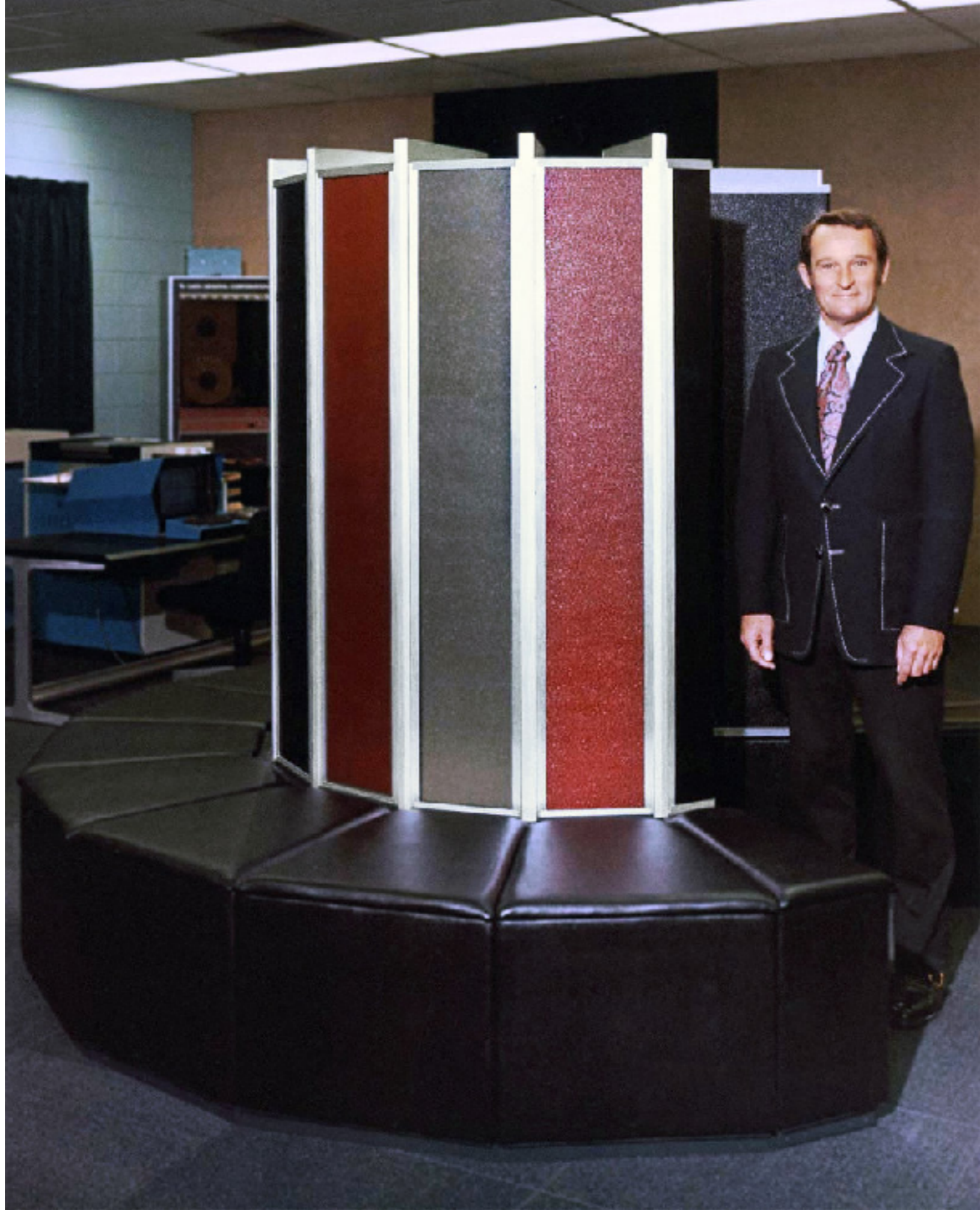


CSE 470

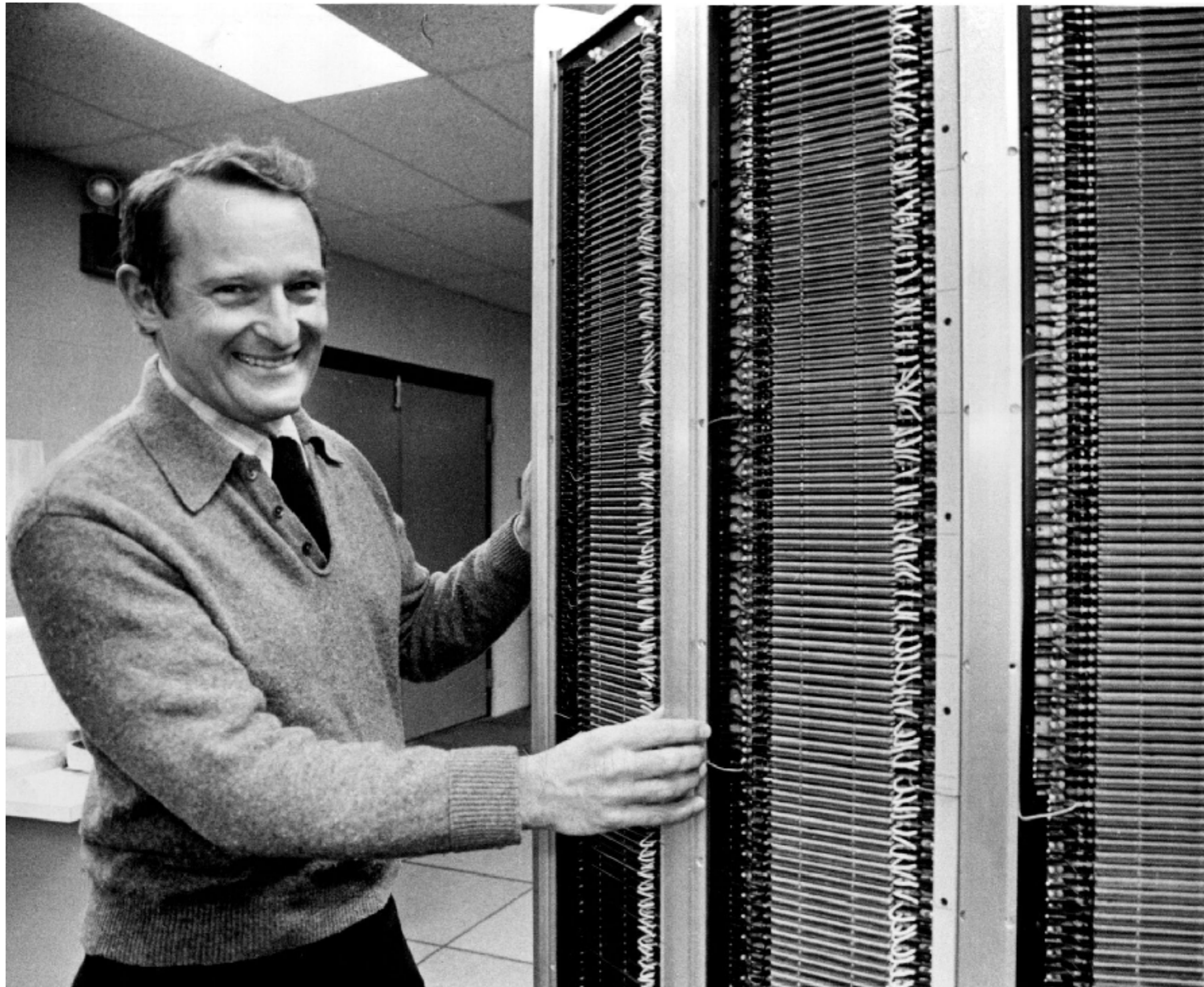
