Chapter 1: Raspberry Pi Pirate Radio

Win32 Disk Imager

Image File

J:/SOFTWARE/2014-09-09-wheezy-raspbian.img

Device

[K:\]

Copy MD5 Hash:

Progress

Version: 0.9.5   Cancel   Read   Write   Exit

```
dan@dannixon-envy-ubuntu ~> udevadm monitor --udev
monitor will print the received events for:
UDEV - the event which udev sends out after rule processing

UDEV  [435.546548] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4 (usb)
UDEV  [435.547730] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0 (usb)
UDEV  [435.548896] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8 (scsi)
UDEV  [435.550318] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/scsi_host/host8 (scsi_host)
UDEV  [436.542079] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0 (scsi)
UDEV  [436.542673] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0 (scsi)
UDEV  [436.543387] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0/scsi_disk/8:0:0:0 (scsi_disk)
UDEV  [436.543987] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0/scsi_device/8:0:0:0 (scsi_device)
UDEV  [436.545361] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0/bsg/8:0:0:0 (bsg)
UDEV  [436.545433] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0/scsi_generic/sg1 (scsi_generic)
UDEV  [436.732587] add      /devices/virtual/bdi/8:16 (bdi)
UDEV  [436.917684] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0/block/sdb (block)
UDEV  [437.064569] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0/block/sdb/sdb1 (block)
UDEV  [437.323475] add      /devices/pci0000:00/0000:00:14.0/usb2/2-4/2-4:1.0/host8/target8:0:0/8:0:0:0/block/sdb/sdb2 (block)
```

```
dan@dannixon-envy-ubuntu ~> umount /dev/sdb1
umount: /dev/sdb1 is not mounted (according to mtab)
dan@dannixon-envy-ubuntu ~>
```
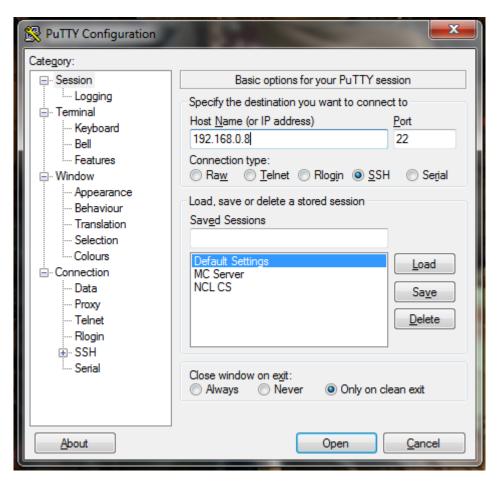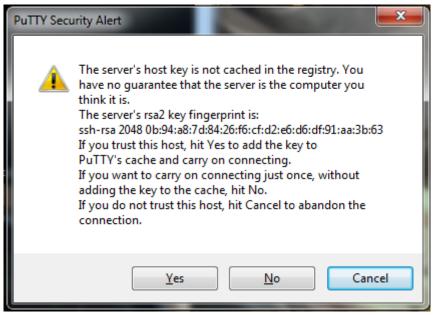
Command Prompt
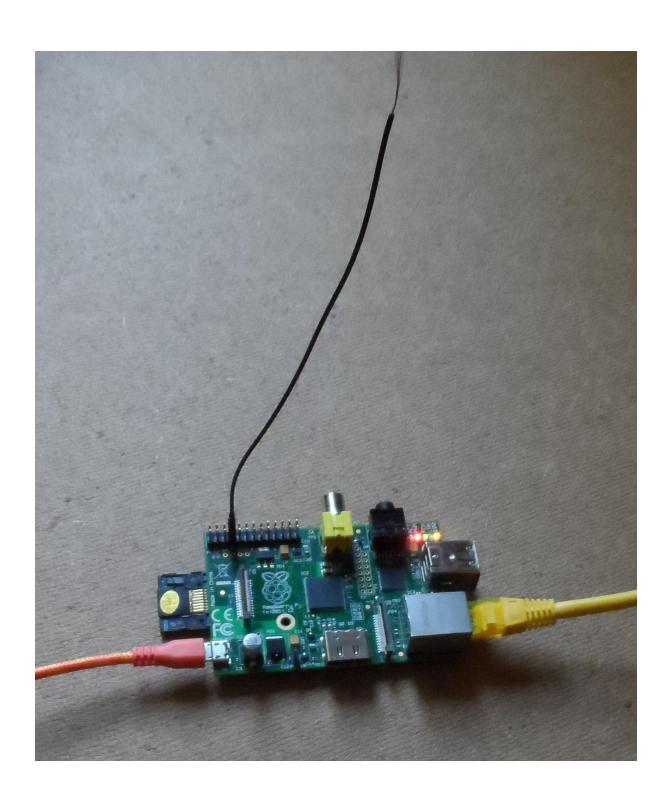
```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\Dan>ipconfig

Windows IP Configuration


Ethernet adapter Local Area Connection:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::59fe:b523:5990:35df%10
   IPv4 Address. . . . . . . . . . . : 192.168.0.7
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.0.1

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::6879:885:266:546d%16
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Tunnel adapter isatap.{E767BA37-DCBF-4DD5-A751-DD1AF99543A0}:
```
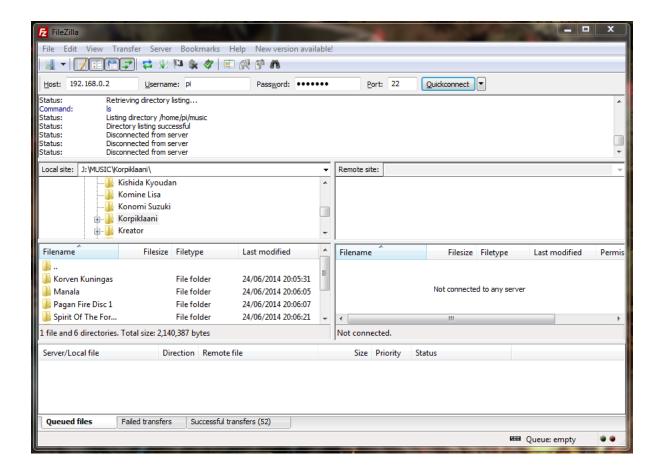
```
fish   /home/dan
dan@dan-HP-G62 ~> ifconfig
eth0      Link encap:Ethernet  HWaddr c8:0a:a9:56:e0:f1
          inet addr:192.168.0.16  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::ca0a:a9ff:fe56:e0f1/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:4186 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2010 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4066311 (4.0 MB)  TX bytes:229568 (229.5 KB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:104 errors:0 dropped:0 overruns:0 frame:0
          TX packets:104 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:11293 (11.2 KB)  TX bytes:11293 (11.2 KB)

wlan0     Link encap:Ethernet  HWaddr f0:7b:cb:66:73:58
          inet6 addr: fe80::f27b:cbff:fe66:7358/64 Scope:Link
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:48 errors:0 dropped:0 overruns:0 frame:0
          TX packets:48 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5424 (5.4 KB)  TX bytes:7440 (7.4 KB)

dan@dan-HP-G62 ~>
```
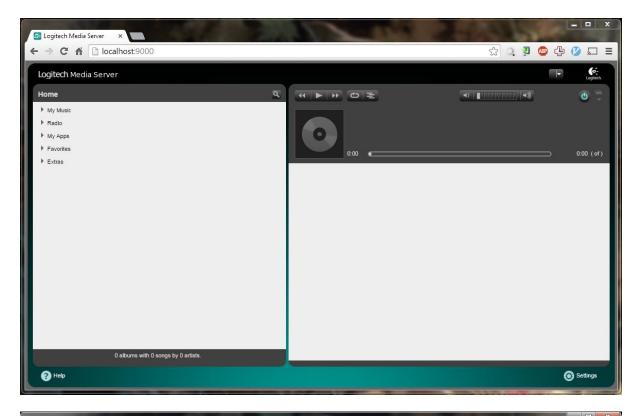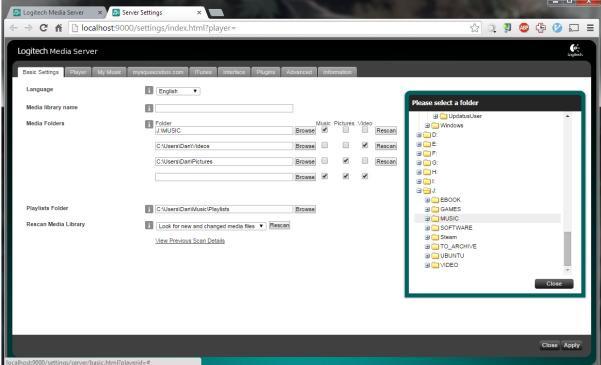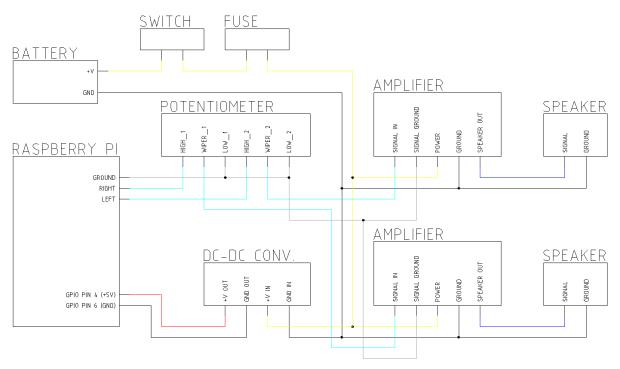
Chapter 2: Portable Speaker System

```
pi@raspberrypi ~ $ sudo iwlist wlan0 scan | grep ESSID
                    ESSID:"VM543181-2G"
                    ESSID:"VM201955-2G"
pi@raspberrypi ~ $
```



```
pi@raspberrypi ~ $ ps aux | grep squeeze
pi       2456  0.0  0.2  4268  1212 pts/0    S    10:35   0:00 /bin/bash /usr/bin/squeez
lite-armv6hf -n Pi -a 160
pi       2467  0.0  0.1  3548   808 pts/0    S+   10:36   0:00 grep --color=auto squeeze
pi@raspberrypi ~ $
```
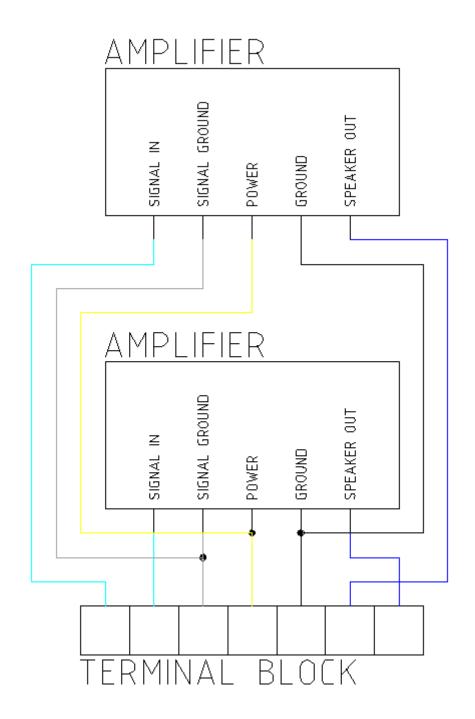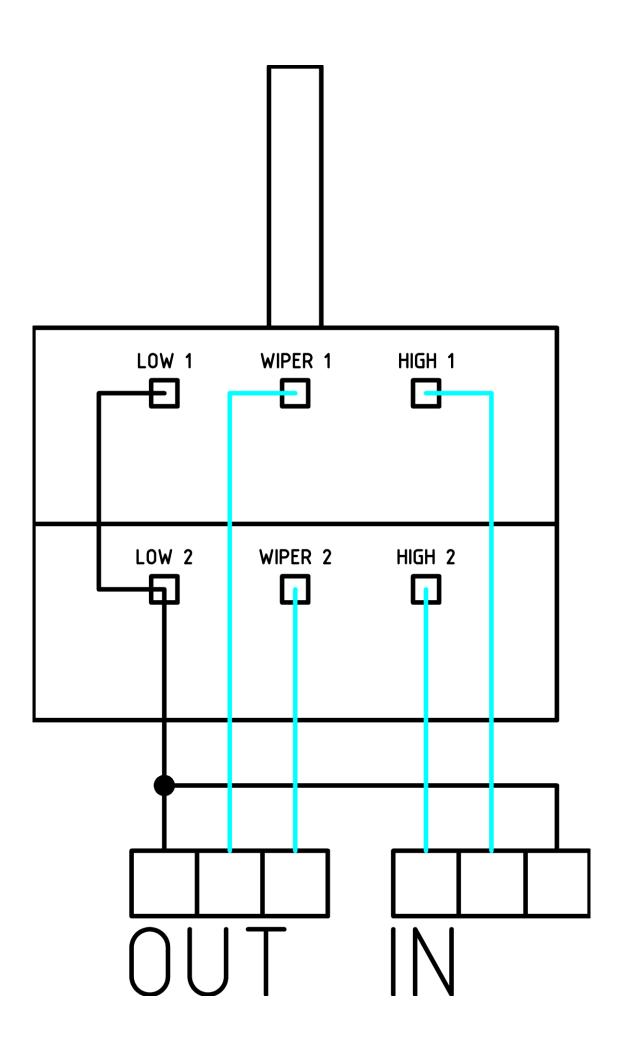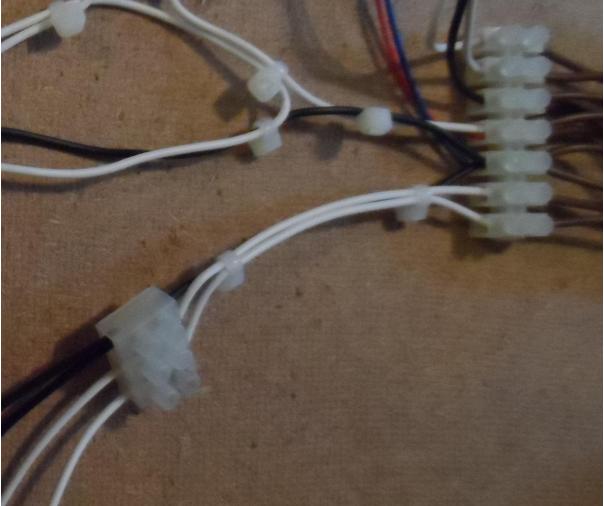
```
pi@raspberrypi ~ $ ifconfig
eth0      Link encap:Ethernet  HWaddr b8:27:eb:26:56:b3
          inet addr:192.168.0.2  Bcast:192.168.0.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:121 errors:0 dropped:2 overruns:0 frame:0
          TX packets:85 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:12232 (11.9 KiB)  TX bytes:10625 (10.3 KiB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

wlan0     Link encap:Ethernet  HWaddr 80:1f:02:f7:3e:08
          inet addr:192.168.0.18  Bcast:192.168.0.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:35 errors:0 dropped:2 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5223 (5.1 KiB)  TX bytes:1608 (1.5 KiB)

pi@raspberrypi ~ $ 
```
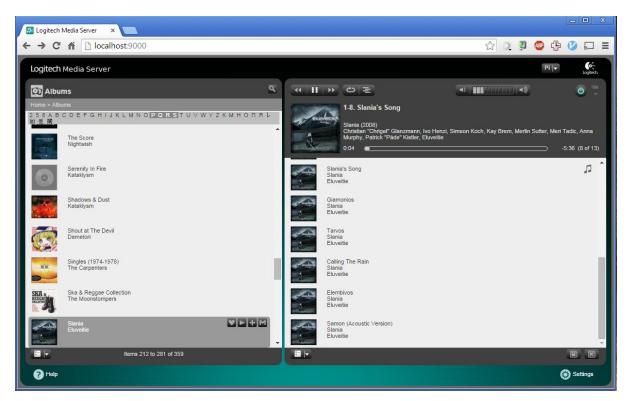
AMPLIFIER

