



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

## Guide to the Tantalus Synchrotron Radiation Source Collection

NMAH.AC.0532

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## Collection Overview

|                    |   |
|--------------------|---|
| <b>Repository:</b> | Archives Center, National Museum of American History  |
| <b>Title:</b>      | "Tantalus" Synchrotron Radiation Source Collection  |
| <b>Identifier:</b> | NMAH.AC.0532  |
| <b>Date:</b>       | 1940-1995   |
| <b>Extent:</b>     | 3.5 Cubic feet (11 boxes)   |
| <b>Creator:</b>    | Tantalus Project<br>Rowe, Ednor "Ed"<br>Pruett, Charles<br>Olson, Cliff<br>Otte, Roger<br>Brown, Fred |
| <b>Language:</b>   | English   |

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## Administrative Information

### Acquisition Information

The collection was donated by Ednor M. Rowe, Associate Director for Accelerator Development, Synchrotron Radiation Center, University of Wisconsin on November 20, 1995.

### Provenance

In March 1994, Ednor Rowe contacted the National Museum of American History about the decommissioning of Tantalus. Museum curators decided to add part of the Tantalus accelerator ring to the collections in modern physics and also collected written documentation in the form of operational and data notebooks and logbooks that trace the creation, building, maintenance, and experiments carried out on the machine. There are also black and white photographs, slides, and oral and video documentation.

With the support of the Lemelson Center, the curators conducted videohistory interviews with Tantalus staff Ednor Rowe, Fred Brown, Cliff Olson, Charles Pruett, and Roger Otte. These discussions and reminiscences capture the human side of this high-tech machine's history.

### Related Materials

The Division of Information, Technology, and Society (now the Division of Medicine and Science) collected part of the Tantalus synchrotron radiation ring. See accession 1997.0078.

### Processing Information

Processed by Alison Oswald, archivist, 1995.

## Preferred Citation

"Tantalus" Synchrotron Radiation Source Collection, 1940-1995, Archives Center, National Museum of American History, Smithsonian Institution.

## Restrictions

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## Biographical / Historical

At the University of Wisconsin during 1965-1967, a team led by particle physicist Ednor Rowe built a machine designed to analyze what goes on inside high-energy particle accelerators. This was the big, exciting technology in physics at the time. But just as the apparatus neared completion, funding was cut off. Its creators, feeling teased by fate and their government backers, dubbed the machine "Tantalus."

Rowe knew, though, that a by-product of Tantalus's operation was intense "synchrotron radiation," a form of ultra violet light that is used to study the structure of matter. He quickly adapted the machine to make this radiation available for use and soon the facility was crowded with experimenters from all over the world. Tantalus not only pioneered the use of synchrotron radiation, but created a research facility where both scientists and graduate students could perform hands-on work.

Researchers shared information and the results of their experiments in a collegial environment. There was no "King of the Ring" among these goal-oriented scientists. Those working at the Synchrotron Radiation Center always sought ways to improve upon Tantalus, with the result that Tantalus remained an important research tool until 1987, when it was retired and replaced by a newer machine, "Aladdin."

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## Scope and Contents

The collection consists primarily of notebooks, manuals, and other data and operational logbooks documenting the creation, building, and maintenance of Tantalus, and the experiments performed on the machine. Tantalus was the first dedicated synchrotron radiation laboratory and source. Series 5 and Series 6 include oral and video histories with Ednor Rowe, Fred Brown, Cliff Olson, Charles Pruett, and Roger Otte.

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## Arrangement

The collection is divided into six series.

**Series 1, Notebooks and Logbooks, 1940-1986**

**Series 2, Data and Operational Logbooks, 1965-1995**

**Series 3, User Beam Schedule Sheets, 1968-1986**

**Series 4, Storage Ring Blueprints, 1966-1972**

**Series 5, Video Histories, 1995**

**Series 6, Oral History Cassettes, 1995**

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## Physical Characteristics and Technical Requirements

Gloves must be worn when handling unprotected photographs, negatives, and slides.

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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:

Laboratories -- 1940-2000  
Physicists -- 1940-2000  
Physics -- Experiments -- 1940-2000  
Radiation -- 1960-1990  
Synchrotron radiation

Types of Materials:

Notebooks  
Videotapes

Names:

Synchrotron Radiation Center  
University of Wisconsin--Madison

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## Container Listing

### Series 1: Notebooks and Logbooks, 1940 - 1986

|                   |   |
|-------------------|---|
| Box 1, Folder 1   | <i>Amplidyne Manual</i> , 1965                                  |
| Box 1, Folder 2   | Amplidyne maintenance procedure, circa 1966                     |
| Box 1, Folder 3-4 | Experiment descriptions, 1967 - 1986                            |
| Box 1, Folder 5   | Mura 50-MeV electron accelerator, 1964                          |
| Box 1, Folder 6   | Alignment fixture calibrations, 1966                            |
| Box 1, Folder 7   | Tantalus I and II design group meetings, 1975 - 1976            |
| Box 1, Folder 8   | Photographs, undated  |
| Box 2             | Low-inductance switching using parallel spark gaps, 1940 - 1967 |
| Box 2             | Kicker inflector , undated                                      |
| Box 2             | Magnet data book , 1969   |
| Box 3             | "Project Bang" , undated  |
| Box 3             | Magnet parameters (coil) , 1966 - 1968                          |

