Guide to the Project Whirlwind Collection
MC.0665

Finding aid prepared by Elizabeth Andrews and Mikki Macdonald

of the MIT Institute Archives. Descriptions for Series 1-16

were created by the staff of the MITRE Corporate Archives.

This finding aid was produced using the Archivists' Toolkit

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Describing Archives: A Content Standard

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Table of Contents

Summary Information

Repository	Massachusetts Institute of Technology. Institute Archives and Special Collections
Creator	Everett, Robert R.
Creator	Forrester, Jay Wright
Title	Project Whirlwind Collection
Date [inclusive]	1944-1959
Extent	56.3 cubic feet in 189 boxes including 142 microfilm reels and 1800 digital objects
Location	Materials are stored off site. Advance notice is required for use.
Language	English
Abstract	The Whirlwind I computer was developed at the Massachusetts Institute of Technology between 1945 and 1952 in a project directed by Jay Forrester. The project was first carried out in the Servomechanisms Laboratory. Later it separated to become the Digital Computer Laboratory and Lincoln Laboratory, Division 6, and testing continued through 1958. Jay Forrester served as director of both laboratories until 1956, and Robert Everett as associate director, then director. A key part of the Whirlwind I design was the high-speed and highly reliable magnetic core memory for the computer storage system, replacing electrostatic storage tubes. Jay Forrester was issued a patent for the magnetic core memory, and it was used successfully and widely in large computers.

Citation

Project Whirlwind Collection, MC 665, box _. Institute Archives and Special Collections, Massachusetts Institute of Technology, Cambridge, Massachusetts

Historical note

The development of Whirlwind I, one of the first large-scale high-speed computers, began during World War II as part of a research project to develop a universal flight trainer that would simulate flight (the Aircraft Stability and Control Analyzer project). It was initiated by the Office of Naval Research and began at the Massachusetts Institute of Technology Servomechanisms Laboratory in 1944. Eventually the focus of the grant, a flight simulator (using an analog computer), changed to developing a high-speed digital computer. While building the computer, researcher Jay W. Forrester invented random-access, coincident-current magnetic storage, which became the standard memory device for digital computers. For this he was granted a patent in 1956. Prior to Forrester's discovery, electrostatic storage tubes were used. The introduction and change to magnetic core memory provided high levels of speed and of reliability.

A public announcement was made in late 1951 that the computer known as Whirlwind I was operational and available for scientific and military research. In 1951 Project Whirlwind was detached from the Servomechanisms Lab to become the Massachusetts Institute of Technology Digital Computer Laboratory. Unclassified research projects using the Whirlwind I computer were managed by the Digital Computer Lab staff on the MIT campus, where Whirlwind I occupied the Barta Building (N42), which had been acquired in 1947 to provide sufficient space for the computer as it was designed and constructed. In 1952 staff working on classified projects left to be part of the newly organized Lincoln Laboratory off campus, to form Division 6, Digital Computer Division. Although their projects were classified, the Whirlwind computer itself was not, and remained in the Barta Building. Jay Forrester served as director of both the Digital Computer Laboratory and Division 6, Lincoln Laboratory until 1956, when he became a member of the MIT faculty pursuing interests in system dynamics in management. Robert Everett served as associate director of both labs until he succeeded Forrester as director.

Division 6 – Digital Computer Division was initially comprised of six groups that were primarily concerned with Whirlwind I, Whirlwind II, Cape Cod System, Magnetic Materials, and Storage Tubes. The Division was eventually expanded to nine groups:

Group 60 – Administration and Services Group 61 – System Design Group 62 – ESS Installation Group 63 – Digital Comuter Development Group 64 – ESS Shakedown Testing Group 65 – Vacuum Tubes Group 66 – Special Studies Group 67 – Advance SAGE Program Development Group 68 – System Office

The U.S. Air Force provided substantial financial support for Whirlwind applications and it was a key component in the design of the Air Force's SAGE (Semi-Automatic Ground Environment) air defense system in the 1950s. Research projects at Lincoln Laboratory resulted in the further development of two additional computers, the MTC (memory test computer) and TX-0 (transistor computer), by Group 63 of Lincoln Lab, Division 6.

In July 1958 the MITRE Corporation was incorporated as a non-profit organization to continue classified research and development projects that had transitioned to an operational stage and needed to be phased

out of Lincoln Laboratory. Robert Everett joined MITRE at that time as technical director, later serving as president of MITRE from 1969 to 1986.

As described in MIT's *Tech Talk*, "the Beast" of the Barta Building, the Whirlwind I computer, was shut down on May 29, 1959. It was leased by the Navy to the Wolf Research and Development Corporation of Massachusetts, and was disassembled and moved out of the Barta building in the spring of 1960. Computer artifacts from Whirlwind I and related Whirlwind projects are held by the Massachusetts Institute of Technology Museum and the Computer History Museum, Mountain View, California.

Scope and Contents of the Collection

The collection consists of laboratory research computation books, computer logbooks, memoranda, technical notes and reports. Materials were created by staff in the Massachusetts Institute of Technology Servomechanisms Laboratory, Digital Computer Laboratory, and Lincoln Laboratory, Division 6, who worked on the development of the Whirlwind I Computer, one of the first high-speed digial computers. Whirlwind I was tested and applied in the Navy Fire Control, Air Traffic Control, Cape Cod System, and SAGE continental air defense system planning and design projects.

