

MS-335, Dr. Hans Joachim Pabst von Ohain Paper

Collection Number: MS-335

Title: Dr. Hans Joachim Pabst von Ohain Papers

Dates: 1907-2003

Creator: Dr. Hans Joachim Pabst von Ohain

Summary/Abstract:

Dr. Hans von Ohain was the co-inventor of the first successful jet engine. After World War II, he moved to Dayton, Ohio where he was a research scientist at the Air Force Research Laboratory at Wright-Patterson Air Force Base. His papers contain patents, correspondence, speeches, technical reports, scientific articles, awards, and photographs. Some documents are in German and French, but the majority of the collection is in English.

Quantity/Physical Description: 11 linear feet

Language(s): English, German

Repository:

Special Collections and Archives, University Libraries, Wright State University, Dayton, OH 45435-0001, (937) 775-2092

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

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Preferred Citation:

MS-335, Dr. Hans Joachim Pabst von Ohain Papers, Special Collections and Archives, University Libraries, Wright State University, Dayton, Ohio

Acquisition:

The von Ohain Papers were donated to Special Collections and Archives by Dr. von Ohain's widow, Hanny von Ohain, on September 29, 2003.

Revisions: The von Ohain Papers were updated to the EAD finding aid format in March 2011.

Other Finding Aid: A complete box and folder inventory for this collection is available on the Special Collections and Archives web site at

http://www.libraries.wright.edu/special/collection_guides/guide_files/ms335.pdf

Related Material:

MS-241, Sir Frank Whittle Papers

Accession Number 1995-0059, Hans von Ohain Collection, National Air and Space Museum Archives, National Air and Space Museum, Smithsonian Institution, Washington, D.C.

Additional Sources:

Conner, Margaret, "Hans von Ohain: Elegance in Flight." Reston, VA: American Institute of Aeronautics, 2001.

Processed by: Tasha R. Hairston, August 2004.

Arrangement:

The Dr. Hans Joachim Pabst von Ohain Papers is arranged into fourteen series:

- Series I:** Correspondence
- Series II:** N.A.S.M./Additional Archival Notes
- Series II:** Speeches
- Series IV:** Jet History
- Series V:** Patents
- Series VI:** Sir Frank Whittle
- Series VII:** Awards
- Series VIII:** General Technical Articles
- Series IX:** General Booklets, Journal Articles, Brochures, Newsletters, & News Clippings
- Series X:** ARL Technical Notes and Articles
- Series XI:** General Technical Notes and Drawings
- Series XII:** Teledyne
- Series XIII:** University of Dayton Lecture Notes
- Series XIV:** Photographs

Biographical/Historical Note:

Dr. Hans Joachim Pabst von Ohain was born on December 14, 1911 in Dessau, Germany. He along with Sir Frank Whittle (1907-1996) are the co-inventors of the jet engine. As a child he had an interest in science and enjoyed physics and creating models. He received his doctorate in Physics and Applied Mechanics in 1935 at the University of Gottingen in Germany. Upon graduation von Ohain remained at the university for an additional year and privately developed a theory of turbojet engines. In 1936 he began an association with the Heinkel Company. Heinkel was enthusiastic about the potential for jet flight and offered the necessary financial assistance that supported the development of the turbojet.

Von Ohain developed and designed the HeS.3B engine that powered the He.178 plane that made the world's first turbojet flight on August 27, 1939. The engine was made by Max Hahn and was flown by pilot Erich Warsitz. A number of weeks after the first flight, Adolph Hitler was persuaded to observe a demonstration. Ohain stated that he seemed unfriendly, icy cold and unwell. He asked an assistant what was wrong. The assistant said that the demonstration had been too early, "the fuhrer (leader) does not like to get out of bed before 11 a.m." Hitler did not

see the need for a new engine, commenting “why is it necessary to fly faster than the speed of sound?” Hitler was expecting a short war.

When applying for the patent for his new invention, Ohain was informed of the existence of British scientist Sir Frank Whittle’s patent. But because of significant differences between the two patents, Ohain was granted his own patent. Later, once Ohain and Whittle met they concluded that they had worked entirely independently of one another and that their discoveries were an example of simultaneous invention.

Ohain received more than 50 company patents relating to radial and axial turbojet engines from 1935-1945. He lost all rights to these inventions with Germany’s defeat in WW II. He left Heinkel in 1945 and worked independently while conducting consultant work on gas turbine engines. In 1947 he began contract work with the U.S. Army Corps on advanced air breathing propulsion systems. He was part of Operation Paperclip, which was the codename for the operation by the U.S. government to take Rocket Weapon (e.g. V-1, V-2), Chemical Weapon (e.g. Zyklon-B), and medical scientists from Germany after World War II. The operation was called “Paperclip” because a paperclip was put on the files of those scientists deemed important to the U.S.

