University of Houston Clear Lake
Archives and Special Collections

HSF-71
Charles W. Yodzis Papers

[Human Space Flight Collection]

Collection Number: **HSF-71**

Title: Charles W. Yodzis Papers

Dates: 1957-1991, 1994, undated

Creator: Charles W. Yodzis; National Aeronautics and Space Administration; and various corporations.

Abstract

The Charles W. Yodzis Papers is composed of correspondence, memorandums, organizational charts, handbooks, manuals, technical reports, technical drawings, handwritten research and calculations, engineering performance studies, general propulsion studies, research files, notes, scientific studies, presentation slides, staff lists, photographs, 35mm slides, directories, magazine issues, and miscellaneous materials, created, used, or collected by Charles W. Yodzis from 1957 to 1994. Yodzis served as the Chief of the Primary Propulsion Branch of the Propulsion and Power Division at NASA Johnson Space Center from 1964 through his retirement.

Most of the materials were used by Yodzis in his research and design for the engine systems for the Apollo Command Service Module and Lunar Module, and for the Space Shuttle Orbiter—for which he and his team were primarily responsible for developing. The collection consists of materials stored in Yodzis' original office subject and research files by project, purpose, engine type, and mission names. The collection is unique in that there is a large amount of Yodzis' original handwritten scientific calculations and notes on all aspects of the development of primary propulsion systems for spacecraft.

Extent: 4.2 linear feet

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

A number of materials in this collection was produced for NASA by contractors on work for-hire contracts. Many of the contractors copyrighted or patented the information or designs or content included in the publications in this collection. As such, the University of Houston-Clear Lake Archives and Special Collections does not own the copyright to all the materials in this collection. Materials created by government agencies such as NASA are public use; but materials created by private organizations other than NASA retain their copyright, and the copyright remains with the creator and organization, under Title 17 of the U.S. Copyright Law. Researchers are responsible for obtaining permission from the copyright holder(s) to use materials beyond the "fair use" clause of the U.S. Copyright Law.

Some of the technical and scientific information in this collection may fall under the International Traffic in Arms Regulations (ITAR) of the United States government. As such, it cannot be shared online, digitally, or in hardcopy format with individuals residing in, citizens of, or representatives of the countries deemed as being restricted for U.S. citizens to share such information. Researchers interested in publication of the technical and scientific information are required to consult the appropriate NASA officials prior to doing so; otherwise, researchers who do not receive permission from NASA may face federal prosecution for breaking ITAR regulations.

Preferred Citation

[Item name or title], [Box Numbers], [Folder Numbers], Charles W. Yodzis Papers, HSF-71, 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 Kathleen Yodzis Schuller (Charles Yodzis' daughter) of Friendswood, Texas, in February 2019.

Processing Information

The collection was received from the donor in 14 sealed U-Haul shipping boxes. The materials were stored in Charles Yodzis' original office file folders with original headings, many in hanging files holding multiple individual folders. Yodzis had organized his materials according to the project name, with subfolders based on the steps or purposes of research materials for the various NASA projects, various contractors' names and work, and various engines' types. The folders were left in their exact organization of documents as used by Yodzis. Since the materials in the folders had not been sorted since Yodzis used them, there was a lot of outdated materials, unnecessary materials, and duplicate materials. These materials were removed from the collection in keeping with the UHCL Archives' collection policy procedures.

The collection materials were covered in pest waste, specifically spider, cockroach, and silverfish waste, and some dead pests were found within the materials. Since the folders were original, there was a lot of waste buildup within the folders that the processing archivist had to shake loose from the folders and the individual documents. Many of the documents had the gritty pest waste on the surface, which was removed as best as possible during the processing to make the collection safe for handling by researchers and Archives staff.

The processing archivist reviewed the materials in each folder, as some folder labels did not fully reflect the contents of the folders and in some cases the labels were missing. Where materials could be retained in their own folders when transferred to acid-free archival folders, this was accomplished. In many cases, there was not enough material per original folder to justify using a folder just to preserve the one-to-one original folder to new archival folder storage and labeling. Such materials were grouped with other materials on the same topics, projects, or with the same purposes, and a new folder title was generated by the processing archivist. A number of rusting bindings and fasteners were removed from the materials, as were three-ring binders, to allow for better long-term preservation and better storage. Acid-free plastic archival clips were used to replace rusting metal clips where possible.