Progress of daily research activities can be followed in the various chronologically numbered memoranda and notes. Memoranda are the most numerous and informal presentations of technical work. Classified research was conducted at Lincoln Laboratory, unclassified research in the Digital Computer Laboratory at MIT, each research group creating its own series of documents. Overall progress of research can be followed chronologically by consulting across series. Research staff numbered and dated reports, so that chronology of work is easy to follow. Summary reports were created to share information with other researchers and the government offices funding the research.

Some material is grouped by specific projects, which are represented by their own series in this collection. For example, Whirlwind I led to the development of two other computers, the MTC (memory test computer) and TX-O (transistor computer) by Group 63 of Lincoln Laboratory, Division 6. Memoranda from both MTC and TX-O are included in this collection, as series 10 and series 14.

During academic year 1952-1953 a series of seminars on magnetism was given by Arthur L. Loeb. Notes were taken by Norman Menyuk. “M” Memoranda on the subjects of “Classical Magnetism and Qualitative Discussion of the Solid State,” “Principles of Quantum Mechanics: Quantitative Explanation of Fermi and Exchange Energies,” and “Review of Some Recent Fundamental Research in Magnetism” can be found in series 7.

Records created during the development of the computer were transferred from the Massachusetts Institute of Technology and MIT's Lincoln Laboratory to the MITRE Corporation when test projects were complete and Division 6, Lincoln Laboratory was phased out. Records were pulled for legal counsel defending the magnetic core patent. After the patent suit was settled those records were transferred to the Institute Archives (collection AC 337). Jay Forrester's research notebook #47, which documents his initial

notes on random-access, coincident-current magnetic storage for memory, is located in AC 337, along with other computation notebooks and documents used to defend the patent lawsuit.

Another subset of documents were sent by MITRE to the Smithsonian in 1970, and are held by the Archives Center, National Museum of American History. Microfilm of those records can be found in series 16 of this collection, and digital copies of those documents can be found in DOME, the MIT Libraries digital repository. Photographs of Whirlwind I research are located at the MITRE Corporate Archives.

Administrative Information

Publication Information

Massachusetts Institute of Technology. Institute Archives and Special Collections

Revision Description

2009

Access note

The collection is open for research. Documents have been reviewed and unclassified prior to transfer.

Source of Acquisition

Records in this collection were created at the Massachusetts Institute of Technology Servomechanisms Laboratory, the Massachusetts Institute of Technology Digital Computer Laboratory, and Lincoln Laboratory, Division 6 as part of research projects sponsored by the Office of Naval Research and the U.S. Air Force. They were brought to the MITRE Corporation by Robert Everett when MITRE was formed to continue the work of Lincoln Laboratory, Division 6, in 1958.

Materials in series 1-16 were assembled and arranged by the archives staff of the MITRE Corporation prior to transfer to MIT in 2008. Additional documents from the holdings of MIT Institute Archives technical reports were added to create series 17-24. Series 17, A memos, combines holdings from MITRE and existing reports holdings of the MIT Institute Archives.

Digital versions of documents on microfilm were created by the MITRE Corporation and transferred as pdf files to the MIT Institute Archives, then cataloged by staff of the MIT Libraries for deposit in MIT Libraries' digital repository, DOME.

Location of Copies

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, the MIT Libraries digital repository,

Location of Originals

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.

From the set of original Whirlwind records items were pulled for the use of legal counsel when MIT became a party to the litigation of the core memory patent. Those records were later transferred from the law firm to the Institute Archives and Special Collections and accessioned into the holdings as AC 337, Patent Litigation records.

Photographs created by Project Whirlwind staff are located at the MITRE Corporate Archives.

Related Materials

Related Archival Materials note

Collections in MIT Institute Archives

Jay Wright Forrester Papers
MC 432
MIT Digital Computer Laboratory Records
AC 362
MIT Servomechanisms Laboratory Records
AC 151
Karl L. Wildes Papers
MC 322
Computers at MIT Oral History Collection
MC 131
Magnetic Core Memory Patent Litigation Records
AC 337

Material in Other Institutions

MITRE Photo Archives
MITRE Corporation

Whirlwind Computer Collection, 1945-1959
National Museum of American History, Archives Center
Oral History Database
Charles Babbage Institute Collections, University of Minnesota

Controlled Access Headings

Corporate Name(s)

- Lincoln Laboratory. Division 6
- Massachusetts Institute of Technology. Digital Computer Laboratory
- Massachusetts Institute of Technology. Servomechanisms Laboratory
- MITRE Corporation

Personal Name(s)

- Everett, Robert R.
- Forrester, Jay Wright

Subject(s)

- Computers--History
- DIC 6345
- Electronic digital computers--History
- Magnetic cores
- Project Whirlwind
- Whirlwind computer

Other Aids to the Collection

Detailed indexes to items in series 1 through 16, are located in boxes 1 and 2 of series 25 and in DOME, the MIT Libraries digital repository.