Operation Paperclip led von Ohain to permanent employment at Wright Patterson Air Force Base and citizenship status in America. He continued his aerospace research and from 1956-1975 he obtained 24 patents at the Aerospace Research Laboratory (ARL). In 1963 he was promoted to the position of Chief Scientist of ARL. He managed nearly all Air Force physical and engineering research. By 1975 Ohain was promoted to Chief Scientist of the Aero Propulsion Laboratory (APL) where he was responsible for maintaining the technical quality of research/development in air breathing propulsion, power and petrochemicals.

He conceptualized and demonstrated the “jet wing” concept to provide cold air thrust augmentation for vertical and short takeoff and landing aircraft. The Navy used this idea with the experimental XFV-12AS fighter. In addition he showed that the potential efficiency of an electro fluid dynamic generator (in which the energy of fluid gases is converted directly into electricity without using moving parts) could be used as a practical power source. He also developed concepts for the economical retention of nuclear fuel in a gas core reactor which enabled further research of its use in high thrust-to-weight space propulsion systems. During his 32 years of government service, Dr. von Ohain published more than 30 technical papers. He received many awards including the Goddard Award, American Institute of Aeronautics and Astronautics, Air Force citations, the Guggenheim Medal, Ludwig Prandtl Ring and the Stark Draper Prize. He is enshrined in the “International Hall of Fame” Engineering and Sciences “Hall of Fame” and the “National Aviation Hall of Fame.” He also served as the Charles Lindbergh Professor of the National Air and Space Museum-Smithsonian Institute and received honorable Doctor of Science degrees from West Virginia University of Morgantown and at the University of Dayton.

After retirement, Ohain worked as a professor at the University of Dayton from 1982-1988. He received 5 patents with the University of Dayton Research Institute. He and his wife moved to Florida and Ohain continued to participate in speaking engagements around the world and

teaches at the University of Florida. He continued to work on independent research projects and received his only independent patent in 1998. Ohain died on March 13, 1998 in Melbourne, Florida. He left behind his wife, four children and grandchildren.

Scope and Content:

Series I, Correspondence: Contains correspondence from 1936-1996 mostly of a professional nature. The correspondents usually include supporting documents that offer a dialogue of communication which can include pictures, drawings and even new invention ideas.

Series II, N.A.S.M./Additional Archival Notes: Contains correspondence and supporting documentation of Dr. Ohain's relationship with the National Air and Space Museum (N.A.S.M). The series spans from 1945-1997. 1966-1976 deals entirely with an exhibit that featured some of Ohain's engine work. N.A.S.M. received a great deal of Ohain's personal papers and we have included the Deed of Gift signed for this exchange along with the Heinkel archive list in Stuttgart, Germany, Junkers item list and a document related to German retrieved war documents.

Series III, Speeches: Contains information pertaining to his speeches and the briefing presentations given while employed at Wright Patterson Air Force Base. The time span for this series is 1963-1997. He gave more speeches later in his life after retirement in 1977. Most of the speeches deal with the history of jet propulsion or topics related to his research with the government.

Series IV, Jet History: Contains an interesting collection of articles, manuscripts, notes, oral history and time lines relating to jet history including Ohain's experiences in Germany. It covers 1951-1996 and contains six folders of information without dates.

Series V, Patents: Contains patent related information from 1907-1997. The patents range from Ohain's work with the Heinkel Company in Germany to his research with the University of Dayton and independent ventures. An oversize file contains blueprints dealing mostly with the Swirl Chamber Device. Many of the patent folders contain (ARL) created technical booklets that relate to the patents. This series also contains a file of contracts and wills from 1954-1984.

Series VI, Sir Frank Whittle: Contains information and supporting documentation related to awards from 1966-1992. Many of the awards he received are not a part of the collection. Yet the series provides an adequate overview of the type and nature of awards Ohain received and it contains a hand signed letter of congratulations from President George Bush for Ohain's Draper Prize award. A complete listing of his awards and accommodations can be found in *Appendix B* of the book *Hans von Ohain: Elegance in Flight* by Margaret Conner. An oversized box houses the larger awards and an honorary degree.

