



NRC & ferut

How the National Research Council inherited
Canada's First Commercial Digital Computer

Presenter:

Brian Jeffrey, former NRC/NAE RCT-1 (1958-60)



Presentation Agenda

- Who was first?
- Why it's important?
- When it all happened?
- Where at NRC?
- Stories from the frontline
- Photo gallery
- Solving the mystery.

Mini-Bio

- Graduate of the OTHS Electronics Technician program (1957)
- Amateur Radio Operator
- First employer: Electronic Materiel International
- Second employer: NRC
- 27% increase in salary
- The job?
- Babysit a \$2M computer



Who was first?

- Manchester University SSEM begat...
- Manchester MU1 (Mark 1) which begat...
- Ferranti Mark 1
- Delivered in February 12, 1951
- The world's first commercially sold digital computer
- Remington Rand's UNIVAC 1 was delivered on March 30, 1951
- Taking second place

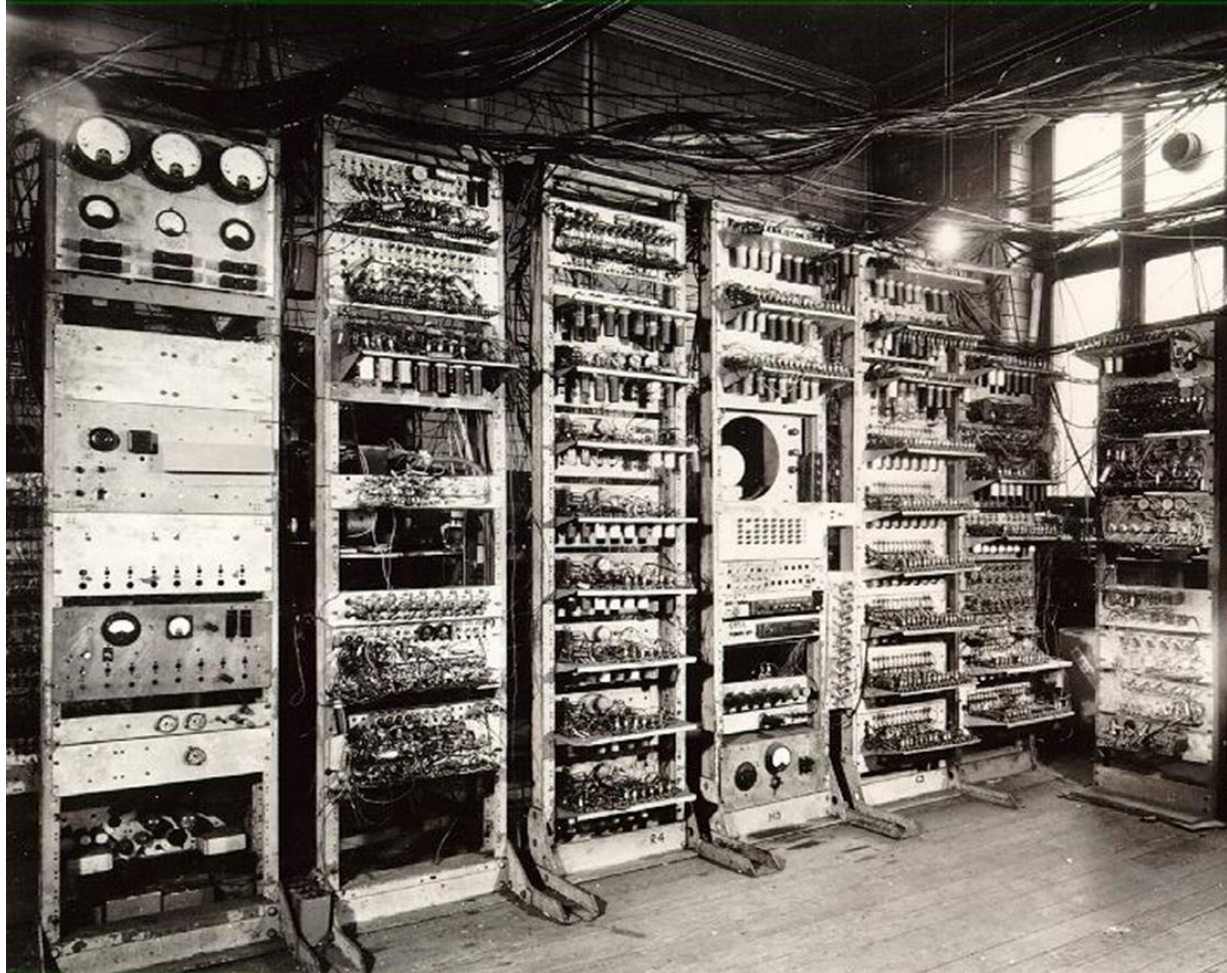
Manchester University SSEM



Affectionately known as “Baby.”

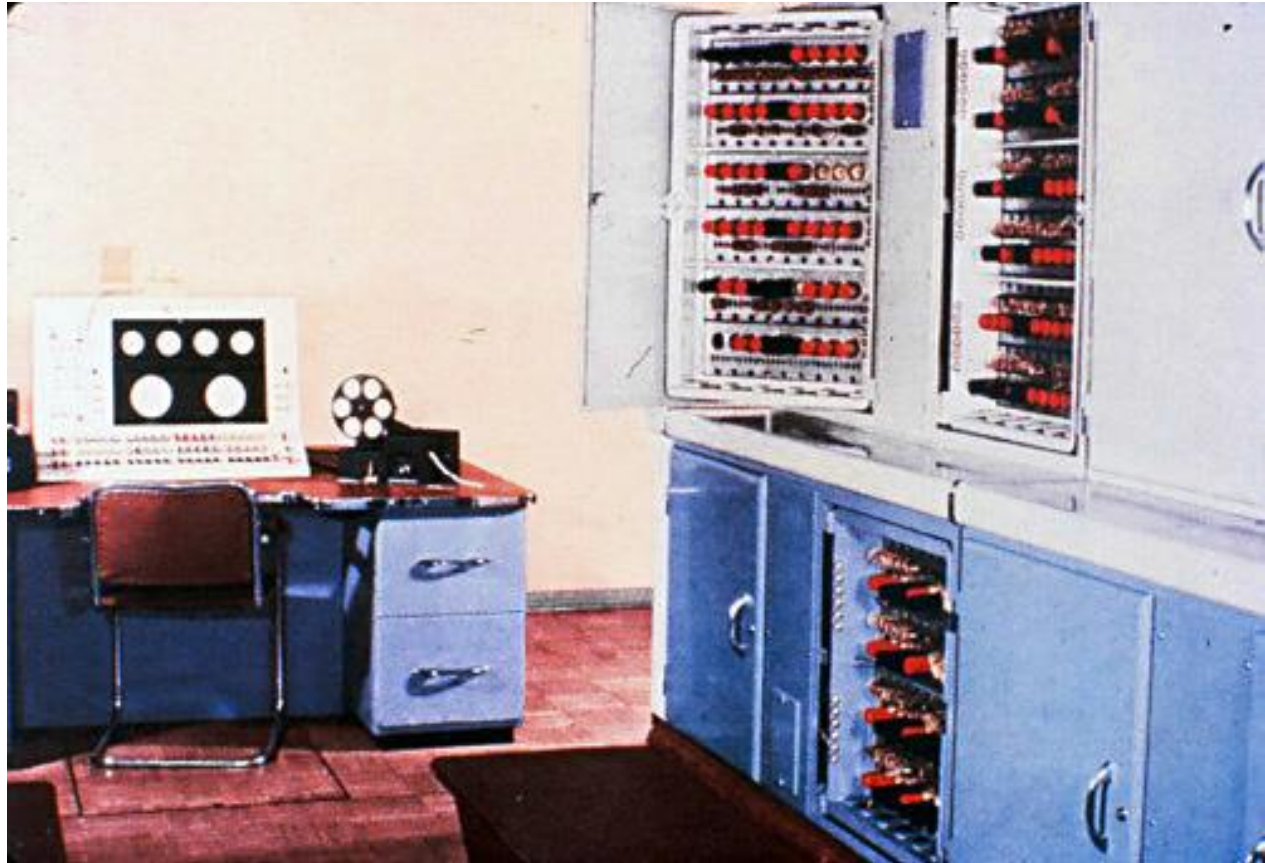
Which evolved into...

Manchester Mark 1 (MADM)



Manchester Automatic Digital Machine

Ferranti Mark 1, Serial Number 1



The world's first commercially sold digital computer.

Ferranti Mark 1



The person on the right is Alan Turing.

Remington Rand UNIVAC 1

UVIVersal Automatic Computer



Alan Turing



1912 to 1954

Turing's Involvement

2nd edition 112781
3rd edition 100225

FERRANTI MARK I
PROGRAMMING MANUAL

1st. Edition.

A.M. TURING, 1950

Turing's Involvement

PREFACE to the Second Edition

This Handbook is written mainly for those who expect to prepare problems for the MK II machine. Although almost complete in itself it is intended to be supplemented by some closer contact with the machine and by instruction from persons already familiar with its use.

Much material has been taken over unaltered, or only slightly modified from the 1st Edition which was written by Dr. A. M. Turing. In addition some of the results of the first year's experience of programming for the MK II have been incorporated in the later chapters.