SIGNAL IN

SIGNAL GROUND

POWER

GROUND

SPEAKER OUT

AMPLIFIER

SIGNAL IN

SIGNAL GROUND

POWER

GROUND

SPEAKER OUT

TERMINAL BLOCK

LOW 1   WIPER 1   HIGH 1

LOW 2   WIPER 2   HIGH 2

OUT   IN
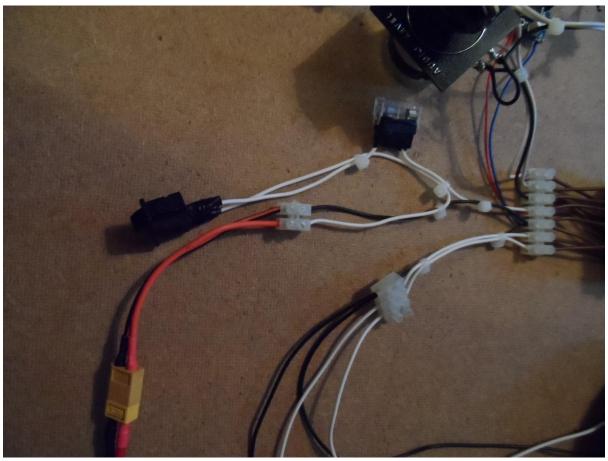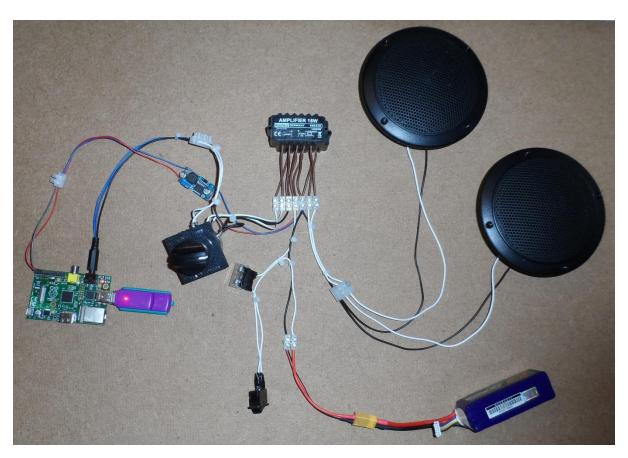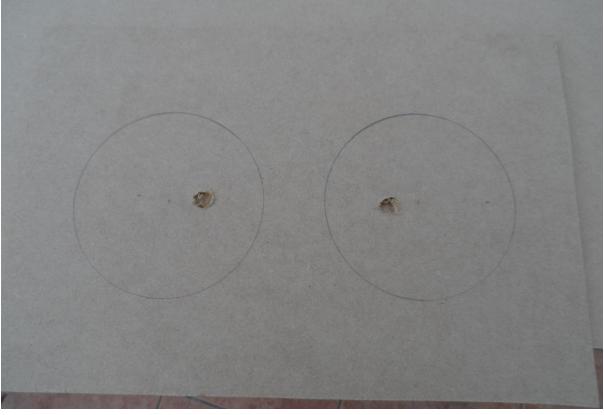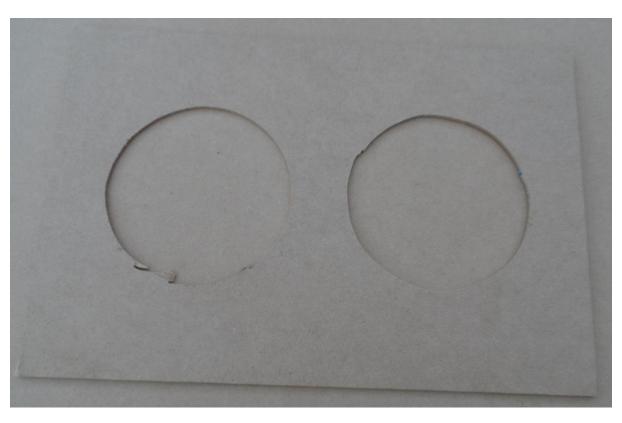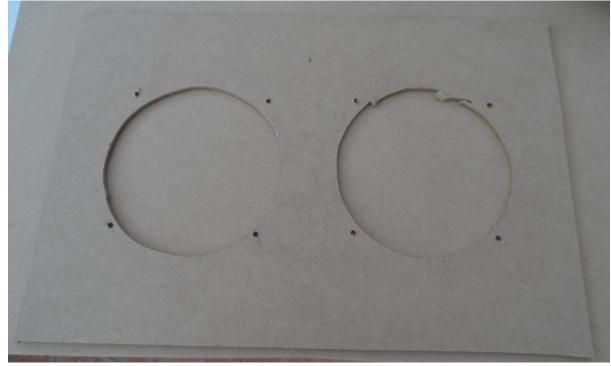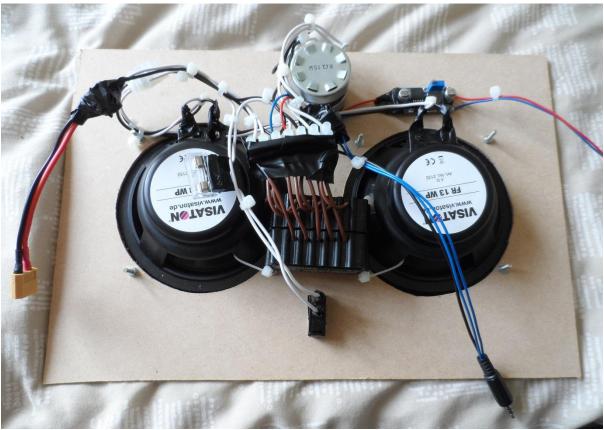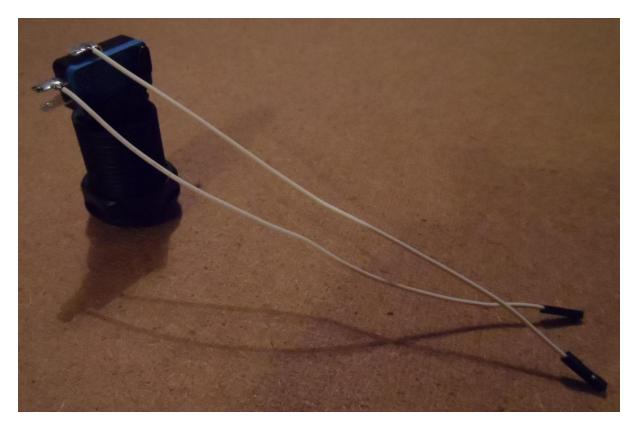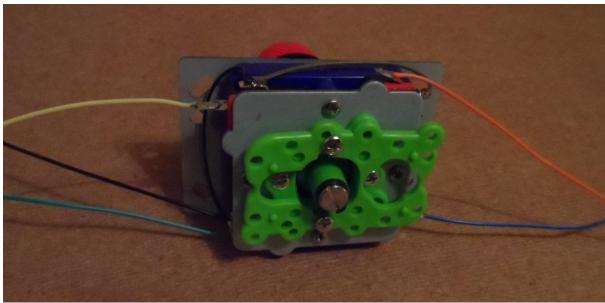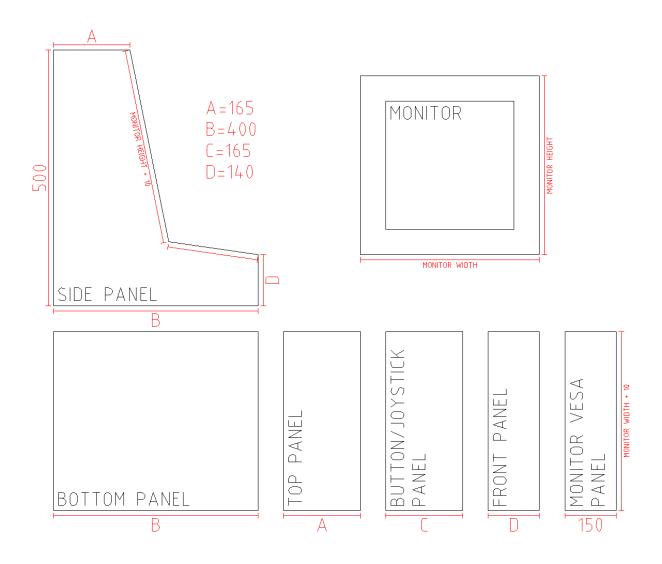
Chapter 3: Mini Retro Arcade Cabinet

SIDE PANEL

A
500
MONITOR HEIGHT + 10
B
D

A=165
B=400
C=165
D=140

MONITOR
MONITOR HEIGHT
MONITOR WIDTH

BOTTOM PANEL
B

TOP PANEL
A

BUTTON/JOYSTICK PANEL
C

FRONT PANEL
D

MONITOR VESA PANEL
MONITOR WIDTH + 10
150

100mm

100mm

PiPlay   Home   ROM Uploader   Tools   Kickstarter Backers

Final Burn - /home/pi/pimame/roms/pifba/
Genesis - /home/pi/pimame/roms/genesis/
NES - /home/pi/pimame/roms/nes/
Atari 2600 - /home/pi/pimame/roms/2600/
Playstation 1 - /home/pi/pimame/roms/psx/
Commodore 64 - /home/pi/pimame/roms/c64/
ScummVM - /home/pi/pimame/roms/scummvm/
Gameboy - /home/pi/pimame/roms/gb/
Gameboy Advance - /home/pi/pimame/roms/gba/
TurboGrafx 16 - /home/pi/pimame/roms/tg16
Neo Geo Pocket Color - /home/pi/pimame/roms/ngpc
Sega Master System - /home/pi/pimame/roms/sms
Game Gear - /home/pi/pimame/roms/gg
ZX Spectrum - /home/pi/pimame/roms/zxspectrum
Cave Story -
Restart -
Shutdown -
Update PiPlay -
Rom Scraper -

192.168.0.2/system/Gameboy

PiPlay   Home   ROM Uploader   Tools   Kickstarter Backers

Gameboy Rom Manager

Pokemon
Blue.gb

1 MB

Show [10] entries   Search: [   ]

File Name

.gitkeep

PacMan.gb

Some files have changed, would you like to scrape this folder for new roms?

