

Midterm #1

- Test corrections due Tuesday
 - MC: in your own words, explain the correct answer
 - Essay: if 21 or below (B), please rewrite your essay

Four assignments

- History of Computing reading; Chapter 3
- Midterm corrections; History of Computing essays

History of computation, pt. 1

Calculators; ancient and semi-modern computing

Abacus (ancient)



Antikythera mechanism



Mid 1800's — mid 1900's

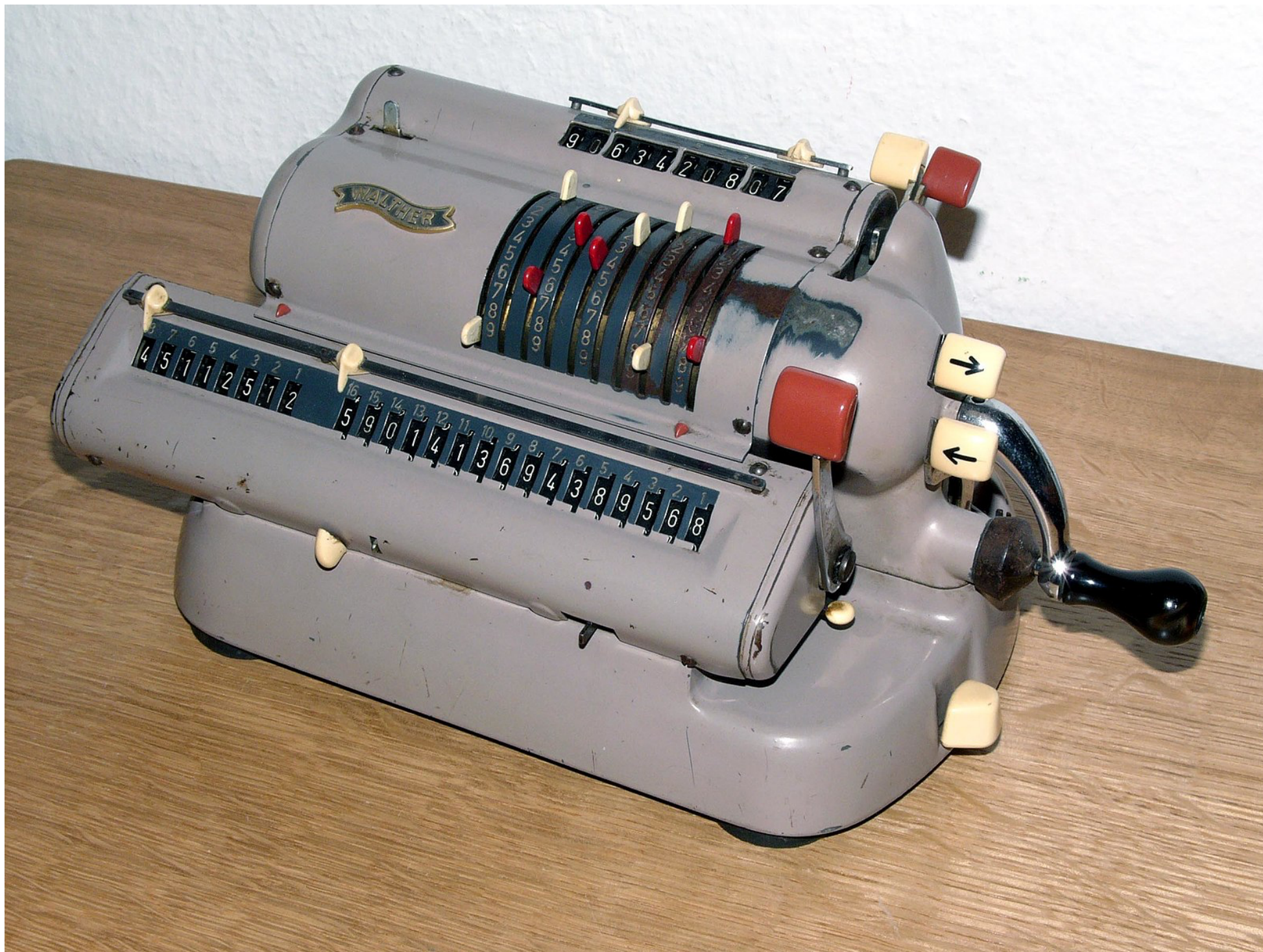
Slide rule



Mechanical calculators (Odhner ~1900)



Mechanical calculator (Walther 1960)



Curta calculator (1947-1972)

- Developed in concentration camp
- Addition, subtraction, multiplication, division



