem Review and some samples of material used for Apollo EVA suits. Many of the records appear to have been maintained by Joe Kosmo (EC6). (Old acc# 76A1057, 81-28, 84-37).

**B-28-28-4**

**E.171F. HAMILTON STANDARD CORRESPONDENCE.**

**1964-1973. 4 ft.**

Arranged by control number (SSN-0123 to SSN-5900) assigned in roughly chronological order by date written. Each folder contains an index to correspondence.

Copies of memoranda and TWXs sent by Hamilton Standard to NASA offices relating primarily to work on the Apollo Suit Assembly Program (NAS9-723), the Portable Life Support System (PLSS) (NAS9-3535), and related Extravehicular Activity equipment. The correspondence relates to all phases of design, manufacture, and testing of equipment and contract administration. (acc# 76A1057).

**A-23-94-3**

**E.171G. RECORDS OF THE FIELD OPERATIONS OFFICE OF ILC INDUSTRIES,  
INC. 1969-1977. 2 ft.**

Arranged by document number (70000 to 111168 with gaps).

Engineering memoranda, weekly activity reports, Test Preparation Sheets, Discrepancy Reports, and minutes of meetings relating primarily to activities under NASA contracts NAS9-

13698 and 9-14768. The records were maintained by B. Lapham and W. Saylor, Managers for Field Operations at the ILC plant in Dover, Delaware. There are also original signed issuances with revisions including Maintenance Manuals, Illustrated Parts Breakdowns, Handling Procedures, Acceptance Test Procedures, Safety Plans, Hazard Analysis, and Contract End Item Details for contract NAS9-6100 for the AL7B Pressure Garment Assembly for the Apollo Extravehicular Mobility Unit. (old acc# 79-14).

**A-30-14-2**

**E.172. TECHNICAL REFERENCE FILES ON LIFE SUPPORT SYSTEMS FOR APOLLO AND SKYLAB. 1968-1973. 2 FT.**

Arranged by flight.

Printed technical pre- and post-flight reports on thermal/thermodynamic performance of Extravehicular Mobility Units (EMU) and spacecraft Environmental Control Systems (ECS) for Apollo 8 through 17 and Skylab 1 through 4 missions. The records include NASA Technical Notes (TND), Technical Information Releases (TIR), and Technical Memorandum prepared by Boeing Company-Space Division, LTV, Lockheed, and General Electric as well as various offices at MSC. They include preflight thermal simulations and predictions, contingency analysis, posttest correlation of data, postflight analysis, metabolic data, analysis of the operation of the Primary Life Support System (PLSS), and mission reports. There are also copies of mission requirements, flight plans, lunar surface operations plans and procedures, mission operation reports, and a technical crew debriefing from Skylab. Wilbert E. Ellis maintained the files for reference. (Old Acc#255-90-0076)

**A-31-102-1**

**E.172C. ACCEPTANCE DATA PACKS FOR SUITS. 1967-1982. 6 ft.**

Arranged by part number.

Original System and Component Historical Records (MSC 772) for Apollo, Skylab, and ASTP suits and related equipment. The printed form includes a description of the item, manufacturer, serial number, and the dates and description of every action taken on the item with original quality control stamps. There are also Test Data Sheets, certificates of acceptance, and inspection receiving reports in most packs. It appears the records were maintained by the Hamilton Standard EMU Data Center. (Old acc# 82-37).

**B-28-28-6**

**E.172G. REFERENCE FILES OF JERRY GOODMAN ON APOLLO AND SHUTTLE ORBITER SYSTEMS. 1967-1977. 6 ft.**

Arranged by subject.

Originals and copies of memoranda, technical reports and studies, briefing charts, working papers, minutes and summaries of Preliminary Design and Critical Design Reviews and Crew Compartment Stowage Reviews, and drawings. The records relate primarily to Apollo systems including the unified hatch, couches, tethers, EVA equipment, Lunar Surface Equipment, tools, cameras, and crew equipment. There are many color and black and white photographs of equipment and astronauts examining mockups and equipment. There are also records on the design of Space Shuttle Orbiter systems including payload bay doors, hatches, cabin pressurization, and acoustics. Many of the documents and drawings have hand-written annotations and there are numerous hand-written notes relating to meetings and designs. The records were accumulated by Jerry R. Goodman who worked in the Apollo Spacecraft Program

Office and later the Systems Integration Office of the Orbiter Office within the Engineering and Development Directorate. (Old acc#78A79)

**A-22-72-2**

**E.172H. REFERENCE FILES OF KEITH HUDKINS ON SHUTTLE RADIATORS.**

**1974-1976. 3 ft.**

Arranged by subject (there is a list of file titles in box 1).

Memoranda, agenda and minutes of meetings, technical reports and studies, contractor status reports, engineering drawings, and briefing materials for Design Reviews. There are also Test Plans, Detailed Test Procedures, Test Readiness Reviews, Data Processing Plans, Data Reduction Formats, and color photographs of test hardware for tests conducted in the Space Environment Simulation Lab. The records relate to the Orbiter Heat Rejection Systems (OHRS), the Shuttle Active Thermal Control System (ACTS), Ammonia Boiler Systems, heat exchangers, and flash evaporators. Some of the studies were conducted by Vought Corporation or Hamilton Standard under contract. The records were maintained by Keith L. Hudkins who worked in the Environmental and Thermal Systems Section (EC2). (old acc#79-30).

**A-30-14-2**

**Laboratory Operations Office**

**E.180. REFERENCE FILES OF THE CHIEF.**

**1967-1972. 2 ft.**

Arranged chronologically.

Correspondence, memoranda, and numerous technical reports written or accumulated by Jesse C. Jones (Chief of EA2 from 1967-72) and William E. Rice (Chief of EA2 in 1972). The records relate to engineering design and testing of various flight systems. (Old ACC# 75A891)

**A30-14-2**

**Experiment Systems Division**

In 1963 a Space Environment Division was established under the Assistant Director for Engineering and Development to work on scientific problems relating to manned space flight such as high temperature radiation. John M. Eggleston was named head of the Division which also included a Mapping Sciences Branch under cartographer John B. Dornbach and a Geology and Geochemistry Branch under geologists Elbert A. King and Ted H. Foss. The staff was called on to contribute to the design and development of spacecraft and systems and to plan and conduct scientific experiments in space. In March, 1964 an Experiments Coordinating Office was established in E&D to support other MSC units, assure reliability and flight worthiness, integrate experiments in flight time lines, and train crew to operate experiments. The Division was abolished in June 1965 and replaced with an Experiments Program Office under Robert O. Piland that was responsible for all aspects of experiments on manned space flight missions (see MSC Announcements 65-81). An MSC Experiments Review Panel was established at the same time to advise on research proposals.

In May 1966, a Space Science Division was established within the Engineering and Development Directorate to investigate space radiation, micrometeoroid flux, lunar surface

conditions, planetary atmospheres, and other topics (see MSC Announcement 66-65). It also reported to Robert O. Piland who continued as head of the Experiments Program Office.

In January 1967, most of the responsibilities for design and development of hardware for lunar experiments was transferred to the Science and Applications Directorate (S&AD). In September 1969, the Lunar Surface Project Office (TD) was transferred from S&AD to Engineering and Development and reported to the Assistant Director for Electrical Systems (EA). It was responsible for the engineering and development work on all hardware while the S&AD retained responsibility for developing lunar science plans and for the conduct of the actual experiments. On December 31, 1971, an Experiments Program Engineering office (ED) was established and given responsibility for managing the implementation plans for lunar surface science projects and the engineering and development of all (MSCA 71-96 and 71-157). It included the Lunar Surface Project Office (which became ED3) and a Lunar Orbit Project Office (ED2).

#### **E.181C5. CENTRAL CORRESPONDENCE FILES.**

**1968-1973. 10 ft.**

Arranged in segments (General, Sent to Bendix, Received From Bendix) and thereunder chronologically.

Correspondence, memoranda, TWXs, and related material maintained by the Lunar Surface Project Office (TD and EH) and its successor the Experiments Division (ED3). The bulk of the correspondence is with the Bendix Aerospace Systems Division and relates to the design, construction, testing, and delivery of scientific experiment hardware for EASEP, ALSEP, and other Apollo projects. See also Bendix documents in entry 209D. (Old acc# 74A798 and 76A425)

**A-30-10-6**

#### **E.181C10. CORRESPONDENCE FILES OF THE LUNAR ORBITAL PROJECT OFFICE. 1969-1972. 8 in.**

Arranged chronologically. There is a mail log in box 1.

Original letters and memoranda received and copies sent by the project office (EF) before it was incorporated into the Experiment Systems Division. The correspondence relates to the design, construction, and testing of a variety of photographic and sensing experiments proposed for flight in the Service Module (SIM). (Old acc# 74A798)

**A-30-10-5**

#### **E.181C15. PROJECT FILES ON THE 3-INCH LUNAR MAPPING CAMERA.**

**1969-1973. 12 ft.**

Arranged by subject or type of document.

Correspondence, technical proposals, progress reports, minutes of meetings and reviews, financial reports, Critical Design Reviews, Flight Readiness Reviews, schedules, failure mode analysis, acceptance data packages, qualification data, hand-written notes and sketches, and drawings. The records appear to have been maintained primarily by Gerald F. Pels of the Lunar Orbital Project Office and relate to the engineering definition, design, construction, calibration, testing, verification, integration, technical support, and operation of the 3 inch mapping camera flown in the scientific instrument module bay of the Apollo Service Module. The camera was built by the Fairchild Camera and Instrument Corporation under contract NAS9-10457. (Old acc# 74A15).

**B-28-22-6**

**E.181C16. ALSEP REQUIREMENTS DOCUMENTS.**

**1965-1969. 3 ft.**

Arranged by document control number (ARD1-531).

Copies of documents issued by Bendix Aerospace under contract NAS9-5829 to build Apollo Lunar Surface Experiment Package hardware. The documents relate to scope of work, technical specifications, performance requirements, subcontract schedules, interdivisional order schedules, and configuration management policy. (Old acc# 74A24).

**B-19-34-4**

**B181C18. ALSEP TECHNICAL MEMOS.**

**1965-1971. 4 ft.**

Arranged by document control number (EATM 1-87 and ATM 1-939). There is an index to the EATMs in box 1.

Copies of documents prepared by Bendix Aerospace under contract NAS9-5829. The documents relate to manufacturing procedures, mechanical interface, qualification status, calibration curves, dynamics analysis, failure mode analysis, weight reports, command lists, surface operating procedures, testing, and engineering support. (Old acc# 73A771).

**B-19-34-5**

**E.181C20. MINUTES OF MEETINGS WITH BENDIX AEROSPACE.**

**1968-1972. 5 FT.**

Arranged chronologically by date of meeting.

Copies of agenda, minutes, and related briefing material and handouts. The meetings include program reviews, Preliminary and Critical Design Reviews, Design Certification Reviews, Design Status Reviews, Qualification Test Reviews, Customer Acceptance Readiness Reviews, and Flight Test Readiness Reviews. There are also drawings and technical reports on design and construction of experiment hardware. See also entry 195C5 and 195C10. (Old acc# 74A798)

**A-30-10-3**

**E.181C22. ALSEP ENGINEERING CHANGE PROPOSALS.**

**1976-1972. 9 ft.**

Arranged by document control number (OS, O1, O2, etc). There is a list of proposals in box 1).

Originals and copies of Engineering Change Proposals initiated by the Lunar Surface Project Office and later the Lunar Experiments Project Office. There are related documents including correspondence with contractors, internal MSC memos, hand-written notes of meetings and technical reports, change proposals, studies and justifications of proposals, Configuration Control Board Directives, Lunar Module Configuration Control Panel Agenda and Minutes, briefing material, drawings, and some color photographs of equipment on the lunar surface or in testing. The bulk of the correspondence is with Bendix or Grumman. (Old acc# 73A1677).

**B-19-34-6**

**E.181C25. APOLLO EXPERIMENT PROPOSALS.**

**1968-1972. 2 FT.**

Arranged by proposal control number (L003 to L233 with gaps). There is a list of proposals and an alphabetical list of Principal Investigators in box 1.

Copies of proposals submitted by universities, contractors, other government agencies, and other NASA Centers for lunar surface experiments. Most of the proposals include NASA Form 1346 which provides the title of the experiment, names and biographies of the Principal Investigator and Principal Administrator, theoretical and engineering information about the experiment, operational requirements, and funding/resource requirements. (Old acc# 74A798)

**A-30-10-3**

**E.181C27. ALSEP PROJECT FILES.**

**1965-1972. 14 ft.**

Arranged by subject.

Correspondence, memoranda, technical reports, minutes of meetings and technical reviews, test plans, drawings, and photographs of hardware and training exercises. The records relate to the design, construction, qualification and flight readiness testing, and operation of various experiments including the Active Seismic Experiment (ASE), Lunar Seismic Profiling Experiment (LSPE), Heat Flow Experiment (HFE), Lunar Surface Magnetometer (LSM), Apollo Lunar Surface Drill (ALSD), and SO68 meteoroid experiment. Many of the reports and review materials have hand-written annotations. (Old acc# 73A756, 73A771, and 73A1677).

**B-19-36-1**

**E.181C30. PROJECT FILES ON EQUIPMENT FOR APOLLO SURFACE EXPERIMENTS. 1966-1972. 2 ft.**

Arranged by type of equipment.

Correspondence, reports, hand written notes, design reviews, familiarization manuals, engineering status reports, specifications, testing and qualification reports, schedules, drawings, and related material pertaining to the design, construction, testing, and operation of equipment to be used primarily for the return of lunar samples. There are records relating to Sample Return Containers (SRC), hand tools, core tubes, sample bags, spring scales, gas analysis sample containers, drill stems, and weigh bags. Much of the correspondence is with the Y-12 Plant of the Union Carbide Corporation, Nuclear Division at Oak Ridge, Tennessee that relates to sample return containers. There are numerous color and black and white photographs of equipment as it was shipped from the plant and received at the Kennedy Space Center. There are some lists of equipment that provide Serial Numbers or Part Numbers. (Old acc#74A798)

**A-30-10-5**

**E.181C35. ACCEPTANCE TEST PROCEDURES.**

**1967-1972. 2 ft.**

Arranged by test number.

Copies of selected functional test procedures conducted or supervised by Bendix under contract NAS9-5829 prior to acceptance of ALSEP equipment. The test documentation generally includes part description, part and serial number, purpose and scope of test, applicable documents, equipment and power requirements, test procedure, variation sheets, discrepancy reports, and approval sign-offs. (Old acc# 73A1677 and 74A24).

**B-28-46-5**

**E.181C40. ACCEPTANCE DATA PACKAGES.**

**1967-1972. 80 ft.**

Arranged by equipment/experiment.

Copies and some originals of documentation submitted by Bendix or its subcontractors for ALSEP equipment. The packages are generally divided into Vehicle/Support Equipment, Limited Life Items, Handling Instructions, and the Ground and Flight Article Detailed Test Plan. The information provided about each item includes part and serial numbers, some drawings, operating time logs, verified configuration record, non-conformance reports, waivers, open item reports, end-item acceptance test procedures and data, qualification status, preservation and packing data, and special handling instructions. Bendix was required to provide NASA with a “reproducible” and two copies of each package. (Old acc# 73A1677 and 74A24).

**B-28-46-6**

**E.181C45. ALSEP EQUIPMENT LOGS.**

**1967-1972. 25 ft.**

Arranged by type of equipment (there is a list of equipment in box 1).

Original signed logs for various types of equipment incorporated in ALSEP experiments. The logs include part and serial numbers, an operating events log, verified configuration, replacement record, weight and balance history, acceptance test and inspection data, failure and corrective action record, open items, spares lists, non-conformance status, and end-item inspection and test procedures. (Old acc# 73A1677 and 74A24).

**B-28-48-6**

**E.182. DOCUMENTS RELATING TO APOLLO LUNAR SAMPLE RETURN CONTAINERS. 1967-1973. 3 ft.**

Arranged by document number. There is an index in box 1.

Correspondence, status reports, hand-written notes of meetings, abstracts, contracts, financial and cost reports. There are many documents created by the Union Carbide Corporation, Nuclear Division at Oak Ridge relating to the design, manufacture, and testing of Lunar Sample Return Containers and “interfacing hardware.” The documents include Design Specifications, Performance Specifications, Quality Assurance Plans, Assembly Procedures, Test and Inspection Procedures, Engineering and Progress Status Reports, Thermal and Vacuum Testing, and Familiarization Manuals. There is also a copy of a printed Summary Report (Y-1867) issued February 16, 1973 that provides a detailed history of the design and manufacture of the hardware and includes photographs. (Old acc# 73A1677 and 74A-1733)

**A-30-004-2**

**E.182A. DATA PACKAGE FOR APOLLO 17 LUNAR SAMPLE RETURN CONTAINERS. 1971-1973. 1 ft.**

Arranged by type of hardware.

Copies of various documents and memoranda created by NASA and support contractors relating to the testing and acceptance of the sample return containers and “interfacing hardware” for the Apollo 17 mission. The documents include Test Preparation Sheets, Discrepancy Reports, Acceptance Plan and Procedures, and System and Component Historical Records (MSC Form 772). The documents contain the signatures and quality control stamps of the staff that conducted the testing and the serial number and part number of every item. (Old acc # 74A-1733)

**A-30-004-2**

**E.182K. PROJECT FILES ON SKYLAB EXPERIMENTS.**

**1970-1973. 2 ft.**

Arranged by subject or experiment number (S, and T numbers).

Correspondence, memoranda, proposals, technical reports, and briefing materials relating to Skylab experiments including the Earth Resources Experimental Package (see also entry 194B). The files were maintained by the Experiments Engineering Project Office (ED) and its predecessors. (Old acc# 76A425)

**A-30-8-7**

**E.182L. SKYLAB CAMERA PROJECT FILES OF B. H. MOLBERG.**

**1971-1975. 3 ft.**

Arranged by subject.

Correspondence, memoranda, requests for proposals, technical and cost proposals, critical design reviews, end item specifications, contracts, engineering change proposals, monthly progress and financial reports, acceptance data packages, inspection and receiving reports, and some drawings. The bulk of the files relate to the Skylab Multispectral Photographic Camera, the Airborne Multispectral Photographic System (AMPS), the Apollo 24-inch Panoramic Camera, and the Earth Resources Experiments Package (EREP experiments S190 and S190A). Most of the hardware was developed by Itek Corporation under contracts NAS9-9800, 9-9973, 9-10294, 9-10698, and 9-12764. The records include Failure Inspection Analysis Reports, Skylab Pass Reports on EREP, Skylab mission reports, and some operating, maintenance, and handling procedures manuals. The records were maintained by B. H. Molberg, Experiments Development Manager in the Experiments System Division (EB8). (acc # 76AB504).

**A-30-8-7**

**E.183. PHOTOGRAPHIC SYSTEMS DEVELOPMENT BRANCH REFERENCE FILES.**

**1963-1974. 19 ft.**

Arranged by subject.

Correspondence, memoranda, data packs, contractor progress and financial reports, quality assurance plans and test data, calibration data, spacecraft flown hardware assignments, photographs of hardware, and drawings. The records relate to cameras, magazines, and related equipment procured primarily under contracts NAS9-6650, NAS9-6187, NAS9-11145, and NAS9-11298 for use on Apollo and Skylab missions. The records include mission documents such as Photographic and Television Operations Plans, Lunar Surface Operations Plans, Failure Mode Analysis, and Stowage Lists for Apollo 9 to Apollo 17 and Skylab 1-4. There are a few records relating to experiments conducted on Mercury missions. These files were maintained primarily by Ron H. Gerlack while with the Flight Equipment Section (CF32) and Jim Ragan. (Old Acc# 75A1426).

**A-19-66-3**

**Chemical and Mechanical Systems Division**

**E.185. OFFICE FILES OF ALECK C. BOND.**

**1962-1971. 1 ft.**

Arranged chronologically.

Memoranda, technical reports, charts and diagrams of equipment, minutes of meetings of flight planning groups, test plans and reports, and various technical records relating to the construction and operations of various test and lab facilities such as space environment chambers. The records relate to Reliability and Quality Assurance programs, flight safety, flammability of flight equipment, construction of the Lunar Receiving Laboratory and the requirements of the back contamination program, and design and testing of various subsystems for Gemini, Apollo,



and Skylab. There are a few photographs of test equipment and flight hardware. These files were maintained by Aleck C. Bond who served as Chief of the Chemical and Mechanical Systems Division (EA1). (255-79-0050)

**A-31-92-7**

### **Landing Technology Branch**

**See Also: Entry 75, boxes 403-409.**

#### **E.187. PARAGLIDER AND PARASAIL PROJECT FILES.**

**1961-1965. 3 FT. and APPROX 400 ITEMS**

Arranged by subject.

Correspondence, memoranda, cost and technical proposals, technical reports, test data, drawings, and photographs relating to studies of developing a land landing system for both Gemini and Apollo spacecraft using either a paraglider or parasail. Studies were done by the Pioneer Parachute Company (contracts NAS9-1157 and NAS9-2860) and Goodyear Aircraft (contract NAS1-1795). The records include data from drop tests of 70 and 80-foot parasails conducted at the U.S. Naval Aerospace Recovery Facility at El Centro, California. It appears that the bulk of the records were maintained by Leland C. Norman working for the Landing Technology Branch (ES8) of the Mechanical Systems Division in the Engineering and Development Branch. See Chariots For Apollo (SP4205) pps 94-96 and Milton O. Thompson and Curtis Peebles, Flying Without Wings (Smithsonian Press, 1999) for information about the program. See also entry 200D. (Old acc# 67A967, 67B967, and 76A1515)

**A-20-76-4 and B-35-28-8 and 9**

#### **E.187A. PARAGLIDER DRAWINGS BY NORTH AMERICAN AVIATION.**

**1963-64. 1 ft. and approx 700 items.**

Arranged by drawing number (with some gaps). There is an alphabetical subject card index to the drawings.

Originals and copies of drawings of a paraglider prepared by North American Aviation under contract NAS9-1484. There are also some internal North American letters, reports, and lab memoranda relating to the project. (Old acc #69A634)

**B-30-40-1**

### **Computation and Analysis Division**

The Computation and Analysis Division (ED) was established on January 9, 1967 by MSCI 1142.7 with responsibility for planning, coordinating, acquiring, and installing computing equipment and performing computer programming to support engineering, development, testing, and management activities. It became part of the Flight Operations Directorate (FD) on April 19, 1971 (MSCI 1145.2).

#### **E.189Z. INFORMATION SYSTEMS DIVISION CORRESPONDENCE.**

**1965-1967. 1 ft.**

Arranged chronologically.

Copies of letters sent and some original letters received relating to the planning, analyzing, and engineering of the design, development, testing, and qualification of on-board data systems

and ground support equipment. The bulk of the records relate to the Apollo Manned Space Flight Network (MSFN). (Old acc# 75A899)

**A-31-98-4**

**E.190. RESEARCH STUDY CASE FILES.**

**1966-1969. 2 ft.**

Arranged by topic. There is a list of titles in box 1.

Drafts and final copies of studies on the use of computers for various administrative operations including supply functions, space utilization, work measurement, processing personnel documents, and accounting. There are feasibility studies on the use of various computer systems and related equipment. Lockheed Electronics did many of the studies under contract. (72A1139).

**A-30-008-6**

**Engineering and Analysis Division (EX)**

The Division was responsible for conducting vehicle-engineering analysis to determine overall performance requirements for advanced systems, especially in the area of aerodynamic performance, flight characteristics, performance and dynamics including aeroelasticity.

**E.192. CORRESPONDENCE AND REFERENCE FILES.**

**1969-1974. 1 ft.**

Arranged chronologically.

Original memos received and copies sent by the Chief of the Division, Bruce G. Jackson; Technical Assistant Carl W. L. Watkins; and Special Assistants William C. Moseley and James P. Bingham. There are also technical studies including MSC Internal Notes. The material relates primarily to Apollo and the Space Shuttle Orbiter. (76A53).

**A-31-96-1**

**E.192C. CENTRAL CORRESPONDENCE FILES.**

**1972-1982. 12 ft.**

Arranged by branch (EX32, EX33, EX4) and thereunder chronologically.