Series VII, Awards: Contains a single file of documents that relates to Sir Frank Whittle the British co-inventor of the jet engine which include, news clippings, correspondence and patent related materials. The series spans from 1930-1996, additional pictures of Whittle are located in the Correspondence Series 1 and the Wright State University Special Collection and Archives houses an additional collection of Frank Whittle papers MS-241 donated by General Electric in

1992. It consists of design and technical reports, correspondence, photographs and technical drawings and charts.

Series VIII, General Technical Articles: A collection of various scientific articles ranging from 1923-1996. The articles deal with a range of topics and were written by numerous authors.

Series IX, General Booklets, Journal Articles, Brochures, Newsletters, and News Clippings: Series 9 is a collection of general scientific booklets, journal articles, press releases, brochures and magazine articles from 1925-1992.

Series X, ARL Technical Books and Articles: A collection of (ARL) created scientific booklets and articles from 1959-1989. Ohain was a contributing author of many of these papers and many of the papers directly relate to his research and patents.

Series XI, General Technical Notes and Drawings: Contains general scientific notes and drawings from 1958-1996. This series is interesting because it documents some of his ideas that never made it to be patented and it shows the progression of an idea. Thirteen of the seventeen folders do not have dates but reflect the folder titles given to the information by Ohain himself.

Series XII, Teledyne: Contains documentation of Ohain's relationship with the then Akron, Ohio based company Teledyne. It spans from 1979-1984. This series documents some of his post retirement activities and his continued contribution into the field of engine development.

Series XIII, University of Dayton Lecture Notes: Contains information relating to Ohain's time as a professor at the University of Dayton and spans from 1984-1987. The series consists of lecture notes, exams and aero-propulsion information. He also taught at the University of Florida but this collection does not contain any documents from that position.

Series XIV, Photographs/Postcards: Consists of images grouped into three categories, Photographs from the early 1930's Germany (street scenes with swastikas) and Postcards featuring scenes from Germany, Airplanes/Engines and Group photographs with miscellaneous images.

(**Note:**-Most series within this collection contain photographs that were found with supporting documentation. Series 14 is a compilation of photographs and postcards that were found without any accompanying documentation.)

Subject Terms

Persons/Families

Ohain, Hans von, 1911-1998

Whittle, Frank, Sir, 1907-1996

Organizations/Corporate Names

Aerospace Research Laboratories (U.S.)

Places

Dayton (Ohio)
Wright-Patterson Air Force Base (Ohio)

Subjects (General)

Aeronautics, Military
Aeronautics – Research
Aeronautics
Jet propulsion
Airplanes – jet propulsion
Heinkel He S3B Turbojet
Heinkel He 178

Material Types

Correspondence
Photographs
Drawings
Publications
Awards

Occupations

Research scientist

Collection Inventory**Series I: CORRESPONDENCE**

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
1	1	Hienkel Correspondence	1936-1945
	2	ARL Memos/Initiatives	1947-1974
	3	Correspondence	1948-1965
	4	Correspondence	1966-1969
	5	Correspondence	1970-1971
	6	Sky Vehicle Correspondence	1971
	7	Tea Brewing Correspondence	1972
	8	Correspondence	1972-1973
	9	Correspondence	1974
	10	Correspondence	1975
	11	Correspondence	1976-1979
	12	Correspondence	1980-1986
2	1	Correspondence	1987
	2	Pratt Whitney Correspondence	1987-1990
	3	U. D. Correspondence	1987-1995
	4	Correspondence	1988

	5	Univ. Florida Press Correspondence	1988
	6	John D. Cranstoun Correspondence	1988-1990
	7	SAE Correspondence	1988-1995
	8	Correspondence	1989
	9	Howmet Correspondence	1989-1990
	10	Bill Chana Correspondence	1990-1995
3	1	Correspondence	1990-1991
	2	Correspondence	1992-1993
	3	AIAA Correspondence	1993-1996
	4	Correspondence	1994
	5	Correspondence	1995-1997
	6	Correspondence	Undated

Series II: N.A.S.M./ADDITIONAL ARCHIVAL NOTES

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
4	1	N.A.S.M. Aero Propulsion Hall Exhibit Correspondence	1966-1976
	2	N.A.S.M. Correspondence	1974-1977
	3	N.A.S.M. Correspondence	1980-1989
	4	N.A.S.M. Correspondence	1990-1994
	5	N.A.S.M. Correspondents	1995-1997
	6	N.A.S.M. Deed of Gift	1995
	7	Heinkel, Junkers Archival Material List	1945-1952

