

**SHUTTLE SERIES****EARLY SHUTTLE DEVELOPMENT STEVE ANDRICH PAPERS**

This subseries consists of documents pertaining to early shuttle development and design from 1969 to 1972, the majority dating from 1970. Early shuttle conceptual design data, as well as numerous correspondence, reports, and diagrams, are an integral part of the collection. The provenance of this material is Steve Andrich, who worked at JSC from 1963 to 1990. Starting in the Special Projects division of the Gemini Program Office, he moved to the Spacecraft Design Office in early 1967 and was involved in early design and development of the space shuttle. From 1975 to 1986 he was assigned to the Orbiter Systems Operation Office, and from 1986 until his retirement worked in the Flight Requirements Office of the STS Orbiter and GFE Projects Office. A letter from Mr. Andrich describing the contents of this collection has been placed in the first folder. The next two folders contain a huge volume of information concerning early shuttle design that Mr. Andrich has simply named Book #1 and Book #2, with the appropriate dates included. From this point forward, the collection has been arranged chronologically. Some subject folders that are of particular interest are the 1968 space suit material; the early shuttle drawings by various contractors dated April 13, 1970; the crew/passenger cabin studies; the in-house early shuttle configurations, which contain numerous drawings and designs; the NR mini shuttle concept; and the management approach folder, which is a detailed flowchart of early shuttle program management. The collection ends with evaluation reports on the first and second shuttle flights. Since they were spaced rather far chronologically from the rest of the collection, they have been placed last in the collection.

**Inventory****SubHeading:****Box Number: 1**

Letter from Steve Andrich explaining collection	November 20, 1990
Book #1 notes, memos, reports, diagrams, etc. on early shuttle research and development	April 1, 1969 - November
Book #2 notes, memos, reports, diagrams, etc., on early shuttle research and development	November 17, 1969 - August
Space Suit Material (Proposal for An Improved Space Suit with Extended Lunar Mission Capability (ELMS), 7 photographs, Litton Chamber Suit, diagrams)	1968
Status of MSC Shuttle Study	May 21, 1969

**SubHeading:****Box Number: 2**

50K Payload (diagrams, calculations, reports, etc.)	June-September 1969
MSC ILRV Space Shuttle	August 13, 1969
MSC ILRV Space Shuttle	September 11, 1969
MSC Report on Space Shuttle Action Items	October 1, 1969
MSC Report on Space Shuttle Action Items	October 18, 1969
Mixture Ratio vs Payload, Orbiter Size, Booster Size	November 1969
Space Shuttle Phase B RFP Review	December 11, 1969
Space Shuttle Design Criteria Board (meeting minutes, reports)	1969-1970
Studies - Flight Technology (NASA CR-1545, various studies and reports)	1969-1970
Main Rocket Engine (Space Shuttle Final Technical Report - v.6 - Propulsion Analysis and Tradeoffs, Pratt & Whitney High Pressure Space Shuttle Engine promo. material, 2 major reports)	1969-1972

**SubHeading:****Box Number: 3**

DC3 Shuttle	March 1970
Level I Program Requirements	March-July 1970

	Air Breathing Engine Studies	March-August 1970
	Shuttle (Grumman, Rockwell, Boeing Summaries; early shuttle drawing)	April 13, 1970
	DC3 - Space Shuttle Study (v.1)	April 27, 1970
	DC3 - Space Shuttle Study (v.2)	April 27, 1970
	Space Shuttle Entry G - Centrifuge Tests	May-August 1970
	Shuttle S.O.W. - Statement of Work	June 1970
	009 Configuration (notes, reports, blueprint)	June-September 1970
	R & Q A Activity	July 27, 1970
	Study Comments (Mass Property Data, Landing Gear on Shuttle)	January 14, 1970
	Mass Properties Phase A	January 30, 1970
	Geometric Data, Mass Properties, Configuration Summaries on Orbiter	January 1970
	Turbo Fan Data	January-March 1970
	Flight Technology Branch - ILRV Study Comparison	February 24, 1970
	Hydraulics (blueprints)	March 6, 1970
<b>SubHeading:</b>	<b>Box Number: 4</b>	
	RCS Meeting	July 1970
	Gimbal System Tradeoff Study	August 5, 1970
	Power Generation	August 5, 1970
	Thrust Vector Control Trade Study Status Review	August 1970
	Landing Gear Data	September 9, 1970
	Aluminum Booster Study GD/C	October 1970
	RCS Engine Info (charts, memos, blueprints, drawings)	1970
	Crew/Passenger Cabin Studies (Booster Crew Station Mockup, Booster Crew Module Pressure Level Studies, memos, Mark I - Mark II Shuttle, Removable Lockers for Shuttle Equipment and Expendables, Integral Passenger Cabin versus Cargo Bay Personnel Module)	1970-1971
	Engine Weights	1970-1972
	Space Shuttle Safety Criteria	March 15, 1971
	In-House Shuttle Configurations (Alternate Shuttle Configurations, Space Shuttle Capability/Weight Assessment, many early shuttle version drawings)	April-June 1971
	McDonnell Douglas Aircraft Corporation (MDAC) Management Approach	June 23, 1971
<b>SubHeading:</b>	<b>Box Number: 5</b>	
	NR Mini Shuttle (Reentry-Mode Transition Flight Research Project Development Plan, SV70-15 document on NR Mini-Shuttle)	July 1970
	MDAC Parametric Sizing	September 24, 1971
	Management Approach (General Manager's Approach to Space Shuttle Program Management, or, The Discipline of Accountability)	October 4, 1971
	MDAC Extension (Phase B Extension Study Plan, External Hydrogen /	1971

Oxygen Tank Orbiter Study, SRM Booster Designs, memos)	
Weight Comparison	July 12, 1972
Weight Reporting Format	July 18, 1972
Main Engine / Avionics ICD	July 1972
Miscellaneous Orbiter material	n/d
Spacecraft Design Office (status report?)	n/d
Integrated Power Generation and Environmental Control System	n/d
OMS Engine Tradeoff	n/d
Filament Wound Tanks	n/d
Space Shuttle Payload - STD Provisions and Design Criteria	n/d
WBS 1.2 and 1.3 System Engineering and Orbiter	n/d
Draft input (Spacecraft Design)	n/d
STS-1 Overview	April 22, 1981
Evaluation of the Space Shuttle Orbiter Second Orbital Flight - Descent Phase	February 1982