Official yellow copies of memoranda sent by the Aerodynamic Subsystems Manager, Entry Performance Dynamics Branch, the Integrated Entry Analysis Branch, and the Integrated Flight Analysis Branch. The correspondence relates to the design, fabrication, testing, and delivery of Space Shuttle systems and components, contract administration, and general administrative matters. (Old acc# 81-39, 81-40, 84-27 and 90-22)

**A-31-96-1**

**E.192C2. APOLLO VISIBILITY STUDIES.**

**1963-1972. 1 ft.**

Arranged by topic.

Studies and technical reports prepared by both MSC units and contractors on topics relating to visibility, photometrics, and photography during lunar landings and on the lunar surface. The studies were done by Bellcomm, Boeing, Eastman Kodak, Grumman, General Electric, Hughes, and TRW. The records include the Surveyor III Mission report, Apollo 11 photographic reports, reports on geological and photographic characteristics of landing sites, and studies and photographs of lunar surface models used for simulations. It appears the records were maintained by R. W. Abel (EX2). (Old acc# 76A1471)

**A-31-96-4**

**E.192C3. AEROTHERMODYNAMIC WORKING GROUP RECORDS.**

**1969-1974. 8 in.**

Arranged chronologically by date of meeting and thereunder by subject.

Correspondence, memoranda, agenda, minutes, briefing materials, and hand-written notes of meetings of the working group studying aerothermodynamic issues relating to the Space Shuttle. The Flight Technology Branch (EX2) maintained the records. (Old acc# 75A1203)

**A-31-96-5**

**E.192C4. SHUTTLE DESIGN CONTRACT REFERENCE FILES.**

**1970-1973. 3 ft.**

Arranged by contract and thereunder by subject.

Correspondence, activity reports, quarterly progress reports, technical reports, and related material maintained primarily by Bruce Jackson (EX23) on contracts with Boeing (NAS9-12220), McDonnell-Douglas (NAS9-10526), and LTV Aerospace (NAS9-11309) for design work on the shuttle. (Old acc# 74A18).

**A-30-90-7**

**E.192C5. SHUTTLE ENTRY INTEGRATION PANEL RECORDS.**

**1972-1976. 6 in.**

Arranged chronologically by date of meeting and thereunder by subject.

Correspondence, memoranda, minutes, agenda, lists of participants, briefing materials, and hand-written notes maintained by the Subsystems Manager, Entry Integrated Flight Systems (EX43). The panel included members from other NASA centers and contractors. (Old acc# 81-39)

**A-31-19-5**

**E.192C7. SHUTTLE ABORT WORKING GROUP RECORDS.**

**1973-1976. 1 ft.**

Arranged chronologically by date of meeting.

Correspondence, memoranda, agenda, minutes, lists of attendees, lists of action items, briefing materials, and hand-written notes. The group included representatives from various MSC units and North American-Rockwell and studied design criteria for abort systems, trajectories, procedures, and systems integration. The records appear to have been maintained by C. T. Hyle, Abort Subsystem Manager (EX44). (Old acc# 78-32)

**A-31-19-5**

#### **E.192C9. SPACE SHUTTLE WIND TUNNEL TEST DATA.**

**1969-1972. 21 ft.**

Arranged by report number (DMS-DR-0001 to DMS-DR-1278). A list of report titles and acronyms is included in box 1.

Copies of reports of tests on shuttle configurations developed during concept feasibility studies and preliminary design studies (Phase A/B). The data was acquired for a variety of alternate configurations by the Chrysler Corporation under a contract with the Marshall Space Flight Center (NAS8-4016). The reports generally include the name of the test facility, configuration, scale, test purpose, mach number range, abstract, test conditions, data set collations, test nomenclature, figures, graphs, photographs, and data display index. The records were created for the Engineering Analysis Office (EX). (Old acc# 96-3).

**B-28-56-3**

#### **E.192C10. PROJECT FILES ON SPACE SHUTTLE WIND TUNNEL TESTS.**

**1969-1973. 7 ft.**

Arranged by subject in accordance with a numeric file system (1.1 to 9.4).

Correspondence, memoranda, test directives, integrated test plans, program requirements documents, planning guidelines, test data, project test and evaluation files, preliminary and final reports. "Show and tell" briefings, hand-written notes, aerodynamic design data books, and configuration drawings. Many of the studies were created by contractors as part of Pre-Phase B, Phase B, and Phase B Extension projects. The contractors include North American/Convair, Grumman/Boeing, and McDonnell/Martin. The studies relate to aerodynamics, heat transfer, dynamic loads, straight-wing designs, a "DC-3 Space Shuttle", and construction of wind tunnel models. Most of the records appear to have been maintained by James C. Young (EX24). (Old acc# 75A1203)

**A-31-19-5**

### **Advanced Programs Office (ED)**

#### **E.192E. CENTRAL CORRESPONDENCE FILES.**

**1985-1986. 8 in.**

Arranged chronologically.

Official yellow copies of memoranda sent. The correspondence relates to the design, fabrication, testing, and delivery of Space Shuttle systems and components, contract administration, and general administrative matters. For correspondence sent by predecessor units, see entries 192C and 192N. (Old acc# 90-22)

**A-30-40-5**

## Instrumentation And Electronic Systems Division (EE)

### **E.192H. PROJECT CASE FILES.**

**1967-1969. 1 ft.**

Arranged by subject.

Correspondence, memoranda, design studies, engineering proposals, project development plans, Lunar Surface EVA Timelines, Component Type Qualification Procedures and Test Reports, hand-written notes of meetings and briefings, drawings, and photographs of hardware. The records relate primarily to the Lunar Ascent Television Electronics (LATE) project and a hand-held laser proposed as a tool for mapping the Lunar surface designated the Lunar Surveying System (LSS). Most of the records appear to have been maintained by the Chief of EE, Ralph J. Sawyer, and various employees in EE4. (Old Acc# 71A1353 and 71A1354).

**A-31-102-5**

## Structures And Mechanics Division (ES)

### **E.192K. DIVISION CORRESPONDENCE FILES.**

**1963-1968. 3 ft.**

Arranged chronologically.

Record copies of letters sent and some letters received. The correspondence relates to projects Mercury, Gemini, and Apollo. (Old acc#74A804).

**A-31-102-7**

### **E.192M. REFERENCE FILES OF THOMAS L. MOSER**

**1977-1982. 5 ft.**

Arranged by subject.

Correspondence, memoranda, hand-written notes, technical articles, test reports, technical reports, photographs of test articles and hardware, drawings, requirements documents, lists of open issues, cost reports, schedules, Orbiter Status Reports, and briefing materials used at various presentations ("pitches") to NASA management. The bulk of the material relates to the design, fabrication, and testing of the Shuttle Thermal Protection System (TPS) and includes photographs and design/test data on tiles and data relating to the flights of STS-1 and STS-2. Moser joined NASA in 1973 as an engineer in the Apollo Command Module Structures Branch of the Structures and Mechanics Division and became the Manager for the Orbital Thermal Protection System, a Special Assistant to the JSC Director, and Deputy Manager of the Space Shuttle Orbiter Project. (Old acc#86-36 and 88-60)

**A-22-74-1**

### **E.192M5. REFERENCE FILES ON CENTAUR.**

**1979-1986. 3 ft.**

Arranged by subject.

Copies of printed reports submitted by General Dynamics and Rockwell International on Centaur and Centaur G. The records include presentations and final reports from Preliminary Design Reviews, Critical Design Reviews, Design Review Reports, Level II Program Definitions and Requirements, functional requirements documents, stress analysis reports, static load and acoustic fatigue reports and analysis, and structural and systems descriptions. The records include

a Structural Verification Review for Galileo and some Jet Propulsion Lab (JPL) reports on Radioisotopic Thermoelectric Generator (RTG) programs. (acc# 86-56).

**B-28-56-7**

### **Systems Engineering Division (ET)**

#### **E.192N. CENTRAL CORRESPONDENCE FILES.**

**1982-1985. 2 ft.**

Arranged chronologically.

Official yellow copies of memoranda sent. The correspondence relates to the design, fabrication, testing, and delivery of Space Shuttle systems and components, contract administration, and general administrative matters. For correspondence sent by predecessor units, see entries 192C. (Old acc# 90-22)

**A-31-90-7**

### **Spacecraft Design Division (EW)**

Formerly the Advanced Spacecraft Technology Division.

#### **E.193C. CENTRAL CORRESPONDENCE.**

**1963-1974. 3 ft.**

Arranged chronologically. Beginning in 1970, the files are in yearly segments and thereunder by subject.

Official yellow copies of correspondence. The records relate to general administration, the Shuttle, Skylab, habitability, food systems, teleoperator systems, mass properties, ASTP, and the Earth Orbital Space Station. (Old acc# 75A1215, 76A927, and 78-3)

**A-31-90-6**

#### **E.193E. PROJECT CASE FILES.**

**1965-1974. 1 ft.**

Arranged by project.

Correspondence, memoranda, draft and final reports and studies, minutes of bioengineering panel and crew quarters panel meetings, requirements documents, briefing materials, hand-written notes, and drawings. The records relate primarily to Crew Habitability (Experiment M487), Kohoutek observations, construction of mockups, the Skylab Parasol design, Skylab Thermal Sail, an Orbital Escape System, Teleoperator systems, and Subsystems Test Bed development. The Parasol and Sail records include samples of material considered and photographs of hardware. These records were maintained for reference by Caldwell C. Johnson who served as Chief of the Advanced Spacecraft Technology Division and a Special Assistant to the MSC Director. (Old acc# 75A1215 and 78-61)

**A-31-90-6**

#### **E.193G. PROJECT FILES OF ROBERT BOND ON SKYLAB EXPERIMENTS.**

**1971-1975. 2 ft.**

Arranged by type of document.

Correspondence, memoranda, monthly progress reports, Skylab Mission Reports, Experiments Debriefing Reports, Technical Crew Debriefings, Photo Operations Books and Logs, photos of equipment, and annotated air-to-ground transcripts. The records include original

Principal Investigator (PI) Logs and mission books with shift schedules for the mission control room, personnel rosters, timelines, and handwritten notes on equipment development and use and mission simulations. The records were maintained by Robert L. Bond who was Chief of the Man-Machine Engineering Section (EW5) and relate to experiments M487 designed to evaluate habitability of crew quarters and work areas and M516 designed to evaluate the Skylab man/machine relationship and the crews' ability to perform work in zero gravity. There are also some records relating to contracts with Martin Marietta for data collection and analysis. (old acc# 78-4).

**A-20-78-6**

### **Energy Systems Division (EP)**

**Formerly called the Propulsion and Power Division.**

#### **E.193T. APOLLO PRE-CARR REPORTS.**

**1968-1971. 1 ft.**

Arranged by spacecraft number.

Copies of Pre-Customer Acceptance Readiness Reviews (CARR) and Flight Readiness Reviews (FRR) prepared by Boeing under NASw-1650. The reports assess the readiness of the propulsion and power generating subsystems of the LM4-8 and CSM 104-109 and include information about configuration, test status, and performance. There is also a pre-FRR pyrotechnic report for CSM-103. (Old acc# 75A1563).

**A-23-94-2**

#### **E.193W. REFERENCE FILES OF JOSEPH G. THIBODAUX ON THE WHITE SANDS TEST FACILITY. 1965-1973. 2 ft.**

Arranged by subject (there is a list of folder titles in box 1).

Correspondence and reports relating to testing done on Apollo and LM subsystems at the White Sands Test Facility (WTSF). The records relate to testing and studies done by Boeing, Grumman, Chrysler, Aerojet, United Technology, Lockheed, and Thiokol. The bulk of the material relates to studies of solid rocket motors for the Space Shuttle. It appears the records were maintained by Thibodaux who served as Chief of the Power and Propulsion Division (EP). (Old acc# 75F899)

**A-22-72-4**

### **Thermochemical Test Branch**

#### **E.193X. TECHNICAL REPORTS.**

**1963-67. 2 ft.**

Arranged numerically by report number (63-EP-1 to 67-EP-42).

Original test evaluation reports issued as MSC Internal Notes. The reports provide detailed data on tests of rocket engines, reaction control systems, fuels and oxidizers, fuel cells and other electrical systems for both Gemini and Apollo spacecraft. Many of the reports include photographs of the test items. Most of the reports were microfiched in 1968-69 and are probably in the JSC Scientific and Technical Information Center. (Old ACC# 71A1240)

**A-31-098-3**

## **Battery and Pyrotechnics Branch**

### **E.193Z. PROJECT FILES ON BATTERIES AND PYROTECHNICS.**

**1964-1984. 5 ft.**

Arranged by subject.

Correspondence, memoranda, minutes of meetings and reviews, hand-written notes and graphs, studies and design proposals, qualification test plans and data, narrative activity reports, certification data, anomaly and flight discrepancy reports, technical and management briefing material, photographs of hardware, and drawings. The records relate to the design, development, production, testing and flight use of batteries, fuel cells, and pyrotechnics for Apollo, Skylab, and Shuttle. There are files relating to the Space Operations Center (SOC), Orbital Service Module (OSM), Extended Orbiter, and the Shuttle Launched Research Vehicle (SLRV). There are also test data sheets and certification reports for lots and batches of the Single Bridgewire Apollo Standard Initiator (SBASI) produced by Hi-shear Corporation. It appears that most of these files were maintained by Bobby J. Bragg and J. Barry Trout (EP5) for reference. (Old acc# 87-4 and 87-13).

**A-22-72-6**

## **Project Support Branch (EP2)**

**Also known as the Systems Branch.**

### **E.194. REFERENCE FILES OF HUBERT J. BRASSEAUX RELATING TO SPACE SHUTTLE DESIGN. 1968-1973. 6 ft.**

Arranged by subject.

Original correspondence, trip and technical reports, and briefing materials used for configuration reviews and concept evaluations including charts, graphs, photographs of equipment, and drawings of early shuttle concepts. Many of the reports were produced by Aerojet General, General Electric, Rocketdyne, Pratt and Whitney, and the Air Force Rocket Propulsion Lab and relate to air-breathing engines, the Aerospike engine, the Titan booster, and various solid rocket boosters. Much of the technical data relates to engine design and performance and includes some data on both the Apollo CSM and LM propulsion systems. Brasseaux was the Technical Assistant to J. G. Thibodaux, Chief of the Power and Propulsion Division. The design team involved with these early Phase I studies of the space shuttle were often referred to as the NASA Skunk Works. Many of these files were improperly marked "Classified" but all were declassified by NASA. (Direct offer NRF-99-255-0002)

**A-22-72-1**

### **194AA. REFERENCE FILES ON SHUTTLE LAUNCHES FROM VANDENBURG AIR FORCE BASE. 1981-1986. 2 ft.**

Arranged by subject.

Copies of technical studies and reports relating to plans to launch the Space Shuttle from Vandenberg Air Force Base maintained by the Systems Branch (EP2) which was responsible for design, development, and certification of propulsion and power systems for the Shuttle Orbiter. The records include Critical Design and Test Implementation Review Board meeting minutes, Requirements Traceability Matrix (RTM) developed for tracking software requirements during



software specification development, Operating Criteria, and Operational Readiness Inspections with Action Dispositions and Closeouts for liquid hydrogen and oxygen systems and the Orbiter Landing Strip. There is also Performance Predictions for the STS-1 launch done in 1981 and minutes of Ascent Performance Panel meetings for STS-4 in 1982. Many of the documents were prepared by contractors Martin Marietta and Lockheed Space Systems for the Air Force's Shuttle Activation Task Force. (old acc# 88-52).

**A-22-68-7**

## **EARTH RESOURCES PROGRAM OFFICE (HA)**

The Earth Resources Project Office was established on March 31, 1972 (MSCA 72-54). It was given responsibility for planning, coordination, and direction of all MSC earth resources activities. As with other program offices, it worked with other MSC Directorates to accomplish its mission goals. Clifford E. Charlesworth, former Deputy Manager of the Skylab Program Office, was named program manager. The Earth Resources Lab was transferred to the National Space Technology Lab on August 24, 1977 (JSCI 1130.1S). The Program Office was abolished April 20, 1979 and its personnel transferred to the Space and Life Sciences Directorate (JSCI 1130.1T).

### **E.194A. GENERAL CORRESPONDENCE FILES.**

**1972-1979. 17 ft.**

Arranged in yearly segments and thereunder by subject using the same categories found in entry 205T5.

Correspondence, memoranda, TWXs, Program Operating Plans, Program Management Plans, budget requests and reports, Research and Technology Operating Plans (RTOPs), experiment proposals, Weekly Activity Reports, Aircraft Status Reports, Aircraft Schedules and Mission Reports, Surveys and Audits, and related material maintained primarily by William E. Rice, and other managers in the program office (HA). The records relate to development and flight of hardware and analysis of data. There is correspondence with NASA Headquarters, contractors, and various scientists relating to proposals for remote sensing experiments, approval, funding, and results. There are records relating to the Earth Resources Experimental Package (EREP), the Large Area Crop Inventory Project, and other remote sensing projects. Many of the experiments were flown on NASA aircraft. (Old acc# 76A275, 77A43, 79A26, and 81-51)

**A-31-94-1**

### **E.194B. PROJECT CORRESPONDENCE.**

**1973-1975. 2 ft.**

Arranged by subject.

Correspondence, memoranda, technical reports, statements of work, proposals, contracts, and other material relating to experiments flown on Skylab missions. The bulk of the correspondence is with Martin, Honeywell, ITEK, the University of Kansas, and other contractors working on experiment hardware or analysis. There is some material relating to the Earth Resources Experimental Package (EREP) and the Environmental Research Institute of Michigan (ERIM). It appears that the records were maintained primarily by G. P. Kenney of the Systems Analysis and Integration Office (HC). (Old acc# 77-74)

**A-31-94-1**

## **RECORDS OF THE DATA SYSTEMS AND ANALYSIS DIRECTORATE (FA)**

An Assistant Director for Computation and Flight Support was established in the Flight Operations Directorate on December 31, 1970. It was responsible for planning, coordinating, and directing all Center computation facilities. It was replaced by the Data Systems and Analysis Directorate (FA) on January 28, 1974 (JSCA 74-8 and JSCI 1145.5) with responsibility for design, implementation, operation, and maintenance of all JSC ground based data systems including mission control systems, crew simulation systems, and earth resources systems. The directorate was responsible for earth resources data processing, design and development of mission profiles, operational trajectories, mission planning and analysis. It was also responsible for the development, coordination, and implementation of all flight computer software. Howard W. Tindall was appointed Director. It initially included Divisions for Ground Data Systems, Institutional Data Systems, Operations Analysis, Spacecraft Software, and Flight Simulation. It was designated the Mission Support Directorate on April 13, 1983 (MSCI 1130.1Y).

### **Mission Planning and Analysis Division**

The Division (FM8) was established on December 2, 1975 by MSCI 1145.5 with responsibility for software formulation and development for spacecraft and ground-based computers, mission planning and analysis, and data product analysis in support of space flight experiments. The Division was abolished on April 11, 1990.

#### **E.194T. INTERNAL NOTES.**

##### **1971-1975. 9 ft.**

Arranged by control number (71FM386 to 75FM81 with gaps).

A record copy technical reports prepared by various units on highly technical topics such as guidance and trajectory, tracking, data acquisition, hardware design and operation, mission parameters, and abort procedures. Some of the documents were created by TRW (see also E.209H). These notes were once maintained in the Flight Operations Directorate but were transferred to the MPAD Document Center. For earlier notes see entry 157G and 209B. (Old acc # 81-42).

##### **B-11-84-1**

#### **E.195. APOLLO-SOYUZ TEST PROJECT FILES.**

##### **1975 84 ROLLS**

Arranged by JSC control number (there is a list of roll numbers in box 1)

Positive 16mm microfilm copies of documents generated in support of ASTP experiments. The documents relate to Apollo Spacecraft ephemeris, attitudes, sensor pointings, fields of view, and other special PI parameters. The documents relate to data tapes that are still in the custody of NASA. (Direct offer 7NC-255-96-0001)

##### **A-26-84-4**

## SCIENCE AND APPLICATIONS DIRECTORATE (TA)

In January, 1967 the Space Science Division and the Experiments Program Office were removed from the Engineering and Development Directorate and a Science and Applications Directorate was created to assume their functions, manage the construction and operation of the Lunar Receiving Laboratory, and serve as the focal point contacts between MSC and the scientific community. Robert O. Piland, formerly manager of the Experiments Program Office, was named Deputy Director. On February 17, 1967 Dr. Wilmot N. Hess, was appointed Director. Hess was a nuclear physicist who had headed the University of California's Lawrence Radiation Laboratory at Livermore, California and worked at NASA's Goddard Space Center.

In 1971 the Directorate was reorganized to include a Lunar Sample Office responsible for supervising the Lunar Receiving Laboratory, a Planetary and Earth Sciences Division, and an Earth Observations Aircraft Program Office that conducted flights to obtain data to correlate with information from space missions. An Earth Resources Experiments Package (EREP) Investigations Office was established in January 1972, under O. Glenn Smith, to work with the Skylab Program Office to develop and conduct experiments. The Directorate was abolished on January 25, 1977 and its functions transferred to the Space and Life Sciences Directorate. See William David Compton, *Where No Man Has Gone Before: A History of Apollo Lunar Exploration Missions* (NASA SP-4214, Washington, 1989) for a detailed study of the Apollo lunar science program. See also Donald A. Beattie, *Taking Science to the Moon: Lunar Experiments and the Apollo Program* (Baltimore, 2001), and Don E. Wilhelms, *To A Rocky Moon: A Geologist's History of Lunar Exploration* (Tucson, 1993).

### **E.195C5. PROJECT FILES ON THE EARLY APOLLO SURFACE EXPERIMENTS PACKAGE (EASEP). 1968-1970. 2 ft.**

Arranged by subject.

Correspondence, experiment proposals, technical reports and studies, briefing materials for program and design reviews and presentations, negotiating plans, financial reports, status and progress reports, minutes of meetings, press releases, familiarization manuals, drawings, and photographs of hardware. The bulk of the correspondence is with Bendix Aerospace Systems Division and relates to the design, testing, and delivery of experiment hardware. The records include a copy of the Apollo 11 Photographic and Scientific Crew Debriefing. It appears the files were maintained by John W. Small who served as Chief of the Lunar Surface Project Office (TD) and by P. Donald Gerke, Manager of the EASEP Project Office (TD3). (Old acc# 72A175 and 73A771)

**A-30-10-1**

### **E.195C10. PROJECT FILES ON THE APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE (ALSEP). 1965-1973. 6 ft.**

Arranged by subject.

Correspondence, experiment proposals, statements of work, technical reports and studies, briefing materials for program and design reviews and presentations, Flight Familiarization Manuals, negotiating plans, financial reports, status and progress reports, implementation plans, inspection and acceptance documents, acceptance data packages, contingency plans, controller's handbooks, minutes of meetings, press releases, drawings, and photographs of hardware. The bulk of the records relate to the Laser Retroreflector (LR3), the Suprathermal Ion Detector Experiment (SIDE), and the Cold Cathode Ion Gauge Experiment (CCGE). The files were

maintained by various staff members in the Lunar Surface Experiments Office (TD2). (Old acc# 71A1357, 72A1126 and 76A200)

**A-30-10-1**

**E.195D10. REFERENCE FILES OF BRUCE G. JACKSON ON LUNAR ORBITAL SCIENCE. 1965-1969. 2 ft.**

Arranged by subject.

Correspondence, materials for briefings and presentations, minutes of meetings, schedules, experiment proposals, statements of work, negotiating plans, financial status reports, progress reports, and drawings. The bulk of the correspondence is with Northrup, North American Aviation, Lockheed, and Martin and relates to the Apollo Experiments Pallet and various experiment hardware to be flown in the Apollo Service Module as part of the Lunar Orbital Science Program. Jackson served with the Experiments Project Office (EX) and later the Advanced Systems Office (TE). (Old acc# 71A1257)

**A-31-78-4**

**E.195E40. EARTH OBSERVATION DIVISION REFERENCE FILES. 1965-1967. 3 ft.**

Arranged by subject.

