VPixx setup (first try)

Checking VPixx functioning after connecting it to PC and CRT for first time

2023-10-05 notes

I connected the Datapixx and the CRT monitor to the grogu PC today (and to each other, of course). I also connected the IR emitter.

I had to make a link to make a `Datapixx.mex` file. I chose `Datapixx_octave5.mex`.

VPixx (3DPixx) system seems to be working: I can see `ImagingStereoDemo(1,1)` (which uses the Datapixx option).

However, the LCD glasses flicker strongly; very noticeably. I think this must be because the CRT monitor is still using its default setting: 75Hz. I set the resolution to be 1600×1200 using the Xubuntu settings.

I looked over the old VNLab notes about xrandr and edid, but I think what I really need is a copy of the boots PC's xorg.conf file. I think the only HDD that might have this is the one labeled “tarballs.” I'll have to check this later.

- Yes, the `/tarballs` HDD contains a file `boots.tar.gz`.

Let's copy this to grogu, unzip it, and hope it has an xorg.conf file.

PTB VBLSyncTest

<2023-10-05>

Looks good:

```
>> VBLSyncTest


PTB-INFO: This is Psychtoolbox-3 for GNU/Linux X11, under GNU/Octave 64-Bit
(Version 3.0.18 - Build date: Jan 20 2022).
PTB-INFO: OS support status: Linux 6.2.0-34-generic Supported.
PTB-INFO: Type 'PsychtoolboxVersion' for more detailed version information.
PTB-INFO: Most parts of the Psychtoolbox distribution are licensed to you
under terms of the MIT License, with
```

```
PTB-INFO: some restrictions. See file 'License.txt' in the Psychtoolbox root
folder for the exact licensing conditions.

PTB-INFO: For information about paid priority support, community membership
and commercial services, please type
PTB-INFO: 'PsychPaidSupportAndServices'.

PTB-INFO: Connected to Advanced Micro Devices, Inc. [AMD/ATI] Polaris 20 XL
[Radeon RX 580 2048SP] GPU with DCE-11.0 display engine [6 heads].


PTB-INFO: OpenGL-Renderer is AMD :: AMD Radeon RX 580 2048SP (polaris10, LLVM
15.0.7, DRM 3.49, 6.2.0-34-generic) :: 4.6 (Compatibility Profile) Mesa
23.0.4-0ubuntu1~22.04.1
PTB-INFO: VBL startline == 1080 , VBL Endline == 1123
PTB-INFO: Measured monitor refresh interval from beamposition == 16.666957 ms
[59.998954 Hz].
PTB-INFO: Will try to use OS-Builtin OpenML sync control support for accurate
Flip timestamping.
PTB-INFO: Measured monitor refresh interval from VBLsync == 16.666918 ms
[59.999096 Hz]. (50 valid samples taken, stddev==0.000469 ms.)
PTB-INFO: Reported monitor refresh interval from operating system == 16.666667
ms [60.000000 Hz].
PTB-INFO: Small deviations between reported values are normal and no reason to
worry.
The refresh interval reported by the operating system is 16.66667 ms.
libptbdrawtext_ftgl: External 'DrawText' text rendering plugin initialized.
libptbdrawtext_ftgl: Maximum number of cacheable fonts is 40, minimum number
of supported concurrent windows is 10.
libptbdrawtext_ftgl: This plugin uses multiple excellent free software
libraries to do its work:
libptbdrawtext_ftgl: OGLFT (http://oglft.sourceforge.net/) the OpenGL-FreeType
library.
libptbdrawtext_ftgl: The FreeType-2 (http://freetype.sourceforge.net/)
library.
libptbdrawtext_ftgl: The FontConfig (http://www.fontconfig.org) library.
libptbdrawtext_ftgl: Thanks!

Measured refresh interval, as reported by "GetFlipInterval" is 16.66692 ms.
(nsamples == 0, stddev == 0.00000 ms)
PTB missed 0 out of 600 stimulus presentation deadlines.
One missed deadline is ok and an artifact of the measurement.
PTB completed 0 stimulus presentations before the requested target time.
Have a look at the plots for more details...
```

lsmod output

```
anthony@grogu:~$ lsmod | grep amd
amdgpu               14516224  15
iommu_v2                24576  1 amdgpu
gpu_sched               61440  1 amdgpu
drm_buddy               20480  2 amdgpu,i915
drm_ttm_helper          16384  1 amdgpu
ttm                    110592  3 amdgpu,drm_ttm_helper,i915
drm_display_helper     212992  2 amdgpu,i915
drm_kms_helper         249856  5 drm_display_helper,amdgpu,i915
i2c_algo_bit            16384  2 amdgpu,i915
drm                    696320  17
gpu_sched,drm_kms_helper,drm_display_helper,drm_buddy,amdgpu,drm_ttm_helper,i9
15,ttm
video                   69632  2 amdgpu,i915
```

Setting CRT to 120Hz refresh rate

2023-10-06 notes

Added a second user account, "user2"

ADC did this to prevent getting locked out of grogu if something goes wrong when he tries to reconfigure xorg.conf on his account (anthony).

Login: user2

For password, see ADC

Created new xorg.conf file

Automatically generated xorg.conf.new file

Followed this advice:
https://unix.stackexchange.com/questions/146842/regenerate-xorg-conf-with-current-settings

When not running X server (I logged into rescue mode root shell), do this:

```
$ Xorg -configure > xorg.conf.new
```

The contents of the automatically generated file:

```
Section "ServerLayout"
    Identifier     "X.org Configured"
    Screen      0  "Screen0" 0 0
    Screen      1  "Screen1" RightOf "Screen0"
    Screen      2  "Screen2" RightOf "Screen1"
    InputDevice    "Mouse0" "CorePointer"
    InputDevice    "Keyboard0" "CoreKeyboard"
EndSection

Section "Files"
    ModulePath   "/usr/lib/xorg/modules"
    FontPath     "/usr/share/fonts/X11/misc"
    FontPath     "/usr/share/fonts/X11/cyrillic"
    FontPath     "/usr/share/fonts/X11/100dpi/:unscaled"
    FontPath     "/usr/share/fonts/X11/75dpi/:unscaled"
    FontPath     "/usr/share/fonts/X11/Type1"
    FontPath     "/usr/share/fonts/X11/100dpi"
    FontPath     "/usr/share/fonts/X11/75dpi"
    FontPath     "built-ins"
EndSection

Section "Module"
    Load  "glx"
EndSection

Section "InputDevice"
    Identifier  "Keyboard0"
    Driver      "kbd"
EndSection

Section "InputDevice"
    Identifier  "Mouse0"
    Driver      "mouse"
    Option      "Protocol" "auto"
    Option      "Device" "/dev/input/mice"
    Option      "ZAxisMapping" "4 5 6 7"
EndSection

Section "Monitor"
    Identifier   "Monitor0"
    VendorName   "Monitor Vendor"
    ModelName    "Monitor Model"
EndSection
```

```
Section "Monitor"
    Identifier   "Monitor1"
    VendorName   "Monitor Vendor"
    ModelName    "Monitor Model"
EndSection

Section "Monitor"
    Identifier   "Monitor2"
    VendorName   "Monitor Vendor"
    ModelName    "Monitor Model"
EndSection

Section "Device"
        ### Available Driver options are:-
        ### Values: <i>: integer, <f>: float, <bool>: "True"/"False",
        ### <string>: "String", <freq>: "<f> Hz/kHz/MHz",
        ### <percent>: "<f>%"
        ### [arg]: arg optional
        #Option     "Accel"                # [<bool>]
        #Option     "SWcursor"             # [<bool>]
        #Option     "EnablePageFlip"       # [<bool>]
        #Option     "SubPixelOrder"        # [<str>]
        #Option     "ZaphodHeads"          # <str>
        #Option     "AccelMethod"          # <str>
        #Option     "DRI3"                 # [<bool>]
        #Option     "DRI"                  # <i>
        #Option     "ShadowPrimary"        # [<bool>]
        #Option     "TearFree"             # [<bool>]
        #Option     "DeleteUnusedDP12Displays"  # [<bool>]
        #Option     "VariableRefresh"      # [<bool>]
        #Option     "AsyncFlipSecondaries"  # [<bool>]
    Identifier  "Card0"
    Driver      "amdgpu"
    BusID       "PCI:1:0:0"
EndSection

Section "Device"
        ### Available Driver options are:-
        ### Values: <i>: integer, <f>: float, <bool>: "True"/"False",
        ### <string>: "String", <freq>: "<f> Hz/kHz/MHz",
        ### <percent>: "<f>%"
        ### [arg]: arg optional
        #Option     "Accel"                # [<bool>]
        #Option     "SWcursor"             # [<bool>]
        #Option     "EnablePageFlip"       # [<bool>]
        #Option     "SubPixelOrder"        # [<str>]
        #Option     "ZaphodHeads"          # <str>
```

```
        #Option     "AccelMethod"           # <str>
        #Option     "DRI3"                  # [<bool>]
        #Option     "DRI"                   # <i>
        #Option     "ShadowPrimary"         # [<bool>]
        #Option     "TearFree"              # [<bool>]
        #Option     "DeleteUnusedDP12Displays"  # [<bool>]
        #Option     "VariableRefresh"       # [<bool>]
        #Option     "AsyncFlipSecondaries"  # [<bool>]
    Identifier  "Card1"
    Driver      "amdgpu"
    BusID       "PCI:1:0:1"
EndSection

Section "Device"
        ### Available Driver options are:-
        ### Values: <i>: integer, <f>: float, <bool>: "True"/"False",
        ### <string>: "String", <freq>: "<f> Hz/kHz/MHz",
        ### <percent>: "<f>%"
        ### [arg]: arg optional
        #Option     "Accel"                 # [<bool>]
        #Option     "AccelMethod"           # <str>
        #Option     "Backlight"             # <str>
        #Option     "CustomEDID"            # <str>
        #Option     "DRI"                   # <str>
        #Option     "Present"               # [<bool>]
        #Option     "ColorKey"              # <i>
        #Option     "VideoKey"              # <i>
        #Option     "Tiling"                # [<bool>]
        #Option     "LinearFramebuffer"     # [<bool>]
        #Option     "HWRotation"            # [<bool>]
        #Option     "VSync"                 # [<bool>]
        #Option     "PageFlip"              # [<bool>]
        #Option     "SwapbuffersWait"       # [<bool>]
        #Option     "TripleBuffer"          # [<bool>]
        #Option     "XvPreferOverlay"       # [<bool>]
        #Option     "HotPlug"               # [<bool>]
        #Option     "ReprobeOutputs"        # [<bool>]
        #Option     "XvMC"                  # [<bool>]
        #Option     "ZaphodHeads"           # <str>
        #Option     "VirtualHeads"          # <i>
        #Option     "TearFree"              # [<bool>]
        #Option     "PerCrtcPixmaps"        # [<bool>]
        #Option     "FallbackDebug"         # [<bool>]
        #Option     "DebugFlushBatches"     # [<bool>]
        #Option     "DebugFlushCaches"      # [<bool>]
        #Option     "DebugWait"             # [<bool>]
        #Option     "BufferCache"           # [<bool>]
    Identifier  "Card2"
```

```
    Driver      "intel"
    BusID       "PCI:0:2:0"
EndSection

Section "Screen"
    Identifier "Screen0"
    Device     "Card0"
    Monitor    "Monitor0"
    SubSection "Display"
        Viewport   0 0
        Depth     1
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     4
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     8
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     15
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     16
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     24
    EndSubSection
EndSection

Section "Screen"
    Identifier "Screen1"
    Device     "Card1"
    Monitor    "Monitor1"
    SubSection "Display"
        Viewport   0 0
        Depth     1
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     4
    EndSubSection
    SubSection "Display"
        Viewport   0 0
```

```
        Depth     8
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     15
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     16
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     24
    EndSubSection
EndSection

Section "Screen"
    Identifier "Screen2"
    Device     "Card2"
    Monitor    "Monitor2"
    SubSection "Display"
        Viewport   0 0
        Depth     1
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     4
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     8
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     15
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     16
    EndSubSection
    SubSection "Display"
        Viewport   0 0
        Depth     24
    EndSubSection
EndSection
```