Language

- Computer used to mean the person

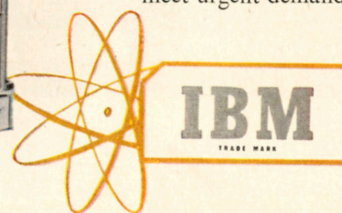
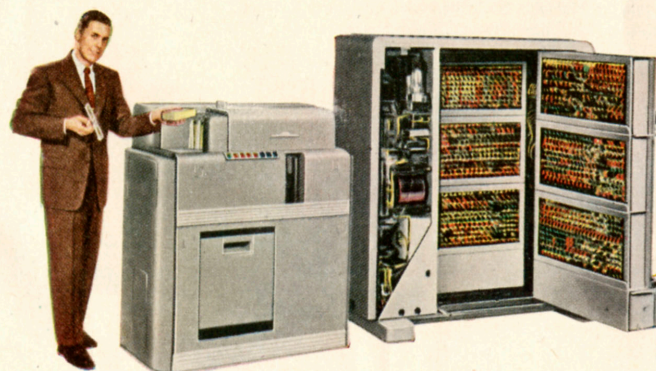


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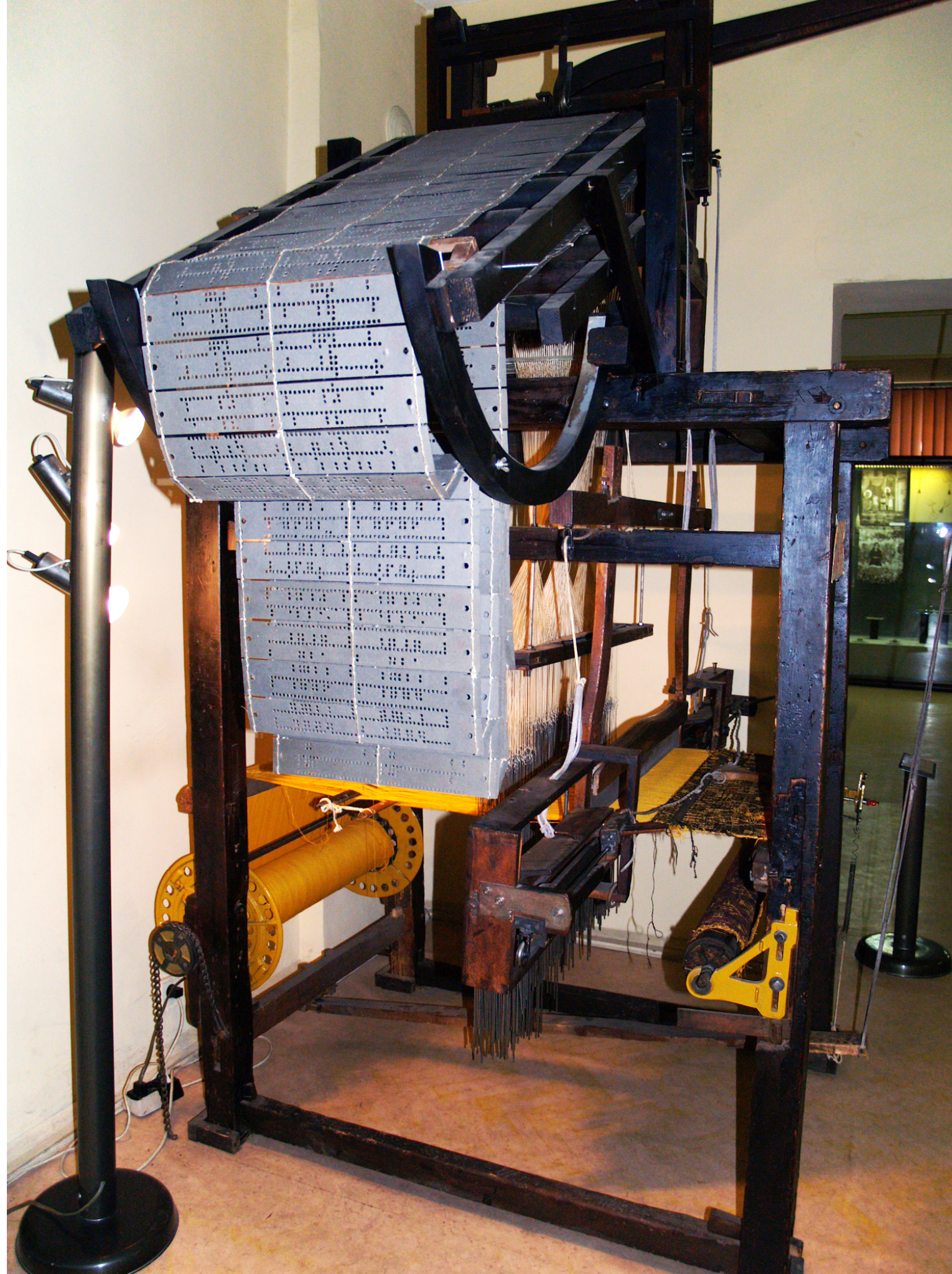