Correspondence, briefing materials for program reviews, minutes of meetings, research proposals, task plans, milestone charts and schedules, photographs, and various technical reports. The bulk of the records relate to remote sensing experiments flown by NASA aircraft operated by the Earth Resources Aircraft Program (EX24) and later by the Earth Resources Survey Aircraft Office (TE2). The records also include research proposals, experimentation implementation plans, progress reports, contract documents, and correspondence relating to proposals for remote sensing experiments to be flown on Apollo Applications missions (AAP-1A and AAP-B). It appears the files were maintained primarily by Leo F. Childs who served as head of both EX24 and TE2. (Old acc# 72A1392)

**A-30-8-5**

**LUNAR RECEIVING LABORATORY PROGRAM OFFICE**

In 1964 Elbert A. King, Jr. and Donald A Flory of the Space Environment Division of the Engineering and Development Directorate, submitted plans for the construction of a Lunar Receiving Laboratory for samples that would be returned to Earth by Apollo missions. A Lunar Receiving Laboratory Board and a Program Office to manage the construction and operation of the facility were established on May 9, 1966 (see MSC Announcement 66-57). Construction of the facility began in July 1967 under the direction of Joseph V. Piland and it became operational in time to support the Apollo 11 lunar landing mission.<sup>6</sup> The LRL was abolished on October 23, 1973 with the establishment of the Office of Curator (JSCI 1130.1N)

---

<sup>6</sup> See Brian Duff, "The Great Lunar Quarantine", *Air and Space* (February/March, 1994). See also NASA's Lunar Back-Contamination Program by Kent Carter (unpublished MA thesis, University of Cincinnati, 1972), and Don E. Wilhelms, To A Rocky Moon: A Geologist's History of Lunar Exploration (Tucson, 1993).

The Geology and Geochemistry Branch was responsible for the operation of the labs and the Engineering Operations Branch was responsible for facilities and program management. A Biomedical Branch was responsible for the quarantine program.

**E.195F. TEST PROCEDURES ON INSTALLATION OF FACILITIES SYSTEMS.**

**1967-68. 2 ft.**

Arranged by test procedure number.

Original detailed technical test procedures governing the installation of electrical, plumbing, HVAC, and other systems in the Lunar Receiving Lab. The procedures were developed by W-N-N Contractors under NASA contract NAS 9-6500. (Old ACC# 71A1330)

**A-30-004-4**

## **LIFE SCIENCES DIRECTORATE (DA)**

Dr. Charles A. Berry joined the STG/MSC as Chief of the Aerospace Medical Operations Office in July 1962. He had been Chief of the School of Aviation Medicine at Randolph Air Force Base and assisted with the selection and testing of the first Mercury astronauts. In 1967, Berry was named head of the Medical Research and Operations Directorate and was given responsibility for all medical programs including the development of crew life support systems that had been done by the Crew Systems Division in the Engineering and Development Directorate.

The MR&O Directorate was designated the Life Sciences Directorate (DA) on March 31, 1972 (MSCA 72-55 and 72-69) and Richard A. Johnston was named Director. The Directorate included a Biomedical Research Division (DB), a Health Services Division (DD), and a Bioengineering Division (DE). The Directorate was abolished on January 25, 1977 with the establishment of a Space and Life Sciences Directorate.

**E.195L2. CORRESPONDENCE RELATING PROJECT APOLLO.**

**1966-1973. 3 FT.**

Arranged by subject (there is a list of folder titles in box 1).

Originals letters received and copies of letters sent relating to medical support for Apollo missions, biomedical testing and experiments, and the lunar back contamination quarantine program. There are also copies of program directives, reports, operations reviews, mission documents, research proposals, and articles retained as background material for medical programs. The records include biomedical test protocols for lunar samples and quarantine procedures. (Old acc# 76A1086)

**A-30-4-3**

**E.195L10. MINUTES OF THE LUNAR AND PLANETARY SAMPLE TEAM.**

**1967-1985. 3 ft.**

Arranged chronologically by date of meeting.

Original minutes of meetings and related material such as agenda, reports of sub-committees, correspondence from members, and action items. The committee was originally established in 1967 as the Lunar Sample Analysis Planning Team (LSAPT) to advise NASA on the handling of lunar material, operation of the Lunar Receiving Laboratory, and the allocations of lunar samples. On December 16, 1978 it was changed to the Lunar and Planetary Samples Team to expand its responsibilities to include all extraterrestrial samples including meteorite samples

returned from Antarctica. It originally reported to the Director of Science and Applications but eventually came under the jurisdiction of the Planetary Science Branch (SN2) in the Solar System Exploration Division (SN) of the Space and Life Sciences Directorate. (Old acc# 89-6)

**A-30-4-4**

## **MERCURY PROJECT OFFICE**

A Mercury Project Office under the direction of Walter C. Williams was established at the Langley Research Center (See *This New Ocean: A History of Project Mercury* by Loyd S. Swenson, Jr. (NASA SP-4201, 1966) for a detailed study of the establishment of the Space Task Group and the Mercury Project Office). In October 1962 Kenneth S. Kleinknecht was placed in charge with responsibility for the technical direction of the McDonnell Aircraft Company and other contractors and the coordination of all Mercury activities with other centers and agencies. The office was abolished in November 1963, and personnel were reassigned to work on Gemini or Apollo.

### **E.196. CENTRAL SUBJECT FILES.**

**1958-1963. 3 ft.**

Arranged by subject in accordance with a numerical filing plan (S1 to S60 with gaps – see entry 210A).

Correspondence, briefing material for program and technical reviews, narrative progress reports, technical reports and studies, Program Management Plans, delivery and flight schedules, and drawings of flight hardware. The records were maintained by or for Kenneth S. Kleinknecht, Mercury Program Manager, and relate to design and construction of hardware, flight planning and operations, tracking and ground instrumentation, accounting and financial management, and quality control and testing. These records are similar to the material described in entry 15. Some of the files were security classified but all were declassified by NASA in 1971. Some files from this series were used in the investigation of the AS204 fire and became part of the records described in entry 210A (Old acc# 66A432/72A5/and 72A798)

**A-31-76-6**

### **E.197. MANNED SPACECRAFT CENTER REPORTS.**

**1961-1963. 3 ft.**

Arranged by type of report and thereunder chronologically.

Copies of Weekly Activity Reports and Consolidated Activity Reports made to the Director of Manned Spaceflight, Technical Information Summary, Technical Memorandum, Engineering Division Memorandum Reports, Project Development Plans, Project Mercury Status Report, Monthly Status Review, and Office of Manned Spaceflight (OMSF) Program Status Reviews. The reports often contain charts, graphs, drawings, and photographs. (Old acc#72A798, 73A767, and 76A475)

**A-31-76-6**

### **E.197A. MANNED SPACECRAFT CENTER TECHNICAL DOCUMENTS.**

**1961-1963. 2 ft.**

Arranged by subject.

Copies of various technical studies, analyses, and reports prepared by NASA staff. The records include data acquisition and preliminary evaluation plans for most Mercury flights, Flight Controller Handbooks, a Descriptive Synopsis of Project Mercury, mission rules, recovery plans,

flight plans for MA-8 and Ma-9, and post-flight debriefing of Gus Grissom and John Glenn. There are some records relating to Little Joe 5A and Scout and data plans and calibration reports. (Old acc# 66A432, 71A1317, 71A1321, 71A1322, and 73A767)

**A-31-76-7**

**E.198. MERCURY WORKING PAPERS.**

**1959-1963. 2 ft.**

Arranged numerically (there are gaps). There is a list of titles in box 1.

Copies of technical papers prepared in the Space Task Group (STG) covering Project Mercury data and mission analyses, system studies, test programs, and operational methods and requirements. The series was established to provide standardization in form, handling, and release of "working papers" to permit the exchange of data, analyses, instructions, requirements, and methods among NASA organizations for planning and coordination purposes. The papers were not considered as formal documents intended for release to the general technical and scientific communities. There is also a set of the papers among the records described in entry 70 boxes 85-92. (Old acc #66A432 and 72A798 and 72A1138)

**A-31-78-1**

**E.198A. POST-LAUNCH REPORTS.**

**1961-1963. 1 ft.**

Arranged by mission.

Copies of printed reports issued by NASA on Little Joe 5A and Mercury-Redstone and Mercury-Atlas flights. The reports include vehicle description, mission resume, trajectory analysis, capsule data and systems performance, booster performance, and recovery. The reports generally include photographs, drawings, graphs, and technical data. (Old acc#72A798 and 73A767)

**A-31-78-1**

**E.198B. CONTRACTOR TECHNICAL DOCUMENTS.**

**1959-1963. 7 ft.**

Arranged alphabetically by company name and thereunder by subject.

Copies of design proposals, management proposals, engineering status reports, progress reports, and detailed technical analysis of all phases of hardware development, testing, and operation. Companies involved include Aerospace Corporation, Air Force Missile Test Center, Avco, Chance-Vought, Collins Radio, Convair, Cornell, General Dynamics, General Electric, Grumman, IBM, North American, Radioplane, and Thiokol. Copies of some of these documents are also in entry 70 boxes 56-62. (Old acc#66A432, 72A5, and 72A798.)

**A-31-78-2**

**E.198B1. MAUNALS FOR GROUND COMPUTER OPERATIONS.**

**1962-1964. 3 ft.**

Arranged by subject.

Operations and maintenance manuals produced by IBM, Bendix, or Western Electric for computer equipment used by Mercury Project ground controllers at Cape Canaveral and other tracking sites. The manuals relate to capsule communications, radar tracking, command control transmission, launch monitor, and acquisition systems. There are operating procedures for Computation and Data Flo Integration Subsystem (CADFISS) tests that led up to a full simulated mission and a Computing Program Description for the MA9 flight prepared by the Goddard Center in 1964. The Real Time Program Development Branch of the Mission Planning and

Analysis Division of the Directorate of Engineering and Development maintained the records.  
(Old acc#67A968)

**A-20-76-4**

**E.198C. MCDONNELL TECHNICAL DOCUMENTS.**

**1960-1963. 11 FT.**

Arranged by subject and thereunder numerically (6000-9631 with gaps). There is a list of the numbered documents in box 1.

Formal technical reports and documents submitted by McDonnell Aircraft Corporation to NASA under the terms of contract NAS 5-59. The documents include checkout procedures, detailed specifications for a Manned Satellite Capsule (6603), structural design criteria and analysis, test specifications and results, quality control procedures and inspection reports, cost and delivery data, operating procedures, and studies of engineering problems. The documents relate to all phases of the Mercury program including launch and recovery, mission rules and procedures, instrumentation, ground support equipment, life support, reliability and safety, and program schedules and accomplishments. (Old acc #66A432, 72A5, and 72A798)

**A-20-72-1**

**E.198D. SERVICE ENGINEERING DEPARTMENT REPORTS (SEDRs).**

**1960-1963. 18 ft.**

Arranged numerically (36 to 238 with gaps). There is a list of titles in box 1. Within each document category, there are generally separate documents for each capsule.

Copies of technical documents prepared by McDonnell Aircraft that served basically as operating and maintenance manuals for Mercury hardware. The documents (generally referred to as "cedars") include acceptance test procedures, checkout procedures, installation checklists, servicing procedures, and operations manuals. There are copies of the spacecraft Familiarization Manual (104), Maintenance Manual (108), Launch Countdowns (103), Flight Simulations (171), Capsule Flight Operations Manual and Astronaut Handbook (109), Flight Controller Handbook (204), Recovery Handbook for Primates (188), and MA-9 Experiments (236). Many of the documents are also identified as Florida Test Procedures. Copies of some of these documents are also in entry 70 boxes 80-84. (Old acc #66A432, 72A5, and 72A798)

**A-20-72-3**

**E.198E. CONTRACT ADMINISTRATION FILES.**

**1958-1963. 17 ft.**

Arranged numerically by contract number (1-430, 5-1 to 5-307, 9-1 to 9-1454) with gaps. Records relating to contract NAS 5-59 are arranged by subject in accordance with a numerical file plan.

Copies of correspondence, contracts, requests for proposals, invitations to bid, statements of work, procurement plans, change proposals, change notices, amendments, cost data, progress reports, and some technical reports submitted by contractors. The correspondence includes both copies and originals of internal NASA memoranda and letters sent to and received from contractors and subcontractors. Most of the correspondence with contractors is signed by Sherwood L. Butler or other NASA contracting officers and relates to contract administration, schedules, and payments. The bulk of the files relate to contract NAS 5-59 (the Mercury capsule) and are marked "Space Contract Files." The records also include transcriptions taken from the capsule onboard voice tape for MA6, MA-8, and MA-9 and the pilot's debriefing for MA-6 flown by John Glenn. There is also some material including photographs and drawings relating to the



Redstone (HS44) and Atlas (HS-36) boosters. Some of the files relating to contract NAS5-59 were used in the investigation of the AS204 fire and became part of the records described in entry 210A. (Old acc#66A43, 72A5, 72A798, 76A475)

**A-20-72-7**

#### **E.199. DRAWINGS.**

Arranged by drawing number. There is a list of drawings in the first map drawer.

(Old acc# 66A432)

**B-35-20-1 and B-27-14-5**

### **GEMINI PROGRAM OFFICE**

A project to develop a 2-man spacecraft was officially announced on December 7, 1961, and officially designated Gemini on January 3, 1962. MSC Director Robert R. Gilruth established the Gemini Program Office (GPO) on January 15, 1962, and appointed James A. Chamberlain, former Chief of the Engineering Division, Manager of it (MSCI 1140.1). The office was responsible for planning and directing all technical, operational, and administrative matters pertaining to the implementation of the Gemini Program and contractor activities within the scope of the contract. In March 1963, Charles W. Mathews became manager. The GPO was responsible for coordination with other government agencies and private contractors.

The first Gemini flights on April 8, 1964, and January 19, 1965, were unmanned. The program was completed on November 12, 1966, with the flight of Gemini 12. The GPO was abolished on February 3, 1967 (MSCA 67-17).

See also the **Source Files on Project Gemini** in the Records of the History Office and Barton C. Hacker and James M. Grimwood, On The Shoulders of Titans: A History of Project Gemini, NASA SP-4203, Washington, 1973.

#### **E.200. CENTRAL SUBJECT FILES.**

**1962-1966. 25 ft.**

Arranged in segments: General, McDonnell Aircraft (MAC), and Air Force Space Systems Division (SSD) and thereunder within yearly segments. Within each yearly segment, files are arranged alphabetically by subject.

Originals and file copies of correspondence, memoranda, TWXs, narrative and statistical reports, agenda and minutes of numerous technical and management committees, financial reports, schedules, and various contract documents. The records relate to spacecraft and related hardware design, development and fabrication as well as crew training, pre-launch operations, experiments, and mission operations. Much of the correspondence is with contractors and sub-contractors including the Lockheed Missile and Space Company (LMSC), General Dynamics/Astronautics (GDA), Aerojet-General, and Martin and relates to development of launch vehicles and the Agena Target Vehicle. There are numerous systems status reports on attitude control and maneuvering, communication, data transmission, environmental control, escape and landing, fuel cell, simulators, and propulsion. (Old acc# 71A90 and 71A1182)

**A-31-62-2**

## **E.200A2. NASA DOCUMENTS.**

**1962-1966. 7 ft.**

Arranged by type of document or subject.

Copies of various reports, studies, and briefing materials produced by NASA centers. The documents include MSC Quarterly Status Reports, Gemini Working Papers, a 1962 Familiarization Briefing, Program Mission Reports (MSC-G-R-#s), a 1964 Data Briefing Book and Administrator's Review, Malfunction Investigation Reports, Network Performance Analysis Reports, Program Instrumentation Requirements Documents (PIRDs), Interface Specification and Control Documents (ISCDs), and various Project Development Plans. (Old acc# 71A1250, 71A1251, 71A1284, and 72A174)

**A-31-66-1**

## **E.200B. MEETING MINUTES AND SUPPORTING DOCUMENTS.**

**1962-1964. 8 ft.**

Arranged in yearly segments and thereunder alphabetically by topic of the meeting. Supporting documents are arranged chronologically by date of meeting.

Original minutes of meetings of various technical committees relating to the Atlas-Agena, Titan II, launch operations, guidance and control, mission planning, extra-vehicular activities (EVA), rendezvous, the paraglider project, recovery operations, training, biomedical, and experiments. Most of the minutes are signed by James A. Chamberlain, Manager, Gemini Project. The supporting documents include technical reports, graphs, charts, drawings, and miscellaneous briefing materials. Similar records are in entry 75 boxes 392-398. (Old acc# 71A1180)

**A-31-64-6**

## **E.200C. CONTRACT ADMINISTRATION FILES.**

**1961-1966. 6 ft.**

Arranged by contract number and thereunder in yearly segments. Within each segment, the files are arranged by subject.

Correspondence, memoranda, TWXs, statements of work, proposals, contracts, changes and amendments, schedules, minutes of meetings of various committees, progress and financial status reports, and technical reports and studies. The bulk of the records relate to contract NAS9-170 but there are also records on contract T2356G for the Titan II launch vehicle, PR100 for the Atlas-Agena Target Vehicle, and NAS9-4412 for work on the Air Force MOL (Gemini B-MOL) program. Much of the correspondence is with McDonnell Aircraft, Martin-Marietta, Aerojet-General, and Aerospace Corporation. (Old acc# 71A90, 71A1182, and 72A174)

**A-31-64-1**

## **E.200D. PARAGLIDER CONTRACT FILES.**

**1962-1963. 4 ft.**

Arranged by contract and thereunder in yearly segments. Within each segment, files are arranged by subject.

Correspondence, memoranda, TWXs, statements of work, proposals, contracts, changes and amendments, schedules, minutes of meetings of various committees, progress and financial status reports, and technical reports and studies. These files relate to contracts NAS9-135 with Ryan Aerospace, NAS9-136 with North American Aviation, NAS9-137 with Goodyear Aircraft, NAS9-167 with North American Aviation for Phase II work, NAS9-170, NAS9-539, and NAS9-1484. These files were maintained separately from similar records described in entry 200C. See also e.187 and 187A. (Old acc# 71A90 and 71A1254)

## **A-31-64-7**

### **E.200F. CONFIGURATION CONTROL BOARD FILES.**

**1964-1966. 10 ft.**

Arranged numerically by a control number assigned by type of change and thereunder chronologically.

Correspondence, memoranda, and various forms including Engineering Change Proposals, Requests for Engineering Change Proposals, and Engineering Job Sheets. The forms relate to requests to make changes in the spacecraft or crew equipment and were submitted to a Configuration Control Board established in July 1964, to provide continuity and coordination by reviewing and deciding on all proposals to change hardware. The forms contain a description of the change, the reason for the change, the estimated cost, and the impact on the weight of the spacecraft. There are often handwritten notes on the technical engineering implications of the request and drawings. There are also some photographs, primarily of space suits and other crew equipment. The records also include reports and other documents relating to the Spacecraft Acceptance Review (SAR) and Flight Readiness Review (FRR) for spacecraft 2 and 3. Much of the correspondence is between the GPO Configuration Definition and Control Office and McDonnell Aircraft or the Air Force Space Systems Division (SSD). (Old acc# 71A90)

## **A-31-64-3**

### **E.202. CONTRACTOR TECHNICAL DOCUMENTS.**

**1962-1966. 40 ft.**

Arranged alphabetically by contractor name and thereunder by type of document or numerically by report control number.

Design reviews and reports, specifications, system studies, progress status reports, reliability plans and reports, failure reports, qualification test reports, acceptance summary reports, familiarization manuals, systems handbooks, System Test Objectives, Flight and Safety Reviews and other technical documents submitted by contractors. The bulk of the documents were prepared by Aerojet General relating to the Titan II engines, Lockheed Missiles and Space Division relating to the Agena Target Vehicle, and Martin-Marietta relating to the Titan II launch vehicle. There are also documents from Aerospace Corporation, the Air Force Systems Command-Space Systems Division, General Dynamics, General Electric, Goodyear, Honeywell, IBM, Lear-Siegler, Northrup, Rocketdyne, Teledyne, Thiokol, Weber Aircraft, and Westinghouse. The Martin-Marietta documents include engineering reports (ER), technical notes on launch vehicle systems (LV), and design specifications (MB). The records include information about activation of launch complex 19, Atlas launch vehicles and target adapters, safety and training programs, space rescue (ER13574p-1), and a plan for a 1967 circumlunar flyby using a modified Gemini spacecraft. Copies of some of these documents are also in entry 75 boxes 317 to 359. Some of these files were originally classified as "Confidential" but all were declassified in 1972. (Old acc#71A92, 71A760, 71A1249, 71A1252, 71A1255, 71A1352, 71A1504, 72A174, and 72A1386)

## **A-31-64-6**

### **E.203. MCDONNELL TECHNICAL DESIGN NOTES.**

**1962-1965. 7 ft.**

Arranged by type of note and thereunder numerically (with gaps).

Copies of technical reports designated as "design notes" for various aspects of the Gemini capsule including guidance and control mechanics, reliability, simulators, structural dynamics,

crew compartment design, aerodynamics, electronics, instrumentation, thermodynamics, and propulsion. Most of the reports include charts and graphs. Copies of some of these reports are in entry 75 boxes 250-259. Copies of some of these notes are also in entry 75 boxes 250-259. Some notes were withdrawn from these files and became part of the records described in entry 210A. (Old acc#71A89)

**A-31-60-3**

#### **E.203B. MCDONNELL TECHNICAL DOCUMENTS.**

**1960-1967. 18 ft.**

Arranged by type of document (includes numbered documents in the A, B, and E series).

Copies of various technical documents prepared by McDonnell Aircraft under contracts NAS 9-170 and NAS 9-4412. The documents include contract proposals, contract effectiveness reviews, program plan and interface requirements for Department of Defense experiments, reliability and test plans, Flight Readiness Reviews, Spacecraft Configuration Reviews, Spacecraft Acceptance Reviews, Performance Parameter Studies, Program Progress Reports (8580-1), Monthly Control Room Reports, and various planning documents. Some of the documents relate to the Mercury Mark II, the Agena Target Docking Adapter, the MOL-HSQ flight program for heat shield qualification (contract NAS 9-4412), MORL flights (A172), and a *Man Around the Moon* Project (8217). There are some Spacecraft Inventories that are similar to the stowage lists in e.204C. Few of the documents contain original signatures. Some of the documents were originally classified as "Confidential" but all were declassified in 1972 by DOD Directive 5200.10. (Old acc# 71A746, 71A768, 71A1253, and 72A174)

**A-31-70-6**

#### **E.203D. SERVICE ENGINEERING DEPARTMENT REPORTS (SEDRs).**

**1962-1966. 53 ft.**

Arranged in segments (General and specific spacecraft) and thereunder by an alphanumeric code. SEDR 600 is an explanation of the numbering system and an index to the documents.

Copies of technical documents prepared by McDonnell Aircraft under contract NAS9-170 that served as operating and maintenance manuals for Gemini spacecraft hardware, adapter hardware, experiments, and mission control consoles. The documents (generally referred to as "cedars") include acceptance test requirements, pre-installation acceptance test plans, test procedures, servicing procedures, operations and service instructions and manuals, Compatibility Test Unit (CTU) test procedures, familiarization manuals (300). Some of the documents are also identified as Florida Test Procedures (FTPs). Most are marked "Preliminary Copy" and none contain original signatures. (Old acc# 69A640)

**A-31-66-7**

#### **E.204. MISSION DOCUMENTS.**

**1964-1966. 13 ft.**

Arranged by mission and thereunder by type of document.

Copies of various documents prepared by the Flight Control Division, Flight Crew Support Division, and Landing Recovery Division including Mission Rules, Spacecraft Operation Handbooks, Flight Control Operations Plans, Standard Operation Procedures for Mission Control Center-Houston (MCC-H) and remote sites, Flight Controllers' Console Handbooks, Data Acquisition Plans and Requirements, Simulation Operations Plans, Experiments Checklists, Master Support Plans, Flight Plans, Recovery Requirements, and Recovery Operations Manuals. There are some Flight Directors Reports, Crew Technical Debriefings, Technical Debriefings, and

Air-to-Ground transcripts. There are Mission Preparation Sheets for Spacecraft 7 only. Copies of some of these documents are in entry 75 boxes 260-314. (Old acc# 71A987 and 71A1181)

**A-31-60-2**

**E.204B. ACCEPTANCE DATA PACKS ON CAMERA EQUIPMENT.**

**1964-1967. 3 ft.**

Arranged by part number (CF, EA, EC, EX, SEB, and V).

Original System Component Historical Records (MSC form 772), Test Preparation Sheets, Discrepancy Reports, Test Data, and Spacecraft Component Logs. The forms provide a chronological record of the acceptance, test, rework, and modification of camera equipment that flew on Gemini missions including part and serial numbers. (Old acc# 74A1726)

**A-31-66-6**

**E.204C. STOWAGE LISTS.**

**1964-1966. 8 in.**

Arranged by spacecraft number (5 to 11).