boots PC xorg.conf file contents

```
ll -h xorg.conf
-rw-r--r-- 1 anthony 1.5K Apr 16  2014 xorg.conf
```

```
Section "ServerLayout"
    Identifier     "amdcccle Layout"
    Screen      0  "amdcccle-Screen[1]-0" 0 0
EndSection

Section "Module"
    Load  "GLcore"
    Load  "glx"
    Load  "dri"
EndSection

Section "Monitor"
    Identifier   "0-CRT1"
    Option      "VendorName" "ATI Proprietary Driver"
    Option      "ModelName" "Generic Autodetecting Monitor"
    Option      "DPMS" "true"
    Option      "PreferredMode" "1600x1200"
    Option      "TargetRefresh" "85"
    Option      "Position" "0 0"
    Option      "Rotate" "normal"
    Option      "Disable" "false"
EndSection

Section "Monitor"

    # 1024x768 119.80 Hz (CVT) hsync: 98.96 kHz; pclk: 137.75 MHz
    Identifier   "0-DFP5"
    ModeLine     "1024x768_120.00" 137.8 1024 1104 1208 1392 768 771 775 826 -
hsync +vsync
    Option      "VendorName" "ATI Proprietary Driver"
    Option      "ModelName" "Generic Autodetecting Monitor"
    Option      "DPMS" "true"
    Option      "PreferredMode" "1024x768"
    Option      "TargetRefresh" "120"
    Option      "Position" "0 0"
    Option      "Rotate" "normal"
    Option      "Disable" "false"
EndSection

Section "Device"
    Identifier  "amdcccle-Device[1]-0"
    Driver      "fglrx"
```

```
    Option      "Monitor-DFP5" "0-DFP5"
    BusID       "PCI:1:0:0"
EndSection

Section "Screen"
    Identifier "Default Screen"
    DefaultDepth     24
EndSection

Section "Screen"
    Identifier "amdcccle-Screen[1]-0"
    Device     "amdcccle-Device[1]-0"
    DefaultDepth     24
    SubSection "Display"
        Viewport   0 0
        Depth     24
    EndSubSection
EndSection
```

Generate new modeline for 120Hz

Current xrandr output:

```
anthony@grogu:~$ xrandr
Screen 0: minimum 320 x 200, current 1600 x 1200, maximum 16384 x 16384
DisplayPort-3 disconnected (normal left inverted right x axis y axis)
DisplayPort-4 disconnected (normal left inverted right x axis y axis)
DisplayPort-5 disconnected (normal left inverted right x axis y axis)
HDMI-A-3 disconnected (normal left inverted right x axis y axis)
DVI-D-0 connected 1600x1200+0+0 (normal left inverted right x axis y axis)
390mm x 293mm
   1280x1024     90.00 + 100.00    85.02    75.02
   1920x1440     60.00
   1600x1200     75.00*
   1440x900      59.90
   1280x960      85.00
   1280x800      90.00
   1152x864      75.00
   1280x720      90.00
   1024x768      85.00    75.03    70.07    60.00
   832x624       74.55
   800x600       85.06    72.19    75.00    60.32    56.25
   640x480       85.01    75.00    72.81    66.67    59.94
   720x400       87.85    70.08
DP-1-1 disconnected (normal left inverted right x axis y axis)
HDMI-1-1 disconnected (normal left inverted right x axis y axis)
```

```
DP-1-2 disconnected (normal left inverted right x axis y axis)
HDMI-1-2 disconnected (normal left inverted right x axis y axis)
DP-1-3 disconnected (normal left inverted right x axis y axis)
HDMI-1-3 disconnected (normal left inverted right x axis y axis)
```

```
cvt 1024 768 120
# 1024x768 119.80 Hz (CVT) hsync: 98.96 kHz; pclk: 137.75 MHz
Modeline "1024x768_120.00"  137.75  1024 1104 1208 1392  768 771 775 826 -
hsync +vsync
```

2023-10-09 notes

xrandr command line

Was able to change the display mode (both resolution and refresh rate) by doing this from command line, *after* putting the modified xorg.conf file in place at `/etc/xorg.conf`. (However, I later determined that the presence of an xorg.conf file is not necessary for the xrandr commands to work.)

```
xrandr --newmode "800x600_120.00"   83.00  800 856 936 1072  600 603 607 646 -
hsync +vsync
xrandr --addmode DVI-D-0 800x600_120.00
xrandr --output DVI-D-0 --mode 800x600_120.00
```

I was able to get both 1280×768 and 800×600 resolutions. (I can't tell for sure what the refresh rates were.) These modes, and the refresh rates that I wanted to associate with them, were available on the pull down menu accessible from the “Settings → Display” menu.

PTB Sync errors

However, PTB gave me nothing but errors. Couldn't run ImagingStereoDemo, nor VBLSyncTest, nor GarboriumDemo.

I tried turning off the SkipSyncTest (or similar name) procedures, but this just made Octave hang even worse, so I turned them back on.

To get PTB to work, I had to change the name of both versions of xorg.conf.new that I had moved to `/etc/` back to their original names, so that there wasn't any `xorg.conf` file present in `/etc/`. I tried moving both `xorg.conf.new` (the file that I had Xorg -configure generate automatically) and `xorg.conf.new.1284x768_120.00` (the file that I edited from `xorg.conf.new` to include the new mode indicated in its file name); both caused errors.

xorg.conf.new.SIMPLIFIED file

I think for the next step I will try to reduce the xorg.conf.new file's contents until PTB works with it in place.

I made a copy of xorg.conf.new called `xorg.conf.new.SIMPLIFIED`. I removed (commented out) many sections, then saved, copied it to `/etc/`, and renamed it as `xorg.conf`, and finally rebooted.

Limited success

RESULT: VBLSyncTest ran! This means that there was something in the original `xorg.conf.new` file that was causing the errors, and not necessarily the display mode information.

Next, I need to try inserting the display mode information into the file. But first, because it's similar, I'm going to try setting the monitor using `xrandr` from the command line, with `xorg.conf.new.SIMPLIFIED` in place.

RESULT: Interesting. xrandr did change the resolution to 800×600. However, PTB gave nothing but Sync errors for VBLSyncTest and GarboriumDemo (it wouldn't display them); but PTB did at least show the splash screen, which I didn't see at all last Friday (today is Monday). Then I used the GUI “Settings” to change the display to 1280×1024 at 90Hz – a setting that apparently comes with the monitor or something, because I didn't specify it anywhere. PTB ran! GarboriumDemo just showed a solid white screen, but VBLSyncTest worked successfully. ImagingStereoDemo worked and the flicker was higher frequency and thus less noticeable than last week when I ran it at 75 or 85 Hz (whatever the default for 1600×1200 is). Semi-yay!

Next, I'm going to try using xrandr to set the resolution to 1284×768 and 120Hz, just to see if that works whereas 800×600 didn't. Not sure why it would succeed, but seems worth a try.

RESULTS: Same pattern of results as with 800×600 at 120Hz. I guess I'll have to try editing `xorg.conf.new.SIMPLIFIED` again, perhaps adding more things from the boots PC's xorg.conf file, which is the only model I have for one that worked.

Next: wait, change of plans! While looking through VPixx's example xorg.conf files, I read that there exits “Psychtoolbox XOrgConfCreator”! I'm going to try that.

2023-10-10 notes

PTB XOrgConfCreator.m

I got `VBLSyncTest` and `ImagingStereoDemo(1,1)` to work in 1284×768 at 120Hz!

I used PTB's `XOrgConfCreator` function to create an xorg.conf file. It created the file

```
.Psychtoolbox/XorgConfs/90-ptbconfig_single_xscreen_amdgpu.conf
```

and (I think?)

```
/etc/X11/xorg.conf.d/90-ptbxorg.conf
```

I tried running PTB with this in place; same problems as above.

Modified version of PTB-generated xorg.conf file

Then I made a modified version of the file:

```
~/lab/equipment/stereopsis/CRT/90-
ptbconfig_single_xscreen_amdgpu_MODIFIED.conf
```

I copied this to `/etc/X11/xorg.conf.d/.`, and appended a string to the other `.conf` file already there so that it wouldn't be recognized as a .conf file (which, I suspect, is what gets the file read during init.). The other file is now named `90-ptbxorg.conf.CHANGEME`

Success!

Then I switched the display resolution using the GUI; it might have been to *1024*x768 instead of to *1284*x768, but it was definitely 120Hz (well, very close to that). And everything worked!

(However, NOTE: GarboriumDemo was strangely dark – low brightness.)

I just checked `~/lab/equipment/stereopsis/CRT/90-ptbconfig_single_xscreen_amdgpu_MODIFIED.conf`; it **does** specify 1024, not 1284. I guess that was the problem – I had misread my boots PC example xorg.conf file as saying 1284?

GPU not producing frame sequential stereo

2023-10-12 notes

The LCD glasses have only been working for a brief time, and it turns out that PTB had been throwing errors while the stereo presentation was happening.

I am going to try to install a different driver for the graphics card. First, I am documenting the current

state of the gpu's driver, and the PTB errors.

Checking AMD driver

Checking AMD driver

PTB errors

PTB errors

2023-10-13 notes

Installing new amdgpu driver from AMD website

Backing up root partition

Backing up up the root partition prior to installing a new amd gpu driver for the Radeon RX 580.

The output below includes (last two lines) the Sandisk USB-C drive that I will use to back up the root partition. I guess I must have made the 77G partition so that I could dd grogu's root partition onto it uncompressed. That actually seems inefficient, since it probably wouldn't take that long to compress the dd output into a .img.gz file that would be significantly smaller.

```
anthony@grogu:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           1.6G  2.0M  1.6G   1% /run
/dev/nvme0n1p4   77G   20G   53G  28% /
tmpfs           7.8G     0  7.8G   0% /dev/shm
tmpfs           5.0M  4.0K  5.0M   1% /run/lock
/dev/nvme0n1p5  290G  2.9G  273G   2% /home
/dev/nvme0n1p1  496M   44M  453M   9% /boot/efi
tmpfs           1.6G  104K  1.6G   1% /run/user/1000
/dev/sdb2        36G   24K   34G   1% /media/anthony/4f41a542-5fff-4140-b640-
deddb7ebf068
/dev/sdb1        77G   24K   73G   1%
/media/anthony/85617021-8551-4ce1-8e99-519ad5db3788
```

I will go ahead and just dump the partition uncompressed into the larger partition of the Sandisk USB-C drive. I just verified the the two partitions are exactly the same size by doing `df` without the `-h` flag.

Usually the “of” argument would be a file, but because the USB drive partition is exactly the same size as the input partition, it seems like there wouldn't be any room left for file information (name, etc.). So I could try making the partition itself, without a file, the “of”.

I'm concerned this could backfire, so I'm just going to compress the output into a file after all.

```
$ sudo bash -c 'dd if==/dev/nvme0n1p4 | gzip >
/media/anthony/85617021-8551-4ce1-8e99-519ad5db3788/grogu_root.img.gz'
```

Result: process took 15 minutes (no rounding). Output file is 11GB.

Copied the output file (`grogu_root.img.gz`) to a new dir I just made on the 3 TB storage HDD that is currently mounted at *media/anthony/data11*.

```
$ sudo cp -p
/media/anthony/85617021-8551-4ce1-8e99-519ad5db3788/grogu_root.img.gz
/media/anthony/data11/grogu/.
```

Came to my senses! Renamed `grogu_root.img.gz` to `grogu_root_2023-10-13.img.gz` in both instances.