Processed by: Matthew M. Peek, April-May 2023.

Arrangement

The collection is arranged in folders and boxes based on the NASA program, purpose of, or source of the materials based on Yodzis' original organization. The collection is organized into the following seven series: Series I: Yodsiz' Personal MSC; Series II: Apollo Program Propulsion Materials; Series III: Space Shuttle Propulsion Materials; Series IV: General Space Propulsion Materials; Series V: Aerospace Corporations' Propulsion Materials; Series VI: TRW Space Log Magazine Issues; and Series VII: Yodzis' Miscellaneous Materials.

Biographical Note

Charles Walter Yodzis was born on June 8, 1925, in Mount Carmel, Pennsylvania, to John and Magdalina Nowasatko Yodzis. Charles' birth name was Casimir Yodzis, but he anglicized his first name at some point. Charles Yodzis grew up in Mount Carmel, and graduated from the local high school in 1943. With the United States' entrance into World War II, Yodzis enlisted in the U.S. Navy sometime after graduation, and served in the Navy as an aircraft machinist mate servicing reciprocating aircraft engines. He was honorably discharged from the U.S. Navy in 1946. After the war, Yodzis attended Penn State University, graduating with a degree in engineering.

After graduation, Charles Yodzis would work for Reaction Motors Company in New Jersey on the liquid-fueled engines that powered the supersonic Bell X-1 Sky Rocket aircraft and the hypersonic North American X-15 aircraft. Yodzis married Irene Markovich in 1953. He went to work with the National Advisory Council for Aeronautics (NACA) at Langley Field, Virginia, on June 25, 1957. He would join the Space Task Group with NACA becoming the National

Aeronautics and Space Administration (NASA); and by September of 1960 Yodzis was working in the Mechanical Systems Section of the Systems Engineering Branch.

After the Space Task Group relocated to the Manned Spacecraft Center in coastal Houston, Texas, Yodzis was named the head of the Propulsion Section by early 1963. He would become the chief of the Primary Propulsion Branch under the Propulsion and Power Division in January 1964, and served in that capacity through the 1970s. The Primary Propulsion Branch in the 1960s was responsible for the propulsion efforts at MSC that were not delegated to a specific project office; they were responsible for research, development, and testing of all liquid, sold, and nuclear propulsion systems. From July 21-24, 1964, Yodzis served as the chairman a special committee established by the director of the NASA Manned Spacecraft Center conducting the first "Operational Readiness Inspection" of a major Manned Spacecraft Center test facility at the Propulsion Systems Development Facility at the NASA White Sands Operations in Las Cruces, New Mexico.

Yodzis and his team were responsible for designing the Saturn V third stage engine, the Apollo Command Service Module engine, the Lunar Module descent and ascent engines. His branch designed the engines for all nine Apollo lunar missions. Yodzis and his team also planned and designed the liquid engines used to power the Space Shuttle orbiter for all of the Shuttle missions. Yodzis' work contributed significantly for the propulsion system designs for the Mercury Program, the Gemini Program, the Apollo Program, and the Space Shuttle Program.

It is unclear when Yodzis retired from NASA Johnson Space Center [but it was not until at least the 1980s]. He had moved his family to Friendswood, Texas, in 1966, would go into work in the real estate field with O'Farrell Realty in Friendswood. Charles W. Yodzis died on December 21, 2010, and was buried in Forest Park East Cemetery in Webster, Texas

[A large amount of this biographical note was taken directly from Yodzis' obituary, viewed online at https://www.chron.com/neighborhood/bayarea/news/article/Charles-Yodzis-9480078.php]

Scope and Content

The collection is composed of correspondence, memorandums, organizational charts, handbooks, manuals, technical reports, technical drawings, handwritten research and calculations, engineering performance studies, general propulsion studies, research files, notes, scientific studies, presentation slides, staff lists, photographs, 35mm slides, directories, magazine issues, and miscellaneous materials, created, used, or collected by Charles W. Yodzis from 1957 to 1994. Yodzis served as the Chief of the Primary Propulsion Branch of the Propulsion and Power Division at NASA Johnson Space Center from 1964 through his retirement.