[YES] NO

<- Back
Pac-Man
Pokémon Green Version

```
GNU nano 2.2.6              File: retrogame.c

        {  18,       KEY_Q          },   // Start 1P
        {  -1,       -1             } }, // END OF LIST, DO NOT CHANGE
        // MAME must be configured with 'z' & 'x' as buttons 1 & 2 -
        // this was required for the accompanying 'menu' utility to
        // work (catching crtl/alt w/ncurses gets totally NASTY).
        // Credit/start are likewise moved to 'r' & 'q,' reason being
        // to play nicer with certain emulators not liking numbers.
        // GPIO options are 'maxed out' with PiTFT + above table.
        // If additional buttons are desired, will need to disable
        // serial console and/or use P5 header.  Or use keyboard.
   ioStandard[] = {
        // This pin/key table is used when the PiTFT isn't found
        // (using HDMI or composite instead), as with our original
        // retro gaming guide.
        // Input   Output (from /usr/include/linux/input.h)
        {  25,       KEY_LEFT       },
        {  11,       KEY_RIGHT      },
        {   8,       KEY_UP         },
        {   9,       KEY_DOWN       },

        {  24,       KEY_ENTER      },
        {  22,       KEY_S          },
        {  17,       KEY_D          },
        {  10,       KEY_Z          },
        {  23,       KEY_X          },
        {  27,       KEY_C          },

        {   7,       KEY_ESC        },

        // For credit/start/etc., use USB keyboard or add more buttons.
        {  -1,       -1             } }; // END OF LIST, DO NOT CHANGE

// A "Vulcan nerve pinch" (holding down a specific button combination
// for a few seconds) issues an 'esc' keypress to MAME (which brings up
// an exit menu or quits the current game).  The button combo is

^G Get Help   ^O WriteOut   ^R Read File  ^Y Prev Page  ^K Cut Text   ^C Cur Pos
^X Exit       ^J Justify    ^W Where Is   ^V Next Page  ^U UnCut Text ^T To Spell
```

```
pi@raspberrypi ~/Adafruit-Retrogame $ make
gcc  -Wall -O3 -fomit-frame-pointer -funroll-loops -s retrogame.c -o retrogame
strip retrogame
gcc  -Wall -O3 -fomit-frame-pointer -funroll-loops -s gamera.c -lncurses -lmenu
-lexpat -o gamera
strip gamera
pi@raspberrypi ~/Adafruit-Retrogame $
```
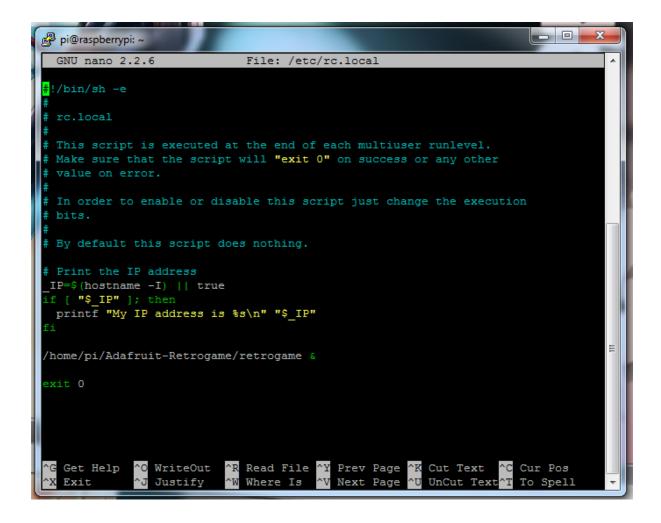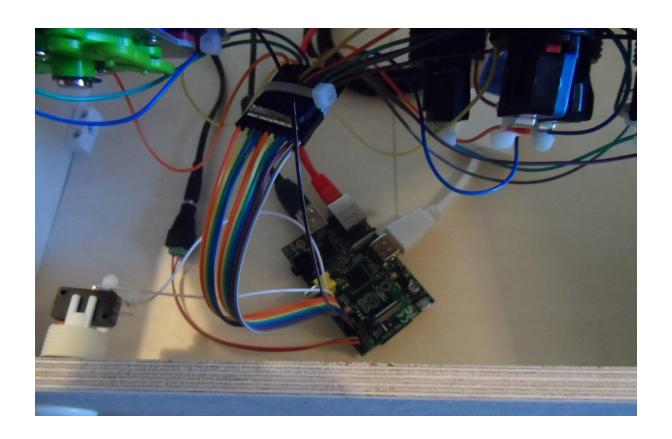
```
  GNU nano 2.2.6              File: /etc/rc.local

#!/bin/sh -e
#
# rc.local
#
# This script is executed at the end of each multiuser runlevel.
# Make sure that the script will "exit 0" on success or any other
# value on error.
#
# In order to enable or disable this script just change the execution
# bits.
#
# By default this script does nothing.

# Print the IP address
_IP=$(hostname -I) || true
if [ "$_IP" ]; then
  printf "My IP address is %s\n" "$_IP"
fi

/home/pi/Adafruit-Retrogame/retrogame &

exit 0




^G Get Help   ^O WriteOut   ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit       ^J Justify    ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

5V

GND

GND

BTN_T3

BTN_B3 GND

BTN_T2 BTN_B2

BTN_T1

BTN_B1 GND

JST_DOWN JST_LEFT

JST_RIGHT JST_UP

GND BTN_PLR1

System Volume:	77%
Theme:	default
Show Cursor:	False
Scene FX:	True
Show IP:	True
Show Update:	True
Sort ABC:	True
Show roms 1st:	True
Hide System Tools:	False
Allow PiPlay Quit:	True
Scrape Clones:	False
Overwrite Images:	False

Controller Setup

Controller: arcade

PUNCH

JAB	STRONG	FIERCE

JUMP

BACK
FLIP

FORWARD
FLIP

BACK
DEFENCE

FORWARD

DEFENSIVE
CROUCH

OFFENSIVE
CROUCH

CROUCH

SHORT	FORWARD	ROUNDHOUSE

Currently configuring button: Top 1

Chapter 4: GPS-enabled Time-lapse Recorder

Setup Options

```
1 Expand Filesystem          Ensures that all of the SD card storage is available to the OS
2 Change User Password       Change password for the default user (pi)
3 Enable Boot to Desktop/Scratch Choose whether to boot into a desktop environment, Scratch, or the command-line
4 Internationalisation Options Set up language and regional settings to match your location
5 Enable Camera              Enable this Pi to work with the Raspberry Pi Camera
6 Add to Rastrack            Add this Pi to the online Raspberry Pi Map (Rastrack)
7 Overclock                  Configure overclocking for your Pi
8 Advanced Options           Configure advanced settings
9 About raspi-config         Information about this configuration tool
```

```
                    <Select>                                          <Finish>
```


Enable support for Raspberry Pi camera?

```
        <Disable>                              <Enable>
```

```
GNU nano 2.2.6                          File: /boot/cmdline.txt

dwc_otg.lpm_enable=0 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait
```

```
                                    [ Read 1 line ]
^G Get Help        ^O WriteOut       ^R Read File      ^Y Prev Page      ^K Cut Text       ^C Cur Pos
^X Exit            ^J Justify        ^W Where Is       ^V Next Page      ^U UnCut Text     ^T To Spell
```

dwc_otg.lpm_enable=0 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait

```
  GNU nano 2.2.6                                        File: /etc/inittab


pf::powerwait:/etc/init.d/powerfail start
pn::powerfailnow:/etc/init.d/powerfail now
po::powerokwait:/etc/init.d/powerfail stop


# /sbin/getty invocations for the runlevels.
#
# The "id" field MUST be the same as the last
# characters of the device (after "tty").
#
# Format:
#   <id>:<runlevels>:<action>:<process>
#
# Note that on most Debian systems tty7 is used by the X Window System,
# so if you want to add more getty's go ahead but skip tty7 if you run X.
#
1:2345:respawn:/sbin/getty --noclear 38400 tty1
2:23:respawn:/sbin/getty 38400 tty2
3:23:respawn:/sbin/getty 38400 tty3
4:23:respawn:/sbin/getty 38400 tty4
5:23:respawn:/sbin/getty 38400 tty5
6:23:respawn:/sbin/getty 38400 tty6


# Example how to put a getty on a serial line (for a terminal)
#
#T0:23:respawn:/sbin/getty -L ttyS0 9600 vt100
#T1:23:respawn:/sbin/getty -L ttyS1 9600 vt100


# Example how to put a getty on a modem line.
#
#T3:23:respawn:/sbin/mgetty -x0 -s 57600 ttyS3



#Spawn a getty on Raspberry Pi serial line
#T0:23:respawn:/sbin/getty -L ttyAMA0 115200 vt100




^G Get Help            ^O WriteOut            ^R Read File
^X Exit               ^J Justify             ^W Where Is
```

Pi

3.3V

GND
Tx
Rx

GPS

+V
GND
Rx
Tx

Configuring gpsd

If you accept this option, gpsd will be started automatically.

Start gpsd automatically?

<Yes>   <No>

```
┤ Configuring gpsd ├

As gpsd only handles GPS devices, it is safe to choose this option.
However, you can disable it if gpsd is causing interference with other
attached devices or programs.

Should gpsd handle attached USB GPS receivers automatically?

                    <Yes>                              <No>
```

```
┤ Configuring gpsd ├
Please enter the device the GPS receiver is attached to. It will
probably be something like /dev/ttyS0 or /dev/ttyUSB0.

Multiple devices may be specified as a space-separated list. Leave empty
if you don't want to connect gpsd to a device on boot or if you want to
use device autodetection only.

Device the GPS receiver is attached to:

/dev/ttyAMA0

                <Ok>                              <Cancel>
```

```
┤ Configuring gpsd ├
You can give additional arguments when starting gpsd; see gpsd(8) for a
list of options.

Do not use '-F' here. The control socket path is set independently.

Options to gpsd:

-n -G

                <Ok>                              <Cancel>
```
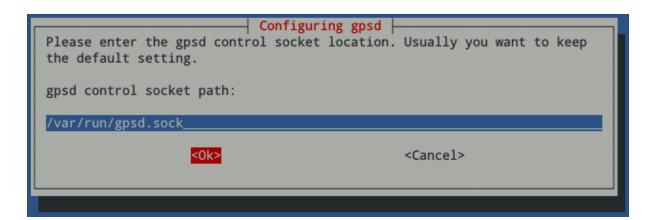
Configuring gpsd

Please enter the gpsd control socket location. Usually you want to keep the default setting.

gpsd control socket path:

/var/run/gpsd.sock_

<Ok>   <Cancel>


```
pi@raspberrypi: ~

  Time:          2014-10-29T20:20:28.000Z    PRN:   Elev:   Azim:   SNR:   Used:
  Latitude:      51.       N                   30     66     148     23      Y
  Longitude:      1.       W                   13     65     069     20      Y
  Altitude:      80.0 m                          5     63     287     18      Y
  Speed:         0.4 kph                         7     57     070     15      Y
  Heading:       125.4 deg (true)              10     53     147     19      Y
  Climb:         0.0 m/min                       2     28     223     30      Y
  Status:        3D FIX (712 secs)             26     28     263     19      Y
  Longitude Err:   +/- 9 m                       9     26     082     29      Y
  Latitude Err:    +/- 13 m                      8     19     044     28      Y
  Altitude Err:    +/- 31 m                     16     06     018     16      Y
  Course Err:      n/a
  Speed Err:       +/- 96 kph
  Time offset:     0.625
  Grid Square:     IO91jr
```

```
pi@raspberrypi ~ $ gpstimelapse -h
usage: gpstimelapse [-h] [-v] [--gps GPS] [-f FOLDER] [-n FILENAME]
                    [-d DISTANCE] [-i INTERVAL] [--width WIDTH]
                    [--height HEIGHT] [--log-file LOG_FILE]
                    [--log-level LOG_LEVEL]

GPS enabled timelapse recorder

optional arguments:
  -h, --help            show this help message and exit
  -v, --verbose         Increases console verbosity
  --gps GPS             Specifies address to connect to cgps daemon (default
                        localhost::2947)
  -f FOLDER, --folder FOLDER
                        Specifies folder to save timelapse recordings in
  -n FILENAME, --filename FILENAME
                        Filename pattern for image files
  -d DISTANCE, --distance DISTANCE
                        Distance in meters to have moved between captures
  -i INTERVAL, --interval INTERVAL
                        Time in seconds between captures
  --width WIDTH         Height of captured images
  --height HEIGHT       Width of captured images
  --log-file LOG_FILE   File to save log to
  --log-level LOG_LEVEL
                        Logging level [DEBUG,INFO,WARNING,ERROR,CRITICAL]
pi@raspberrypi ~ $
```
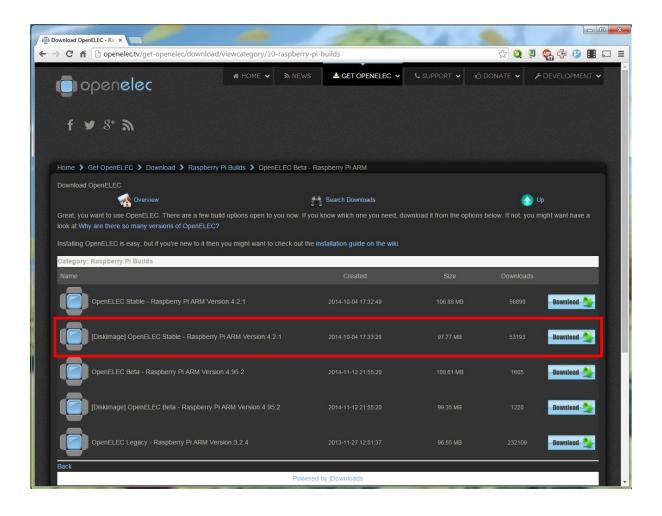
```
  GNU nano 2.2.6                                    File: /etc/rc

#!/bin/sh -e
#
# rc.local
#
# This script is executed at the end of each multiuser runlevel.
# Make sure that the script will "exit 0" on success or any other
# value on error.
#
# In order to enable or disable this script just change the execution
# bits.
#
# By default this script does nothing.