Originals and copies of Engineering Change Proposals submitted as stowage lists for GFAE/CFE. The forms provide a description of each item, its part or serial number, quantity, location in the spacecraft, and unit weight. Related ECPs may be in entry 200F. Stowage lists have also been reproduced by the JSC History Office on a CD which is available in the NARA-SW Region reading room. (Old acc# 71A90)

**A-31-64-4**

**E.205. SPACECRAFT TEST CASE FILES.**

**1965-1968. 2 ft.**

Arranged by test number (SC-2 to SC-12).

Requests for tests on systems and components with test results logs and technical test results and reports. The tests relate to both hardware and environmental/life support systems. There are some photographs and engineering drawings of test items. (Old acc# 72A1128)

**A-30-006-2**

**E.205A. POSTFLIGHT SPACECRAFT EVALUATIONS.**

**1965-1967. 3 ft.**

Arranged by spacecraft (2 to 12).

Memoranda, TWXs, test requests, inspection reports, hand-written notes of test results, and photographs of spacecraft hardware. Most of the tests were conducted at the McDonnell plant in St. Louis. Ed A. Armstrong (organizational code GS5) maintained these files. (Old acc #74A1743)

**A-31-60-2**

**E.205B. REFERENCE FILES ON DISPOSITION OF PROPERTY.**

**1966-1969. 2 ft.**

Arranged by subject.

Correspondence, memoranda, lists of hardware, and documents transferring property and flight hardware to other NASA offices, the Air Force, and various museums. There is also information on the closing of contracts for hardware and the final Gemini Summary Conference. There are some photo-illustrations of spacecraft and systems. (Old ACC# 72A1128)

**A-31-60-2**

## **E.205D. DRAWINGS.**

**1962-1967. 262 ft.**

Arranged by contractor and thereunder numerically.

Drawings generated under contract NAS9-170. (Old acc # 69A639, 69A642, 71A1504, and 72A174)

**B-27-16-7**

## **APOLLO SPACECRAFT PROGRAM OFFICE (PA)**

An Apollo Project Office was established in the STG in May 1961 under Robert O. Piland. It awarded study contracts to General Electric, General Dynamics, and Martin-Marietta. A contract to build the Apollo spacecraft was awarded to North American Aviation on December 15, 1961. Charles W. Frick was appointed to manage the Apollo Spacecraft Project Office (ASPO) in October 1962 and Robert O. Piland was named his Deputy Director (see MSC I 1141.1). The Office was responsible for planning, coordinating, and directing all aspects of the Apollo Spacecraft Program including the design, construction, and testing of the command/service module and lunar module and the supervision of industrial contractors. ASPO and its various sub-offices and also controlled mission planning and analysis.

Frick left ASPO in April 1963 and Piland was Acting Manager until Joseph F. Shea was appointed on October 8, 1963. There were a number of organizational changes following the AS-204 fire on January 27, 1967. George M. Low replaced Shea as head of ASPO on April 10, 1967 (MSC Announcement 67-51).

The Apollo Program Manager was the primary and official interface with all contractors with responsibility for the overall management of resources and schedules and integration between contractors and all other participating organizations. Subsystem Managers within functional divisions of MSC were designated by ASPO and were given responsibility for the development of specific subsystems. Resident Apollo Spacecraft Program Offices (RASPO) were established at major contractor sites to serve as the official NASA interface with contractor personnel, oversee all operations involving NASA personnel stationed at or visiting the contractor, provide technical guidance, assure that hardware met contract requirements, monitor the correspondence flow between the contractor and ASPO, and to provide the official NASA authorization for shipment of deliverable hardware.

ASPO was assigned responsibility for all Apollo closeout activities in July, 1973 and abolished November 3, 1975 by JSCA 75-83. Most of the staff was transferred to the Shuttle Payload Integration and Development Program Office (PA).

See William David Compton, Where No Man Has Gone Before: A History of Apollo Lunar Exploration Missions, NASA SP4214, (Washington, 1989); Roger D. Launius and J. D. Hunley, An Annotated Bibliography of the Apollo Program, (NASA History Office, 1994); and Arnold S. Levine, Managing NASA in the Apollo Era, NASA SP-4102, (Washington, 1982). See also Mike Gray, Angle of Attack: Harrison Storms and the Race to the Moon (New York, 1992); and Thomas J. Kelly, Moon Lander: How We Developed the Apollo Lunar Module (Washington, 2001).

## **E.205T5. GENERAL SUBJECT FILES.**

**1962-1973. 161 ft.**

Arranged in yearly segments and thereunder by the following subject headings: Communications & Instrumentation, Crew Systems, Electrical Power Systems, Environmental Control Systems, Flight Operations, Ground Support Equipment, Launch Escape Systems, Launch Vehicles, Logistics, Navigation & Guidance, Program Management, Propulsion Systems, Reaction Control Systems, Reliability, Research, Stabilization and Control, Structural Systems, Systems Engineering, Tests, Training and Trainers, and Technical Information. Within each subject heading, there are often numerous sub-headings. Beginning in 1969, Lunar Landing and Lunar Receiving Laboratory were added as major subject headings. In 1970, a category was added for Space Station.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, technical studies and reports, activity and progress reports, specifications, requirements, engineering studies, proposals, cost reports, schedules, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to contract negotiation and administration, design and development of hardware, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents. The Program Management files relating to meetings include records from Customer Acceptance Readiness Reviews (CARR), Flight Readiness Reviews (FRR), Configuration Control Panels and Boards, and Apollo site selection committees. The records relating to research include material on scientific experiments, the Apollo Extension System (Apollo Applications), Space Station, back-contamination, and lunar samples. Beginning in 1970, the files contain a great deal of material on Skylab, ASTP, and advanced missions. The History Office Apollo Collection contains ASPO reading files from 1960-1972. (Old acc# 71A986, 71A1298, 72A196, 72A1135, 72A1390, 73A1233, 74A1730, and 75E899)

**A-26-6-6**

## **E.205T10. SUBJECT FILES OF THE NORTH AMERICAN AVIATION RESIDENT ASPO. 1962-1973. 51 ft.**

Arranged in yearly segments and thereunder by the following subject headings: Communications & Instrumentation, Crew Systems, Electrical Power Systems, Environmental Control Systems, Flight Operations, Ground Support Equipment, Launch Escape Systems, Launch Vehicles, Logistics, Navigation & Guidance, Program Management, Propulsion Systems, Reaction Control Systems, Reliability, Research, Stabilization and Control, Structural Systems, Systems Engineering, Tests, Training and Trainers, and Technical Information. Within each subject heading, there are often numerous sub-headings.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, technical studies and reports, activity and progress reports, specifications, requirements, engineering studies, proposals, contract and engineering change proposals, memorandum of understanding, surveys and audits, cost reports, schedules, PERT charts, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to contract negotiation and administration, design and development of hardware, design changes, production progress, component availability, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents. The Program Management files relating to meetings include records from Customer Acceptance Readiness Reviews (CARR), Flight Readiness Reviews (FRR), Configuration Control Panels and Boards, Block II redefinition reviews, Design Certification Reviews, and Critical Design Reviews. Beginning in 1967, there is a great deal of material on the

AS204 investigation and mission planning. The files were maintained by the Resident ASPO assigned to North American Rockwell's Space and Information Systems Division at Downey, California to monitor contract NAS9-150. (Old acc# 71A986, 71A1243, 71A1298, 72A196, 72A1390, 73A1233, and 74A1730)

**A-31-100-1**

**E.205T15. SUBJECT FILES OF THE GRUMMAN RESIDENT ASPO.**

**1962-1973. 40 ft.**

Arranged in yearly segments and thereunder by the same subject categories used in entry 205T5.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, technical studies and reports, activity and progress reports, specifications, requirements, engineering studies, proposals, cost reports, schedules, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to contract negotiation and administration, design and development of hardware, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents. John W. Small maintained the records and other NASA staff who served as Resident ASPO to administer contract NAS9-1100. (Old acc# 71A986, 71A999, 71A1298, 72A196, 72A1135, 72A1390, and 74A1730)

**A-26-16-3**

**E.205T17. SUBJECT FILES OF THE AC ELECTRONICS RESIDENT ASPO**

**1965-1969. 6 FT.**

Arranged by subject by the same subject categories used in entry 205T5.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, technical studies and reports, activity and progress reports, specifications, requirements, engineering studies, proposals, cost reports, schedules, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to contract negotiation and administration, design and development of hardware, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents. These records were maintained by the Resident ASPO at AC Spark Plug/Electronics (ACSP) of General Motors Division, Milwaukee, Wisconsin, which built the navigation and guidance system under contracts NAS9-497, NAS9-469, and NAS9-3426. (Old acc# 71A986, 72A788)

**A-26-22-1**

**E.205T19. SUBJECT FILES OF THE GENERAL ELECTRIC RESIDENT ASPO.**

**1965-1967. 5 ft.**

Arranged by subject by the same subject categories used in entry 205T5.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, technical studies and reports, activity and progress reports, Weekly Status Reports, specifications, requirements, engineering studies, statements of work, proposals, cost reports, schedules, mission management plans, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to contract negotiation and administration, design and development of hardware, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents. These records were maintained by the Resident ASPO at the General Electric Apollo Support Division (GE/ASD) at Daytona Beach, Florida. General Electric reviewed all



programs for reliability and quality assurance under contract NASw-410 and was responsible for Apollo Checkout Equipment-Spacecraft (ACE-S/C). (Old acc# 71A986, 72A788)

**A-26-22-2**

**E.205T21. CONTRACT ADMINISTRATION REFERENCE FILES.**

**1965-1969. 20 ft.**

Arranged alphabetically by contractor and there under by the same subject categories used in entry 205T5.

Correspondence, memoranda, proposals, statements of work, progress reports, audits and cost reports, management plans, and technical reports and studies submitted as deliverables under terms of contracts. The bulk of the records relate to contracts with the Massachusetts Institute of Technology and TRW but there are files on Aerojet General, Boeing, Control Data Corporation, IBM, Kollsman, Link, and Radiation, Inc. (Old acc# 71A999, 72A788).

**A-26-22-3**

**E.206. WEEKLY MANAGEMENT REPORTS.**

**1963-1966. 9 ft.**

Arranged chronologically.

Original weekly narrative reports submitted by division level units in both ASPO and the Engineering and Development Directorates. The instructions for completing the reports required each unit to submit no more than two pages on its accomplishments and problems that would provide management a way of “gauging Apollo Spacecraft organization’s operation and effectiveness.” Many of the reports include ink comments made by Joe Shea and other ASPO officials. The reports were discontinued in 1966. A set of reports is item #2 in the History Office Apollo Collection. (Old acc #71A1176C and 73A768)

**A-19-54-1**

**E.206A. APOLLO SPACECRAFT PROGRAM QUARTERLY STATUS REPORTS.**

**1962-1968. 4 in.**

Arranged chronologically (1-19 and 21-25).

Printed copies of a printed report covering spacecraft development, flight and ground test, CSM and LM subsystems, ground support equipment, astronaut activities, and program management. The reports include photographs and diagrams of hardware. (Old acc #71C1176 and 73A768)

**A-19-54-2**

**E.206B. APOLLO PROGRAM SCHEDULE STATUS REPORT (U).**

**MAY 1964-1966. 3 FT.**

Arranged chronologically.

Printed copies of a bi-weekly report prepared by North American Aviation, Apollo Plans and Programming Division that provides an “analysis and summarization of information portrayed by the latest PERT cycle.” The report covers all vehicles and subsystems and includes numerous charts showing key dates and events. Some of the reports were security classified but all were declassified by NASA-SCB of 7-1-70. (Old acc#71C1176 and 72A1136)

**A-19-54-3**

**E.206B5. APOLLO SCHEDULE REPORTS.**

**1963-1968. 4 ft.**

Arranged chronologically.

Copies of the "Office of Manned Space Flight Status Review: Manned Space Flight Schedules: Book 2 Apollo." This report was produced monthly and includes development and delivery schedules, cost and manpower charts, and weight summary reports for the Command Module, Service Module, Lunar Module, and related equipment. The reports were originally classified as *Confidential* but were declassified by NASA-SCB 71:170 dated March 3, 1971. (old acc# 72A799).

**A-19-60-7**

**E.206C5. COMMAND AND SERVICE MODULE SCHEDULE PERFORMANCE AND RESOURCES REPORTS. 1964-1966. 1 ft.**

Arranged chronologically.

Biweekly narrative reports prepared by the C&SM Contract Engineering Branch. The report includes sections on Milestones, Coming Events, Problem Indicators, Critical Problems, and Vehicle and Subsystem Status. (Old acc# 71A1245)

**A-19-54-3**

**E.207. MINUTES OF MEETINGS.**

**1962-1969. 6 ft.**

Arranged by type of group and thereunder chronologically.

Minutes of meetings of committees, working groups, panel and sub-panels, boards, councils involved in the design, construction, and planning of Apollo programs. There are internal MSC and MSC-contractor groups working on communications and instrumentation, crew systems, navigation and guidance, environmental control systems, electrical systems, flight operations, ground support equipment, reliability and quality control, experiments and testing, and general program management. See also the Program Management-3 category in entry 205T5, 205T10, and 205T15 for minutes of various committees and reviews. (Old acc# 73A736 and 74A1828)

**A-19-54-4**

**E.209. APOLLO WORKING PAPERS.**

**1960-1968. 3 ft.**

Arranged numerically (1002 to 1342) by a control number assigned in roughly chronological order by the date the paper was printed. There are numerous gaps.

Copies of technical papers prepared by NASA staff on a variety of topics relating to spacecraft design and operation. Some of the reports were security classified but all were declassified by NASA-SCB of 7-1-70. (Old Acc # 71B1176 and 73A768)

**A-19-66-7**

**E.209A. NASA GENERAL WORKING PAPERS.**

**1963-1967. 1 ft.**

Arranged numerically (10,0005 to 10,076) by a control number assigned in roughly chronological order by the date the paper was printed. There are numerous gaps.

Copies of technical papers prepared on a variety of topics including space station design, centrifuge operations and tests, design of land landing spacecraft, the Manned Orbiting Laboratory, a Mars flyby mission, and Lunar ephemeris and selenographic coordinates for various years. (Old acc #71B1176)

**A-19-60-3**

## **E.209B. MSC INTERNAL TECHNICAL NOTES.**

**1964-1969. 9 ft.**

Arranged in yearly segments and thereunder by a control number assigned by the organizational unit that created the document. There are numerous gaps.

Copies of technical reports prepared by various units including ED, EG, EP, ES, ET, FM, OM, and PT on highly technical topics such as guidance and trajectory, tracking, data acquisition, hardware design and operation, mission parameters, and abort procedures. Some of the documents were created by TRW (see also E.209H). The notes were widely distributed and this group appears to have been maintained by the Apollo Trajectory Support Office (FM13) for ASPO. (Old acc # 71A998, 71B1176, 71C1176, and 72A1136)

**A-19-60-3**

## **E.209D. CONTRACTOR TECHNICAL DOCUMENTS.**

**1961-1972. 78 ft.**

Arranged alphabetically by contractor name and thereunder by control numbers assigned by the contractor. There is a copy of the Apollo Engineering and Technology Index (AETI) in box 1 that includes both a Corporate Author Index and a Systems Index.

Copies of technical proposals, management and cost proposals, studies, progress reports, quality and reliability reports, manuals, data packages, and Technical Information Releases. The contractors include A-C Sparkplug, Aerojet-General (Little Joe II), Bendix (ALSEP), Bissett-Berman (Guidance Notes), Boeing (Multi-purpose Mission Module), Chance Vought, Douglas (LM, MOL), General Dynamics/Convair (Little Joe II), General Electric (Apollo Support Program, ACE-S/C), Goodyear (paraglider), Hamilton Standard (suits, ECS-LM), Hughes (LM Optics), IBM, Kollsman Instruments, Lockheed (Mars Return Module, Orbital Rotating Station, Nuclear Propulsion Module), McDonnell, Martin, Pratt and Whitney, Raytheon, Sperry, and Thiokol. The records include 1961 technical proposals and feasibility studies for Apollo submitted by General Dynamics, General Electric, Douglas, McDonnell, and Martin under RFP302. Some of these documents were security classified but have been declassified by NASA SCG1 dated October 21, 1968. Many of the documents appear to have been microfiched and the fiche is probably in the JSC Technical Library. (Old acc# 71A1164, 71A1173, 71A1177, 71A1505, 72A782, 72A784, 72A787, 72A800, 72A1137, 73A770, 75A1432, 76A831).

**B-28-14-3**

## **E.209E. NORTH AMERICAN-ROCKWELL TECHNICAL REPORTS.**

**1961-1972. 212 ft.**

Arranged by document control number (SID, SD, SM, AP#) assigned in roughly chronological order by date of report. Document SID 63-180 is a list of document titles.

Copies of reports prepared by the Space and Information Systems Division and its successors under contract NAS9-150. The documents include statements of work, design criteria, monthly progress reports, systems interface requirements, studies, technical proposals, cost and management proposals, test plans, model and test specifications for mockups and boilerplates, wind tunnel test data, support plans and manuals (SM), Ground Support Equipment (GSE) end item specifications and maintenance manuals, Apollo Requirements and Technical Manuals (ARM), Vehicle Test Plans, Spacecraft Operations Handbooks, management and technical reviews, drawing lists, document lists, and film lists. Some of these documents were originally classified as *Confidential* but all were declassified by NASA SCG1 dated October 23, 1968. It appears that many of these documents were microfiched between 1968 and 1972 and the film may

be in the JSC Technical Library. (Old acc# 71A988, 71A1177, 71A1178, 72A782, 72A799, 72A800, 72A1381, 73A769, 73A1684, 76A484).

**B-28-4-1**

**E.209F. COMMAND AND SERVICE MODULE OPERATIONAL CHECKOUT PROCEDURES. 1965-1972. 24 ft.**

Arranged by spacecraft number and thereunder by document control number.

Copies of selected Operational Checkout Procedures (OCPs) for Command and Service Module systems, subsystems, and ground support equipment. The procedures generally list test objectives, cite references to related documents, and provide detailed checklists and instructions for conducting the procedure with support and safety requirements. Most of the checklists are annotated with quality stamps, the date completed, and results. There are procedures for compatibility, readiness, and profile checkouts. There are also some Test Configuration Checklists, Verification Procedures, Procedure Deviation Reports, Test and Inspection Reports, Test Preparation Sheets, Disposition Records, schematic diagrams, and illustrations of hardware. The documents are signed by the Test Engineer and Project Engineer. (Old acc# 71AB1165, 71AB1244, 71A1526, 72A178, 72A1115, 72A1117, 72A1401, 73A1678, 75CD900.)

**B-28-40-2 and V-10-20-6**

**E.209G. MASSACHUSETTES INSTITUTE OF TECHNOLOGY DOCUMENTS. 1960-1969. 40 ft.**

Arranged by document control number (E, R, PS, MC). The AETI index in box 1 of E.206D provides a partial index to these documents.

Copies of printed technical progress reports, studies, statements of work, specifications, program plans, manuals, Operations Handbooks, drawing standards, weight and balance reports, documentation status reports, flight data analysis, and error analysis. The studies relate to all phases of the Apollo Guidance and Navigation Program including trajectory analysis, circuit design and construction, reliability and quality assurance, celestial navigation techniques, software development and verification, systems analysis, production and verification of guidance equations, optics, sensors, radar systems, and crew procedures. There are functional descriptions and operations plans for missions using flight programs Sundisk, Colossus, Comanche, and Luminary. These documents were produced under contracts NAS9-153, NAS9-3079, and NAS9-4065. Many of the documents were originally classified as Confidential but were declassified by NASA SCG1 dated October 23, 1968 and NASA-SCB dated July 1, 1970. It appears that many of these documents were microfiched between 1968 and 1972 and the film may be in the JSC Technical Library. (Old acc# 71A1164, 71A1177, 72A800, 72A784, 72A787).

**B-28-18-3**

**E.209H. TRW TECHNICAL DOCUMENTS. 1964-1970. 62 ft.**

Arranged by document control number. The AETI index in box 1 of E.206D provides a partial index to these documents.

Copies of printed reports, technical studies, Technical Memorandum, performance evaluation studies, system analyses, mission profiles, mission requirements, mission planning guides, mission rules, data specifications, test plans, control plans, operational support plans, program users manuals. Most of the documents in the 059 series were prepared by the Spaceflight Operations Department for the Mission Planning and Analysis Division and were issued as MSC Technical Notes in support of the Mission Trajectory Control Program. Many of the studies relate

to the development and verification of software and hardware for flights and simulations, mission planning and evaluation, orbital analysis, LM radar systems, and lunar visibility. These documents were produced by Thompson, Ramo, Woldridge (TRW) to complete various task orders under contracts NAS9-153, NAS9-2938, NAS9-2990, NAS9-3079, NAS9-4065, NAS9-4810, and NAS9-8166. Some of the documents relate to the Gemini Program. Many of the documents were originally classified as Confidential but were declassified by NASA SCG1 dated October 23, 1968 and NASA-SCB dated July 1, 1970. . It appears that many of these documents were microfiched between 1968 and 1972 and the film may be in the JSC Technical Library. (Old acc# 72A787, 75A1221, 76A831).

**B-28-20-1**

#### **E.209K. CSM PROJECT ENGINEERING DIVISION (PF) CASE FILES.**

**1968. 3 FT.**

Arranged by subject in accordance with a numeric files system (1.1 to 12.0).

Correspondence, memoranda, reports, test and evaluation documents, program directives, records of meetings, and briefing material relating primarily to vibration and acoustic testing of Spacecraft 105. The records include reports prepared by Wyle Labs and Boeing on POGO-Low Level Longitudinal Oscillation Tests and Short Stack Testing. The records include a briefing on the C Prime Mission, the Apollo 8 Flight Readiness Review, Spacecraft 105 Configuration, and Apollo Design Certification Reviews. There are color photographs of the spacecraft being assembled and tested. (Old acc# 73A766, 73A1680)

**A-19-60-2**

#### **E.209L. GRUMMAN TECHNICAL DOCUMENTS.**

**1961-1972. 45 ft.**

Arranged by document control number (LCS to LVR with numerous gaps). The AETI index in box 1 of E.206D provides a partial index to these documents.

Technical and management proposals, technical reports, end item specifications and specification amendments, functional requirements, mission planning studies, failure analysis reports, equipment status lists, nomenclature and documentation lists, Ground Support Equipment requirements, Operations Handbooks, support and familiarization manuals, test procedures, checkout plans, test and operations plans, Standard Manufacturing Procedures, Operational Checkout Procedures (OCPs) and vendor requirements. The documents were produced by the Grumman Aircraft Engineering Company under contract NAS9-1100 to design, build, and test the Lunar Module. The records include early feasibility studies on Apollo and Projects 279, 306, 344, and 378B. (Old acc# 71A1178, 72A1117, 72A782, 73A1246, 73A1681, 74A4, 74ABCD12).

**B-28-40-5**

#### **E.209L-6. TEST ARTICLE LTA-8 DATA PACK.**

**1965-1969. 30 ft. 4,600 drawings**

Arranged by subject.

Test Readiness Review (TRR) reports, discrepancy logs and reports, acceptance specifications, test preparation sheets, Inspection Crab Sheets, Materials Review Reports (MRR), systems and flight panel log books, engineering orders, Government Furnished Equipment (GFE) System and Component Historical Record Cards, color photographs of hardware and Chamber B, and drawings. The records relate to hot and cold mission simulations of the ascent and descent stages of Lunar Test Article 8 (LTA-8) constructed by Grumman as a thermal-vacuum demonstration vehicle. The tests were conducted at the Space Environment Simulation Lab at

MSC. Grumman built a total of six LTAs with most of them used for vibration testing or engine firings. Test Vehicle 2TV-1 was used for a manned duration test in MSC's vacuum chamber. (Old acc# 72A1383).

**B-28-32-4**

#### **E-209L-8. LUNAR MODULE ACCEPTANCE DATA PACKS.**

**1967-1972. 108 ft. and 359 rolls of 16mm microfilm.**

Arranged by lunar module number and thereunder by type of document.

