

Z80 Monitor Type Operating System and SBC

By [mkpeker](#) (/member/mkpeker/) in Technology (/technology/) > Microcontrollers (/technology/microcontrollers/)

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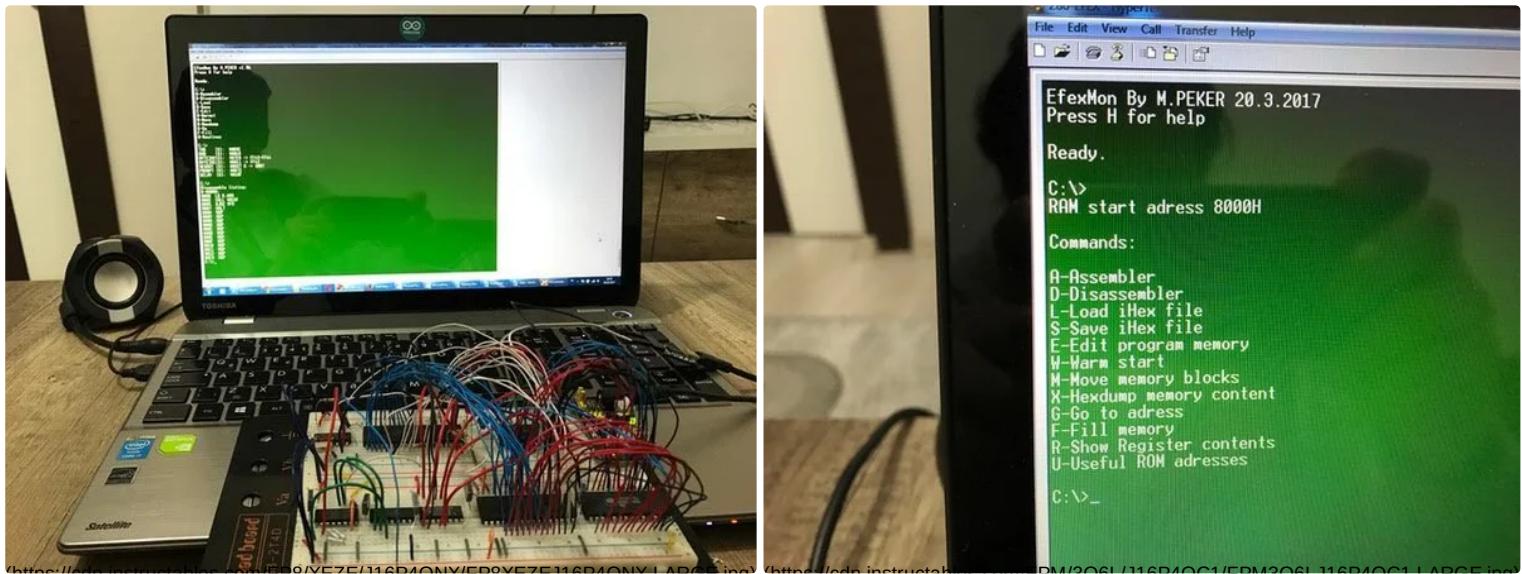
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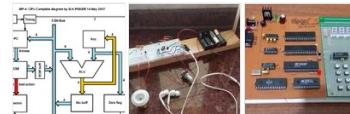
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mkpeker.wixsite.com/efex

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About: Orthopaedic Surgeon, Paragliding, Skiing, Digital electronics, Microcomputer lover. More About [mkpeker](#) > (/member/mkpeker/)

EfexV4 is a monitor ROM with inline assembler and disassembler and

basic utilities to write, run and debug your z80 programs in real hardware

EfexMon do not needs CP/M, N8VEM or other complicated hardware. You need only standard Z80 architecture SBC and one UART with terminal

