

Whittle Papers

MS – 241

Wright State University  
Department of Special Collections and Archives

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## Introduction

The Whittle Papers were accessioned into the Wright State University Department of Archives and Special Collections in September 1992. They were donated by General Electric Aircraft Engines, Cincinnati, Ohio (Eric Falk).

The papers in this collection date from 1936-1964 and fill 4 Hollinger boxes and 92 file folders. The collection is arranged into 5 series as follows:

- Series 1: Design and Technical Reports
- Series 2: Correspondence
- Series 3: Photographs
- Series 4: Technical Drawings and Charts
- Series 5: Miscellaneous

There are no restrictions on the use of this collection.

## Biographical Sketch

Frank Whittle first proposed the use of the gas turbine for jet propulsion in a science thesis in 1928. His thesis, *Future Development of Aircraft*, was his fourth term project at the R.A.F. College. Whittle filed British Patent No. 374206 for his idea in January of 1930. The British Air Ministry did not take much interest in the idea at that time due mostly to the unavailability of materials necessary to build such a power plant.

Whittle did not let the idea rest though. After a brief posting as a flying Instructor, Group Captain Whittle attended the R.A.F. Officers Engineering Course (1932-1934). From there he continued his graduate studies in Mechanical Sciences at Cambridge University. In 1936, Whittle teamed up with J.C.B. Tinling and R.D. Williams to form Power Jets Ltd. The R.A.F. was supportive of Whittle and allowed him to pursue his research and development with Power Jets Limited and the British Thomson-Houston Co., Rugby, to produce a working jet engine. In April 1937, the first engine was started and run up to 13,600 r.p.m.

In July 1939, the Gloster Aircraft Co. was contracted to build an aircraft for the new engine. The Gloster E28/39 (nicknamed the Squirt) took to the air on 14 May 1941 with Whittle's engine, the W1. In the years to follow much testing and improvement was completed before reliable production models came about. The Whittle engine technology was shared with the United States, and became the foundation for the American jet aircraft program.

## Scope and Content

Series 1 consists of design and technical reports: basic jet concepts, research and development, and bench and flight testing of gas turbine aircraft engines. The reports are arranged chronologically. The bulk of these reports were prepared by Power Jet Limited, a company in which Sir Frank Whittle played an elemental role. This series also includes reports by The British Air Ministry, The National Gas Turbine Establishment, as well as reports from a variety of other sources. The reports are rich with early jet aircraft technology at its beginning stage. Many of today's standard jet aircraft concepts are shown in their developmental phase. Ideas that were new and innovative in the 1930s-1940s, like water injection, afterburners, special jet fuel, inlet guide vane designs, turbo-props, thrust reversers, supersonic jets, etc. are discussed in these reports as possibilities for development.

Besides the test data on early British jets, some test data on America's first jet aircraft, the Bell YP-59, is included. Many of the reports carry interesting photographs, schematics, and technical drawings. Anyone studying the stepping stones to jet power will find these reports essential.

Series 2 contains correspondence, internal and external, mostly of Power Jets Limited and The British Air Ministry. It is arranged chronologically, with some groupings on specific subjects. Trip reports show the sharing of technology between various agencies within the British aircraft manufacturing community, as well as sharing with the United States. Most of the correspondence is technical in nature, and some reports are included as part of memos and letters. Security concerns and patent information are among the non-technical topics which show up in the series.

Series 3 contains loose photographs which were not part of technical reports. Most of the photographs are dated, but most are not labeled specifically. Many of the photographs are of various types of jet engines. There are also some interesting photographs of compressor damage caused by foreign objects.

Series 4 consists of loose drawings and charts which were not part of any specific technical report. One large fold-out jet engine drawing is especially informative with different systems color coded. An organizational chart of Power Jets Ltd. is also included in this series.

Series 5 is made up of miscellaneous documents having to do with jet aircraft and engines. There are two Bibliographies of technical reports which will be of great use to researchers. This series also includes early histories of British jet aircraft development, and a script for a motion picture about jet aircraft.

