



Smithsonian  
*National Museum of American History*  
*Kenneth E. Behring Center*

## Guide to Whirlwind Computer Collection

NMAH.AC.0290

Craig A. Orr

1994

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## Collection Overview

<b>Repository:</b>	Archives Center, National Museum of American History
<b>Title:</b>	Whirlwind Computer Collection
<b>Identifier:</b>	NMAH.AC.0290
<b>Date:</b>	1945-1959
<b>Extent:</b>	10.3 Cubic feet (Includes 31 vertical boxes)
<b>Creator:</b>	Massachusetts Institute of Technology Mathematics, Division of (NMAH, Smithsonian Institution).
<b>Language:</b>	English  English.

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## Administrative Information

### Immediate Source of Acquisition

This collection was donated by the MITRE Corporation, February 1983. The Whirlwind I Computer Project originated at the Servomechanics Laboratory at the Massachusetts Institute of Technology (M.I.T.) in 1945. The records were transferred in 1959 to the MITRE Corporation.

### Ownership and Custodial History

This collection was transferred to the Archives Center from the Division of Physical Sciences and Mathematics, September 1987. Additional records were transferred to the Archives Center, January 1998.

### Location of Originals

Project Whirlwind Collection is located at the Massachusetts Institute of Technology, Institute Archives and Special Collections (<http://libraries.mit.edu/archives/research/collections/collections-mc/mc665.html#ref31>). Originals of material on microfilm in series 16 of this collection are held at the Archives Center, National Museum of American History. They were donated in 1970 by the MITRE Corporation.

### Available Formats

Whirlwind Computer Collection records held in the Archives Center, National Museum of American History, were microfilmed by MITRE and the microfilm is (as of 2007) located in the Project Whirlwind Collection at the MIT Institute Archives (Series 16 of MC 665).

Digital copies of selected material are located in DOME (<http://dome.mit.edu/>), the MIT Libraries digital repository.

## Processing Information

Processed by Craig Orr (archivist), June, 1994, revised, Craig Orr, March 1998; revised Alison Oswald November, 2004; October, 2010.

## Preferred Citation

Whirlwind Computer Collection, 1945-1959, Archives Center, National Museum of American History

## Restrictions

The collection is open for research use.

## Conditions Governing Use

Collection items available for reproduction, but the Archives Center makes no guarantees concerning copyright restrictions. Other intellectual property rights may apply. Archives Center cost-recovery and use fees may apply when requesting reproductions.

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## Biographical / Historical

Project Whirlwind was sponsored by the Special Devices Center of the Office of Naval Research from 1945 to 1952. The original objective of the project was the development of a device that would simulate airplanes in flight. As the project progressed, other applications of the computer evolved.

The project was centered in the Servomechanisms Laboratory of the Massachusetts Institute of Technology (M.I.T.). In the course of the research, Whirlwind evolved from an aircraft simulator into a high speed digital computer and finally into a key element of the United States' early air defense system. In 1948, M.I.T., believing that it was inappropriate for an educational institution to be so heavily involved in air defense research, transferred Whirlwind responsibility to the new M.I.T. Lincoln Laboratory in 1952. There, under the direction of Jay Forrester, pioneering work was done on magnetic core memory. MITRE's Whirlwind group spun off from Lincoln Laboratory to the new MITRE Corporation in 1958. Whirlwind served SAGE (Semiautomatic Ground Environment) air defense activities until being retired in May of 1959.

Whirlwind I was of the high-speed electronic digital type, in which quantities were represented as discrete numbers, and complex problems were solved by the repeated use of fundamental arithmetic and logical operations. Computations were executed by fractional microsecond pulses in electronic circuits, of which the principal ones were the flip-flop, the gate coincidence circuit and the magnetic core memory. Whirlwind I used numbers of 16 binary digits; this length was selected to limit the machine to a practical size.

The Whirlwind I Computer was utilized by such projects as Navy Fire Control, Air Traffic Control, the Cape Cod System, Experimental SAGE Sector, and many others. Whirlwind I spawned two computers, the MTC (memory test computer) and TX O (transistor computer), both developed by ESS Installation Group 63.

The Whirlwind I Computer and its facilities were later leased to the Wolf Research and Development Corporation, West Concord, Massachusetts, under Navy Lease Contract Nonr 2956(00) in 1963. Kent C. Redmond and Thomas M. Smith wrote a history of the project, *Project Whirlwind: Case History* (Bedford, Massachusetts: The MITRE Corporation, 1975).

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## Scope and Contents

This collection consists of over 2,516 items, housed in 31 document boxes. The material is arranged into chronological order and covers the project dates of 1945- 1959. The items were originally classified Secret, Confidential, and Unclassified.

