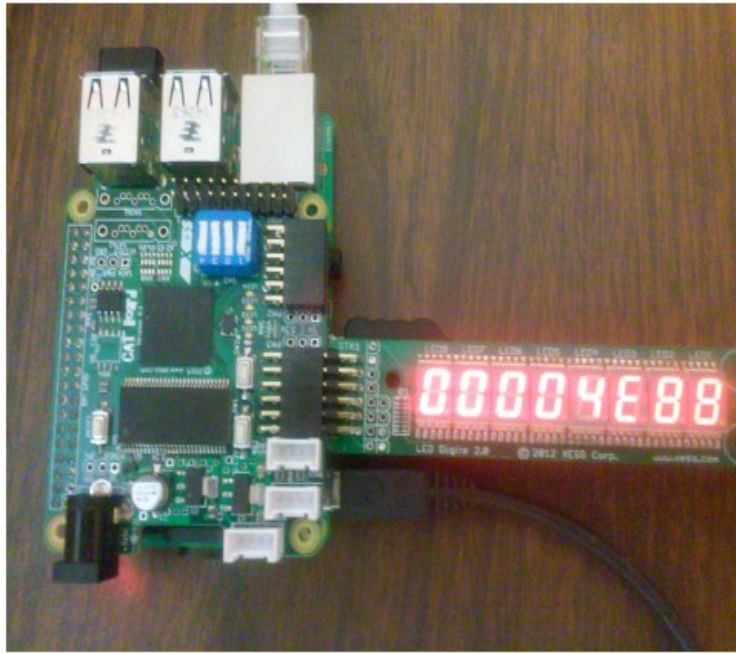


Catboard HX8K  
11/28/19

## Catboard mounted in Rpi3B+



## Raspbian Buster with desktop and recommended software

Version:

**September 2019**

Release date: **2019-09-26**

Kernel version: **4.19**

Size: **2541 MB**

```
SHA-256:549da0fa9ed52a8d7c2d66cb06afac9fe856638b06d8f23df4e6b72e67ed4cea  
devel@mypi3-16:~/Downloads $ ls -la 2019-09-26-raspbian-buster-full.zip
```

```
-rw-r--r-- 1 devel devel 2664314355 Nov 29 09:51 2019-09-26-raspbian-buster-full.zip
```

```
devel@mypi3-16:~/Downloads $ sha256sum 2019-09-26-raspbian-buster-full.zip
```

```
549da0fa9ed52a8d7c2d66cb06afac9fe856638b06d8f23df4e6b72e67ed4cea 2019-09-26-raspbian-  
buster-full.zip
```

```
gzip -dc 2019-06-20-raspbian-buster-full.zip | dd bs=4M status='progress' of=/dev/sda
```

```
5286559744 bytes (5.3 GB, 4.9 GiB) copied, 295 s, 17.9 MB/s
```

```
gzip: 2019-06-20-raspbian-buster-full.zip: invalid compressed data--length error
```

0+146238 records in

0+146238 records out

5289017344 bytes (5.3 GB, 4.9 GiB) copied, 302.261 s, 17.5 MB/s

Additonal software required is installed with “extra\_pkgs.sh”.

```
#!/bin/bash
```

```
sudo apt-get update
```

```
sudo apt-get install octave vlc kicad hexchat \
```

```
ecryptfs-utils gawk gimp gtwave iverilog clang \
```

```
samba samba-common-bin smbclient cifs-utils \
```

```
libftdi-dev libmpc-dev libmpfr-dev verilator bc mercurial \
```

```
libbison-dev libgmp-dev libelf-dev ncurses-dev ctags \
```

```
default-jdk libreadline-dev xdot graphviz minicom xpdf lrzsz \
```

```
libusb-1.0.0 exuberant-ctags gparted ffmpeg qt5-default \
```

```
mesa-utils libboost-all-dev freeglut3 freeglut3-dev \
```

```
python3-dev libgtk2.0-dev libcairo2-dev libpango1.0-dev \
```

```
libgdk-pixbuf2.0-dev libatk1.0-dev libghc-x11-dev binutils-arm-none-eabi \
```

```
gcc-arm-none-eabi diffuse gitk tcl-dev telnet tftp hexedit cmake flex bison \
```

```
gtkmm-3.0 gperf build-essential qt5-default nfs-kernel-server gpac
```

Change hostname in file “/etc/hostname”

```
< mypi3-16
```

```
---
```

```
> raspberrypi
```

Increase the swap space size in file “/etc/dphys-swapfile”

```
16c16
```

```
< CONF_SWAPSIZE=1000
```

```
---
```

```
> CONF_SWAPSIZE=100
```

Conterts of “/home/devel/.octaverc”

```
graphics_toolkit("gnuplot");
```

```
1.0    catzip
```

