

University of Houston Clear Lake

Archives and Special Collections

HSF-60

Kenneth R. Goodwin Papers

[Human Space Flight Collection]

Collection Number: HSF-60

Title: Kenneth R. Goodwin Papers

Dates: 1965-1972

Creator: Goodwin, Kenneth R.; National Aeronautics and Space Administration; Massachusetts Institute of Technology

Abstract

The Kenneth R. Goodwin is composed of internal NASA and MIT Instrumentation Laboratory (now Charles Stark Draper Laboratory), memorandums, space guidance analysis memos, and research and procedure booklets for the operations of Project Apollo and space flight missions, used and kept by Kenneth R. Goodwin between 1965-1972. Goodwin used the materials while working as an Apollo Program test engineer executing functional tests in the hardware-software area of the optical/radar subsystems for the Apollo vehicles, including while assigned to the Lab's Field Site Office at the NASA Manned Spacecraft Center (MSC). Included in the collection are the memorandums of Howard W. "Bill" Tindall, Jr. between 1966-1970, known as Tindallgrams, documenting technical decisions for all unmanned and manned flights through Apollo 13. A large portion of the collection are the MIT Space Guidance Analysis Memos which include research topics spanning between 1965-1968 from multiple engineers that guided space travel for the Apollo Missions, including research on position and velocity uncertainties for lunar missions. The MIT Apollo Guidance, Navigation, and Control booklets cover a majority amount of the collection and are limited published books spanning between 1965-1972, they were used and kept by Goodwin during his time at NASA, covering topics such as a system operations plan for manned LM earth orbital and lunar missions using program luminary IA.

Extent: 0.95 linear foot

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 restrictions on using this collection.

Preferred Citation

[Item name or title], [Box Numbers], [Folder Numbers], Kenneth R. Goodwin Papers, HSF-60, 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 deposited with the University of Houston-Clear Lake Archives and Special Collection by Kenneth R. Goodwin in March 2016, with the donation completed in September 2022.

Processing Information

The collection has kept the original order as received with its original dates in chronological order along with its corresponding materials. The MAC Algebraic Language System folder has been moved to the end of the collection to keep the MIT Apollo Guidance, Navigation, and Control books in continuous order.

Several sets of materials originally included in the donation were removed during processing the collection in keeping with UHCL Archives processing standards. The items included oral histories transcripts from interviews held at another institution.

Processed by: Elizabeth Lira, September-October 2022

Arrangement

This collection is arranged based on by subject and purpose of the materials in chronological order.

Biographical Note

Kenneth R. Goodwin was hired by the Massachusetts Institute of Technology Instrumentation Laboratory upon graduation from Tufts University with a degree in Arte Electrica (EE) in June, 1967. He transferred to the Apollo Project/System Test Group (23T) in May 1968 after completing work on the Agena vehicle Inertial Reference Package (IRP). As an Apollo Program test engineer, he executed functional tests in the hardware-software area of the optical/radar subsystems for the Apollo vehicles. In December 1968, Goodwin was assigned to the Lab's Field Site Office at the NASA Manned Spacecraft Center (MSC) where he supported the Flight Software Branch and the Guidance & Control Division for Apollo 8 through Apollo 17, continuing with Skylab, Apollo-Soyuz and all of the Shuttle missions. In April 1978, he was appointed Laboratory's Field Site Manager at the now Johnson Space Center (JSC). He retired in July 2003 after 34 years with the Lab. Since 1977 he has been a University Adjunct Professor at

the University of Houston – Clear Lake, teaching graduate computer engineering courses most of them related to the Lab’s projects with NASA; specifically, Fault Tolerant Computing. He was awarded The Presidential Medal of Freedom as a member of the Apollo 13 Mission Operations Team and the MIT Exceptional Service Award for Apollo 14. Goodwin is a Professional Engineer registered in the State of Texas and a Life Senior Member of the IEEE.

Scope and Content

The collection is composed of internal NASA and MIT Instrumentation Laboratory (now Charles Stark Draper Laboratory), memorandums, space guidance analysis memos, and research and procedure booklets for the operations of Project Apollo and space flight missions, used and kept by Kenneth R. Goodwin between 1965-1972. Goodwin used the materials while working as an Apollo Program test engineer executing functional tests in the hardware-software area of the optical/radar subsystems for the Apollo vehicles, including while assigned to the Lab’s Field Site Office at the NASA Manned Spacecraft Center (MSC). Included in the collection are the memorandums of Howard W. “Bill” Tindall, Jr. between 1966-1970, known as Tindallgrams, documenting technical decisions for all unmanned and manned flights through Apollo 13.

