Z80 & CP/M 2.2 Emulator v2.1 10/30/85

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Enter 'HELP' or '?' for command help screen.

'n' is entered as follows (with optional leading +/-):

```
  FFFF               Hex
  .99999             Decimal
  %1111111111111111  Binary
  'c                 ASCII char c
  '\c                Escape char c (\r, \n, etc)
  '\xFF              Hex byte FF
  xxxxxx             Label name xxxxxx (as defined by LABEL command)
  n[+/-n]            Expression with 2 or more n's joined by + or -
```

!xxxxxx

>   Pass command xxxxxx to PC-DOS for processing.

>   Example: !chkdsk B:
>   Example: !cd z80source

* CP/M Builtin commands that are emulated

d:
>   Change default drive to d.
>   Example: B:

DELETE <filename_pattern>
DEL <filename_pattern>

>   Removes file(s) matching the given pattern from the disk.
>   Invokes PC-DOS 'DEL' command (q.v.).

>   Example: DELETE b:\bin\z80mu.exe
>   Example: DELETE *.*

ERASE <filename_pattern>
ERA <filename_pattern>

>   Removes file(s) matching the given pattern from the disk.
>   Invokes PC-DOS 'DEL' command (q.v.).

>   Example: ERASE b:z80mu.*
>   Example: ERASE c:\z80\test*.*

DIR <filename_pattern>
STAT <filename_pattern>

>   Displays disk filenames matching the given pattern.
>   Use instead of CP/M STAT.COM, which cannot be emulated.
>   Invokes PC-DOS 'DIR' command (q.v.).

>   Example: DIR b:
>   Example: STAT ..*.?q?

TYPE <filename.typ>
TY <filename.typ>

      Type the contents of the specified file on the screen.
      Invokes PC-DOS 'TYPE' command (q.v.).

      Example: TYPE z80mu.ini

* Emulator Builtin commands that are similar to CP/M builtins

RENAME <oldpattern> <newpattern>
REN <oldpattern> <newpattern>

      Renames files whose names match <oldpattern> to <newpattern>.
      Invokes PC-DOS 'RENAME' command (q.v.).

      Example: RENAME FOO.ASM FOO.MAC

SAVE n <filename.typ>
SA n <filename.typ>

      Saves n 256-byte pages of Z80 memory (starting at 0100h) to the
      specified file. Save WILL NOT write a proper .HEX file. It simply
      writes a memory image (per .COM files).

      NOTE: Default radix for n is HEX!

      Example: SAVE 5 driver.com
      Example: SA .30 newddt.com

COPY <filename_pattern> <destination>
CO <filename_pattern> <destination>

      Copies file(s) matching the given pattern to the destination.
      Invokes PC-DOS 'COPY' command (q.v.).

      Example: COPY b:z80mu.* a:\z80
      Example: COPY *.* NUL

* General Emulator commands

HELP [<keyword>]
? [<keyword>]

      Obtain HELP for all commands (keyword absent) or for specific keyword
      (keyword present).

      Example: HELP XREG
      Example: HELP B:

ILLOP [FAULT | NOP]:
I [FAULT | NOP]:

      Tells Emulator whether Illegal Opcodes should cause a fault,
      or should be handled as if they were NOP's.

      Example: ILLOP FAULT
      Example: I NOP

EXIT
E
      Exits Emulator, back to PC-DOS.
      Example: E

HOWFAST?
SPEED?

>Computes the effective speed of the imaginary Z80, and
reports it. THIS COMMAND COLDBOOTS THE CP/M SEGMENT,
wiping out anything that you may have in it.

>Example: SPEED?

* Emulator DEBUG commands

BTRACE [SOME | ALL]
BT [SOME | ALL]

>Displays trace of current BDOS TRACE circular buffer. Buffer is
cleared with each .COM file load, and at other times when needed.
'SOME' excludes console character functions. 'ALL' includes them.

>Example: BTRACE
Example: BT ALL

BREAK
B
>Displays current breakpoint addresses.

BREAK CLEAR
B CLEAR

>Clears all current breakpoint addresses.

BREAK CLEAR n [n...]
B CLEAR n [n...]

>Clears specific breakpoint addresses.

BREAK SET n [n...]
B SET n [n...]

>Sets specific breakpoint addresses.

>Example: BREAK CLEAR 0100
Example: B SET driver_start 0d00 0d03 driver_ret-1

DUMP [n1 [n2]]
D [n1 [n2]]

Dumps Z80 memory to the screen in hex and ASCII, beginning at address
n1 and ending at address n2 (if given).