Most of the materials were used by Yodzis in his research and design for the engine systems for the Apollo Command Service Module and Lunar Module, and for the Space Shuttle Orbiter—for which he and his team were primarily responsible for developing. The collection consists of materials stored in Yodzis' original office subject and research files by project, purpose, engine type, and mission names. The collection is unique in that there is a large amount of Yodzis'

original handwritten scientific calculations and notes on all aspects of the development of primary propulsion systems for spacecraft.

The collection is arranged in folders and boxes based on the NASA program, purpose of, or source of the materials based on Yodzis' original organization. The collection is organized into the following seven series: Series I: Yodsiz' Personal MSC; Series II: Apollo Program Propulsion Materials; Series III: Space Shuttle Propulsion Materials; Series IV: General Space Propulsion Materials; Series V: Aerospace Corporations' Propulsion Materials; Series VI: TRW Space Log Magazine Issues; and Series VII: Yodzis' Miscellaneous Materials.

Subject Terms

Personal/Family Name

Yodzis, Casimir
Yodzis, Charles W. (Charles Walter)

Corporate Names

Grumman Aircraft Engineering Corporation
Lockheed Martin
Lyndon B. Johnson Space Center
Rockwell International. Space Division
United States. National Aeronautics and Space Administration

Geographic Name

Houston (Tex.)

Topical Term

Manned space flight--History
Manned Spacecraft Center (U.S.)
Project Apollo (U.S.)
Space shuttles--United States--History
Space--Social aspects--History
United States. National Aeronautics and Space Administration--History

Genre/Physical Characteristic

Booklets
Brochure
Correspondence
Handbooks
Memorandums
Organization charts

Operating manuals
Personnel records
Photographs
Publications
Research
Technical drawings
Technical manuals
Technical reports

Collection Inventory

Series I: Yodsiz' Personal MSC

Series I consists of correspondence, memorandums, organizational charts, notes, presentation slides, scientific studies, staff lists, and miscellaneous materials, created, used, or collected by Charles W. Yodzis from 1959 to 1990. Yodzis served as an engineer in the Mechanical Systems Section, Systems Engineering Branch, from 1962-1964; and he served as the Chief of the Primary Propulsion Branch of the Propulsion and Power Division at NASA Johnson Space Center from 1964 through his retirement. Most of the materials were used or created by Yodzis in his role as a manager for a NASA branch in the 1960s and 1970s. Some of the materials document his security clearances and relocation information for the move of NASA's Space Task Group from Langley Field to coastal Houston, Texas, between 1960 and 1962.

The most significant set of materials in this series are organizational and staff charts for the members of the Primary Propulsion Branch in the 1960s and 1970s. There are also two original Primary Propulsion Branch employee contact lists from 1974 and 1976 created by or for Yodzis, which not only list the male employees and their addresses, but also the names of the employees' spouses. These lists are some of the only records listing the full names engineeers' spouses from this time period. There is also a file with Yodzis' original notes and records related to NASA's 1990s Mars/Moon Common Lander Study.

Box/Folder	Description	Date
1/1	Charles Yodzis' NASA and Manned Spacecraft Center Security Clearance Memos	March 1960, January 1962
1/2	NASA Space Task Group Organization and Relocation Memos	1959-1960
1/3	Primary Propulsion Branch and Division Organizational Charts and Employee Assignments	1962-1963, 1965-1972, 1974-1976, undated
1/4	Manned Spacecraft Center Organizational Charts	1961, 1964, 1969
1/5	Yodzis' Memo on Breakdown of Contracting Procedure	February 20, 1963

	For Head of Manned Spacecraft Center Flight Vehicle Integration Branch	
1/6	Yodzis' Personal Typed JSC Primary Propulsion Branch Employee Contact Lists	December 1974, July 1976
1/7	Yodzis' Original JSC Primary Propulsion Branch Presentation Text and Charts	[circa 1960s]
1/8	Miscellaneous Primary Propulsion Branch Memos	1969, 1972, 1974, 1977
1/9	Yodzis' Original Notes and Documents for Mars/Moon Common Lander Study	1989-1990, undated
1/10	Yodzis' Power Generating Systems Study File	Undated
1/11	Miscellaneous Yodzis' Calculations and Notes	Undated

Series II: Apollo Program Propulsion Materials

Series III consists of correspondence, memorandums, manuals, technical reports, technical drawings, handwritten research and calculations, engineering performance studies, general propulsion studies, research files, notes, scientific studies, and miscellaneous materials, created, used, or collected by Charles W. Yodzis from 1957 to 1974. Yodzis served as the Chief of the Primary Propulsion Branch of the Propulsion and Power Division at NASA Johnson Space Center starting in 1964 through the entire Apollo Program. Most of the materials in this series were used by Yodzis in his research and design for the engine systems for the Apollo Command Service Module and Lunar Module, as well as for the rocket systems used to launch the Apollo spacecraft. Many of the files were research files that he referenced throughout the development of Apollo propulsion systems.