Cray-1





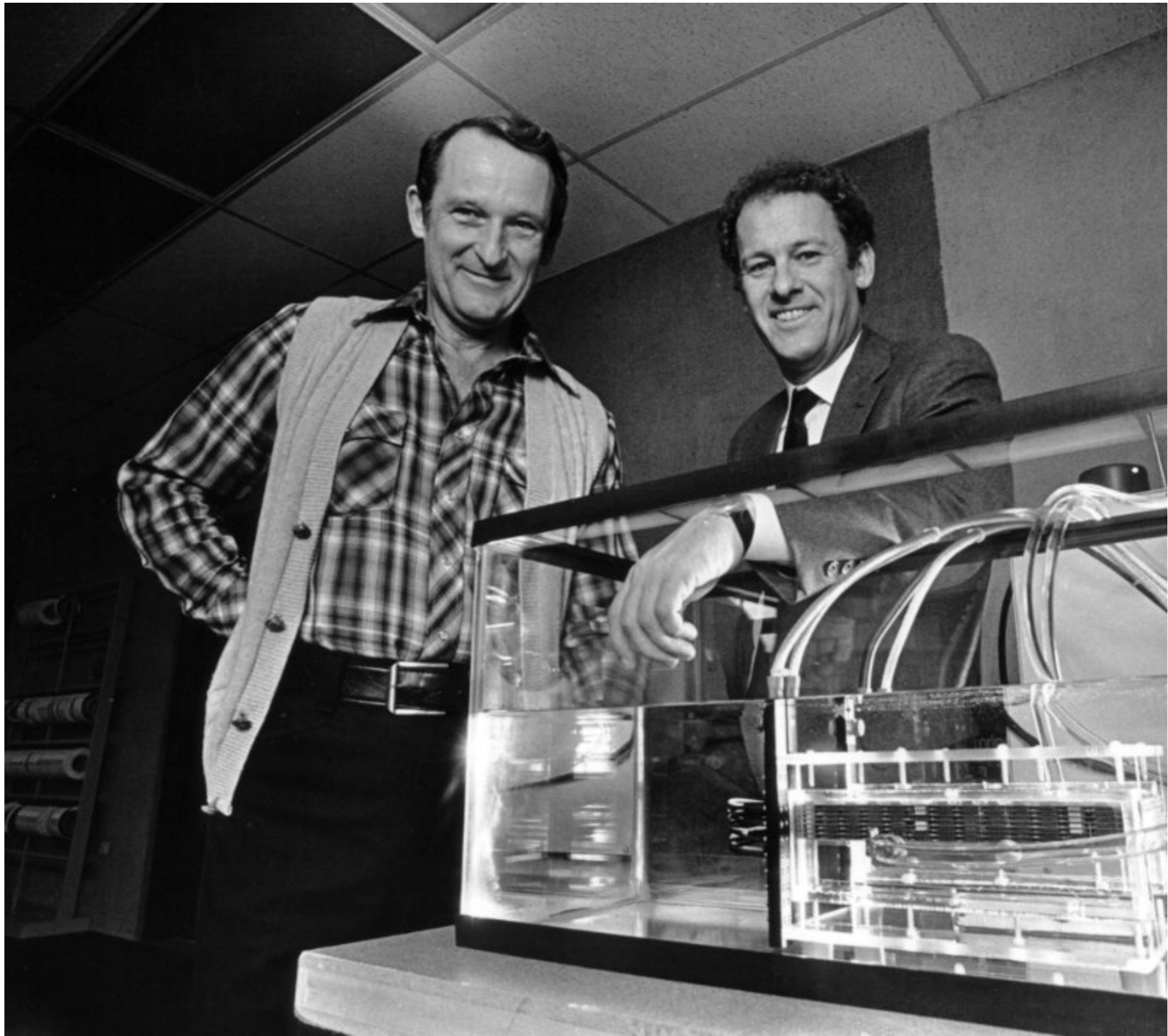


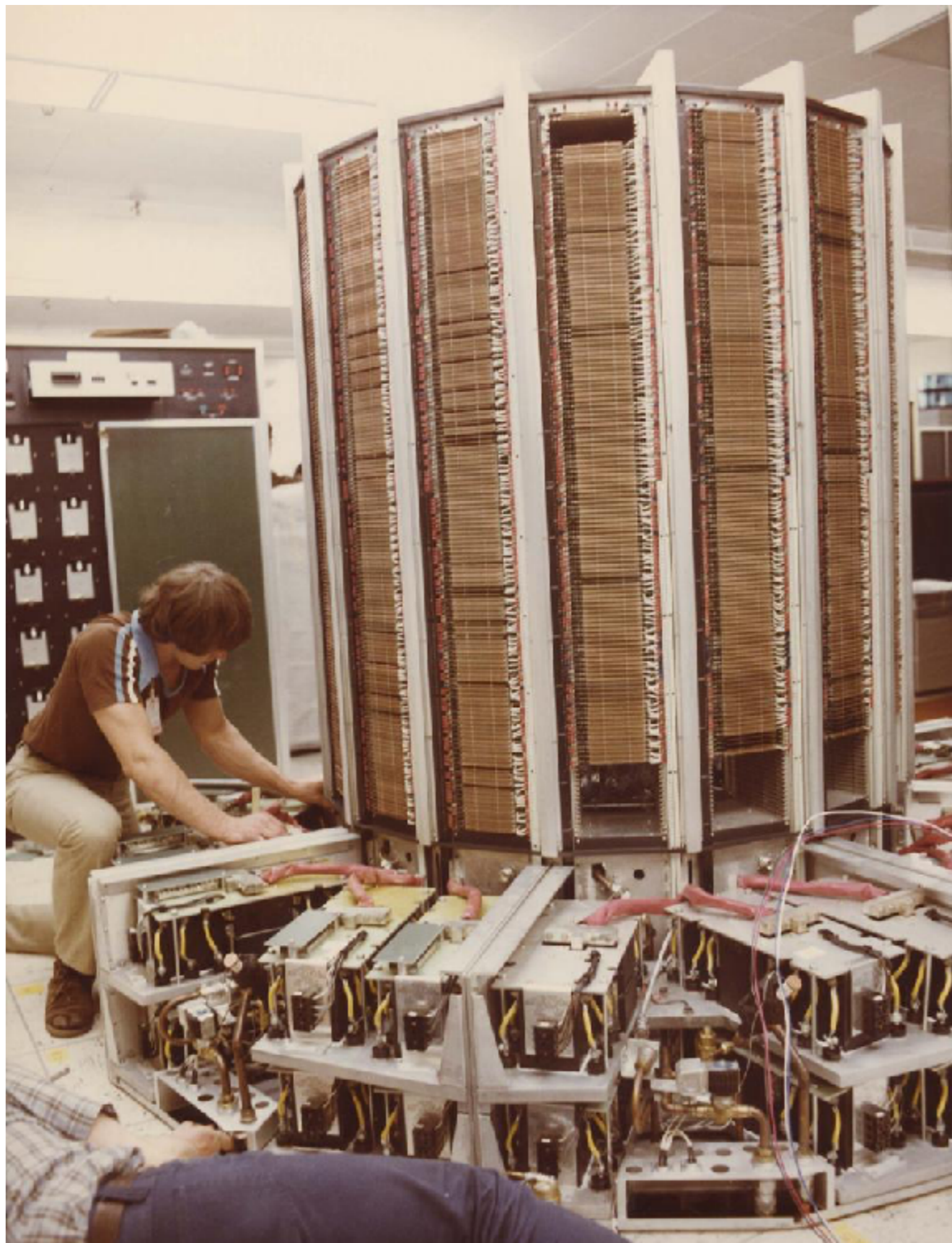