Series III: SPEECHES

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
5	1	Press Presentation: Germany	1959
	2	Speech-Briefing "Energy Conversion Research Program"	1963
	3	Speech-Briefings	1963-1973
	4	Speech-Briefing "Magnetic Fluid Dynamics Electro Fluid Dynamics Research"	1965
	5	Speech	1966-1972
	6	Speech	1980-1997
	7	Speech-Montreal	1990
	8	Speech	Undated
	9	Speech - "Historical Trends of Jet Propulsion"	Undated
	10	Speech M.I.T.	Undated
	11	Speech - "Air Force Technology Trends in Propulsion/Flight Power"	Undated
	12	Speech "Aero Propulsion Past, Present, Future"	Undated

Series IV: JET HISTORY

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
5	13	Jet History-German Strahltriebwerke-Sonderentwicklung	1940
6	1	History of Jet/Engine	1951-1979
	2	Oral Interview for E.C. Simpson Manuscript Project	1986-1987
	3	Interim Research Report "Gas Turbine Engine History	1987-1988
	4	Articles-Aircraft	1989-1996
	5	Draft of Foreword "Elements of Gas Turbine Engines"	1993-1994
	6	Manuscript "A Tradition of Excellence" by James St. Peter	1995-1996
	7	History of Jet Engine Development	Undated
7	1	Article Notes-Evolution Gas Turbine	Undated
	2	"Evolution/Future of Aero Propulsion Systems	Undated
	3	Jet Development Time Line	Undated
	4	Jet History - German	Undated
	5	Jet History - German	Undated
	6	Jet History - German	Undated
	7	Jet History - German	Undated
	8	History of Jet Engine Development	Undated
	9	History of Jet Engine Development	Undated
	10	Ernst Heinkel Strahltriebwerke/Pics	Undated

Series V: PATENTS

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
8	1	Boundary Layer Control of Flow Separation and Heat Exchange	1968
	2	Colloidal Core Reactor	1966-1976
	3	Curved Wedge Deflector	1966
	4	Colloidal Gas Reactor	1964-1972
	5	Development of a Novel Constant Volume Combustor	1959
	6	Energy Exchange Device/Separator	1966-1968
	7	Fluid Machine Related Materials	1907-1959
	8	First Patent w/ Correspondence	1935-1947
	9	Generation of Ions in High Pressure Velocity Gas Stream	1967
	10	Miscellaneous Patent Drawings	1961-1975
	11	Non-Resonant High Pressure Constant Volume Combustor	1962
	12	Reversed Meridian Flow Swirl Chamber High Dust Colloidal Landing Cavity Reactor w/Coaxial Separator	1966-1967
	13	Simulating Reentry Conditions in a Particle Laden Atmosphere	1962-1974
	14	Swirl Chamber Reversed Meridian Flow Pattern w/ Multiple Injection	1964
	15	Swirl Chamber Cold Gas Injection Hot Gas Readmission	1964

	16	Two-Component Electro Fluid Power Generator Employing Contact Ionization Materials	1964-1969
	17	Wing w/ Thrust Augmentor	1967-1973
9	1	Aircraft Propulsion System	1971-1973
	2	Apparatus Generating Ultra High Total Enthalpy Gases w/ Multi-Component Flow	1972-1974
	3	Cavity Reactor Eternal Separation	1971-1972
	4	Cavity Reactor w/Two Stage Separation	1970
	5	Centrifugal Particle Separator	1970
	6	Contracts/Wills	1954-1984
	7	Electro Fluid Dynamic Generator System	1971
	8	Fluid Dynamic Energy Transfer	1971
	9	Gas Compression Cycle and Apparatus Therefore	1982
	10	Jet Wing w/ Multiple Thrust Augmenters	1974
	11	Rankine Cycle Ejector Augmented Turbine Engine and Hot Gas Flow Generator w/o Moving Parts	1984-1988
	12	Supersonic Diffuser	1973
	13	Supersonic Dual Stage Diffuser Materials	1973
	14	Supersonic Duals Stage Diffuser Materials	1973-1976
	15	V/Stol ARL Thrust Augmentation Concepts-Transport Lit Mission	1975
10	1	Patent Contract/Correspondence (Germany)	1936-1992
	2	Hirth, Moteren, Hienkel	1936-1991
	3	Patents – Other Inventors	1930-1972
	4	Patent Related News Clippings	1954-1973
	5	Presentation-High Performance Diffusers	1973
	6	Potential Infringement Claim	1974
	7	Patent Related Pamphlets	1967-1979
	8	Watercraft w/Hydrofoil Bladed Wheel Assembly	1996-1997
	9	Cavity Reactor Propulsion System w/Separator	Undated