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## Series 2: Data and Operational Logbooks, 1965 - 1995

|       |   |
|-------|---|
| Box 3 | Storage ring maintenance log, 1968                                  |
| Box 4 | Storage ring alignment, 1967 - 1969                                 |
| Box 2 | Storage ring operational data (photos) , undated                    |
| Box 4 | Storage ring aata book-probes, 1965                                 |
| Box 4 | Storage ring magnet alignment data (blueprints and drawings) , 1966 |
| Box 5 | Storage ring maintenance log, 1968                                  |
| Box 5 | Storage ring operating data book one, 1968                          |
| Box 5 | Storage ring operating data book two, 1969                          |
| Box 6 | Storage ring running time log book , 1966, 1970 - 1980              |
| Box 6 | Storage ring data book three, 1977                                  |
| Box 6 | Synchrotron radiation experiments, 1970                             |
| Box 7 | Tantalus amplidyne generators (photos) , 1966 - 1986                |
| Box 7 | Tantalus daily log (photos) , 1970 June 15-1986 May 12              |
| Box 7 | Tantalus spark gap logs (photos) , 1967 March 13-1976 November      |
| Box 8 | Storage ring running time log book, 1981 May 1 - 1995 August 31     |
| Box 8 | Tantalus spark gaps log book, 1967 November 7-1968 October 8        |
| Box 8 | Tantalus survey and optical alignment log, 1965 October-1967 June   |
| Box 3 | Tantalus alignment fixture calibration , 1966                       |

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## Series 3: User Beam Schedule Sheets, 1968 - 1986

*Map-folder 1*

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Map-folder 1

4: Storage Ring Blueprints, 1966 - 1972



## Series 5: Video Histories, 1995

### Subseries 5.1: Original Videos, 1995

|       |                                   |
|-------|-----------------------------------|
| Box 9 | OV 532.1, Tantalus Project, 1995  |
| Box 9 | OV 532.2, Tantalus Project, 1995  |
| Box 9 | OV 532.3, Tantalus Project, 1995  |
| Box 9 | OV 532.4, Tantalus Project, 1995  |
| Box 9 | OV 532.5, Tantalus Project, 1995  |
| Box 9 | OV 532.6, Tantalus Project, 1995  |
| Box 9 | OV 532.7, Tantalus Project, 1995  |
| Box 9 | OV 532.8, Tantalus Project, 1995  |
| Box 9 | OV 532.9, Tantalus Project, 1995  |
| Box 9 | OV 532.10, Tantalus Project, 1995 |
| Box 9 | OV 532.11, Tantalus Project, 1995 |
| Box 9 | OV 532.12, Tantalus Project, 1995 |

### Subseries 5.2: Master Videos, 1995 April 25

|        |   |
|--------|---|
| Box 12 | MV 532.1, Tantalus Project, 1995 April 25 |
| Box 12 | MV 532.2, Tantalus Project, 1995 April 25 |
| Box 12 | MV 532.3, Tantalus Project, 1995 April 25 |
| Box 13 | MV 532.4, Tantalus Project, 1995 April 25 |
| Box 13 | MV 532.5, Tantalus Project, 1995 April 25 |
| Box 13 | MV 532.6, Tantalus Project, 1995 April 25 |

### Subseries 5.3: Reference Videos, 1995 May 24

|        |   |
|--------|---|
| Box 10 | RV 532.1, Tantalus Project, 1995 May 24 |
| Box 10 | RV 532.2, Tantalus Project, 1995 May 24 |
| Box 10 | RV 532.3, Tantalus Project, 1995 May 24 |
| Box 10 | RV 532.4, Tantalus Project, 1995 May 24 |
| Box 10 | RV 532.5, Tantalus Project, 1995 May 24 |
| Box 10 | RV 532.6, Tantalus Project, 1995 May 24 |

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## Series 6: Oral History Cassettes, 1995 April 24 - 1995 April 25

|        |  |
|--------|--|
| Box 11 | OTC 532.1, Tantalus Project, 1995 April 24 |
| Box 11 | OTC 532.2, Tantalus Project, 1995 April 24 |
| Box 11 | OTC 532.3, Tantalus Project, 1995 April 24 |
| Box 11 | OTC 532.4, Tantalus Project, 1995 April 25 |
| Box 11 | OTC 532.5, Tantalus Project, 1995 April 25 |
| Box 11 | OTC 532.6, Tantalus Project, 1995 April 25 |

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