## 2.0 autofpga

<https://github.com/develone/autofpga.git> forked from <https://github.com/ZipCPU/autofpga.git>

commit 32f036a6fcc1b099b27e0202dd6cb63f29080a26 (HEAD -> master, origin/master, origin/HEAD)

Author: ZipCPU <dgisselq@ieee.org>

Date: Sat Jul 27 09:13:30 2019 -0400

Missing refs to peripherals that can create errors now do so

devel@mypi3-16:~/autofpga \$ make

Create links in “/usr/local/bin”

lrwxrwxrwx 1 root root 32 Nov 28 10:59 autofpga -> /home/devel/autofpga/sw/autofpga

## 3.0 zipcpu

<https://github.com/develone/zipcpu.git> forked from

<https://github.com/ZipCPU/zipcpu.git>

commit 006f4c6a0ace5a1e6badcc583520b57cc9212e33 (HEAD -> master, origin/master, origin/HEAD)

Author: ZipCPU <dgisselq@ieee.org>

Date: Mon Apr 1 14:52:50 2019 -0400

Updated interrupt controller, simplified cascades

1. Updated the interrupt controller to create atomic accesses to enable particular interrupts without also enabling (or disabling) the master interrupt enable.
2. Logic simplification within the CPU in an attempt to balance multiplexers, using case statements instead of cascaded ifs

## 4.0 icestorm

<https://github.com/develone/icestorm.git> forked from <https://github.com/cliffordwolf/icestorm.git>

commit 8cac6c584044034210fe0ba1e6b930ff1cc59465 (HEAD, upstream/master, origin/master, origin/HEAD, master)

Author: Clifford Wolf <clifford@clifford.at>

Date: Mon Jul 30 16:04:04 2018 +0200

Also install text timing databases

Signed-off-by: Clifford Wolf <[clifford@clifford.at](mailto:clifford@clifford.at)>

## 5.0 yosys

<https://github.com/develone/yosys.git> forked from <https://github.com/YosysHQ/yosys.git>

commit e275692e84c935d0cdf42c2a4adf7ac949a88132 (HEAD -> master, upstream/master, origin/master, origin/HEAD)

Author: Clifford Wolf <clifford@clifford.at>

Date: Sun Jul 22 18:44:05 2018 +0200

Verific: Produce errors for instantiating unknown module

Because if the unknown module is connected to any constants, Verific will actually break all constants in the same module, even if they have nothing to do structurally with that instance of an unknown module.

Signed-off-by: Clifford Wolf <[clifford@clifford.at](mailto:clifford@clifford.at)>

6.0 nextpnr

<https://github.com/develone/nextpnr.git> forked from <https://github.com/YosysHQ/nextpnr.git>  
commit 7d5dba3ad378563869657b4330c178ecd8c24931 (HEAD -> master, origin/master, origin/HEAD)

Author: Miodrag Milanovic <[mmicko@gmail.com](mailto:mmicko@gmail.com)>

Date: Sat Aug 4 16:27:33 2018 +0200

compile fix

7.0 arachne-pnr

<https://github.com/develone/arachne-pnr.git> forked from <https://github.com/YosysHQ/arachne-pnr.git>

commit 5d830dd94ad956d17d77168fe7718f22f8b55b33 (HEAD -> master, upstream/master, origin/master, origin/HEAD)

Merge: 3a40328 9763e6e

Author: Clifford Wolf <[clifford@clifford.at](mailto:clifford@clifford.at)>

Date: Sun May 13 20:58:41 2018 +0200

Merge pull request #115 from awygle/lm

Add basic lm4k support (no hard IP)

8.0 catboard\_yosys

[https://github.com/develone/catboard\\_yosys.git](https://github.com/develone/catboard_yosys.git)

Create links in "/usr/local/bin"

lrwxrwxrwx 1 root root 37 Nov 29 08:15 config\_cat ->  
/home/devel/catboard\_yosys/config\_cat

lrwxrwxrwx 1 root root 36 Nov 29 08:15 reset\_cat -> /home/devel/catboard\_yosys/reset\_cat

9.0 verilator

<http://git.veripool.org/git/verilator>

commit c8e437c45cf0a9849e0a0465ecca882dbb66933a (HEAD, tag: verilator\_3\_926, tag: v3.926)