Patent Related Oversize Material

<u>Loc.</u>	<u>Fol.</u>	<u>Description</u>	<u>Date</u>
42	09	1. RN-63-D-1213 Assembly Turbo-Swirl Chamber Device for Gas Flow of Approximate 15 ATM. Pressure (Box 6 File 10 Swirl Chamber x/ Cold Gas Injection and Hot Gas Readmission, 1964).	1963
		2. RN-63-C-1243 High Pressure Swirl Chamber Configuration Assembly No. I with cavity Tubing 2 ½ O:D 3 1/8 LG.	1963
		3. RN-63-B-1400 Low Pressure Swirl Chamber Injector Ring I (3" U,D) 24 Nozzle Right Hand	1963
		4. RN-63-B-1401 Low Pressure Chamber Injector Ring II	1963

		(4.1.o.) 32 Nozzle Holes, Right Hand	
		5. RN-63-B-1402 Low Pressure Swirl Chamber Injector Ring III (6.1.D) 32 Nozzle Holes Right Hand	1963
		6. RN-63-D-1477 Assembly Turbo Swirl Chamber for Multiple Injection for High Pressure: 15 Atm. (Box 6-File-9 Swirl Chamber w/Reversed Meridian Flow Pattern Multiple Injection Relating to Gas Core Reactor, 1964).	1963
		7. RN-63-D-1477 Assembly Turbo Swirl Chamber for Multiple Injection	1963
		8. RN-63-C-1611 Readmission Swirl Chamber Body of Center Swirl Chamber	1963
		9. RN-64-D-267 Reinforced Plexiglas Swirl Chamber Right Hand Outer Housing	1964
		10. RN-64-D-1658 Low Pressure Swirl Chamber Outlet Swirl Chamber Left Hand	1964
		11. RN-64-D-1659 Low Pressure Swirl Chamber Outlet Swirl Chamber Right Hand	1964
		12. RN-64-D-1667 Low Pressure Swirl Chamber (Dual out Flow) Configuration of Assembly RN-63-D-1379 with Spiral Shaped Swirl Chamber RN-64-D-1656	1964
		13. RN-64-B-1952 Alternate Swirl Chamber Housing Modification	1965
		14. RN-64-D-1893 Jet Driven Ring Vortex Assembly Ring Vortex with Supports for 15 ATM. Pressure	1964
61	12	15. RN-65-D-448 High Pressure Plastic Chamber Short Type	1965
		16. RN-65-D-451 High Pressure Plastic Chamber Long Type	1965
		17. RN-65-D-494 Mach-I Nozzle Thrust Stand	1965
		18. RN-65-D-495 Nozzle Tube Test Stand	1965
		19. RN-65-D-496 Nozzle Assembly Thrust Stand	1965
		20. RN-65-D-497 Side View Assembly Thrust Stand	1965
		21. RN-65-B-537 Construction View of Nozzle Tubes Thrust Rig	1965
		22. RN-65-D-2141 Low Pressure Swirl Chamber Assembly Instruction for Different Test Combination with New Nozzle Chambers	1965
		23. RN-65-C-2163 Energy Exchange Rig Assembly Ring Slot Diffuser	1965
		24. RN-65-C-2164 Energy Exchange Rig outside Part of Ring Slot Diffuser	1965
		25. RN-65-C-2165 Energy Exchange Rig inside Part of Ring Slot Diffuser	1965
		26. RN-65-C-2166 Energy Exchange Rig Explanation and Assembly Ring Slot Nozzle I	1965
		27. RN-65-B-2168 Rig Ring Slot Nozzle I inside Ring	1965
		28. RN-65-B-2169 Ring Slot Nozzle I outside Ring	1965