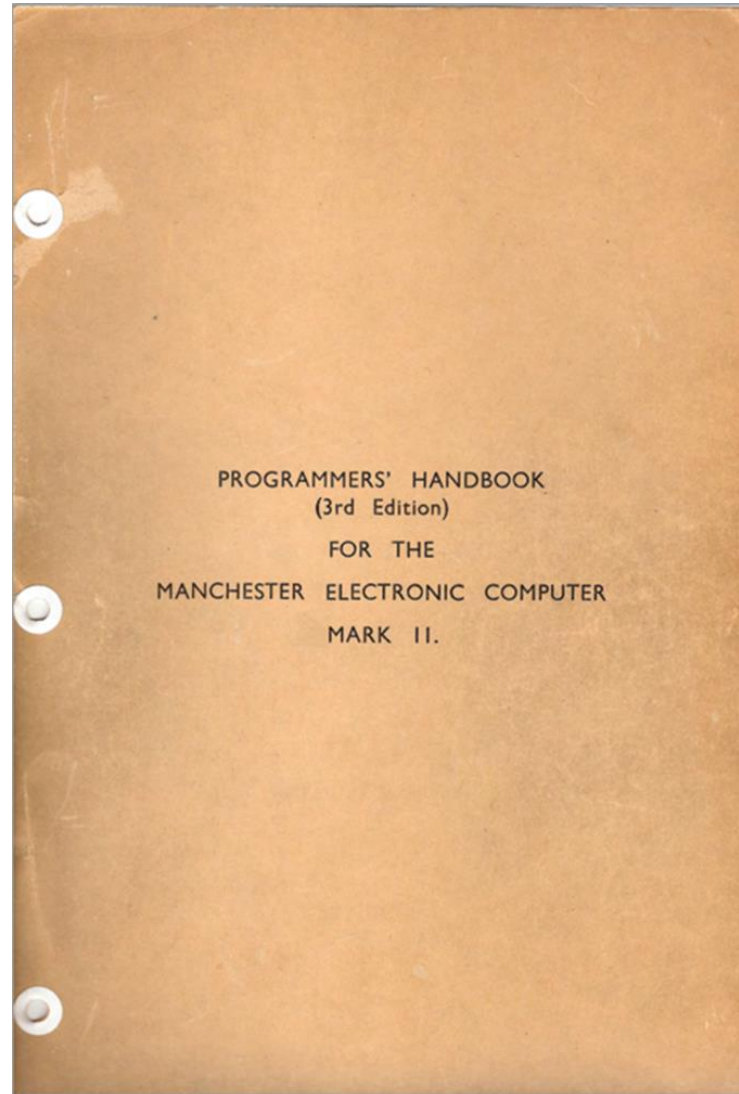
Miss C. M. Popplewell and N. E. Hoskin of the staff of this Laboratory, and A. E. Glennie of the Armament Research Establishment, Port Halstead, Sevenoaks, Kent, were responsible for chapters 3, 7, and 6 respectively. Some of the examples of chapter 2 were originally designed as exercises for the Summer School in Programme Design held at the University Mathematical Laboratory, Cambridge, (England) in September 1951.

At all stages in the preparation of this edition Dr A. M. Turing offered valuable criticism and advice.

R. A. BROCKER.

August 1952.

Turing's Involvement



Turing's Involvement

PREFACE to the Third Edition

This edition has been prepared mainly because the author was dissatisfied with certain chapters of the previous edition. Having rewritten these chapters it was then decided to take the opportunity of revising the entire Handbook. Fewer topics are covered but they have been more carefully chosen and treated in greater detail. The new edition is not intended to replace the 2nd edition. Instead it provides an alternative treatment of some rather fundamental topics, in particular, routine changing and the input of teleprint material.

Many of the suggestions contained in the following pages have originated from members of the staff of the Laboratory and others with experience of the MK II, in particular R. K. Livesley, A. M. Turing, A. E. Glennie, and G. Strachan.

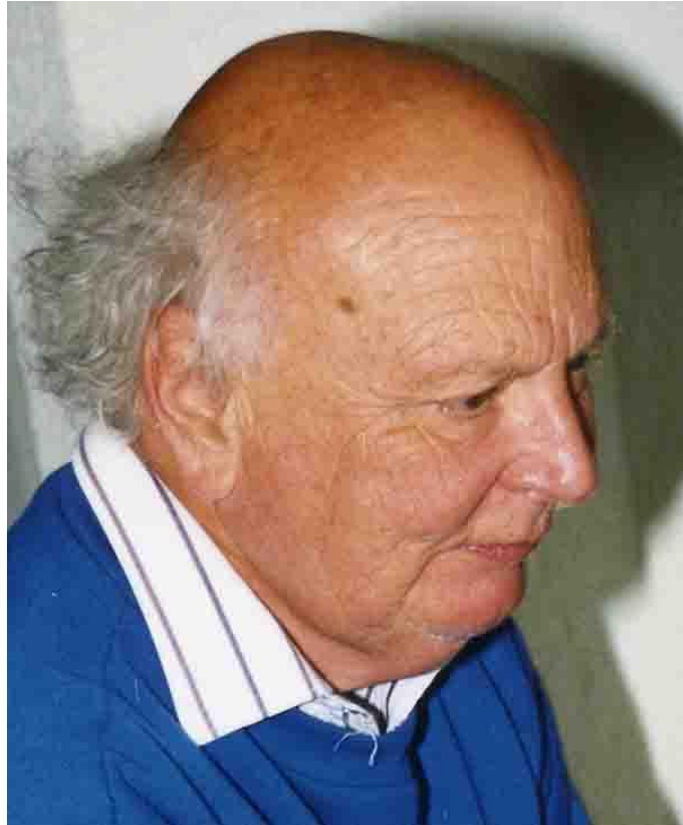
Many of the tables in the appendix are the work of the FERUT group at Toronto University.

R. A. BROOKER.

Computing Machine Laboratory,

September 1953.

Conway Berners-Lee



Father of Sir Tim Berners-Lee,
the inventor of the World Wide Web.

University of Toronto & ferut

Ferranti + u of t = ferut



University of Toronto Archives, 2005-57-1MS

ferut's Accomplishments

- St Lawrence Seaway backwater calculations
- First remote computing application
- Toronto's computer-controlled traffic system
- Antenna spacing for astronomical arrays
- Avro Arrow resonant frequency calculations
- Radiation dosage calculations...
- and much more.
- Basically, one machine was responsible for an entire nation's computer calculations!

ferut Fun Facts

- Consumed 27 kilowatts of power
- Over 4000 vacuum tubes
- 2500 capacitors
- 15,000 resistors
- 6 miles of wire
- 100,000 hand-soldered joints
- And yet...
- Less computing power than today's handheld calculators

Last known U of T ferut Crew



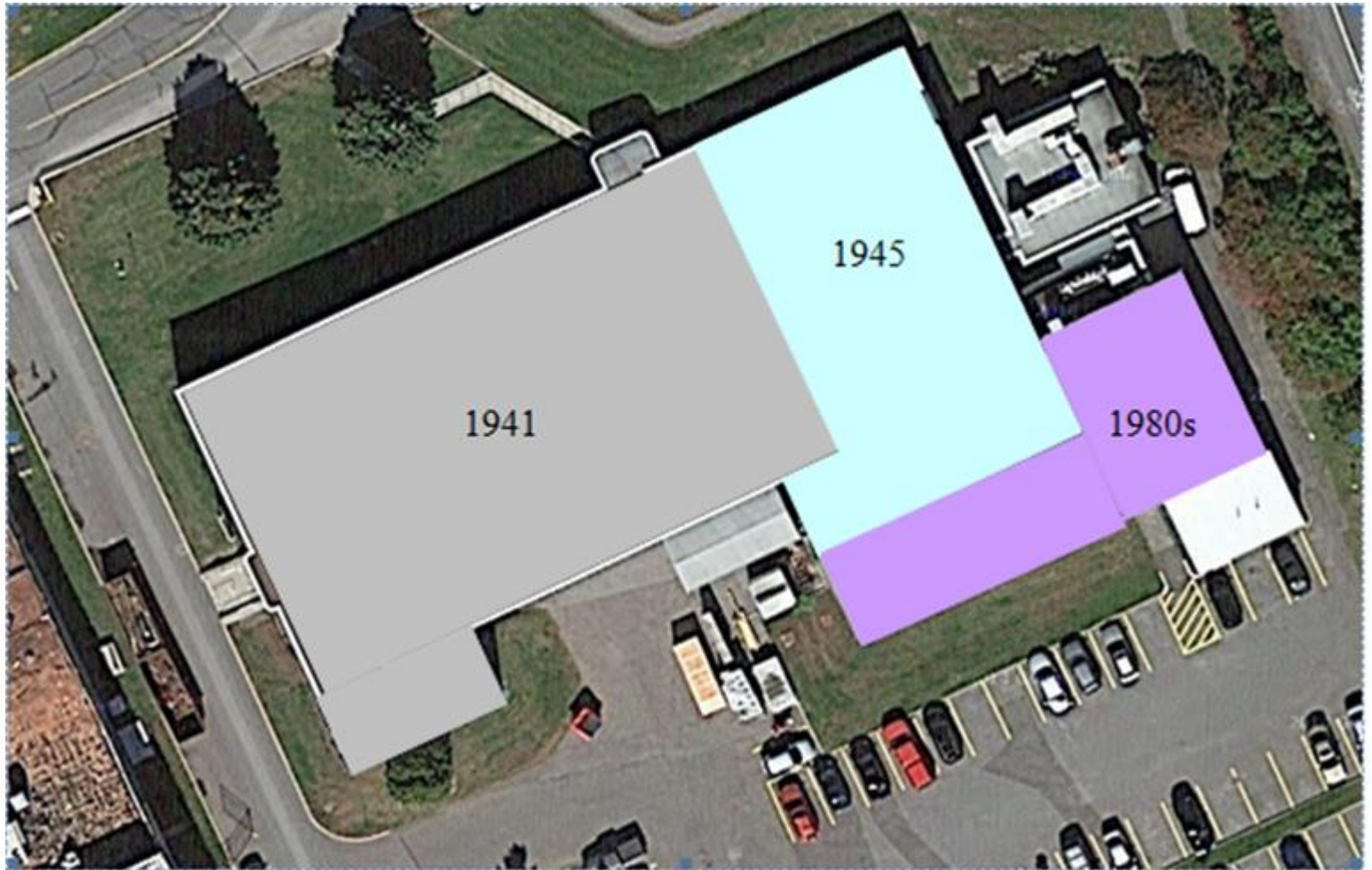
Front row, L to R, Dr. Stuart Baxter, Edith (Laurie) Davis, unknown, Prof. Hume (?).
Back row, right, Dr. David Thorp.