Yodzis had organized these materials according to the project name, with subfolders based on the steps or purposes of research materials for the various NASA projects, various contractors' names and work, and various engines' types. This structure was largely retained in the folders in this series. When the materials in a folder were largely created by Yodzis, such as having a lot of handwritten notes and calculations, the folder titles began with "Yodzis." These materials are a complete set of items documenting the full development of the propulsion systems used for the whole Apollo Program.

Box/Folder	**Description**	**Date**
1/12	Yodzis' Apollo Special Engine Studies File	1957-1958
1/13	Apollo Program Engines Testing Records and Papers File	1960, 1964-1967

1/14	Apollo Primary Propulsion Systems Performance Records And Calculations File	1961-1964, 1966, 1969, 1976, undated
1/15	Apollo Service Module Engine Propellants Performance File	1962-1963, 1967, undated
1/16	Apollo LM Ascent Engine Combustion Stability Records File	1962, 1967-1968, 1970-1972, 1976
1/17	Liquid Propellant for Apollo Program Research and Calculations File	1963, 1965, undated
1/18	Miscellaneous Apollo Power Systems Meetings Memos	1963, 1965
1/19	Apollo Propellant Memos and Calculations File	1963, 1967, undated
1/20	Apollo Program Dissolved Helium in Propellants Records File	1963, 1967
1/21	Apollo Engine Injectors Performance Analysis Records File	1964-1965, 1969, undated
1/22	Lunar Module Engines Stability Records File	1964-1967, undated
1/23	Apollo Spacecraft Propulsion Systems Decontamination Procedures Records File	1964-1965, 1969, undated
1/24	Apollo Program Propulsion Tanks Structures File	1965-1968, 1970 undated
1/25	Apollo GFE Engine Records File	1965, 1967, undated
1/26	Yodzis' Apollo Propulsion Propellant and Systems Records and Notes File	1966-1967
1/27	Miscellaneous Apollo Propellant Systems Records File	1966-1968, undated
1/28	Apollo Systems: Reduction of Tank Pressure File	1966-1967, undated
1/29	Apollo Service Module Stability Bomb Test Program Records	July-October 1968, undated
1/30	Apollo Propellant Leakage Problems File	1968-1970, undated
1/31	Apollo Propulsion System Cleanliness Records and	1969-1970, undated

	Research Notes File	
1/32	Apollo Engines Leakage, Valve, and Decontamination File	1969, 1971-1972
1/33	Apollo Propellant Gauging Systems Records File	1971, 1974, undated
1/34	Thiokol Chemical Corporation Apollo Program Propulsion Design Study and Leakage Issues File	1961, undated
1/35	Thiokol Chemical Corporation Radiation Cooled Pulse Rocket Performance and Other Engine File	1961, undated
1/36	Manned Spacecraft Center Apollo Program Specification For Creating Service Propulsion System File	1962, undated
1/37	Lockheed Paper: Thermal Analysis of the Apollo Service Module Propulsion System	May 1966
1/38	Apollo Service Propulsion System Block II Engine Performance Memos	June 1967
1/39	Grumman Aircraft Engineering General Specifications For Surface and LM Fluids Cleanliness	December 1967, September 1971
1/40	Apollo Spacecraft Engine Specific Impulse Report	May 1968, July 1968
1/41	NASA Manned Spacecraft Center Request for Proposal On Intermediate Size Lunar Landing Spacecraft Phase B	January 20, 1969
1/42	Manned Spacecraft Center RCS Performance During the Apollo 8 Mission Report	February 11, 1969
1/43	Grumman Aircraft Apollo Contract Monthly Financial Management Report	February 1969
1/44	Yodzis' Handwritten Notes and Calculations on Apollo Propulsion Systems and Propellants	[circa 1960s]
2/1	Apollo Program: Manufacturer Aeronautical Engines Data File	[circa 1960s]
2/2	Miscellaneous Apollo Program Service Propulsion System Flight Reports	1960s, 1970
2/3	Manned Spacecraft Center Employee Essays on Past	1970, undated