Download AMD driver

Download from this site:

https://www.amd.com/en/support/graphics/radeon-500-series/radeon-rx-500-series/radeon-rx-580

Select

```
Radeon™ Software for Linux® version 23.20 for Ubuntu 22.04.3
Revision Number
23.20
File Size
14 KB
Release Date
9/6/2023
```

and read instructions from here:

https://amdgpu-install.readthedocs.io/en/latest/

<2023-10-13 12:55>

Did:

```
$ amdgpu-install -y --accept-eula
```

Therefore, installed proprietary components.

Check driver after installing version downloaded from AMD

```
anthony@grogu:~/Downloads$ sudo lshw -c video
  *-display
       description: VGA compatible controller
       product: Polaris 20 XL [Radeon RX 580 2048SP]
       vendor: Advanced Micro Devices, Inc. [AMD/ATI]
       physical id: 0
       bus info: pci@0000:01:00.0
       logical name: /dev/fb0
       version: ef
       width: 64 bits
       clock: 33MHz
       capabilities: pm pciexpress msi vga_controller bus_master cap_list rom
fb
       configuration: depth==32 driver==amdgpu latency==
resolution==1280,1024
       resources: irq:138 memory:a0000000-afffffff memory:b0000000-b01fffff
ioport:3000(size==256) memory:b2200000-b223ffff memory:c0000-dffff
```

```
anthony@grogu:~$ lsmod | grep amd
amdgpu              15171584  5
amddrm_ttm_helper      16384  1 amdgpu
amdttm                114688  2 amdgpu,amddrm_ttm_helper
amdxcp                 16384  1 amdgpu
iommu_v2               24576  1 amdgpu
amddrm_buddy           20480  1 amdgpu
drm_display_helper    212992  2 amdgpu,i915
drm_kms_helper        249856  5 drm_display_helper,amdgpu,i915
amd_sched              61440  1 amdgpu
amdkcl                 40960  3 amd_sched,amdttm,amdgpu
drm                   696320  15
drm_kms_helper,amd_sched,amdttm,drm_display_helper,drm_buddy,amdgpu,amddrm_bud
dy,i915,ttm,amdkcl,amddrm_ttm_helper,amdxcp
i2c_algo_bit           16384  2 amdgpu,i915
video                  69632  2 amdgpu,i915
```

```
anthony@grogu:~$ sudo dmesg | grep -i amd
[sudo] password for anthony:
[    0.000000] Linux version 6.2.0-34-generic (buildd@bos03-amd64-059)
(x86_64-linux-gnu-gcc-11 (Ubuntu 11.4.0-1ubuntu1~22.04) 11.4.0, GNU ld (GNU
Binutils for Ubuntu) 2.38) #34~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Thu Sep  7
13:12:03 UTC 2 (Ubuntu 6.2.0-34.34~22.04.1-generic 6.2.16)
```

```
[    0.000000]   AMD AuthenticAMD
[    0.008873] RAMDISK: [mem 0x79e49000-0x7fffdfff]
[    0.008969] ACPI: VFCT 0x000000008B16B9B8 00E884 (v01 LENOVO TC-M1V
00001720 AMD  31504F47)
[    1.731377] amdkcl: loading out-of-tree module taints kernel.
[    1.731475] amdkcl: module verification failed: signature and/or required
key missing - tainting kernel
[    1.778106] AMD-Vi: AMD IOMMUv2 functionality not available on this system
- This is not a bug.
[    3.432063] [drm] amdgpu kernel modesetting enabled.
[    3.432064] [drm] amdgpu version: 6.2.4
[    3.432145] amdgpu: CRAT table not found
[    3.432146] amdgpu: Virtual CRAT table created for CPU
[    3.432154] amdgpu: Topology: Add CPU node
[    3.448008] amdgpu: PeerDirect support was initialized successfully
[    3.448082] amdgpu 0000:01:00.0: enabling device (0006 -> 0007)
[    3.448200] amdgpu 0000:01:00.0: amdgpu: Fetched VBIOS from VFCT
[    3.448202] amdgpu: ATOM BIOS: xxx-xxx-xxx
[    3.448273] amdgpu 0000:01:00.0: vgaarb: deactivate vga console
[    3.448275] amdgpu 0000:01:00.0: amdgpu: Trusted Memory Zone (TMZ) feature
not supported
[    3.448361] amdgpu 0000:01:00.0: amdgpu: VRAM: 8192M 0x000000F400000000 -
0x000000F5FFFFFFFF (8192M used)
[    3.448363] amdgpu 0000:01:00.0: amdgpu: GART: 256M 0x000000FF00000000 -
0x000000FF0FFFFFFF
[    3.448395] [drm] amdgpu: 8192M of VRAM memory ready
[    3.448396] [drm] amdgpu: 7910M of GTT memory ready.
[    3.449362] amdgpu: [powerplay] hwmgr_sw_init smu backed is polaris10_smu
[    3.665230] kfd kfd: amdgpu: Allocated 3969056 bytes on gart
[    3.665237] kfd kfd: amdgpu: Total number of KFD nodes to be created: 1
[    3.665359] amdgpu: Virtual CRAT table created for GPU
[    3.665409] amdgpu: Topology: Add dGPU node [0x6fdf:0x1002]
[    3.665410] kfd kfd: amdgpu: added device 1002:6fdf
[    3.665420] amdgpu 0000:01:00.0: amdgpu: SE 4, SH per SE 1, CU per SH 9,
active_cu_number 32
[    3.669059] amdgpu 0000:01:00.0: amdgpu: Using BACO for runtime pm
[    3.669552] [drm] Initialized amdgpu 3.54.0 20150101 for 0000:01:00.0 on
minor 0
[    3.680427] fbcon: amdgpudrmfb (fb0) is primary device
[    3.774103] amdgpu 0000:01:00.0: [drm] fb0: amdgpudrmfb frame buffer device
[    4.920528] amdgpu 0000:01:00.0: vgaarb: changed VGA decodes:
olddecodes==io+mem,decodes==io+mem:owns==mem
[    4.996814] snd_hda_intel 0000:01:00.1: bound 0000:01:00.0 (ops
amdgpu_dm_audio_component_bind_ops [amdgpu])
```

PTB Errors

VBLSyncTest

```
>> VBLSyncTest


PTB-INFO: This is Psychtoolbox-3 for GNU/Linux X11, under GNU/Octave 64-Bit
(Version 3.0.18 - Build date: Jan 20 2022).
PTB-INFO: OS support status: Linux 6.2.0-34-generic Supported.
PTB-INFO: Type 'PsychtoolboxVersion' for more detailed version information.
PTB-INFO: Most parts of the Psychtoolbox distribution are licensed to you
under termsof the MIT License, with
PTB-INFO: some restrictions. See file 'License.txt' in the Psychtoolbox root
folder for the exact licensing conditions.

PTB-INFO: For information about paid priority support, community membership
and commercial services, please type
PTB-INFO: 'PsychPaidSupportAndServices'.

PTB-INFO: Connected to Advanced Micro Devices, Inc. [AMD/ATI] Polaris 20 XL
[Radeon RX 580 2048SP] GPU with DCE-11.0 display engine [6 heads].
PTB-INFO: Trying to enable at least 10 bpc fixed point framebuffer.
PTB-INFO: Output 0 of screen 0 has too low max bpc 16 <== 8 bpc for high
precision (10bpc) mode. Requesting a new maximum bpc of 10 bits.
PTB-INFO: Output 1 of screen 0 has too low max bpc 16 <== 8 bpc for high
precision (10bpc) mode. Requesting a new maximum bpc of 10 bits.
PTB-INFO: Output 2 of screen 0 has too low max bpc 16 <== 8 bpc for high
precision (10bpc) mode. Requesting a new maximum bpc of 10 bits.
PTB-INFO: Output 3 of screen 0 has too low max bpc 16 <== 8 bpc for high
precision (10bpc) mode. Requesting a new maximum bpc of 10 bits.
PTB-INFO: Output 4 of screen 0 has too low max bpc 16 <== 8 bpc for high
precision (10bpc) mode. Requesting a new maximum bpc of 10 bits.
PTB-INFO: Linux native 10 bit per color framebuffer requested, and the OS
claims it is working fine. Good.
PTB-INFO: Real (OS native, queried) color resolution of the GPU framebuffer is
10 bits per RGB color component.


PTB-INFO: OpenGL-Renderer is AMD :: AMD Radeon RX 580 2048SP (polaris10, LLVM
16.0.6,DRM 3.54, 6.2.0-34-generic) :: 4.6 (Compatibility Profile) Mesa 23.2.0-
devel
PTB-INFO: VBL startline == 768 , VBL Endline == 824
PTB-INFO: Measured monitor refresh interval from beamposition == 8.343979 ms
[119.846901 Hz].
PTB-INFO: Will try to use OS-Builtin OpenML sync control support for accurate
```

```
Flip timestamping.
PTB-INFO: Measured monitor refresh interval from VBLsync == 8.343916 ms
[119.847804 Hz]. (50 valid samples taken, stddev==0.000376 ms.)
PTB-INFO: Reported monitor refresh interval from operating system == 8.343972
ms [119.847000 Hz].
PTB-INFO: Small deviations between reported values are normal and no reason to
worry.
The refresh interval reported by the operating system is 8.33333 ms.
libptbdrawtext_ftgl: External 'DrawText' text rendering plugin initialized.
libptbdrawtext_ftgl: Maximum number of cacheable fonts is 40, minimum number
of supported concurrent windows is 10.
libptbdrawtext_ftgl: This plugin uses multiple excellent free software
libraries to its work:
libptbdrawtext_ftgl: OGLFT (http://oglft.sourceforge.net/) the OpenGL-FreeType
libr.
libptbdrawtext_ftgl: The FreeType-2 (http://freetype.sourceforge.net/)
library.
libptbdrawtext_ftgl: The FontConfig (http://www.fontconfig.org) library.
libptbdrawtext_ftgl: Thanks!

Measured refresh interval, as reported by "GetFlipInterval" is 8.34392 ms.
(nsample 0, stddev == 0.00000 ms)


NFO: PTB's Screen('Flip', 10) command seems to have missed the requested
stimulus pentation deadline
INFO: a total of 2 times out of a total of 163 flips during this session.

INFO: This number is fairly accurate (and indicative of real timing problems
in youwn code or your system)
INFO: if you provided requested stimulus onset times with the 'when' argument
of Scn('Flip', window [, when]);
INFO: If you called Screen('Flip', window); without the 'when' argument, this
count more of a ''mild'' indicator
INFO: of timing behaviour than a hard reliable measurement. Large numbers may
indic problems and should at least
INFO: deserve your closer attention. Cfe. 'help SyncTrouble', the FAQ section
at wwsychtoolbox.org and the
INFO: examples in the PDF presentation in PsychDocumentation/Psychtoolbox3-
Slides.pfor more info and timing tips.

PTB missed 1 out of 156 stimulus presentation deadlines.
One missed deadline is ok and an artifact of the measurement.
PTB completed 0 stimulus presentations before the requested target time.
Have a look at the plots for more details...
```