# Print the IP address
_IP=$(hostname -I) || true
if [ "$_IP" ]; then
  printf "My IP address is %s\n" "$_IP"
fi

/usr/local/bin/gpstimelapse -i 60 -f /home/pi/captures -n frame_%d.jpg

exit 0
```
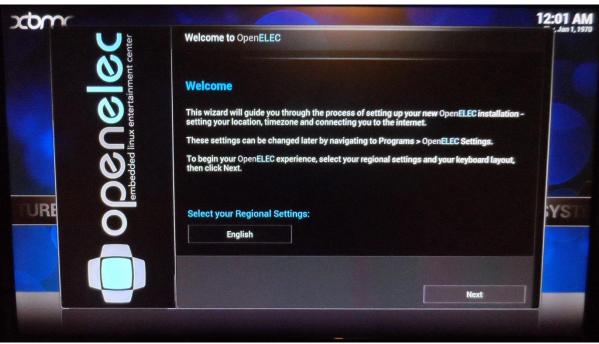
```
dan@dan-desktop ~/8> avconv -framerate 10 -i frame_%d.jpg -c:v libx264 -r 30 -pix_fmt yuv420p out.mp4
avconv version 9.16-6:9.16-0ubuntu0.14.04.1, Copyright (c) 2000-2014 the Libav developers
  built on Aug 10 2014 18:16:02 with gcc 4.8 (Ubuntu 4.8.2-19ubuntu1)
Input #0, image2, from 'frame_%d.jpg':
  Duration: 00:00:19.50, start: 0.000000, bitrate: N/A
    Stream #0.0: Video: mjpeg, yuvj420p, 1248x1024, 10 fps, 10 tbr, 10 tbn
[libx264 @ 0x1418920] using cpu capabilities: MMX2 SSE2Fast SSSE3 SSE4.2 AVX
[libx264 @ 0x1418920] profile High, level 3.2
[libx264 @ 0x1418920] 264 - core 142 r2389 956c8d8 - H.264/MPEG-4 AVC codec - Copyleft 2003-2014 - http://www.v
ideolan.org/x264.html - options: cabac=1 ref=3 deblock=1:0:0 analyse=0x3:0x113 me=hex subme=7 psy=1 psy_rd=1.00
:0.00 mixed_ref=1 me_range=16 chroma_me=1 trellis=1 8x8dct=1 cqm=0 deadzone=21,11 fast_pskip=1 chroma_qp_offset
=-2 threads=6 lookahead_threads=1 sliced_threads=0 nr=0 decimate=1 interlaced=0 bluray_compat=0 constrained_int
ra=0 bframes=3 b_pyramid=2 b_adapt=1 b_bias=0 direct=1 weightb=1 open_gop=0 weightp=2 keyint=250 keyint_min=25
scenecut=40 intra_refresh=0 rc_lookahead=40 rc=crf mbtree=1 crf=23.0 qcomp=0.60 qpmin=0 qpmax=69 qpstep=4 ip_ra
tio=1.25 aq=1:1.00
Output #0, mp4, to 'out.mp4':
  Metadata:
    encoder         : Lavf54.20.4
    Stream #0.0: Video: libx264, yuv420p, 1248x1024, q=-1--1, 30 tbn, 30 tbc
Stream mapping:
  Stream #0:0 -> #0:0 (mjpeg -> libx264)
Press ctrl-c to stop encoding
frame=  583 fps= 36 q=32766.0 Lsize=    3151kB time=19.37 bitrate=1332.7kbits/s
video:2936kB audio:0kB global headers:0kB muxing overhead 7.298904%
[libx264 @ 0x1418920] frame I:4     Avg QP:19.83  size: 57603
[libx264 @ 0x1418920] frame P:304   Avg QP:22.15  size:  9391
[libx264 @ 0x1418920] frame B:275   Avg QP:23.90  size:   475
[libx264 @ 0x1418920] consecutive B-frames: 33.3% 11.3%  0.5% 54.9%
[libx264 @ 0x1418920] mb I  I16..4:  8.7% 78.5% 12.8%
[libx264 @ 0x1418920] mb P  I16..4:  0.5%  1.6%  0.1% P16..4: 46.7%  4.4%  4.8%  0.0%  0.0%    skip:41.9%
[libx264 @ 0x1418920] mb B  I16..4:  0.0%  0.0%  0.0% B16..8:  9.4%  0.0%  0.0%  direct: 0.0%  skip:90.5%  L0:
46.1% L1:53.5% BI: 0.4%
[libx264 @ 0x1418920] 8x8 transform intra:74.1% inter:81.3%
[libx264 @ 0x1418920] coded y,uvDC,uvAC intra: 53.9% 48.1% 14.9% inter: 10.1% 24.0% 0.3%
[libx264 @ 0x1418920] i16 v,h,dc,p: 20% 48%  7% 25%
[libx264 @ 0x1418920] i8 v,h,dc,ddl,ddr,vr,hd,vl,hu: 12% 13% 31%  7%  7% 11%  6%  5%  9%
[libx264 @ 0x1418920] i4 v,h,dc,ddl,ddr,vr,hd,vl,hu: 19% 16% 19% 10%  9% 11%  6%  5%  7%
[libx264 @ 0x1418920] i8c dc,h,v,p: 61% 22% 13%  4%
[libx264 @ 0x1418920] Weighted P-Frames: Y:33.2% UV:32.9%
[libx264 @ 0x1418920] ref P L0: 62.6%  8.1% 11.9% 10.5%  6.9%
[libx264 @ 0x1418920] ref B L0: 96.1%  2.1%  1.8%
[libx264 @ 0x1418920] ref B L1: 98.3%  1.7%
[libx264 @ 0x1418920] kb/s:1323.95
dan@dan-desktop ~/8> 
```

```
dan@dan-HP-G62 ~/c/8> python ~/RaspberryPi-Blueprints/04-GPSTimelapseRecorder/frames_to_gps_path.py -f frame_%d.jpg -o gps_data.csv
Getting points from images with format: frame_%d.jpg
        (first index = 0, last index = 9223372036854775807)
Reducing point count (max 500)
Saving CSV file: gps_data.csv
dan@dan-HP-G62 ~/c/8> 
```

Chapter 5: Home Theater PC

Welcome to OpenELEC

Interface

To be identified easily on the network, your new OpenELEC machine needs a name.

Try to choose something meaningful - like the room it's in - so you'll know what it is when you see it on the network.

This name is used when configuring network services, like file sharing using samba.

Hostname:

PiMedia

Next

Welcome to OpenELEC

Networking

In order to download backdrops, banners and thumbnails for your movies and TV shows and to stream online content from sites like YouTube, OpenELEC needs to be connected the Internet.

An Internet connection is also required for OpenELEC to automatically update itself.

The following Networks are currently available:

Next

Sharing and Remote Access

OpenELEC also supports SSH for remote access. This is for advanced users who wish to interact with OpenELEC's underlying operating system. The default user is root and the default password is openelec.

Configure Services:

SSH   Samba

Next

Working...

Welcome to OpenELEC

Thank you

You OpenELEC installation is now complete and you'll now enter XBMC when you can set up your media libraries. For help with this, there is a guide available at wiki.xbmc.org

OpenELEC is developed by a dedicated team of developers who work purely in their spare time. Even as a volunteer project, we still have to pay for our internet bandwidth and development resources so if you find OpenELEC useful, we will always appreciate a donation of any amount.

Finally, we hope you enjoy using OpenELEC as much as we've enjoying building it. If you need any more help, you can find links to get help along with latest news at openelec.tv

Next

Pi

B__3.3V
5V
GND
B__ENTER
LCD__D7
B__UP
B__DOWN   LCD__D6
LCD__D5
B__LEFT   LCD__RW
B__BACK   LCD__D4
B__RIGHT   LCD__EN
LCD__RS

LCD

5V GND CONT RS RW EN   D4 D5 D6 D7 BL BL
                                              VIN GND

B__RIGHT B__LEFT B__DOWN B__UP B__BACK +3.3V

Pi__+5V
BL__VIN   BACKLIGHT   CONTRAST   LCD__5V   B__ENTER   Pi__GND   +5V
BL__GND   BRIGHTNESS   LCD__CONT   GND
                                                      LCD__GND

7:47 AM

Confluence

Appearance

Video

Live TV

Music

Pictures

Weather

Add-ons

Services

System

Change Your Settings   ×

CONFIGURE ADD-ONS

Manage your installed Add-ons · Browse for and install Add-ons from xbmc.org
Modify Add-on settings

Add-ons   7:50 AM

Disabled Add-ons

Enabled Add-ons

Get Add-ons

Install from zip file

Search

xbmc

(5) Items - Page (1/1)

..

Services - XBMC LCDproc

XBMC LCDproc

TEMP
70.9°F

Author: XBMC: Memphiz, Daniel 'herrnst' Schell
Version: 2.5.1
Rating: ★ ★ ★ ★ ★

Displays configurable information e.g. about playing media or XBMC status on any LC/VF-display driven by LCDproc, and acts as direct drop-in replacement to the LCD/VFD-feature previously available in XBMC's core. Supports additional display elements (icons, bars) on SoundGraph iMON LCD and Targa/Futaba mdm166a VFD hardware. Requires a properly configured and running LCDd either locally or

(1) Items - Page (1/1)

Services - X

Add-on Information   x

TEMP
70.9°F

XBMC LCDproc

Type: Services
Author: Team XBMC: Memphiz, Daniel 'herrnst' Scheller
Version: 2.5.1
Rating: ★ ★ ★ ★ ★
Summary: XBMC LCDproc

Description   Page (1/1)

Displays configurable information e.g. about playing media or XBMC status on any LC/VF-display driven by LCDproc, and acts as direct drop-in replacement to the LCD/VFD-feature previously available in XBMC's core. Supports additional display elements (icons, bars) on SoundGraph iMON LCD and Targa/Futaba mdm166a VFD hardware. Requires a properly configured and running LCDd either locally or somewhere on the network.

Disclaimer

Manager on Win32 are not supported. No liability taken for damaged hardware and/or software caused by this addon.

Configure
Update
Install
Enable
Rollback
Change log

(1) Items - Page (1/1)

Add-on Information   ✕

XBMC LCDproc

TEMP
70.9F

Type:	Services
Author:	Team XBMC: Memphiz, Daniel 'herrnst' Scheller
Version:	2.5.1
Rating:	
Summary:	XBMC LCDproc

Configure

Update

Uninstall

Disable

Rollback

Change log

Description   Page (1/1)

Displays configurable information e.g. about playing media or XBMC status on any LC/VF-display driven by LCDproc, and acts as direct drop-in replacement to the LCD/VFD-feature previously available in XBMC's core. Supports additional display elements (icons, bars) on SoundGraph iMON LCD and Targa/Futaba mdm166a VFD hardware. Requires a properly configured and running LCDd either locally or somewhere on the network.

Disclaimer

Manager on Win32 are not supported. No liability taken for damaged hardware and/or software caused by this addon.

(1) Items - Page (1/1)

Settings - XBMC LCDproc   ✕

Behaviour	**Backlight**	**Connection**

Delay for scrolling text   1

Scroll mode   Marquee ▼ ▲

Navigation display duration (s)   2

Display refresh rate (Hz)   1

Use alternate charset   ⦿

- **Charset**   ISO8859-1 (default) ▼ ▲

Support for extra display elements (e.g. icons)   ⦿

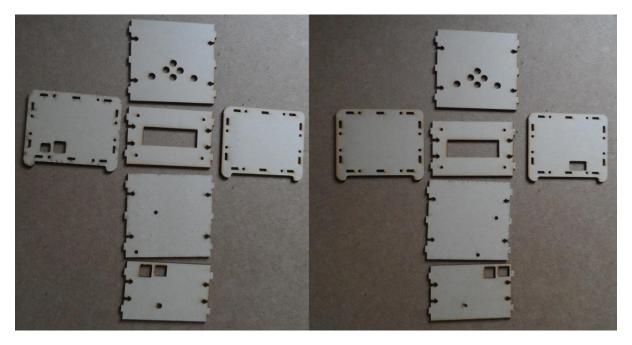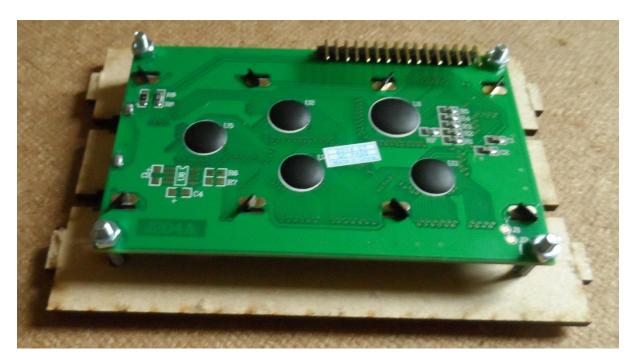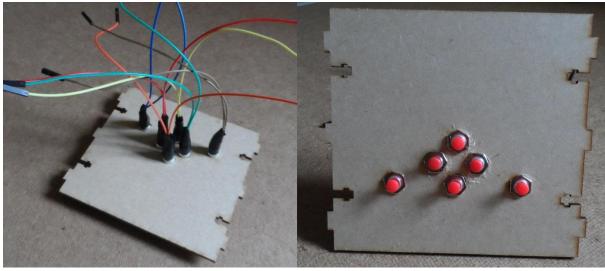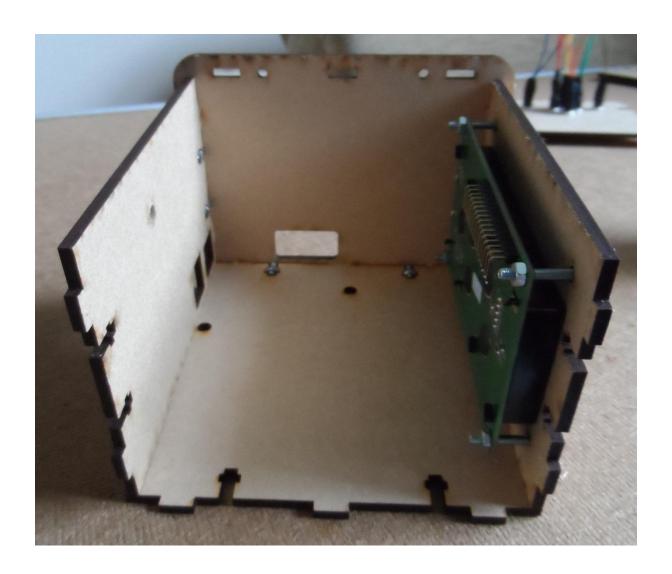| **OK**	**Cancel**	**Defaults**

(1) Items - Page (1/1)

```
192.168.0.17 - PuTTY
OpenELEC:~ # python /storage/.config/button_watcher.py
Setting up GPIO
Running
back pressed
down pressed
up pressed
left pressed
right pressed
enter pressed
back pressed
back pressed
^CGot signal 2, will exit.
Exiting
OpenELEC:~ #
```

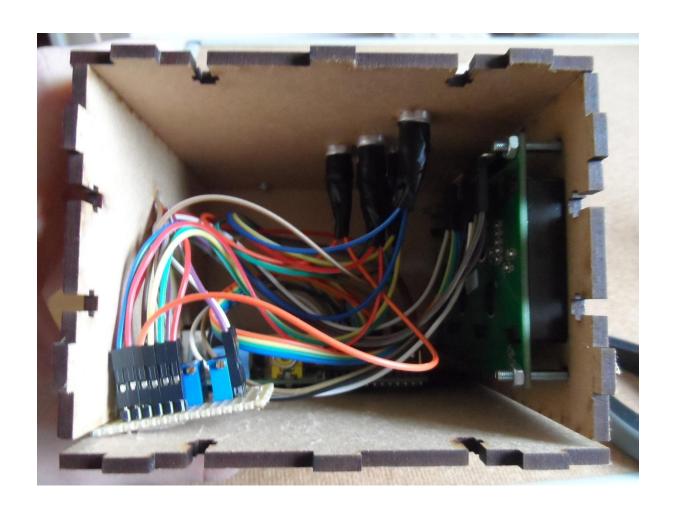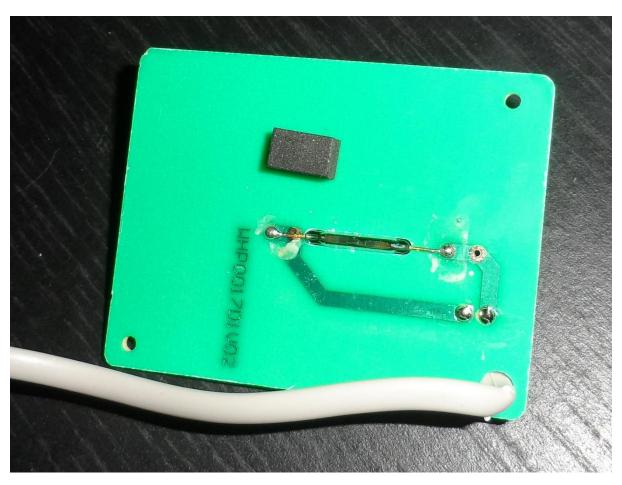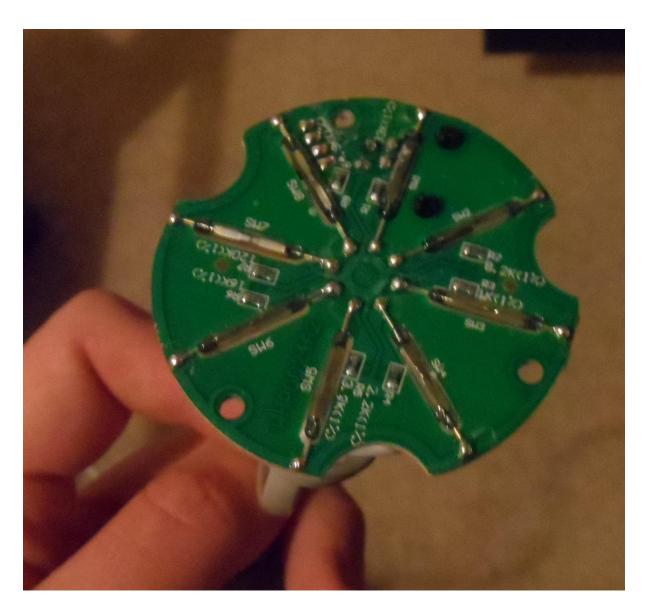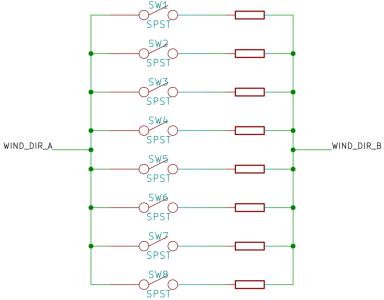# Chapter 6: Outdoor Weather Station

Wind Sensor Green ———————— 5V
Wind Sensor Red ———————— GND
Light Resistor ———————— GND
Light LDR ———————— Vin

Wind Sensor Black ———————— A0
Light Common ———————— A1

GND ○ ———— Rain Sensor Green

3 ○ ———— Wind Sensor Yellow
2 ○ ———— Rain Sensor Red

File   Edit   Sketch   Tools   Help

MaplinWeatherInstrumentDriver