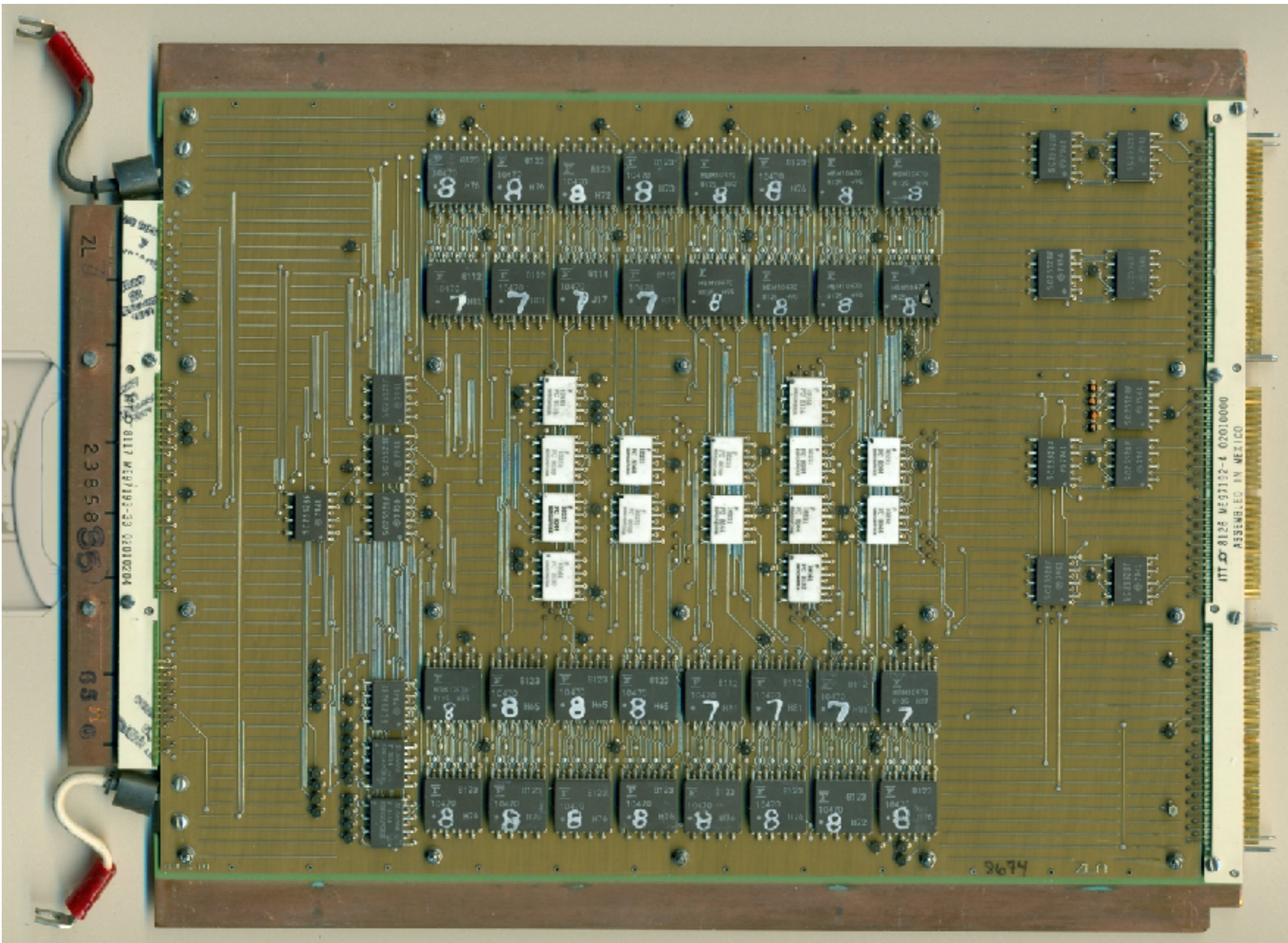












ZL

23858

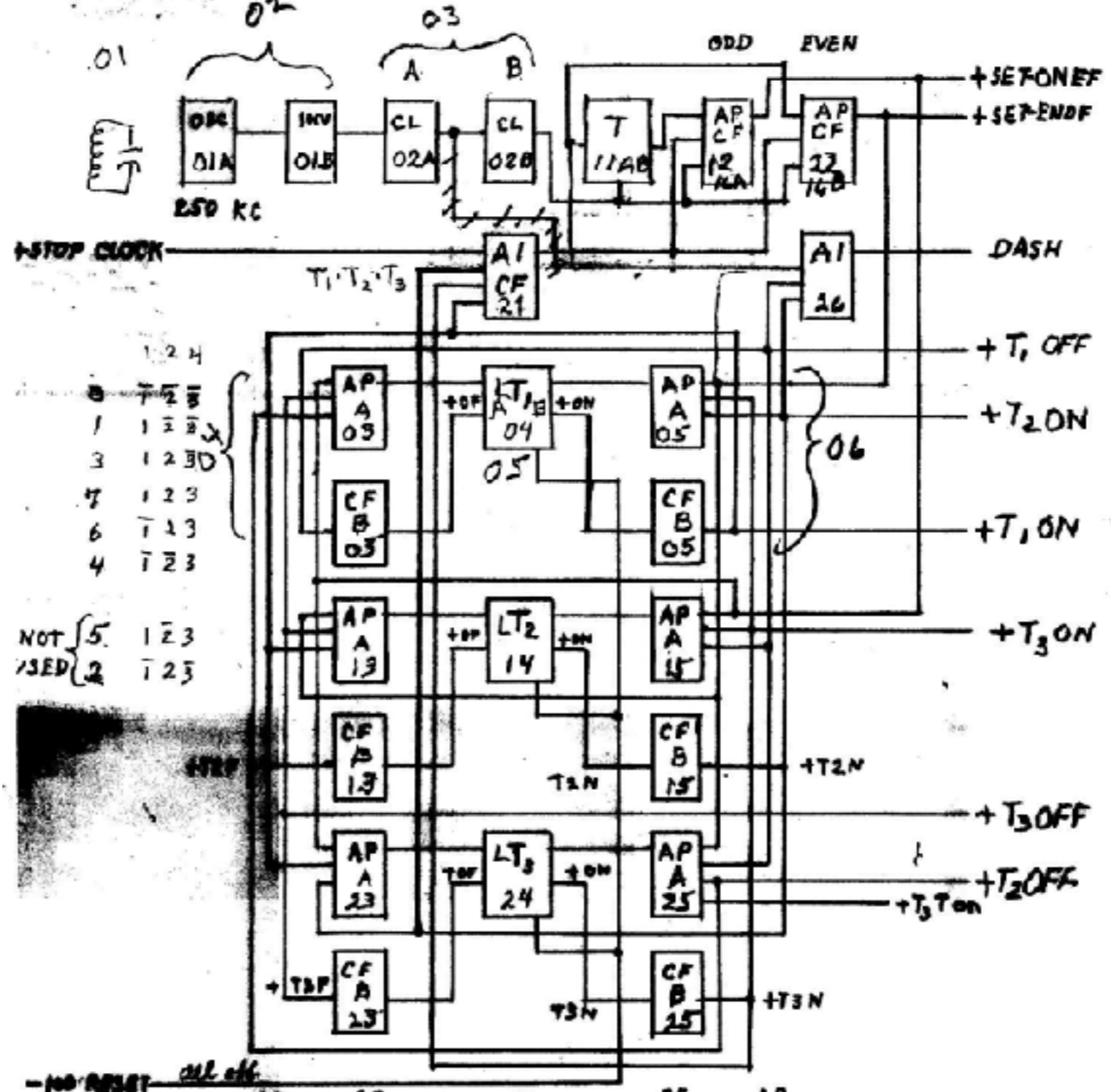