ImagingStereoDemo(1,1)

```
>> ImagingStereoDemo(1,1)
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation


PTB-INFO: This is Psychtoolbox-3 for GNU/Linux X11, under GNU/Octave 64-Bit
(Version 3.0.18 - Build date: Jan 20 2022).
PTB-INFO: OS support status: Linux 6.2.0-34-generic Supported.
PTB-INFO: Type 'PsychtoolboxVersion' for more detailed version information.
PTB-INFO: Most parts of the Psychtoolbox distribution are licensed to you
under terms of the MIT License, with
PTB-INFO: some restrictions. See file 'License.txt' in the Psychtoolbox root
folder for the exact licensing conditions.

PTB-INFO: For information about paid priority support, community membership
and commercial services, please type
PTB-INFO: 'PsychPaidSupportAndServices'.

PTB-INFO: Connected to Advanced Micro Devices, Inc. [AMD/ATI] Polaris 20 XL
[Radeon RX 580 2048SP] GPU with DCE-11.0 display engine [6 heads].
PTB-INFO: Trying to enable at least 10 bpc fixed point framebuffer.
PTB-INFO: Linux native 10 bit per color framebuffer requested, and the OS
claims it is working fine. Good.
PTB-INFO: Real (OS native, queried) color resolution of the GPU framebuffer is
10 bits per RGB color component.


PTB-INFO: OpenGL-Renderer is AMD :: AMD Radeon RX 580 2048SP (polaris10, LLVM
16.0.6, DRM 3.54, 6.2.0-34-generic) :: 4.6 (Compatibility Profile) Mesa
23.2.0-devel
PTB-INFO: VBL startline == 768 , VBL Endline == 824
PTB-INFO: Measured monitor refresh interval from beamposition == 8.344203 ms
[119.843686 Hz].
PTB-INFO: Will try to use OS-Builtin OpenML sync control support for accurate
Fliptimestamping.
PTB-INFO: Measured monitor refresh interval from VBLsync == 8.343997 ms
[119.846639Hz]. (50 valid samples taken, stddev==0.000498 ms.)
PTB-INFO: Reported monitor refresh interval from operating system == 8.343972
ms [119.847000 Hz].
PTB-INFO: Small deviations between reported values are normal and no reason to
worry.
PTB-INFO: Stereo display via OpenGL built-in frame-sequential stereo
requested.

PTB-INFO: Your script requests use of frame-sequential stereo, but your
```

```
graphics card
PTB-INFO: and driver doesn't support this. I will now fully enable the imaging
pipeline
PTB-INFO: and use my own home-grown frame-sequential stereo implementation.
Note that this
PTB-INFO: may not be as robust and high-performance as using a graphics card
with native
PTB-INFO: frame-sequential stereo support. But let's see what i can do for
you...

PTB-INFO: Psychtoolbox imaging pipeline starting up for window with requested
imagingmode 1025 ...
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus
drawing.
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus post-
processing (if any).
PTB-INFO: SetDitherMode: Trying to disable digital display dithering on
display head 0.
PTB-INFO: SetDitherMode: Current dither setting before our dither disable on
head 0 is 0xc900. Disabling.
LoadIdentityClut: Used GPU low-level setup code to configure (hopefully)
perfect identity pixel passthrough.
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
.Dots   Mean (s)        Max (s) %>20ms  %>30ms

1000    0.017   0.058       0       0
```

HolesCrowd_PTB_TEST.m

```
PTB-INFO: This is Psychtoolbox-3 for GNU/Linux X11, under GNU/Octave 64-Bit
(Version 3.0.18 - Build date: Jan 20 2022).
PTB-INFO: OS support status: Linux 6.2.0-34-generic Supported.
PTB-INFO: Type 'PsychtoolboxVersion' for more detailed version information.
PTB-INFO: Most parts of the Psychtoolbox distribution are licensed to you
under terms of the MIT License, with
PTB-INFO: some restrictions. See file 'License.txt' in the Psychtoolbox root
folder for the exact licensing conditions.

PTB-INFO: For information about paid priority support, community membership
and commercial services, please type
PTB-INFO: 'PsychPaidSupportAndServices'.

PTB-INFO: Connected to Advanced Micro Devices, Inc. [AMD/ATI] Polaris 20 XL
[Radeon RX 580 2048SP] GPU with DCE-11.0 display engine [6 heads].
PTB-INFO: Trying to enable at least 10 bpc fixed point framebuffer.
```

```
PTB-INFO: Linux native 10 bit per color framebuffer requested, and the OS
claims it is working fine. Good.
PTB-INFO: Real (OS native, queried) color resolution of the GPU framebuffer is
10 bits per RGB color component.


PTB-INFO: OpenGL-Renderer is AMD :: AMD Radeon RX 580 2048SP (polaris10, LLVM
16.0.6, DRM 3.54, 6.2.0-34-generic) :: 4.6 (Compatibility Profile) Mesa
23.2.0-devel
PTB-INFO: VBL startline == 768 , VBL Endline == 824
PTB-INFO: Measured monitor refresh interval from beamposition == 8.344139 ms
[119.844595 Hz].
PTB-INFO: Will try to use OS-Builtin OpenML sync control support for accurate
Fliptimestamping.
PTB-INFO: Measured monitor refresh interval from VBLsync == 8.344092 ms
[119.845270Hz]. (50 valid samples taken, stddev==0.000469 ms.)
PTB-INFO: Reported monitor refresh interval from operating system == 8.343972
ms [119.847000 Hz].
PTB-INFO: Small deviations between reported values are normal and no reason to
worry.
PTB-INFO: Psychtoolbox imaging pipeline starting up for window with requested
imagingmode 1027 ...
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus
drawing.
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus post-
processing (if any).
PTB-INFO: SetDitherMode: Trying to disable digital display dithering on
display head 0.
PTB-INFO: SetDitherMode: Dithering already disabled. Skipped.
LoadIdentityClut: Used GPU low-level setup code to configure (hopefully)
perfect identity pixel passthrough.
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
libptbdrawtext_ftgl: External 'DrawText' text rendering plugin initialized.
libptbdrawtext_ftgl: Maximum number of cacheable fonts is 40, minimum number
of supported concurrent windows is 10.
libptbdrawtext_ftgl: This plugin uses multiple excellent free software
libraries to do its work:
libptbdrawtext_ftgl: OGLFT (http://oglft.sourceforge.net/) the OpenGL-FreeType
library.
libptbdrawtext_ftgl: The FreeType-2 (http://freetype.sourceforge.net/)
library.
libptbdrawtext_ftgl: The FontConfig (http://www.fontconfig.org) library.
libptbdrawtext_ftgl: Thanks!

 k == -5
k == -4
k == -3
```

```
k == -2
k == -1
gk == -5
k == -4
k == -3
k == -2
k == -1
ggk == -5
k == -4
k == -3
k == -2
k == -1
f

TB-INFO: There are still 45 textures, offscreen windows or proxy windows open.
Screen('CloseAll') will auto-close them.
PTB-INFO: This may be fine for studies where you only use a few textures or
windows, but a large number of open
PTB-INFO: textures or offscreen windows can be an indication that you forgot
to dispose no longer needed items
PTB-INFO: via a proper call to Screen('Close', [windowOrTextureIndex]); ,
e.g., atthe end of each trial. These
PTB-INFO: stale objects linger around and can consume significant memory
ressources, causing degraded performance,
PTB-INFO: timing trouble (if the system has to resort to disk paging) and
ultimately out of memory conditions or
PTB-INFO: crashes. Please check your code. (Screen('Close') is a quick way to
release all textures and offscreen windows)



INFO: PTB's Screen('Flip', 10) command seems to have missed the requested
stimuluspresentation deadline
INFO: a total of 138 times out of a total of 2557 flips during this session.

INFO: This number is fairly accurate (and indicative of real timing problems
in your own code or your system)
INFO: if you provided requested stimulus onset times with the 'when' argument
of Screen('Flip', window [, when]);
INFO: If you called Screen('Flip', window); without the 'when' argument, this
count is more of a ''mild'' indicator
INFO: of timing behaviour than a hard reliable measurement. Large numbers may
indicate problems and should at least
INFO: deserve your closer attention. Cfe. 'help SyncTrouble', the FAQ section
at www.psychtoolbox.org and the
INFO: examples in the PDF presentation in PsychDocumentation/Psychtoolbox3-
Slides.pdf for more info and timing tips.
```

```
WARNING: This session of your experiment was run by you with the setting
Screen('Preference', 'SkipSyncTests', 1).
WARNING: This means that some internal self-tests and calibrations were
skipped. Your stimulus presentation timing
WARNING: may have been wrong. This is fine for development and debugging of
your experiment, but for running the real
WARNING: study, please make sure to set Screen('Preference', 'SkipSyncTests',
0) for maximum accuracy and reliability.
```

VPixx Equipment Causing Errors?

<2023-10-13>

I don't think it's the problem.

Datapixx status

After doing “Datapixx('Open')” first.

```
>> status == Datapixx('GetVideoStatus')
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
status ==

  scalar structure containing the fields:

    horizontalResolution == 1024
    verticalResolution == 768
    horizontalTotal == 1392
    verticalTotal == 826
    verticalFrequency == 119.85
    horizontalFrequency == 9.8998e+04
    dotFrequency == 1.3780e+08
    mode == 0
    greyscaleMode == 0
    receivingVideo == 1
    receivingDualLinkVideo == 0
    stereoEye == 1
    verticalStereo == 0
    stereoBlueline == 1
    stereoVesaWaveform == 32
    stereoVesaPhase == 245
```

```
    horizontalSplit == 0
    horizontalOverlay == 0
    horizontalOverlayBoundsLeft == 0
    horizontalOverlayBoundsRight == 0
    horizontalOverlayBoundsTop == 0
    horizontalOverlayBoundsBottom == 0
    pixelSyncTimeout == 0
    overClocked == 0
    pixelSyncRasterLine == 0
    pixelSyncSingleLine == 0
    pixelSyncBlankLine == 0
    scanningBacklight == 0
    backlightIntensity == 0
    lcd3D60Hz == 0
    videoClutTransparencyColorMode == 0
    pixelMode == 0
    propixxCeilingMount == 0
    propixxRearProjection == 0
    propixx3DCrosstalk == 0
    propixx3DCrosstalkLR == 0
    propixx3DCrosstalkRL == 0
    propixxLampLed == 0
    propixxHotSpotCorrection == 0
    propixxTScopePrepAcknowledge == 0
    propixxTScopeScheduleFrame == 0
    propixxLedMask == 0
    propixxQuad3d == 0
    Error == -1012
```

Current Datapixx.mex

I copied

```
/usr/share/VPixx Software Tools/Software
Tools/DatapixxToolbox_trunk/mexdev/build/octave/linux64/Datapixx_octave5.mex
```

to

```
/usr/share/psychtoolbox-3/PsychBasic/Datapixx.mex
```

and then made a symlink from that to `Datapixx_octave5.mex`.

In `/usr/share/psychtoolbox-3/PsychBasic/`,

```
ll Datapixx*mex
```

gives:

```
lrwxrwxrwx  1 root root   20 Oct  5 13:03 Datapixx.mex -> Datapixx_octave5.mex
-rw-r--r--  1 root root 1694640 Oct  5 11:27 Datapixx_octave5.mex
```

Altered xorg.conf file

I tried running the WIC study script, `ClusterCircle.m`, to see how it might run on this system. It couldn't paint the dots green. I thought that maybe the depth in bits parameter that PTB set when I ran `XOrgConfCreator.m` might have messed with the gpu's ability to portray color correctly (at least in PTB?), so I generated a new xorg.conf using `XOrgConfCreator` and examined it. It was minimal, but it lacked the line specifying `DefaultDepth 30`. So, I commented that line out of the xorg.conf file that I'm currently using. Then I rebooted the system, and `ClusterCircle.m` ran fine, showing green dots when it should have.

While I was at it, I removed the copy of the xorg.conf file in the critical directory (`/etc/X11/xorg.conf.d/` and replaced it with a link to the copy of the file in `~/lab/equipment/stereopsis/CRT`. That latter directory is part of a git repo, so now I won't have to worry about version control for a separate copy.

The name of the file and the location of the link that actually matter for controlling the CRT:

```
/etc/X11/xorg.conf.d/90-ptbconfig_single_xscreen_amdgpu_MODIFIED.conf
```

Again, the above is now a *link*, no longer a file.

Trying one more thing with drivers

```
$ sudo apt install firmware-amd-graphics libgl1-mesa-dri libglx-mesa0 mesa-
vulkan-drivers xserver-xorg-video-all
```

From: https://wiki.debian.org/AtiHowTo#Firmware

Got this message:

```
Package firmware-amd-graphics is not available, but is referred to by another
package.
This may mean that the package is missing, has been obsoleted, or
is only available from another source

E: Package 'firmware-amd-graphics' has no installation candidate
```

Summary: nothing needed to be installed, except for something not found.