INTERNATIONAL BUSINESS MACHINES

Data

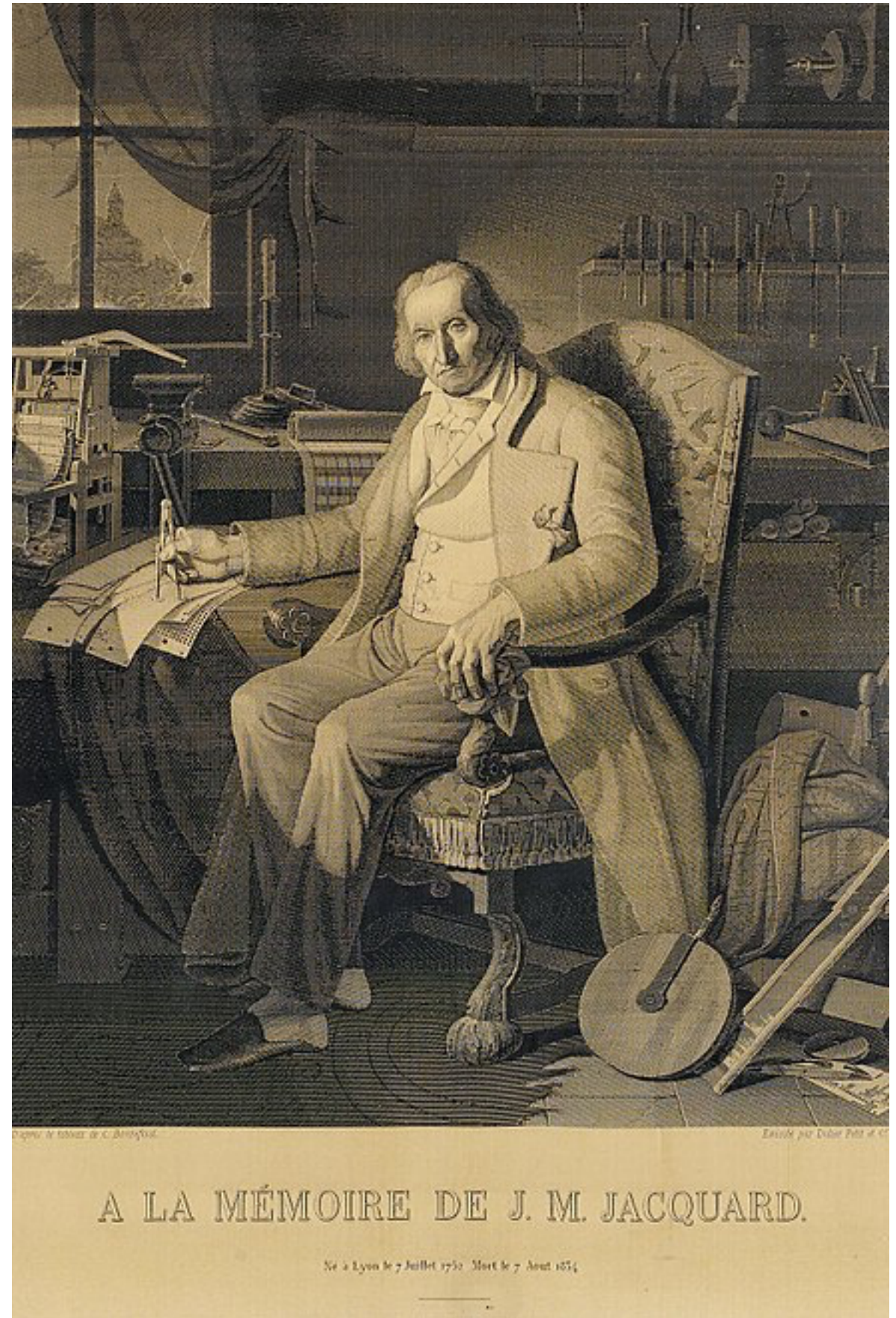
Jacquard loom 1804