	Apollo Programs on Redundancies	
2/4	Manned Spacecraft Center Command and Service Module/Lunar Module Launch Operations Fluid Servicing Specification	September 24, 1971
2/5	Apollo Engines Components Memos	1971-1972
2/6	Manned Spacecraft Center Technical Note: Apollo Experience Report Descent Propulsion Subsystem	January 1972
2/7	Yodzis' Apollo Ascent Propulsion Subsystem Cost Data Memos	June-July 1972
2/8	Apollo Lunar Lander Cone Design Information and Notes	Undated

Series III: Space Shuttle Propulsion Materials

Series III consists of correspondence, memorandums, manuals, technical reports, technical drawings, handwritten research and calculations, engineering performance studies, general propulsion studies, research files, notes, and miscellaneous materials, created, used, or collected by Charles W. Yodzis from 1967 to 1980. Yodzis served as the Chief of the Primary Propulsion Branch of the Propulsion and Power Division at NASA Johnson Space Center from 1964 through his retirement. Most of the materials in this series were used by Yodzis in his research and design for the engine systems for the Space Shuttle orbiter during the initial NASA planning and testing stages for the orbiter. Many of the files were research files that he referenced throughout the development of Shuttle orbiter propulsion systems.

Yodzis had organized these materials according to the project name, with subfolders based on the steps or purposes of research materials for the various NASA projects, various contractors' names and work, and various engines' types. This structure was largely retained in the folders in this series. When the materials in a folder were largely created by Yodzis, such as having a lot of handwritten notes and calculations, the folder titles began with "Yodzis." These materials are a complete set of items documenting the full development of the propulsion systems used for the Space Shuttle Program. Some of the materials that are unique in this series are original propellants and propulsion testing records. Yodzis and NASA explored a wide variety of propellants for possible use in the Shuttle, and the materials here go into great detail on the reasons specific propellants and engine designs were not used.

Box/Folder	**Description**	**Date**
2/9	Orbital Maneuvering System A-50 and MMH Propellant Systems Comparisons Memos	1967, 1973-1974
2/10	Alternate OMS Shuttle Concepts Records File	1969-1972

2/11	Shuttle OMS-E Records File	1970, 1973-1979, undated
2/12	Orbital Maneuvering System Memos	1972-1979
2/13	Pump-Fed Orbit Orbital Maneuvering Engine (OME) Records File	1975-1977
2/14	Orbiter Maneuvering Subsystem Components Records and Design Materials	1975-1977
2/15	Orbital Maneuvering System Gaging System and Performance Memos	1975-1977
2/16	Miscellaneous Shuttle Orbital Maneuvering System Propellants and Tanks Records File	1975-1978, undated
2/17	Memos on Testing of MBS/RCS Acquisition Screens at Kennedy Space Center	March 1977
2/18	JSC Investigation of OMS Blowdown Capability Memo	June 1977
2/19	Space Shuttle Booster Engine Memos, Notes, and Research File	1969-1972, 1974-1976, 1978-1979
2/20	Space Shuttle Engine Combustion Stability Records	1970
2/21	Orbiter DC-3 Shuttle Boost Engine Characteristics Memo	April 1970, undated
2/22	Orbiter Hydraulic Power and Fluids System and Selections Memo and Working Paper	May 1971, November 1972
2/23	NASA Space Shuttle Program Working Paper: Auxiliary Power Units and Hydraulic Power Systems and Their Application to the Space Shuttle	May 1971
2/24	Original Space Shuttle Pressure-Fed Booster Design Philosophy File	January 1972
2/25	Warren Brasher's Memo and Charts on Space Shuttle Main Engine Combustion Stability Tests	November 1972
2/26	Shuttle Mixed-Mode Propulsion Systems Records File	1973-1975
2/27	Shuttle Orbiter Propulsion Advanced Studies Memos and Reports	1973, 1975-1976

