

University of Houston Clear Lake

Archives and Special Collections

HSF-65

Francis Johnson Jr. Papers

[Human Space Flight Collection]

Collection Number: HSF-65

Title: Francis Johnson Jr. Papers

Dates: 1962-1970, 1960s, undated

Creator: Francis Johnson Jr.

Abstract

The Francis Johnson Jr. Papers is composed of handwritten scientific and mathematical calculations, handwritten notes, memorandums, technical reports, internal NASA notes, and miscellaneous papers, authored, created, or kept by Francis Johnson Jr. between 1962 and 1970 while working at NASA Manned Spacecraft Center in Houston, Texas. He would work during this period as an aerospace engineer in trajectory analysis in the Mission Analysis Branch (MAB) during the Apollo Program, where he calculated trajectories to and from the Moon for space travel. The collection includes a large number of published internal Manned Spacecraft Center notes authored or co-authored by Johnson, featuring his technical calculations and review of project work for the Apollo Program.

There are original copies of memos written by or to Johnson, mainly dealing with lunar trajectory calculations. There are also Johnson's handwritten research papers and calculation notes that he originally stored in binders, containing mathematical workings, graphed trajectory calculations, scientific equation workings, and other notes, used to calculate lunar trajectories for the Apollo Program missions. The collection is significant for demonstrating the process by which engineers worked through the problem of space travel and lunar trajectories for spacecraft at NASA during the 1960s.

Extent: Approximately 0.70 linear feet (2 document boxes)

Language(s): English

Repository

University of Houston-Clear Lake Archives and Special Collections, Alfred R. Neumann Library, 2700 Bay Area Blvd., Houston, TX 77058-1002

Restrictions on Access: There are no restrictions on accessing this collection.

Restrictions on Use: There are no known restrictions on using this collection.

Preferred Citation

[Item name or title], [Box Numbers], [Folder Numbers], Francis Johnson Jr. Papers, HSF-65, University of Houston-Clear Lake Archives and Special Collections, Alfred R. Neumann Library, 2700 Bay Area Blvd., Houston, TX 77058-1002

Acquisition

The collection was donated to the University of Houston-Clear Lake Archives and Special Collections by Robert Handy of Dickinson, Texas, in November 2017. Handy was a friend of Francis Johnson Jr., and donated the papers on his behalf according to available paperwork.

Processing Information

The entire collection had been stored by Francis Johnson Jr. in green fabric and black three-ring binders, with titles written on spine labels. These binders were rusting, and had mildew on them from exposure to moisture. The rust and mildew spread to the front and back pages of the papers stored in the binders. There were some dead pests and grit from rust found inside of the binders, with the processing archivist shaking all of the binders' contents in order to loosen and remove as much dead pest carcasses and other detritus. Most of the binders in Series I were arranged by Johnson in chronological order, with paper labels written in black marker taped outside or inside the binders with the year(s) represented in the binders written on them.

The binders in Series II were described by the processing archivist as being "Trajectory Analysis" calculations, as the primary work that Johnson is known to have been assigned to working on between the dates represented in these Series II binders was lunar trajectory analysis for the Apollo Program missions. The processing archivist removed all of the materials from each of the binders, and stored in the exact same order in acid-free archival folders as they were in the binders.

Processed by: Matthew M. Peek, January 2023.

Arrangement

The collection is arranged based on Francis Johnson Jr.'s original organization and notation on the original binders in which the materials were stored. The collection was divided into the following series: Series I: General NASA and Lunar Trajectory Memos and Internal Notes, and Series II: Lunar Trajectory Analysis Calculations Binders.

Biographical Note

Francis Johnson Jr. (who went by "Fran") was born on May 8, 1934, to Francis and Ebba Johnson. He grew up in West Palm Beach, Florida, in a Seventh-day Adventist Church family.

His parents sent him away for high school to a Seventh-day Adventist Church boarding school in a suburb of Chicago, Illinois. After graduating high school, Johnson attended Palm Beach Junior College in Florida. Between semesters and in the evenings while in college, he worked as a janitor and errand boy for the company Remington Rand, an early manufacturer of business machines and computers.

In 1955, Francis Johnson moved to Gainesville, Florida, after he transferred for his junior year to the University of Florida. Between his junior and senior year, he worked as a technician at the U.S. Bureau of Standards in Washington, D.C. Upon graduating from the University of Florida in 1957, Johnson began working for the General Electric Company near Cincinnati, Ohio, in their Aircraft Nuclear Propulsion (ANP) department. The ANP project was cancelled in 1961. Looking for a job, Johnson accepted a position with the young National Aeronautics and Space Administration in Hampton, Virginia.

Johnson would move sometime in the early 1960s to the NASA Manned Spacecraft Center (MSC) in coastal Houston, Texas. He would work as an aerospace engineer in trajectory analysis in the Mission Analysis Branch (MAB) [also called the Lunar Mission Analysis Branch] during the Apollo Program, where he calculated trajectories to and from the Moon for space travel. During this period in the 1960s, Johnson received his master's degree in physics from the University of Houston. Sometime in the 1970s, he would change jobs from trajectory analysis to working in earth science and remote sensing at the now Johnson Space Center. Johnson took early retirement from NASA in 1985.

He was a member of the Bay Area Unitarian Universalist Church and their choir for many years in Houston, Texas, near Webster. He never married. Francis Johnson Jr. passed away at his house in Houston on May 10, 2021.

