Atanasoff-Berry Computer Users Guide

A practical guide to the operation of the worlds first digital electronic computer

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Table of Contents

Identification of Operational Components

Image 1. Front of ABC

A. Base-2 Conversion Drum (rear)
B. KA Drum
C. Operators Panel
D. Base-2 Input Output trays
E. Base-10 Card Reader
F. Base-10 odometer
G. Add / Subtract Module

ABC Front Panel Identification

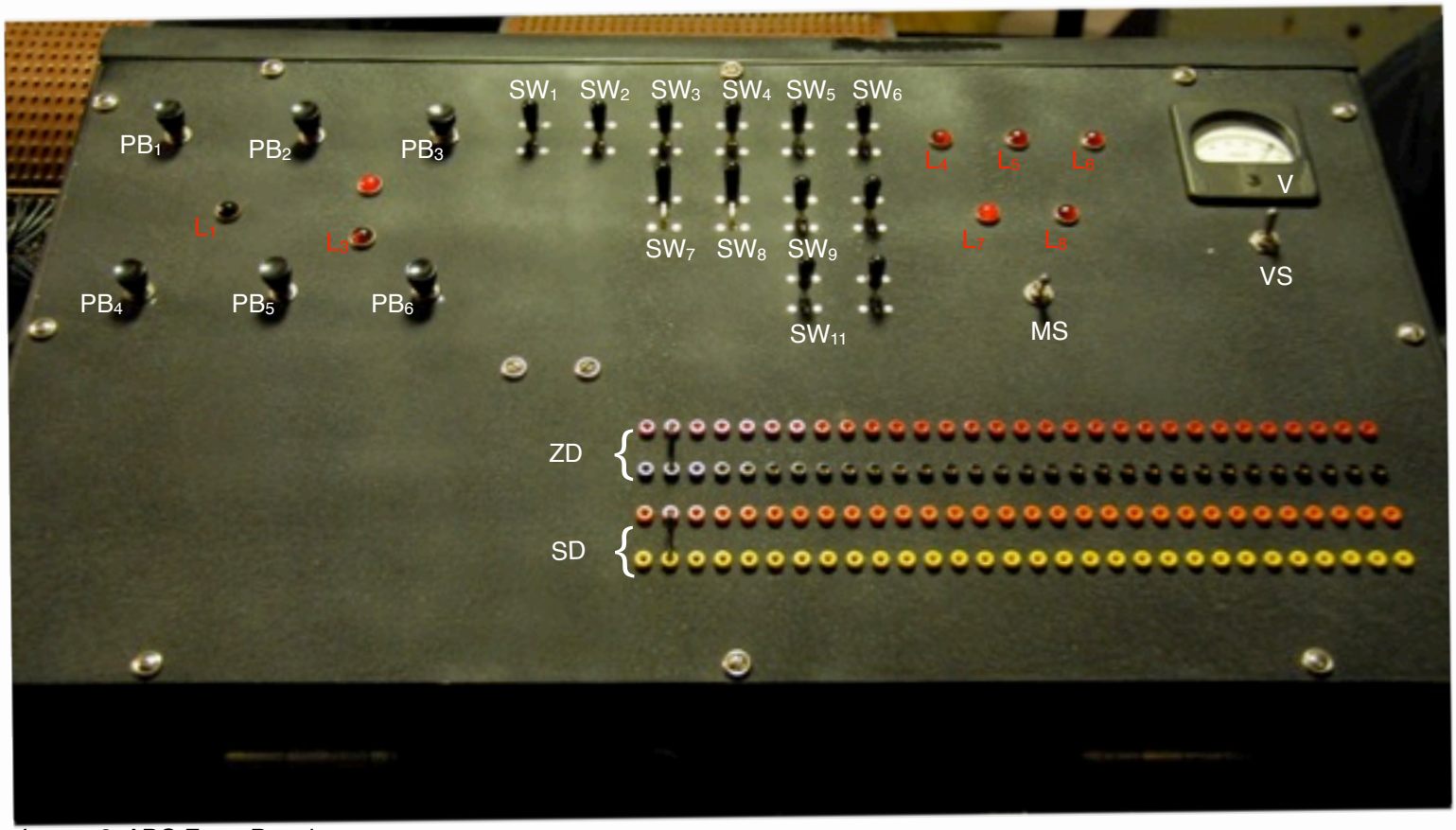

Image 2. ABC Front Panel

1. **PB**$_1$ Add / Subtract Selection Push-Button
2. **PB**$_2$ Start Base-10 Read Operation
3. **PB**$_3$ Transfer CA-Drum to KA-Drum
4. **PB**$_4$ Start Base-2 Punch
5. **PB**$_5$ Start Base-2 Read
6. **PB**$_6$ Start Computation
7. **SW**$_1$ Coefficients Input Selection: 1-5
8. **SW**$_2$ Coefficients Input Selection: 6-10
9. **SW**$_3$ Coefficients Input Selection: 11-15
10. **SW**$_4$ Coefficients Input Selection: 16-20
11. **SW**$_5$ Coefficients Input Selection: 21-25
12. **SW**$_6$ Coefficients Input Selection: 26-30
13. **SW**$_7$ Card Read Switch
14. **SW**$_8$ IBM Card Sign Control
15. **SW**$_9$ Unused
16. **SW**$_{10}$ IBM Card 1's Output Limit
17. **SW**$_{11}$ Clear-KA Switch
18. **SW**$_{12}$ Clear-CA Switch
19. **L**$_1$ Base-2 Read Operation
20. **L**$_2$ Add Operation
21. **L**$_3$ Subtract Operation
22. **L**$_4$ Read IBM Card Operation
23. **L**$_5$ Coefficient Elimination Operation
24. **L**$_6$ Decimal Output Operation
25. **L**$_7$ Positive Number Indicator
26. **L**$_8$ Negative Number Indicator
27. **V** Voltmeter
28. **VS** Voltage Selector Switch (Pos/Neg)
29. **MS** Motor Switch
30. **ZD** Zero Detection Coefficient Selection
31. **SD** Sign Detection Coefficient Selection

Base-10 Data Input