		29. RN-65-B-2170 Ring Slot Nozzle I inside Ring with Sleeve Holder	1965
		30. RN-65-B-2171 Support Flange	1965
		31. RN-65-B-2172 Support End Flange	1965
		32. RN-65-B-2172 Support and Spacer Ring	1965
		33. RN-65-B-2174 Main Shaft	1965
		34. RN-65-B-2174 Sleeve for ¾ Dia. Shaft	1965
		35. RN-65-B-2175 Extension Ring 2.75 OLG with Flange	1965
		36. RN-65-A-2176 Support Shaft	1965
		37. RN-65-A-2177 Support Shaft for Ring Slot Diffuser	1965
		38. RN-65-A-2178 Extension Ring 2.375 LG.	1965
		39. RN-65-A-2179 Extension Ring 1.250 LG.	1965
		40. RN-65-A-2180 Extension Plug 2.750LG.	1965
		41. RN-65-A-2181 Extension Plug 1.875 LG.	1965
		42. RN-65-A-2182 Extension Plug .750 LG.	1965
		43. RN-65-A-2183 Spacer Tube	1965
		44. RN-65-A-2184 Air Inlet Tube	1965
		45. RN-65-A-2185 Control Dimension for Ring Slot Diffuser	1965
		46. Effect of Dust on Pressure Drop	Undated
		47. Specific Heat at Constant Pressure Chart 1	Undated
		48. Specific Heat at Constant Pressure Chart 2	Undated
		49. Test Chamber	Undated
		50. Untitled Drawing	Undated
61	12	51. RN-65-A-2191 Energy Exchange Rig Drawing List	1965
		52. Four (4) Miscellaneous Drawings	Undated
		53. Two (2) Identical Blue Print Drawings, Effect of Dust on Pressure Drop	Undated
	13	Reproduction of Turbojet HeS3B, Power Plant of the Heinkel Airplane He178, Which Made the World's First Turbojet Powered Flight on 27 Aug 1939. Copyright 1974 by Hans J. P. Von Ohaim. Drawings by Charles C. McCulloch	Dec 22, 1973
		1. Cross Section View – Full Size	
		2. Four Section Views	
		3. Exhaust Bearing Holder	
		4. Compressor Bearing Holder	
		5. Compressor	
		6. Turbine Details	
		7. Schematic of Oil, Fuel, Ignition & Starting System	

Series VI: SIR FRANK WHITTLE

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
11	1	Sir Frank Whittle	1930-1996

Series VII: AWARDS

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
11	2	Award Related Materials	1935-1993
	3	AAIA, Goddard Award Materials	1965-1973
	4	Frank Draper Prize Materials	1989-1992
12	1	von Ohain Family Tree	Undated
	2	Ernst Heinkel Strahltriebwerke (Presentation Cards)	Undated
	3	N.A.S.A. Award Certificate	Mar 1959
	4	Certificate of Service 30 Years	1977
	5	Wings Club Certificate	1980
	6	Honorary Degree	Undated
	7	N.A.S.M. Award Certificate	Undated

Series VIII: GENERAL TECHNICAL ARTICLES

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
13	1	Scientific Articles	1923-1955
	2	Scientific Articles	1942-?
	3	Scientific Articles	1960-1968
	4	Scientific Articles-Gas Particle Flow	1963-1970
	5	Scientific Articles	1970-1973
	6	Scientific Articles	1974-1977
	7	Scientific Articles	1981-1988
	8	Scientific Articles	1990-1996
	9	Scientific Articles	Undated
	10	Scientific Articles: "Untersuchungene an Radialturbinen Fur nichtraumbestandiges Arbeitsmittel Inhaltsübersicht"	Undated
	11	Scientific Article: "Mechanik II. Bewefunflehre der Getriebe	Undated

Series IX: GENERAL BOOKLETS, JOURNAL ARTICLES, BROCHURES, NEWSLETTERS AND NEWS CLIPPINGS

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
		Technical Reports/Booklets	
14	1	Bureau of Aeronautics, Navy Department, Report No. 218, "Standard Atmosphere—Tables and Data" by Walter S. Diehl	Oct 1925
	2	N.A.C.A. Technical Note 3589, "Design Criteria for Axisymmetric and Two-Dimensional Supersonic Inlets and Exits," by James F. Connors & Rudolph C. Meyer	Jan 1956
	3	N.A.C.A. Technical Note 4150, "Approximations for the Thermodynamic and Transport Properties of High-Temperature Air," by C. Frederick Hansen	Mar 1958

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|----|---|----------|
| 4 | N.A.S.A. Technical Note D-475, "Some Nuclear Calculations of U235-D ₂ O Gaseous-Core Cavity Reactors," by Robert G. Ragsdale & Robert E. Hyland | Oct 1961 |
| 5 | NASA SP-7012, "The International System of Units, Physical Constraints and Conversion Factors," Revised, by E. A. Mechtly | 1969 |
| 6 | NASA SP-3069, "Thermodynamic Properties and Theoretical Rocket Performance of Hydrogen to 100000 K and 1.01325x10 ⁸ N/m ² ," by R. W. Patch | 1971 |
| 7 | Detroit Diesel Allison Progress Report, NASA Contract: DEN 3-168, "Advanced Gas Turbine Powertrain System Development Project" | Oct 1979 |
| 8 | Smithsonian Annals of Flight, Number 6, "Langley's Aero Engine of 1903" | 1971 |
| 9 | "Aerodynamic Aspects of Animal Flight" by Sir James Lighthill, F.R. S., Fifth Fluid Science Lecture at the Royal Institution | Jun 1974 |
| 10 | "Alcohol Fueled Automobiles, Performance-Emissions-Environment," The University of Santa Clara, CA | Oct 1979 |
| 11 | "NERVA Nuclear Propulsion for Space," Westinghouse Electric Corporation Astronuclear Laboratory | ca1970 |