Summary of important files for making the 3DPixx work

```
/etc/X11/xorg.conf.d/90-ptbconfig_single_xscreen_amdgpu_MODIFIED.conf
    [or whatever file in that dir. that ends in *.conf, apparently]

/usr/share/psychtoolbox-3/PsychBasic/Datapixx.mex
    [Need to copy one of several Datapixx*.mex files to this location and
rename it "Datapixx.mex"]
    [Currently: Datapixx.mex -> Datapixx_octave5.mex]
    [Datapixx_octave5.mex was originally copied from /usr/share/VPixx Software
Tools/Software
Tools/DatapixxToolbox_trunk/mexdev/build/octave/linux64/Datapixx_octave5.mex]

[amdgpu driver files]
```

Summary of this week's work: Need to contact VPixx

I couldn't fix the PTB problems by installing the different driver.

My next plan is to contact VPixx about this, giving them information from the things I've copied and pasted above and on other pages.

Future Plans

- Try using PTB with MATLAB instead of Octave
- Try AMDGPU-PRO driver

Installing PTB in MATLAB

2023-10-16 notes

http://psychtoolbox.org/download#Linux

The instructions included adding NeuroDebian repository to apt sources list. I chose the option that included non-free software sources.

PTB-matlab installation command output messages

PTB Errors

VBLSyncTest Errors

Seems like it was nothing but errors :(

Here is the very end of the output. (I had escaped out of the demo only a second or so after it started.)

```
PTB-WARNING: Flip 212 for window 10 didn't use pageflipping for flip. Visual
presentation timing and timestamps are likely unreliable!
PTB-WARNING: Something is misconfigured on your system, otherwise pageflipping
would have been used by the graphics driver for reliable timing.
PTB-WARNING: However, if you see this message only sporadically, this might be
caused by onscreen popup messages a la "You have new mail!" or
PTB-WARNING: "New updates are ready to install" etc. Being low on free system
memory can cause this as well, especially on integrated graphics chips.
PTB-WARNING: Read the Linux specific section of 'help SyncTrouble' for some
other common causes and fixes for this problem.


INFO: PTB's Screen('Flip', 10) command seems to have missed the requested
stimulus presentation deadline
INFO: a total of 151 times out of a total of 152 flips during this session.
```

Whoa, the display even seems to have switched back from 1024×768@120Hz to 1600×1200@75Hz on its own accord after that last demo, too!

For MATLAB, have to kill VPixx background process that is often (always?) running in background before doing the following, in order to get stereo scrips to work:

```
$ ps aux | grep -i vpix  [note the ps number]
$ sudo kill [vpixx ps number]
```

```
>> isReady = Datapixx('Open')
```

will work

Fixed VBLSyncTest Errors

Turns out I think the problem was that I still had Octave open and running PTB. I think the Datapixx was being counted as open in Octave, and therefore couldn't be counted as open in MATLAB, somehow. This is based on the error message I kept getting for `Datapixx('Open')`.

In any case, the VBLSyncTest errors went away after I closed Octave, and did `Datapixx('Open')` in MATLAB.

ImagingStereoDemo(1,1) and HolesCrowd_PTB_TEST errors

Got the same problems as I have been having with Octave. `ImagingStereoDemo(1,1)` worked nicely once, but not again after that.

Namely, kept getting this error with both scripts:

```
PTB-INFO: Your script requests use of frame-sequential stereo, but your
graphics card
PTB-INFO: and driver doesn't support this. I will now fully enable the imaging
pipeline
PTB-INFO: and use my own home-grown frame-sequential stereo implementation.
Note that this
PTB-INFO: may not be as robust and high-performance as using a graphics card
with native
PTB-INFO: frame-sequential stereo support. But let's see what i can do for
you...
```

That is, PTB switches the stereo mode to mode 11.

CONCLUSION: I guess I'll move on to installing the AMDGPU-PRO driver now.

Installing AMDGPU-PRO driver

I find it a little confusing to find this driver. There doesn't seem to be a reference to download something called “amdgpu-pro” as a driver or package, but the AMD website https://www.amd.com/en/support/linux-drivers does talk about “AMD Radeon PRO graphics.” Also, an ArchLinux site (https://aur.archlinux.org/pkgbase/amdgpu-pro-installer) has a page for a package called “amdgpu-pro-installer,” but it's in a format (https:*.git) I'm not familiar with. The good page https://linuxconfig.org/amd-radeon-ubuntu-20-04-driver-installation, in its “Proprietary AMDGPU-PRO drivers” section, simply points to the AMD drivers download page.

Downloading .deb file from "Linux® Drivers for AMD Radeon™ PRO Graphics" official site

Under the encouraging heading “Pro Driver.”

File is

```
amdgpu-install_5.5.50503-1_all.deb
```

Then, from the AMD site's instructions:

```
$ cd ~/Downloads
# For Ubuntu:
$ sudo apt-get install ./amdgpu-install-VERSION.deb
$ sudo apt-get update
```

After doing that, this script is available:

```
anthony@grogu:Downloads$ which amdgpu-install
/usr/bin/amdgpu-install
```

Did this:

```
$ amdgpu-install --usecase=workstation -y --vulkan=pro --opencl=rocr,legacy
```

I accepted the License Agreement from the terminal.

Got this error message:

```
Some packages could not be installed. This may mean that you have
requested an impossible situation or if you are using the unstable
distribution that some required packages have not yet been created
or been moved out of Incoming.
The following information may help to resolve the situation:

The following packages have unmet dependencies:
 amdgpu : Depends: amdgpu-lib (= 1:5.5.50503-1620033.22.04) but
1:5.7.50700-1646729.22.04 is to be installed
E: Unable to correct problems, you have held broken packages.
```

Solution: Turns out I had a newer version of the amdgpu-install* package already in the ~/Downloads dir. (*5.7* instead of *5.5*), so I just repeated the process using that one. No more errors.

Going to reboot and try Octave and then MATLAB PTB again.

(2023-10-16 16:17)

White Screen of Error

Got an all-white screen, and unable to do anything other than move mouse pointer, after logging back in (i.e. the login screen was normal, and I typed my password first).

Used `ctrl-alt-F1` to get to a TTY terminal, then did

```
$ less .bash-history
```

to see the recent amdgpu-install command.

Tried redoing that a few times in different ways and rebooting again, no difference.

Now I'm going to try doing

```
amdgpu-uninstall
```

Looks scary, though, so I said no the first time, decided to look up more info.

Did

```
amdgpu-uninstall
```

Perhaps unsurprisingly, got zero graphics (black screen) when rebooted.

Did

```
$ amdgpu-install -y --usecase=graphics --accept-eula
```

Then

```
$ sudo apt update
```

(actually, I'd been doing that after every time I ran an amdgpu-install command above)

The AMD drivers site instructions calls this the “All-Open Variant”

Got same problems/errors as before trying to install pro version of driver. But at least I can see the screen again.

OK, last thing to try for today:

```
amdgpu-install -y --usecase=workstation --accept-eula, but after doing amdgpu-
```

```
uninstall first
```

Got White Screen of Error again!

OK, for reals last thing to try for today:

Followed the advice from this page:

https://askubuntu.com/questions/1451506/how-to-make-ubuntu-22-04-work-with-a-radeon-rx-7900-xtx/1451852#1451852

firmware updating advice commands

Didn't help :(

2023-10-17 notes

Installing OEM kernel for Linux

OK, yesterday I didn't do step #1 of the instructions listed on the page referenced immediately above. It is this, and I'm going to do it now:

```
Install the latest OEM kernel available by running the command:

sudo apt install linux-oem-22.04c
```

BUT FIRST, note the current kernel:

```
$ uname -a
$ Linux grogu 6.2.0-34-generic #34~22.04.1-Ubuntu SMP PREEMPT-DYNAMIC Thu Sep 7 13:12:03 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
```

Did it.

Some error messages came up while it was running.

After rebooting, still White Screen.

Performing steps 2 through 4 from above, again.

Still White Screen.

Tried logging in to root shell via Rescue Mode. Then did `startx` from root command line. Did get XFCE desktop, but Octave wouldn't run. Also, couldn't set the 120Hz mode (absent) using `xrandr`, because xrandr couldn't find the `DVI-D-0` display.

Rebooted and did `amdgpu-uninstall -y` as `anthony`.

Then did `amdgpu-install -y –accept-eula`, rebooted, as sanity check.

No more White Screen of Error, just like previous time(s?) when I did the uninstall/install the basic version of the driver (no options) before.

No more PRB graphics card error messages!

BUT THIS TIME, WHEN I RAN PTB, NO MORE ERROR MESSAGES ABOUT THE GRAPHICS CARD!!!

I can run `ImagingStereoDemo(1,1)` and `HolesCrowd_PTB_TEST.m` without getting the PTB messages about my graphics card not providing sequential frame stereo, anymore. However, I still have **the same phenomenon/issue/problem** as before: sometimes I will get less than a minute of good stereo, but then the glasses will stop working completely. No extra message output comes from PTB after compared to before the stoppage, as far as I can tell.

PTB output for HolesCrowd_PTB_TEST

```
>> HolesCrowd_PTB_TEST
warning: inputdlg: 5th 'options' argument ignored
warning: called from
    inputdlg at line 120 column 5
    HolesCrowd_PTB_TEST at line 14 column 8



PTB-INFO: This is Psychtoolbox-3 for GNU/Linux X11, under GNU/Octave 64-Bit
(Version 3.0.19 - Build date: Aug 16 2023).
PTB-INFO: OS support status: Linux 6.2.0-34-generic Supported.
PTB-INFO: Type 'PsychtoolboxVersion' for more detailed version information.
PTB-INFO: Most parts of the Psychtoolbox distribution are licensed to you
under termsof the MIT License, with
PTB-INFO: some restrictions. See file 'License.txt' in the Psychtoolbox root
folder for the exact licensing conditions.

PTB-INFO: For information about paid support, support memberships and other
commercial services, please type
PTB-INFO: 'PsychPaidSupportAndServices'.

PTB-INFO: Connected to Advanced Micro Devices, Inc. [AMD/ATI] Polaris 20 XL
[Radeon RX 580 2048SP] GPU with DCE-11.0 display engine [6 heads].


PTB-INFO: OpenGL-Renderer is AMD :: AMD Radeon RX 580 2048SP (polaris10, LLVM
```

```
16.0.6,DRM 3.54, 6.2.0-34-generic) :: 4.6 (Compatibility Profile) Mesa 23.2.0-
devel
PTB-INFO: VBL startline = 768 , VBL Endline = 824
PTB-INFO: Measured monitor refresh interval from beamposition = 8.343410 ms
[119.855078 Hz].
PTB-INFO: Will try to use OS-Builtin OpenML sync control support for accurate
Flip timestamping.
PTB-INFO: Measured monitor refresh interval from VBLsync = 8.343349 ms
[119.855955 Hz]. (50 valid samples taken, stddev=0.000578 ms.)
PTB-INFO: Reported monitor refresh interval from operating system = 8.343972
ms [119.847000 Hz].
PTB-INFO: Small deviations between reported values are normal and no reason to
worry.
PTB-INFO: Psychtoolbox imaging pipeline starting up for window with requested
imagingmode 1027 ...
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus
drawing.
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus post-
processing (if any).
PTB-INFO: SetDitherMode: Trying to disable digital display dithering on
display head 0.
PTB-INFO: SetDitherMode: Current dither setting before our dither disable on
head 0 is 0xc900. Disabling.
LoadIdentityClut: Used GPU low-level setup code to configure (hopefully)
perfect identity pixel passthrough.
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
libptbdrawtext_ftgl: External 'DrawText' text rendering plugin initialized.
libptbdrawtext_ftgl: Maximum number of cacheable fonts is 40, minimum number
of supported concurrent windows is 10.
libptbdrawtext_ftgl: This plugin uses multiple excellent free software
libraries to do its work:
libptbdrawtext_ftgl: OGLFT (http://oglft.sourceforge.net/) the OpenGL-FreeType
library.
libptbdrawtext_ftgl: The FreeType-2 (http://freetype.sourceforge.net/)
library.
libptbdrawtext_ftgl: The FontConfig (http://www.fontconfig.org) library.
Version Id: 21301
libptbdrawtext_ftgl: Thanks!

  fhytzk = -5
k = -4
k = -3
k = -2
k = -1


TB-INFO: There are still 54 textures, offscreen windows or proxy windows open.
```

```
Screen('CloseAll') will auto-close them.
PTB-INFO: This may be fine for studies where you only use a few textures or
windows, but a large number of open
PTB-INFO: textures or offscreen windows can be an indication that you forgot
to dispose no longer needed items
PTB-INFO: via a proper call to Screen('Close', [windowOrTextureIndex]); ,
e.g., at the end of each trial. These
PTB-INFO: stale objects linger around and can consume significant memory
ressources, causing degraded performance,
PTB-INFO: timing trouble (if the system has to resort to disk paging) and
ultimately out of memory conditions or
PTB-INFO: crashes. Please check your code. (Screen('Close') is a quick way to
releaseall textures and offscreen windows)



INFO: PTB's Screen('Flip', 10) command seems to have missed the requested
stimulus presentation deadline
INFO: a total of 88 times out of a total of 2916 flips during this session.

INFO: This number is fairly accurate (and indicative of real timing problems
in your own code or your system)
INFO: if you provided requested stimulus onset times with the 'when' argument
of Screen('Flip', window [, when]);
INFO: If you called Screen('Flip', window); without the 'when' argument, this
count is more of a ''mild'' indicator
INFO: of timing behaviour than a hard reliable measurement. Large numbers may
indicate problems and should at least
INFO: deserve your closer attention. Cfe. 'help SyncTrouble', the FAQ section
at www.psychtoolbox.org and the
INFO: examples in the PDF presentation in PsychDocumentation/Psychtoolbox3-
Slides.pdffor more info and timing tips.



WARNING: This session of your experiment was run by you with the setting
Screen('Preference', 'SkipSyncTests', 1).
WARNING: This means that some internal self-tests and calibrations were
skipped. Yourstimulus presentation timing
WARNING: may have been wrong. This is fine for development and debugging of
your experiment, but for running the real
WARNING: study, please make sure to set Screen('Preference', 'SkipSyncTests',
0) for maximum accuracy and reliability.
ans = 0
```