Bibliography

Redmond, Kent, and Thomas Smith. *Project Whirlwind: The History of a Pioneer Computer*. Bedford, MA: Digital Press, 1980.

Everett, Robert R. *A History of Computing in the Twentieth Century*, chapter on Whirlwind. Academic Press, 1980.

Wildes, Karl, and Nilo Lindgren. *A Century of Electrical Engineering and Computer Science at MIT, 1882-1982*, chapter 17 "From Whirlwind to SAGE," 280-301. Cambridge: MIT Press, 1985, pages 280-301.

Redmond, Kent, and Thomas Smith. *From Whirlwind to MITRE, the R & D Story of the SAGE Air Defense Computer*. Cambridge: MIT Press, 2000.

Collection Inventory

Series 1 Laboratory Computation Notebooks 1944-1958

Scope and Contents Note

Originated by the Servomechanisms Laboratory, Digital Computer Laboratory, and Division 6 personnel, the contents of these notebooks pertain to Aircraft Stability and Control Analyzer (6295), Navy Fire Control (6782), Whirlwind I (6345), and various Division 6 projects. A limited number of these books concern thesis research done by both graduate and undergraduate students. An appendix to this collection contains notebooks that were kept on tube testing in Whirlwind I.

Books are filed alphabetically by author's surname. This series comprises MITRE collection AC 3. Selected notebooks were donated by MITRE to the Archives Center, National Museum of American History, and can be found in their Whirlwind Computer Collection. Other notebooks were pulled for use of legal counsel and can be found in the MIT Instiute Archives collection, AC 337.

	Box
Adams – Angus (5 books)	1.01
Angus – Barlow (7 books)	1.02
Becker – Blumenthal (8 books)	1.03
Blumenthal – Boyd (8 books)	1.04
H.R. Boyd (6 books)	1.05
H.R. Boyd – H.W. Boyd (6 books)	1.06
Brock – Campling (5 books)	1.07

Campling – Cann (7 books)	1.08
Caswell (5 books)	1.09
Caswell (4 books)	1.1
Caswell – Clough (5 books)	1.11
Clough (5 books)	1.12
Clough (4 books)	1.13
Clough – Corderman (7 books)	1.14
Corderman – Crowley (7 books)	1.15
Crowley – DiGiorgio (9 books)	1.16
Di Vincenzo – Ellis (9 books)	1.17
Ellis – Ely (7 books)	1.18
Ely – Everett (9 books)	1.19
Everett (10 books)	1.2
Everett – Fahnestock (9 books)	1.21
Farnsworth – Flanagan (5 books)	1.22
Flanagan – Florencourt (6 books)	1.23
Florencourt (6 books)	1.24
Forbes – Gaff (8 books)	1.25

Gaff – Greenwood (5 books)	1.26
Greenlaw – Harvey (8 books)	1.27
Hayes – Heydt (8 books)	1.28
Hoberg - Hollnagel (7 books)	1.29
Holmes – Hunt, J. (7 books)	1.30
Hunt, R.E. – Jacobwitz (5 books)	1.31
Jacobwitz – Jahn (4 books)	1.32
Kaplan – Kirk (7 books)	1.33
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Leary – Lee (8 books)	1.35
Leslie – Loud (7 books)	1.36
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Loud – Macdonald (8 books)	1.38
MacKechnie – Mann, M (7 books)	1.39
Margolin – McCusker (7 books)	1.4
McCusker (8 books)	1.41
McVicar (7 books)	1.42
McVicar - Mercer (7 books)	1.43

Morrisson – Nardone (7 books)	1.44
Nelson, L.W. – Nelson, R.A. (6 books)	1.45
Nelson, R.A. – O'Brien, J.A. (7 books)	1.46
O'Brien, J.J. (7 books)	1.47
O' Rourke – Parkins (5 books)	1.48
Parkins – Pickel (6 books)	1.49
Pickett (4 books)	1.5
Pickett (4 books)	1.51
Pickett - Platt (7 books)	1.52
Poland – Reich (7 books)	1.53
Remis – Rising (7 books)	1.54
Rising – Row (7 books)	1.55
Rowe – Savio (7 books)	1.56
Savio – Shumrak (9 books)	1.57
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Tuttle – Wimett (9 books)	1.62
Young – Youtz (7 books)	1.63
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Youtz (4 books)	1.65
Youtz (3 books)	1.66
Youtz (3 books)	1.67
Youtz (4 books)	1.68
Youtz – Zimbel (6 books)	1.69
5-digit multiplier logbooks (9 books)	1.7
TV readout and demonstrator logbooks (4 books)	1.71
TV readout and demonstrator (2 books)	1.72
Component testing (2 books)	1.72
Allocation book – Air traffic control staff allocation (1 book)	1.72
Storage tube video and RF line-up log (1 book)	1.72
Brata 222 log (1 book)	1.72
Filament voltage WWI (1 book)	1.72
Lab power supplies (1 book)	1.73
Life test unit (1 book)	1.73

Special tests (1 book)	1.73
Test data multiplier (1 book)	1.73
Test tube data (2 books)	1.73
Vacuum tube testing (2 books)	1.73
Life data components multiplier (1 book)	1.73
Miscellaneous tubes II (1 book)	1.73
Tube testing data (9 books)	1.74
Tube testing data (9 books)	1.75

Series 2 Whirlwind I Computer Logbook Photocopies 1948-1952

Scope and Contents note

Project Whirlwind was sponsored by the Special Devices Center of the Office of Naval Research under Contract N5ori-60. 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.

