My Rasberry Pi Emulates the 80's

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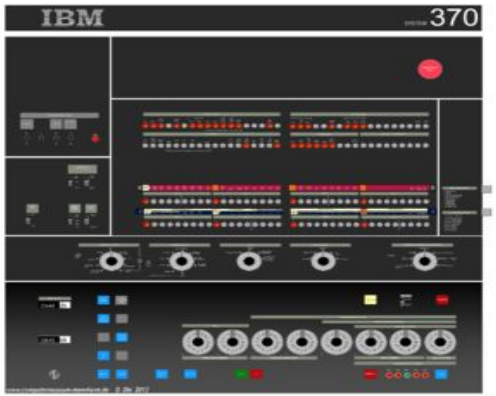
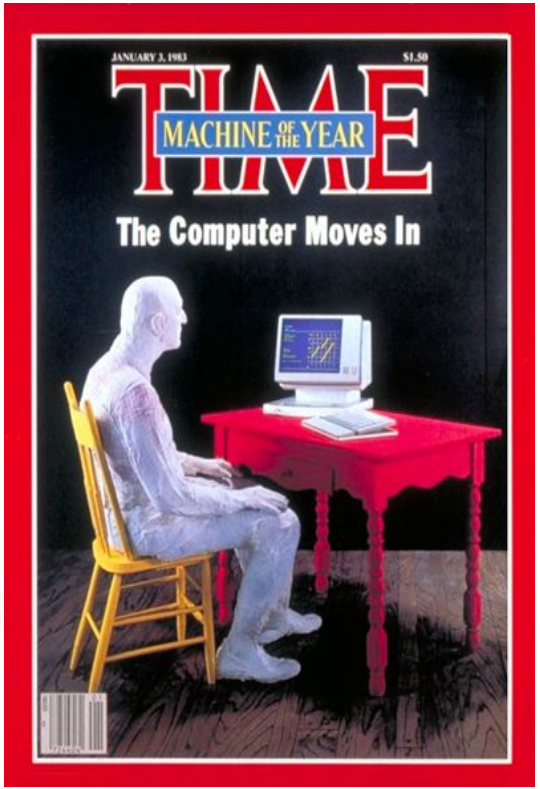
HAPPY BIRTHDAY!

Aren’t you glad I didn’t add a picture?

The $35 replacement for 80's computing

- Retropie - https://retropie.org.uk/
  - It is great, but not exactly what I was looking for.
- I am using a stock Raspberry Pi with a basic install.
- Hercules - http://www.hercules-390.org/ and VICE - http://vice-emu.sourceforge.net/ are built from source.





A Little About My 80's Computing

- I got an Atari 2600 when I was ten (actually mine was a Sears branded unit).
- When I was twelve, I got a TI 99/4A (once again from Sears). But I played with A Timex Sinclair and VIC-20 at the local Fischer Big Wheel in near my house.
- When I was 14, I got a Tandy 1000x.
- In High School we had TRS-80 Model III (and if you were lucky, you got the Model IV and it's TWO floppy drives! No swapping during FORTRAN compiles).
- During 1984, worked on a Science Fair project with friends. We all worked on the same basic programming, using my Tandy, a Mac, a VIC-20 and an C64.
- When I was 16, I worked at a manufacturing plant, in the shop section, and worked on improving the dBase database running on a IBM AT. My first encounter with a hard drive.

And The Rest Of the Story

Wanted to go into EE and work on manufacturing equipment, but while in college I seen the decline in jobs, so I switched around and when into Computer Engineering.

First job was working on HP/3000, Novell Servers, MVS, and IBM desktops at the place I encountered dBase.

Learned about Linux while I worked there and my next job including setting up Apache Proxy servers for school installations.

I now maintain infrastructure and legacy systems for American Greetings Interactive, while hounding my boss to get an LPAR on the corporate mainframe. Once I get that, we'll load a C64 instance for fun.

System 370 and Hercules

Emulates System/370, System/390 and Z-Series (yep, can can zOS on it)

Can run:

- OS/360
- DOS/360
- DOS/VS
- MVS
- VM370
- TTS370
- MTS
- Linux and Solaris Z-versions

Much of the old IBM software was either int he public domain or copyrighted software that provided without charge. This was true of MVS 3.8, up until the J release.

I don't have a long of time to attempt to figure out how to IPL and load a few version of MVS, lucky for me somebody is not as lazy as I am!