Test Project Engineering Reports (TPERs), Phase I-III Requests for Action, Test Readiness Review (TRR) reports, System Summary Acceptance Documents (SSADs), Operational Checkout Procedures (OCPs), Open Item Review Sheets, Part Information and Removal Records (PIRRs), Temporary Installation Records (TIRs), Shakedown Inspection Reports, discrepancy logs and reports (DRRs), acceptance test plans and specifications, test preparation sheets (TPS), Failure Investigation Reports (Crab Sheets), Materials Review Reports (MRR), systems and flight panel log books, engineering orders, Standard Manufacturing Procedures (SMPs), Government Furnished Equipment (GFE) System and Component Historical Record Cards, and Narrative End-Item Inspection Reports. There are also black and white and color engineering photographs of hardware testing and closeout. The records document the acceptance and pre-flight readiness testing and certification of every part, subsystem, and system in the Lunar Module. Most of the records appear to have been microfilmed by Boeing as part of the TRIS program and 137 rolls of 16mm silver negative film has been located (see also entry 154C). (Old acc# 71A-F1003, 71A1178, 71A1312, 71A1510, 72A199, 72A783, 72A1115, 73A1238, 73A1678, 74ABC786, and 76A1516).

**B-28-34-5 and film at A-21-28-1**

#### **E.209M. LUNAR MODULE FLIGHT READINESS REVIEW RECORDS.**

**1967-1972. 13 ft.**

Arranged by spacecraft number (LM-1 to LM-11) and thereunder by type of document.

Correspondence, memoranda, minutes of Customer Acceptance Readiness Reviews and other boards, Design Certification Reviews, Requests for Action, Acceptance Readiness Statements, Flight Readiness Review Reports, and other documents relating to testing and acceptance of Lunar Modules and related sub-systems and systems. The bulk of the correspondence is with Grumman and Boeing. The various reviews include Phase I, II, and III activities. The records were maintained by the LM Project Engineering Division and there are weekly activity reports from that unit for 1968-1969. (Old acc# 71A1517, 72A783, 72A1384, 73A1679).

**A-23-92-1**

#### **E.209P. FAILURE REPORTS.**

**1964-1972. 140 ft. x rolls of microfilm.**

Arranged by control number.

Copies of computer-generated reports on failures of systems, subsystems, and parts. There are also some Grumman Failure Notification Forms. (Old acc# 71A991, 71A1183, 73A1243, 77A48).

**B-19-70-5 and V4-2-7 and V7-6-1**

#### **E.210. RECORDS RELATING TO THE APOLLO 13 ACCIDENT INVESTIGATION.**

**1970-1971. 12 ft.**

Arranged by subject. There is a list of folder titles in box 1.

Originals and copies of memoranda, TWX's, drafts and final versions of interim and final activity reports, briefing papers, minutes of some meetings, lists of action items, material on press conferences and law briefings, test procedures and results, control and progress charts, technical drawings, and working papers of various panels. There are audiotapes and transcripts of various status reviews and copies of tapes of some air-to-ground and flight directors loops. There are a few prints of test hardware and 16 x 20 inch enhanced photographs of the Apollo 13 Command Module. There are also 3 reels of 16mm movie film of tests conducted in support of the investigation. The bulk of the records were maintained by J. R. Brinkmann (code BL) who was chairman of Panel 4. (72A-795, 72B795, and 255-77-0046).

**A-30-006-1**

**E.210-1. RECORDS OF THE TECHNICAL ASSISTANT RELATING TO THE APOLLO 13 ACCIDENT INVESTIGATION. 1970-1971. 2 ft.**

Arranged by subject.

Copies of memoranda and other correspondence, minutes of meetings, transcripts of status review meetings, briefings made to Dr. George M. Low and other NASA management officials, panel reports, the Apollo 13 (AS208 CM109/LM-7) stowage list, Flight Readiness Review, Discrepancy Closeout Report, post-flight mission reports, and Subsystem Reassessment Reviews. There is an annotated copy of the Final Review Board Report and the OMSF Response. It appears Ron W. Kubicki for the Technical Assistant to the ASPO Manager maintained these records. (Old acc# 76A201)

**A-30-006-4**

**E.210A. OFFICE FILES OF JOHN G. MCCLINTOCK RELATING TO THE AS204 INVESTIGATION. 1959-1967. 11 ft.**

Arranged by subject (Category I to XX). There is a log of the documents in box 1.

Copies and some originals of correspondence, memoranda, minutes of management reviews, technical reports and studies, Gemini Design Notes, SEDRs, photographs, flammability test data sheets, and other material collected as part of a review of the "history and design philosophy" of projects Mercury and Gemini in areas including hatches, Apollo Block I and II spacecraft design, electrical circuit design, one gas/two gas systems, pad egress, escape and egress procedures, and crew safety. The review was part of Project Action/Project X to investigate the causes of the fire in Apollo spacecraft 201. The files were maintained by John G. McClintock, Chief, Program Control Division (PP). Some of the files were security classified but all were declassified by NASA-SCB dated 7-1-70. (Old acc# 72A174, 73A1683, and 76A475)

**A-30-6-5**

**E.210B. INCIDENT INVESTIGATION FILES.  
1965-1967. 8 in.**

Arranged by incident.

Original incident investigation reports including photographs and drawings. NASA management established an Apollo Accident Report Review Task on February 8, 1967 to investigate "in retrospect" all known major accidents or failures that preceded the Apollo 201 fire. The records relate to ten incidents from 1965 to 1967 at the White Sands Test Facility and contractor sites including fires, leaks, and drops of the command module. The Program Planning and Analysis Office (PP3) maintained the records and are similar to material in Category XX of the records described in entry 210A. (Old acc# 74A788)

**A-30-6-7**

**E.211C10. CONFIGURATION CONTROL BOARD AGENDA AND MINUTES.**

**1967-1975. 2 ft.**

Arranged chronologically.

Original agenda and signed minutes of meetings of the Apollo Configuration Control Board. The Board was established to make decisions on Requests for Engineering Change Proposals (RECPs) that had been reviewed by Configuration Control Panels for both the Command and Service Modules and the Lunar Module. All changes to Apollo hardware had to be approved by the Board chaired by George M. Low, the Apollo Program Manager. Most of the minutes were signed by George Abbey, who was serving as Technical Assistant (PA2). The CCB met 90 times from June 1967 to July 1969 and considered 1,697 changes of which 1,341 were approved. The title of the Board was changed to the Apollo/ASTP/Skylab Configuration Control Board on September 3, 1971. (Old acc# 76A201)

**A-19-54-6**

**E.211C15. CONFIGURATION CONTROL BOARD PRESENTATION AND BACK-UP MATERIAL (“PACKAGES”). 1967-1973. 34 ft.**

Arranged chronologically by date of meeting.

Requests for Engineering Change Proposals, Decision and Status Papers, Spacecraft Weight Summary Reports, briefing charts and diagrams, Reliability and Quality Assurance Comments and Recommendations, technical evaluation reports, correspondence with contractors about proposed changes, contract change documents, and internal memoranda. Many of the documents are annotated by George Low and others with comments and questions. There are hand-written notes on various topics, a copy of the Configuration Management Manual (SB07-C-001A), and some photographs of hardware. The Integration Division (BT2/WC2) eventually maintained these files. (Old acc# 76A201, 76A491, 76A2036, and 78-9)

**A-19-54-7**

**E.211C20. CONFIGURATION CONTROL BOARD DIRECTIVES.**

**1965-1973. 3 ft.**

Arranged chronologically by date approved.

Copies of Directives (Form MSC 1156A) issued by the Board. The information given in the Directive includes the title of the change, a description of it, a summary of the staff recommendations, and the impact on both spacecraft weight and contract cost and delivery date. (Old acc# 71A1176 and 76A201)

**A-19-56-6**

**E.214. COMPOSITE APOLLO STOWAGE LISTS.**

**1968-1973. 3 ft.**

Arranged by Flight and thereunder chronologically by date issued.

Printed lists of equipment stowed in the Command Module and Lunar Module for Apollo 9 through Apollo 16. The lists were prepared weekly by Boeing for PF3 to track the location of items as they were placed in spacecraft awaiting launch. The lists contain the item number, part number, nomenclature, stowage area, and unit weight of each item. These do not appear to be the final “as flown” lists. Stowage lists have been reproduced by the JSC History Office on a CD which is available in the NARA-SW Region reading room. (Old acc#71C1176)

**A-17-28-3**



**E.214B. SPACECRAFT HARDWARE UTILIZATION RECORDS.**

**1967-1972. 4 ft.**

Arranged by spacecraft number (S/C 017 to S/C 118).

Original signed Apollo Spacecraft Hardware Utilization Requests (ASHURs), Hardware Reuse Evaluations, Engineering Summary Reports, and related correspondence. The forms generally include a description of the hardware, part numbers, serial numbers, and disposition. (Old acc# 81-16).

**A-17-28-5**

**E.215. APOLLO DRAWINGS.**

**1962-1974. 170 ft.**

Arranged by drawing number. The original SF135s for each accession often provide a detailed list of drawings but no consolidated finding aid to all the various drawing numbers has been located.

Copies of drawings of all sizes (A to J) and aperture cards. Many of these drawings were maintained by the Engineering Document Control Center (Old acc# 71A1519, 71A1520, 71A1521, 72A180, 72A1118, 72A1131, 72A1382, 73A735, 73A1235, 73B1235, 73ABC1672, 73A1685, 74A787, 75AB894, 76A1358, 76A1757, 86-33, 87-44).

**B-20-062-5, B-27-50-4, B-27-54-7, and B-35-28-10**

**E.216. MICROFILM APERTURE CARDS OF DRAWINGS.**

**1968-1975. 140 ft.**

Arranged by drawing number.

Microfilm copies mounted on aperture cards of drawings done by Rockwell International and associated vendors. There are also drawings relating to Skylab done by Martin-Marietta, General Electric, and associated vendors. It is not clear where the original drawings are, but some may be among the records described in entry 215. (acc # 80-3).

**B-30-44-5**

**APOLLO-SOYUZ TEST PROJECT OFFICE**

Talks with the Russian government about a joint docking maneuver began in 1969 and working groups were established to study the problems involved in October 1970. Six Technical Working Groups were established under an agreement signed May 24, 1972. Glynn Lunney was appointed Manager of the Apollo-Soyuz Test Project within the Apollo Spacecraft Program Office (ASPO) on June 26, 1972 (JSCA 72-98). Captain Chester M. Lee was appointed Project Director. On July 1, 1974, Dr. R. Thomas Giuli was named ASTP Program Scientist (JSCA 74-78). The docking mission was accomplished on July 17, 1975. See The Partnership: A History of the Apollo-Soyuz Test Project (Washington, DC, 1978, NASA SP4209).

**E.260. GENERAL SUBJECT FILES.**

**1972-1975. 12 ft.**

Arranged in yearly segments and thereunder by the following subject headings: Communications & Instrumentation, Crew Systems, Electrical Power Systems, Environmental Control Systems, Flight Operations, Ground Support Equipment, Launch Operations, Logistics, Missions, Navigation & Guidance, Program Management, Propulsion Systems, Reaction Control Systems, Reliability, Research, Reviews, Stabilization and Control, Structural Systems, Systems

Engineering, Tests, Training and Trainers, Technical Information, and Working Groups. Within each subject heading, there are often numerous sub-headings.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, technical studies and reports, activity and progress reports, specifications, requirements, engineering studies, working group documents, test plans, mission reports, proposals, cost reports, schedules, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to contract negotiation and administration, design and development of hardware, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents. The Program Management files and Reviews files include material relating Preliminary Design Reviews (PDR), Critical Design Reviews (CDR), Design Certification Reviews (DCR), Customer Acceptance Readiness Reviews (CARR), Flight Readiness Reviews (FRR), Configuration Control Panels and Boards (CCB), Technical Status Reviews, Crew Station Reviews, and Systems Requirements Reviews. (Old Acc# 76A796)

**A-19-62-1**

#### **E.262. MINUTES OF JOINT US-USSR MEETINGS.**

**1970-1975. 6 ft.**

Arranged chronologically by date of meeting.

Original signed minutes of meetings of the main US/USSR committee and the Working Groups in both English and Russian. There are also Summary of Results, Summary of Activity, correspondence and transmittal letters, hand-written notes by NASA participants, and drafts of some documents such as Preliminary Systems Reviews, Crew Activity Plans, and Mission Requirements. The records include notes on astronaut and cosmonaut training visits and joint flight controller training. (Old acc# 76A971, 85-0009, and 85-0038)

**A-19-62-3**

#### **E.264. ASTP PROJECT DOCUMENTS.**

**1972-1975. 8 ft.**

Arranged by a numerical control number (ASTP 10000 to 40800). There is a list of document titles in box 1.

Drafts and final versions in both English and Russian of Planning Documents, Safety Assessment Reports, Scheduling Documents, and Mission Documents. Many of the drafts contain hand-written annotations. The documents include the Project Technical Proposal, Organization Plan, Mission Requirements, Design Characteristics, Flight Plan Guidelines, Mission Operations Plan, Contingency Plan, Flight Readiness Review, and Post Mission Reports. (Old acc# 76A2036, 85-0009, and 85-0038)

**A-19-62-4**

#### **E.265. INTERACTING EQUIPMENT DOCUMENTS.**

**1972-1975. 15 ft.**

Arranged by a numerical control number (IED50001 to 50807). There is a list of document titles in box 1.

Drafts and final versions in both English and Russian of Interacting Equipment Documents (IED) prepared by various joint US-Russian working groups. The documents were done to record specific technical data to ensure compatibility, lay out test plans, and present hardware specifications and drawings in a standardized format. The records include Interacting Equipment Revision Notices and withdrawal sheets for documents. (Old acc #85-009 and 85-0038)

**A-19-62-6**

**E.266. WORKING GROUP RECORDS.**

**1972-1975. 26 ft.**

Arranged by working group and thereunder by document number. There is a list of documents in box 1.

Drafts and final versions ("Masters") in both English and Russian of documents and working papers prepared by USA and USSR Working Groups. Working Groups were established for Mission Model, Guidance and Control Docking Aids, Mechanical Design, Communications and Tracking, and Life Support and Crew Transfer. Records include procedures, instructions, timelines, simulation outlines, joint operations instructions, technical drawings, and photographs of hardware. (Old acc# 85-009 and 85-010)

**A-19-64-3**

**E.267. TRANSMITALS OF DOCUMENTS.**

**1970-1975. 3 ft.**

Arranged in two segments (To the USSR and From the USSR) and thereunder chronologically.

Copies of correspondence and telegrams to and from Konstantin Bushuyev, Academy of Sciences-USSR, and other Russian officials that transmit various technical and program documents. There is a message log for 1975. (Old acc# 85-009)

**A-19-66-2**

**E.267C. CONTRACT PROPOSAL BY NORTH AMERICAN ROCKWELL.**

**1972. 4 in.**

Arranged by volume number.

A printed copy of a contract proposal (SD-72-CS-0044) prepared by North American Rockwell Space Division in June 1972 for a joint US-USSR docking mission. The proposal includes volumes on cost, management, technical issues, engineering, test operations, quality assurance, and business management. (Old acc# 87-54).

**A-19-62-4**

**E.267D. WALTER GUY'S REFERENCE FILES ON ASTP LIFE SUPPORT.**

**1968-1976. 2 ft.**

Arranged by type of document.

Correspondence, memoranda, minutes of working group meetings, organizational plans, mission requirements, project schedules, and various technical reports. There are annotated copies of Interacting Equipment Documents (IEDs) and numbered Working Group documents that can also be found in entries 265 and 266. These records were maintained by Walter W. Guy who worked in the Crew Systems Division (EC) and served as Chairman of Working Group 5 which was responsible for issues relating to life support systems, crew transfer, and non-flammability of American and Soviet equipment. (old acc#98-58).

**A-20-78-5**

**E.267F. COMMAND AND SERVICE MODULE OPERATIONAL CHECKOUT PROCEDURES. 1972. 2 ft.**

Arranged by document control number.

Copies of selected Operational Checkout Procedures (OCPs) for Command and Service Module 111 systems, subsystems, and ground support equipment. The procedures generally list

test objectives, cite references to related documents, and provide detailed checklists and instructions for conducting the procedure with support and safety requirements. Most of the checklists are annotated with quality stamps, the date completed, and results. There are procedures for compatibility, readiness, and profile checkouts. There are also some Test Configuration Checklists, Verification Procedures, Procedure Deviation Reports, Test and Inspection Reports, Test Preparation Sheets, Disposition Records, schematic diagrams, and illustrations of hardware. The documents are signed by the Test Engineer and Project Engineer. (Old acc#77-31).

**A-31-34-3**

#### **E.268. AIR TO GROUND TRANSCRIPTS.**

**1975. 2 ft.**

Arranged by type of transcript.

The master Technical Air-To-Ground (TAG) Voice Transcription, the Mission Soviet Release, and the USSR Mission Commentary. The transcripts provide the time, speaker, and text. (Old acc# 85-38)

**A-19-66-2**

### **APOLLO APPLICATIONS (SKYLAB) PROGRAM OFFICE (KA)**

A Space Station Program Office was established in the STG as early as 1962 and NASA conducted various studies of post-Apollo programs. In the summer of 1965 an Apollo Applications Program Office was established in NASA Headquarters.<sup>7</sup>

At MSC, a Skylab Program Office, managed by Kenneth S. Kleinknecht, was established on July 7, 1966 and became the contact point for all NASA centers and government agencies involved with the project. It included a Missions Office, an Engineering Office, a Manufacturing and Test Office, an Orbital Assembly Project Office, and resident offices at both MSFC and KSC. The office was responsible for interface control and configuration control on four levels.

The unmanned Skylab workshop was launched on May 14, 1973 and the first crew (Skylab 2) was launched on May 25, 1973, and spent 28 days in orbit. The Skylab 3 crew was launched on July 28 and Skylab 4 on October 1, 1973. The Skylab office was abolished January 28, 1975 (1130.1P). See Living and Working in Space: A History of Skylab (Washington, D.C., 1983, NASA SP-4208).

---

<sup>7</sup> See Compton, W. David and Charles D. Benson, Living and Working in Space: A History of Skylab (Washington, NASA SP-4208, 1983,

**E.280. GENERAL CORRESPONDENCE FILES.**

**1966-1974. 58 ft.**

Arranged in yearly segments and thereunder by the organization that generated the document. Beginning in 1973 the same categories found in entry 205T5 are used.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, contract documents, financial reports, surveys and audits, technical studies and reports, activity and progress reports, specifications, requirements, engineering studies, proposals, cost reports, schedules, Review Item Discrepancies, and drawings. The correspondence is with other NASA centers, contractors, and subcontractors and relates to contract negotiation and administration, design and development of hardware, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents, Daily Mission Reports for Skylab missions, mission status reports, transcripts of press conferences, Flight Management Team minutes, and Experience Reports ("Lessons Learned"). The section for Experiments includes experiment implementation plans and requirements, integration documents, design reviews, and status reviews for all flown scientific, medical, and earth resources experiments including Student Experiments. There is also information about the Comet Kohoutek Viewing program. Records for Skylab for the period from 1970 to 1972 were maintained with the files described in entry 205T5. There are some records relating to the termination of the Gemini program. (Old acc# 72A179, 72A196, and 76A275)

**A-23-16-2**

**E.281. REFERENCE FILES ON MARTIN-MARRIETTA.**

**1970-1972. 6 ft.**

Arranged in yearly segments and thereunder by subject using the same categories found in entry 205T5.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, contract documents, technical studies and reports, activity and progress reports, specifications, requirements, engineering studies, proposals, cost reports, schedules, and drawings. The correspondence is with other NASA centers, Martin-Marietta corporate officials, and subcontractors and relates to contract negotiation and administration, design and development of hardware, testing and acceptance of equipment, mission planning, and general administrative matters. There are numerous annotated drafts of procedures and other mission documents. The bulk of the records relate to Experiments and include files relating to meetings include records from Customer Acceptance Readiness Reviews (CARR), Flight Readiness Reviews (FRR), Configuration Control Panels and Boards, Technical Status Reviews, and Crew Interface Reviews and Skylab experiments and the Earth Resources Experiments Package (EREP). Similar records for the period prior to 1970 are contained in entry 280. (Old acc# 74A1730)

**A-23-16-2**

**E.282. MSC TECHNICAL DOCUMENTS.**

**1967-1972. 12 ft.**

Arranged by type of document and thereunder by control number.

Printed technical documents prepared by MSC staff. The documents include AAP Working Documents 5100 to 5105; documents in the MSC-KW-D and E and SSA series; Mission Requirements Documents (MRD-001); and various MSC/JSC technical publications. The records include mission rules, flight plans, crew debriefings, mission contingency plans, program specifications, Baseline Operations Plans, flight controllers handbooks, experiment handbooks and

specifications, Interface Control Documents, evaluation of radiation hazards, life support definition, electrical power system study, thermal control system study, and portable life support equipment study. Some of these documents were once part of the TRIS system described in entry 154C. (Old acc# 72A781, 72A1130, 75B900, 81-49).

**A-23-16-5**

**E.283. CONTRACTOR TECHNICAL DOCUMENTS.**

**1964-1971. 32 ft.**

Arranged by company and thereunder by control number.

Technical reports, studies, and analysis prepared by Grumman, Martin-Marietta, McDonnell-Douglas, and North American-Rockwell. The bulk of the documents were prepared by Martin-Marietta under contract NAS8-21004 and include Mission Definition Design Reviews, Design Reference Mission Documents, progress reports, Crew Safety Analysis, Experiments Data Handbooks, Mission Feasibility Analysis, Ground Support Equipment Plan, Program Management Plans, Mission Timelines and Task Analysis, and Crew Habitability studies. The reports include North American and Grumman studies on the Extended Apollo Systems that were formerly classified but were declassified by NASA SCB 7-1-70. The reports are designated CR, CX, ED, EL, EP, ER, KW, MCR, MSC, Pl, and Pr. Documents prepared by North American-Rockwell under contract NAS9-6593 (designated SD) include specifications, Interface Control Documents, Operational Procedures, Verification Plans, Failure Mode Analysis, and Flight Crew Procedures. (Old acc# 71A1256, 71A1313, 72A785, 72A786, 72A1130, 76A1499)

**A-19-56-7E**

**E.285. COMMAND AND SERVICE MODULE OPERATIONAL CHECKOUT PROCEDURES. 1972-74. 2 ft.**

Arranged by spacecraft number (SC/116 to SC/118) and thereunder by document control number.

Copies of selected Operational Checkout Procedures (OCPs) for Command and Service Module systems, subsystems, and ground support equipment. The procedures generally list test objectives, cite references to related documents, and provide detailed checklists and instructions for conducting the procedure with support and safety requirements. Most of the checklists are annotated with quality stamps, the date completed, and results. There are procedures for compatibility, readiness, and profile checkouts. There are also some Test Configuration Checklists, Verification Procedures, Procedure Deviation Reports, Test and Inspection Reports, Test Preparation Sheets, Disposition Records, schematic diagrams, and illustrations of hardware. The documents are signed by the Test Engineer and Project Engineer. There are also checkout procedures prepared by Martin Marietta for the Apollo Telescope Mount, the Multiple Docking Adapter, and various scientific experiments. (Old acc# 75CD900).

**A-23-22-7**

**E.287. DRAWINGS OF SKYLAB EXPERIMENTS ON APPERTURE CARDS.**

**1972-1974. 10 ft. approx 10,000 items**

Arranged by drawing number. No index to the drawings has been located.

Drawings reproduced on apperture cards of Skylab experiment hardware. The bulk of the drawings were made by Ball Brothers and relate to experiments SO52, SO54, SO55A, SO82A, and SO82B. There are also drawings done by ITEK, Massachusetts Institute of Technology, Northwestern University, Southwest Research, TRW, Westinghouse, Naval Aerospace Medecine, Actron, Perkins-Elmer, American Science Engineering, General Electric, R.E. Darling, Applied

Physics Lab, Burnes Engineering Co., Univeristy of Texas, Ludley Observatory, Block Engineering, Spacelabs, Inc., EMR, SCI Electronics, Rosemont, Crouzet-Sagem, and Ail-Cuttler Hammer. There are some drawings for the Airborne Multispectral Photographic System (AMPS) and the Apollo Telescope Mount (ATM). The location of the original drawings is not known. (acc# 79-75, 79-77).

**B-30-52-1**

**E.289. SKYLAB STOWAGE LISTS.**

**1972-1974. 4 in.**

Arranged by type of list.