General Booklets

- | | | |
|----|--|----------|
| 12 | "Jet Pioneers Association of USA Activity Report" | May 1971 |
| 13 | Gougeon Brothers Boat Works Booklets | 1973 |
| 14 | Anniversary Booklet, "The University of Tennessee Space Institute, Tullahoma, TN, Tenth Anniversary, 1964-1974" | 1974 |
| 15 | Anniversary Booklet, "Celebration of the Golden Anniversary of Jet Powered Flight, 1939-1989," Dayton-Cincinnati Section of AIAA | Aug 1989 |
| 16 | "Tribute to Dr. Frank L. Wattendorf," NATO Advisory Group for Aerospace Research & Development | Undated |

Journals/Journal Articles

- | | | |
|----|---|--------------|
| 17 | <i>AIAA Journal</i> , Volume 12, Number 5 | May 1974 |
| 18 | <i>The Bridge</i> , National Academy of Engineering, Volume 13, Number 1 | 1983 |
| 19 | <i>Journal of Flight Sciences and Space Research</i> , Volume 8, Number 1 | Jan/Feb 1984 |
| 20 | <i>New Zealand Wings</i> | Aug 1989 |
| 21 | "Electrofluid Dynamic Energy Conversion Present Status and Research Areas," by Maurice Lawson & Hans von Ohain, <i>Journal of Engineering for Power</i> | Apr 1971 |
| 22 | "Gas-Particle Flow in Convergent Nozzles at High Loading Ratios," by George Rudinger, <i>AIAA Journal</i> | Jul 1970 |

15	1	Newsletters	1960-1996
	2	Newsletters- <i>Dayton Engineer</i> , Dayton Engineers Clubs	1989-1993
	3	Newsletters: Deutsche Gesellschaft für und Lilienthal-Oberth e.v.	1994-1996
	4	Press Releases	1965-2003
	5	News Clippings	1949-1996
	6	Magazine Articles	1952-1974
	7	Magazine Articles	1981-1996
	8	Magazine Articles	Undated
	9	Brochures	1976-1992

Series X: ARL TECHNICAL BOOKS AND ARTICLES

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
16	1	Thesis –“Thrust Augmentation” by David Walker Pinkerton	1959
	2	Concepts for the Application of Fluid Dynamics Condensation Phenomena to Nuclear Gas Core Reactors	1962
	3	Electro Fluid Dynamic Energy Conversion, Aerodynamic Performance of Reversed Flow Vortex Chambers	1964-1965
	4	Experimental Optimization of the Reverse Flow Swirl Chamber	1965
	5	Aerodynamic Performance of Reversed Flow Vortex Chambers w/ notes	1965
	6	Thermo Mechanics Research Laboratory Program Review	1965
	7	Articles	1965-1973
	8	Separation of Submicron Condensation Particles in a Vortex Chamber	1966
	9	20 Years of Research Progress	1967
17	1	A Summary of Dust Separator Research	1968
	2	Engineering Study of Colloid Fueled Nuclear Rocket	1969
	3	Techniques for Injection and of Particles by Ultra High Speed Gas Jets	1973
	4	Parametric Study of the Colloid Core Reactor Rocket Engine	1974
	5	Thrust Augmenters, Characteristics of High Ejectors	1979-1981
	6	Tenth Anniversary Historical Symposium	1986
	7	History of Gas Turbine Engine in the U.S. Bibliography	1989

Series XI: GENERAL TECHNICAL NOTES AND DRAWINGS

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
18	1	Boat Propulsion Unit	1958
	2	Constant Volume Combustion Chamber Application and History of Development	1959
	3	Cavity Reactor Notes	1965-1996
	4	Miscellaneous Notes	1967-1996