System/370

- 31-bit Addressing, 24 bit instruction set, 24 bit addressing. DAT (Dynamic Address Translation) and Floating Point Instructions were optional.
- Offered in various forms from 1970-1988 and several companies made clones.
- DASD, DAT, Virtual Memory .. all have a different meaning.
- Used everywhere until the Z/Systems (64 bit, z/OS) took over.
- Nuclear reactor programs for the IBM system/370: Revision I (IBM Palo Alto Scientific Center report ; no. G320-3353)

Odds are very good you still interact with a mainframe some how in every day.

Hercules

http://www.hercules-390.eu/

Hercules is a software implementation of the System/370, ESA/390 and z/Architecture mainframe architectures

Warning: Unless you have IPL'd a mainframe, building a system from scratch is like an English speaker attempting to learn Chinese using Spanish subtitles. Eventually you'll get it, maybe. But then, you'll still not be completely sure you are right.

So, thankfully, somebody did the work for us: http://wotho.ethz.ch/tk4-/

A fully Functional MVS system

- Download
- Unzip
- Run

All the software is public domain, free (due to licensing requirements for government work), or as copyrighted but free with the hardware. Includes:

- FORTRAN, PL/1, ALGOl compilers
- System configs, additional software
- A working system! EXCELLENT!

Changes I make:

Change conf/tk4-.cnf, set model to a 3084 (Dual CPUs!)

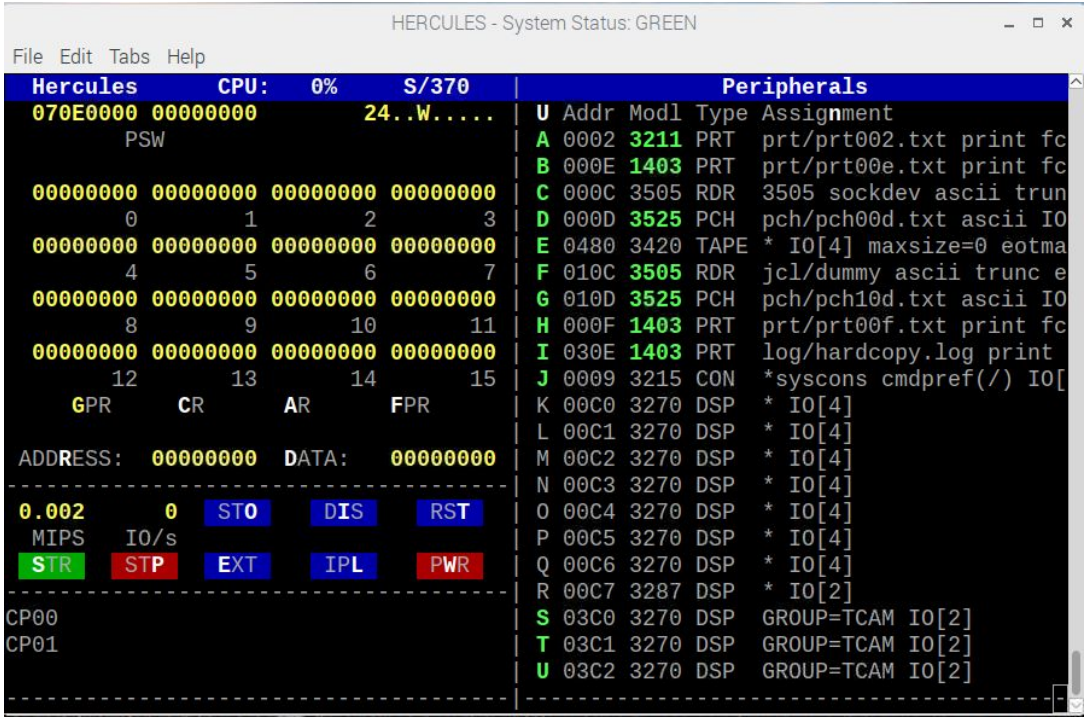
Change NUMCPU and MAXCPU to 2.

Download and compile the x3270 suite.