ferut's New Home



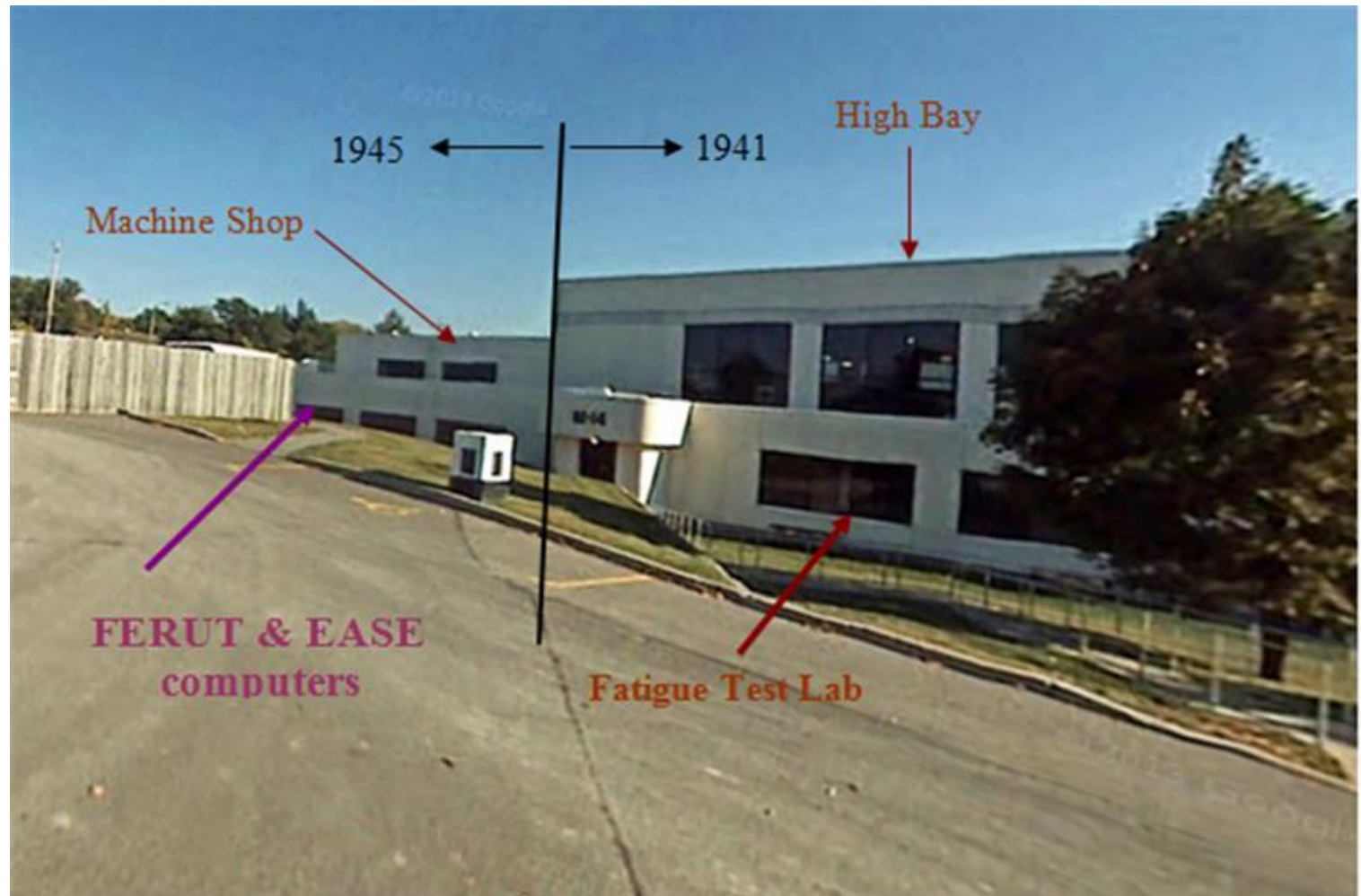
Structures Laboratory, M-14

Structures Lab, M-14



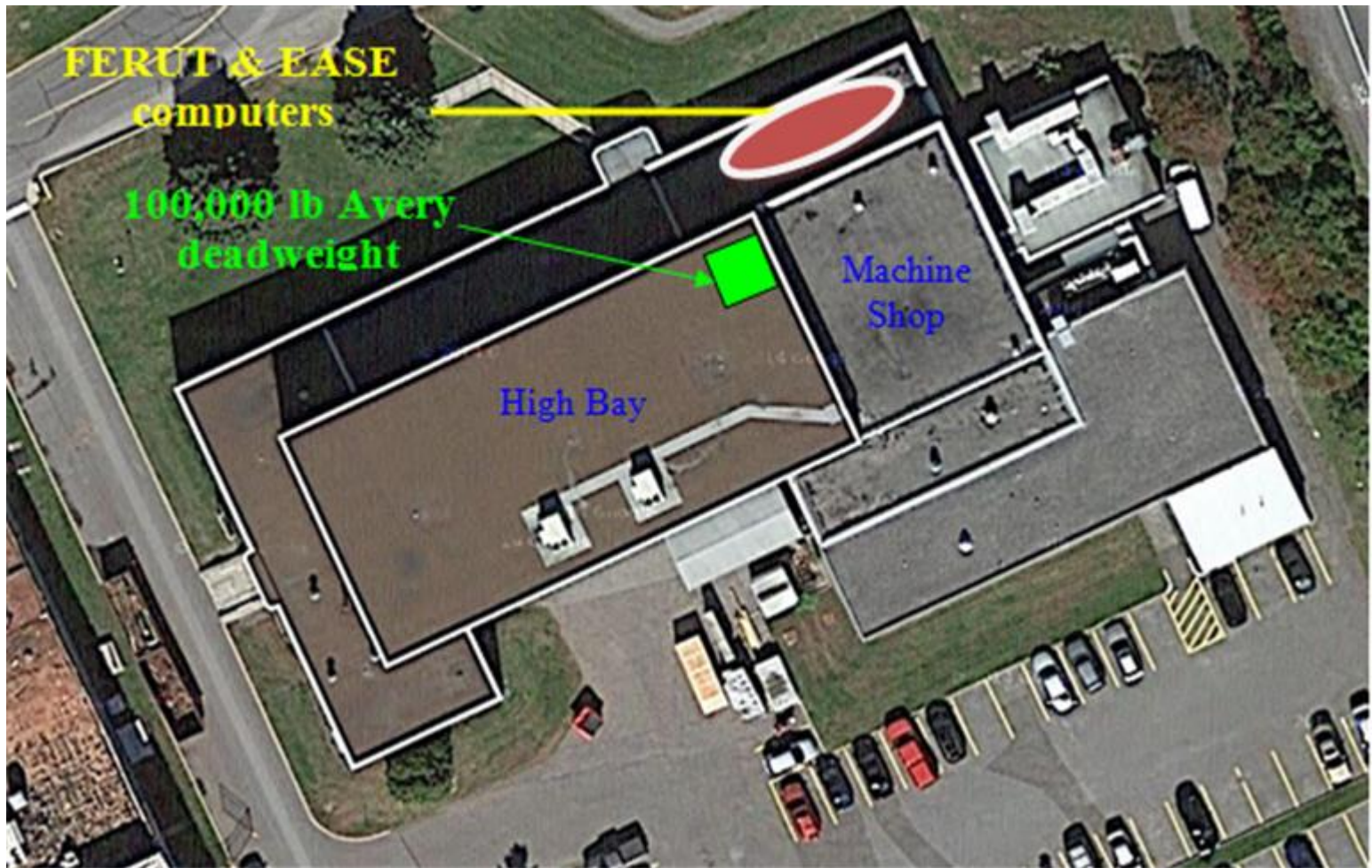
Courtesy, Ron Gould, former NRC/NAETO.

Structures Lab, M-14



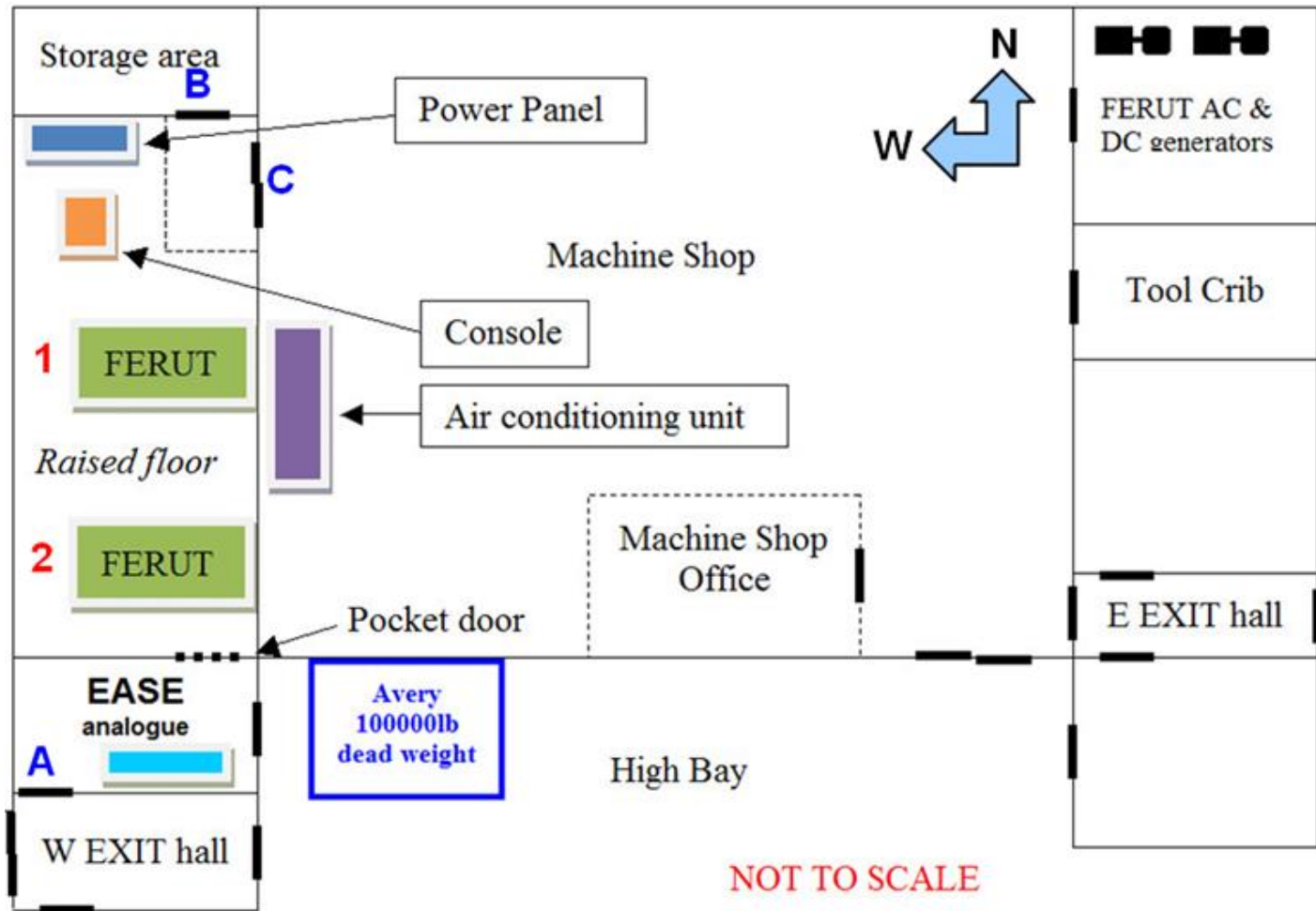
Courtesy, Ron Gould, former NRC/NAETO.