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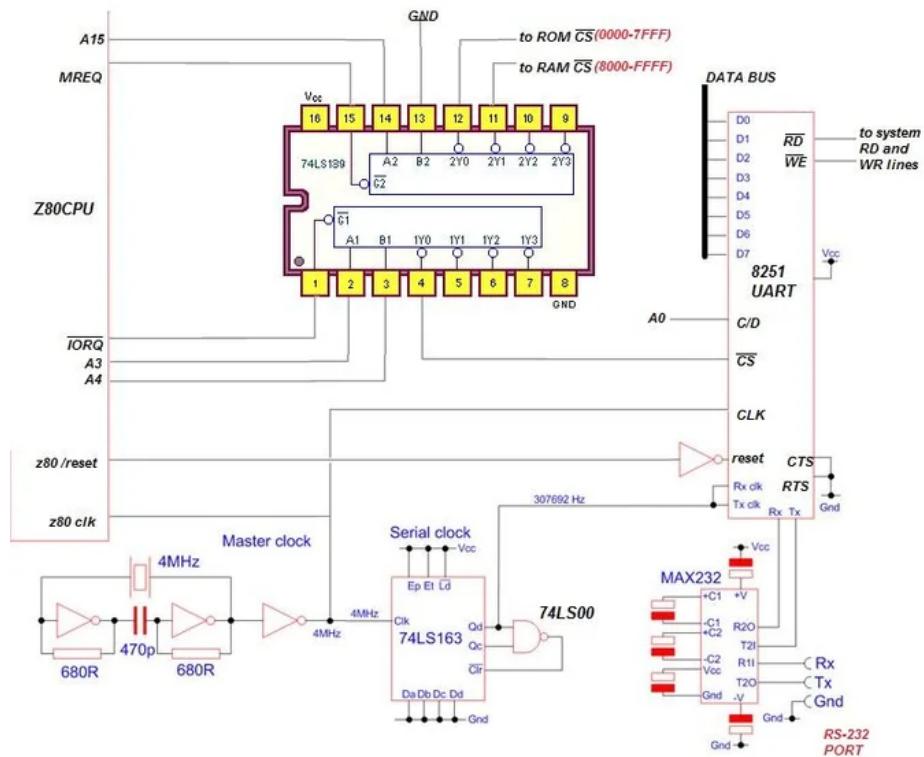
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Step 1: HARDWARE TO RUN EfexMonV4

EFEX MEMORY ORGANISATION AND UART CONNECTIONS



<https://edn.instructables.com/FY1AAZM/11SD10A1/FY1AAZM/11SD10A1.FADCE.ino>

MEMORY MAP

XTAL = 4 MHZ

USE ATTACHED CLOCK CIRCUIT

ROM START: 0000H TOTAL LENGTH 8KB

RAM START: 8000H RAM END : FFFFH

STACK: F800H

SYSTEM VARIABLES: F900H-F910H FF00-FFFFH

UART 8251 PORT ADDRESS: 00H, BAUDRATE: 19200 KBS 8-n-1

PIO 8255 PORT ADDRESS: 08H : CONNECT 8255 CS TO IC 74LS139'S PIN 5



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Step 2: SOFTWARE

As described in previous page, Efexmon needs 32Kb of ram (62256 SRAM is good), and 8 Kb of ROM (28c64 may be)