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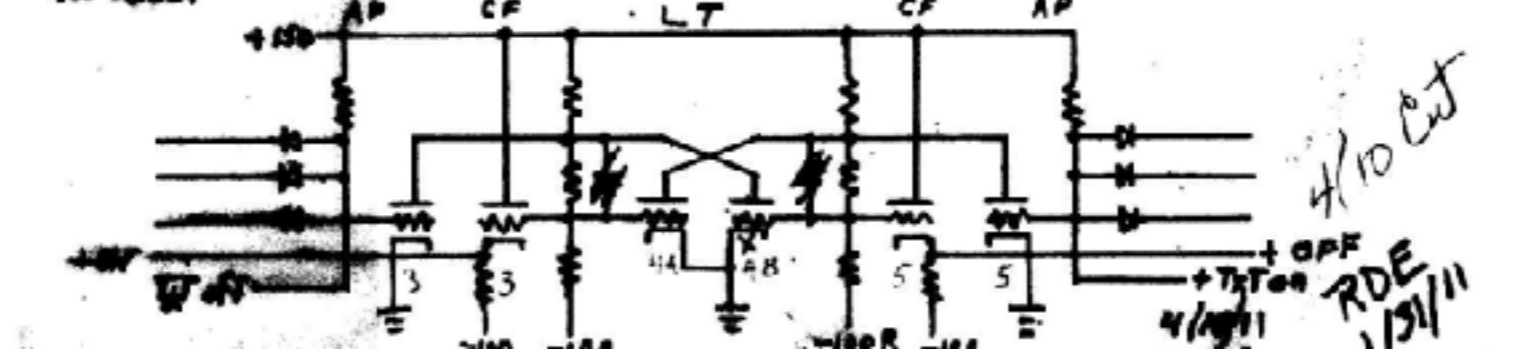
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ASSEMBLED IN MEXICO