Structures Lab, M-14



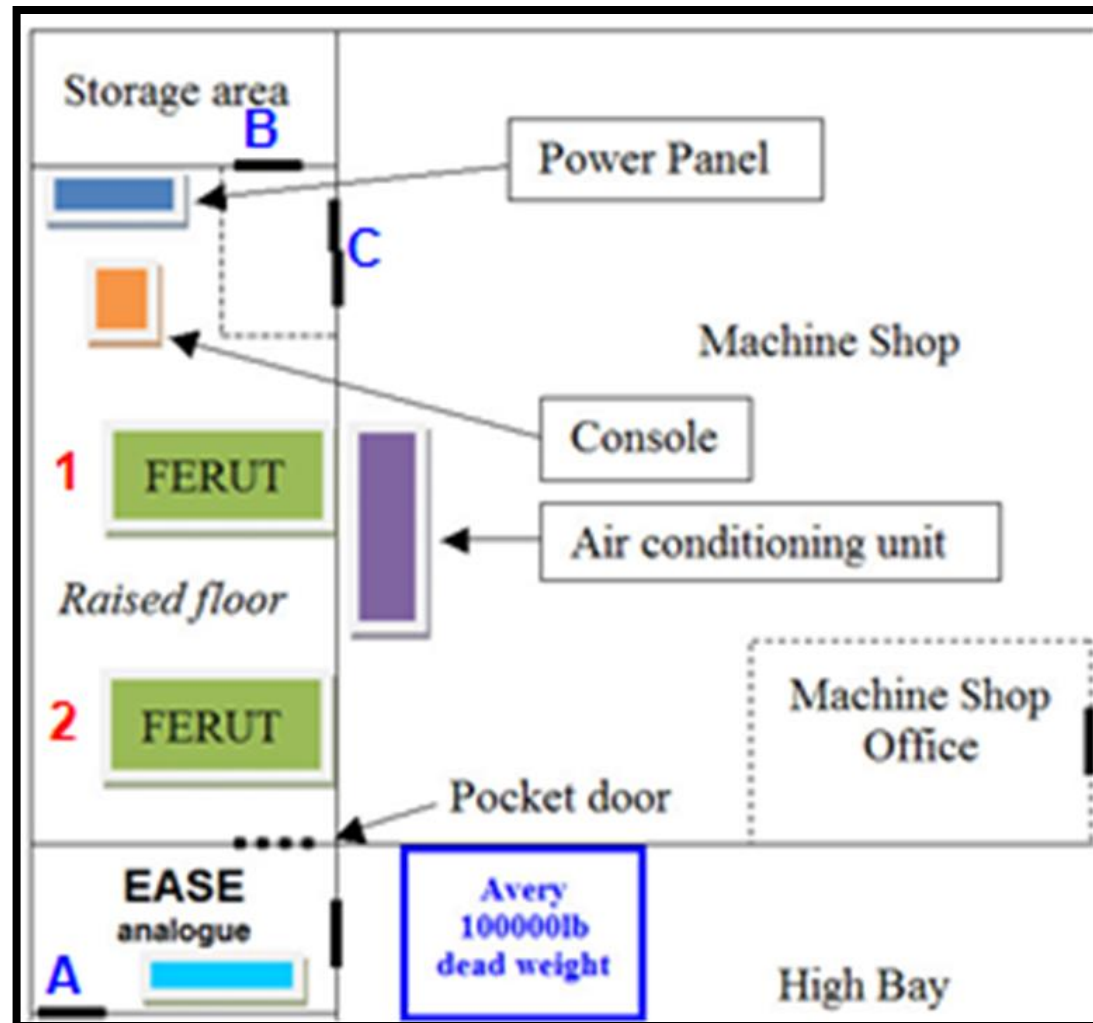
Courtesy, Ron Gould, former NRC/NAETO.

Structures Lab, M-14



Courtesy, Ron Gould, former NRC/NAETO.

Structures Lab, M-14

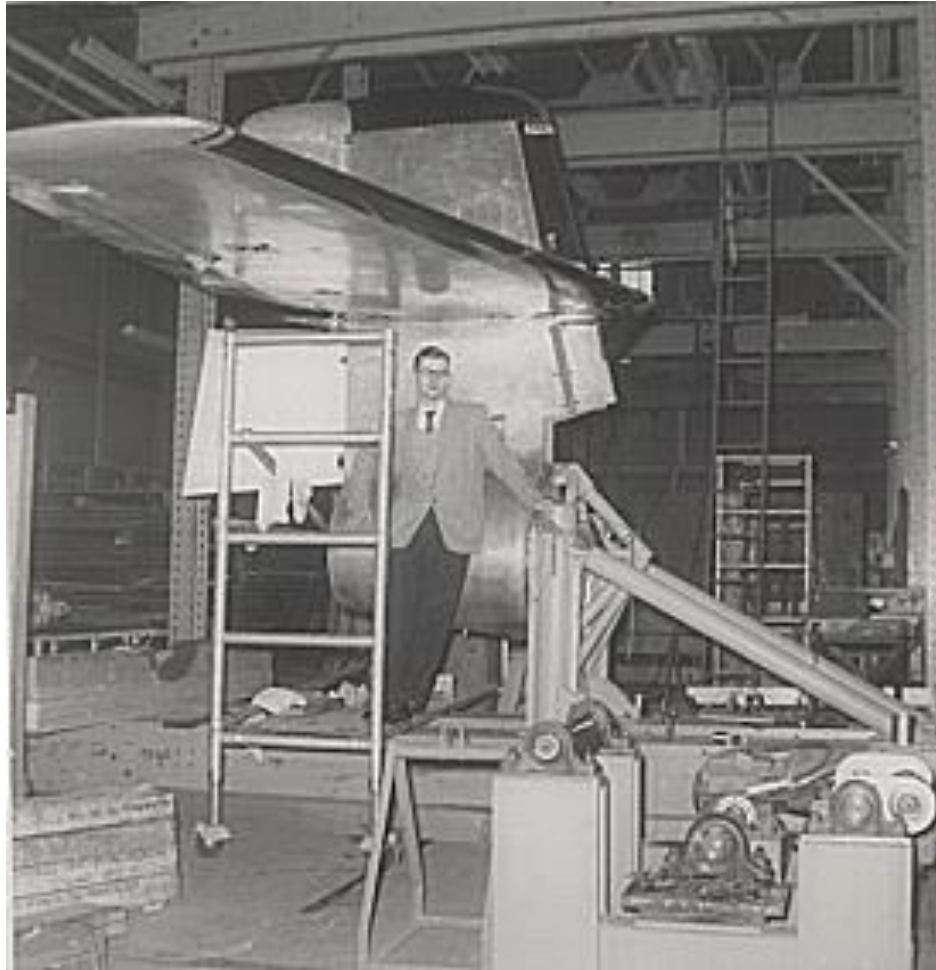


Beckman EASE



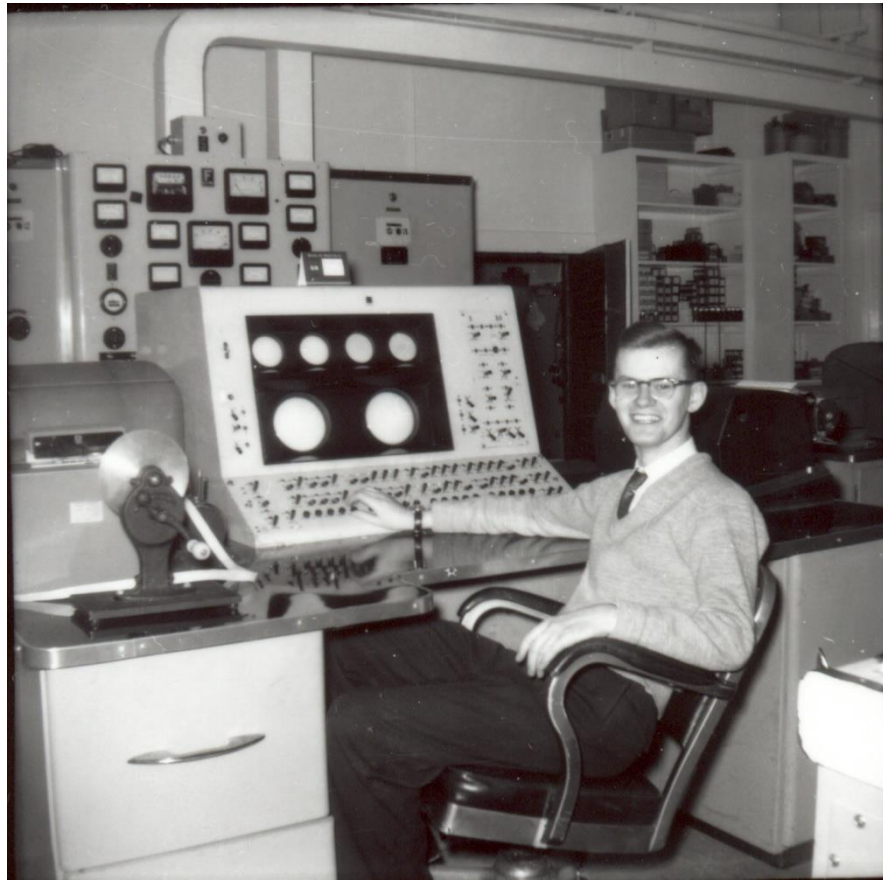
Behind the sliding door.