See? No mention of the graphics card not providing frame-sequential something something. From the PTB output messages, it sounds like everything should have gone well.

I finally commented out the offending “SkipSyncTests” line that was at the beginning of the `HolesCrowd_PTB_TEST.m` script; made no difference other than getting rid of that warning message, I think.

Conclusion about amdgpu drivers

I conclude that installing the OEM Kernel, which did reduce the number of “Firmware missing” type warnings that I saw during the subsequent `update-initramfs` command step, must have updated the firmware or the driver or *something*, to an extent that enabled the graphics card to produce frame-sequential stereo for PTB.

Just had decent success with generic DLP-Link glasses

PTB output when I ran `HolesCrowd_PTB_TEST` and then `ImagingStereoDemo(1,1)` in succession:

```
>> Datapixx('GetVideoStatus')
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
ans =

  scalar structure containing the fields:

    horizontalResolution = 1024
    verticalResolution = 768
    horizontalTotal = 1392
    verticalTotal = 826
    verticalFrequency = 119.85
    horizontalFrequency = 9.8998e+04
    dotFrequency = 1.3780e+08
    mode = 0
    greyscaleMode = 0
    receivingVideo = 1
    receivingDualLinkVideo = 0
    stereoEye = 0
    verticalStereo = 0
    stereoBlueline = 1
    stereoVesaWaveform = 32
    stereoVesaPhase = 245
    horizontalSplit = 0
    horizontalOverlay = 0
    horizontalOverlayBoundsLeft = 0
    horizontalOverlayBoundsRight = 0
    horizontalOverlayBoundsTop = 0
    horizontalOverlayBoundsBottom = 0
```

```
    pixelSyncTimeout = 0
    overClocked = 0
    pixelSyncRasterLine = 0
    pixelSyncSingleLine = 0
    pixelSyncBlankLine = 0
    scanningBacklight = 0
    backlightIntensity = 0
    lcd3D60Hz = 0
    videoClutTransparencyColorMode = 0
    pixelMode = 0
    propixxCeilingMount = 0
    propixxRearProjection = 0
    propixx3DCrosstalk = 0
    propixx3DCrosstalkLR = 0
    propixx3DCrosstalkRL = 0
    propixxLampLed = 0
    propixxHotSpotCorrection = 0
    propixxTScopePrepAcknowledge = 0
    propixxTScopeScheduleFrame = 0
    propixxLedMask = 0
    propixxQuad3d = 0
    Error = -1012

>> HolesCrowd_PTB_TEST
warning: inputdlg: 5th 'options' argument ignored
warning: called from
    inputdlg at line 120 column 5
    HolesCrowd_PTB_TEST at line 14 column 8



PTB-INFO: This is Psychtoolbox-3 for GNU/Linux X11, under GNU/Octave 64-Bit
(Version 3.0.19 - Build date: Aug 16 2023).
PTB-INFO: OS support status: Linux 6.2.0-34-generic Supported.
PTB-INFO: Type 'PsychtoolboxVersion' for more detailed version information.
PTB-INFO: Most parts of the Psychtoolbox distribution are licensed to you
under termsof the MIT License, with
PTB-INFO: some restrictions. See file 'License.txt' in the Psychtoolbox root
folder for the exact licensing conditions.

PTB-INFO: For information about paid support, support memberships and other
commercial services, please type
PTB-INFO: 'PsychPaidSupportAndServices'.

PTB-INFO: Connected to Advanced Micro Devices, Inc. [AMD/ATI] Polaris 20 XL
[Radeon RX 580 2048SP] GPU with DCE-11.0 display engine [6 heads].
```

```
PTB-INFO: OpenGL-Renderer is AMD :: AMD Radeon RX 580 2048SP (polaris10, LLVM
16.0.6,DRM 3.54, 6.2.0-34-generic) :: 4.6 (Compatibility Profile) Mesa 23.2.0-
devel
PTB-INFO: VBL startline = 768 , VBL Endline = 824
PTB-INFO: Measured monitor refresh interval from beamposition = 8.344081 ms
[119.845433 Hz].
PTB-INFO: Will try to use OS-Builtin OpenML sync control support for accurate
Flip timestamping.
PTB-INFO: Measured monitor refresh interval from VBLsync = 8.344045 ms
[119.845955 Hz]. (50 valid samples taken, stddev=0.000423 ms.)
PTB-INFO: Reported monitor refresh interval from operating system = 8.343972
ms [119.847000 Hz].
PTB-INFO: Small deviations between reported values are normal and no reason to
worry.
PTB-INFO: Psychtoolbox imaging pipeline starting up for window with requested
imagingmode 1027 ...
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus
drawing.
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus post-
processing (if any).
PTB-INFO: SetDitherMode: Trying to disable digital display dithering on
display head 0.
PTB-INFO: SetDitherMode: Dithering already disabled. Skipped.
LoadIdentityClut: Used GPU low-level setup code to configure (hopefully)
perfect identity pixel passthrough.
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
libptbdrawtext_ftgl: External 'DrawText' text rendering plugin initialized.
libptbdrawtext_ftgl: Maximum number of cacheable fonts is 40, minimum number
of supported concurrent windows is 10.
libptbdrawtext_ftgl: This plugin uses multiple excellent free software
libraries to do its work:
libptbdrawtext_ftgl: OGLFT (http://oglft.sourceforge.net/) the OpenGL-FreeType
library.
libptbdrawtext_ftgl: The FreeType-2 (http://freetype.sourceforge.net/)
library.
libptbdrawtext_ftgl: The FontConfig (http://www.fontconfig.org) library.
Version Id: 21301
libptbdrawtext_ftgl: Thanks!

jyk = -5
k = -4
k = -3
k = -2
k = -1
ok = -5
k = -4
k = -3
```

```
k = -2
k = -1
tk = -5
k = -4
k = -3
k = -2
k = -1
zk = -5
k = -4
k = -3
k = -2
k = -1
nk = -5
k = -4
k = -3
k = -2
k = -1
zmnak = -5
k = -4
k = -3
k = -2
k = -1
vk = -5
k = -4
k = -3
k = -2
k = -1
nnk = -5
k = -4
k = -3
k = -2
k = -1
uk = -5
k = -4
k = -3
k = -2
k = -1
xuvk = -5
k = -4
k = -3
k = -2
k = -1
uk = -5
k = -4
k = -3
k = -2
k = -1
ssznk = -5
```

```
k = -4
k = -3
k = -2
k = -1
m

TB-INFO: There are still 207 textures, offscreen windows or proxy windows
open. Screen('CloseAll') will auto-close them.
PTB-INFO: This may be fine for studies where you only use a few textures or
windows, but a large number of open
PTB-INFO: textures or offscreen windows can be an indication that you forgot
to dispose no longer needed items
PTB-INFO: via a proper call to Screen('Close', [windowOrTextureIndex]); ,
e.g., at the end of each trial. These
PTB-INFO: stale objects linger around and can consume significant memory
ressources, causing degraded performance,
PTB-INFO: timing trouble (if the system has to resort to disk paging) and
ultimately out of memory conditions or
PTB-INFO: crashes. Please check your code. (Screen('Close') is a quick way to
releaseall textures and offscreen windows)



INFO: PTB's Screen('Flip', 10) command seems to have missed the requested
stimulus presentation deadline
INFO: a total of 28 times out of a total of 8399 flips during this session.

INFO: This number is fairly accurate (and indicative of real timing problems
in your own code or your system)
INFO: if you provided requested stimulus onset times with the 'when' argument
of Screen('Flip', window [, when]);
INFO: If you called Screen('Flip', window); without the 'when' argument, this
count is more of a ''mild'' indicator
INFO: of timing behaviour than a hard reliable measurement. Large numbers may
indicate problems and should at least
INFO: deserve your closer attention. Cfe. 'help SyncTrouble', the FAQ section
at www.psychtoolbox.org and the
INFO: examples in the PDF presentation in PsychDocumentation/Psychtoolbox3-
Slides.pdffor more info and timing tips.

ans = 0
>> jyomtznzmnavnnuxuvussznm
error: 'jyomtznzmnavnnuxuvussznm' undefined near line 1, column 1
>> Datapixx('GetVideoStatus')
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
ans =
```

```
  scalar structure containing the fields:

    horizontalResolution = 1024
    verticalResolution = 768
    horizontalTotal = 1392
    verticalTotal = 826
    verticalFrequency = 119.85
    horizontalFrequency = 9.8998e+04
    dotFrequency = 1.3780e+08
    mode = 0
    greyscaleMode = 0
    receivingVideo = 1
    receivingDualLinkVideo = 0
    stereoEye = 0
    verticalStereo = 0
    stereoBlueline = 1
    stereoVesaWaveform = 32
    stereoVesaPhase = 245
    horizontalSplit = 0
    horizontalOverlay = 0
    horizontalOverlayBoundsLeft = 0
    horizontalOverlayBoundsRight = 0
    horizontalOverlayBoundsTop = 0
    horizontalOverlayBoundsBottom = 0
    pixelSyncTimeout = 0
    overClocked = 0
    pixelSyncRasterLine = 0
    pixelSyncSingleLine = 0
    pixelSyncBlankLine = 0
    scanningBacklight = 0
    backlightIntensity = 0
    lcd3D60Hz = 0
    videoClutTransparencyColorMode = 0
    pixelMode = 0
    propixxCeilingMount = 0
    propixxRearProjection = 0
    propixx3DCrosstalk = 0
    propixx3DCrosstalkLR = 0
    propixx3DCrosstalkRL = 0
    propixxLampLed = 0
    propixxHotSpotCorrection = 0
    propixxTScopePrepAcknowledge = 0
    propixxTScopeScheduleFrame = 0
    propixxLedMask = 0
    propixxQuad3d = 0
    Error = -1012

>> ImagingStereoDemo(1,1)
```

```
PsychDataPixx: Warning: DataPixx command IsReady returned error code -1012


PTB-INFO: This is Psychtoolbox-3 for GNU/Linux X11, under GNU/Octave 64-Bit
(Version 3.0.19 - Build date: Aug 16 2023).
PTB-INFO: OS support status: Linux 6.2.0-34-generic Supported.
PTB-INFO: Type 'PsychtoolboxVersion' for more detailed version information.
PTB-INFO: Most parts of the Psychtoolbox distribution are licensed to you
under termsof the MIT License, with
PTB-INFO: some restrictions. See file 'License.txt' in the Psychtoolbox root
folder for the exact licensing conditions.

PTB-INFO: For information about paid support, support memberships and other
commercial services, please type
PTB-INFO: 'PsychPaidSupportAndServices'.

PTB-INFO: Connected to Advanced Micro Devices, Inc. [AMD/ATI] Polaris 20 XL
[Radeon RX 580 2048SP] GPU with DCE-11.0 display engine [6 heads].


PTB-INFO: OpenGL-Renderer is AMD :: AMD Radeon RX 580 2048SP (polaris10, LLVM
16.0.6,DRM 3.54, 6.2.0-34-generic) :: 4.6 (Compatibility Profile) Mesa 23.2.0-
devel
PTB-INFO: VBL startline = 768 , VBL Endline = 824
PTB-INFO: Measured monitor refresh interval from beamposition = 8.344062 ms
[119.845713 Hz].
PTB-INFO: Will try to use OS-Builtin OpenML sync control support for accurate
Flip timestamping.
PTB-INFO: Measured monitor refresh interval from VBLsync = 8.344007 ms
[119.846502 Hz]. (50 valid samples taken, stddev=0.000423 ms.)
PTB-INFO: Reported monitor refresh interval from operating system = 8.343972
ms [119.847000 Hz].
PTB-INFO: Small deviations between reported values are normal and no reason to
worry.
PTB-INFO: Stereo display via OpenGL built-in frame-sequential stereo
requested.

PTB-INFO: Your script requests use of frame-sequential stereo, but your
graphics card
PTB-INFO: and driver doesn't support this. I will now fully enable the imaging
pipeline
PTB-INFO: and use my own home-grown frame-sequential stereo implementation.
Note thatthis
PTB-INFO: may not be as robust and high-performance as using a graphics card
with native
PTB-INFO: frame-sequential stereo support. But let's see what i can do for
you...
```

```
PTB-INFO: Psychtoolbox imaging pipeline starting up for window with requested
imagingmode 1025 ...
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus
drawing.
PTB-INFO: Will use 8 bits per color component framebuffer for stimulus post-
processing (if any).
PTB-INFO: SetDitherMode: Trying to disable digital display dithering on
display head 0.
PTB-INFO: SetDitherMode: Dithering already disabled. Skipped.
LoadIdentityClut: Used GPU low-level setup code to configure (hopefully)
perfect identity pixel passthrough.
ERROR: Invalid device for current operation
ERROR: Invalid device for current operation
.Dots   Mean (s)        Max (s) %>20ms  %>30ms

1000    0.017   0.033       0       0
```