A large portion of the collection are the MIT Space Guidance Analysis Memos which include research topics spanning between 1965-1968 from multiple engineers that guided space travel for the Apollo Missions, including research on position and velocity uncertainties for lunar missions. The MIT Apollo Guidance, Navigation, and Control booklets cover a majority amount of the collection and are limited published books spanning between 1965-1972, they were used and kept by Goodwin during his time at NASA, covering topics such as a system operations plan for manned LM earth orbital and lunar missions using program luminary IA.

Subject Terms

Personal/Family Name

Goodwin, Kenneth R.
Tindall, Howard W. (Howard Wilson), 1925-1995

Corporate Names

Charles Stark Draper Laboratory
Massachusetts Institute of Technology. Instrumentation Laboratory
United States. National Aeronautics and Space Administration

Geographic Name

Cambridge (Mass.)
Houston (Tex.)

Topical Term

Apollo 7 (Spacecraft)
Apollo 8 (Spacecraft)
Apollo 9 (Spacecraft)
Apollo 10 (Spacecraft)
Apollo 11 (Spacecraft)
Apollo 12 (Spacecraft)
Apollo 13 (Spacecraft)
Apollo 14 (Spacecraft)
Apollo 15 (Spacecraft)
Apollo 16 (Spacecraft)
Apollo 17 (Spacecraft)
Apollo Project (U.S.)
Manned space flight--History Project Apollo (U.S.)
Space flight--Handbooks, manuals, etc.
Space flight--History--Research
Space flight--Mathematical models
Space flight--Planning
Space flight--Research
Space flight to the moon
United States. Earth Observations Programs Division
United States. National Aeronautics and Space Administration--History

Genre/Physical Characteristic

Handbooks
Memorandums
Photographs
Technical reports

Collection Inventory

| Box/Folder | Description | Date |
|-------------------|---|-------------|
| 1/1 | Apollo "Tindallgrams" Computer Program Status Reports | 1966-1970 |
| 1/2 | MIT Space Guidance Analysis Memos | 1965 |
| 1/3 | MIT Space Guidance Analysis Memos | 1966 |
| 2/1 | MIT Space Guidance Analysis Memos | 1967 |

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| 2/2 | MIT Space Guidance Analysis Memos | 1968 |
| 2/3 | MIT Apollo Guidance and Navigation: Organization of Computation and Control in the Apollo Guidance Computer | April 1965 |
| 2/4 | MIT Apollo Guidance and Navigation: Rope Memory Module Assembly Processing Procedures | June 1965 |
| 2/5 | MIT Apollo Guidance and Navigation: Guidance System Operations Plan for Manned LM Earth Orbital and Lunar Missions Using Program Luminary | January 1968 |
| 2/6 | MIT Apollo Guidance, Navigation, and Control: Man/Machine Allocation in the Apollo Navigation, Guidance, and Control System | July 1968 |
| 2/7 | MIT Apollo Guidance and Navigation: Recovery from Transient Failures of the Apollo Guidance Computer | August 1968 |
| 2/8 | MIT Apollo Guidance, Navigation, and Control: Guidance System Operations Plan for Manned LM Earth Orbital and Lunar Missions using Program Luminary IA | February 1969 |
| 2/9 | MIT Apollo Guidance and Navigation: Apollo Navigation, Guidance, and Control Systems – A Progress Report | April 1969 |
| 2/10 | MIT Apollo Guidance and Navigation: Apollo Guidance and Control System Flight Experience | June 1969 |
| 3/1 | MIT Apollo Guidance and Navigation: Operations and Functions of the Apollo Guidance Computer During Rendezvous | November 1969 |
| 3/2 | MIT Apollo Guidance and Navigation: The Minimum-Time Thrust-Vector Control Law in the Apollo Lunar-Module Autopilot | December 1969 |
| 3/3 | MIT Apollo Guidance, Navigation, and Control: A Comprehensive Digital Simulation for the Verification of Apollo Flight Software | January 1970 |
| 3/4 | MIT Apollo Guidance, Navigation, and Control: Man-Machine Design for the Apollo Guidance, Navigation, and Control System – Revisited: Subtitle – Apollo, A Transition in the Art of Piloting a Vehicle | January 1970 |

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| 3/5 | MIT Apollo Guidance, Navigation, and Control: Apollo Guidance and Navigation Documentation Handbook and Plan | August 1970 |
| 3/6 | MIT Apollo Guidance, Navigation, and Control: Lunar Mission Navigation Performance of the Apollo Spacecraft Guidance and Navigation Systems | September 1970 |
| 3/7 | MIT Apollo Guidance, Navigation, and Control: Reliability History of the Apollo Guidance Computer | January 1972 |
| 3/8 | MIT Apollo Guidance, Navigation, and Control: MIT's Role in Project Apollo Final Report on Contracts – Volume III Computer Subsystem | August 1972 |
| 3/9 | The MAC Algebraic Language System | November 1970 |