>Example: DUMP .256
Example: D driver_start driver_end-1

FIND n "text"
F n "text"
>Searches CP/M Segment (starting at address n) for "text",
and displays addresses of matches. The "text" string may
contain imbedded escape sequences.

>Example: FIND 100 "Copyright"
Example: F output_handler "\xcd\x05\x00"

```
GO [n]
G [n]
      Begins execution of the Z80 at address n (default if n not
      given is the current Z80 PC). This is the usual way to run a
      program that was read manually from disk. Note that .COM
      programs that are invoked by name (per standard CP/M) do
      not need this command. They are automatically executed.

      Example: GO 113
      Example: G
      Example: G driver_start

PATCH [n [string]]
P [n [string]]

      Begins interactive patching at location n. Enter '?' at patch prompt
      for specific help. If string arg is present, then string is applied
      to memory and interactive mode is not entered.

      Example: PATCH table_start+3f
      Example: P 5C+filename_offset
      Example: PATCH 5C "\0FOO      ASM"

XREG [rr n]
X [rr n]

      If no args are present, then current Z80 regs/flags are displayed.
      If args are present, then Z80 reg/flag rr is set to the value n.

      rr = reg/flag to be set, one of following:

          regs:  A    F    B    C    D    E    H    L
                 A'   F'   B'   C'   D'   E'   H'   L'
                 AF   BC   DE   HL   AF'  BC'  DE'  HL'
                 IX   IY   SP   PC   IFF1 IFF2 IMF  I R

          flags: SF   ZF   HF   P/V  NF   CF
                 SF'  ZF'  HF'  P/V' NF'  CF'

      Example: XREG BC .63000 (sets 16-bit BC)
      Example: XREG B 'X      (sets 8-bit B)
      Example: X ZF 1         (sets ZERO flag true)
      Example: X CF 0         (sets CARRY flag false)

TRACE [n]
T [n]
      Executes n (default = 1) Z80 instructions, beginning at the
      current Z80 PC. The Z80 regs/flags are displayed after each
      execution.

      Example: TRACE
      Example: T .10

NOTRACE [n]
N [n]
      Executes n (default = 1) Z80 instructions, beginning at the
      current Z80 PC. The Z80 regs/flags ARE NOT displayed during
      execution, but ARE DISPLAYED after the final instruction.

      Example: NOTRACE
      Example: N .200
```

PCTRACE? [FIRST | LAST   n [FULL | BRIEF]]
PC? [FIRST | LAST   n [FULL | BRIEF]]

        Displays Z80 PC's as captured during last TRACE or NOTRACE.
        Display proceeds from oldest PC toward newest (FIRST n) or in
        opposite direction (LAST n). Shows just PC's (BRIEF) or dis-
        assembled source lines (FULL). Default is LAST 512 FULL.

        Example: PCTRACE?
        Example: PC? FIRST .100 BRIEF
        Example: PCTRACE? LAST .256 FULL

MOVE nlo nhi ndest
M nlo nhi ndest

        Moves chunk of memory (nlo to nhi inclusive) to address ndest.
        Uses either left-to-right or right-to-left copy, as needed.

        Example: MOVE driver_start driver_end-1 f000

MATH <expression>
MA <expression>

        Displays 16-bit results of given expression, in HEX and
        decimal. <expression> is composed of 1 or more numeric
        args connected with '+' or '-' operators.

        Example: MATH table_end-table_start
        Example: MA 'A-40+'a
        Example: MATH 0-.4096

* CP/M Environment and file control commands

ARGS <command_tail>
AR <command_tail>

        Formats FCB's at 05Ch and 06Ch as well as default DMA at 080h
        per command tail, exactly as CP/M's CCP would.

        Example: ARGS foo.asm foo.hex
        Example: AR foo.c -b -n -v

COLDBOOT!
COLD!
        COLD BOOTs CP/M segment by reformatting all 64K, rebuilding BIOS
        and BDOS hooks, etc.

        Example: COLDBOOT!

TERMINAL [ON | OFF]
TERM [ON | OFF]

        If ON, then BIOS console goes through builtin terminal
        emulator. If OFF, then BIOS console calls are routed to
        PCDOS. If no arg, then current state is reported.

        Example: TERMINAL on
        Example: TERM

READ [n] <filename.typ>
R [n] <filename.typ>

     Reads filename.typ into location n (default = 0100h). Note that
     .HEX files are handled properly, overriding n with actual
     addresses from .HEX records. This is the usual way to load
     a file for debugging purposes.