There was an aliasing sort of dark line that wandered up and down during `HolesCrowd`, and something like dropped frames (frames without any stereo) during `ImagingStereoDemo`.

Next steps

Create a file based on the example in the 3DPixx manual booklet, try to run it.

Could also try installing “All Open” and “Workstation” use case versions of the amdgpu driver, now that I have installed the OEM kernel.

VPixx version of ImagingStereoDemo.m

2023-10-23 notes

Created VPixx git repo

This past weekend, created a private repo named “VPixx” on my github account (acate).

I filled it with the directory of scripts that I downloaded from the “MyVpixx” website; the directory named “psychtoolbox–datapixx_demo_OCTAVE”. That is, the VPixx directory/repo contains a subdir. named “psychtoolbox–datapixx_demo_OCTAVE” which contains a bunch of octave scripts.

I am going to clone this repo onto `grogu` in the lab.

Testing the VPixx version of ImagingStereoDemo.m

The script is

```
.../Vpixx/psychtoolbox--datapixx_demo_OCTAVE/DatapixxImagingStereoDemo.m
```

Strange behavior of the system.

I could see in stereo for a few seconds, and then the glasses/system stopped working, much like it always has up to this point.

However, unlike before, the stereo started off showing uncrossed disparity (concave in the demo) for which the absolute disparity shrank gradually until the disparity became crossed (convex) until the perceived depth was too great to perceive any more. Then the glasses/system quit working.

I couldn't get the demo to work again, because I kept getting “Datapixx is not open” type errors, and then more errors when I tried the “Datapixx('Open')” command. However, unlike before, those error messages were accompanied by the message “unable to connect to server”. I Googled that with the term Datapixx, and found that there is something called a “device server” (see https://vpixx.com/developer/VPixx_Software_Tool_Update_Guide_3R5.pdf p. 2) that has to be running, according to the page I saw. I'm not sure about whether this is completely necessary, but I followed the advice I saw and did:

```
sudo systemctl start vpixx-device-server
```

… and this allowed the command

```
Datapixx('Open')
```

to work again.

However, even though I was able to get `DatapixxImagingStereoDemo` to work again, it worked similarly to the first time, but with a flipped sign of disparity: it started off displaying a (fairly shallow) crossed disparity (convex) bump, which then shrank until the Gaussian region became more and more strongly uncrossed disparity, until the disparity became too large, and then the glasses/system quit working again.