Newly Minted RCT-1

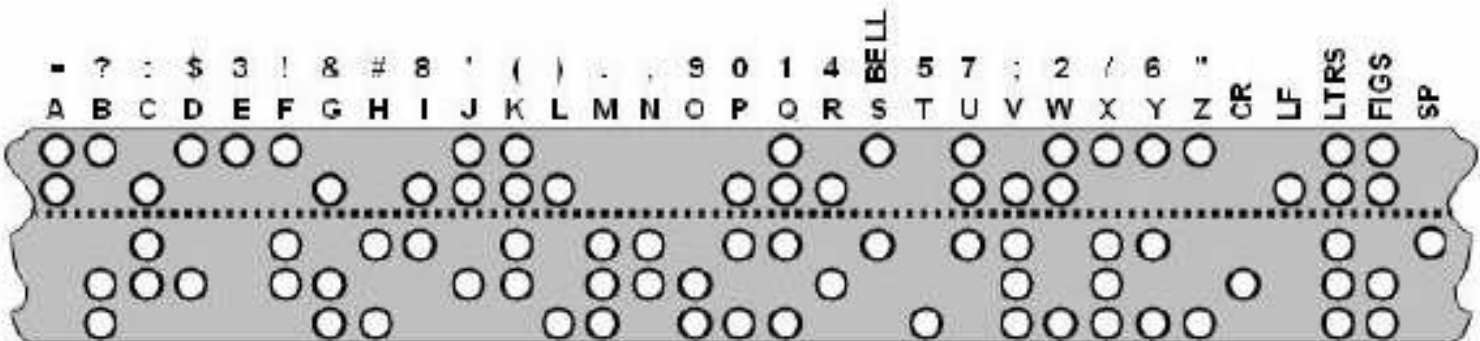


Brian (Simon) Jeffrey, circa 1958.

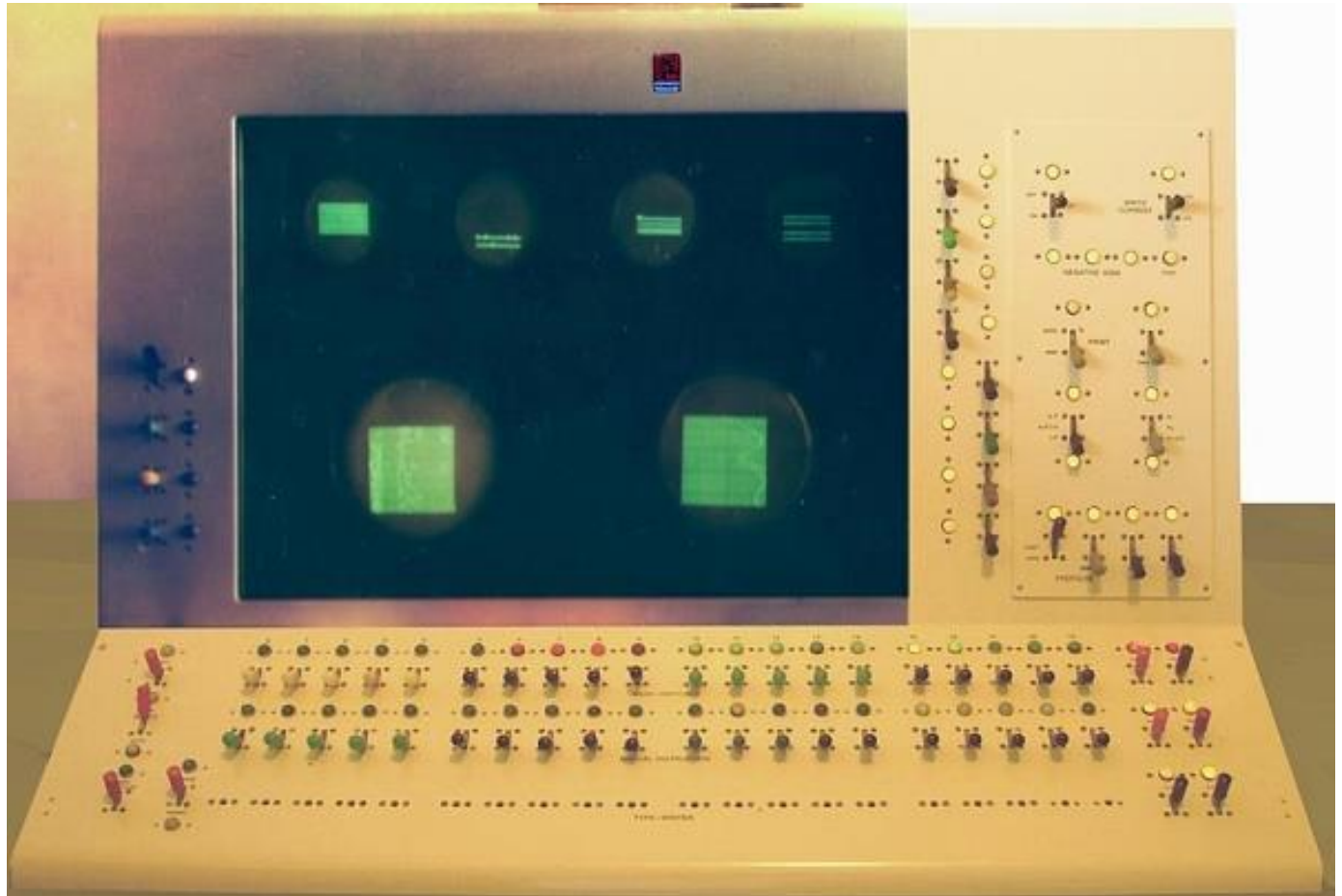
The ferut Operator's Console



Controlling the (computing) world!



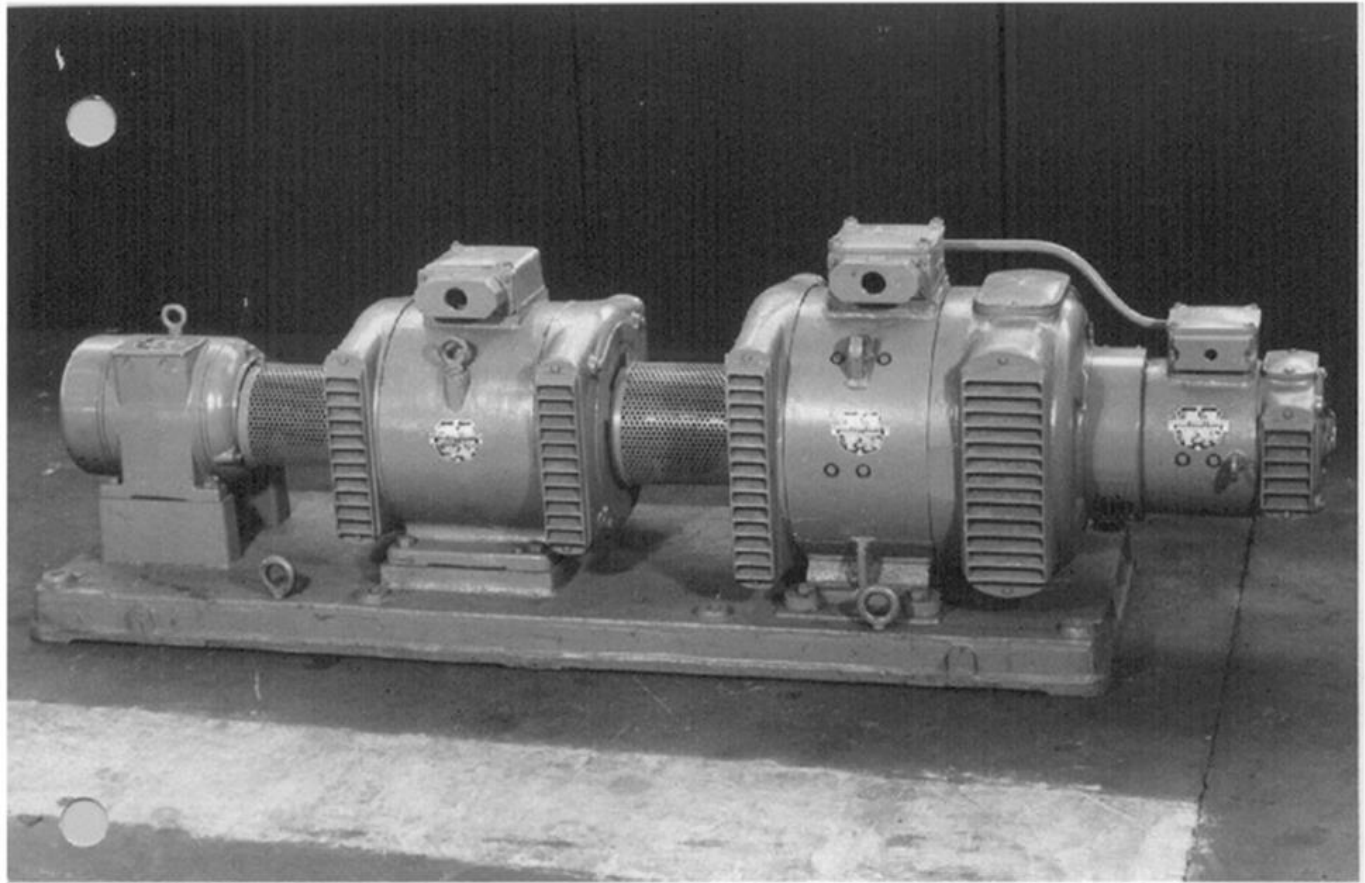
The ferut Main Console



Power Control Panel



ferut's Generators



Vacuum tubes everywhere!