```cpp
/**
 * Maplin Weather Instrument Driver
 */

// Speed for serial connection
#define SERIAL_BAUD 115200

// Number of half revolutions taken by wind speed sensor to calculate RPM
const uint8_t windSpeedHalfRevolutionsThreshold = 5;
// For conversion from RPM to MPH
const float windSpeedMultFactor = 0.0117439155;
// Approximate analog values for centre of each direction reading
const uint16_t windDirectionLevels[] = {930, 830, 735, 390, 75, 135, 235, 560};
// Tolerance/width of each wind direction reading
const uint16_t windDirectionTolerance = 50;
// Amount light level must have changed to be reported to serial port
const uint16_t lightLevelThreshold = 10;

volatile bool rainFlag = false;
volatile uint16_t windSpeedHalfRevolutions = 0;
uint16_t windSpeedStartTime = 0;
uint8_t lastWindDirection = 0;
int16_t lastLightLevel = 0;

/**
 * Setup code to configure the Arduino.
 */
void setup()
{
  // Open serial connection
  Serial.begin(SERIAL_BAUD);

  // Configure interrupt for rainfall sensor
```

1   Arduino Mega 2560 or Mega ADK on /dev/ttyACM0

File Edit Sketch Tools Help

MaplinWeatherInstrumentDriver

```
/**
 * Maplin Weather Instrument Driver
 */

// Speed for serial connection
#define SERIAL_BAUD 115200

// Number of half revolutions taken by wind speed sensor to calculate RPM
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volatile bool rainFlag = false;
volatile uint16_t windSpeedHalfRevolutions = 0;
uint16_t windSpeedStartTime = 0;
uint8_t lastWindDirection = 0;
int16_t lastLightLevel = 0;

/**
 * Setup code to configure the Arduino.
 */
void setup()
{
  // Open serial connection
  Serial.begin(SERIAL_BAUD);

  // Configure interrupt for rainfall sensor
```

Uploading...

Binary sketch size: 7,666 bytes (of a 258,048 byte maximum)

1   Arduino Mega 2560 or Mega ADK on /dev/ttyACM0

File Edit Sketch Tools Help

MaplinWeatherInstrumentDriver

```
/**
 * Maplin Weather Instrument Driver
 */

// Speed for serial connection
#define SERIAL_BAUD 115200

// Number of half revolutions taken by wind speed sensor to calculate RPM
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volatile uint16_t windSpeedHalfRevolutions = 0;
uint16_t windSpeedStartTime = 0;
uint8_t lastWindDirection = 0;
int16_t lastLightLevel = 0;

/**
 * Setup code to configure the Arduino.
 */
void setup()
{
  // Open serial connection
  Serial.begin(SERIAL_BAUD);

  // Configure interrupt for rainfall sensor
```

Done uploading.

Binary sketch size: 7,666 bytes (of a 258,048 byte maximum)

1   Arduino Mega 2560 or Mega ADK on /dev/ttyACM0

```
WIND_DIRECTION:ARB:1;
WIND_DIRECTION:ARB:2;
WIND_DIRECTION:ARB:1;
WIND_DIRECTION:ARB:3;
WIND_DIRECTION:ARB:4;
WIND_DIRECTION:ARB:6;
WIND_DIRECTION:ARB:7;
WIND_SPEED:MPH:0.03;
WIND_SPEED:MPH:7.19;
WIND_SPEED:MPH:13.55;
WIND_SPEED:MPH:10.81;
WIND_SPEED:MPH:12.67;
WIND_SPEED:MPH:13.25;
WIND_SPEED:MPH:12.49;
WIND_SPEED:MPH:12.41;
WIND_SPEED:MPH:5.89;
WIND_SPEED:MPH:6.43;
WIND_SPEED:MPH:13.76;
WIND_SPEED:MPH:11.67;
WIND_SPEED:MPH:12.32;
LIGHT_LEVEL:ARB:579;
WIND_SPEED:MPH:0.42;
WIND_SPEED:MPH:4.00;
WIND_SPEED:MPH:4.44;
WIND_DIRECTION:ARB:1;
WIND_DIRECTION:ARB:2;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
RAIN_DETECT;
```

Send

☑ Autoscroll   No line ending ▼   115200 baud ▼

```
pi@raspberrypi ~/Adafruit_Python_DHT/examples $ sudo ./AdafruitDHT.py 11 4
Temp=19.0*C   Humidity=21.0%
pi@raspberrypi ~/Adafruit_Python_DHT/examples $ █
```

```
pi@raspberrypi: ~
  GNU nano 2.2.6                                    File: /etc/modules

# /etc/modules: kernel modules to load at boot time.
#
# This file contains the names of kernel modules that should be loaded
# at boot time, one per line. Lines beginning with "#" are ignored.
# Parameters can be specified after the module name.

snd-bcm2835
i2c-bcm2708
i2c-dev
```

```
pi@raspberrypi: ~
  GNU nano 2.2.6                        File: /etc/modprobe.d/raspi-blacklist.conf

# blacklist spi and i2c by default (many users don't need them)

#blacklist spi-bcm2708
#blacklist i2c-bcm2708
blacklist snd-soc-pcm512x
blacklist snd-soc-wm8804
```

```
pi@raspberrypi ~ $ sudo i2cdetect -y 1
     0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:          -- -- -- -- -- -- -- -- -- -- -- -- --
10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
20: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
40: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
70: -- -- -- -- -- -- -- 77
pi@raspberrypi ~ $
```

```
pi@raspberrypi ~/Adafruit_Python_BMP/examples $ sudo python simpletest.py
Temp = 18.50 *C
Pressure = 99319.00 Pa
Altitude = 168.62 m
Sealevel Pressure = 99313.00 Pa
pi@raspberrypi ~/Adafruit_Python_BMP/examples $
```

```
pi@raspberrypi ~ $ sudo nginx -t
nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
nginx: configuration file /etc/nginx/nginx.conf test is successful
pi@raspberrypi ~ $ 
```
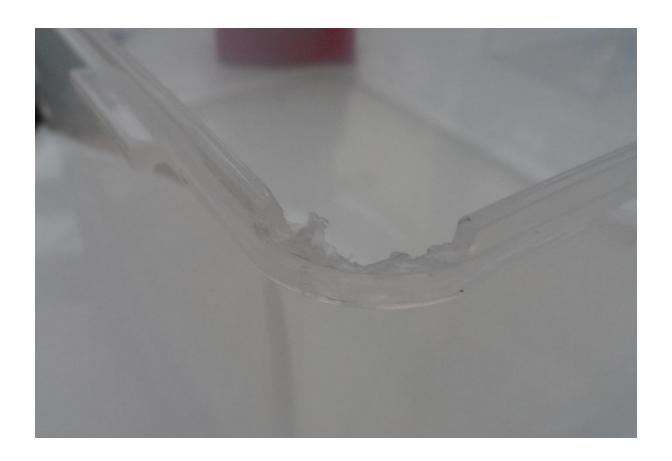
rPi Weather Station – Google Chrome

rPi Weather Station ✕

192.168.0.7

rPi Weather Station

Current History

No data recorded yet.

```
  GNU nano 2.2.6                              File: /etc/rc.local

#!/bin/sh -e
#
# rc.local
#
# This script is executed at the end of each multiuser runlevel.
# Make sure that the script will "exit 0" on success or any other
# value on error.
#
# In order to enable or disable this script just change the execution
# bits.
#
# By default this script does nothing.

# Print the IP address
_IP=$(hostname -I) || true
if [ "$_IP" ]; then
  printf "My IP address is %s\n" "$_IP"
fi

python /home/pi/sensor_manager.py --database /home/pi/weather_station_webapp/weather.db --poll-interval 10 --submit-interval 600 &