9674 1.0

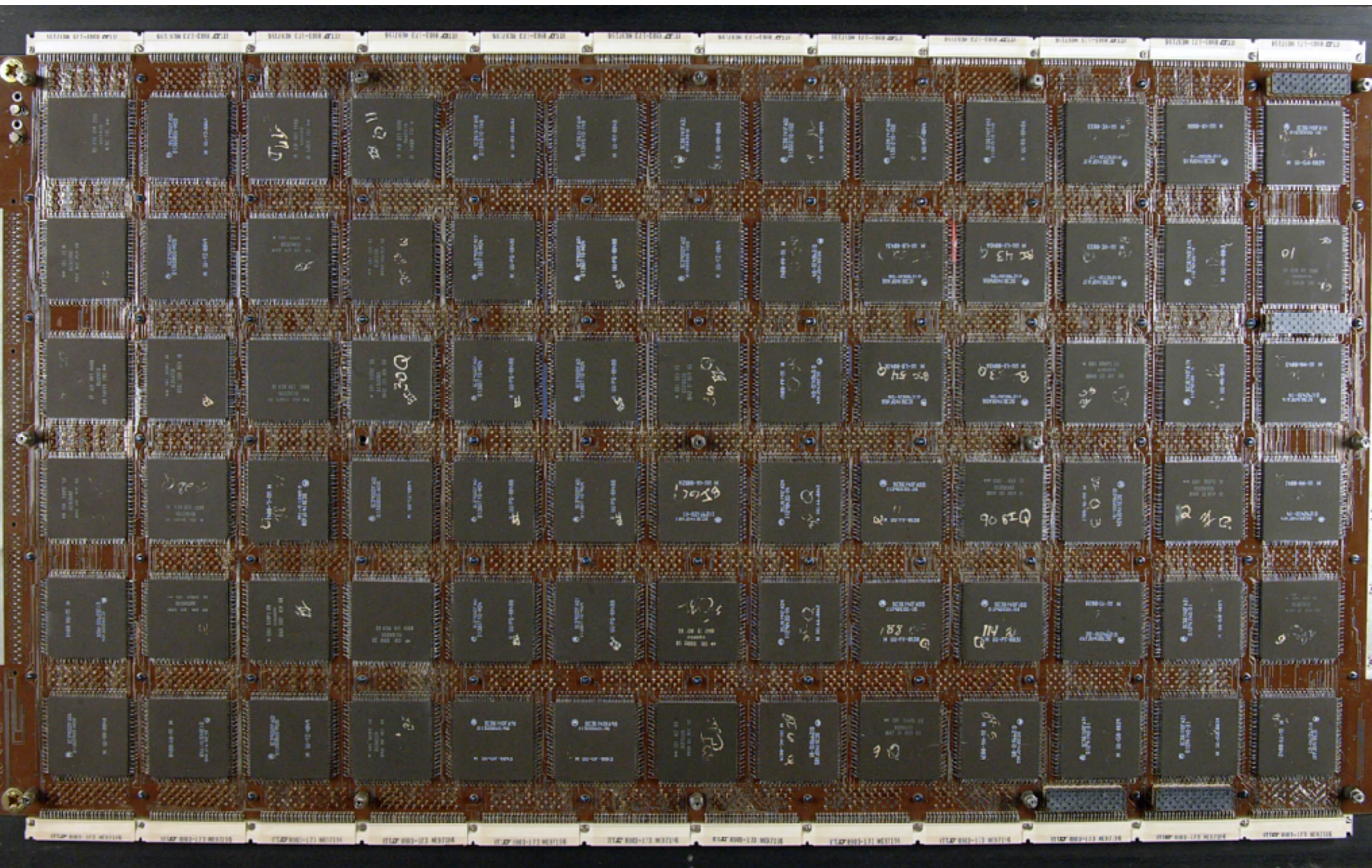
CLOCK CL.A



1 2 4	7 2 3
1 1 2 3	1 1 2 3
3 1 2 3 0	3 1 2 3
4 1 2 3	4 1 2 3
6 1 2 3	6 1 2 3
4 1 2 3	4 1 2 3
NOT USED 5 1 2 3	5 1 2 3
NOT USED 2 1 2 3	2 1 2 3