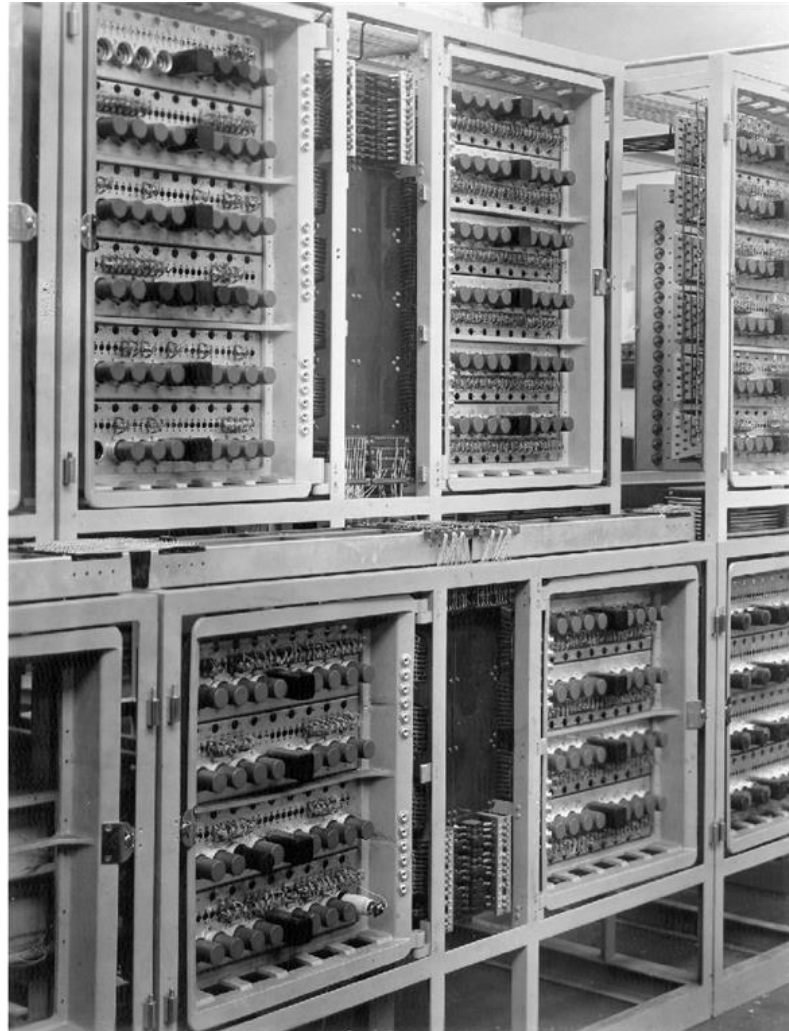


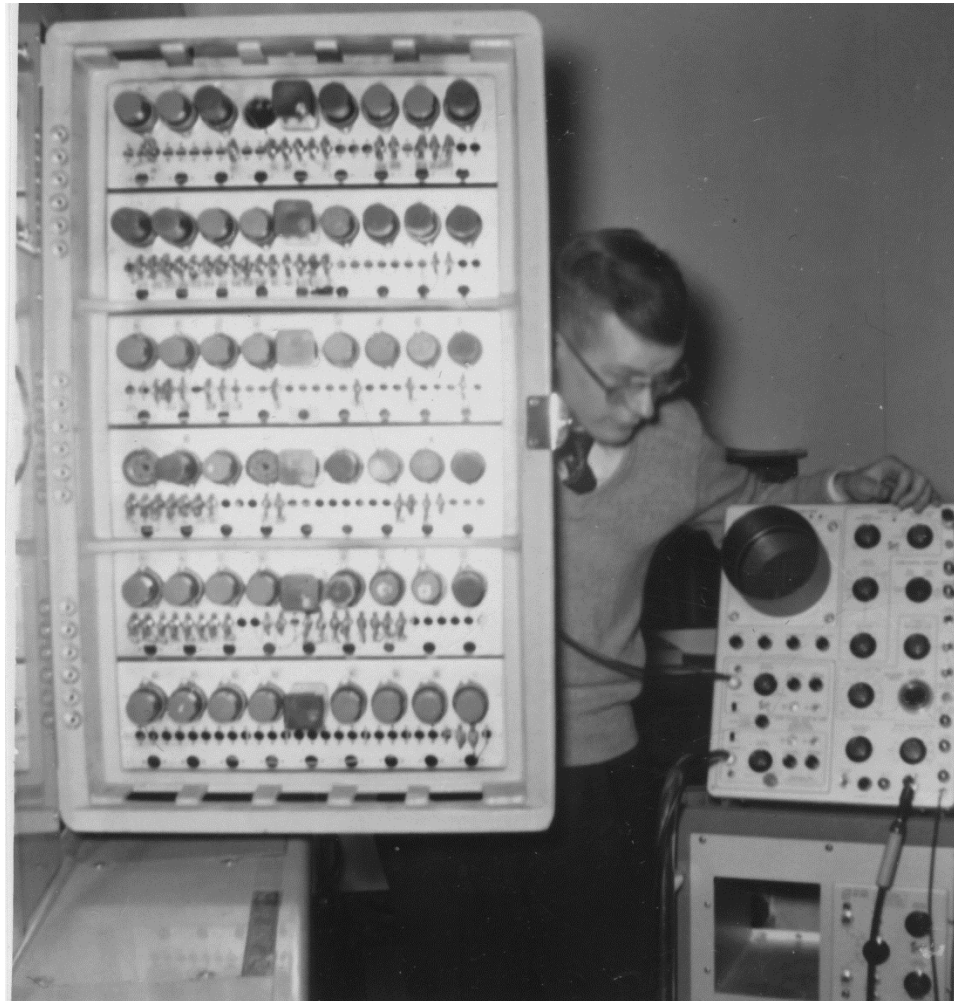
Photo courtesy the Computer Conservation Society website: <http://www.ourcomputerheritage.org/>

Typical “Door”

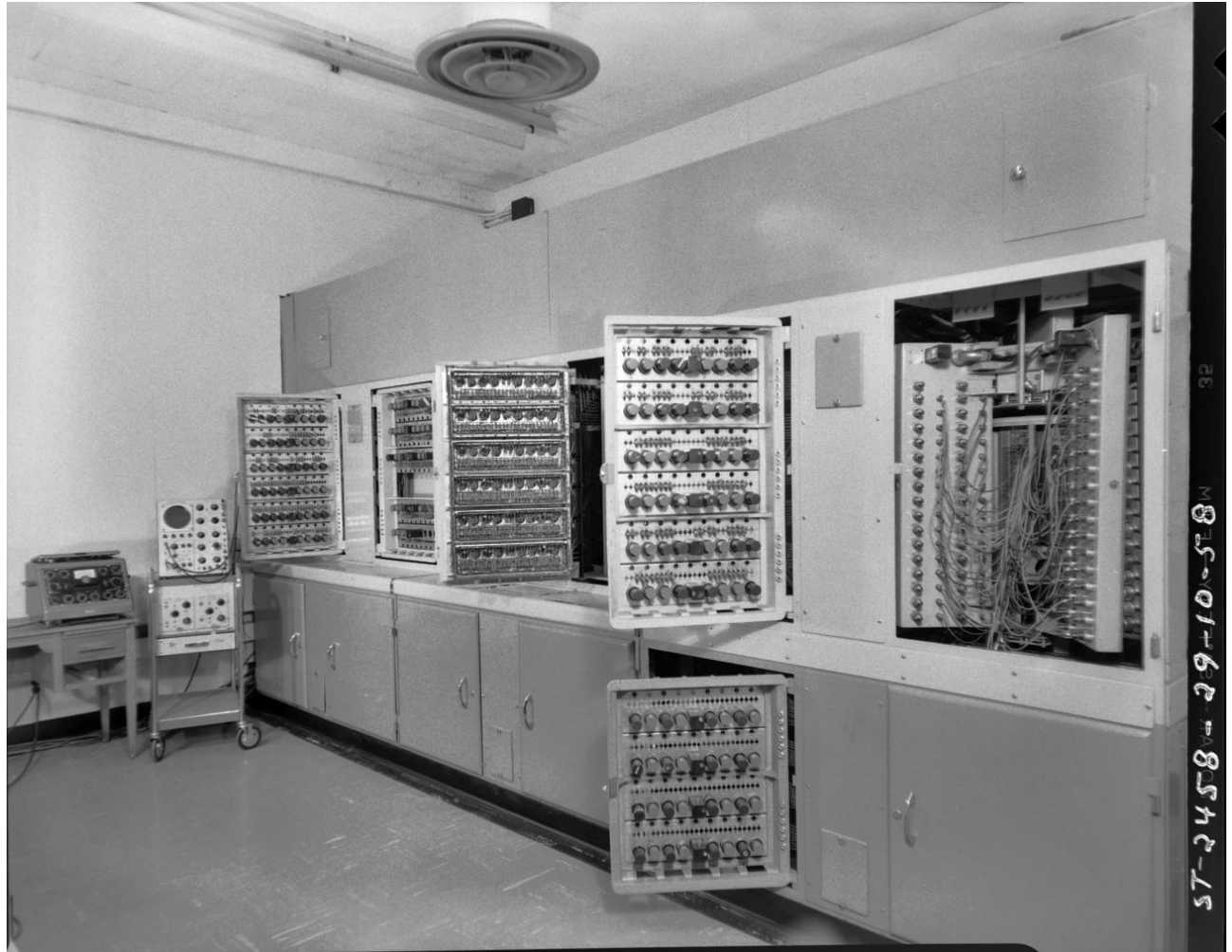


Copyright: Mark Richards.

Not always a bad vacuum tube

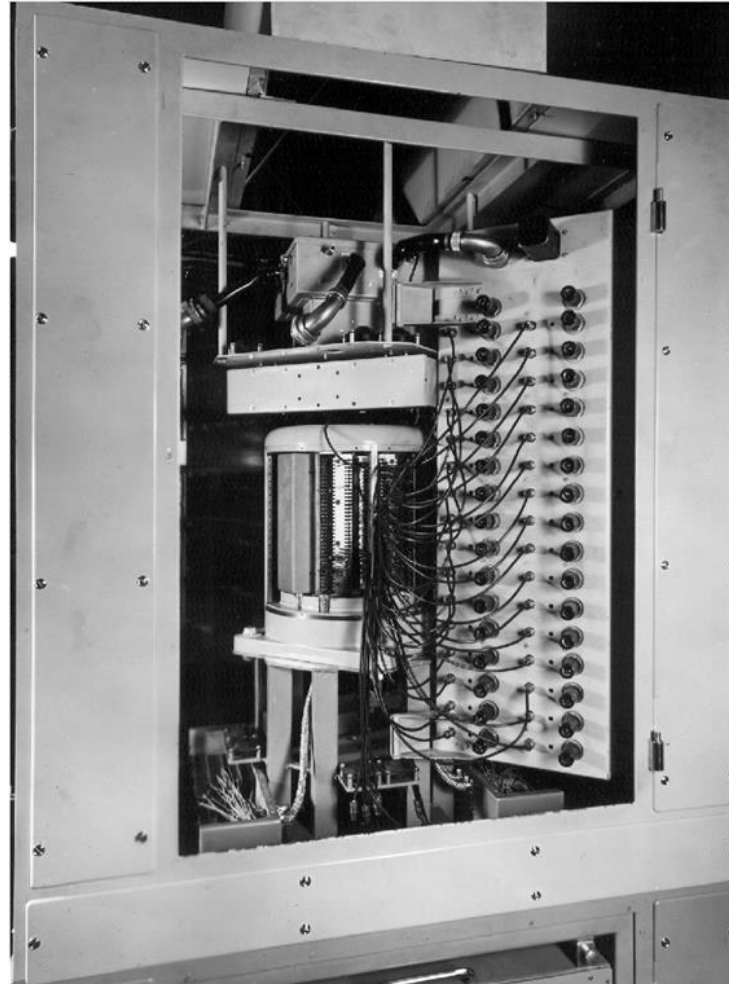


ferut Bay #2



Courtesy, NRC archives.