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. The basic elements of the computer were the control, input and output, electrostatic storage and the arithmetic element.

The arithmetic element of Whirlwind I was a parallel digit type with pulsed accumulator, a high speed carry, combined shift and carry for multiplication, and higher repetition frequency for the multiplication operation. The arithmetic element consisted of three registers; an accumulator (AC) or adding unit, which held the result of an arithmetic operation; an A-Register (AR), which received the number from

the main bus and held the multiplicand during multiplication; and a B-Register (BR), an auxiliary register which held the multiplier during multiplication.

Testing of the complete A-Register was begun on December 15, 1948 along with the B-Register and Program Registers (PR). Log Books were kept from that date until June 11, 1952. The log books eventually broadened in range to reflect the daily operation of the computer.

The Whirlwind I Computer was leased to the Wolf Research and Development Corporation, West Concord, Massachusetts, under Navy Lease Contract Nonr-2956(00) in 1963.

This series was MITRE collection AC 101.

	Box
Whirlwind I computer log books 1948 December to 1950 May	2.01
Whirlwind I computer log books 1950 June to 1951 February	2.02
Whirlwind I Computer log books 1951 March to 1952 January	2.03
Whirlwind I Computer log books 1952 February to 1952 June	2.04

Series 3 Aircraft Stability and Control Analyzer Memoranda and Reports 1944 November to 1945 December

Scope and Contents note

Navy contract number NOa(S) 5216 and MIT Grant Project number 6295. This contract was awarded to investigate the feasibility of using an electrical computing machine which would be capable of accurate rapid and continuous solution of equations of motion and the accompanying auxiliary equations of an airplane.

As a result of this study, the Navy awarded a contract to the Servomechanisms Laboratory to design and construct the Whirlwind I Computer.

The series is arranged in chronological order. This series was MITRE collection AC 1.

	Box
Reports 1944 August to 1945 December	3.01
Drawings 20000 – 20385 oversize	3.02
Drawings 20386 – 20710 oversize	3.03
Drawings 20711 – 20778 oversize	3.04

Series 4 Naval Fire Control Project Memoranda and Reports 1950-1953

Scope and Contents note

Contract N5ori-06002, Project NR-232-001, was awarded to MIT's Servomechanisms Laboratory by The Computer Branch Office of Naval Research. Work under this contract was performed from July 1950 through June 1951 by Supervisor R. A. Nelson and Research Assistants J. M. Dodd, Jr. and A. Katz under the general direction of R. R. Everett.

Known as DIC Project 6782, the group studied the possible application of digital techniques to the naval fire-control problem. With the use of the Whirlwind I computer, enough programming was done to demonstrate that digital computer techniques could perform the functions performed by analog fire-control equipment, such as the Mark 47 system.

Work performance of the contract may be found in the Project Bi-Weekly and Quarterly Progress Reports. The complete report of work performed, and the conclusions and recommendations, may be found in R-231.

On June 20, 1951, Jay Forrester, director of MIT's Servomechanisms Laboratory, proposed an extension of this contract. The proposal was accepted by the Office of Naval Research, and the work period was extended to June 1952.

Under the direction of W. K. Linvill, the project was primarily concerned with the programming problems related to the computer's ability to make decisions, and use of the digital computer in simulation of other equipment.

This series was MITRE collection AC 2.

	Box
Memoranda 1950-1953	4.01

Series 5 Magnetic Materials Studies Memoranda and Reports 1951-1958

Scope and Contents note

The urgent need for improved reliability of high-speed digital computers spurred the search for components having longer life. Lincoln's Group 62 investigated the use of ferromagnetic and ferroelectric materials and their adaptability to digital computer circuits.

In September 1953, Group 63 installed two 32 x 32 x 17 ferrite-core-magnetic-memory banks in the Whirlwind I Computer, and increased the usable computer time from 80 to 92.5 percent. A larger 64 x 64 x 17 ferrite-core memory was installed in the MTC (prototype of the Whirlwind II air defense computer) in February 1954. Group 63 also provided the ferrite cores for the magnetic core memory of the Lincoln TX-0 computer.

Group 63 was also responsible for ensuring that satisfactory cores were provided for the high-speed, coincident-current memories of the AN/FSQ-7's.

The series is arranged in chronological order. This series was MITRE collection AC 20.

	Box
Memoranda 1951 December to 1954 January	5.01
Memoranda 1954 February to 1956 October	5.02

Memoranda 1956 November to 1958 September	5.03

Series 6 Transistor Studies Memoranda and Notes 1951-1958

Scope and Contents note

In an effort to provide a faster and more reliable computer for the air defense system, Lincoln's Group 62 established the Transistor Section. This section was charged with the responsibility of studying the transistor as a possible component in the Whirlwind II system and of evaluating the performance in terms of maximum reliability with the maximum possible speed obtainable.

