Using the IIgs Monitor

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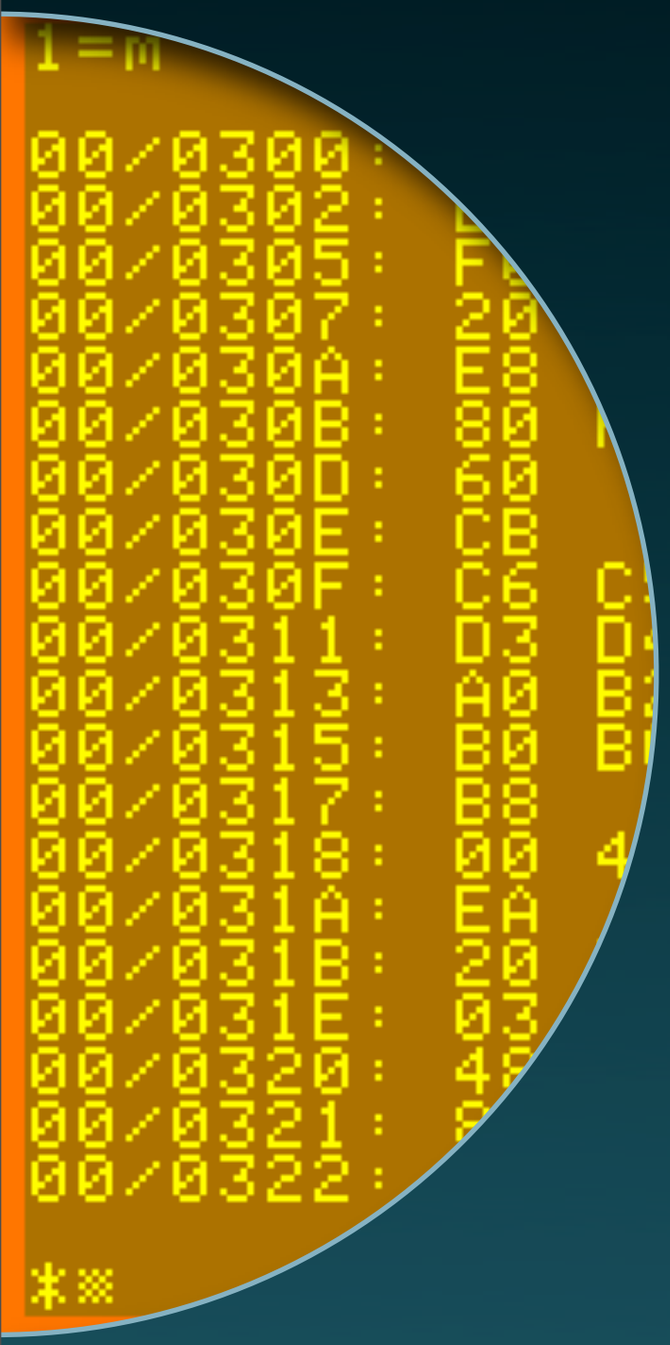
Monitor?


1=M
00/0300:
00/0302:
00/0305:
00/0307:
00/030A:
00/030B:
00/030D:
00/030E:
00/030F:
00/0311:
00/0313:
00/0315:
00/0317:
00/0318:
00/031A:
00/031B:
00/031E:
00/0320:
00/0321:
00/0322:
*

No. Monitor!

Objectives

- Learn how to use the Monitor program in the IIgs to
  - Type in programs
  - Examine and change memory
  - Execute programs
  - Perform miscellaneous tasks

Entering the Monitor

- From the AppleSoft BASIC prompt, type:

  ]CALL -151

- Using the Visit Monitor CDA
  - (More on that later)

Displaying Memory

- {Addr}
  - Displays the value at memory location {Addr}
- {Addr1}.{Addr2}
  - Displays a block of memory starting at {Addr1} and ending at {Addr2}

Modifying Memory

- {Addr}:{Val}
  - Stores the value {Val} at address {Addr}
- {Addr}:{Val1} {Val2} … {ValN}
  - Stores values in consecutive areas of memory starting at {Addr}
  - This is one of the main ways you enter programs into memory
- {Addr}:{“ASCII string”}
  - Places the ASCII string in memory starting at {Addr}