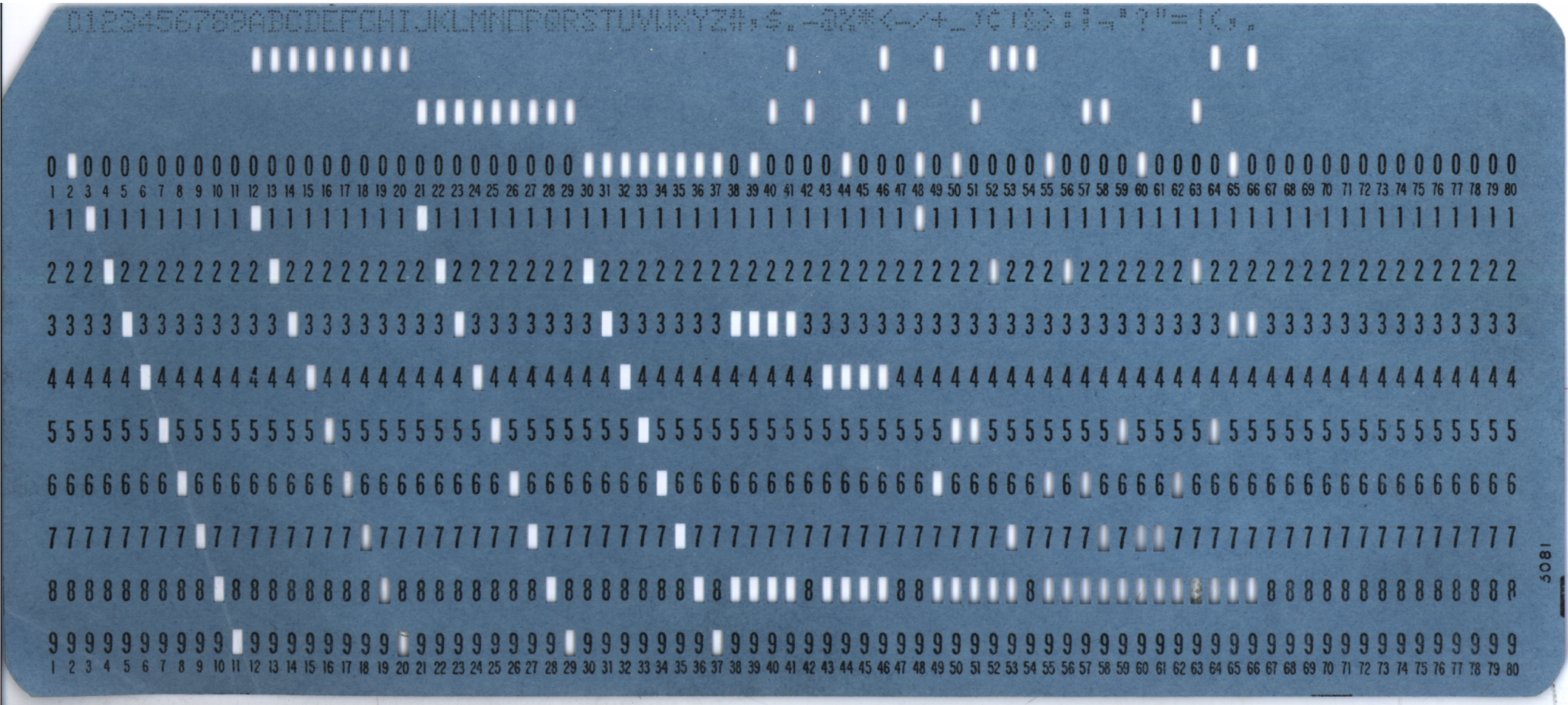


Silk weaving

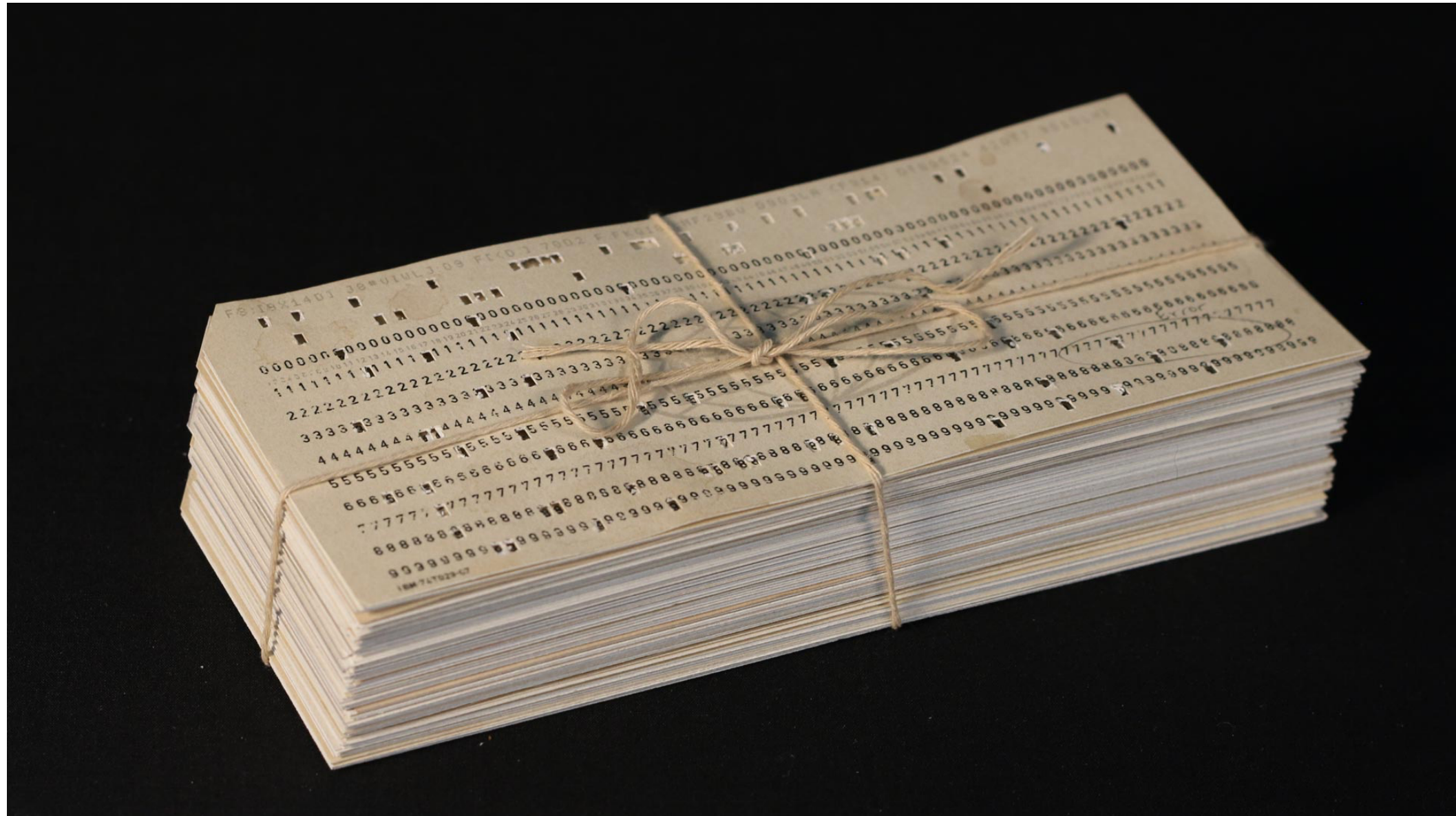
- 24,000 cards!