     Example: READ driver.hex
     Example: R d000 newddt.com

WRITE nlo nhi <filename.typ>
W nlo nhi <filename.typ>

     Writes Z80 memory from nlo thru nhi (inclusive) to the given
     file. This is a raw binary write, unless you specify a .HEX
     filetype (in which case INTEL HEX records will be written).

     Example: WRITE driver_start driver_end-1 driver.hex
     Example: W 0 ffff model100.mem

SUBMIT <filename.typ>
SUB <filename.typ>

     Switches input (for emulator commands only) to the given
     file. Application input does not get switched. Input reverts
     to the keyboard at EOF on the given file. SUBMITs do not nest.

     Example: SUBMIT ddt.fix
     Example: SUB patcher.sub

     * Re-Source commands

LIST [n1 [n2]] [>outfile | >>outfile]
L [n1 [n2]] [>outfile | >>outfile]

     Disassembles Z80 instructions beginning at address n1, and ending
     at address n2 (if given). If '>' or '>>' is present, then the output
     is redirected to the indicated file instead of the screen.

LIST PROLOGUE n1 n2 [>outfile | >>outfile]
L PROLOGUE n1 n2 [>outfile | >>outfile]

     Generates assembler prologue for code residing between n1 and n2.
     Labels outside of this range are EQUated. Normally used prior to
     a regular disassembly to a file.

LIST INCLUDE   [A][O][F]
L INCLUDE   [A][O][F]

     level of detail to be included in disassembled instructions:
     A[ddresses]: include Z80 addresses on left
     O[pcodes]: include raw Z80 opcode bytes on left
     F[lags]: include description ofinstruction's affect on flags
                   (as comment)

     Example: LIST 0100
     Example: L INCLUDE FLAGS
     Example: LIST INCLUDE A O
     Example: L PROLOGUE 0100 cpu_end >cpu.asm
     Example: L 0100 cpu_end >>cpu.asm

CONTROL LIST [n]
C LIST [n]

> Lists all current disassembly control breaks (including labels,
> comments, and true control breaks), starting with controls
> for Z80 address n (default = 0).

CONTROL CLEAR
C CLEAR

> Clears (wipes out) all current disassembly control breaks (including
> labels, comments, and true control breaks).

CONTROL READ <filepath>
C READ <filepath>

> Clears (wipes out) current control breaks and replaces them
> with controls (including labels and comments) from <filepath>.

CONTROL WRITE <filepath>
C WRITE <filepath>

> Writes current control breaks to the specified file, for later use
> via the READ control command above.

CONTROL n | I | B | W | T | S | C |
C n | I | B | W | T | S | C |

> Assigns control break type to Z80 address n, so that later dis-
> assembly will switch to the indicated mode when address n is
> encountered. Control break types are as follows:

```
  I[nstructions] : switch to Z80 instructions
        B[ytes] : switch to DB pseudo-ops
        W[ords] : switch to multi DW pseudo-ops per line
        T[able] : switch to single DW pseudo-op per line
      S[torage] : switch to DS (to next control break)
        C[lear] : clear current control break for address n
```

> Example: CONTROL LIST
> Example: C LIST d00
> Example: C CLEAR
> Example: C READ ddt.ctl
> Example: CONTROL write b:\z80\pip.ctl
> Example: CONTROL 0100 Instructions
> Example: CONTROL driver_table Bytes
> Example: C driver_table+1f I
> Example: C jump_table Table
> Example: C 0f31 Clear

LABEL n labelname
= n labelname

> Associates text 'labelname' with Z80 address n.
> If 'labelname' is absent, then existing labelname is
> simply deleted. Labels must be alphanumeric or '_'.

LABEL AUTOGEN n1 n2
= AUTOGEN n1 n2

 Automatically generates labels (of form 'AUTOxxxx') for all addresses
 that are referenced by code that resides from n1 to n2. Existing
 labels are not overwritten.

 Example: LABEL 5 bdos
 Example: = 05c fcb1
 Example: LABEL AUTOGEN 100 de3

COMMENT n "text"
; n "text"

 Associates comment string with Z80 address n, so that future
 disassemblies will display "text" when the associated address is
 disassembled. If "text" is absent, then existing comment is
 simply deleted. If text contains whitespace characters (blanks
 etc), then it must be enclosed in quotes. You may imbed standard
 UNIX escape sequences (\n, \t, etc) for formatting. A ';' char
 is automatically inserted before the comment and after every '\n'.

 An INSTRUCTION comment is displayed on the line before the
 instruction if it starts with '\n', else on the same line.

 Example: COMMENT 07f2 "Try to open file"
 Example: ; driver_start "\n--- Main Entry ---\n"

*** END OF COMPLETE HELP ***