exit 0
```
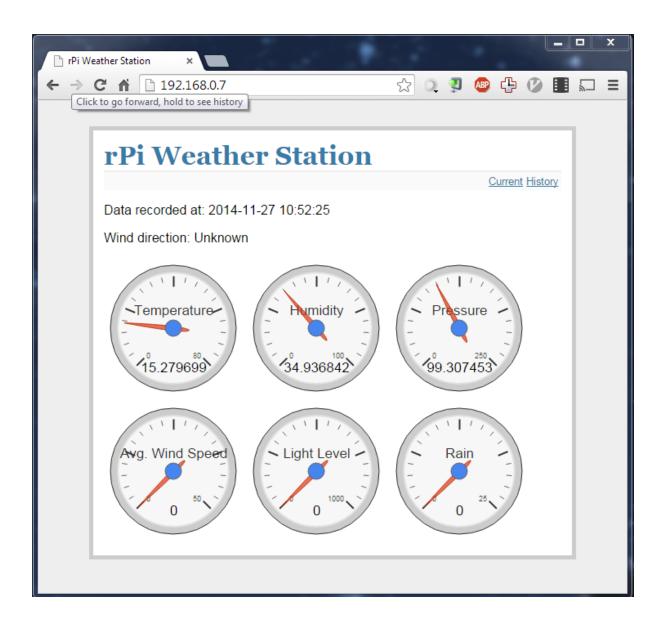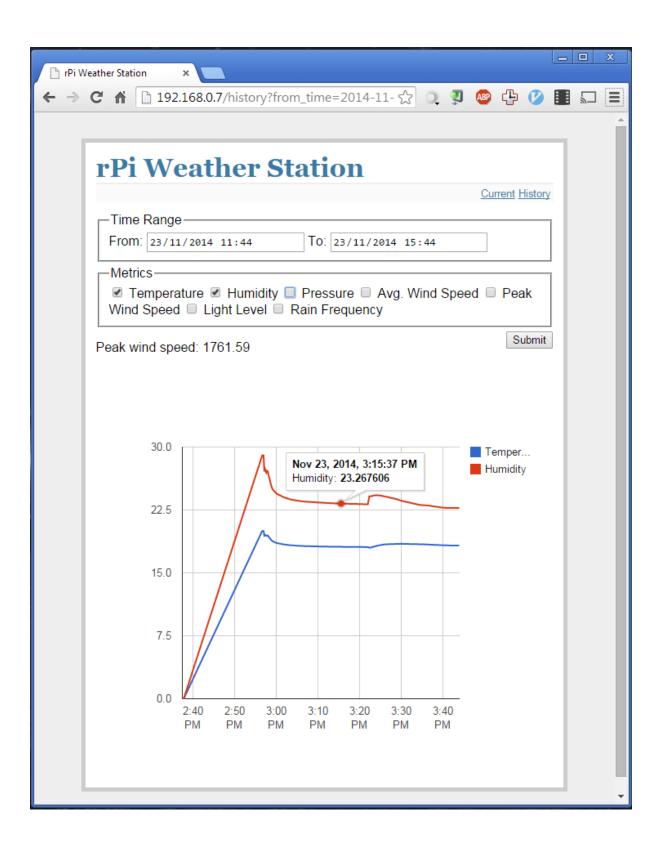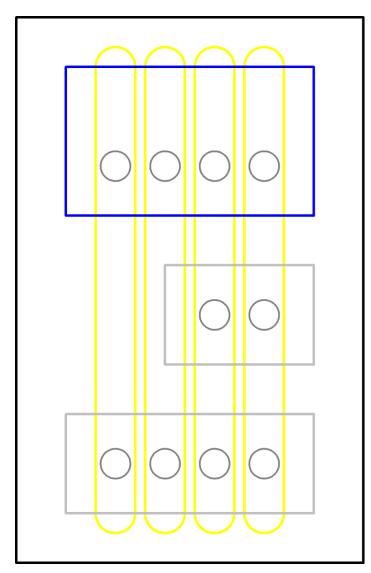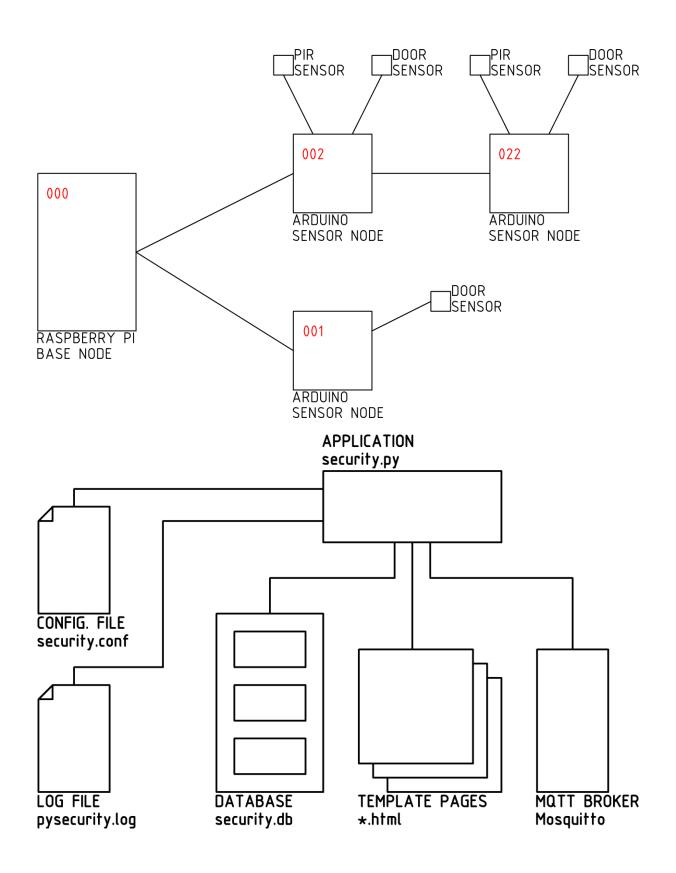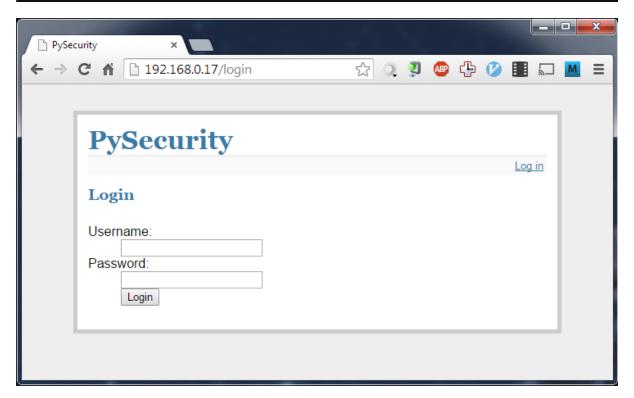
DHT
SENSOR

10K
RESISTOR

PIN
HEADER
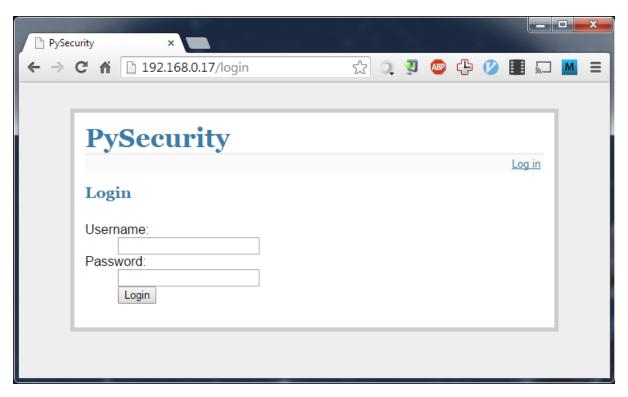
Chapter 7: Home Security System

PIR
SENSOR

DOOR
SENSOR

PIR
SENSOR

DOOR
SENSOR

002

022

ARDUINO
SENSOR NODE

ARDUINO
SENSOR NODE

000

RASPBERRY PI
BASE NODE

DOOR
SENSOR

001

ARDUINO
SENSOR NODE

APPLICATION
security.py

CONFIG. FILE
security.conf

LOG FILE
pysecurity.log

DATABASE
security.db

TEMPLATE PAGES
*.html

MQTT BROKER
Mosquitto
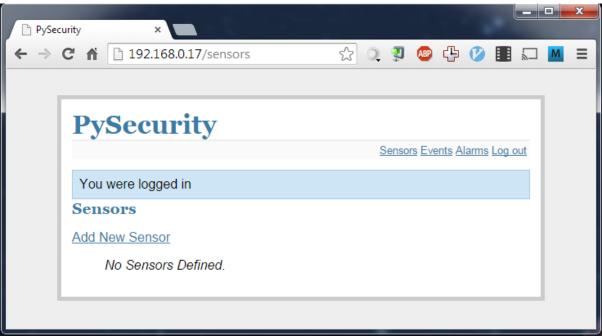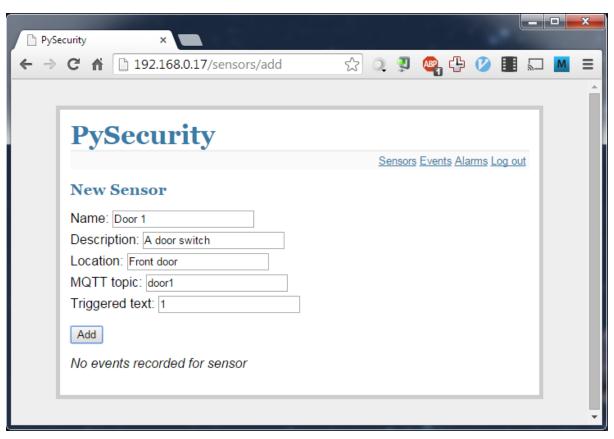
```
pi@raspberrypi ~/security_webapp $ flask --app=security initdb
Initialized the database.
Exception in thread Thread-1 (most likely raised during interpreter shutdown):
Traceback (most recent call last):
  File "/usr/lib/python2.7/threading.py", line 552, in __bootstrap_inner
  File "/usr/lib/python2.7/threading.py", line 505, in run
  File "/usr/local/lib/python2.7/dist-packages/paho/mqtt/client.py", line 2180, in _thread_main
pi@raspberrypi ~/security_webapp $
```


PySecurity

Log in

Login

Username:

Password:

Login
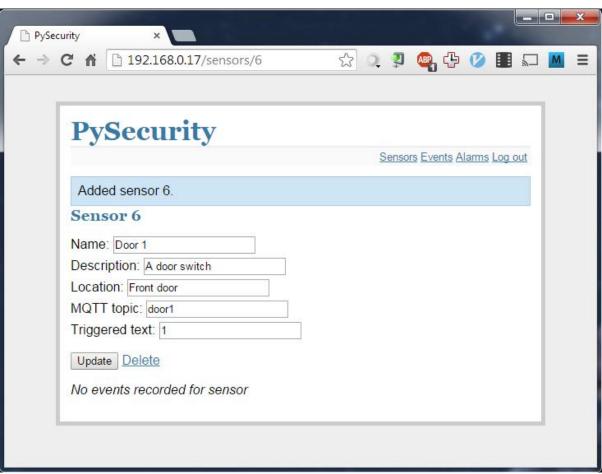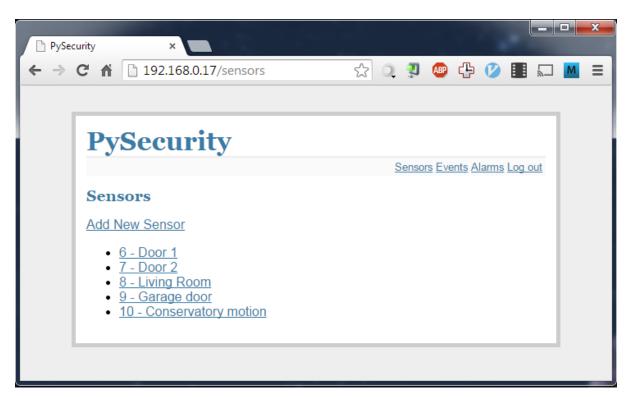

```
GNU nano 2.2.6

SECRET_KEY="74hdue83js8683jsldu38fh6"
USERNAME="admin"
PASSWORD="default"
LOG_LEVEL="DEBUG"
MQTT_BROKER="localhost"
MQTT_PORT=1883
SMTP_SERVER="smtp.gmail.com:587"
SMTP_USERNAME="meiling@dan-nixon.com"
SMTP_PASSWORD="               "
FROM_EMAIL="meiling@dan-nixon.com"
```
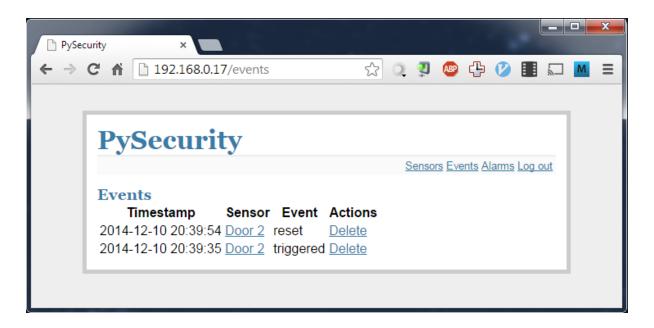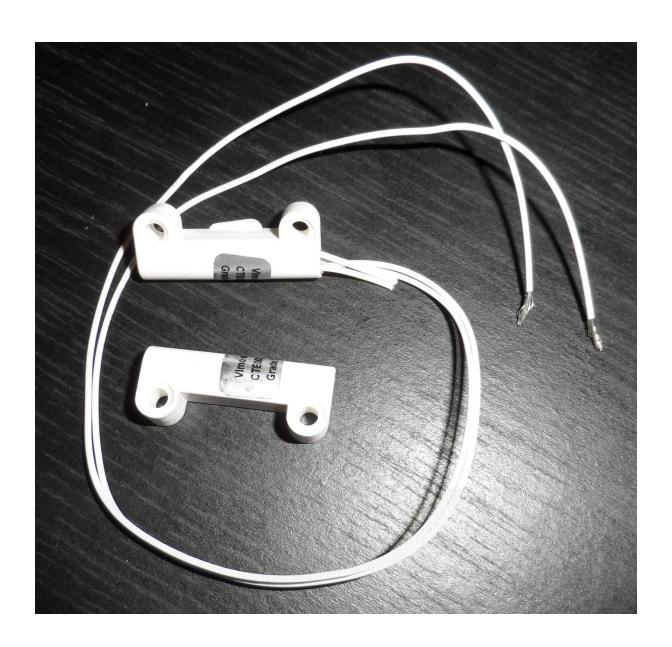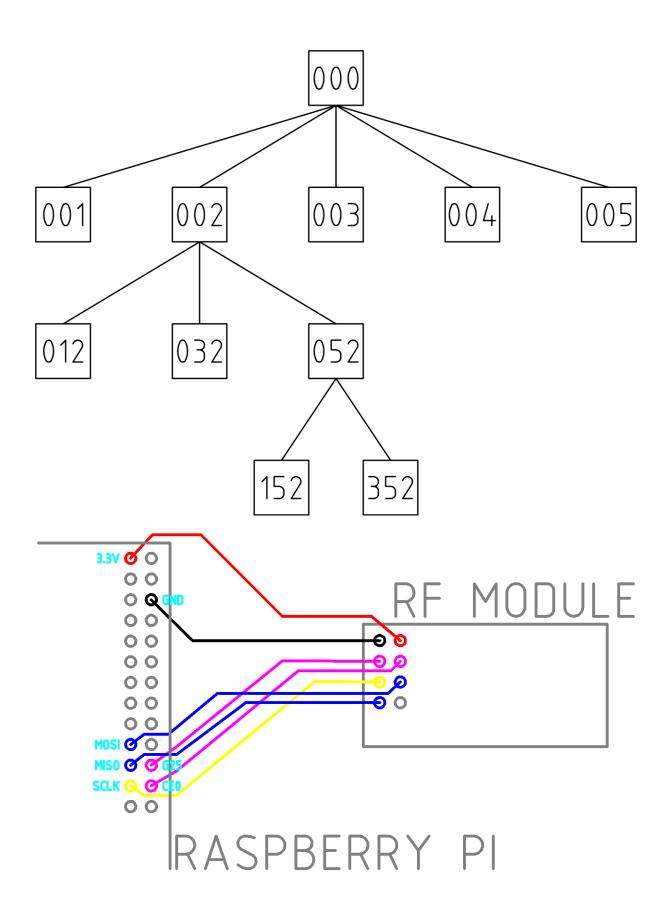
PySecurity

Log in

Login

Username:

Password:

Login

PySecurity

Sensors Events Alarms Log out

You were logged in

Sensors

Add New Sensor

No Sensors Defined.

PySecurity

New Sensor

Name: Door 1

Description: A door switch

Location: Front door

MQTT topic: door1

Triggered text: 1

Add

No events recorded for sensor

PySecurity

Added sensor 6.

Sensor 6

Name: Door 1

Description: A door switch

Location: Front door

MQTT topic: door1

Triggered text: 1

Update Delete

No events recorded for sensor

PySecurity

Sensors Events Alarms Log out

Sensors

Add New Sensor

- 6 - Door 1
- 7 - Door 2
- 8 - Living Room
- 9 - Garage door
- 10 - Conservatory motion

192.168.0.17/sensors

PySecurity

Sensors Events Alarms Log out

New Alarm

Name: Motion Anywhere

Description:

Email: dan@dan-nixon.com

Alert When: Any One Triggered ▼

┌─ Sensors ─────────────────────────────────┐
│ ☐ Door 1 ☐ Door 2 ☑ Living Room ☐ Garage door ☑ Conservatory │
│ motion   │
└──┘

Add

192.168.0.17/alarms/add

PySecurity

Events

Timestamp	Sensor	Event	Actions
2014-12-10 20:39:54	Door 2	reset	Delete
2014-12-10 20:39:35	Door 2	triggered	Delete

PySecurity Alert   Inbox   x

meiling@dan-nixon.com
to dan

20:40 (0 minutes ago)

Alarm Alert Any Triggered was triggered.

000

001 002 003 004 005

012 032 052

152 352

3.3V
GND
MOSI
MISO
SCLK
G25
CE0

RF MODULE

RASPBERRY PI

```
pi@raspberrypi ~ $ sudo python BaseNode_RPi.py localhost 1883
================ SPI Configuration ================
CSN Pin              = CE0 (PI Hardware Driven)
CE Pin               = Custom GPIO25
Clock Speed          = 8 Mhz
================ NRF Configuration ================
STATUS               = 0x0e RX_DR=0 TX_DS=0 MAX_RT=0 RX_P_NO=7 TX_FULL=0
RX_ADDR_P0-1         = 0xf0f0f0f03c 0xf0f0f0f05a
RX_ADDR_P2-5         = 0x69 0x96 0xa5 0xc3
TX_ADDR              = 0xe7e7e7e7e7
RX_PW_P0-6           = 0x20 0x20 0x20 0x20 0x20 0x20
EN_AA                = 0x3f
EN_RXADDR            = 0x3f
RF_CH                = 0x5a
RF_SETUP             = 0x07
CONFIG               = 0x0f
DYNPD/FEATURE        = 0x00 0x00
Data Rate            = 1MBPS
Model                = nRF24L01+
CRC Length           = 16 bits
PA Power             = PA_MAX
```

```
  GNU nano 2.2.6                                    File: /etc/rc.local

#!/bin/sh -e
#
# rc.local
#
# This script is executed at the end of each multiuser runlevel.
# Make sure that the script will "exit 0" on success or any other
# value on error.
#
# In order to enable or disable this script just change the execution
# bits.
#
# By default this script does nothing.