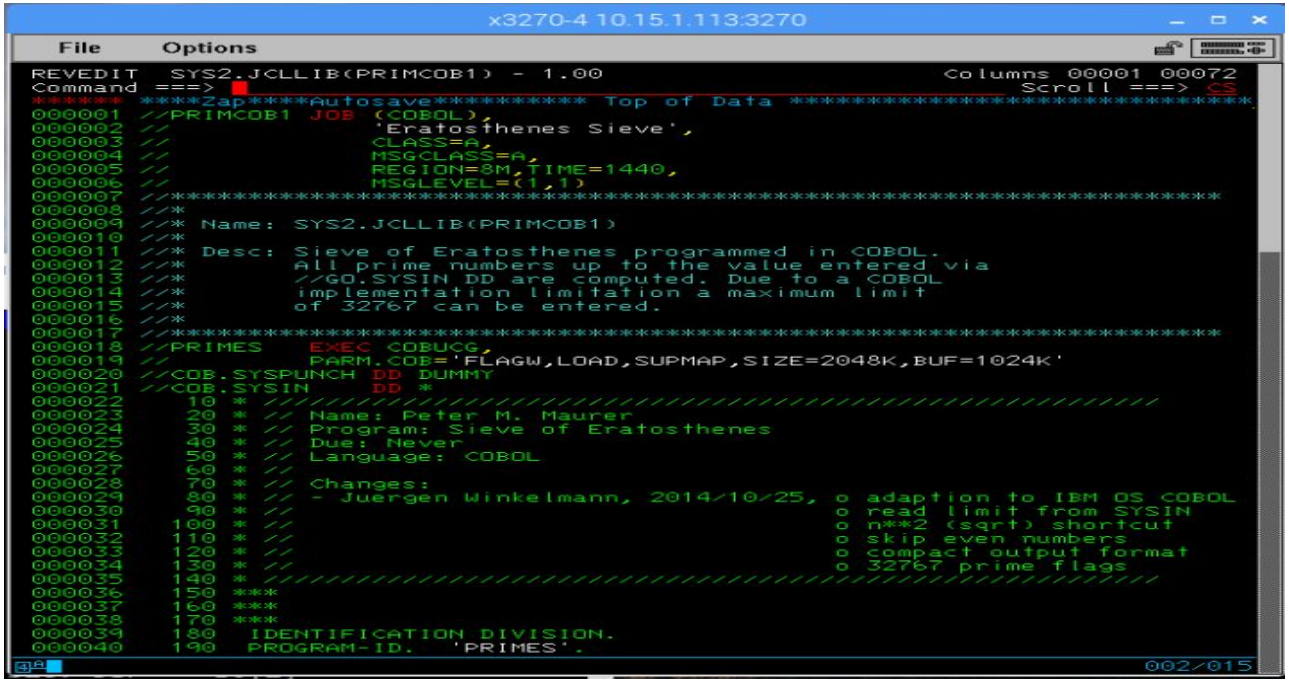
cd ./unattended/ ; set_console_mode

cd ../ ; ./mvs

Gag Me With A Batch Job



COBOL, JCL, EDIT and 3270 Fonts



Other fun things

- There is a FTP server that would allow you to submit jobs via FTP and you can change a printer to print to a file. Therefore, you would run patching changes and gather the output and somewhat make use of this 2CPU 16Mb system.
- https://www.youtube.com/channel/UCR1ajTWGiUtiAv8X-hpBY7w - This guy makes some excellent videos filled with information.

Commodore 64 and VICE

12+ Million Units sold

- 8 bit MOS 6510
- 64K of RAM
- 20K of ROM
- BASIC Built-In
- VIC-II Video Chip
- SID Chip for Sound
- 6526 CIA (Complex Inter. Adaptor)
- Cassette and an incredibly slow 1541 disk drive

Yes, 40 columns!