The collection is arranged into four series: Series 1, Summary Reports; Series 2, Bi-weekly Reports; Series 3, Correspondence, Memoranda, and Reports; and Series 4, Indexes. The summary reports include originals of "Summary Report #1, April, 1946" and "Summary Report #2," in twenty-two volumes, and photocopies of summary reports #3 through #40. The bi-weekly reports, covering the period December, 1947 to May, 1953, are arranged chronologically. The bulk of the collection consists of correspondence, notes, memos, and reports. These date from August, 1945 to January, 1959 and are arranged chronologically. A 210 page index to the reports and correspondence (prepared by Whirlwind project personnel) is located in box 31. This guide has a table of contents and lists topic, author, date, and identification number for all items in the collection. Other indexes are located in boxes 30 and 31.

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## Arrangement

The collection is arranged into four series.

Series 1: Summary Reports, 1946-1954

Series 2: Bi-weekly Reports, 1947-1953

Series 3: Correspondence, Memoranda, and Reports, 1945-1959

Series 4: Indices, undated

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## Names and Subject Terms

This collection is indexed in the online catalog of the Smithsonian Institution under the following terms:

Subjects:

- Aerospace engineering
- Airplanes
- Computer science
- Computers
- Flight Simulation

Types of Materials:

- Papers
- Reports

Names:

- "MITRE Matrix"
- Everett, Robert R.
- MITRE Corporation
- Mathematics, Division of (NMAH, Smithsonian Institution).

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## Container Listing

### Series 1: Summary reports, 1946-1954

Summary report #1, 1946 April

*Box 1*

Summary report #2, volumes, 1-8, undated

*Box 1*

Whirlwind Computer Block Diagram, volumes, 1-2, , 1947 September

*Box 1*

Summary report #2, volumes 9-13, undated

*Box 2*

Summary report #2, volumes 14-19, undated

*Box 3*

Summary report #2, volumes 20-22, undated

*Box 4, Folder 1-3*

Summary reports, volumes 3-12, , 1947-1949

*Box 4, Folder 4*

Summary reports, volumes 13-20, , 1949-1954

*Box 4, Folder 5*

Summary reports, volumes 21-28, , 1949-1951

*Box 5, Folder 1*

Summary reports, volumes 29-35, , 1952-1953

*Box 5, Folder 2*

Summary reports, volumes 36-38, , 1953-1954

*Box 5, Folder 3*

Summary reports, volumes 39-40, , 1954

*Box 5, Folder 4*

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## Series 2: Bi-weekly reports, 1947-1953

1947 December - 1949 March, 1947 December - 1949 March

*Box 6, Folder 1-7*

1949 April - 1950 June, 1949 April - 1950 June

*Box 7, Folder 1-5*

1950 October - 1952 March, 1950 October - 1952 March

*Box 8, Folder 1-7*

1952 April - 1953 May, 1952 April - 1953 May

*Box 9, Folder 1-6*

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## Series 3: Correspondence, memoranda, and reports, 1945-1959

1945 August -- 1946 April, , 1945 August – 1946 April

*Box 10, Folder 1-9*

1946 May - 1947 March, 1946 May - 1947 March

*Box 11, Folder 1-12*

1947 April - 1947 September, 1947 April - 1947 September

*Box 12, Folder 1-7*

1947 October - 1947 December, 1947 October - 1947 December

*Box 13, Folder 1-8*

1947 December - 1948 April, 1947 December - 1948 April

*Box 14, Folder 1-6*

1948 April - 1948 June, 1948 April - 1948 June

*Box 15, Folder 1-7*

1948 July - 1948 September, 1948 July - 1948 September

*Box 16, Folder 1-5*

1948 October - 1948 December, 1948 October - 1948 December

*Box 17, Folder 1-5*

1948 December - 1949 March, 1948 December - 1949 March

*Box 18, Folder 1-5*

1949 April - 1949 June, 1949 April - 1949 June

*Box 19, Folder 1-5*

1949 July - 1949 October, 1949 July - 1949 October

*Box 20, Folder 1-5*

1949 November - 1950 May, 1949 November - 1950 May

*Box 21, Folder 1-7*

1950 June - 1950 November, 1950 June - 1950 November

*Box 22, Folder 1-7*

1950 December - 1951 July, 1950 December - 1951 July

*Box 23, Folder 1-8*

1951 August - 1952 March, 1951 August - 1952 March

*Box 24, Folder 1-8*



1952 April - 1952 November, 1952 April - 1952 November

*Box 25, Folder 1-8*

1952 December - 1953 December, 1952 December - 1953 December

*Box 26, Folder 1-13*

1954 January - 1955 April, 1954 January - 1955 April

*Box 27, Folder 1-16*

1955 May - 1957 May, , 1955 May - 1957 May

*Box 28, Folder 1-19*

1957 June - 1959 January, 1957 June - 1959 January

*Box 29, Folder 1-20*

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## Series 4: Indices, undated

Index prepared at MIT's Lincoln Lab, undated

*Box 30, Folder 1-5*

Duplicate indexes, index to reports and correspondence, , undated

*Box 30, Folder 6-13*

Inventory of summary reports and bi-weekly reports, undated

*Box 31, Folder 1*

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