Printed stowage lists for SL 1, 2, 3, and 4. The information contained in the form includes Item Number, nomenclature, unit weight and volume, total quantity, and stowage location. These are probably no "as flown" lists. Stowage lists have been reproduced by the JSC History Office on a CD which is available in the NARA-SW Region reading room. (Old acc# 74A1730)

**A-23-22-6**

**E.290. SKYLAB 3 AND 4 AIR-TO-GROUND TRANSCRIPTS.**

**1973-1974. 16 FT.**

Arranged by mission and thereunder by type of tape transcribed.

Typed transcripts of both the Technical Air to Ground Tape (A) and the Dump Tape (B). There are edited transcripts for the Apollo Telescope Mount (ATM) Experiment, Corollary Experiments, Student Experiments, Astronaut Experiments, CSM Systems, Bio-medical Experiments. There are also some evening reports and comments on the flight plan, flight data files, and anomaly reports. (Old acc# 76A959)

**A-23-22-2**

**E.304. ORBITAL ASSEMBLY PROJECT OFFICE CASE FILES.**

**1965-1972. 4 ft.**

Arranged by subject.

Correspondence, memoranda, hand-written notes from meetings and reviews, design studies produced by contractors, program briefing materials, agenda and minutes of reviews, and some drawings. The records relate to Gemini paraglider and ejection seat, EVA and IVA, zero gravity workbench, payload integration, LM/ATM, neutral buoyancy training, crew habitability, and crew station design. There are also records relating to planning for the AAP Mission IA. It appears that these files were maintained for reference by Fred Burns, Fred Koons, John Stanley, Jim Prim, and Ed Armstrong were assigned to the Project Office (KW). (Old acc# 72A1129)

**A-23-16-4**

**E.305. REFERENCE FILES OF JAMES C. SNOW ON THE ORBITAL WORKSHOP TASK TEAM. 1971-1972. 2 ft.**

Arranged by subject (there is a list of folder titles in box 1).

Correspondence, activity reports, minutes of meetings, action items, configuration control documents, crew interface requirements, stowage plans, and contracting documents assembled by James C. Snow who served as the Senior MSC Resident Representative on the Orbital Workshop Task Team. The OWS Team was established on August 31, 1971 to provide "timely programmatic and technical interface" with the McDonnell Douglas Astronautics Company, Western Division, at Huntington Beach, California. The duties of the Team were defined in MSC Announcement 71-127 and included ensuring timely delivery of hardware and adequate documentation. (Old acc# 75C899)

## SPACE SHUTTLE PROGRAM OFFICE

Contracts were signed for Shuttle Studies on January 26, 1969 that involved MSC, MSFC, and Langley with MSC acting as the "Lead Center." A Space Shuttle Program Office (LA) was established at MSC on February 13, 1970 (MSCA 73-24) with Robert F. Thompson appointed as Manager in April 1970. President Nixon authorized construction of a Space Shuttle in 1972. JSC was given responsibility for Level II Program Management which included systems engineering and integration, configuration, and design and development. An Orbiter Project Office (MA) was established on February 15, 1973 (MSCA 73-24) with Aaron Cohen designated as Manager. The Project Office had level III responsibilities for the design, development, testing, and production of the Orbiter.

Under NASA Management Instruction, NMI 8020.18 issued in July 1971, Level I program direction was assigned to NASA Headquarters with authority over budget, schedule, and performance requirements and the allocation of funds among NASA field centers. Level II was exercised by the shuttle program manager, Robert F. Thompson, at JSC with responsibility for integration of systems and project management. Level III provided management of the individual projects such as the orbiter and main engines that were part of the overall shuttle project. The JSC orbiter project office at JSC under Aaron Cohen exercised control over the orbiter while a similar Level III project office at the Marshall Space Flight Center exercised control over all major propulsion systems. Initially, all Level III project offices reported the Level II program office at JSC, but more Level II control was given to NASA Headquarters in 1974.

An Office of Manager for Operations Integration was established at JSC on August 19, 1974 (JSCA 74-94). This became the Shuttle Payload Integration and Development Program Office (SPIDO) on August 4, 1975, under Glynn S. Lunney. It was responsible for the planning and implementation of JSC payloads and payload carrier activities. In 1980 it was re-designated the STS Operations Program Office (PA) with responsibility for planning and integrating all JSC-sponsored payloads and all engineering and operations interfaces.

The first flight of the Space Shuttle (STS-1) was launched on April 12, 1981. On May 14, 1982, the STS Operations Office (PA) and the Space Shuttle Program Office (LA) were merged (1130.1V). On April 13, 1983, this office was designated the National Space Transportation Systems Program Office (1130.1Y). On December 18, 1985 the office was merged with the Orbiter Project Office (MA) to form a single National Space Transportation Systems Office (GA) that included a Space Transportation Systems Integration and Operations Office (TA). An NSTS Engineering Office (WA) was established on September 26, 1986 to facilitate the interchange of technical information among all program and project elements. On January 1, 1987, and Orbiter and Government Furnished Equipment Projects Office (VA) was established that reported to the Deputy Director of National Space Transportation System Program Office (GA).

In October 1996, Lockheed-Martin and Boeing were awarded a contract as United Space Alliance to manage Shuttle operations.



See T.A. Heppenheimer, *The Space Shuttle Decision: NASA's Search for a Reusable Space Vehicle* (NASA SP-4221, GPO, 1999), and *Development of the Space Shuttle, 1972-1981* (Smithsonian Institution Press, 2002); and Dennis R. Jenkins, *Space Shuttle: The History of Developing the National Space Transportation System* (Walsworth Publishing, 1999).

#### **E.310. CENTRAL PROJECT CORRESPONDENCE FILES.**

**1970-1985. 384 ft.**

Arranged in yearly segments and thereunder by the following subject headings: Communications & Instrumentation, Crew Systems, Change Configuration Board, Electrical Power Systems, Environmental Control Systems, Experiments, Flight Operations, Ground Support Equipment, Launch and Landing Operations, Logistics, Mission Planning, Navigation & Guidance, Payloads, Program Management, Propulsion Systems, Reliability, Research, Reviews, Structural Systems, Space Lab and Transportation System, Systems Engineering, Tests, Training and Trainers, Technical Information, and Working Groups.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, Program Operations Plans, briefing materials for program reviews, contract documents, financial reports, surveys and audits, technical studies and reports, activity and progress reports, specifications, requirements definition documents, engineering studies, proposals, cost reports, schedules, and drawings. The correspondence is with NASA Headquarters, other NASA centers, contractors, and subcontractors and relates to program planning and analysis, funding and financial management, contract negotiation and administration, design and development of hardware, configuration management, testing and acceptance of equipment, mission planning, scientific data management, computer hardware and software development and testing, and general administrative matters. The records relate to all phases of Shuttle design, fabrication, testing, and operation and include material on the Shuttle Avionics Integration Lab (SAIL), Orbiter payloads, Space Tug, Space Lab, the European Space Research Organization, the Thermal Protection System, the Shuttle Carrier Aircraft, the Shuttle Attached Manipulator System (SAMS), the Long Duration Exposure Facility (LDEF), Centaur, the Interim Upper Stage (IUS), and Vandenburg and Edwards Air Force Bases. The reviews include Preliminary and Critical Design, Preliminary Requirements, Systems Requirements, Systems Integration, Technical Integration, Monthly Program Director's Reviews, Flight Readiness (FRR), Flight Evaluation, Flight Readiness Firings, and Crew Station. Testing includes Horizontal Flight Tests, Shuttle Approach and Landing, and Orbital Flight Tests. There are records of all of the proceedings held by the Level II Program Requirements Control Board (PRCB) and related groups. (Old acc# 76A1287, 77A43, 79A26, 83-13, 84-11, 86-7, 93-69, and 93-71).

**A-29-4-5-3**

#### **E.315. CENTRAL CORRESPONDENCE.**

**1982-1985. 32 ft.**

Arranged by organizational unit and thereunder chronologically.

Copies of letters received from and sent to other NASA centers, contractors, subcontractors, foreign governments including Canada, and other federal agencies including the Department of Defense. The correspondence is annotated with the organizational symbol of the office responsible for action and relates to Management Council activity, contract negotiation and administration, budgets and funding, design and development of hardware, testing and acceptance of equipment, mission planning, facilities, property, equipment, and general administrative matters. These letters are primarily duplicate copies of original letters found in entry 310 and appear to have been maintained by the Correspondence Control Section in the Information Services Branch,

Management Services Division, Center Operations Directorate for both the Space Shuttle Program Office and the Space Station Program Office. For similar records see entry 16. (Old acc# 89-44, 93-69, 93-70, and 93-71).

**A-20-084-1**

**E.316. PHASE B CONTRACTOR STUDIES.**

**1970-1972. 25 ft.**

Arranged by contractor and thereunder by document control number.

Copies of technical studies, design notes, design criteria, cost and schedule data, test plans, status and progress reports, briefing books for program reviews, and preliminary and final reports produced by North American Rockwell (contract NAS9-10960), McDonnell-Douglas (contract NAS8-26016), General Dynamics/Convair (contract NAS9-10960), Lockheed Missiles and Space Company (NAS8-26362), and Grumman/Boeing (contract NAS9-11160). The bulk of the studies are Phase B Shuttle and Phase B Extension and relate to all aspects of shuttle design and potential operation. Many of the reports include illustrations and drawings. The reports were initially maintained by Merle J. Denny and Wayne R. Young for the "LA Files." There is a copy of the report of an MSC Space Shuttle Symposium held on December 18, 1969, and Lists of Source Documentation provided to contractors under RFP 9-BC421-67-2-40P. (Old acc# 73A1237 and 74ABC803).

**A-30-92-3**

**E.317. ORBITER MANAGEMENT REVIEWS.**

**1973-1979 5 ft.**

Arranged chronologically.

Copies of minutes of reviews, printed briefing books, and annotated copies of meeting handouts. The reviews contain information about schedules, resources, manufacturing and procurement status, and technical issues. (Old acc# 79-6 and 81-52).

**A-30-92-2**

**E.318. ORBITER/ROCKWELL TECHNICAL STATUS REVIEWS.**

**1973-1979. 8 ft.**

Arranged chronologically.

Original signed minutes of meetings between NASA officials and Rockwell-Space Division. The minutes contain a description of the technical problem under discussion and any decision made. There are also briefing handouts with hand-written annotations. (Old acc# 79-6 and 81-52).

**A-30-94-1**

**E.320. RECORDS RELATING TO THE SHUTTLE VERIFICATION/CERTIFICATION ASSESSMENT REVIEW. 1980-1981. 5 ft.**

Arranged in roughly chronological order by date of review.

Correspondence, agenda, reports, lists of recommendations, responses from the Shuttle Program Office and cognizant engineers, hand-written notes, and drafts and final versions of presentation materials. The records were created by a review team headed by Walter C. Williams, NASA Chief Engineer, who was detailed to the Rockwell Plant at Downey, California on March 17, 1980 to provide a "senior NASA management presence on-site." Williams was directed to review all Rockwell activities relating to the orbiter loads and structures, Space Shuttle Main Engines (SSME), systems engineering and integration, acoustics, ascent, aero-thermodynamics,

hydraulics, thermal protection system, propulsion, and ground systems. Williams reported directly to the NASA Deputy Administrator. The records include sketches of hardware and details on shuttle operational procedures. Originals of most of the correspondence and reports are in entry 310 (Reliability 70). (Old acc# 83-28).

**A-22-74-4**

### **E.325. PROGRAM REQUIREMENTS CONTROL BOARD CORRESPONDENCE.**

**1990. 2 ft.**

Arranged chronologically.

Copies of memoranda sent to board members transmitting agenda, schedule changes, directives, and Level I Change Requests. The correspondence is signed by the Secretary to the Board, David C. Shultz. (Old acc# 99-18).

**A-30-90-7**

### **E.328. FLIGHT REQUIREMENTS DOCUMENTS.**

**1982-1986. 2 ft.**

Arranged by shuttle flight.

Original signed Flight Requirements Documents (JSC-17462s) that define the requirements to be implemented on each shuttle flight. The documents contain level II approved requirements, mission objectives, general requirements, cargo requirements and arrangement, configuration requirements, and references to applicable documents. There are also original signed Change Request/Directives that contain a narrative description of proposed changes, justifications, and actions taken. There are FRDs for STS-1 to STS-26, 51D, 51E, 51I, and 61A to 61M. The records were maintained by the Integration Management Office (LH) and later the Flight Production Office (TB). (acc# 88-39).

**A-19-22-3**

### **E.335. SHUTTLE/CENTAUR REFERENCE FILES.**

**1979-1986. 41 ft.**

Arranged by subject. There is a list of folder titles in box 1.

Correspondence, minutes of meetings, technical reports and studies, briefing materials for presentations to management and Congress, project plans, schedules, Preliminary Design Reviews, Critical Design Reviews, Design Certification Reviews, Functional Requirements documents, Definition Documents, Systems Interface Documents, Systems Requirements Reviews, control plans, reliability and safety plans, Change Requests, Review Item Disposition Summary and Logs, Disposition Summary and Control Logs, Interface Control Documents, Configuration Management Plans, Integrated Test Plans, Change Control Board Directives, Waiver Requirements, Flight Operations Reviews for STS-61F and G, Critical Item Lists, abort landing studies, Payload Hazard Reports, and some drawings. Many of the studies were prepared by General Dynamics, Rockwell, and Boeing. The correspondence is primarily with NASA Headquarters, other NASA Centers, and contractors. The records include information about plans for the Galileo and Ulyses projects which were to have been launched using the Shuttle and Centaur combination. Plans to use the liquid fueled Centaur were abandoned in June, 1986, (87-7).

**B-25-46-4**

## **Orbiter Project Office (MA)**

An Orbiter Project Office (MA) was established on February 15, 1973 (MSCA 73-24) with Aaron Cohen designated as Manager. The Project Office had level III responsibilities for the design, development, testing, and production of the Orbiter. The office was re-designated the Space Shuttle Projects Office on April 13, 1983. It included a Space Shuttle Projects Control Office (MC), the Shuttle Data and Evaluation Office (MD), the Orbiter Engineering Office (ME), the Shuttle Avionics Office (MG), and the Shuttle Support Equipment and Logistics Office (MP).

**E.370. ORBITER SYSTEMS INTEGRATION OFFICE REFERENCE FILES.**

**1974-1979. 2 ft.**

Arranged by subject. (There is a list of document titles in box 1).

Copies of correspondence, reports, studies, Delta Preliminary Design Reviews, Readiness Reviews, Design Certification Reviews, OV101 System Handbook, and Customer Acceptance Reviews. The material was created by Orbiter Shuttle Team 09 and relates to Approach and Landing Tests (ALT), the 747 interface, and Orbiter 101 and 102. The records appear to have been retained by R.W. Kubiciki and P. Deans of ME3. (Old acc# 84-21).

**A-30-92-1**

**E.375. INTERFACE CONTROL DOCUMENTS.**

**1974-1984. 5 ft.**

Arranged by document locator number (32.120.001 to 32.137.001). There is a list of document titles in box 1.

Correspondence, Level III Interface Control Document forms, technical evaluations, engineering drawings. These technical requirements and agreement for design and performance of physical and functional interfaces between equipment, subsystems, and systems were initially maintained by the Program Operations Office (WC2). It was abolished in 1983 and the records transferred to the Program Operations Office, Integration Division and then to the Flight Engineering Office (VF). The bulk of the correspondence is between the JSC Contracting Officer and officials of Rockwell under NAS9-14000. (Old acc#95-7).

**A-30-92-1**

**E.375B. ORBITER CONFIGURATION CHANGE PANEL MINUTES.**

**1972-1977. 6 ft.**

Arranged chronologically.

Original signed minutes of meetings of the Orbiter Level IV Engineering Configuration Change Panel. The records also include transmittal memoranda, agenda, reports of Action Item Status, briefing material, and hand-written notes. From 1-15-1974 to 9-15-1975 the CCP was designated the Orbiter Level III Review Group. These records were maintained by the Engineering Office (ME). (Old acc# 79-6).

**B-30-44-4**

**E.376. PROGRAM CHANGE CONTROL FILES.**

**1972-1979. 90 ft.**

Arranged by Control Board Directive number (S or R00011 to S04469; R06000 to R06999; R16000 to R16999). There are gaps in the files.

Original signed Space Shuttle Program Change Evaluation forms (JSC281D), Program Requirements Control Board Directives, minutes of Level II and Level III Program Requirements Control Board meetings, Engineering Change Proposals, Contract Modifications, Rockwell Space

Division Specification Change Notices and Waiver Approval Requests, Orbiter Action Item Status Reports, hand-written notes of meetings, and correspondence with North American Rockwell relating to engineering and contract changes. There is also correspondence with National Research Council of Canada and SPAR Aerospace Products, Ltd. These files were maintained by the Orbiter Contract Engineering Branch. (Old acc# 79-6 and 81-52).

**B-30-40-3**

**E.379. SHUTTLE ENGINEERING DRAWINGS.**

**1976-1980. 200 items**

Arranged by drawing number (26100018 to 36129416 with gaps).

Original engineering drawings in various sizes (A to D). The bulk of these drawings relate to cable assemblies and wiring diagrams of the Shuttle Orbiter S-Band system. The drawings were maintained in the Engineering Document Control Center (EDCC). (86-60).

**B35-29-8**

**NATIONAL SPACE TRANSPORTATION SYSTEM PROGRAM OFFICE  
(GA)**

The establishment of this office was announced on August 14, 1985. It reported directly to NASA Headquarters and consolidated all program and project management activities. The office included the Integration and Operations functions formerly conducted by the Shuttle Program Office (LA). On September 26, 1986, a National Space Transportation System Engineering Office (WA) was established to facilitate the interchange of technical information between all program and project elements.

**NATIONAL SPACE TRANSPORTATION SYSTEM INTEGRATION AND  
OPERATIONS OFFICE (TA)**

This office included a Customer Integration Office (TC), a Systems Integration Office (TE), a Mission Integration Office (TM), a Management Integration Office (TO), and a Program Control Office (TN). Leonard S. Nicholson was named Manager. In 1986 a Flight Production Management Office (TB) and a Cargo Engineering Office (TJ) were established.

**E.388. FLIGHT PRODUCTION PAYLOAD FILES.**

**1982-1986. 2 ft.**

Arranged by payload and thereunder by Interface Control Document number. There is a list of folder titles in box 1.

Original signed Level II Interface Control Documents (ICDs), Preliminary Interface Revision Notices (PIRNs), correspondence with customers about changes to payloads, evaluations of Interface Revision Notices, Change Request/Directives, and related documents. The information contained in the files generally includes a description of the proposed change, reasons for the change, drawings of hardware involved, technical information about the payload, and concurrences. There are records for Centaur, Ulysses, and Gaileo. (acc# 88-38).

**A-30-94-3**

**E.390. CARGO ENGINEERING PAYLOAD FILES.**

**1984-1990. 5 ft.**

Arranged by payload and thereunder by Interface Control Document number.

Original signed Level II Interface Control Documents (ICDs), Preliminary Interface Revision Notices (PIRNs), correspondence with customers about changes to payloads, evaluations of Interface Revision Notices, Change Request/Directives, and related documents. The information contained in the files generally includes a description of the proposed change, reasons for the change, drawings of hardware involved, technical information about the payload, and concurrences. There are records for the Space Telescope, the Space Lab, the Shuttle Compatible Orbit Transfer System (SCOTS), Spartan 203, Syncom IV, Canadian Experiments (CANEX), the Long Duration Exposure Facility (LDEF), the Oasis Cargo Element, and the Orbiter Middeck Standard ICD. These records were maintained by the Cargo Engineering Office (TJ3). (acc# 92-6).

**A-30-94-4**

## **ORBITER AND GOVERNMENT FURNISHED EQUIPMENT PROJECTS OFFICE (VA)**

This office was made a separate JSC organizational element on December 11, 1986 and Richard A. Colonna was appointed Manager. The office reported to Richard H. Khors, the Deputy Director of the NSTS Program Office on programmatic matters.

### **Space Station Program Office (KA)**

A Space Station Task Group was established July 22, 1969. The Space Station Program Office was established September 22, 1982 (1130.1W). In 1983, JSC was designated as the lead center and given Level B Program Management with responsibility for systems engineering and integration. The office included the Project Engineering Office (KB), the Engineering and Operations Office (KC), the Manufacturing and Test Office (KD), and the User Integration Office (KE).

In January, 1984 President Ronald Reagan announced the U.S. intention to build Space Station Freedom. A Request for Proposals (RFP) for Phase B studies was issued in September 1984 and contracts were awarded in April 1985. Rockwell and McDonnell worked with JSC on "work package 2" which related to structural work and habitation, Boeing and Martin worked with MSFC on design of modules, General Electric and RCA worked with Goddard on a lab module, and Rocketdyne and TRW worked with Lewis on power systems.

In July 1987 Grumman was awarded a support contract to provide centralized management oversight similar to that used in Apollo. Follow-on contracts were awarded to Rocketdyne, McDonnell-Douglas, Boeing, and General Electric in 1988. In 1993, Boeing was selected as the single prime contractor and Level B management at JSC was eliminated. On June 17, 1993, President William J. Clinton announced that the United States would build Space Station Alpha in cooperation with various international partners. With the addition of Russia as a partner in 1993, the designation International Space Station (ISS) was adopted. See Howard E. McCurdy, *The Space Station Decision: Incremental Politics and Technological Choice* (Johns Hopkins University Press, 1990) and Roger D. Launius, *Space Stations: Base Camps to the Stars* (Smithsonian Press, 2003).

#### **E.400. CENTRAL PROJECT CORRESPONDENCE FILES.**

**1985-86. 21 ft.**

Arranged in yearly segments and thereunder by the following subject headings: Communications & Instrumentation, Crew Systems, Change Configuration Board, Electrical Power Systems, Environmental Control Systems, Experiments, Flight Operations, Ground Support Equipment, Launch and Landing Operations, Logistics, Mission Planning, Navigation & Guidance, Payloads, Program Management, Propulsion Systems, Reliability, Research, Reviews, Structural Systems, Space Lab and Transportation System, Systems Engineering, Tests, Training and Trainers, Technical Information, Program Directives, and Technical Directives.

Original letters received and copies sent, memoranda, TWXs, agenda and minutes of meetings, Program Operations Plans, briefing materials for program reviews, contract documents, financial reports, surveys and audits, technical studies and reports, activity and progress reports, specifications, requirements definition documents, engineering studies, proposals, cost reports, schedules, and drawings. The correspondence is with NASA Headquarters, other NASA centers, contractors, and subcontractors and relates to program planning and analysis, funding and financial management, contract negotiation and administration, design and development of hardware, configuration management, testing and acceptance of equipment, mission planning, scientific data management, computer hardware and software development and testing, and general administrative matters. (old acc# 97-41,

**A-24-84-1**

#### **E.404. PHASE B DEFINITION STUDY REPORTS.**

**1969-1972. 12 ft.**

Arranged by document control number (SD69-11 to SD71-235).

Copies of printed reports prepared by the Space Division of North American Rockwell under contract NAS9-9953. The reports include technical proposals, progress reports, briefings, and studies relating to various space station concepts including a nuclear reactor-powered, radioisotope-powered, and solar-powered station. There are also drawings and a few reports prepared by Boeing, Grumman, and MSC units. (Old acc# 74-803).

**A-24-86-1**

#### **E.406. CONTRACTOR TECHNICAL DOCUMENTS. 1984-1993. 17 ft.**

Arranged in two segments: one is numerical by document control number and the second is alphabetical by subject. The majority of the control numbers are in the MDC H category. The subjects used are: Configuration Management; International Integration; Logistics; Management and Resources; Manufacturing; Operations; Safety, Reliability, and Quality Assurance; Support Equipment; Systems Engineering and Integration; and Test and Verification.

Positive microfiche copies of technical documents produced under contract NAS9-18200 by McDonnell Douglas Space Systems Company-Space Station Division and subcontractors General Electric, Honeywell, IBM, and Lockheed. All of the documents were produced as part of Work Package 2 which covered design, development, test, and evaluation of various Space Station Freedom systems and components including thermal control, propulsion, data management, communications and tracking, guidance and navigation, and EVA systems. The documents types include development plans, verification and validation plans, qualification test procedures, specifications, contract end item specifications, integration reports, certification requirements, parts lists, critical item lists, requirements documents, safety analysis, fault tolerance analyses, failure modes and effects analysis, acquisition plans, trade studies, interface control and requirements documents, software design and requirements documents, software test

specifications, status reports,, contractor progress reports, financial status reports, architectural control documents, user's guides, and training plans. There are a few documents created as early as 1973 and several hundred aperture cards of oversize drawings included with the reports. All of this microfiche appears to have been maintained by the JSC Technical Library for reference. (Direct offer NRF-255-03-0010).