In 1955, Lincoln's Group 63 designed and constructed the TX-0 computer to demonstrate a computer using high-speed transistor circuitry and to gain operating experience with transistor systems which communicated with core memory and terminal systems.

The series is arranged in chronological order. This series was MITRE collection AC 19.

	Box
Engineering notes and memoranda 1954 May to 1958 August	6.02
Engineering notes and memoranda, October 1951 – March 1954 1951 October to 1954 March	6.01

Series 7 Group 63 Seminar on Magnetism Memoranda 1952-1955

Scope and Contents note

A series of seminars on magnetism were given by Arthur L. Loeb during the academic year 1952-1953. The seminar was divided into three categories:

A. Classical Magnetism and Qualitative Discussion of the Solid State (Series I through XVIII) B. Principles of Quantum Mechanics; Qualitative Explanation of Fermi and Exchange Energies (Series XIX through XXXV) C. Review of Some Recent Fundamental Research in Magnetism (Series XXXV through LV)

A breakdown of the topics discussed during the seminar may be found in M-2260.

The series is filed numerically by series, with an appendix containing material pertinent to the seminar. This series was MITRE collection AC 12.

	Box
Seminar on magnetism 1952-1953	7.01

Series 8 Group Leaders' Meetings Minutes 1952-1958

Scope and Contents note

The first of these Group Leaders' Meetings was held on March 26, 1952. Those attending agreed to meet each Monday morning. The meetings covered all phases of Division 6 activity – technical, administration, and personnel.

Beginning with the August 1958 meetings, the minutes include various topics of discussion regarding the newly chartered MITRE Corporation.

The series is arranged in chronological order. This series was MITRE collection AC 9.

	Box
Meeting memoranda 1952-1958	8.01

Series 9 Test Equipment Committee Meeting Minutes 1952-1958

Scope and Contents note

The Test Equipment Committee was formed in April 1952 at the Group Leaders' Meeting of April 21. D. R. Brown (Group 63) was selected chairman. The first meeting was held on May 9; however, minutes of the meetings were not issued until July 1952. The Test Equipment Committee generally met twice a month, and did so until December 1958. See L-39.

The series is arranged in chronological order. This series was MITRE collection AC 13.

	Box
Meeting memoranda 1952-1958	9.01

Series 10 Memory Test Computer Memoranda 1952-1958

Scope and Contents note

Initially referred to as the WWI½ and later as the WWIA, the Memory Test Computer (MTC) was a prototype of the WWII air defense computer. Designed and constructed in 1952 by Lincoln Laboratory's Group 62 and Group 63, MTC was built to test new computer elements. It was first used to test the practicability of a coincident-current magnetic memory.

The Memory Test Computer was a parallel computer with a word length of 16 binary digits. MTC had the same general characteristics of Whirlwind I. The computer had its first run in March 1953 and the MTC memory was installed and operational by the end of May.

The first application of MTC as a computer was to estimate the probable time necessary to transmit a group of messages from ground to aircraft over the G.E. data-link system. The Memory Test Computer was also used to test equipment for the Experimental SAGE Subsector, and to produce known data to test GFL, LRI and LRI monitor circuits before it was connected with XD-1.

MTC was shut down permanently on March 21, 1958 after all data processing activities had been transferred to the IBM-704.

The series is arranged in chronological order. This series was MITRE collection AC 23.

	Box
Engineering notes and memoranda 1952 July to 1955 November	10.01
Engineering notes and memoranda 1956 January to 1958 March	10.02

Series 11 Lincoln Laboratory, Division 6, Quarterly Progress Reports 1952-1958

Scope and Contents note

In addition to the Quarterly Progress Reports, Division 6 issued Biweekly Reports and individual Biweekly Reports.

The series is arranged in chronological order. This series was MITRE collection AC 39.

	Box
Quarterly Progress Reports 1952-1955	11.01
Quarterly Progress Reports 1956-1958	11.02

Series 12 Lincoln Laboratory, Division 6, Biweekly Reports 1953-1957

Scope and Contents note

The Division 6 staff discontinued the project Biweekly Reports (Whirlwind I and Air Defense) in May 1953. The work performed by the various groups was reported in a joint biweekly. The first of these, M-2183, was issued on May 22, 1953.

Projects included the following:

Group 61 – Defense (1963), SAGE System Test and Planning (1955), SAGE Operational Planning (1956), System Design (1956)

Group 62 – Whirlwind II (1953), AN/FSQ-7 Development (1954,AN/FSQ-7 Prototype Design and Installation (1955), Prototype Design and Installation (1956), ESS Installation (1956)

Group 63 – Magnetic Materials (1953), Advance Development (1955) Group 64 – Whirlwind I Computer (1953), AN/FSQ-7 Duplex and WWI (1954), Production AN/FSQ-7 and Cape Cod Direction Center (1955), ESS Test Planning – WWI and MTC Operation (1956), ESS Shakedown Testing – WWI and MTC Operation (1956)

Group 65 – Storage Tubes (1953),Vacuum Tubes (1955)

Group 66 – Production Coordination Office (1955), SAGE – Direction Center and Combat Center Sites (1956), SAGE DC and CC Sites Program Installation (1957) Group 67 – Computer Program Production (1956)

In September 1956, the Biweekly Reports were discontinued and the Division 6 Editorial Office replaced them with Crosstalk. Individual Groups began issuing their own reports late in 1956.