## Container Listing

### **Series I: Design and Technical Reports**

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
1	1	The Theories and Inventions Forming the Basis of Developments Undertaken by Power Jets Limited Ltd. – Frank Whittle	1936
	2	Report #159 – First Tests in an Experimental Gas Turbine – Frank Whittle	1938
	3	Gyrone W 1, Design Sheets	1940
	4	Gyrone W 2, Design Sheets	1940
	5	Some General Comments on High Speed Centrifugal Compressors	1941
	6	W2/500 Design Calculations	1942
	7	No. 3 Design Thruster Augmenter for W2/500	1942
	8	Estimated Performance of W.R.1	1942
	9	Dimensional Analysis Leading to Correction of Test Results	1942
	10	W2/500 Supercharger Test Report	1942
	11	Summary of Tests 4 to 17, W1A No. 2 Series W1/317A	1942
	12	No. 4 Thrust Augmenter for W2/700 – Projects Department Note No. D.106	1943
	13	Gas Turbine Developments at Power Jets Ltd. – Engine Department	1943
	14	Performance Testing in Flight – Report A.11 2b	1943
	15	Bench Test of G.E.C. Type 1A2. Engine No. 23 EX-Bell Aircraft Type YP-59A RJ.362 (Port)	1943
	16	Flight Tests of Rolls-Royce W.2.B Engine No. 141 in E.28/39 Aircraft W.4046/G, Series IV Tests	1943
	17	Comparison of Bench Test Results of the G.C.C. Engines N.22 and 23 During Flight Tests of the Bell Aircraft, Type YP-59A, No. RJ.362	1944
	18	Combustion Report No. 370 – The Spill-Controlled Burner	1944
	19	Handling of Engine Test Results	1944
	20	Summary of Strip, Rebuild, and Bench Rating Tests, G.E.C. Engine No.22, EX-Bell Aircraft YP-59A, R.J.362/G	1944
	21	Bench Calibrations of G.E.C. Type 1A2 Turbine Engines Nos.22 and 23 After Series III Flight Tests in Bell YP-59A Aircraft	1944
	22	Report on the Special Projects Mission to U.S.A. – By H. Constant	1944
	23	Flight Tests of W2/500 Turbine Engine No. 5 in E.28/39 Aircraft No.W.4041/G Flight Series II	1944
	24	Principles of Governing P.T.L. Power Units – H. Kuhl – ZWB Report U&M.1272	1944

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
1	25	Flight Calibration and Estimated Performance – W2/700 No. 10. Series 2A. In E.28/29	1944
	26	Performance Tests of power Jets W2/700 Engines in an F.9/40 aircraft – Power Jets Memorandum No.M.1019	1944
	27	Take-off Boost with Refrigerant	1944
	28	T.N. No. Engine.247 – Flight Tests of Meteor	1944
2	1	W2/500 Aero Engine – Running and Servicing Notes	1944
	2	Drawings and Schematics for – W2/500 Aero Engine – Running and Servicing Notes Report	1944
	3	The Whetstone Full Scale Compressor and Gas Turbine Test Rig 1 – Memorandum No. 1058	1945
	4	Power Jets L.R.1. Engine – Projects Department Report A. 137	1945
	5	Gas Turbine for Aircraft Propulsion – Rolls-Royce Limited	1945
	6	Proposal for New Supersonic Engine	1945
	7	Some General Notes on Gas Turbine Testing – Technical Service Note #102	1945
	8	The Aircraft Gas Turbine Part 1 – Ministry of Aircraft Production	1946
	9	Performance of Meteor EE.221 – W2/700 Engines	1946
	10	Fluid Flow Through Cascades of Aerofoils – Paper for the Sixth International Congress for Applied Mechanics – National Gas turbine Establishment	1946
	11	Power Jets L.R.1. Engine – Projects Department Note No. D.125	1946
	12	Performance Graphs for Meteor EE.221 – W2/700 Engines Nos. 44 & 34	1946
	13	Flight Tests of Metropolitan – Vickers F.2 Turbine Engine No.3 in Tail of Lancaster LL 735/G – Series III Tests – National Gas Turbine Establishment Report #10	1947
	14	Flight Tests of Power Jets W2/700 Engines in Meteor I Aircraft No. EE.215 Fitted With the MK.VII Exhaust Reheat [Afterburner] System National Gas Turbine Establishment Report Number 21	1947
	15	DeHavilland Goblin 2 Jet Propulsion Unit	1947
	16	Use of Carbon Dioxide Gas in Kerosene Fuel Tanks to Minimize Explosion Risks – Effect on Performance of Meteor III (Derwent I) Aircraft – National Gas Turbine Establishment Report #R.23	1948
	17	The Thrust Spoiler in Relation to the Aircraft Jet Turbine: Development and Tests on W2/700 Type Engine – National Gas turbine Establishment Report #R.26	1948