**A-22-78-2**

**E.408. SPACE STATION FREEDOM CONFIGURATION CONTROL BOARD MINUTES. 1985-1987. 2 ft.**

Arranged chronologically.

Original signed agenda and minutes maintained by the Configuration Engineering Office (KM#). There are also briefing materials used during the meetings. (Old acc# 90-26).

**A-24-86-5**

## **MARSHALL SPACE FLIGHT CENTER**

**E.420. CASE FILES ON PROJECT MERCURY.**

**1958-1964. 11 ft.**

Arranged by subject. There is a list of folder titles in box 1.

Originals and copies of correspondence, memoranda, drawings, technical reports, and test reports relating to the design, construction, testing of Project Mercury flight hardware and the conduct of actual flights. There are numerous photographs of test and flight operations and aperture card microfilm copies of detailed technical drawings. There are some copies of project histories prepared by the Marshall Center Historical Office. It appears that these records were assembled from various offices within the Marshall Space Flight Center at the conclusion of Project Mercury and then transferred to the Johnson Space Center. (66A527)

**A-20-70-5**

**E.421. FORMERLY SECURITY CLASSIFIED REFERENCE FILES ON PROJECT MERCURY. 1958-1963. 4 ft.**

Arranged by office and thereunder by subject. There is a detailed list of documents in box 1.

Original correspondence, TWX, technical reports, and drawings created by the Propulsion and Vehicle Engineering Lab, the Aero-Astroynamics Lab, the Office of the Deputy Director, and the Technical Staff. The records relate to the design, testing, and flight of Mercury-Redstone and related hardware and include studies on trajectory and guidance, tracking and ground instrumentation, flight evaluations and post-launch reports, and various Mercury Working Papers. There are copies of the Specifications for a Manned Space Capsule, the Project Mercury Familiarization Manual (SEDR 104), drawings for a parachute booster recovery system, and studies relating to the Adam Program for a Manned-Satellite. These records are very similar to the material described in Entry 220 but appear to have been maintained separately because of their security classification. NASA declassified all of the records by 1978. (Old acc#66A469)

**A-20-70-7**

## **JOHN F. KENNEDY SPACE CENTER**

**E.422. REFERENCE FILES ON PROJECT MERCURY.**



**1959-1963. 3 ft.**

Arranged by subject. There is a list of folder titles in box 1.

Correspondence, TWXs, hand-written notes, technical reports, minutes of meetings, copies of printed reports, drawings of the gantry and other ground support equipment, drawings of boosters and related hardware, and photographs of construction of facilities and some flight/test hardware. The bulk of the correspondence is with officials of the Marshall Space Flight Center. The records relate to range and ground safety, emergency abort and rescue procedures, instrumentation and other ground support equipment, booster recovery, Department of Defense support, trajectory, and telemetry. The records include copies various Mercury Working Papers, Launch Operations Directorate Monthly Progress Reports, minutes of meetings of the Launch Operations Committee and the Flight Test Working Group, and plans and operational orders of the Atlantic Fleet recovery forces. It appears that the bulk of the files were maintained by Emil P. Bertram who was an assistant to Kurt H. Debus with the Army Ballistic Missile Agency's Missile Firing Laboratory and subsequently the Marshall Space Flight Center's coordinator for pad operations at the Kennedy Space Center. Many of the records were formerly classified but were all declassified by NASA by 1975. The folders are annotated "Filmed" but there is no indication who may have done the filming or where the film is now located. (Old acc#69A78)

**A-31-78-3**

## **LANGLEY RESEARCH CENTER**

In February 1959, the Instrument Research Division of the Langley Research Center at Hampton, Virginia was assigned the task of setting up a worldwide tracking network for Project Mercury. Hartley A. Soule, the division director, and Sherwood L. Butler, the Langley Procurement Officer, worked closely with the Space Task Group, which was also located at Langley until its move to Houston. A Tracking and Ground Instrumentation Unit (TAGIU) with 35 employees was established at Langley to implement the recommendations of studies for a world-wide tracking network that were done in the Summer of 1958 (See *This New Ocean*, pps 146 and 213-219). Western Electric was selected as the prime contractor to build the network under contract NAS 1-430.

### **Records Relating to Tracking and Ground Instrumentation**

**E.423. SUBJECT FILES.**

**1958-1962. 27 ft.**

Arranged by a numerical classification system (with gaps). A copy of the file guide is in box 1.

Originals and copies of correspondence, memoranda, TWXs, narrative progress reports, siting team reports, minutes of meetings of various committees including the Mercury Project Managers and the Network Coordinating Committee, technical engineering studies and test reports, operations and procedures manuals, drawings, and some photographs and slides of sites and facilities. Much of the correspondence is with other NASA units, the Department of Defense and its various service commands, the State Department, Western Electric, and sub-contractors. The records relate to the design, construction, inspection, and acceptance of facilities and related ground equipment. There are also records relating to the negotiation of both interagency agreements and government-to-government agreements with Australia, Spain, Nigeria, Zanzibar, Canada, Great Britain, and Mexico. It appears that the files were maintained primarily by the Engineering Service Division and were sent to the Manned Spacecraft Center at Houston at the

conclusion of the Mercury Project. Some of the records were classified Confidential but all were declassified by NASA in 1972. (Old acc# 69A200 and 69A201)

**A-20-74-4**

**E.424. CONTRACT ADMINISTRATION FILES.**

**1959-1963. 5 ft.**

Arranged by subject or type of document and thereunder chronologically.

Originals and copies of correspondence, memoranda, TWXs, contract proposals, amendments, agenda and minutes of meetings, and various contracting documents relating primarily to contract NAS 1-430. The bulk of the correspondence is between NASA officials and the Western Electric Company, Bendix, or the numerous subcontractors. There are also copies of some technical reports submitted by the Massachusetts Institute of Technology Lincoln Lab. (Old acc#69A200 and 69A201)

**A-20-76-3**

**E.425. SITE PLAN DRAWINGS.**

**1960-1962. APPROX. 300 items.**

Arranged by site and thereunder by type of drawing.

Sepia copies of engineering drawings prepared by Burns and Roe Inc of sites for tracking stations. Most of the drawings appear to be "As Built" and some are reversed "reproducible" versions. There are also some pen drawings of "Site Plans-Transmitter Area" on mylar and four sets of drawings that were part of file MT8.1.1.A.2 from entry E.223. (Old acc #69A201)

**B-35-19-10 and 11**

## APPENDIX A

### File Numbers Used in subject files described in **Entry 15**

SP-1	General Administration
SP-2	Personnel
SP-3	Financial Management
SP-4	Procurement
SP-5	Security
SP-6	Ground Safety
SP-7	Publishing and Publications
SP-8	NASA Committees
SP-9	Outside Committees
SP-10	Library Services
SP-11	Publicity
SP-12	Visits
SP-13	Travel
SP-14	Reports
SP-15	Conference, Meetings
SP-16	Awards-Commendations
SP-17	Complaints
SP-18	Real Estate Facilities
SP-19	Supply
SP-20	Photography
SP-21	Drawings, Graphs, Charts, Maps
SP-22	Transportation
SP-23	Agreements
SP-24	Inventions (NASA)
SP-25	Organization
SP-26	Support
SP-27	Astronauts
SP-28	Translations
SP-29	Lectures, Speeches (by NASA Personnel)
SP-30	Communications
SP-31	Programs and Plans
SP-32	Legal
SP-33	Inspections and Investigations
SP-34	Congressional Hearings, Reports to Congress
SP-35	Personal Folders (VIPs)
SP-36	Educational Programs
SP-40	Agreements

## APPENDIX B

File numbers used in subject files described in Entry 20

SS-1	Space Flight Sciences
SS-2	Space Stations, Space Platforms
SS-3	Lunar Exploration and Vehicles
SS-4	Solar System Exploration and Vehicles
SS-5	Human Factors Engineering
SS-6	Manned Spacecraft
SS-7	Materials and Structures
SS-8	Loads
SS-9	Heating
SS-10	Cooling
SS-11	Radiation
SS-12	Bioastronautical Effects
SS-13	Pre-launch
SS-14	Launching or Take-off Systems, Sites, etc.
SS-15	Reentry
SS-16	Landing and/or impact
SS-17	Recovery
SS-18	Instrumentation
SS-19	Propulsion Systems
SS-20	Communication Systems
SS-21	Control Systems
SS-22	Retrograde Rocket Systems
SS-23	Guidance and Navigational Systems
SS-24	Tracking (Systems and Stations)
SS-25	Meteorological Conditions and Observations
SS-26	Data, Computing and Handling
SS-27	Atmosphere
SS-28	Fuels
SS-29	Escape Systems
SS-30	Trainers, Simulators, Centrifuges, etc.
SS-31	Flight and Crew Safety
SS-32	Environmental Equipment
SS-33	Wind Tunnels
SS-34	Altitude Systems
SS-35	Explosives
SS-36	Research and Studies
SS-37	Vibration, Flutter, and Noise
SS-38	Environmental Control Systems
SS-39	Adapters
SS-40	Satellites
SS-41	Space Projects
SS-42	Launch Vehicles, Missiles and Rockets
SS-43	Aircraft
SS-44	Ground Operational Support Systems

SS-45	Reliability and Quality Control
SS-46	Electrical Systems
SS-47	NASA Long Range Plan
SS-48	Tests
SS-49	Operations
SS-50	Air Traffic Control
SS-51	Systems
SS-52	Models and Displays
SS-53	Mock-ups and Boilerplates
SS-54	Trajectories and Orbits
SS-55	Ground Support Equipment (GSE)
SS-56	Aerospace Equipment

## APPENDIX C

### OLD FRC ACCESSION NUMBERS WITH NEW ENTRY NUMBERS

66A432	E.196	Mercury Subject Files
66A469	E.421	Classified Subj. Files
66A527	E.420	Mercury Project Files
66A621	E.100	Contract Admin
67A292	E.5	Technical Drawings
67A967	E.187	Paraglider files
67B967	E.187	Paraglider files
67A968	E.198B1	Ground Computer Manuals
68A1289	E.100	Contract Admin
69A78	E.422	Kennedy Mercury Files
69A200	E.423-5	Langley Ground Tracking
69A201	E.423-5	Langley Ground Tracking
69A634	E.187A	N. America Paraglider Drawings
69A639	E.205D	Gemini Drawings
69A640	E.203D	Gemini SEDRs
69A642	E.205D	Gemini Drawings
70A225	E.100	Contract Admin
71A89	E.203	McDonnell Design Notes
71A90	E.200	Gemini Central Files
71A90	E.200C	Contract Files
71A90	E.200D	Paraglider Files
71A90	E.200F	Configuration Control Board
71A90	E.204C	Gemini Stowage Lists
71A92	E.202	Contractor Tech Docs
71A211	E.5	Technical Drawings
71A276	E.100	Contract Admin
71A746	E.203B	McDonnell Technical Documents
71A760	E.202	Contractor Tech Docs
71A768	E.203B	McDonnell Technical Documents
71A985	E.110	Articles
71A986	E.205T5	ASPO Gen. Corresp
	E.205T10	NAA RASPO Corresp
	E.205T15	Grumman RASPO Corresp
	E.205T17	AC Electronics RASPO
	E.205T19	GE PASPO Corresp
71A987	E.204	Gemini Mission Docs
71A988	E.209E	NAA Tech Docs
71ABCD990	E.15 & 20	Subject Files
71A991	E.209P	Apollo Failure reports
71A992	E.115	Forms

71A993	E.65	Picture Prod Cases
71A995	E.105	Case Files
71A998	E.209B	MSC Internal Tech Notes
71A999	E.205T17	AC Elect RASPO Corresp
	E.205T19	GE RASPO Corresp
	E.205T21	Contract Admin files
71A-F1003	E.209L-8	LM Data Packs
71A1164	E.209D	Contractor Tech Docs
	E.209G	MIT Docs
71AB1165	E.209F	OCPs
71A1173	E.209D	Contractor Tech Docs
71ABC1176	E.206	ASPO Weekly Reports
	E.206A	ASPO Quarterly
	E.206B	Apollo Schedule
	E.209	Apollo Working Papers
	E.209A	NASA General Working Papers
	E.209B	MSC Internal Tech Notes
	E.211C20	CCB Directives
71A1177	E.209E	NAA Tech Docs
	E.209G	MIT Docs
71A1178	E.209E	NAA Tech Docs
	E.209L	Grumman Tech Docs
	E.209L-8	LM Acceptance Packs
71A1179	E.156N	Apollo Mission Docs
71A1180	E.200B	Gemini Meeting Docs
71A1181	E.204	Gemini Mission Docs
71A1182	E.200	Gemini Central Files
	E.200C	Gemini Contract Admin
71A1183	E.209P	Apollo Failure reports
71A1237	E.30 & 35	Monthly Activity Reports
71A1238	E.170	Gemini Tech Reports
71A1239	E.120	Leased Space
71A1240	E.193X	Tech Reports
71A1241	E.171B	Crew Systems files
71A1242	E.154C	TRIS Docs
71AB1244	E.209F	OCPs
71A1245	E.206C5	C&SM Status reports
71A1249	E.202	Gemini Contractor Docs
71A1250	E.200A2	NASA Docs
71A1251	E.200A2	NASA Docs
71A1252	E.202	Gemini Contractor Docs
71A1253	E.203B	McDonnell Tech Docs
71A1254	E.200D	Paraglider Contract Files
71A1255	E.202	Gemini Contractor Docs
71A1256	E.283	Skylab Contractor Docs
71A1257	E.195D10	Lunar Orbital Science

71A1270	E.125	Mgmt Info Studies
71A1277	E.167F	MORL Studies
71A1284	E.200A2	NASA Gemini Docs
71A1298	E.205T5	ASPO Corresp
	E.205T10	NAA RASPO
	E.205T15	Grumman RASPO
71A1309	E.154C	TRIS Docs
71A1310	E.55 & 60	Ind Info Release
71A1312	E.209L-8	LM Data Packs
71A1313	E.283	Skylab Contractor Docs
71A1317	E.197A	Mercury Tech Docs
71A1321	E.197A	Mercury Tech Docs
71A1322	E.197A	Mercury Tech Docs
71AB1328	E.100	Contract Admin
71A1330	E.196F	Fac Test Procedures
71A1352	E.202	Gemini Contractor Docs
71A1353	E.192H	EE Lunar Survey Files
71A1354	E.192H	EE Lunar Survey Files
71A1357	E.195C10	ALSEP files
71A1504	E.202	Gemini Contractor Docs
	E.205D	Gemini Drawings
71A1505	E.209D	Contractor Tech Docs
71A1510	E.209L-8	LM Data Packs
71A1513	E.115	Forms
71A1516	E.209M	LM FRRs
71A1517	E.209M	LM FRRs
71A1519	E.215	Apollo Drawings
71A1520	E.215	Apollo Drawings
71A1521	E.215	Apollo Drawings
71A1526	E.209F	OCP tapes
72A5	E.196	Mercury Subject Files
72A174	E.200C	Gemini Contract Admin
	E.202	Gemini Contractor Docs
72A174	E.202A	NASA Docs
	E.203B	McDonnell Tech Docs
	E.210A	AS204 Investigation
72B174	E.25	Classified Subject Files
	E.200A2	NASA Gemini Docs
	E.205D	Gemini Drawings
72A175	E.195C5	EASEP files
72A178	E.209F	OCPs
72A179	E.280	Skylab Corresp
72A180	E.215	Apollo Drawings
72A193	E.110	Articles
72A196	E.205T5	ASPO Corresp
	E.205T10	NAA RASPO
	E.205T15	Grumman RASPO



	E.280	Skylab Corresp
72A198	E.157E	Gemini Simulations
72A199	E.209L-8	LM Data Packs
72A770	E.110	Articles
72A776	E.171C	ECP Space Suit Files
72A781	E.106	NASA General Working Papers
72A782	E.209E	NAA Tech Docs
	E.209L	Grumman Tech Docs
72A783	E.209L-8	LM Data Packs
	E.209M	LM FRRs
72A784	E.209D	Contractor Tech Docs
	E.209G	MIT Docs
72A785	E.283	Skylab Contractor Docs
72A786	E.283	Skylab Contractor Docs
72A787	E.209D	Contractor Tech Docs
	E.209G	MIT Docs
	E.209H	TRW Tech Docs
72A788	E.205T17	AC Electronics
	E.205T19	GE Docs
	E.205T21	General Contractors
72A789	E.154C	TRIS Docs
72A792	E.100	Contract Admin
72A794	E.155B1	LM Simulator
72A795	E.210	Apollo 13 investigation
72B795	E.210	Apollo 13 investigation
72A797	E.154W	Crew Support Corresp
	E.155B	LLTV files
72A798	E.196	Mercury Subject Files
72A799	E.206B5	Apollo Status Reports
	E.209E	NAA Tech Docs
72A800	E.209G	MIT Docs
	E.209E	NAA Tech Docs
72AB852	E.65	Picture Prod Cases
72A1114	E.156N	Mission Docs
72A1115	E.209F	OCPs
	E.209L-8	LM Data Packs
72A1116	E.156N	Mission Docs
72A1117	E.209F	OCPs
	E.209L	Grumman Tech Docs
72A1118	E.215	Apollo Drawings
72A1119	E.154C	TRIS Docs
72A1126	E.195C10	ALSEP files
72A1128	E.205	Ref Files/Test Case
	E.205B	Property Disposition
72A1129	E.304	Skylab case files
72A1130	E.282	Skylab MSC Docs
	E.283	Skylab Contractor Docs

72A1131	E.215	Apollo Drawings
72A1135	E.205T5	ASPO Corresp
	E.205T15	Grumman RASPO
72A1136	E.206B	Apollo Schedule Reports
	E.209B	MSC Internal Tech Notes
72A1137	E.209D	Contractor Tech Docs
72A1138	E.198	Mercury Working Papers
72A1139	E.190	Research Studies
72A1364	E.15	Subject Files
72A1381	E.209E	NAA Tech Docs
72A1382	E.215	Apollo Drawings
72A1383	E.209L-6	LTA-8 tests
72A1384	E.209M	LM FRRs
72A1386	E.202	Gemini Tech reports
72A1390	E.205T5	ASPO Corresp
	E.205T10	NAA RASPO
	E.205T15	Grumman RASPO
72A1392	E.195E40	Earth Observation
72A1401	E.209F	OCPs
73A735	E.215	Apollo Drawings
73A736	E.207	ASPO Meetings
73A739	E.85	Subject Files
73A744	E.170A	Apollo reports
73A745	E.170	Gemini docs
73A746	E.171C	Space Suit files
73A747	E.171A	Gemini ELSS
73A751	E.105	Case Files
73A752	E.115	Forms
73A756	E.181C27	ALSEP files
73A760	E.100	Contract files
73A766	E.209K	CSM Proj Eng. Div
73A767	E.197	MSC Reports
	E.197A	MSC Tech Docs
	E.198A	Post-launch reports
73A768	E.30	Monthly Activity Reports
	E.35	Weekly Activity Reports
	E.37	Quarterly Activity Reports
	E.40	Weekly Reports to NASA HQ
	E.206	Apollo Weekly Mgmt Reports
	E.206A	Apollo Quarterly Status
	E.209	Apollo Working Papers
73A769	E.209E	NAA Docs
73A770	E.209D	Apollo Contractor Docs
73A771	E.181C18	ALSEP Tech Memos
	E.181C27	ALSEP files
	E.195C5	EASEP project files
73A773	E.154C	TRIS docs

73A1233	E.205T5	ASPO files
	E.205T10	NAA files
73A1235	E.215	Apollo Drawings
73B1235	E.215	Apollo Drawings
73A1237	E.316	Shuttle Phase B Notes
73A1238	E.209L-8	LM Data Packs
73A1241	E.65	Picture Prod Cases
73A1243	E.209P	Apollo Failure Reports
73A1245	E.156N	Apollo Mission docs
73A1246	E.209L	Grumman Tech Docs
73A1669	E.171C	Space Suit files
73A1672	E.215	Apollo Drawings
73B1672	E.215	Apollo Drawings
73C1672	E.215	Apollo Drawings
73ABC1675	E.155B	LLTV files
73A1677	E.181C22	ALSEP Eng Change Proposals
	E.181C27	ALSEP files
	E.181C35	Test Procedures
	E.181C40	Acceptance Data Packs
	E.181C45	ALSEP Equipment Logs
	E.182	Sample Return Container files
73A1678	E209F	NAA OCPs
	E209L-8	LM Data Packs
73A1679	E.209M	LM FRR records
73A1680	E.209K	CSM Files
73A1681	E.209L	Grumman Tech Docs
73A1682	E.155B10	Apollo Cameras
73A1683	E.156N	Apollo Mission Docs
	E.210A	Apollo 204 fire files
73A1684	E.209E	NAA Tech Docs
73A1685	E.215	Apollo Drawings
74A4	E.209L	Grumman Docs
74ABCD12	E.209L	Grumman Docs
74A15	E181C15	3 inch mapping camera
74AB17	E.165L	Weather maps
74A18	E.192C4	Shuttle contracts
74A20	E.140 & 145	Mgmt Anal Studies/University
74A23	E.171B	Crew Systems files
74A24	E.181C16	ALSEP Req Docs
	E.181C35	Acceptance Test Procedures
	E.181C40	Acceptance Data Packs
	E.181C45	ALSEP Equipment Logs
74ABC786	E.209L-8	LM Data Packs
74A787	E.215	Apollo Drawings
74A788	E.210B	Incident Investigations
74D791	E.100	Contracts
74A797	E.50	Reports

74A798	E.181C5	Experiments Div Corresp
	E.181C10	Lunar Orbital PO Corresp
	E.181C20	Meetings with Bendix
	E.181C25	Apollo Experiment Proposals
	E.181C30	Experiment Case Files
74ABC803	E.209F	NA OCPs
	E.316	Shuttle Phase B Studies
	E.404	Space Station Phase B
74A804	E.192K	ES Corresp
74A805	E.171	Life Support Files
74B805	E.171	Life Support Files
74A1715	E.40 & 45	Weekly Reports to NASA
74A1726	E.204B	Gemini Data Packs
74A1730	E.205T5	ASPO Corresp
	E.205T10	Grumman RASPO
	E.205T15	NAA RASPO
	E.281	Martin-Marrietta Corresp
74A1733	E.182 & 182A	Lunar Sample Containers
74A1734	E.100	Contracts
74ABC1735	E.100	Contracts
74AB1737	E.100	Contracts
74A1743	E.205A	Gemini post-flight evals
74A1828	E.207	ASPO Meetings
75A19	E.100	Contract Files
75A891	E.15&45&50	Subject Files
75A891	E.180	Ref Files
75AB894	E.215	Apollo Drawings
75A895	E.153	Skylab IV film
75A896	E.65	Picture Prod Cases
75AB897	E.115	Forms
75A899	E.189Z	Info-systems Div Corresp
75B899	E.171B	Crew Systems Project files
75C899	E.305	Orbital Workshop Task Team
75E899	E.159C	Apollo crew logs
75F899	E.193W	Prop & Power files
75A900	E159C	Apollo crew logs
75B900	E.156N	Apollo Mission docs
	E.282	Skylab Docs
75CD900	E.209F	Apollo OCPs
	E.285	Skylab OCPs
75A910	E.80	Presentations
75A912	E.100	Contracts
75A1203	E192C3	Aerothermodynamic
	E.192C10	Shuttle Wind Tunnel
75A1215	E.193C	EW Corresp
	E.193E	EW project files