2/28	Shuttle Orbital Alternate Propellants Studies and Notes	1973-1975, 1979
2/29	Propellant TUG Configurations for Space Shuttle	1974, undated
2/30	Rockwell International Space Shuttle Main Propulsion System Drawing and Schematic	1974, undated
2/31	Space Shuttle Main Engine Turbopump Information	1974, 1977-1978
2/32	Orbiter Main Propulsion Subsystem Component Records	1974, 1979, undated
2/33	Warren Brasher Presentation Slides: Space Shuttle Main Engine Design and Operation Characteristics	March 26, 1975
2/34	Yodzis' Notes, Memos, and Records from the Space Shuttle Ascent Flight System Integration Group	1975, undated
2/35	Shuttle Orbiter Main Propulsion Subsystem Records File	1976, 1978
2/36	NASA Shuttle Orbital Maneuvering System Engine Contract and Cost Records File	1978-1979, undated
2/37	Shuttle Orbital Maneuvering System (OMS) Engines Testing Records File	1978-1980
2/38	United Technologies: Orbiter Fuel Cell Power Plant Component Familiarization Manual	October 1979
2/39	United Technologies: Orbiter Fuel Cell Power Plant Review and Training Course	October 1979
2/40	Shuttle J-2S Engines File	Undated

Series IV: General Space Propulsion Materials

Series IV consists of scientific studies, memorandums, technical reports, technical drawings, handwritten research and calculations, engineering performance studies, general propulsion studies, research files, notes, scientific studies, and miscellaneous materials, created, used, or collected by Charles W. Yodzis from 1959 to 1980—with the majority dating to the 1960s and early 1970s. Yodzis served as the Chief of the Primary Propulsion Branch of the Propulsion and Power Division at NASA Johnson Space Center from 1964 through his retirement. Most of the materials in this series were used by Yodzis in his research and design for the various chemical propellants and engine systems he used or referenced while working at NASA.

Yodzis had organized these materials according to the project name, with subfolders based on the steps or purposes of research materials for the various NASA projects, various contractors' names and work, and various engines' types. This structure was largely retained in the folders in this series. When the materials in a folder were largely created by Yodzis, such as having a lot of handwritten notes and calculations, the folder titles began with "Yodzis." Yodzis and NASA explored a wide variety of propellants for possible use in various NASA programs' engines. The great majority of the materials in this series relate to propellant tests and studies.

Box/Folder	**Description**	**Date**
3/1	Manned Spacecraft Center Flourine Working Group Cryogenic Fluids for Space Propulsion Systems Research Materials	1959-1960, 1967, undated
3/2	Yodzis' Original Handwritten and Draft Drawings for Tiger Solid Booster Study	1959-1961
3/3	Propulsion Propellant Performance Analysis File	1959, 1962-1963, 1971, undated
3/4	Space Vehicle Cryogenic Fluid Tank Insulation Corporate Papers	1960, undated
3/5	Liquid Nitrogen and Hydrogen Storage and Injection for Rocket Engines Reports	1960-1961
3/6	Pratt and Whitney Aircraft Correspondence and Records on Engines and Propellants	1960-1964
3/7	Thickol Chemical Corporation Advanced Technology for Liquid Propellant Space Engines: Vol. 1, The Case for Improved Liquid Propellant Combinations Report	January 1961
3/8	Nitrogen Tetroxide Propellant File	1961, 1963, 1966-1967, 1975
3/9	Manned Spacecraft Center Working Group on Use of Flourine in Rocket Stages for Future Missions Yodzis' Handwritten Notes and Information File	1962, undated
3/10	Low Frequency Stability of Liquid Rocket Engines (POGO Problem)	1964, 1968-1969
3/11	Pratt and Whitney Aircraft: Preliminary Liquid Rocket Engine Specifications	October 1965, April 1967