Main Magnetic Storage



Spare Memory Drum



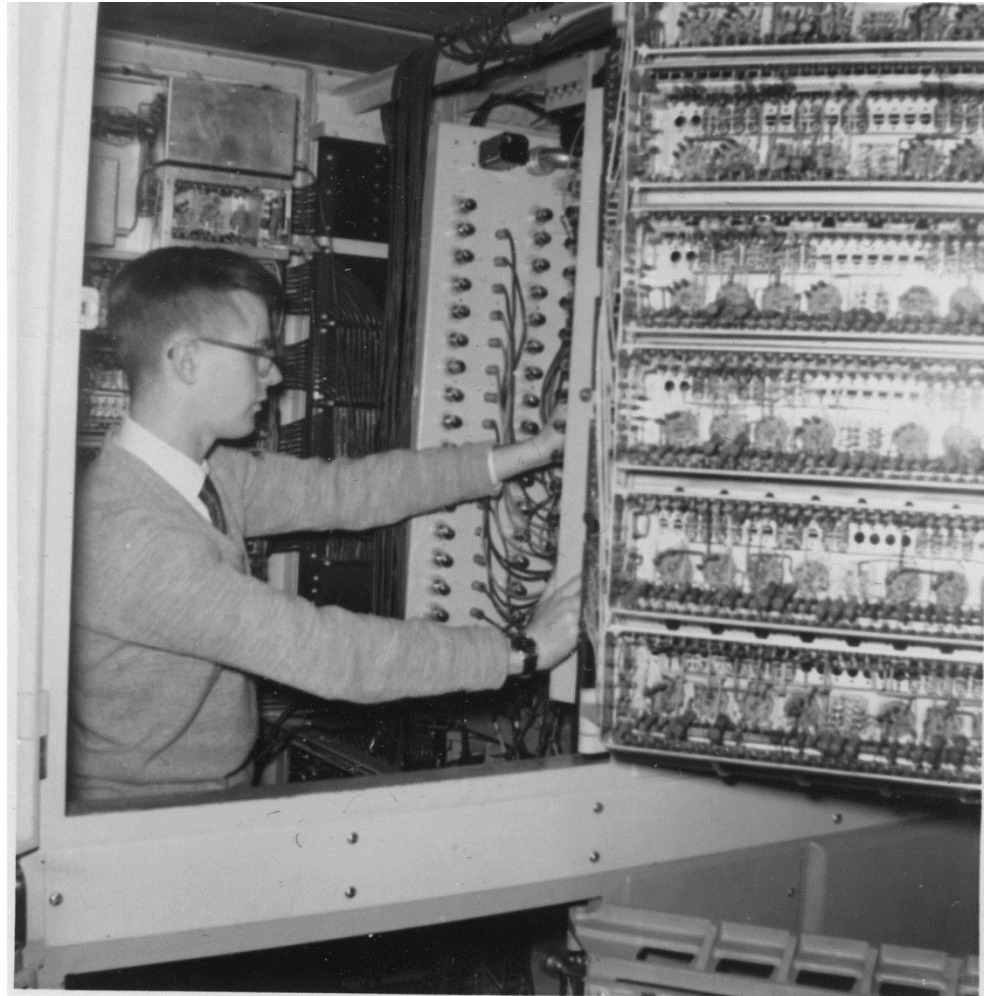
Courtesy, NRC archives.

Main Memory Drum



Courtesy, NRC archives.

Main Memory Drum

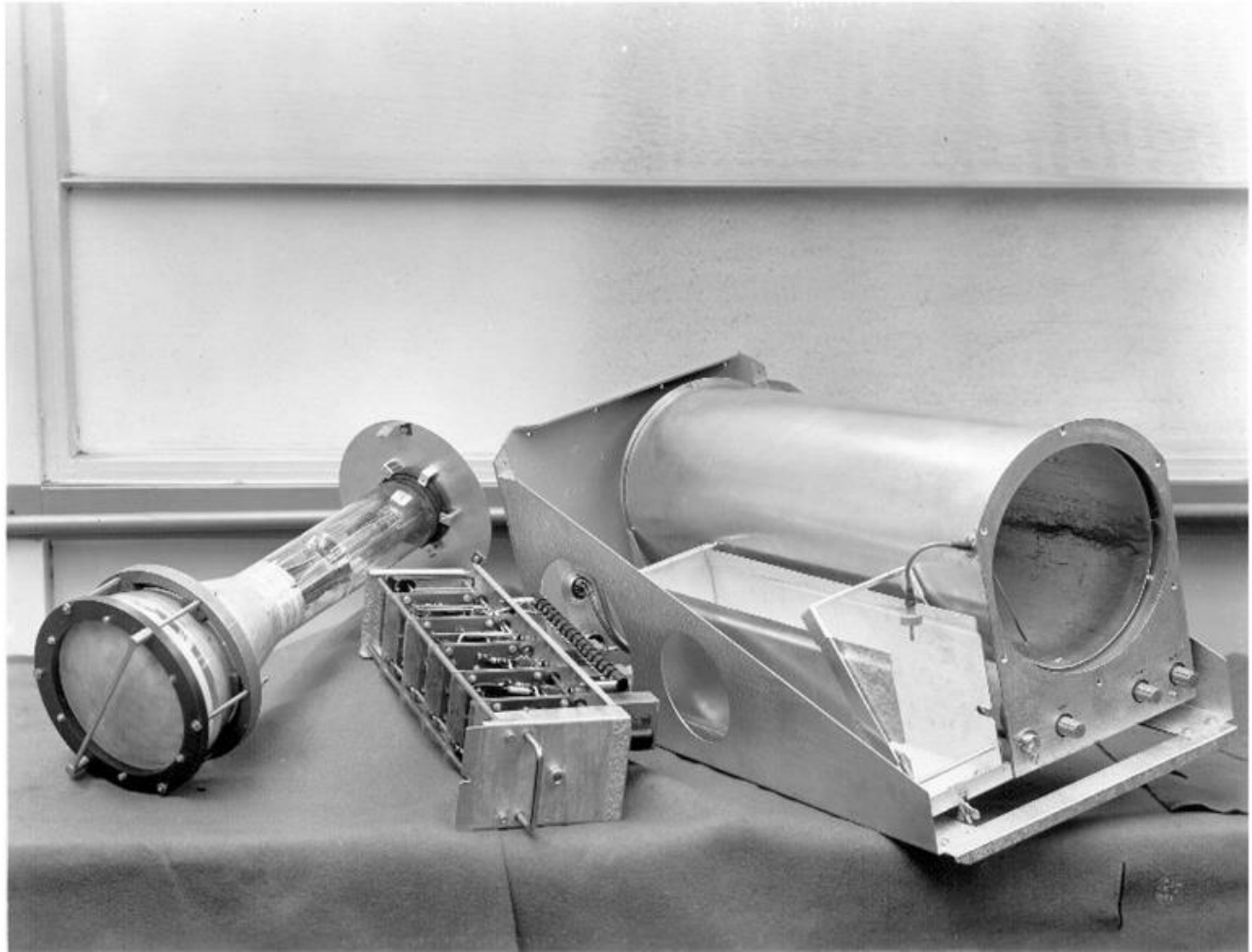


RAM Memory

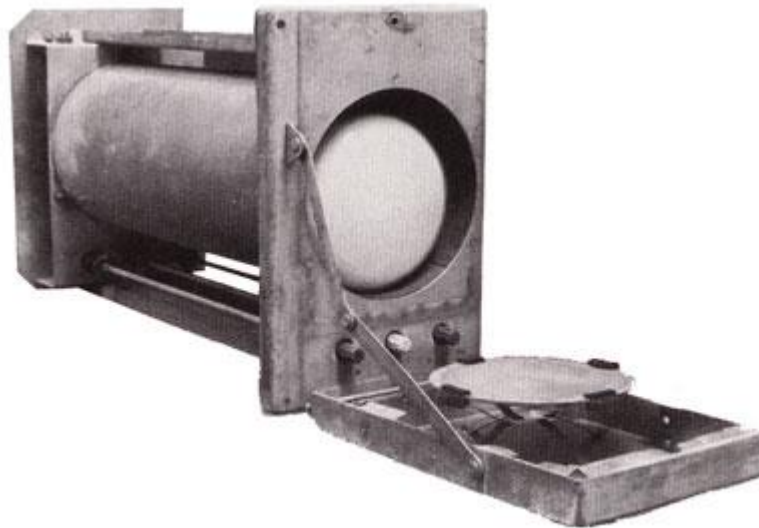


Courtesy, NRC archives.