# Print the IP address
_IP=$(hostname -I) || true
if [ "$_IP" ]; then
  printf "My IP address is %s\n" "$_IP"
fi

python /home/pi/BaseNode_RPi.py localhost 1883

exit 0
```
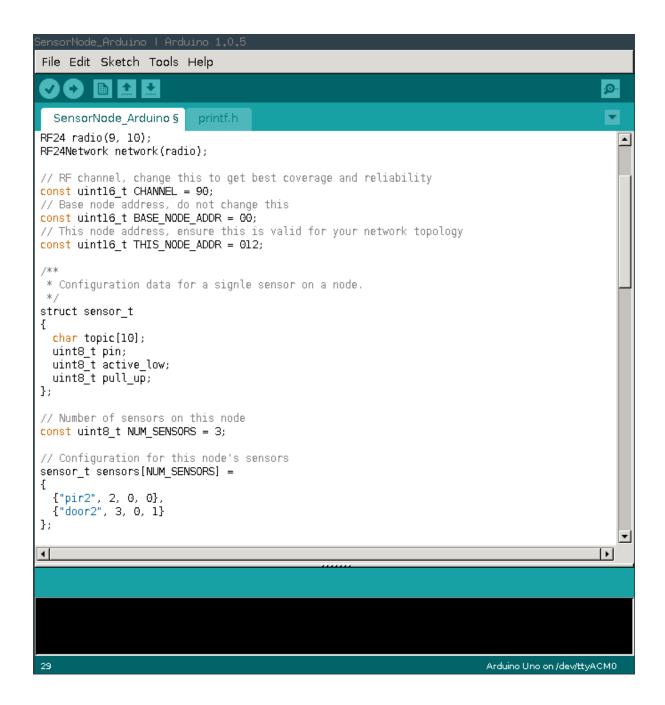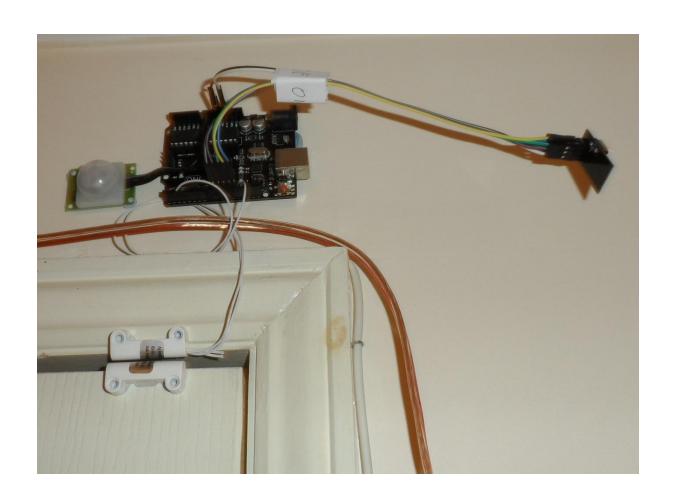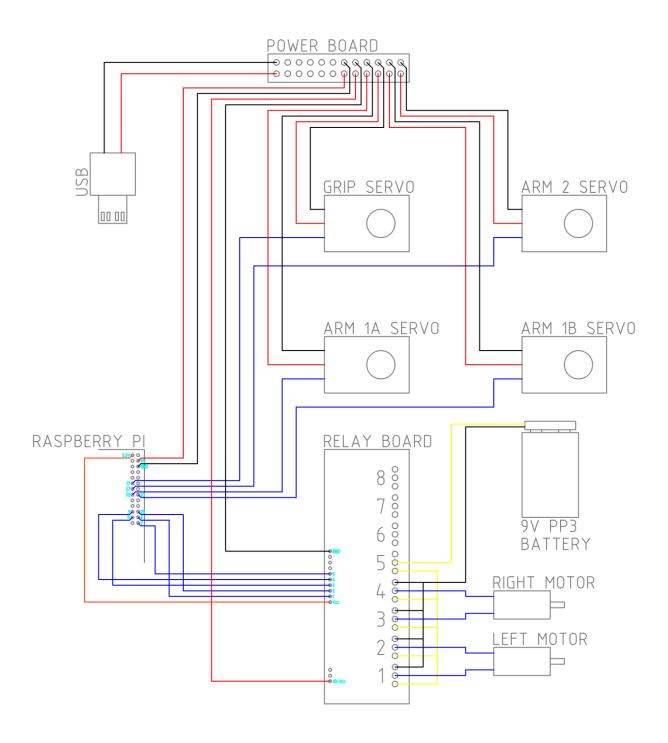
libraries

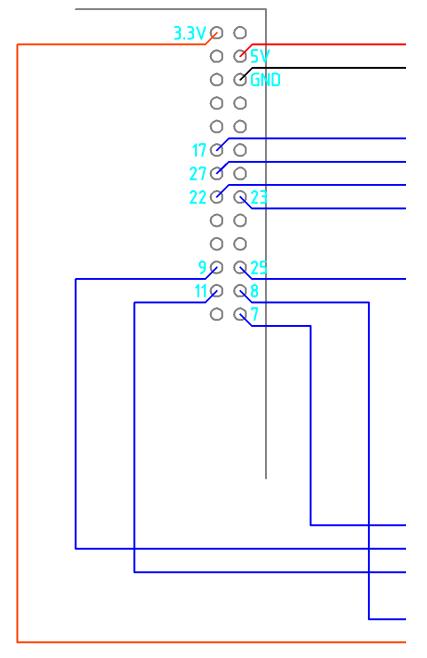File Edit View Go Bookmarks Help

Bookmarks

Local Docum...
Dropbox

Computer
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
File System
Rubbish Bin

Network
Browse Netw...

Home   sketchbook   libraries

Back   Forward   Search

Name	Size	Type	Date Modified
controlP5	5 items	folder	Sat 05 Jul 2014 16:46:30 BST
RF24	16 items	folder	Sun 07 Dec 2014 08:25:36 GMT
examples	12 items	folder	Sun 07 Dec 2014 08:25:36 GMT
examples_RPi	7 items	folder	Sun 07 Dec 2014 08:25:36 GMT
RPi	5 items	folder	Sun 07 Dec 2014 08:25:36 GMT
tests	4 items	folder	Sun 07 Dec 2014 08:25:36 GMT
Doxyfile	102.9 kB	plain text document	Sun 07 Dec 2014 08:25:36 GMT
doxygen-custom.css	12.3 kB	CSS stylesheet	Sun 07 Dec 2014 08:25:36 GMT
FAQ	2.8 kB	C source code	Sun 07 Dec 2014 08:25:36 GMT
keywords.txt	357 bytes	plain text document	Sun 07 Dec 2014 08:25:36 GMT
Makefile	1.8 kB	Makefile	Sun 07 Dec 2014 08:25:36 GMT
nRF24L01.h	3.5 kB	C header	Sun 07 Dec 2014 08:25:36 GMT
printf.h	1.2 kB	C header	Sun 07 Dec 2014 08:25:36 GMT
README.md	6.2 kB	Markdown document	Sun 07 Dec 2014 08:25:36 GMT
RF24.cpp	45.6 kB	C++ source code	Sun 07 Dec 2014 08:25:36 GMT
RF24.h	42.6 kB	C header	Sun 07 Dec 2014 08:25:36 GMT
RF24_config.h	5.2 kB	C header	Sun 07 Dec 2014 08:25:36 GMT
wikidoc.xslt	2.0 kB	XSLT stylesheet	Sun 07 Dec 2014 08:25:36 GMT
RF24Network	11 items	folder	Sun 07 Dec 2014 08:25:19 GMT
examples	5 items	folder	Sun 07 Dec 2014 08:25:19 GMT
RPi	3 items	folder	Sun 07 Dec 2014 08:25:19 GMT
tests	3 items	folder	Sun 07 Dec 2014 08:25:19 GMT
Doxyfile	101.2 kB	plain text document	Sun 07 Dec 2014 08:25:19 GMT
Jamfile	84 bytes	plain text document	Sun 07 Dec 2014 08:25:19 GMT

RF MODULE

13
12
11
10
9

3.3V
GND

ARDUINO

File   Edit   Sketch   Tools   Help

SensorNode_Arduino §   printf.h

```
RF24 radio(9, 10);
RF24Network network(radio);

// RF channel, change this to get best coverage and reliability
const uint16_t CHANNEL = 90;
// Base node address, do not change this
const uint16_t BASE_NODE_ADDR = 00;
// This node address, ensure this is valid for your network topology
const uint16_t THIS_NODE_ADDR = 012;

/**
 * Configuration data for a signle sensor on a node.
 */
struct sensor_t
{
  char topic[10];
  uint8_t pin;
  uint8_t active_low;
  uint8_t pull_up;
};

// Number of sensors on this node
const uint8_t NUM_SENSORS = 3;

// Configuration for this node's sensors
sensor_t sensors[NUM_SENSORS] =
{
  {"pir2", 2, 0, 0},
  {"door2", 3, 0, 1}
};
```

29   Arduino Uno on /dev/ttyACM0

Chapter 8: Remote-operated Robotic Arm

RASPBERRY PI
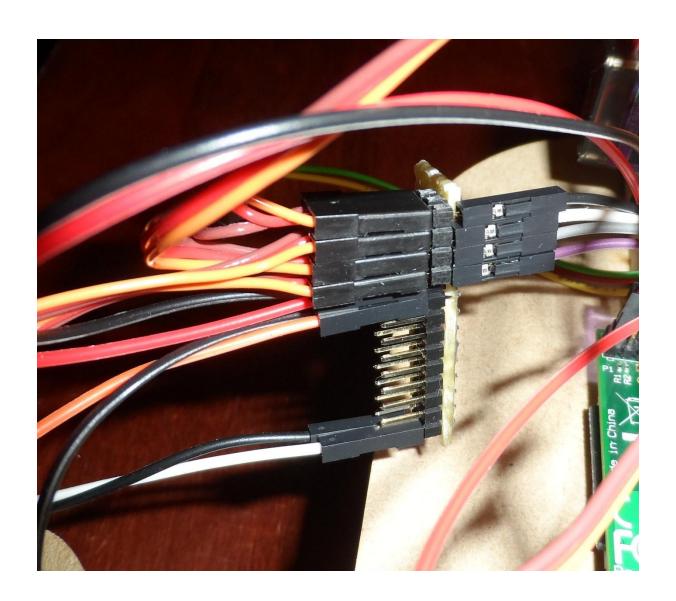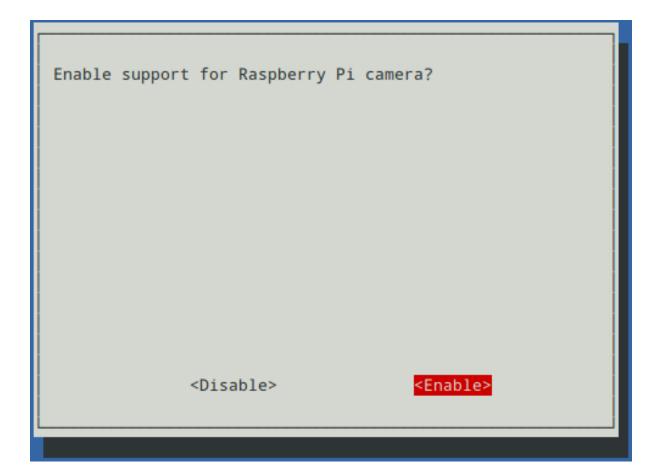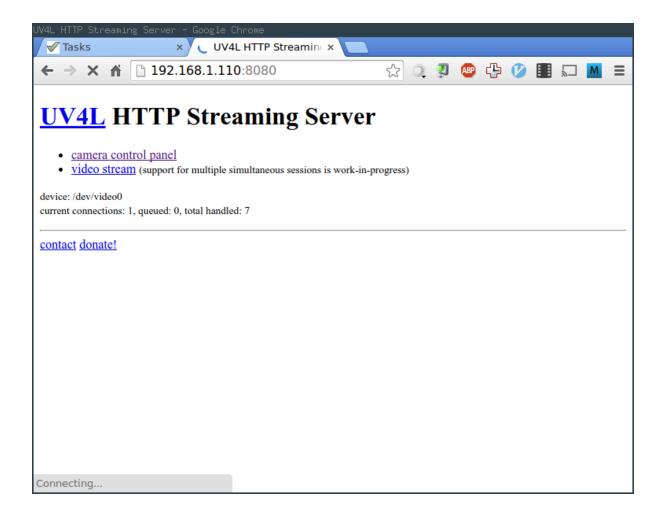
3.3V
5V
GND
17
27
22   23
9   25
11   8
7

```
┤ Raspberry Pi Software Configuration Tool (raspi-config) ├
Setup Options

        1 Expand Filesystem          Ensures that all of the SD card storage is available to the OS
        2 Change User Password       Change password for the default user (pi)
        3 Enable Boot to Desktop/Scratch Choose whether to boot into a desktop environment, Scratch, or the command-line
        4 Internationalisation Options  Set up language and regional settings to match your location
        5 Enable Camera              Enable this Pi to work with the Raspberry Pi Camera
        6 Add to Rastrack            Add this Pi to the online Raspberry Pi Map (Rastrack)
        7 Overclock                  Configure overclocking for your Pi
        8 Advanced Options           Configure advanced settings
        9 About raspi-config         Information about this configuration tool