[This entire biographical note was taken directly from Johnson's obituary published online by the Crowder Funeral Home—Webster, viewed at <https://www.crowderfuneralhome.com/obituaries/francis-johnson-jr/>]

Scope and Content

The collection is composed of handwritten scientific and mathematical calculations, handwritten notes, memorandums, technical reports, internal NASA notes, and miscellaneous papers, authored, created, or kept by Francis Johnson Jr. between 1962 and 1970 while working at NASA Manned Spacecraft Center in Houston, Texas. He would work during this period as an aerospace engineer in trajectory analysis in the Mission Analysis Branch (MAB) during the Apollo Program, where he calculated trajectories to and from the Moon for space travel. The collection includes a large number of published internal Manned Spacecraft Center notes authored or co-authored by Johnson, featuring his technical calculations and review of project work for the Apollo Program.

There are original copies of memos written by or to Johnson, mainly dealing with lunar trajectory calculations. There are also Johnson's handwritten research papers and calculation notes that he originally stored in binders, containing mathematical workings, graphed trajectory

calculations, scientific equation workings, and other notes, used to calculate lunar trajectories for the Apollo Program missions. The collection is significant for demonstrating the process by which engineers worked through the problem of space travel and lunar trajectories for spacecraft at NASA during the 1960s.

Subject Terms

Personal/Family Name

Johnson, Francis, 1934-2021

Corporate Names

Lyndon B. Johnson Space Center
United States. National Aeronautics and Space Administration

Geographic Name

Houston (Tex.)

Topical Term

Manned space flight--History
Moon--Exploration
Project Apollo (U.S.)
Space--Social aspects--History
Space travel--1960-1970
United States. National Aeronautics and Space Administration--History

Genre/Physical Characteristic

Memorandums
Notes
Publications
Technical reports

Collection Inventory

Series I: General NASA and Lunar Trajectory Memos and Internal Notes

Series I consists of memorandums, technical reports, internal NASA notes, and miscellaneous papers, authored, created, or kept by Francis Johnson Jr. between 1962 and 1970 while working at NASA Manned Spacecraft Center in Houston. He would work during this period as an aerospace engineer in trajectory analysis in the Mission Analysis Branch (MAB) during the Apollo Program, where he calculated trajectories to and from the Moon for space travel. This series includes a large number of published internal Manned Spacecraft Center notes (which

were bound like NASA technical reports) authored or co-authored by Johnson, featuring his technical calculations and review of project work for the Apollo Program.

There are also original copies of memos written by or to Johnson, mainly dealing with lunar trajectory calculations. A particularly interesting memo is from Johnson’s NASA personnel recruiting interview trip to the University of Florida, in which he details all his interviews, candidates and their qualifications, advice on planning future recruiting trips to the area, and advice on recruiting from technology businesses that were struggling to retain highly-talented personnel. The memo offers a unique insight in the means by which the Manned Spacecraft Center conducted university recruiting trips for scientific personnel from the Mercury through Apollo programs.

Box/Folder	Description	Date
1/1	Johnson’s Lunar Trajectory Memos, Reports, and Papers	1962-1964
1/2	Johnson’s Lunar Trajectory Memos and Internal MSC Notes	1965
1/3	Johnson’s Lunar Trajectory Memos and Internal MSC Notes	January-July 1966
1/4	Johnson’s Lunar Trajectory Memos and Internal MSC Notes	August-November 1966
1/5	Johnson’s General NASA and Lunar Trajectory Memos and Internal MSC Notes	1967
1/6	Johnson’s General NASA and Lunar Trajectory Memos and Internal MSC Notes	1068

Series II: Lunar Trajectory Analysis Calculations Binders

Series II consists of memorandums, technical reports, handwritten scientific and mathematical calculations, and handwritten notes, created or used by Francis Johnson Jr. between 1966 and 1970 while working at NASA Manned Spacecraft Center in Houston. He would work during this period as an aerospace engineer in trajectory analysis in the Mission Analysis Branch (MAB) during the Apollo Program, where he calculated trajectories to and from the Moon for space travel. The papers and calculation notes were originally stored in binders by Johnson, with spine labels having basic descriptions for the purposes of the materials and calculations. Since most of these materials seem to be connected to his lunar trajectory work, the folders in this series were labeled to start with “Trajectory Analysis.”

The materials contain Johnson’s mathematical workings, graphed trajectory calculations, scientific equation workings, and other notes, used to calculate lunar trajectories for the Apollo Program missions. Most of the work relates directly for planning the Apollo 1 and Apollo 7-13

missions. Although the calculations and work represented in these records exist in published form, this set of materials are the only copies of Johnson's original handwritten calculations for lunar trajectories showing the progress he made in conducting these calculations.

Box/Folder	Description	Date
1/7	Trajectory Analysis: Perigee Energy (Wpc) Partial Calculations Binder	1968
1/8	Trajectory Analysis: Energy at Perigee Calculations Binder	1968
2/1	Trajectory Analysis: Pericy State Predictions Binder	February 1966
2/2	Trajectory Analysis: Energy at Pericyynthion Calculations Binder	1968
2/3	Trajectory Analysis: Flight Time Calculations Binder	1966-1970
2/4	Trajectory Analysis: General Node Calculations Binder	1966, undated
2/5	Trajectory Analysis: Coast Arc (A4) Partial Calculations Binder	1968
2/6	Trajectory Analysis: Coast Time Partial Calculations Binder	circa 1960s
2/7	Trajectory Analysis: CL Calculations Binder	1967-1968
2/8	Trajectory Analysis: Trajectory LAWG Calculations Binder	1968