Vice

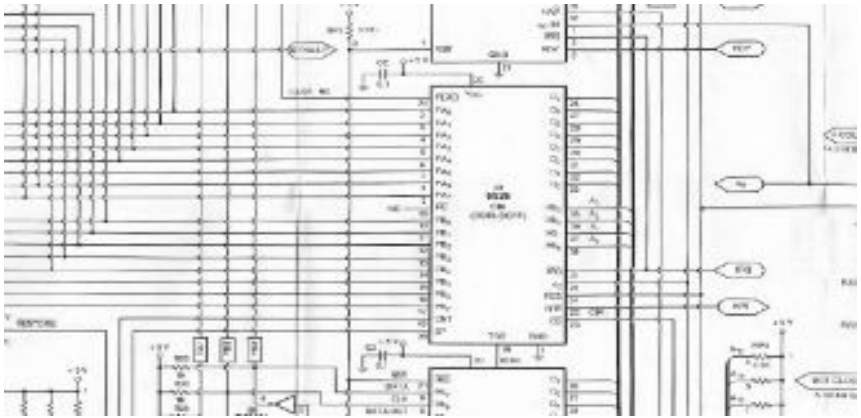
http://vice-emu.sourceforge.net/

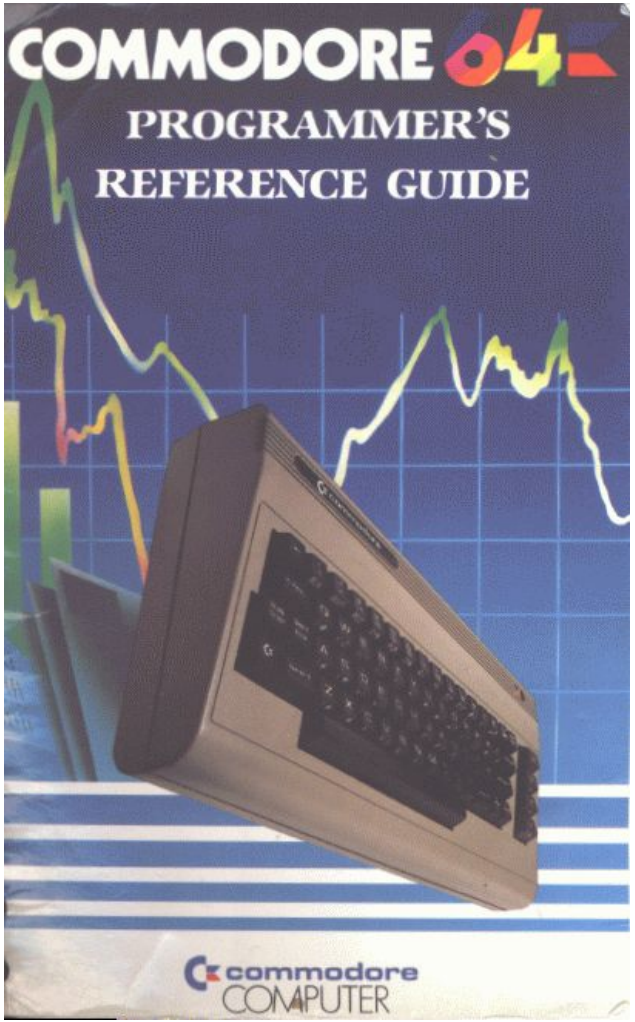
- C64
- C64DTV
- C128
- VIC20
- Most PET models
- PLUS4
- CBM-II (aka C610/C510)

Emulates Disk Drives, Cassette Drives, I/O Ports, and Cartridge ports.

Examples and Schematics

```
10 PRINT "THIS IS THE PROGRAM"
20 GOSUB 1000
30 PRINT "PROGRAM CONTINUES"
40 GOSUB 1000
50 PRINT "MORE PROGRAM"
60 END
1000 PRINT "THIS IS THE GOSUB":RETURN
```





Programming, Gaming and Hobbies in One

The Commodore was able to being a gaming systems that let people learn the more about computers than the traditional game consoles at the time could.

Instead of, say, having an Atari 2600 and a Computer, for a small price point you could have both.

You could buy them at Sears, K-Mart, and places Mom and Dad weren't intimidated by.

You got the SCHEMATICS! Along with a fairly simple programming language, it was easy things beyond gaming, it could be used for hobbies.

The Raspberry Pi, with Linux, can be seen as a relative of the Commodore.

Vice and Commodore Past and Present

- People are still making products, software, and games for C64 now.
- Even on a bad monitor, VICE looks much better than the 13” Tube TV sets they use to be hooked up to.
- Commodore did quite a bit with their own chip sets.
- A bunch of X64 games are available to run on the web now, but that feels terribly wrong.
- There is a mini C64 that was recently released.
- BASIC is still interesting to play around with.
- COMPUTE! Magazine https://archive.org/details/compute-magazine
    - Including the useful https://en.wikipedia.org/wiki/SpeedScript

Beyond the Fun: What use is old Systems

- Different way to approach problems
- We can learn from the past and maybe apply long old approaches to the future.
- Can we just do something things with bare bone implementations?
- Are we really fixing problems or just moving them along and making them bigger.

- Oddly enough, there is a kind of circus of the soul in how things have changed and yet remained the same. At the center of computing many of the fears remain, the problems have not changed much, and we just seem to clean things up and make the same problem bigger.

  Much like a ``Perpetual Coney Island of the Mind.'' -- MLB Historian John Thorn said this once and I think it rings true here.