This series was MITRE collection AC 24.

	Box
Biweekly Reports 1953 May to 1953 December	12.01
Biweekly Reports 1954 January to 1954 October	12.02
Biweekly Reports 1954 November to 1955 June	12.03
Biweekly Reports 1955 July to 1957 August/September	12.04

Series 13 Scientific and Engineering Computation Group Biweekly Reports 1953-1957

Scope and Contents note

The Scientific and Engineering Computation Group provided computer engineering for Whirlwind I and developed a comprehensive system of service routines to simplify the process of coding for Whirlwind I.

The S & EC Group began issuing their own Biweekly Reports in June 1953, although earlier biweeklys may be found in the WWI Computer-Group 6345 Biweekly Reports.

The series is arranged in chronological order. This series was MITRE collection AC 26.

	Box
Biweekly Reports 1953 June to 1957 September	13.01

Series 14 TX-0 and TX-2 Computer Memoranda 1955-1958

Scope and Contents note

Designed and built at the MIT Lincoln Laboratory by Group 63 – Advance Development, the TX-0 and TX-2 experimental digital computers were constructed to check transistor circuitry and magnetic core memory. TX-2 was a research tool in scientific computations, data-handling, and real-time problems.

The Lincoln TX-2 computer was a general-purpose binary parallel machine with a code of 64 single-address instructions, and 64 index registers. The design provided for a random-access memory of 260,000 36-bit words. The instruction code includes the usual arithmetic and logic operations executed at a peak rate of 160,000 36-bit additions per second, with several interesting variants.

The series is arranged in chronological order. This series was MITRE collection AC 31. Reports and memoranda numbers start with 6M.

	Box	Folder
Memoranda, August 1955 – October 1958 1955 August to 1958 October	14.01	

Series 15 Microfilm of MITRE collection AC 133, Division 6 Engineering Drawings and Drawing Logbooks

Scope and Contents note

The drawings in this series date from 1945 to 1959. They are numbered from 30000 to 89325. The early ones relate to the Whirlwind Computer (Project 6345). Other projects included are 6469 (Hydraulic), 6673 (Air Traffic Control), and the XD-1 Comuter.

The drawings were filmed by size (A, B, etc.) and then by number, and are separated into the following categories: Drawings, Parts Lists, Flow Diagrams, Obsolete and Reshots.

The series consists of 73 microfilm rolls of drawings, drawing log books, and microfilm work sheets. This series was MITRE collection AC 133.

	Box	Folder
Reels 1 – 5, see box 20	15.01	
Reels 6 – 11, see box 20	15.02	
Reels 12 – 16, see box 20	15.03	
Reels 17 – 22, see box 20	15.04	
Reels 23 – 28, see box 20	15.05	
Reels 29 – 34, see box 20	15.06	
Reels 35 – 40, see box 21	15.07	
Reels 41 – 46, see box 21	15.08	
Reels 47 – 52, see box 21	15.09	

Reels 53 – 58, see box 21	15.1
Reels 59 – 64, see box 21	15.11
Reels 65 – 70, see box 21	15.12
Reels 71 – 73, see box 22	15.13
Drawing Logbook for 30000 to 37999	15.14
Drawing Logbook for 38000 to 48878	15.15
Drawing Logbook for 50000 to 55001	15.16
Drawing Logbook for 55002 to 62099	15.17
Drawing Logbook for 62100 to 78000	15.18
Drawing Logbook for 80000 to 89318	15.19
Contains boxes 1 – 6 of this series	15.2
Contains boxes 7 -12 of this series	15.21
Contains box 13 of this series	15.22
Lists of drawings on reels 1-54	15.23
Lists of drawings on reels 55-69	15.24

Series 16 Microfilm of MITRE Collection, AC 6, Whirlwind I Computer Records

Scope and Contents note

This series consists of 35 reels of microfilm copies of Whirlwind Computer records, reports, and correspondence. Originals of records on the microfilm were donated by MITRE to the National Museum of American History, Archives Center. Prior to transfer by MITRE, the collection of materials was designated as MITRE collection AC 6. Digital copies(PDFs) were made by MITRE Corporation of items on the first 30 reels of the microfilm, and are stored in the MIT Libraries digital repository, DOME. Hard copies of some of the reports represented on the microfilm and by digital copies were also part of the technical reports holdings of the MIT Institute Archives and constitute series 17 to 24 of this collection.

This series was MITRE collection AC 136.