Punch cards



Data



Data



Data

NARA-A Brief History



Storage of IBM record cards at the Federal records center in Alexandria, Virginia, November 1959.

Post-war computing

My family and computers



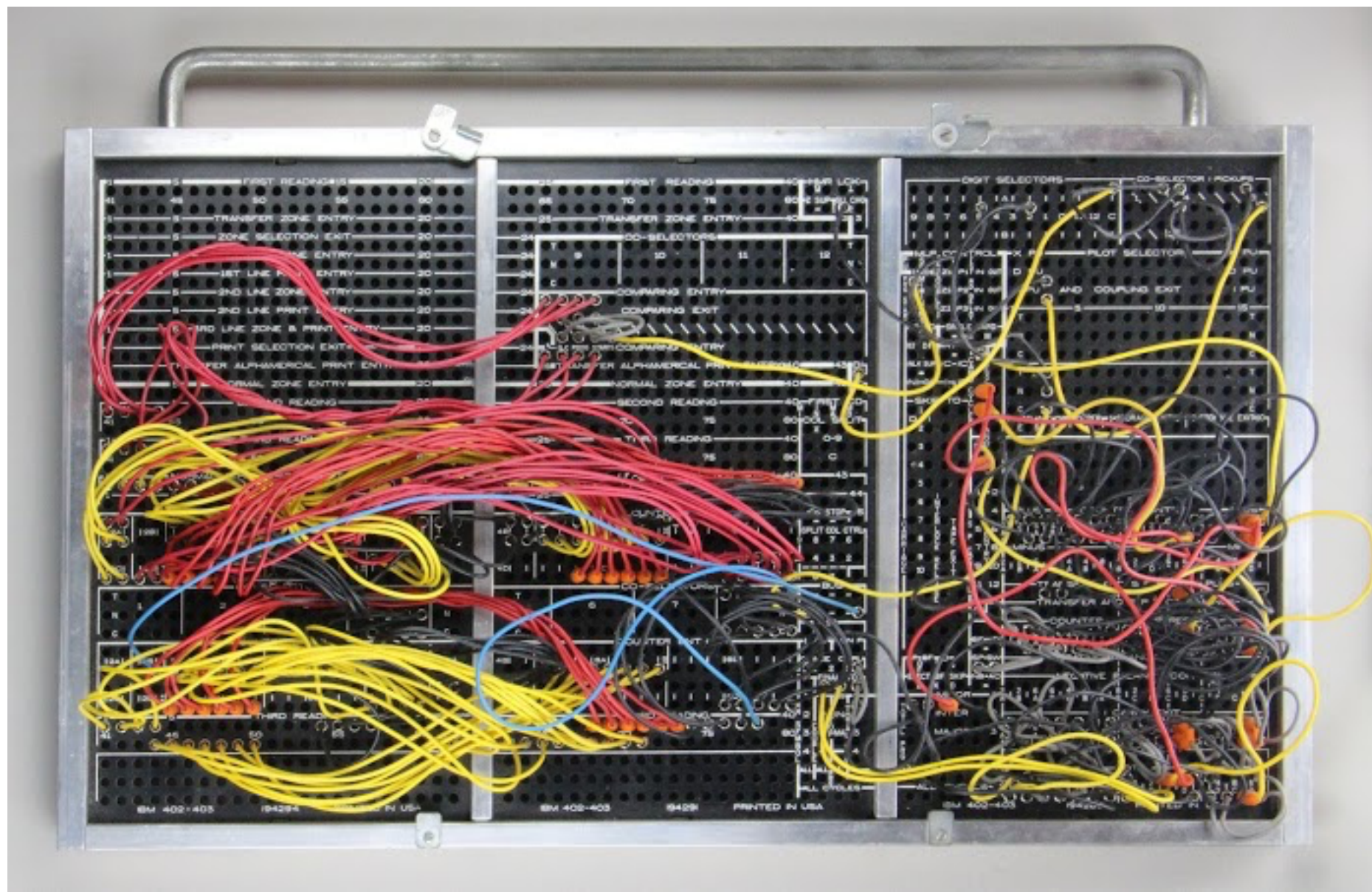
Pete Morales



Barbara Hosier

Plug board programming

- Data on punch cards
- Program hard wired



IBM 403 & 403



'Software'