RAM Memory

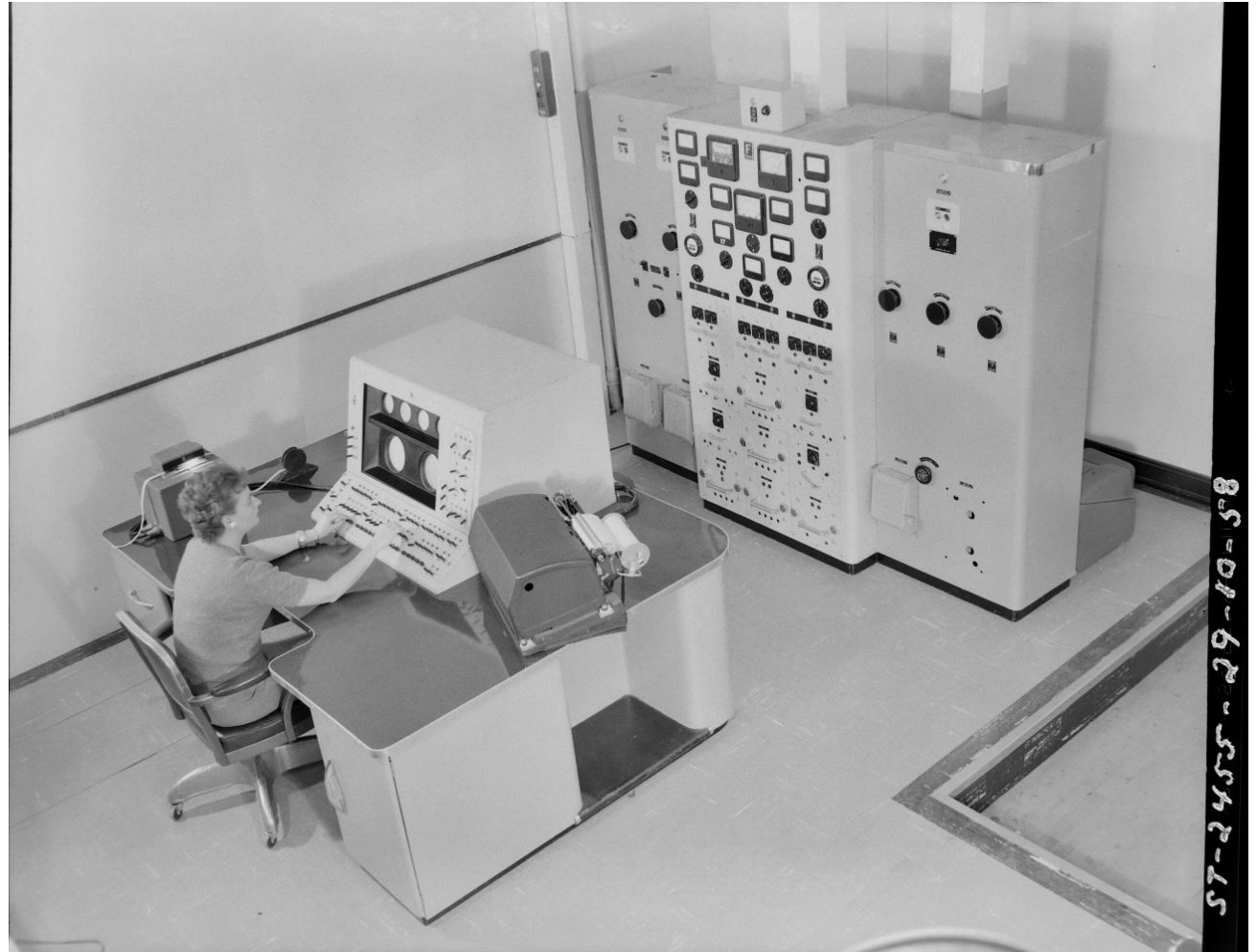


RAM Memory



Note the capacitance plate
Displayed 64, 20-bit lines for a total of 1280 bits or 256 digits

Long Lost Photos



Courtesy, NRC archives.

Long Lost Photos



Courtesy, NRC archives.

Long Lost Photos



Courtesy, NRC archives.

Long Lost Photos



Courtesy, NRC archives.

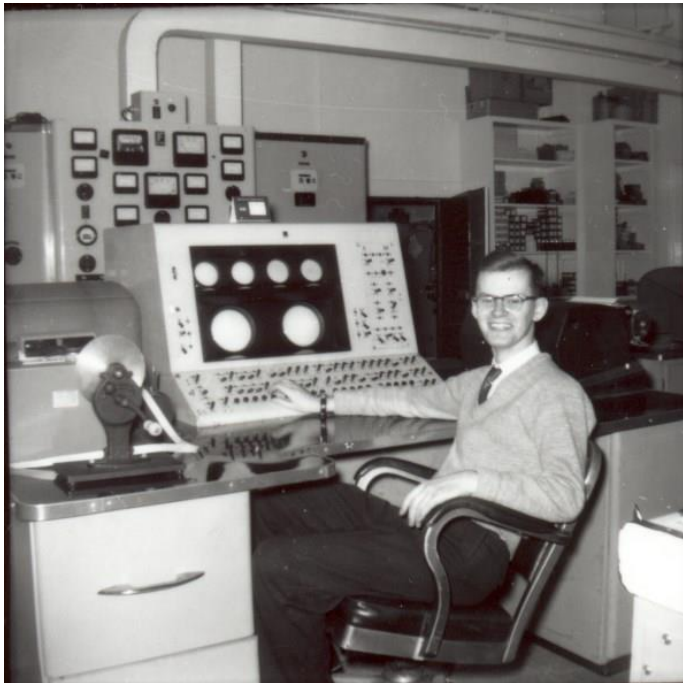
Long Lost Photos



Courtesy, NRC archives.

Moving on

In 1960 a change in salary precipitated...



...a change of consoles!



ELECTRONIC TECHNICIANS

SALARIES
\$195 PER WEEK
PLUS ROOM
AND BOARD

After Short Training Period

Salaries Are Based On
54-Hour Week And Are
Subject To
Canadian Income Tax
(No Arrangement Can Be
Made for Family Relocation)

ASSIGNMENT IN DEW LINE
(DISTANT EARLY WARNING SYSTEM)

TO QUALIFY YOU MUST HAVE AT LEAST
A TECHNICAL SCHOOL DIPLOMA
WITH 2 YEARS' CURRENT
EXPERIENCE IN THE FOLLOWING FIELDS:

COMMUNICATIONS

UHF AND VHF
TRANSMITTERS AND RECEIVERS

RADAR NAVIGATIONAL AIDS

TV-RADIO SERVICE
EXPERIENCE NOT ACCEPTABLE

Only Persons With The Above Experience
Need Apply

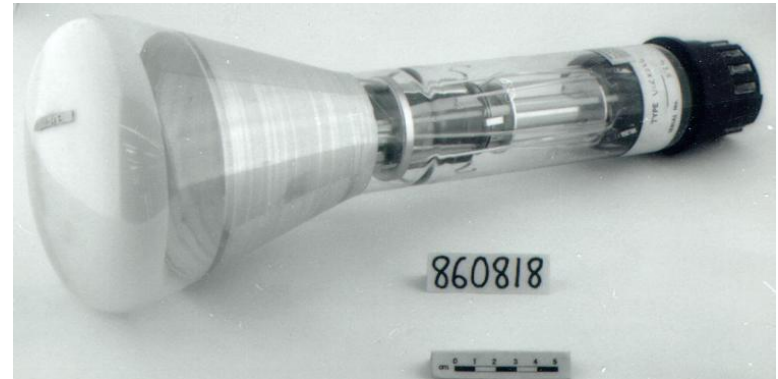
Canadian Or British Citizens
Pass A Technical Test.
Be In Top Physical Condition,
Pass A Psychological Screening

Mail your complete resume to

FEDERAL ELECTRIC CORP.

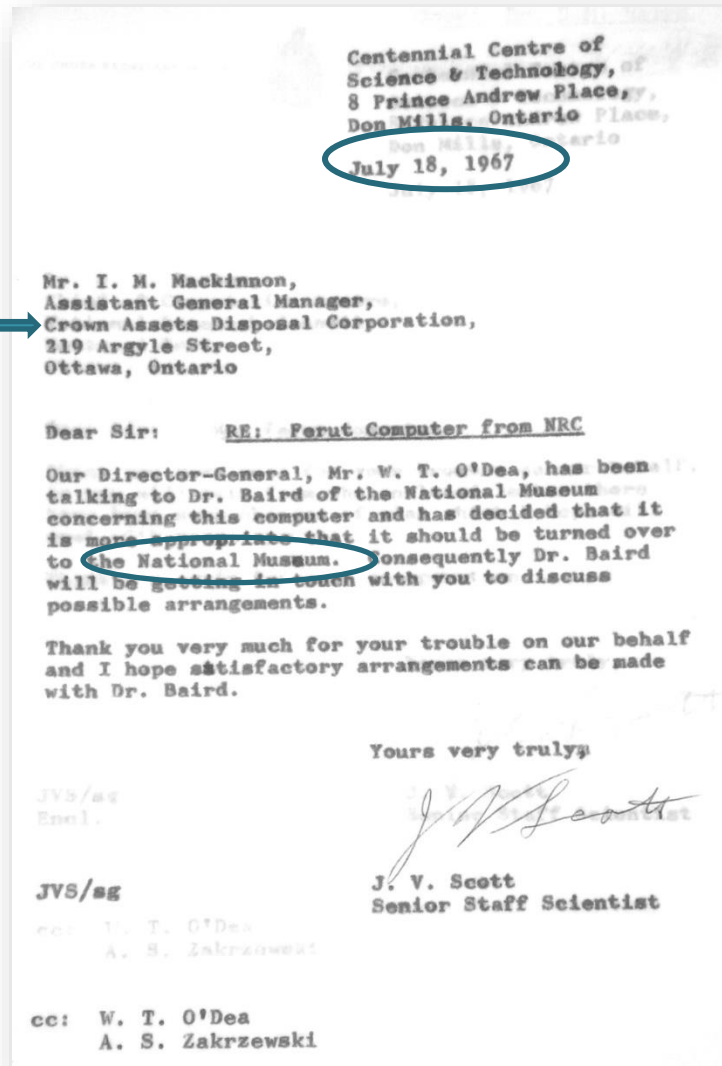
SERVICE DIVISION OF
INTERNATIONAL TELEPHONE
AND TELEGRAPH CORPORATION
DEW LINE OFFICE, MONTREAL AIRPORT
MONTREAL, QUEBEC

What's left of ferut



That's it!!!

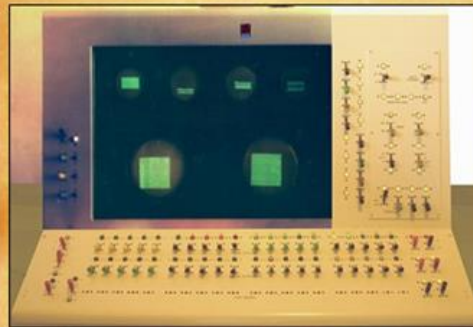
Where did ferut go?



The Mystery Continues

WANTED!

The remains of FERUT,
Canada's 1st commercial
digital computer.



Last seen in NRC's M-14
building in the mid-1960's.

For more information, visit www.FERUT.ca

HELP SOLVE THE MYSTERY



Thank you!

Q&A Time