Digital objects of Whirlwind I Computer records microfilm, 1944-1959

[http://dome-test.mit.edu/handle/1234567890/29657]

	Box
Whirlwind reports, reels 1 - 6	16.01
Whirlwind reports, reels 7 - 12	16.02
Whirlwind reports, reels 13 - 18	16.03
Whirlwind reports, reels 19 - 24	16.04
Whirlwind reports, reels 25 – 30	16.05
Whirlwind reports, reels 31 – 35	16.06

Series 17 Administrative Memoranda (A-series)

	Box
no.1-no.86 1946-1949	17.01

no. 88-no. 168 1949-1955	17.02
no. 169-no. 227 1955-1958	17.03

Series 18 Conference Notes (C-series)

	Box
nos. 10, 11, 12, 13, 24, 86, 88 -89, 91, 93-99, 102-106, 118 1946-1951	18.01

Series 19 Engineering Notes (E-series)

	Box
Project 6345, list of engineering notes, notes no. 1-no.129 1945-1948	19.01
Project 6345, notes no.131-no.250 1948-1949	19.02
Project 6345, notes no.251-no. 350 1949-1950	19.03
Project 6345, no.351-no. 440 1950-1951	19.04
Project 6345, no. 442-no. 560 1952-1953	19.05

Series 20 Limited Distribution Memoranda (L-series)

	Box

no.1-no.28 1947 October 1 to 1951 June 20	20.01

Series 21 Memoranda (M-series)

	Box
no. 5–no. 170 1946-1947	21.01
no. 171–no. 418 1947-1948	21.02
no. 434– no. 670 1948	21.03
no. 672–no. 850 1948-1949	21.04
no.851–no.990 1949-1950	21.05
no.992–no.1110 1950	21.06
no.1111– no.1210 1950-1951	21.07
no.1221– no.1360 1951	21.08
no.1361–no. 1506 1951-1952	21.09
no.1511– no.1673 1952	21.1
no.1675–no.1830 1952-1953	21.11
no.1831– no. 2019 1953 February to 1949	21.12
no.2021– no.2199 1949-1950	21.13
no.2203– no.2340 1953	21.14

no.2351–no.2474 1953-1954	21.15
no.2475, no.6M 2475 1953	21.16
no.2476–no.2629 1953-1954	21.17
no.2633– no.2798 1954	21.18
no.2803–no.3066 1954	21.19
no.6M 3072– no.6M 3287 1954-1955	21.2
no.6M 3291–no.6M 3538 1955	21.21
no.6M 3552–no.6M 3843 1955	21.22
no.6M 3851–no.6M 4024 1955	21.23
no.6M 4033– no.6M 4339 1955-1956	21.24
no.6M 4343–no.6M 4785 1956	21.25

Series 22 Reports (R-series)

	Box
no.36– no.125, incomplete 1945-1947	22.01
no.127– no.139, incomplete 1947-1948	22.02
no.140–no. 156, incomplete 1948-1949	22.03
no.157– no.167, incomplete 1949	22.04

no.168–no.173-2 1949-1951	22.05
no.174–no.177 1950	22.06
no.178–no.188 1950	22.07
no.189–no.199-1 1950-1951	22.08
no.200–no.213, incomplete 1951-1952	22.09
no.214–no.222, incomplete 1952-1953	22.1
no.224–no. 236, incomplete 1953-1955	22.11

Series 23 Digital Computer Laboratory Memoranda

	Box
no.11-no.113, incomplete 1954-1955	23.01

Series 24 Project Whirlwind Summary Reports 1946-1957

	Box
Machine Methods of Computation and Numerical Analysis Group Reports, no. 1-no.21 1951-1956	24.01
Project Whirlwind no.1-no.2, volume 8 1946-1947	24.02
Project Whirlwind, no.2, volume 9-no.2, volume 14 1947	24.03

Project Whirlwind, no. 2, volume 21 & volume 22, no. 3- no. 25 1947-1949	24.05
Project Whirlwind, no.2, volume 15-no.2, volume 20 1947	24.04
Project Whirlwind, no. 26-no.50 1951-1957	24.06

Series 25 Whirlwind Finding Aids

Scope and Contents note

Finding aids were created in the 1960s through the 1980s by staff of the MITRE Corporate Archives after material had been transferred from Lincoln Laboratory.

	Box
MITRE collection, AC 1, Aircraft Stability and Control Analyzer Memoranda and Reports, finding aid (MIT series 3) MITRE collection, AC 1, Aircraft Stability and Control Analyzer Memoranda and Reports, finding aid (MIT series 3), 1963 [http://libraries.mit.edu/archives/whirlwind/pdf/AC001_Aircraft_Stability_and_Control_Analyzer.pdf]	25.01
MITRE collection, AC 2, Navy Fire Control Memoranda and Reports, finding aid (MIT series 4) MITRE collection, AC 2, Navy Fire Control Memoranda and Reports, finding aid (MIT series 4), 1963 [http://libraries.mit.edu/archives/whirlwind/pdf/AC002_Navy_Fire_Control_6782.pdf]	25.01
MITRE collection, AC 3, MIT and Lincoln Laboratory Computation Books records, finding aid (MIT series 1)	25.01