75A1221	E.209H	TRW Docs
75A1281	E.45	Weekly Reports Sub
75A1282	E.15	Subject Files
76A1358	E.215	Apollo drawings
75A1383	E.140 & 145	Mgmt Anal Studies/University
75A1384	E.140	Mgmt Anal Studies
75A1432	E.209D	Contractor Tech Docs
75A1457	E.90	Subject Files
75A1563	E.193T	Pre-CARR reports
75A1638	E.90	Subject Files
75A1642	E.65	Picture Prod Cases
76A19	E.137	Issuances
76A53	E.192	Engineering & Analysis
76A155	E.45	Weekly Reports Sub
76A200	E.195C10	ALSEP files
76A201	E.210-1	Apollo 13 Investigation
	E.211C10	CCB Minutes
	E.211C15	CCB Packages
	E.211C20	CCB Directives
76A275	E.15A	General Subject Files
	E.194A	Earth Resources files
	E.280	Skylab Corresp
76A350	E.155B5	Crew Integration Corresp
76A425	E.181C5	ED Corresp
	E.182K	Skylab Experiments
76A475	E.196	Mercury Subject Files
	E.198E	Mercury Contract Files
	E.210A	AS204 Investigation
76A484	E.209E	NAA Tech Docs
76A491	E.211C15	Apollo CCB Packages
76AB504	E.182L	Molberg files on cameras
76A626	E.170C	EVA Br files
76A796	E.260	ASTP Corresp files
76A801	E.100	Contracts
76A827	E.90	Subject Files
76A831	E.209D	Contractor tech docs
	E.209H	TRW tech docs
76A865	E.150	Studies
76A874	E.156L	Handbooks
76A927	E.193C	EW Corresp
76A959	E.155C	Flight Planning Br Cor
	E.155E	Apollo CPCB records
	E.155F	Apollo FDF Change Files
	E.155G	Skylab FDF Change Files
	E.290	Skylab Transcripts
76A971	E.262	ASTP Minutes
76A1057	E.171E	EVA Project Files

76A1287	E.171F	Hamilton Standard Corresp
76A1363	E.310	Shuttle Corresp
76A1364	E.157M	Flight Support Corresp
76A1365	E.157M	Flight Support Corresp
76A1366	E.157M	Flight Support Corresp
76A1367	E.157M	Flight Support Corresp
76A1368	E.157M	Flight Support Corresp
76A1369	E.157M	Flight Support Corresp
76A1385	E.170D	EVA Equip reference files
76A1398	E.100	Contracts
76A1416	E.100	Contracts
76A1442	E.171C	EC9 Suits
76A1443	E.100	Contracts
76A1464	E.100	Contracts
76A1471	E192C2	Apollo Visibility
76A1494	E.155	Ref Files
76A1499	E.283	Skylab Contractor Docs
76A1515	E.187	Paraglider
76A1516	E.209L-8	LM Data Packs
76A1519	E.102	Reference Files
76A1713	E.145	University Studies
76A1715	E.153F	WC ref files
76A1757	E.215	Apollo Drawings
76AB1839	E.100	Contracts
76A1857	E.130 & 135	Announcements/Issuances
76A2036	E.101	Program Procurement files
	E.211C15	CCB packages
	E.264	ASTP Documents
77A16	E.100	Contracts
77A28	E.100	Contract Files
77A31	E.267F	ASTP OCPs
77A38	E.115	Forms
77A39	E.156R	Skylab Mission Docs
77A43	E.15A	General Corresp
	E.194A	Earth Resources files
	E.310	Shuttle Corresp
77A46	E.210	Apollo 13 Investigation
77A48	E.209P	Apollo Failure reports
77A49	E.154C	TRIS docs
77-54	E.155D	Crew Training Reports
77A66	E.90	Subject Files
77A74	E.194B	Earth Resources Projects
78A3	E.193C	EW Corresp
78A9	E.211C15	CCB Packages
78-18	E.151E	Reference Reports

78A23	E.90	Subject Files
78-32	E.192C7	Shuttle Abort Panel
78A38	E.130 & 135	Announcements/Issuances
78A35	E.154C	TRIS docs
78A48	E.154C	TRIS data
78A51	E.154C	TRIS data
78A55	E.154C	TRIS data
78A56	E.154C	TRIS data
78A61	E.193E	EW project files
78A72	E.90	Subject Files
78-73	E.157R	Approach & Landing Corresp
78A79	E.172G	Goodman's Ref Files
79-6	E.317	Orbiter Mgmt Reviews
	E.318	Orbiter/Rockwell TSRs
	E.375B	Orbiter CCP minutes
	E.376	Shuttle Change Control Files
79A12	E.100	Contracts
79-14	E.171G	ILC field office files
79-23	E.170B	EC6 Corresp files
	E171A1	EC2 ASTP files
	E.171A2	EC2 Shuttle files
	E171B1	EC9 Corresp files
	E.171D	EC9 Space Suit files
79A26	E15A	Genl Corresp
	E194A	Earth Resources Corresp
	E.310	Shuttle Corresp
79-29	E.167	Reading files of R. O. Piland
79-30	E.172H	Hudkins files on Shuttle Radiators
79A35	E.130 & 135	Announcements/Issuances
79A50	E.185	Aleck C. Bond Files
79-54	E.167B	Space Station study
79A58	E.90	Subject Files
79-75	E.287	Skylab Drawings
79-77	E.287	Skylab Drawings
80-3	E.215	Apollo aperture cards
80-14	E.100	Contracts
80-33	E.154D	SR&QA failure reports
81-16	E.214B	ASHURs
81-28	E.171A	Gemini Suits
	E.171C	Space Suit files
	E.171E	EVA Branch files
81-31	E.153F	Integration Div files
81-32	E.154C	TRIS docs
81-38	E.90 & 95	Subject Files

81-39	E.192C E.192C5	EX Corresp Shuttle Entry Panel
81-40	E.192C	EX Corresp
81-42	E.194T	MPAD Internal Notes
81-49	E.154E E.154C E.282	Hardware packs TRIS docs
81-51	E.194A E.16	Earth Resources Corresp Central Corresp Files
81-52	E.317 E.318 E.376	Orbiter Mgmt Reviews Rockwell Tech Status Reviews Program Change Files
82-37	E.172C	Acceptance Data Packs-Suits
82-43	E.154C	TRIS docs
83-11	E.154C	TRIS docs
83-13	E.310	Shuttle Corresp
83-28	E.320	Walt Williams Committee
83-33	E.130 & 135	Announcements/Issuances
83-36	E.156F E.156H	Flight Ops Corresp Flight Ops Action Items
83-71	E.154C	TRIS Docs
84-11	E.310	Shuttle Corresp
84-21	E.370	Orbiter Team 09 files
84-22	E.100	Contracts
84-27	E.192C	EX Corresp
84-32	E.100	Contracts
84-37	E.171E	EVA Branch files
84-38	E.171C	Space Suit files
84-43	E.100	Contracts
85-4	E.100	Contracts
85-09	E.262 E.264 E.265 E.266 E.267	ASTP minutes ASTP Documents ASTP IED documents ASTP Working Groups Transmittals
85-10	E.266	ASTP Working Groups
85-13	E.153H	Spacelab ICD Minutes
85-34	E.90 E.95	Tech Planning files Tech Planning Reading Files
85-35	E.130 & 135	Announcements/Issuances
85-38	E.262 E.264 E.265 E.268	ASTP Minutes ASTP Documents ASTP IED documents ASTP Transcripts



86-12	E.130 & 135	Announcements/Issuances
86-17	E.310	Shuttle Corresp
86-33	E.215	Apollo drawings
86-36	E.192M	Moser's files on Shuttle
86-56	E.192M5	Centaur reports
86-60	E.379	Shuttle Engineering Drawings
87-4	E.193Z	Battery and Pyro files
87-7	E.335	Shuttle/Centaur files
87-12	E.16	Central Corresp files
87-13	E.193Z	Battery and Pyro files
87-31	E.115	Forms
87-44	E.215	Apollo Drawings
87-50	E.100	Contracts
87-54	E.267C	ASTP proposal
88-3	E.151	Program Support files
88-9	E.159	Flight Data Files
88-30	e.154K	Files of Robert Parker
88-33	E.130 & 135	Announcements/Issuances
88-35	E.165D	Harlan's files on Skylab re-entry
88-38	E.388	Shuttle payload files
88-50	E.165L	Landing weather reports
88-60	E.167C	Dir of Eng Subject Files
	E.192M	Moser's files
88-70	E.100	Contracts
88-71	E.100	Contracts
88-73	E.115	Forms
89-3	E.154G	Flight Crew Corresp
	E.154H5	Flight Crew Subject Files
89-6	E.195L10	Lunar Sample minutes
89-21	E.16	Central Corresp files
89-28	E.16	Central Corresp files
89-32	E.130 & 135	Announcements/Issuances
89-42	E.16	Central Corresp files
89-44	E.315	Shuttle Corresp
89-55	E.130 & 135	Announcements/Issuances
89-57	E.154W	Flight Crew Corresp
	E.155C	Crew Training Corresp
90-11	E.130 & 135	Announcements/Issuances
90-22	E.192C	Corresp
	E.192E	Corresp
	E.192N	Corresp
90-26	E.408	Station CCB Minutes
90-29	E.100	Contracts

90-30	E.100	Contracts
90-46 to56	E.160	Flight Data Files
90-61 to73	E.160	Flight Data Files
90-76	E.172	Life Support Systems
90-97	E.172	Life Support-Apollo/Skylab
91-13	E.130 & 135	Announcements/Issuances
91-23	E.160	FDF STS-26
91-24&25	E.160	Flight Data Files
91-26	E.160	FDF STS-34
91-27	E.160	Flight Data Files
91-37	E.160	FDF STS-27
91-36	E.160	FDF STS-27
91-38 to 40	E.160	Flight Data Files
91-41	E.160	FDF STS-36
91-42	E.160	Flight Data Files
91-43	E.160	FDF STS-36
91-55	E.160	FDF STS-31
91-56	E.160	FDF STS-38
91-57	E.160	FDF STS-38
92-6	E.390	Shuttle Payload files
92-11	E.100	Contracts
92-43	E.160	FDF STS-41
92-45	E.160	FDF STS-35
92-46 to 49	E.160	Flight Data Files
93-8	E.160	FDF STS-32
93-9	E.160	Flight Data Files
93-10	E.160	Flight Data Files
93-20	E.160	FDF STS-42
93-21	E.160	FDF STS-45
93-23	E.160	FDF STS-49
93-24	E.160	FDF STS-50
93-49	E.160	FDF STS-51
93-56	E.160	Flight Data Files
93-58	E.160	FDF STS-47
93-69	E.16	Dir Corresp
	E.310	Shuttle Central Files
	E.315	Shuttle PO Corresp
93-70	E.16	Dir Corresp
	E.310	Shuttle Central Files
	E.315	Shuttle PO Corresp
93-71	E.16	Dir Corresp
	E.315	Shuttle PO Corresp
94-13	E.160	FDF STS-53
94-31	E.160	FDF STS

94-67	E.160	FDF STS-46
94-83	E.160	FDF STS-54
94-95	E.160	FDF STS-58
94-147	E.160	FDF STS-56
94-148	E.160	FDF STS-57
95-7	E.375	Orbiter ICDs
95-9	E.160	FDF STS-60
95-28	E.97	New Initiatives Library
95-61	E.160	FDF STS-61
95-62	E.160	FDF STS-62
95-63	E.160	FDF STS-59
95-73	E.160	FDF STS-65
95-88	E.160	FDF STS-51
96-3	E.192C9	Shuttle Wind Tunnel Data
96-12	E.160	FDF STS-64
96-13	E.160	FDF STS-66
96-14	E.160	FDF STS-68
96-15	E.160	FDF STS-63
96-52	E.138	JSC Phone Books
96-60	E.160	FDF STS-67
96-61	E.160	FDF STS-70
97-28	E.101S	Space Station Contracts
97AB-41	E.16	Central Corresp
	E.310	Shuttle Corresp
	E.400	Space Station Corresp
97-52	E.160	FDF STS-71
97-53	E.160	FDF STS-69
97-54	E.160	FDF STS-73
97-55	E.160	FDF STS-72
97-56	E.160	FDF STS-76
98-1	E.16A	Central Corresp
98-10	E.16A	Central Corresp
98-18	E.160	FDF STS-75
98-19	E.160	FDF STS-78
98-20	E.160	FDF STS-74
98-21	E.160	FDF STS-80
98-24	E.16A	Central Corresp
98-35	E.16A	Central Corresp
98-43	E.16A	Central Corresp
98-46	E.160	FDF STS-77
98-47	E.160	FDF STS-79
98-48	E.160	FDF STS-82
98-52	E.100	Contract files
98-57	E.160	FDF STS-84

98-62	E.160	FDF STS-81
98-63	E.160	FDF STS-83 and 94
98-70	E.16A	Central Corresp
99-6	E.16A	Central Corresp
99-17	E.160	FDF STS-85
99-18	E.16A	Central Corresp
	E.325	PRCB Corresp
99-19	E.160	FDF STS-87
99-20	E.160	FDF STS-86
99-25	E.16A	Central Corresp
99-30	E.16A	Central Corresp
00-6	E.160	FDF STS-90
00-7	E.160	FDF STS-91
00-69	E.160	FDF STS-89
00-70	E.160	FDF STS-95
02-89	E.154H10	Astronaut Office Files
7NS94-27	E.70	Mercury Source Files
7NS94-28	E.75	Gemini Source Files
7NC255-77-46	E.210	
7NC255-79-50	E.185	
7NC255-95-1	E.165	
7NC255-96-1	E.195	
NRF99-255-0001	E.159	Pre-Shuttle Flight Data Files
NRF03-255-0010	E.406	Station Tech Documents

## APPENDIX C-1

### APOLLO SPACECRAFT ASSIGNMENTS

NASA contractors produced 33 Command and Service Modules and 20 Lunar Modules. Twenty-three were used for ground testing (See Howard E. McCurdy, *Inside NASA*, Baltimore, 1993, p. 166).

2TV-1                      CSM Test vehicle used for manned tests in MSC vacuum chamber

LTA-1                      House S/C

LTA-2                      Huntsville-Vibration Tests

LTA-3                      Shaking, Vibration, Engine Test Firing

LTA-5                      Shaking, Vibration, Engine Test Firing

LTA-8                      Thermal Vacuum Testing at MSC

LTA-10                     Tulsa-Adapter fits

A004

Little Joe II

CSM002                    Launched 1-20-66

AS201

CM009                    Launched 2-26-66

AS202

S/C011                    Launched 8-25-66

AS204

S/C012                    Fire on Pad

Apollo 4

AS501

S/C017                    Launched 11-9-67, S/C017 damaged by explosion at factory

Apollo 5

AS204

LM1                      Launched 1-22-68

LM2

used for Pogo Tests, landing strut tests

Apollo 6

AS502

CM020

SM104

LTA-2R                    Launched 4-4-68

Apollo 7

AS205

CSM101	Launched 10-11-68
Apollo 8 AS503 CSM103	Launched 12-21-68
Apollo 9 AS504 CSM104 LM3	Launched 3-3-69
CSM105	Ground Test Spacecraft May 1968
Apollo 10 AS505 CSM106 LM4	Launched 5-18-69
Apollo 11 AS506 CSM107 EASEP LM 5	Launched 7-16-69
Apollo 12 AS507 CSM108 ALSEP Array A LM6	Launched 11-14-69
Apollo 13 AS508 CSM109 ALSEP Array B LM7	Launched 4-11-70
Apollo 14 AS509 CSM110 ALSEP Array C LM8	Launched 1-31-71
Apollo 15 AS510	

CSM112 ALSEP Array A-2 LM10	Launched 7-26-71
Apollo 16 AS511 CSM113 ALSEP Array D LM11	Launched 4-16-72
Apollo 17 AS512 CSM114 ALSEP Array E LM12	Launched 12-7-72
Skylab 1	Launched 5-14-73
Skylab 2 CSM116	Launched 5-25-73
Skylab 3 CSM117	Launched 7-28-73
Skylab 4 CSM118	Launched 11-16-73
ASTP SA210 CSM111	Launched 7-15-75

## APPENDIX C-2

### APOLLO LUNAR SCIENCE EXPERIMENTS PACKAGE (ALSEP) FLIGHT ASSIGNMENTS

Apollo Mission	11 (EASEP)	12 Array A	13 Array B	14 Array C	15 Array A-2	16 Array D	17 Array E
Experiments							
S-031 Passive Seismic experiment	X	X	X	X	X	X	
S-033 Active Seismic experiment		X			X	X	
S-034 Lunar Surface Magnetometer		X			X	X	
S-035 Solar Wind Experiment		X			X		
S-036 Suprathermal ion detector		X		X	X		
S-037 Heat flow experiment			X		X	X	
S-038 Charged particle lunar environment			X	X			
S-058 Cold cathode ion gauge		X		X	X		
S-059 Lunar field geology	X	X	X	X	X	X	X
S-080 Solar wind composition	X	X	X	X	X	X	
S-078 Laser ranging retroreflector	X			X	X		
M-515 Lunar dust detector		X	X	X	X		
S-198 Portable magnetometer				X		X	
S-199 Lunar gravity traverse							X
S-200 Soil mechanics				X	X	X	X
S-201 Far-ultraviolet camera/spectroscope				X			
S-202 Lunar ejecta and meteorites							X
S-203 Lunar seismic profiling							X
S-204 Surface electrical properties							X
S-205 Lunar atmospheric composition							X
S-207 Lunar surface gravimeter							X
S-229 Lunar neutron probe							X



**APPENDIX D  
HISTORY OFFICE  
SOURCE FILES ON PROJECT MERCURY**



**APPENDIX E  
HISTORY OFFICE  
SOURCE FILES ON PROJECT GEMINI**

# INDEX

## A

Abbey, George.....81  
 Aldridge, Roy C.....13  
 Algranti, Joseph.....21  
 Apollo. 1, 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 16, 26, 28,  
 30, 31, 32, 35, 37, 39, 40, 42, 43, 44, 45, 47, 48,  
 49, 51, 53, 54, 57, 58, 59, 60, 61, 70, 71, 73, 74,  
 75, 77, 79, 80, 81, 82, 85, 88, 105, 107, 108, 109,  
 110, 111, 112, 113, 116  
 Apollo Lunar Science Experiments Package 16, 28, 31,  
 42, 58, 106, 108, 111  
 Apollo-Soyuz.....1, 6, 8, 28, 30, 82  
 Armstrong, Ed A.....69, 88  
 Atlas.....5, 62, 64, 65, 66, 67

## B

Bertram, Emil P.....98  
 Bingham, James P.....48  
 Blue Books.....7  
 Bond, Aleck C.....47, 114  
 Bowman, Julian H.....6  
 Brasseaux, Hubert.....54  
 Brinkmann, J. R.....79  
 Burns, Fred.....88  
 Butler, Sherwood L.....64, 99

## C

Chamberlain, James A.....64, 65  
 Charlesworth, Clifford E.....55  
 Childs, Leo F.....59  
 Computation and Data Flo Integration Subsystem.....63  
 Crew Logs.....30

## D

Debus, Kurt H.....98  
 Dornbach, John B.....41  
 Dyna-Soar.....5

## E

Earth Resources Experiments Project 18, 31, 56, 57, 86  
 Earth Resources Lab.....33  
 Eggleston, John M.....41  
 Ellis, Wilbert E.....39  
 Elms, James C.....12  
 Emme, Eugene M.....8  
 Environmental Control Systems.....39  
 Environmental Control Systems. .3, 39, 71, 82, 90, 96,  
 102  
**Extra Vehicular Activities**.....36, 40, 65, 88

Extravehicular Equipment Branch.....35

## F

Faget, Max.....32  
 Flight Crew Support Division.....21, 68  
 Flight Hardware.....2, 21, 47, 61, 69, 97  
 Flory, Donald A.....59  
 Foss, Ted. H.....41

## G

Gemini 1, 3, 5, 6, 7, 8, 9, 14, 16, 24, 27, 28, 29, 31, 34,  
 36, 37, 47, 54, 61, 64, 65, 66, 67, 68, 69, 80, 86,  
 88, 104, 105, 106, 107, 108, 110, 119, 125  
 Gerke, P. Donald.....58  
 Gibbons, Howard.....7  
 Gilruth, Robert R.....1, 3, 8, 21, 64  
 Giuli, R. Thomas.....82  
 Glenn, John.....57, 62, 64  
 Goodman, Jerry R.....40, 113  
 Grissom, Gus.....61

## H

Hall, Thomas J.....16  
 Hammack, Jerome B.....9  
 Hjernevik, Wesley J.....11, 12  
 Hodge, John D.....9, 10  
 Holloway, Tom.....26  
 Huffstetler, William.....10  
 Hyle, C. T.....50

## J

Jackson, Bruce G.....48, 58  
 Johnson, Caldwell C.....52  
 Johnston, Richard A.....60

## K

Kenney, G. P.....56  
 King, Elbert A.....41, 59  
 Kleinknecht, Kenneth S.....61, 85  
 Koons, Fred.....88  
 Kraft, Christofer C., Jr.....27, 31  
 Kubicki, Ron W.....80

## L

Langley.....1, 2, 3, 11, 21, 24, 27, 34, 61, 89, 99, 104  
 Lee, Chester M.....82  
 Loftus, J. P.....10, 11

Low, George M.....	70, 80, 81
Lunar Exploration Program.....	9, 10
Lunar Receiving Lab.....	16, 59
Lunar Roving Vehicle.....	28, 31
Lunney, Glynn.....	82
Lunney, Glynn S.....	89

**M**

Management Analysis Office.....	15, 17
Manned Orbital Research Laboratory.....	34, 68, 106
Manned Orbiting Lab.....	5
Manned Space Flight.....	3, 5, 6, 48
Manned Space Flight Laboratory.....	3
Manned Spacecraft Center.....	1, 2, 3, 6, 7, 8, 9, 10, 12, 14, 16, 21, 23, 24, 25, 26, 27, 32, 39, 41, 45, 48, 49, 52, 54, 55, 57, 59, 60, 64, 65, 68, 70, 74, 75, 81, 85, 86, 87, 89, 99, 105, 108, 109
Mars Landing.....	37
Mathews, Charles W.....	64
McClintock, John G.....	80
Mercury.....	1, 2, 3, 5, 6, 7, 8, 9, 12, 14, 21, 24, 27, 31, 37, 60, 61, 62, 63, 64, 67, 80, 97, 98, 99, 104, 106, 107, 108, 112, 119, 124
Moseley, William C.....	48
Moser, Thomas J.....	51, 115

**N**

North, Warren.....	24
North, Warren J.....	21

**O**

Optimized Portable Life Support System.....	35
---	----

**P**

Photographs.....	7, 8, 10, 14, 24, 28, 36, 40, 44, 45, 47, 49, 51, 52, 54, 58, 59, 61, 62, 64, 66, 69, 73, 78, 79, 80, 81, 84, 97, 98, 99
Piland, Joseph V.....	12, 59, 114
Piland, Robert O.....	32, 33, 41, 57, 70
Polaris.....	5
Portable Environmental Control System.....	35
Portable Life Support System.....	36, 37, 39
Powers, John "Shorty".....	6
Prim, Jim.....	88

Project Cyclops.....	10
Purser, Paul E.....	5

**R**

Redstone.....	5, 62, 64, 98
Rice, William E.....	41, 55

**S**

Saljut.....	11
Saturn.....	5, 28
Saultz, James.....	31
Shea, Joe.....	73
Shepard, Alan.....	21
Skylab.....	1, 3, 6, 10, 12, 13, 16, 26, 28, 30, 31, 32, 39, 45, 47, 52, 55, 56, 57, 71, 81, 85, 86, 106, 107, 108, 111, 112, 116
Slayton, Donald K. "Deke".....	21
Smith, O. Glenn.....	57
Soule, Hartley A.....	99
Space Advanced Research and Technology.....	10
Space Shuttle.....	1, 3, 4, 6, 8, 10, 17, 30, 32, 40, 48, 49, 50, 51, 52, 53, 89, 90
Space Shuttle Orbiter.....	1, 40, 48, 51
Space Station.....	4, 8, 9, 14, 33, 52, 71, 85
Space Task Group.....	1, 2, 3, 61, 62, 99
Spacelab.....	11, 17, 31
Stanley, John.....	88
Stowage Lists.....	68, 69, 88

**T**

The Roundup.....	17
Thibodaux, Joseph G.....	53, 54
Tindall, Howard W.....	56
<b>Titan</b> .....	54, 65, 66, 67

**W**

Watkins, Carl W. L.....	48
Whitbeck, Philip H.....	12
White Sands.....	6, 53, 80

**Y**

Young, James C.....	50
Young, R. Wayne.....	10