Kelley Air Force Base (IBM 402 & 403)

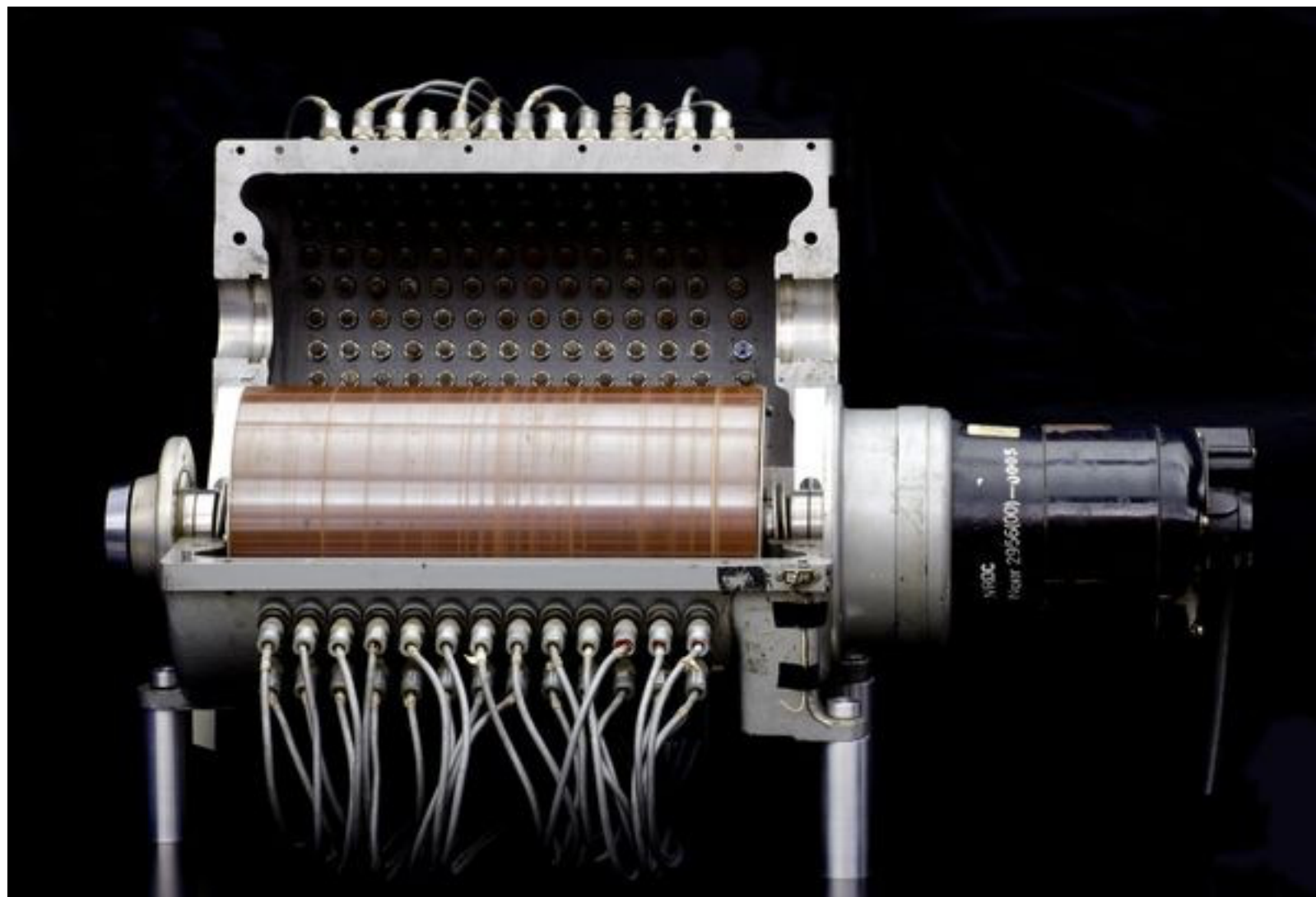


IBM 650



Magnetic drum (IBM 650)

- Program stored on drum (along with memory)
- Data on punch cards or magnetic tape



Grace Hopper and COBOL



Machine language

; Main program

```
-----
Start
; **** YOUR CODE GOES HERE ****

      MOVLW      b'00001111'
      MOVWF      H'20'
      CLRF       H'21'
      MOVLW      b'11001100'
      MOVWF      H'21'
LoopPoint RRF      H'20',F
      INCF       H'21',F
      GOTO       LoopPoint

Finish
      END                ; End of program
.
```