Reading the base-10 data begins before the machine is even turned on. The equations must first be encoded on IBM punch cards. Each IBM card encodes up to five numbers. The ABC uses fifty bits of precision in a two's compliment format. This gives us an integer range of ((2^49-1) to (-2^49)) or ((5,629,499,953,421,311) to (5,629,499,953,421,312) (NOTE: As of the writing, the ABC can still be used for accounting on the national level). Each IBM card has eighty columns. Fifteen are used to encode the number with a blank column between each; sixteen times five equals eighty. The base-10 cards are punched in the same way that numbers are written: 1-2-3 = 123. Negative numbers are indicated with the zero hole punched for each digit.

Example:

-13x + 54y = -105

Would be encoded on the base-10 card as:

----------000----------000

----------13----------54----------105

NOTE: '-' is simply left unpunched.

Once the stack of cards have been prepared, the machine is then made ready to receive the input as follows:

1. Tun the ABC power on.
2. Check the main voltage levels. This is done by reading the voltage readout on the Voltmeter (v).
3. The Voltage Switch (VS) is used to check positive and negative levels. Each should read 120 volts.
4. The motor is then turned on (MS). DANGER: Revolving drums are hazardous!
5. Clear the CA and KA drums (SW_{11}, SW_{12}).
6. The Base-10 card is then entered into the base-10 card reader (upside down from the operator).
7. Direct the output to the desired bank of five coefficients (SW_1-SW_6).
8. Activate the card read switch (SW_7).
9. Activate the Add/Sub control from the base-10 reader (SW_8).
10. Start the card read (PB_{10}).
11. Note the base-10 read light is lit (L_4).
12. The card read process will automatically stop after the IBM card has been read.