OpenGL info

glxgears output

Do this on command line as a way of testing OpenGL:

```
glxgears
[then]
glxgears -info
```

```
Running synchronized to the vertical refresh.  The framerate should be
approximately the same as the monitor refresh rate.
657 frames in 5.0 seconds = 131.242 FPS
X connection to :0.0 broken (explicit kill or server shutdown).
```

```
GL_RENDERER   = AMD Radeon RX 580 2048SP (polaris10, LLVM 16.0.6, DRM 3.54,
6.2.0-34-generic)
GL_VERSION    = 4.6 (Compatibility Profile) Mesa 23.2.0-devel
GL_VENDOR     = AMD
GL_EXTENSIONS = GL_ARB_multisample GL_EXT_abgr GL_EXT_bgra GL_EXT_blend_color
GL_EXT_blend_minmax GL_EXT_blend_subtract GL_EXT_copy_texture
GL_EXT_subtexture GL_EXT_texture_object GL_EXT_vertex_array
GL_EXT_compiled_vertex_array GL_EXT_texture GL_EXT_texture3D
GL_IBM_rasterpos_clip GL_ARB_point_parameters GL_EXT_draw_range_elements
GL_EXT_packed_pixels GL_EXT_point_parameters GL_EXT_rescale_normal
GL_EXT_separate_specular_color GL_EXT_texture_edge_clamp
GL_SGIS_generate_mipmap GL_SGIS_texture_border_clamp
GL_SGIS_texture_edge_clamp GL_SGIS_texture_lod GL_ARB_framebuffer_sRGB
GL_ARB_multitexture GL_EXT_framebuffer_sRGB GL_IBM_multimode_draw_arrays
GL_IBM_texture_mirrored_repeat GL_ARB_texture_cube_map GL_ARB_texture_env_add
GL_ARB_transpose_matrix GL_EXT_blend_func_separate GL_EXT_fog_coord
GL_EXT_multi_draw_arrays GL_EXT_secondary_color GL_EXT_texture_env_add
GL_EXT_texture_filter_anisotropic GL_EXT_texture_lod_bias
GL_INGR_blend_func_separate GL_NV_blend_square GL_NV_light_max_exponent
GL_NV_texgen_reflection GL_NV_texture_env_combine4 GL_S3_s3tc
GL_SUN_multi_draw_arrays GL_ARB_texture_border_clamp
GL_ARB_texture_compression GL_EXT_framebuffer_object
GL_EXT_texture_compression_s3tc GL_EXT_texture_env_combine
GL_EXT_texture_env_dot3 GL_MESA_window_pos GL_NV_packed_depth_stencil
GL_NV_texture_rectangle GL_ARB_depth_texture GL_ARB_occlusion_query
GL_ARB_shadow GL_ARB_texture_env_combine GL_ARB_texture_env_crossbar
GL_ARB_texture_env_dot3 GL_ARB_texture_mirrored_repeat GL_ARB_window_pos
GL_ATI_fragment_shader GL_EXT_stencil_two_side GL_EXT_texture_cube_map
GL_NV_copy_depth_to_color GL_NV_depth_clamp GL_NV_fog_distance
GL_NV_half_float GL_APPLE_packed_pixels GL_ARB_draw_buffers
GL_ARB_fragment_program GL_ARB_fragment_shader GL_ARB_shader_objects
GL_ARB_vertex_program GL_ARB_vertex_shader GL_ATI_draw_buffers
GL_ATI_texture_env_combine3 GL_ATI_texture_float GL_EXT_depth_bounds_test
GL_EXT_shadow_funcs GL_EXT_stencil_wrap GL_MESA_pack_invert
GL_NV_primitive_restart GL_ARB_depth_clamp GL_ARB_fragment_program_shadow
GL_ARB_half_float_pixel GL_ARB_occlusion_query2 GL_ARB_point_sprite
GL_ARB_shading_language_100 GL_ARB_sync GL_ARB_texture_non_power_of_two
GL_ARB_vertex_buffer_object GL_ATI_blend_equation_separate
```

```
GL_EXT_blend_equation_separate GL_OES_read_format GL_ARB_color_buffer_float
GL_ARB_pixel_buffer_object GL_ARB_texture_compression_rgtc
GL_ARB_texture_float GL_ARB_texture_rectangle GL_ATI_texture_compression_3dc
GL_EXT_packed_float GL_EXT_pixel_buffer_object GL_EXT_texture_compression_dxt1
GL_EXT_texture_compression_rgtc GL_EXT_texture_mirror_clamp
GL_EXT_texture_rectangle GL_EXT_texture_sRGB GL_EXT_texture_shared_exponent
GL_ARB_framebuffer_object GL_EXT_framebuffer_blit
GL_EXT_framebuffer_multisample GL_EXT_packed_depth_stencil
GL_ARB_vertex_array_object GL_ATI_separate_stencil GL_ATI_texture_mirror_once
GL_EXT_draw_buffers2 GL_EXT_draw_instanced GL_EXT_gpu_program_parameters
GL_EXT_gpu_shader4 GL_EXT_texture_array GL_EXT_texture_compression_latc
GL_EXT_texture_integer GL_EXT_texture_sRGB_decode GL_EXT_timer_query
GL_OES_EGL_image GL_AMD_performance_monitor GL_EXT_texture_buffer_object
GL_AMD_texture_texture4 GL_ARB_copy_buffer GL_ARB_depth_buffer_float
GL_ARB_draw_instanced GL_ARB_half_float_vertex GL_ARB_instanced_arrays
GL_ARB_map_buffer_range GL_ARB_texture_buffer_object GL_ARB_texture_rg
GL_ARB_texture_swizzle GL_ARB_vertex_array_bgra GL_EXT_texture_swizzle
GL_EXT_vertex_array_bgra GL_NV_conditional_render GL_AMD_conservative_depth
GL_AMD_depth_clamp_separate GL_AMD_draw_buffers_blend
GL_AMD_seamless_cubemap_per_texture GL_AMD_shader_stencil_export
GL_ARB_ES2_compatibility GL_ARB_blend_func_extended GL_ARB_compatibility
GL_ARB_debug_output GL_ARB_draw_buffers_blend GL_ARB_draw_elements_base_vertex
GL_ARB_explicit_attrib_location GL_ARB_fragment_coord_conventions
GL_ARB_provoking_vertex GL_ARB_sample_shading GL_ARB_sampler_objects
GL_ARB_seamless_cube_map GL_ARB_shader_stencil_export
GL_ARB_shader_texture_lod GL_ARB_tessellation_shader
GL_ARB_texture_buffer_object_rgb32 GL_ARB_texture_cube_map_array
GL_ARB_texture_gather GL_ARB_texture_multisample GL_ARB_texture_query_lod
GL_ARB_texture_rgb10_a2ui GL_ARB_uniform_buffer_object
GL_ARB_vertex_type_2_10_10_10_rev GL_ATI_meminfo GL_EXT_provoking_vertex
GL_EXT_texture_snorm GL_MESA_texture_signed_rgba GL_NV_copy_image
GL_NV_texture_barrier GL_ARB_draw_indirect GL_ARB_get_program_binary
GL_ARB_gpu_shader5 GL_ARB_gpu_shader_fp64 GL_ARB_robustness
GL_ARB_separate_shader_objects GL_ARB_shader_bit_encoding
GL_ARB_shader_precision GL_ARB_shader_subroutine
GL_ARB_texture_compression_bptc GL_ARB_timer_query GL_ARB_transform_feedback2
GL_ARB_transform_feedback3 GL_ARB_vertex_attrib_64bit GL_ARB_viewport_array
GL_EXT_direct_state_access GL_EXT_shader_image_load_store
GL_EXT_vertex_attrib_64bit GL_NV_vdpau_interop GL_AMD_multi_draw_indirect
GL_ANGLE_texture_compression_dxt3 GL_ANGLE_texture_compression_dxt5
GL_ARB_base_instance GL_ARB_compressed_texture_pixel_storage
GL_ARB_conservative_depth GL_ARB_internalformat_query
GL_ARB_map_buffer_alignment GL_ARB_shader_atomic_counters
GL_ARB_shader_image_load_store GL_ARB_shading_language_420pack
GL_ARB_shading_language_packing GL_ARB_texture_storage
GL_ARB_transform_feedback_instanced GL_EXT_framebuffer_multisample_blit_scaled
GL_EXT_transform_feedback GL_AMD_query_buffer_object
GL_AMD_shader_trinary_minmax GL_AMD_vertex_shader_layer
```

```
GL_AMD_vertex_shader_viewport_index GL_ARB_ES3_compatibility
GL_ARB_arrays_of_arrays GL_ARB_clear_buffer_object GL_ARB_compute_shader
GL_ARB_copy_image GL_ARB_explicit_uniform_location
GL_ARB_fragment_layer_viewport GL_ARB_framebuffer_no_attachments
GL_ARB_invalidate_subdata GL_ARB_multi_draw_indirect
GL_ARB_program_interface_query GL_ARB_robust_buffer_access_behavior
GL_ARB_shader_image_size GL_ARB_shader_storage_buffer_object
GL_ARB_stencil_texturing GL_ARB_texture_buffer_range
GL_ARB_texture_query_levels GL_ARB_texture_storage_multisample
GL_ARB_texture_view GL_ARB_vertex_attrib_binding GL_KHR_debug
GL_KHR_robustness GL_KHR_texture_compression_astc_ldr GL_AMD_pinned_memory
GL_ARB_bindless_texture GL_ARB_buffer_storage GL_ARB_clear_texture
GL_ARB_compute_variable_group_size GL_ARB_enhanced_layouts
GL_ARB_indirect_parameters GL_ARB_internalformat_query2 GL_ARB_multi_bind
GL_ARB_query_buffer_object GL_ARB_seamless_cubemap_per_texture
GL_ARB_shader_draw_parameters GL_ARB_shader_group_vote
GL_ARB_shading_language_include GL_ARB_texture_mirror_clamp_to_edge
GL_ARB_texture_stencil8 GL_ARB_vertex_type_10f_11f_11f_rev GL_EXT_debug_label
GL_EXT_shader_integer_mix GL_NVX_gpu_memory_info GL_ARB_ES3_1_compatibility
GL_ARB_clip_control GL_ARB_conditional_render_inverted GL_ARB_cull_distance
GL_ARB_derivative_control GL_ARB_direct_state_access
GL_ARB_get_texture_sub_image GL_ARB_pipeline_statistics_query
GL_ARB_shader_texture_image_samples GL_ARB_texture_barrier
GL_ARB_transform_feedback_overflow_query GL_EXT_polygon_offset_clamp
GL_EXT_shader_image_load_formatted GL_KHR_blend_equation_advanced
GL_KHR_context_flush_control GL_KHR_robust_buffer_access_behavior
GL_NV_shader_atomic_int64 GL_ARB_ES3_2_compatibility GL_ARB_gpu_shader_int64
GL_ARB_parallel_shader_compile GL_ARB_shader_atomic_counter_ops
GL_ARB_shader_ballot GL_ARB_shader_clock GL_ARB_shader_viewport_layer_array
GL_EXT_shader_samples_identical GL_EXT_texture_sRGB_R8 GL_KHR_no_error
GL_KHR_texture_compression_astc_sliced_3d GL_ARB_gl_spirv
GL_ARB_spirv_extensions GL_EXT_window_rectangles
GL_MESA_shader_integer_functions GL_ARB_polygon_offset_clamp
GL_ARB_texture_filter_anisotropic GL_EXT_memory_object GL_EXT_memory_object_fd
GL_EXT_semaphore GL_EXT_semaphore_fd GL_KHR_parallel_shader_compile
GL_NV_alpha_to_coverage_dither_control GL_AMD_framebuffer_multisample_advanced
GL_EXT_EGL_image_storage GL_EXT_texture_shadow_lod GL_INTEL_blackhole_render
GL_MESA_framebuffer_flip_y GL_NV_compute_shader_derivatives GL_EXT_EGL_sync
GL_EXT_demote_to_helper_invocation GL_NV_ES1_1_compatibility
VisualID 1300, 0x514
```

glxheads output

```
anthony@grogu:PsychBasic$ glxheads :0
Name: :0
  Display:     0x55c94333cd10
```

```
  Window:      0x5a00002
  Context:     0x55c94335eaa0
  GL_VERSION:  4.6 (Compatibility Profile) Mesa 23.2.0-devel
  GL_VENDOR:   AMD
  GL_RENDERER: AMD Radeon RX 580 2048SP (polaris10, LLVM 16.0.6, DRM 3.54,
6.2.0-34-generic)
```

glxinfo output

Output is rather long, so follow this link to see it:

glxinfo output

Next steps

- Try downloading the VPixx scripts, but the versions for MATLAB instead of for Octave. Then run the same demos.

- Finally email Vpixx.

Ran PsychLinuxConfiguration

2024-01-22

Ran it on octave command line (i.e. no gui), as sudo.

Not sure whether I had run it before.

Tried ImagingStereoDemo again

Mostly successful! Only qualified by the following error/warning messages.

I ran octave from the command line as a regular user.

[Can't copy text for some reason; will try pasting screenshot]

Package update problem after rebooting on 2024-01-22

I tried `sudo apt update` and `sudo apt upgrade`, but still get:

```
You might want to run 'apt --fix-broken install' to correct these.
The following packages have unmet dependencies:
 libgl1-amdgpu-mesa-dri : PreDepends: mesa-amdgpu-va-drivers (=
1:23.2.0.50700-1646729.22.04) but 1:23.2.0.50702-1683306.22.04 is installed
                          Recommends: libtxc-dxtn-s2tc0 but it is not
installable or
                                      libtxc-dxtn0 but it is not installable
 libgl1-amdgpu-mesa-dri:i386 : PreDepends: mesa-amdgpu-va-drivers:i386 (=
1:23.2.0.50700-1646729.22.04) but 1:23.2.0.50702-1683306.22.04 is installed
                               Recommends: libtxc-dxtn-s2tc0:i386 but it is
not installable or
                                           libtxc-dxtn0:i386 but it is not
installable
 mesa-amdgpu-va-drivers : Depends: libllvm16.0.50702-amdgpu but it is not
installed
 mesa-amdgpu-va-drivers:i386 : Depends: libllvm16.0.50702-amdgpu:i386 but it
is not installed
E: Unmet dependencies. Try 'apt --fix-broken install' with no packages (or
specify a solution).
```

Do `sudo apt –fix-broken install` doesn't help:

```
anthony@grogu:~$ sudo apt --fix-broken install
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Correcting dependencies... Done
The following packages were automatically installed and are no longer
required:
  libdrm-intel1:i386 libgl1-amber-dri libpciaccess0:i386 libva2:i386
libvulkan1:i386
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libgl1-amdgpu-mesa-dri libgl1-amdgpu-mesa-dri:i386 libllvm16.0.50702-amdgpu
libllvm16.0.50702-amdgpu:i386
Suggested packages:
  libglide3 libglide3:i386
Recommended packages:
  libtxc-dxtn-s2tc0 | libtxc-dxtn0 libtxc-dxtn-s2tc0:i386 | libtxc-dxtn0:i386
```

```
The following NEW packages will be installed:
  libllvm16.0.50702-amdgpu libllvm16.0.50702-amdgpu:i386
The following packages will be upgraded:
  libgl1-amdgpu-mesa-dri libgl1-amdgpu-mesa-dri:i386
2 upgraded, 2 newly installed, 0 to remove and 87 not upgraded.
2 not fully installed or removed.
Need to get 0 B/58.8 MB of archives.
After this operation, 192 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
(Reading database ... 385902 files and directories currently installed.)
Preparing to unpack .../libllvm16.0.50702-
amdgpu_1%3a16.0.50702-1683306.22.04_i386.deb ...
Unpacking libllvm16.0.50702-amdgpu:i386 (1:16.0.50702-1683306.22.04) ...
dpkg: error processing archive /var/cache/apt/archives/libllvm16.0.50702-
amdgpu_1%3a16.0.50702-1683306.22.04_i386.de
b (--unpack):
 trying to overwrite '/opt/amdgpu/lib/i386-linux-
gnu/llvm-16.0/lib/libLLVM-16.so', which is also in package libllvm1
6.0.50700-amdgpu:i386 1:16.0.50700-1646729.22.04
dpkg-deb: error: paste subprocess was killed by signal (Broken pipe)
Preparing to unpack .../libllvm16.0.50702-
amdgpu_1%3a16.0.50702-1683306.22.04_amd64.deb ...
Unpacking libllvm16.0.50702-amdgpu:amd64 (1:16.0.50702-1683306.22.04) ...
dpkg: error processing archive /var/cache/apt/archives/libllvm16.0.50702-
amdgpu_1%3a16.0.50702-1683306.22.04_amd64.d
eb (--unpack):
 trying to overwrite '/opt/amdgpu/lib/x86_64-linux-
gnu/llvm-16.0/lib/libLLVM-16.so', which is also in package libllv
m16.0.50700-amdgpu:amd64 1:16.0.50700-1646729.22.04
dpkg-deb: error: paste subprocess was killed by signal (Broken pipe)
Errors were encountered while processing:
 /var/cache/apt/archives/libllvm16.0.50702-
amdgpu_1%3a16.0.50702-1683306.22.04_i386.deb
 /var/cache/apt/archives/libllvm16.0.50702-
amdgpu_1%3a16.0.50702-1683306.22.04_amd64.deb
E: Sub-process /usr/bin/dpkg returned an error code (1)
```

From:
https://wiki.anthonycate.org/ - **Visual Cognitive Neuroscience**

Permanent link:
https://wiki.anthonycate.org/doku.php?id=resources:vpixx_setup_first_try

Last update: **2024/01/26 10:21**