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
2	18	The Advantages of high Inlet Temperature for Gas Turbines and Effectiveness of Various Methods of Cooling Blades – The American Society of Mechanical Engineers Paper #48-A-105	1948
	19	Centrifugal V. Axial Flow Compressors for Marine and Industrial Gas Turbines	1949
	20	Centrifugal V. Axial Flow Compressors for Aircraft Gas Turbines	1949
	21	Oil Smoke Screening with Gas Turbine Engine Aircraft – Part 1. Interim Report – Royal Aircraft Establishment	1949
	22	Endurance Flight Test of a Vampire I Aircraft Using Neat Fuel to Specification RDE/F/KER/206 – National Gas Turbine Establishment Memorandum No. M.61	1949
	23	Design of an Air Cooled Jet Pipe Suitable for Installation in a Valiant Aircraft	1952
3	1	Flight Tests of Rolls-Royce Conway Engine at R. Co. 5 and R. Co. 8 Ratings in Ashton F.T.B.W.B.491 – National Gas Turbine Establishment NT. #296	1957
	2	The Birth of an Engine: British Practice in Aviation Engine Procurement and Development	1953
	3	Fuel Atomisers for Gas Turbines – Shell Petroleum Co. Ltd. – Technical Report #1.C.T./15	n.d.
	4	The Advent of the Aircraft Turbine	n.d.
	5	Handling of Engine Test Results	n.d.
	6	Modern Methods of Testing Aero-Engines and Power Plants	n.d.
	7	The Bypass Jet Engine – Turbines Jets and Rockets Subcommittee – Aeronautical Research Council	n.d.
	8	A Note on production, Design, Development, and Research, With Special Reference to Aircraft Gas Turbine Power Plant	n.d.
	9	Descriptive Memorandum of Gyron W.1. as installed in Gloster Aircraft E.28/39	n.d.
	10	National Gas Turbine Establishment – Engine Running Progress Reports	June '47-June '50

## **Series 2: Correspondence**

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
3	11	Correspondence (Including Trip Reports)	1940
	12	Correspondence (Including Trip Reports)	1941
	13	Undated Correspondence Found Filed With 1941 Docs.	n.d.
	14	Correspondence Dealing with Projected Compound Engines	1941
	15	Correspondence (Movable Guide Vane Info.)	1942

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
3	16	Correspondence Dealing with Rolls-Royce – Rover B.26 Engine Development	1942
	17	Correspondence/Patent Information	1942-1944
	18	Correspondence Dealing with Rolls-Royce Takeover from Rover	1942-1943
	19	Correspondence	1943
	20	Correspondence	1944
4	1	Correspondence – Weekly Flight Progress Reports of Gloster E.28/39 Aircraft	1944-1945
	2	Correspondence Dealing with L.R.1 Axial Flow Compressor Design	1945
	3	Correspondence (Radio Broadcast Script)	1945
	4	Correspondence (Power Jets Ltd. Employee List)	1946
	5	Correspondence Dealing with Reheat [Afterburner] Development	1950-1952

### **Series 3: Photographs**

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
4	6	Photographs of Gloster E.28/39	1941-1945
	7	Photographs of W2/700.M Engine Cross-Section	1945
	8	Photographs of jet Engines	1949-1950
	9	Photographs of Foreign Objects Damage to Compressor Section of Jet Engine	1949
	10	Photographs of Stanfford Cripps and Co. Visit to Whetstone	1945
	11	Photographs of Thrust Reverser	1950

### **Series 4: Technical Drawings and Charts**

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
4	12	Drawings of Jet Engines	1940
	13	Drawings (Graphs) of L.R.1 Axial Flow Compressor	1945
	14	Organizational Chart for the National Gas Turbine Establishment	n.d.
	15	Chart 1 – Experimental and Pre-Production Programme	1964

### **Series 5: Miscellaneous**

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
4	16	Power Jets Listing of Technical Reports	1944
	17	Gas Turbine Power Plant Biography	1947
	18	Basis for Script of Instructional Film	n.d.

<u>Box</u>	<u>File</u>	<u>Description</u>	<u>Date</u>
4	19	Talk to Dominion Personnel by Wing Commander Lees – Part Played by Power Jets Ltd. In the Development of Jet Propulsion	n.d.
	20	“Turbo Jet” – Movie Script	n.d.
	21	“Topics Related to The Air Technical Efforts During the Last Ten Years of Japanese Navy Within My Personal Experiences” – Osama Nagano	n.d.