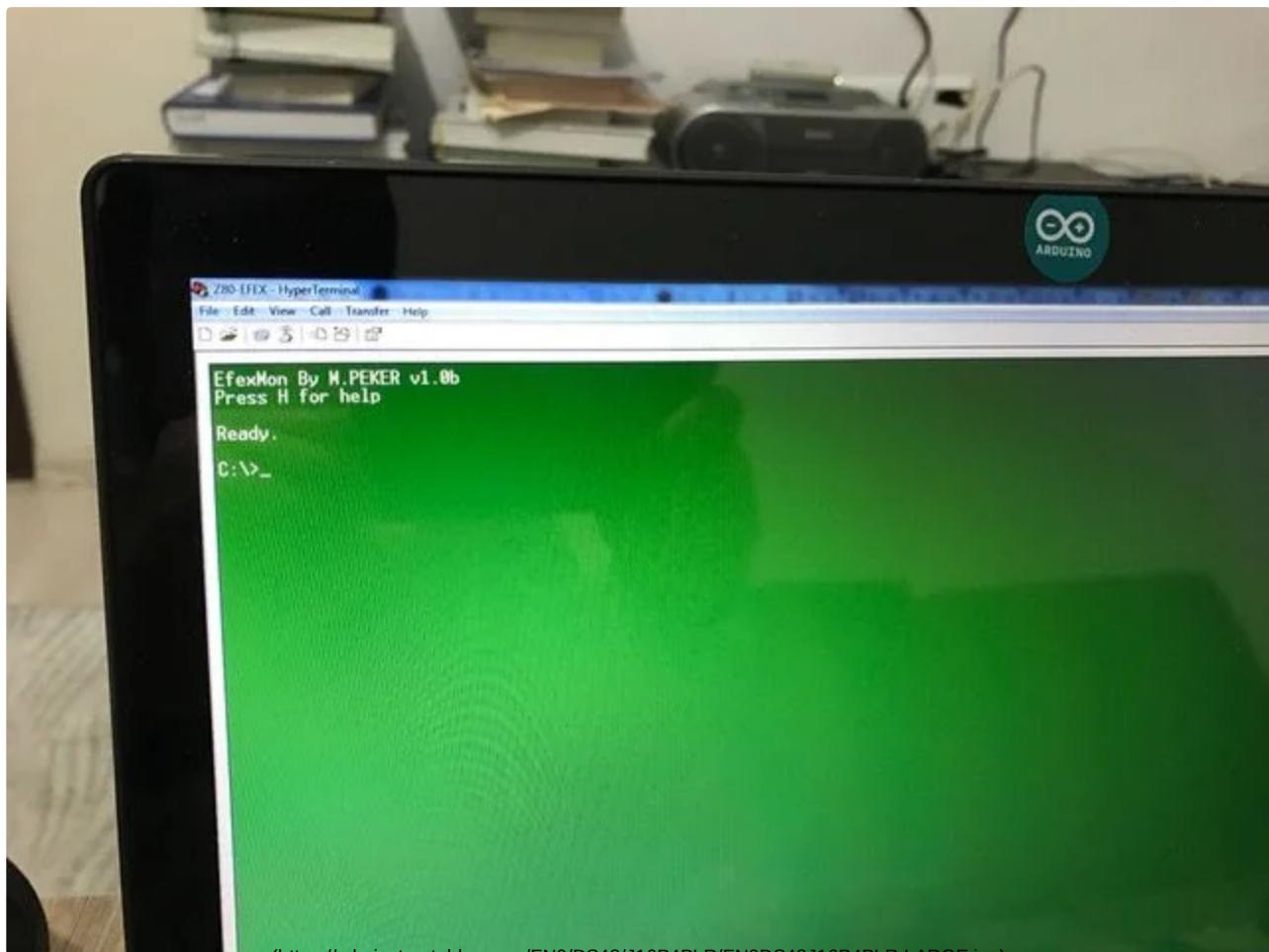
stack and system variables sits top of ram, so, after 8000H there is tons of free bytes

[!\[\]\(121d1a804c3084399d566ee3a643a862_img.jpg\) Assembler-V1_0-8K-A...](#)
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[!\[\]\(6412efaf7d420eae7fa15b0d681dcc2b_img.jpg\) Assembler-V1_DeskAd](#) (<https://cdn.instructables.com/ORIG/F85/BRW1/J16P4P5A/F85BRW1J16P4P5A.obj>)
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Step 3: USAGE:



You must use a Terminal emulator program to reach EfexV4

System starts with greeting message and version info

command prompt comes then

C:> this is an irony to DOS prompt :)

all input must be UPPERCASE CHARACTERS! dont forget to press caps lock one time.

Pres H for help, press U for useful routines

(S) mean subroutine must be called

(R) mean routine must be jumped

ASSEMBLER:

Aseembler is full powered and rocksolid, only (IX+*) and (IY+*) bit manipulation commands excluded

except this, Efex assembler accepts all official z80 commands.

During mnemonic input, backspace is welcome till # or \$ characters. do not backspace after this chars.

(Full backspace function disabled to fit ROM in 8k)

Some parts of this ROM written on itself! with its own assembler.

DISASSEMBLER:

Disassembler can recognise all z80 code and it can recognise non-command bytes

and points them with '***' sign

INPUT:

Efex Hexadecimal inputs can recognise nonhex chars and ignores them.