3/12	Atlantic Research Corporation Letter Report on Gemini 25-lb. Thrust Chamber Assembly Propellant Valves Leakage	January 1966
3/13	Manned Spacecraft Center Internal Note: Evaluation of Frothing Characteristics of Aerozine-50 and Monomethylhydrazine	November 1966, undated
3/14	Fuel Tank Pressure Vessel Factors Materials	1966
3/15	Propulsion Systems Instrumentation and Data Recording Memos	1966-1967, 1977
3/16	Regenerative Cooled Liquid Rocket Engine File	1966, 1977, 1980, undated
3/17	Manned Spacecraft Center Internal Note: Study of Helium Gas Evolution from Saturated Aerozine 50 and Monomethylhydrazine Propellants	January 21, 1967
3/18	Manned Spacecraft Center Specification: Spacecraft Chemical and Fluid Cleanliness Requirements	1967, 1969
3/19	Fluid Cleanliness, Fluid Servicing, and Leakage Measurements for Propulsion File	1967-1969, 1972-1973, 1979, undated
3/20	Transtage Mixture Ratio Shift and Flow Decay Information File	1968-1969, 1977, undated
3/21	Chamber-Injector Compatibility Program File	1969, 1971, undated
3/22	Manned Spacecraft Center NASA General Working Paper: Spacecraft Cryogenic Gas Storage Systems	[circa 1960s]
3/23	Jim Nestlerode Paper and Presentation on J-2 and J-2S Engines Combustion Instability	1970
3/24	Gas Generator Combustion Engines	1970, undated
3/25	Cryogenic Propulsion Stage for the Solar Power Satellite Document	April 1976
3/26	JSC Employee Angelica Perez Texas A&M Course Paper: Rocket Engines of U.S. Space Program Launch Vehicles	April 1979

3/27	Miscellaneous Rocket Propulsion and Engine Systems Information	Undated
3/28	Yodzis' Propellant Systems: Tanks and Propellants Notes and Work Assignments File	1959
3/29	Yodzis' Notes on Engine Water Injection Study	Undated

Series V: Aerospace Corporations' Propulsion Materials

Series V consists of correspondence, memorandums, handbooks, manuals, technical reports, technical drawings, handwritten research and calculations, engineering performance studies, general propulsion studies, research files, notes, scientific studies, and miscellaneous materials, produced by various aerospace companies who were contractors with NASA between 1958 and the 1980s. Many of these materials were sent by the companies to Charles W. Yodzis in his role as the Chief of the Primary Propulsion Branch of the Propulsion and Power Division at NASA Johnson Space Center from 1964 through his retirement. Some of the folders in this series consist of Yodzis' original handwritten notes on aspects of the materials sent to him by these contractors. Most of the items relate to the corporations' propulsion engines and propellants for potential use by NASA. The materials are arranged in this series in alphabetical order by the name of the company, then in chronological order by individual company name.

Box/Folder	**Description**	**Date**
3/30	Aerojet Liquid Rocket Company Delta and Transtage Engines File	1970, 1970s
3/31	Aerojet Liquid Rocket Company Rockets and Launch Systems Reference Materials File	1982, 1987, 1994, undated
3/32	Aerojet Tech Systems LOX/CH4 Propellant Reviews	June 17, 1987
3/33	Aerojet Liquid Rocket Company Rocket: Liquid Rocket Engines	Undated
3/34	Aerospike Engine Records and Yodzis' Notes	1969, undated
3/35	Bell Aerosystems: Launch Area Servicing of a Flourine/ Hydrogen Upper Stage Report	December 30, 1960
3/36	Bell Aerosystems Company Memo on Engine Throttling Injectors	June 6, 1962
3/37	Bell Aerosystems: Propellant Performance Handbook, Vol. 1	August 1965

3/38	Eagle Engineering: A Review of Man-Rating in Past and Current Manned Space Flight Programs by Aleck C. Bond	May 20, 1988
3/39	Eagle Engineering Library Copy: Preliminary Space Station Freedom Technical Overview Manual (Copy)	October 1988
3/40	General Electric Company: NASA Plug Nozzle Handbook	August 1965
3/41	Kidde and Company Missile Gas and Fuel Systems Reports	November 1959, May 1960
3/42	Glenn L. Martin Company: Tables of Mach Number Functions Book	[circa 1960s]
3/43	Martin Marietta Report: Gaging and Leak Detection Systems, Apollo Applications Program CSM Modification Study	June 6, 1968
3/44	Martin Marietta Orbital Transfer Vehicle Concept Definition and System Analysis Study (Midterm Review)	March 1985
4/1	Martin Marietta Shuttle Transtage Mixture Ratio Data and History	May 1977
4/2	Martin Marietta Shuttle Preliminary Tank Material Selection Summary Presentation Slides (Copy)	Undated
4/3	Norman Engineering Company High Temperature Hot Water Vacuum Systems Information	March 1966
4/4	Rocketdyne Report (Copy): LM Ascent Engine Alternate Injector Program—Monthly Cost, Progress Report for November 1967	November 1967
4/5	Rocketdyne and TRW Systems Group Brochures	1959, 1968-1969, undated
4/6	Rockwell International Integrated Main Propulsion System, Final Report	July 1985
4/7	Star Rocket Motors Materials File	1986-1987
4/8	TRW Systems Propellant Gauging System Presentation Slides	April 1966