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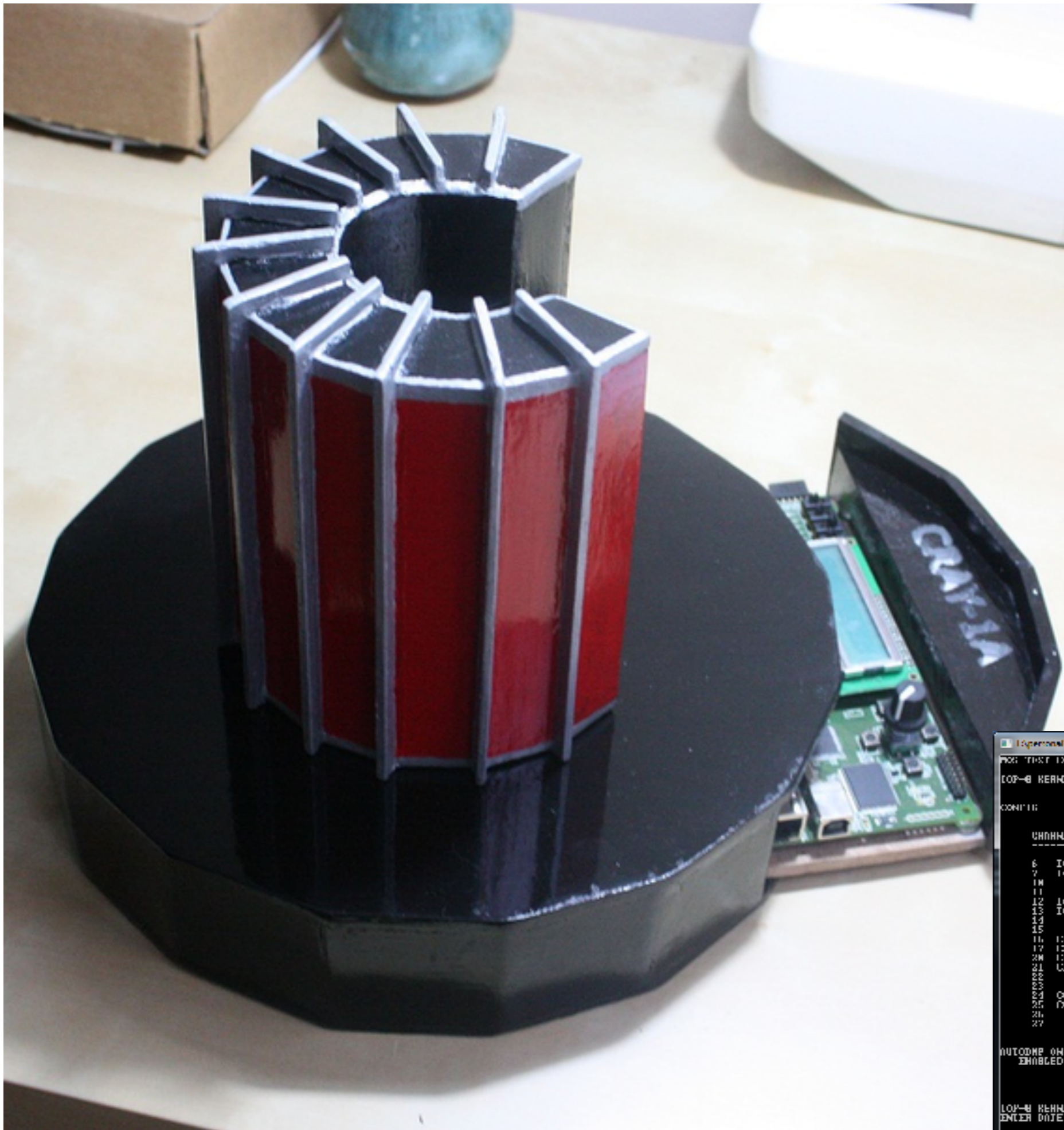
\$149.00