Once input started, you must fill all areas till end;

#: mean 1 byte input (two hex char)

\$:mean 2 byte input (four hex char)

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Step 4: WHATS NEXT?

-USB KEYBOARD SUPPORT (TEST IMPLEMENTATION COMPLETE)

-LCD ON BOARD WIDE SCREEN 128X64 GRAPH LCD IN TEXT MODE (TEST IMPLEMENTATION COMPLETE)

-BASIC INTERPRETER (TEST IMPLEMENTATION COMPLETE)

--SD CARD SUPPORT

THIS FOUR IMPLEMENTATION WILL MAKE EFEXV4 A STANDALONE COMPUTER

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Step 5: SOURCES

```

C:\>
Useful ROM routines :

UART adress : I/O PORT 00
8255 adress : I/O PORT 08
TXD (S): $002F
RXD (S): $003B
BYTEIN2(S): $209B 2 Byte input to FF43-FF44
BYTEIN1(S): $20C1 1 Byte inputto FF42
HEXOUT (S): $22BF Sends register A to UART
PROMPT (R): $0169
DELAY (R): $03C3

C:\>A-$B000
Assembler:

B000 LD A,#41      :3E 41
B002 NOP          :00
B003 OUT A,(#00)   :D3 00
Syntax error !
B003 OUT (#00),A   :D3 00
B004

EflexMon By M.PEKER v1.0b
Press H for help
Ready.

C:\>
A-Assembler
D-Disassembler
L-Load
S-Save
E-Edit
W-Warnst
M-Move
X-Hexdump
G-Go
F-Fill
U-Routines

C:\>
C:\>
TXD (S): $003C
RXD (S): $0043
BYTEIN2(S): $07E9 -> FF43-FF44
BYTEIN1(S): $0811 -> FF42
HEXOUT (S): $0037 A -> UART
PROMPT (R): $0072

```

- 1) z80 instruction table <http://clrhome.org/table/> (<http://clrhome.org/table/>).
- 2) TASM assembler code tables: <http://www.filewatcher.com/m/tasm301.zip.144656-0.html> (<http://www.filewatcher.com/m/tasm301.zip.144656-0.html>).
- 3) Grandmaster Erturk KOCALAR's 6809 monitor (inspired)
<http://www.8bitforce.com/simon6809/> (<http://www.8bitforce.com/simon6809/>).
- 4) Grant Searle's works (inspired) <http://searle.hostei.com/grant/> (<http://searle.hostei.com/grant/>).
- 5) Integrated circuits and microprocessors. R C HOLLAND 1986 book
- 6) Z80Simulatorde <http://www.oshonsoft.com/z80.html> (<http://www.oshonsoft.com/z80.html>).
- 7) Leventhall Z80 assembly routines book
- 8) Brian M. Phelps's 6502 works
<http://mypeoplepc.com/members/spacebacker/symon/index.html> (<http://mypeoplepc.com/members/spacebacker/symon/index.html>).
- 9) Zilog z80 catalogs and chip descriptions
- 10) z80 info website <http://www.z80.info/> (<http://www.z80.info/>).
- 11) Project based on :<https://www.instructables.com/id/Build-your-own-z80-microcomputer/> (<https://www.instructables.com/id/Build-your-own-z80-microcomputer/>).
- 12) My followers opinions and talks

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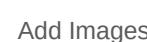


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(/member/dprefont/) dprefont (/member/dprefont/) 6 months ago

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Is the source code available?



(/member/Jesper+K.P/) Jesper K.P (/member/Jesper+K.P/) 1 year ago

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i have absolutely No use for this... but I just have to make a z80 CPU based SBC to bring me down memory lane. my first computer was the marathon 32K computer... basically a zx81 with 2kb memory instead of the zx81's 1kb RAM



(/member/Tominaz/) Tominaz (/member/Tominaz/) 1 year ago

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wow z80. I still have one of those in my parts cabinet. great job thanks for sharing



(/member/mkpeker/) mkpeker (author) 1 year ago

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This project is entered 2017 DIY microcontroller contest in instructables.com. Please vote if you like this project.

Thankyou



(/member/TheThinker/) TheThinker (/member/TheThinker/) 1 year ago

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Cool! Reminds my of my youthful computer.

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