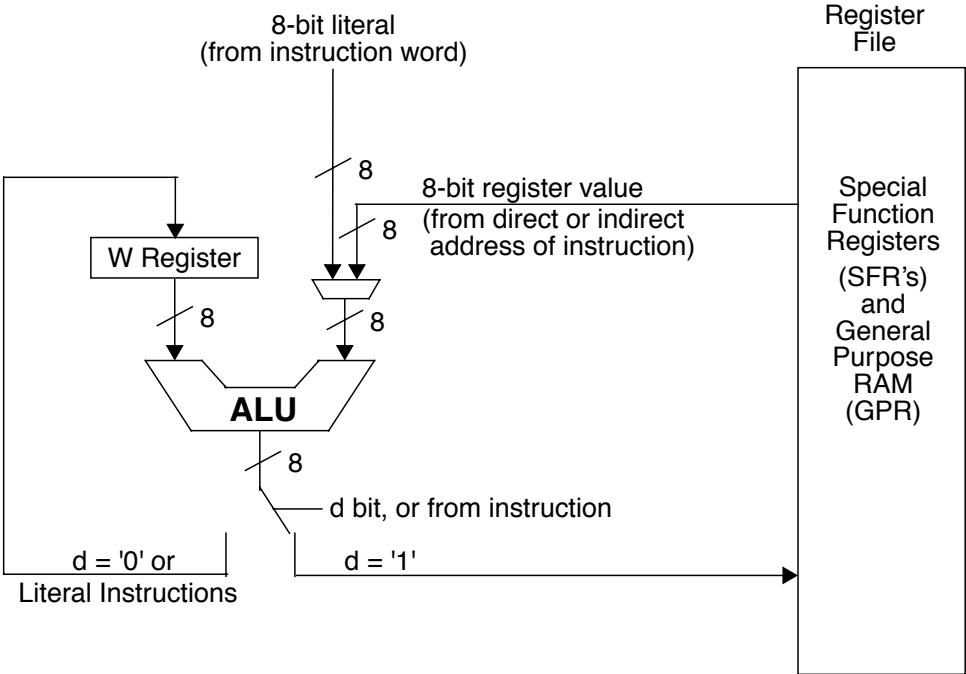
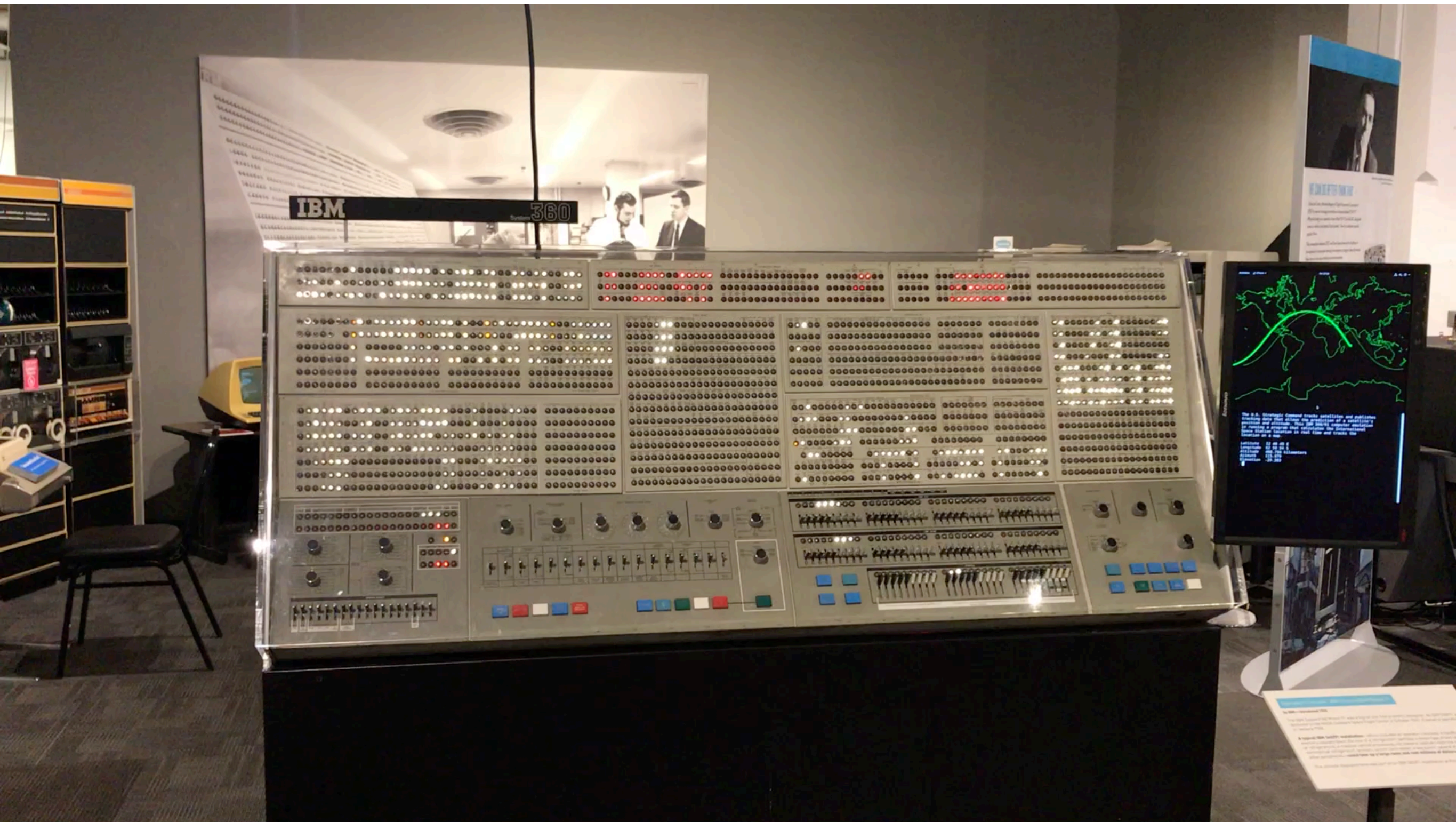