Moving Data

- M (Move)
  - {Dest}<{From1}.{From2}M
    - Moves (copies) the range of memory starting at {From1} and ending at {From2} to {Dest}
- Z (Zap)
  - {Val}<{From1}.{From2}Z
    - Fills the range of memory starting at {From1} and ending at {From2} with {Val}

Searching

- Several ways to search a range of memory
  - Values
    - \{Val1} ... {ValN}\<{From1}.{From2}P
      - Searches the range of memory from {From1} to {From2} for the values {Val1} to {ValN} in that order.
  - Strings
    - \{“ASCII String”}\<{From1}.{From2}P
      - Searches the range of memory from {From1} to {From2} for the values in that order.

Disassembler

{Addr}L

- Disassembles the next 20 commands (opcodes) starting at {Addr}
- Subsequent entries of “L” by itself will display the next 20 commands and so on
- May use several Ls on a line to display more than 20 commands at a time (E.G. {Addr}LLL)

Running Programs

- G (Go)
  - {Addr}G
    - Runs the program starting at {Addr}

Hands On

- Use the monitor to enter the following program into memory, starting at $300

```
300- A2 05
302- 20 DD FB
305- CA
306- F0 03
308- 4C 02 03
30B: 60
```

Registers

- {Control-E}
  - Displays the contents of the 65816's registers
- Each register can be changed directly
  - {Val}=A (Changes Accumulator to {Val})
  - {Val}=X (Changes X register to {Val})
  - {Val}=Y (Changes Y Register to {Val})

Math Commands

- Hexadecimal/Decimal Conversion
  - To convert a value from decimal to hexadecimal
    - {Dec}=
  - To convert a value from hexadecimal to decimal
    - ={Hex}

Math Commands

- You can perform hexadecimal calculations with the following
  - {Val1}+{Val2} (Addition)
  - {Val}-{Val2} (Subtraction)
  - {Val1}*{Val2} (Multiplication)
  - {Val1}_{Val2} (Division)

Hands On

- Perform the following calculations. What do you get for each one?
  - 6 x 4
  - BEEF ÷ 5
  - BAD + DAD
  - DEAF - DEAD

Other Commands

- I (Inverse video)
  - Sets display mode to inverse video (Like "INVERSE" command in BASIC)
- N (Normal video)
  - Sets display mode to normal video (Like "NORMAL" command in BASIC)
- {Slotnum}{CTRL-P}
  - Redirects output to {Slotnum} (Like "PR#" in BASIC)
- {Slotnum}{CTRL-K}
  - Redirects input from {Slotnum} (Like "IN#" in BASIC)

Other Commands

- =T
  - Displays the Time and Date
- =T=mm/dd/yy hh:mm:ss
  - Changes time and date to that specified by mm/dd/yy hh:mm:ss

Other Commands

- # (Install CDAs)
  - Installs two useful CDAs for debugging purposes
    - Visit Monitor
    - Memory Peeker

Other Commands

- Q (Quit)
  - Quits monitor program
  - Same as typing 3D0G
- {CTRL-C}
  - Jumps to BASIC (Warmstart)

Toolbox Calls

- You can call the toolbox from the monitor
  - U (Tool Locator)
    - Described in detail in Apple IIgs Firmware Reference manual

Toolbox Calls

- Example
  - \C 2 0 0 0 1 20 81 0FF 0 8D 0 1 24 C\U <return>
    - Enter some text afterwards. The monitor will respond by printing the hex count of the number of characters.
- Store the value given at location 01/2080
- \4 0 0 1 20 80 1C C\U <return>
  - Displays the text you entered in step 1

Mini-Assembler

- The Mini-Assembler is a way to enter programs using mnemonic names for the opcodes instead of using the numeric values

- The command to start the Min-Assembler is ! (Exclamation Point)

Hands On

- Use the Mini-Assembler to enter the following program

```
00/300:LDX #00
 LDA $30E,X
 BEQ $30D
 JSR $FDED
 INX
 BRA $302
 RTS
 “KFEST 2008
 :00
```

QUESTIONS?