                        <Select>                                    <Finish>
```

Enable support for Raspberry Pi camera?

<Disable>   <Enable>
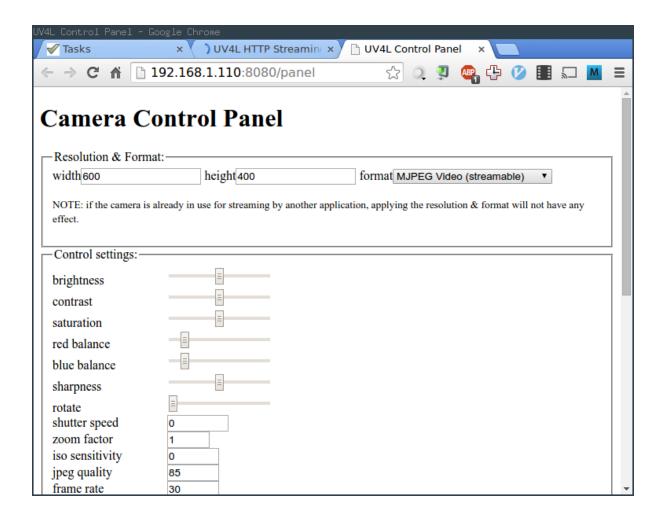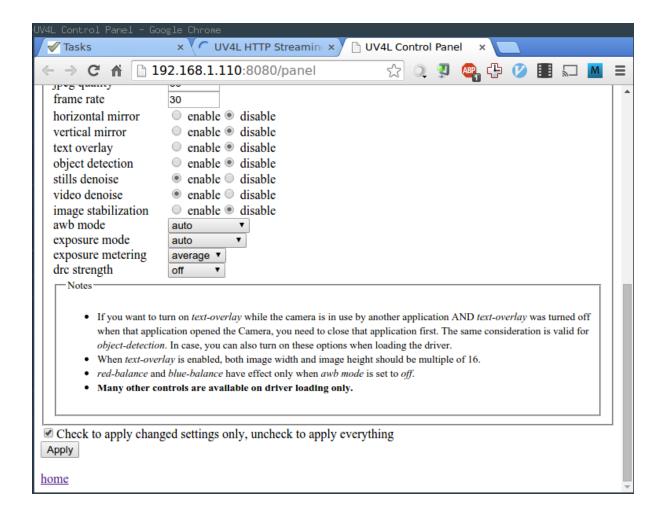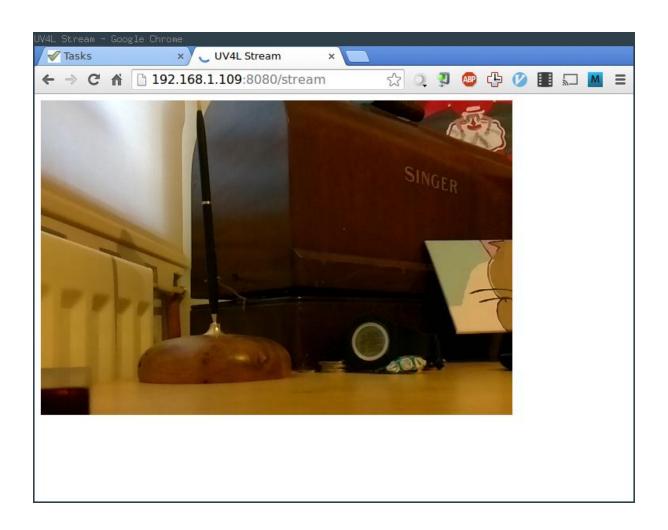
```
  GNU nano 2.2.6          File: /etc/apt/sources.list

deb http://mirrordirector.raspbian.org/raspbian/ wheezy main contrib non-free rpi
deb http://www.linux-projects.org/listing/uv4l_repo/raspbian/ wheezy main
```
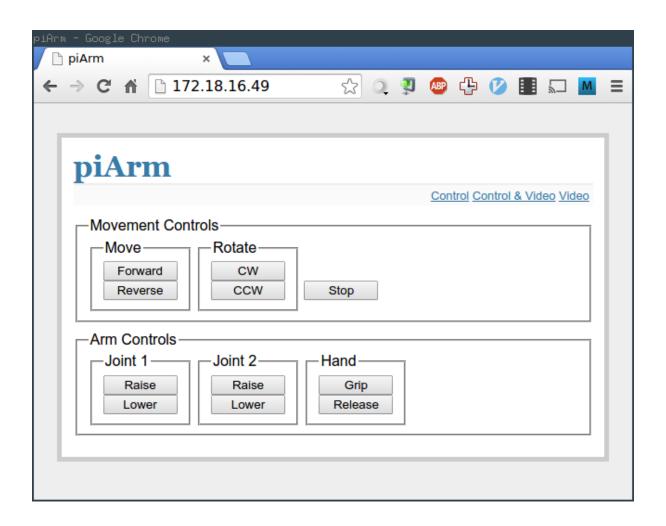
Tasks ✕   UV4L HTTP Streaming ✕

← → ✕ 🏠 | 192.168.1.110:8080

<u>UV4L</u> HTTP Streaming Server

- <u>camera control panel</u>
- <u>video stream</u> (support for multiple simultaneous sessions is work-in-progress)

device: /dev/video0
current connections: 1, queued: 0, total handled: 7

<u>contact</u> <u>donate!</u>

Connecting...

192.168.1.110:8080/panel

Camera Control Panel

Resolution & Format:

width 600   height 400   format MJPEG Video (streamable) ▾

NOTE: if the camera is already in use for streaming by another application, applying the resolution & format will not have any effect.

Control settings:

brightness

contrast

saturation

red balance

blue balance

sharpness

rotate

shutter speed   0

zoom factor   1

iso sensitivity   0

jpeg quality   85

frame rate   30

Tasks   ×   UV4L HTTP Streamin ×   UV4L Control Panel   ×

192.168.1.110:8080/panel

jpeg quality	
frame rate	30
horizontal mirror	○ enable ● disable
vertical mirror	○ enable ● disable
text overlay	○ enable ● disable
object detection	○ enable ● disable
stills denoise	● enable ○ disable
video denoise	● enable ○ disable
image stabilization	○ enable ● disable
awb mode	auto ▼
exposure mode	auto ▼
exposure metering	average ▼
drc strength	off ▼

Notes

- If you want to turn on *text-overlay* while the camera is in use by another application AND *text-overlay* was turned off when that application opened the Camera, you need to close that application first. The same consideration is valid for *object-detection*. In case, you can also turn on these options when loading the driver.
- When *text-overlay* is enabled, both image width and image height should be multiple of 16.
- *red-balance* and *blue-balance* have effect only when *awb mode* is set to *off*.
- **Many other controls are available on driver loading only.**

☑ Check to apply changed settings only, uncheck to apply everything

Apply

home

Chapter 9: Magic Mirror

```
# For more options and information see
# http://www.raspberrypi.org/documentation/configuration/config-txt.md
# Some settings may impact device functionality. See link above for details

# uncomment if you get no picture on HDMI for a default "safe" mode
#hdmi_safe=1

# uncomment this if your display has a black border of unused pixels visible
# and your display can output without overscan
#disable_overscan=1

# uncomment the following to adjust overscan. Use positive numbers if console
# goes off screen, and negative if there is too much border
#overscan_left=16
#overscan_right=16
#overscan_top=16
#overscan_bottom=16

# uncomment to force a console size. By default it will be display's size minus
# overscan.
#framebuffer_width=1280
#framebuffer_height=720

# uncomment if hdmi display is not detected and composite is being output
hdmi_force_hotplug=1
☐
display_rotate=1

# uncomment to force a specific HDMI mode (this will force VGA)
#hdmi_group=1
#hdmi_mode=1

# uncomment to force a HDMI mode rather than DVI. This can make audio work in
# DMT (computer monitor) modes
#hdmi_drive=2

# uncomment to increase signal to HDMI, if you have interference, blanking, or
```

^G Get Help   ^O WriteOut   ^R Read File
^X Exit   ^J Justify   ^W Where Is

Clouds
Scattered clouds
10.4°C
High:
Low:
Humidity: 64%
Pressure: 10 9.9hPa

Tech News
- Solving squabbles over in-car sounds
- In pictures: High-tech fashion at CES
- Ageing-tech expert sought by DWP

BBC UK News
The public is being warned not to approach a restricted patient who has gone on the run while on escorted leave in Glasgow.


```
┤ Raspberry Pi Software Configuration Tool (raspi-config) ├

Setup Options

   1 Expand Filesystem            Ensures that all of the SD card storage is available to the OS
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   4 Internationalisation Options Set up language and regional settings to match your location
   5 Enable Camera                Enable this Pi to work with the Raspberry Pi Camera
   6 Add to Rastrack              Add this Pi to the online Raspberry Pi Map (Rastrack)
   7 Overclock                    Configure overclocking for your Pi
   8 Advanced Options             Configure advanced settings
   9 About raspi-config           Information about this configuration tool


                    <Select>                              <Finish>
```

```
Chose boot option

Console Text console, requiring login (default)
Desktop Log in as user 'pi' at the graphical desktop
Scratch Start the Scratch programming environment upon boot

                <Ok>                        <Cancel>
```

```
Would you like to reboot now?

                <Yes>                        <No>
```

```
  GNU nano 2.2.6

@lxpanel --profile LXDE
@pcmanfm --desktop --profile LXDE
#@xscreensaver -no-splash
[ ]
@xset s off
@xset -dpms
@xset s noblank
@chromium --kiosk --incognito http://localhost
```

BACK PANEL

Hb

Wb

SHORT
SIDE PANEL

T

H

LONG SIDE PANEL

T

W

[position]
mode=top
index=0

[position]
mode=top
index=1

[position]
mode=top
index=2

TOP
BAR

[position]
mode=left
index=0

[position]
mode=floating
x=40
y=40

[position]
mode=floating
x=20
y=100

RIGHT
BAR

LEFT
BAR

[position]
mode=bottom
index=0

[position]
mode=bottom
index=1

[position]
mode=bottom
index=2

BOTTOM
BAR

Saturday
10 Jan
2015

Tech News

- Solving squabbles over in-car sounds
- In pictures: Hi-tech fashion at CES
- Ageing-tech expert sought by DWP
- Sony: 'No playbook' for hack attack
- Healing the sick at CES 2015

Clouds

Broken clouds
11.1°C High: 11.1°C
Low: 11.1°C
Wind: **south west at** 11.1 mps
Humidity: 63%
Pressure: 1012.6hPa
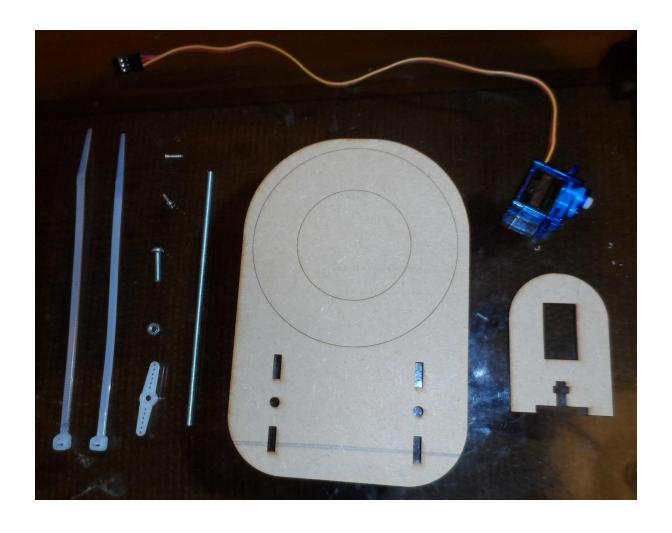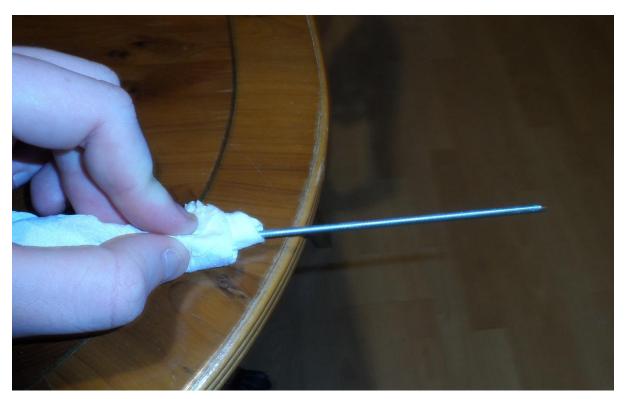
BBC UK News
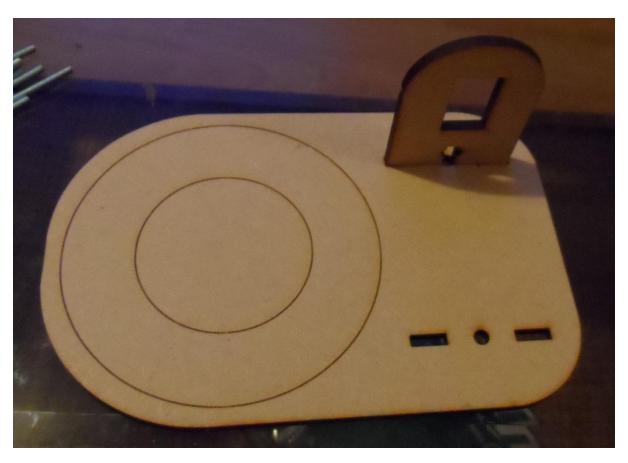
Gales cause damage and disruption to travel and power supplies, while firefighters deal with cladding which has come loose on Cardiff City's stadium roof.

Chapter 10: Bottle Xylophone

Pi

	○ ○	
	○ ○	
	○ ○	GROUND
4	○ ○	
	○ ○	
17	○ ○	18
27	○ ○	
22	○ ○	23
	○ ○	24
10	○ ○	
9	○ ○	25
11	○ ○	8
	○ ○	7

- - - - - - - - - - - - - - -

	○ ○	
5	○ ○	
6	○ ○	12
13	○ ○	
19	○ ○	16
26	○ ○	20
	○ ○	21

Bottle Xylophone

Uploaded MIDI file: Bad-Apple.mid

Playback

[stop]
BPM: 60   Submit

MIDI Files

- Bad-Apple.mid   [play]   [delete]

Upload MIDI File

Choose File   No file chosen   Submit

Bottle Xylophone

BPM set to 110

Playback

[stop]
BPM: 110 Submit

MIDI Files

- Bad-Apple.mid [play] [delete]

Upload MIDI File

Choose File No file chosen Submit

Power
Supply

Capacitors

Pi

Servo