TABLE 16-2: PIC16F87/88 INSTRUCTION SET

Mnemonic, Operands		Description	Cycles	14-Bit Opcode				Status Affected	Notes
				MSb		LSb			
BYTE-ORIENTED FILE REGISTER OPERATIONS									
ADDWF	f, d	Add W and f	1	00	0111	dfff	ffff	C,DC,Z	1,2
ANDWF	f, d	AND W with f	1	00	0101	dfff	ffff	Z	1,2
CLRF	f	Clear f	1	00	0001	1fff	ffff	Z	2
CLRW	-	Clear W	1	00	0001	0xxx	xxxx	Z	
COMF	f, d	Complement f	1	00	1001	dfff	ffff	Z	1,2
DECf	f, d	Decrement f	1	00	0011	dfff	ffff	Z	1,2
DECFSZ	f, d	Decrement f, Skip if 0	1(2)	00	1011	dfff	ffff		1,2,3
INCF	f, d	Increment f	1	00	1010	dfff	ffff	Z	1,2
INCFSZ	f, d	Increment f, Skip if 0	1(2)	00	1111	dfff	ffff		1,2,3
IORWF	f, d	Inclusive OR W with f	1	00	0100	dfff	ffff	Z	1,2
MOVF	f, d	Move f	1	00	1000	dfff	ffff	Z	1,2
MOVWF	f	Move W to f	1	00	0000	1fff	ffff		
NOP	-	No Operation	1	00	0000	0xx0	0000		
RLF	f, d	Rotate Left f through Carry	1	00	1101	dfff	ffff	C	1,2
RRF	f, d	Rotate Right f through Carry	1	00	1100	dfff	ffff	C	1,2
SUBWF	f, d	Subtract W from f	1	00	0010	dfff	ffff	C,DC,Z	1,2
SWAPF	f, d	Swap nibbles in f	1	00	1110	dfff	ffff		1,2
XORWF	f, d	Exclusive OR W with f	1	00	0110	dfff	ffff	Z	1,2
BIT-ORIENTED FILE REGISTER OPERATIONS									
BCF	f, b	Bit Clear f	1	01	00bb	bfff	ffff		1,2
BSF	f, b	Bit Set f	1	01	01bb	bfff	ffff		1,2
BTFSC	f, b	Bit Test f, Skip if Clear	1 (2)	01	10bb	bfff	ffff		3
BTFSS	f, b	Bit Test f, Skip if Set	1 (2)	01	11bb	bfff	ffff		3
LITERAL AND CONTROL OPERATIONS									
ADDLW	k	Add literal and W	1	11	111x	kkkk	kkkk	C,DC,Z	
ANDLW	k	AND literal with W	1	11	1001	kkkk	kkkk	Z	
CALL	k	Call subroutine	2	10	0kkk	kkkk	kkkk		
CLRWDT	-	Clear Watchdog Timer	1	00	0000	0110	0100	$\overline{TO}, \overline{PD}$	
GOTO	k	Go to address	2	10	1kkk	kkkk	kkkk		
IORLW	k	Inclusive OR literal with W	1	11	1000	kkkk	kkkk	Z	
MOVLW	k	Move literal to W	1	11	00xx	kkkk	kkkk		
RETFIE	-	Return from interrupt	2	00	0000	0000	1001		
RETLW	k	Return with literal in W	2	11	01xx	kkkk	kkkk		
RETURN	-	Return from Subroutine	2	00	0000	0000	1000		
SLEEP	-	Go into Standby mode	1	00	0000	0110	0011	$\overline{TO}, \overline{PD}$	
SUBLW	k	Subtract W from literal	1	11	110x	kkkk	kkkk	C,DC,Z	
XORLW	k	Exclusive OR literal with W	1	11	1010	kkkk	kkkk	Z	

Grace Hopper & COBOL

- Human write instruction in 'English-like language' (COBOL)
- A program translates to machine language (compiler)
- Same program (in COBOL) can be compiled (translated) to run on different computers
 - Don't have to rewrite software for each computer



My family and computers



Pete Morales



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