	5	011 Engine	Undated
	6	Fog Generation by Cold Gas	Undated
	7	Multi-component Flow Energy Conversion	Undated
	8	Thermodynamic Characteristics of Aircraft Gas Turbine Components	Undated
	9	Miscellaneous Notes and Drawings	Undated
	10	Cycle Analysis Gas Turbine Engines	Undated
	11	Miscellaneous Notes and Drawings	Undated
	12	Jet Engine Related Materials	Undated
	13	Energy Transfer Gas-Gas	Undated
	14	Boat: Parallel Flow Fan	Undated
	15	Conversion Table	Undated
	16	Equations, Tables, Charts Compressible Flow	Undated
	17	Performance Characteristics of Viscous E.F.D. Energy Conversion Process	Undated
19	1	A.F.I.T. Notes	1962-1965
	2	Fluid Dynamic Energy Transfer for Air Breathing Propulsion	1962-1966
	3	Theory Considerations F.E.T. Propulsion	1966
	4	Fluid Dynamic Energy Thrust Augmentation	1966-1967
	5	Thrust Augmentations Materials	1967
	6	VTOL Potentials	1996
	7	Glider Project S.F.	Undated
	8	Schematic View of Open Longitudinal Configuration (VTOL Wing w/ Thrust Vectoring Flap)	Undated
	9	Miscellaneous Drawings and Notes	Undated
	10	Intermediate System Analysis Momentum Exchange Particles to Air, Vortex Generator	Undated

Series XII: TELEDYNE

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
20	1	Magazine Articles	1979
	2	Internal Bypass Monorotor Engine Historical Review	1982
	3	Fundamental Research Direct Energy Transfer Process	1980
	4	Aeronautics R&T "Issues/Answer/Data Base Requirements"	1982
	5	Technology Reports	1974-1980
	6	Speech: Low Cost Gas Turbine Engine	1979-1980
	7	Speech: Management of Aircraft Procurement	1979
	8	Speech: Status of Modified Monorotor	1983
	9	Trends Fuel Economy w/ Small Turbine Gas Engines	1980
	10	Article: Aircraft Turbine Engine Maintenance	1980
	11	Correspondence	1980-1981
	12	Correspondence	1982-1984
	13	Memorandums	1980-1981
	14	Memorandums	1982-1984

15	Report: Blade Cooling Techniques	Undated
16	Consultant Agreements	1979-1984
17	Miscellaneous Notes and Drawings	Undated

Series XIII: UNIVERSITY OF DAYTON LECTURE NOTES

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
21	1	Aero-Propulsion	1984
	2	Exams	1987
	3	Aero-Propulsion	Undated
	4	Notes	Undated
	5	Notes	Undated
	6	Notes	Undated

Series XIV: PHOTOGRAPHS/POSTCARDS

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
		Photograph Album	
21	7	Photograph Album, Part I: 20 th Anniversary Establishment of Arnold Engineering Development Center	Nov1965
	8	Photograph Album, Part II: 20 th Anniversary Establishment of Arnold Engineering Development Center	Nov1965
	9	Photographs: Germany	
		1. Weender Street-Germany	Undated
		2. Kurze Geismar Street-Germany	1933
		3. George Kuster	1933
		Postcard Collection	
		4. Rostock-Warnemunde (Set of 8)	Undated
		5. Gottfried-Pabst Von-Ohain-Schule (Building)	Undated
		6. Berbaudenkmaler in Freiberg/Sachs	Undated
		7. Treiberg/Gachsen	Undated
10		Photographs: Airplanes/Engines	
		1. Side view of First Model	1935
		2. Rotor Gotlingen (2 copies)	Undated
		3. He178	Undated
		4. He178	Undated
		5. He 178 w/ Pilot	Undated
		6. He178 Drawing	Undated
		7. Boeing AMST YC-14 IOT&E	Undated
		8. Unidentified Plane	Undated
11		Photographs: Group Pictures/Misc.	
		1. Von Ohain w/ friends	1938
		2. J.E. Henderson, D.M. Spiers Visit	1971
		3. Stephanie, Hanny Ohain, John Glenn	1986

4. Family-Paris, France	1987
5. Deutches Museum	1988
6. Elder Man-Germany	1989
7. WPAFB Dignitaries at Officer's Club Protocol Room	Undated
8. Reception Line at Officers Club	Undated
9. Air Commodore Sir Frank Whittle	Undated
10. Whittle, von Ohain, Colonels	Undated
11. Mr. and Mrs. Von Ohain	Undated
13. Unidentified man w/cigarette	Undated
14. Doctrina Multiplex –Veritas (Building)	Undated
15. Open/Close Device	Undated
16. Von Ohain w/young man	Undated
17. Von Ohain w/young man	Undated
18. Lab Photo	Undated