MITRE collection, AC 3, MIT and Lincoln Laboratory Computation Books records, finding aid (MIT series 1), 1963 [http://libraries.mit.edu/archives/whirlwind/pdf/AC003_MIT_and_Lincoln_Lab_Computation_Notebooks.pdf]	
MITRE collection, AC 4 , MIT and Lincoln Laboratory Theses Research, 1945-1958, finding aid 1944-1958 MITRE collection, AC 4 , MIT and Lincoln Laboratory Theses Research, 1945-1958, finding aid , 1963 [http://libraries.mit.edu/archives/whirlwind/pdf/AC004_MIT_and_Lincoln_Lab_Theses.pdf]	25.01
MITRE collection, AC 6, Whirlwind I Computer Records, finding aid (MIT series 16) 1945-1948 MITRE collection, AC 6, Whirlwind I Computer Records, finding aid (MIT series 16), 1965 [http://libraries.mit.edu/archives/whirlwind/pdf/AC006_WHIRLWIND_I_Computer_Collection_at_Smithsonian.pdf]	25.01
MITRE collection, AC 8, Administrative Memoranda, finding aid (MIT series 17) MITRE collection, AC 8, Administrative Memoranda, finding aid (MIT series 17), 1964 [http://libraries.mit.edu/archives/whirlwind/pdf/AC008_MIT_and_Lincoln_Lab_Administrative_Memoranda.pdf]	25.01
MITRE collection, AC 9, Group Leader's Meetings Minutes, finding aid (MIT series 8) MITRE collection, AC 9, Group Leader's Meetings Minutes, finding aid (MIT series 8), 1964 [http://libraries.mit.edu/archives/whirlwind/pdf/AC009_MIT_and_Lincoln_Lab_Group_Leaders_Meetings.pdf]	25.01

MITRE collection, AC 12, Group 63 Seminar on Magnetism Memoranda, finding aid (MIT series 7) MITRE collection, AC 12, Group 63 Seminar on Magnetism Memoranda, finding aid (MIT series 7), 1964 [http://libraries.mit.edu/archives/whirlwind/pdf/AC012_Group_63_Seminar_on_Magnetism.pdf]	25.01
MITRE collection, AC 13, Test Equipment Committee Meeting Minutes, finding aid (MIT series 9) MITRE collection, AC 13, Test Equipment Committee Meeting Minutes, finding aid (MIT series 9), 1964 [http://libraries.mit.edu/archives/whirlwind/pdf/AC013_Test_Equipment_Committee_Meetings.pdf]	25.01
MITRE collection, AC 19, Transistor Studies Memoranda and Notes, finding aid (MIT series 6) MITRE collection, AC 19, Transistor Studies Memoranda and Notes, finding aid (MIT series 6), 1965 [http://libraries.mit.edu/archives/whirlwind/pdf/AC019_Transistor_Studies.pdf]	25.01
MITRE collection, AC 20, Magnetic Materials Studies records, finding aid (MIT series 5) MITRE collection, AC 20, Magnetic Materials Studies records, finding aid (MIT series 5), 1965 [http://libraries.mit.edu/archives/whirlwind/pdf/AC020_Magnetic_Materials_Studies.pdf]	25.01
MITRE collection, AC 23, Memory Test Computer (MTC) Memoranda, finding aid (MIT series 10)	25.01
MITRE collection, AC 24, Lincoln Laboratory, Division 6, Biweekly Reports, finding aid (MIT series 12)	25.02

MITRE collection, AC 24, Lincoln Laboratory, Division 6, Biweekly Reports, finding aid (MIT series 12), 1963 [http://libraries.mit.edu/archives/whirlwind/pdf/AC024_Lincoln_Lab_Division_6_Biweekly_Reports.pdf]	
MITRE collection, AC 26, Scientific and Engineering Computation Group Biweekly Reports, finding aid (MIT series 13) MITRE collection, AC 26, Scientific and Engineering Computation Group Biweekly Reports, finding aid (MIT series 13), 1963 [http://libraries.mit.edu/archives/whirlwind/pdf/AC026_Scientific_and_Engineering_Computation_Group_Biweekly_.pdf]	25.02
MITRE collection, AC 31, TX-0 and TX-2 Computer Memoranda, finding aid (MIT series 14) MITRE collection, AC 31, TX-0 and TX-2 Computer Memoranda, finding aid (MIT series 14), 1965 [http://libraries.mit.edu/archives/whirlwind/pdf/AC031_TX-0_and_TX-2_Computers.pdf]	25.02
MITRE collection, AC 39, Lincoln Laboratory, Division 6, Quarterly Progress Reports, finding aid (MIT series 11) MITRE collection, AC 39, Lincoln Laboratory, Division 6, Quarterly Progress Reports, finding aid (MIT series 11), 1966 [http://libraries.mit.edu/archives/whirlwind/pdf/AC039_Lincoln_Lab_Division_6_Quarterly_Progress.pdf]	25.02
MITRE collection AC 101, Whirlwind I Computer Log Books, finding aid (MIT series 2) MITRE collection AC 101, Whirlwind I Computer Log Books, finding aid (MIT series 2), 1981	25.02

[http://libraries.mit.edu/archives/whirlwind/pdf/AC101_Whirlwind_I_Computer_Log_Books.pdf]

MITRE collection, AC 133, Division 6 Engineering Drawings and Drawing Log Books (MIT series 15) 25.02

MITRE collection, AC 133, Division 6 Engineering Drawings and Drawing Log Books (MIT series 15), 1960

[http://libraries.mit.edu/archives/whirlwind/pdf/AC133_Division_VI_Lincoln_Laboratory_Engineering_Drawings.pdf]