Printed circuit boards and power supply components are exposed as engineers install the CRAY-1 at UCS





```

C:\operational\project\MyWork\ghyos\11\my01\console
LOG TEST COMPLETE
LOP-M KERNEL, VERSION 1.2.2.  Bu302/25. * Bowling Edge * 06/06/99 12:35:38

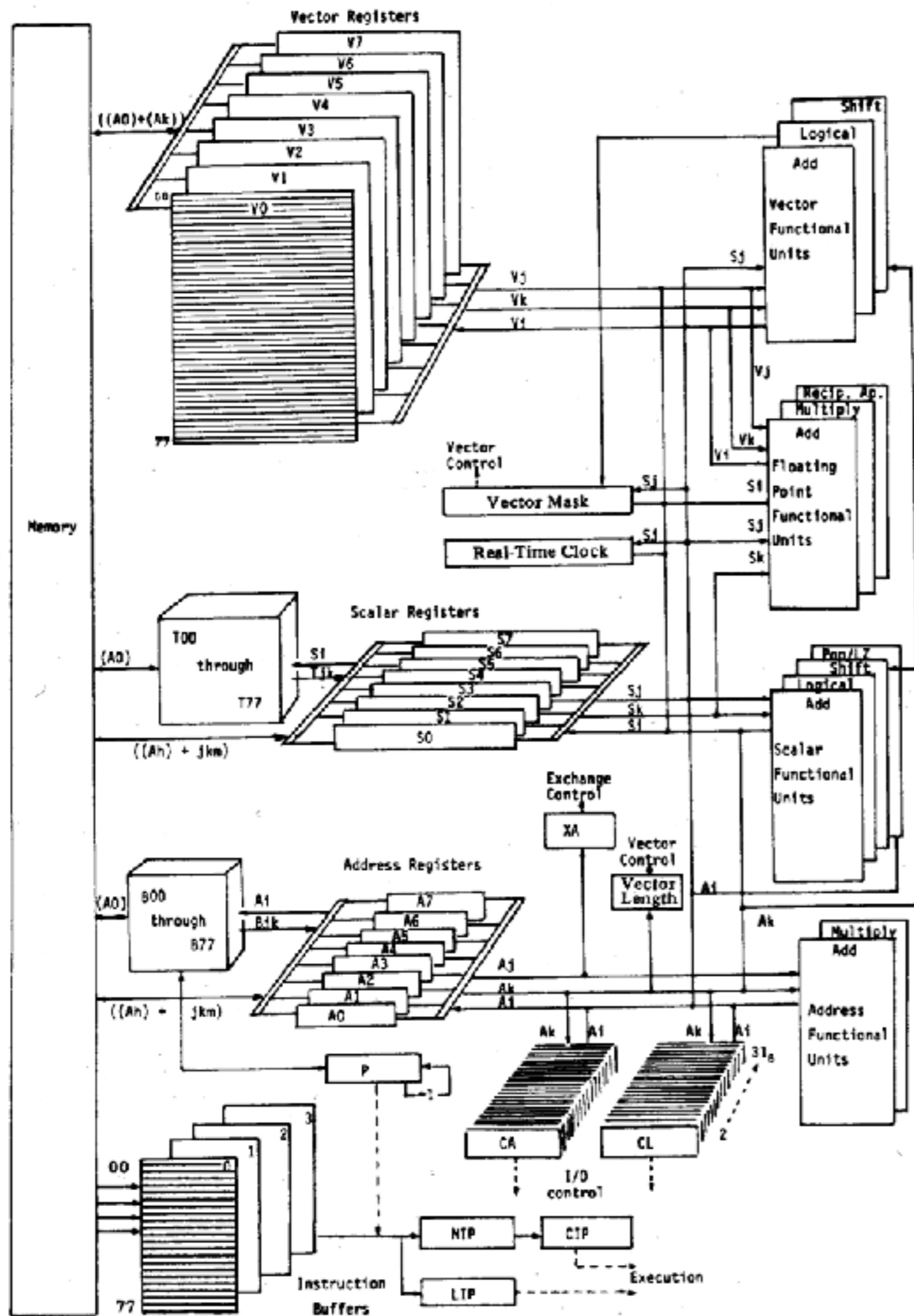
CONFIG
-----
          LOP-M CONFIGURATION
CHANNEL (ORD)          CHANNEL (ORD)          RESOURCES
-----
6  IOP1 0->0          30
7  IOP1 0->0          31
10
11
12  IOP2 0->0          34
13  IOP2 0->0          35
14
15
16  IOP3 0->0          36
17  IOP3 0->0          37
18  IOP4 0->0          40  AMPK  HH
19  IOP4 0->0          41  AMPK  HH
20  IOP4 0->0          42  AMPK  HH
21  IOP4 0->0          43  AMPK  BB
22  IOP4 0->0          44  AMPK  BB
23  IOP4 0->0          45  AMPK  BB
24  IOP4 0->0          46  AMPK  BB
25  IOP4 0->0          47  AMPK  BA
26
27

AUTODMP ON
          ENABLED

LOP-M KERNEL, VERSION 1.2.2.  Bu302/25. * Bowling Edge * 06/06/99 12:35:38
ENTER DATE [MM/DD/YY]
  
```

What/Why is a vector processor?

- What:
 - A collection of registers that make up a vector
 - A vector operation adds those registers together with a single instruction
 - Good for matrix computations
 - Single instruction multiple data (SIMD)
- Why
 - SIMD expresses parallelism
 - ILP from chaining: $A \text{ pairwise } X B + C$



How big should a vector be?

- Shorter length vectors are supposedly easier to program for
- Shorter is more flexible for applications to use
- If you have the **data parallelism** then longer vectors are more efficient

Where do we see vector (or vector like) processors today?

- GPUs
- Floating point unit of your processor
- TPU ?

What stood out for you about the Cray-1?

- Interrupts
- Differential signaling for minimizing interference
- Precise timing for wires
- Memory was most of the machine
- Compiler was key, famous for giving feedback to developer