4/9	TRW Military Space Systems Division Adaptable Space Propulsion System Study Mid-Term Review	September 25, 1987
4/10	Vickers Inc. Power Systems for Missiles Handouts and Information	1959, undated
4/11	Miscellaneous Corporate and Military Rocket Engines and Aircraft Booklets	1958, 1964, undated

Series VI: *TRW Space Log* Magazine Issues

Series VI consists of set of original TRW Systems Group corporate magazines documenting advances in human space flight technology and TRW's own contributions to the United States' space race. The magazine was published starting in 1960 and continued through the 1990s. Although there are many issues of this magazine available scattered across the country, this set of issues from the summer of 1964 to 1977 is the one of the most complete sets of the magazine issues in the United States. These issues were sent to and kept by Charles W. Yodzis throughout his NASA career, with these issues being the ones that were retained by him or survived.

Box/Folder	**Description**	**Date**
4/12	*TRW Space Log* Magazine Issues	1960, Summer 1964-Spring 1965
5/1	*TRW Space Log* Magazine Issues	Summer 1965-Summer 1966
5/2	*TRW Space Log* Magazine Issues	Winter 1966-Fall 1967
5/3	*TRW Space Log* Magazine Issues	Winter 1967-Fall 1968
5/4	*TRW Space Log* Magazine Issues	Winter 1968-Fall 1969
5/5	*TRW Space Log* Magazine Issues	Winter 1969-1972
6/1	*TRW Space Log* Magazine Issues	1973-1977

Series VII: Yodzis' Miscellaneous Materials

Series VII consists of memorandums, research and calculations, notes, a scientific study, staff lists, photographs, 35mm slides, directories, and miscellaneous materials, created, used, or collected by Charles W. Yodzis from 1957 to 1991 that did not fit within other series in this

collection. Of interest are a set of original White Sands Missile Range photographs used by Yodzis when he served as the chairman a special committee established by the director of the NASA Manned Spacecraft Center conducting the first "Operational Readiness Inspection" of a major Manned Spacecraft Center test facility at the Propulsion Systems Development Facility at the NASA White Sands Operations in Las Cruces, New Mexico, in July 1964. There is a set of 35mm slides used by Yodzis for an unidentified propulsion presentation, believed to have been given at NASA. One rare item is an Eagle Engineering Houston Division staff list from 1991, which is unknown to exist outside of the UHCL Archives' collections from other Eagle Engineering staff.

Box/Folder	**Description**	**Date**
6/2	Miscellaneous Aircraft Engines and Airbreathing Jet Engines Materials File	1957, 1971, 1985, undated
6/3	Original Langley Field Document: A Central Recording and Computing Facility for Transient Type Data	November 5, 1959
6/4	Lewis Research Center Retrograde Rocket Misalignment Tests Records	1959-1960
6/5	Langley Manned Spacecraft Center Memo: Photographic Documentation of Manned Spacecraft Center Programs	March 26, 1962
6/6	White Sands Missile Range Photographs	1963-1964
6/7	Miscellaneous NASA Manned Spacecraft Center Propulsion Systems Injector Engines 35mm Slides	1963-1964, undated
6/8	White Sands Test Facility and Wiancko Trip for APS PAI Terst Rig Inspection	January 1966, July 1966, undated
6/9	CPIA Publication: Special Considerations for Combustion Instability Instrumentation and Data Representation	June 1968
6/10	Johnson Space Center Telephone Directories	1971, 1979, 1987
6/11	Yodzis' Handwritten Notes on Apollo Engine Burn Time During Missions Measurements	November 15, 1978
6/12	JSC Launch and Orbital Flight Experience of ELV's (Expendable Launch Vehicles) and the STS (Space Transportation System) Study	July 1985
6/13	Eagle Engineering Houston Division Staff List	January 21, 1991