Author: Wilson Snyder <[wsnyder@wsnyder.org](mailto:wsnyder@wsnyder.org)>

Date: Wed Aug 22 18:09:06 2018 -0400

Version bump

devel@mypi3-16:~/testbuilds/catzip/sw/host \$ sudo ./arm-netpport

Listening on port 8363

Listening on port 8364

The jpeg program is loaded in memory

The rgb\_bin data is read into memory and split in a r b g images

```
. ptrs.inpbuf = 0x100f120 buf_red = 0x104f198
. fwd_inv = 0x10cf1a0
. x = 0xe22247c sp = 0x7c z = 0x7c
. x = 0xde22083 sp = 0x83 z = 0x83
. x = 0xe221475 sp = 0x75 z = 0x75
. x = 0xe32207b sp = 0x7b z = 0x7b
. x = 0xa812055 sp = 0x55 z = 0x55
. x = 0xb210c4c sp = 0x4c z = 0x4c
. splitting blue sub band
. fwd lifting step only
. w = 0x100 wptr = 0x104f198 alt = 0x108f198 fwd_inverse = 0x10cf1a0 fwd_inver. = 0x1
. starting red dwt
. in singlelift
. in singlelift
. in singlelift
. in singlelift
. in singlelift
. in singlelift
. testing test_fwd
. finished ted dwt
```

devel@mypi3-16:~/testbuilds/catzip/sw/host \$ ./runjpeg.sh

devel@mypi3-16:~/testbuilds/catzip/sw/host \$ ./runjpeg.sh

00a01000 ( )-> 00000002

00a01004 ( )-> 00000001

Halting the CPU

Memory regions:

Block RAM: 00a00000 - 00a02000

SDRAM : 01000000 - 02000000

Loading: ../board/jpeg

Section 0: 01000000 - 0104f190

Writing to MEM: 01000000-0104f190

Clearing the CPUs registers

Setting PC to 01000000

The CPU should be fully loaded, you may now

start it (from reset/reboot) with:

> wbregrs cpu 0x0f

CPU Status is: 0000060f

The size of the buffer is 0x00ffff or 65535 words

READ-COMplete

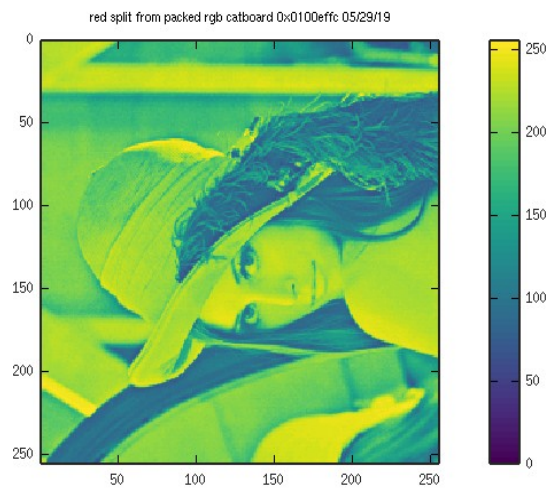
02000000 ( )-> 0000000f

Write-COMplete

The size of the buffer is 0x00ffff or 65535 words

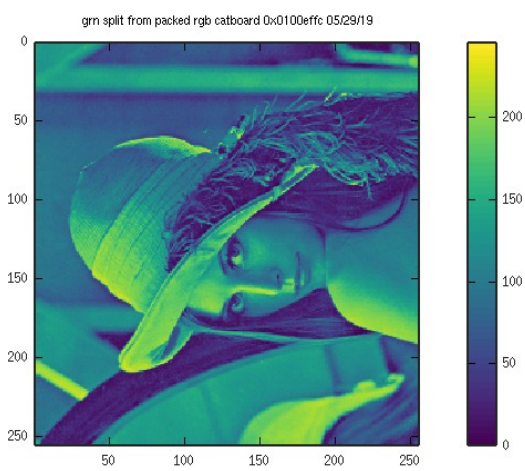
devel@mypi3-16:~/testbuilds/catzip/sw/host \$ octave

red image



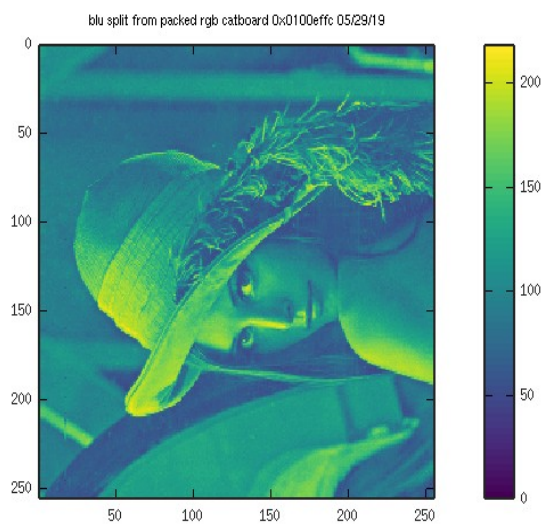
$\mu_2 = 273,644$

## green image



$\mu_2 = 267,219$

## blue image



$\mu_2 = 198,229$

dwt image

