mount-rpi-image.sh

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Recent Changes in Tag raspberrypi

- raspios
- PCF8591
- OV7670

Interestring projects

TODO: test them out and write full description on this wiki :-)

- FreeLSS is a laser scanning program for the Raspberry Pi. It allows a Raspberry Pi to function as the core to a complete turn table laser scanning system.
    - https://github.com/hairu/freelss
- PWM on the Raspberry pi - done properly (in hardware, stable)
    - https://github.com/sarfata/pi-blaster
- https://github.com/ali1234/raspi-teletext
- https://github.com/jgarff/rpi_ws281x

- u-boot on sdcard for nfs boot: http://elinux.org/RPi_U-Boot

- RF transmitter for Raspberry Pi https://github.com/F5OEO/rpitx

development

- distcc setup http://openframeworks.cc/setup/raspberrypi/Raspberry-Pi-DISTCC-guide.html
- RPi (Raspbian arm) chroot on x86 Linux
  http://dev.xff.lt/b/archives/2015/01/11/rpi_raspbian_arm_chroot_on_x86_linux/
    - https://wiki.debian.org/QemuUserEmulation
      https://wiki.debian.org/RaspberryPi/qemu-user-static

OV7670

- http://www.raspberrypi.org/phpBB3/viewtopic.php?uid=25856&f=44&t=11839&start=0

DHT11/DHT22

- http://www.tortosaforum.com/raspberrypi/dht11driver.htm
- http://learn.adafruit.com/dht-humidity-sensing-on-raspberry-pi-with-gdocs-logging/overview

BlinkM + i2c

- http://www.raspberrypi.org/forums/viewtopic.php?t=11969

CEC - control your TV

http://www.raspberrypi.org/forum/viewtopic.php?f=35&t=15749

```
root@raspberrypi:/home/pi# git clone https://github.com/Pulse-Eight/libcec.git
root@raspberrypi:/home/pi# cd libcec/
root@raspberrypi:/home/pi/libcec# apt-get install autoconf automake libtool liblockdev1-dev libud
root@raspberrypi:/home/pi/libcec# sh -x bootstrap
root@raspberrypi:/home/pi/libcec# ./configure --with-rpi-include-path=/opt/vc/include/ --with-rpi

################################################################################

libCEC version 2:1:0 configured
```

```
Compilation flags:
  CXXFLAGS :       -g -O2 -fPIC -Wall -Wextra -Wno-missing-field-initializers  -Wno-psabi
  libCEC LDFLAGS : -lbcm_host -llockdev -lrt -ldl -lpthread  -L/opt/vc/lib/ -lvcos -lvchiq_arm -l
  client LDFLAGS : -lrt -ldl -lpthread

Configured features:
  Pulse-Eight CEC Adapter :             yes
  Pulse-Eight CEC Adapter detection :   yes
  Raspberry Pi support :                yes
  TDA995x support :                     no

You can now build libCEC by running:
  make

############################################################################

make install
```

TV on

```
pi@raspberrypi ~ $ echo "on 0" | cec-client -s
```

Hints from forum

screen saver

http://www.raspberrypi.org/phpBB3/viewtopic.php?p=84831#p84831

```
# prevent screensaver from powering down display
setterm -blank 0 -powerdown 0 > /dev/tty0

# clear the display and turn off the flashing cursor
clear > /dev/tty0
setterm -cursor 0 > /dev/tty0

# turn the cursor back on when done with omxplayer
setterm -cursor 1 > /dev/tty0
```

YouTube transcoding in VLC

http://www.raspberrypi.org/phpBB3/viewtopic.php?p=163658#p163658

```
cvlc 'youtube.com/watch?v=XXXXXXXXXX' :sout='#transcode{vcodec=h264,vb=0,fps=0,scale=0,height=720
```

Education materials

- http://pi.cs.man.ac.uk/download/Raspberry_Pi_Education_Manual.pdf
- http://www.ocr.org.uk/qualifications/by-subject/computing/raspberry-pi/

- http://www.cl.cam.ac.uk/projects/raspberrypi/

Raspberry Pi Accessories Starter Kit

http://www.conrad.com/ce/en/product/409208/Raspberry-Pi-Accessories-Starter-Kit?ref=searchDetail

- 1x Rapberry sticker

- Power supply for the Raspberry
- Sturdy acrylic housing, which includes all possible connections for this Raspberry and perfectly protects
- 4 GB SD card to store your programs
    - https://learn.adafruit.com/adafruit-raspberry-pi-lesson-1-preparing-and-sd-card-for-your-raspb
- USB Micro Card Reader
- USB cable (for power supply or the power supply of a PC)
- 3 m Ethernet cable
    - https://learn.adafruit.com/adafruits-raspberry-pi-lesson-6-using-ssh
    - https://learn.adafruit.com/adafruit-raspberry-pi-lesson-7-remote-control-with-vnc
- TTL USB cable
    - https://learn.adafruit.com/adafruits-raspberry-pi-lesson-5-using-a-console-cable/test-and-conf
- PI Cobbler (KIT hereby connect the RP with other circuit boards)
- Large breadboard circuit
- Colored board cable connector

- 5x 560 ohm resistors (for LEDS)
- 3x LED's (red, green, blue)
    - https://learn.adafruit.com/raspberry-pi-e-mail-notifier-using-leds
    - https://learn.adafruit.com/debugging-with-the-raspberry-pi-webide/debug-a-blinking-led
- 5x 10K resistors (for buttons)
- 3x pushbutton
    - https://learn.adafruit.com/playing-sounds-and-using-buttons-with-raspberry-pi/bread-board-se
- 1x photocell
    - https://learn.adafruit.com/basic-resistor-sensor-reading-on-raspberry-pi/basic-photocell-readi
- 1x 1uf capacitor (for photocell)

GPU

- FFT
    - http://www.raspberrypi.org/accelerating-fourier-transforms-using-the-gpu/
    - https://github.com/raspberrypi/userland/tree/master/host_applications/linux/apps/hello_pi/hell
- SHA-256
    - http://rpiplayground.wordpress.com/
    - https://github.com/elorimer/rpi-playground/tree/master/QPU
- Machine learning - the Deep Belief image recognition SDK
    - http://petewarden.com/2014/06/09/deep-learning-on-the-raspberry-pi/
    - http://scientistnobee.wordpress.com/2014/06/20/machine-learning-with-raspberry-pi/

Arduino

- Connect using I2C
  http://www.pihomeserver.fr/en/2013/08/13/raspberry-pi-home-server-arduino-lier-les-deux-via-bus-i2

JTAG

- https://github.com/synthetos/PiOCD/wiki/Using-a-Raspberry-Pi-as-a-JTAG-Dongle

Arduino ProMini 3.3V 8MHz

Disable serial port console

edit `/boot/cmdline.txt` and remove all ttyAMA0 leaving:

```
pi@raspberrypi ~ $ cat /boot/cmdline.txt
dwc_otg.lpm_enable=0 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait
```

also, comment out ttyAMA0 in `/etc/inittab`

connect Arduino serial

RX->TX
TX->RX

https://github.com/dpavlin/avrdude-rpi/tree/fix_channel_in_use

pin definitions in GPIO.RPi are physical pins on board **not** BCM or wiring ip!

P1: The Main GPIO connector							
WiringPi Pin	BCM GPIO	Name	Header		Name	BCM GPIO	WiringPi Pin
		3.3v	1	2	5v		
8	Rv1:0 - Rv2:2	SDA	3	4	5v		
9	Rv1:1 - Rv2:3	SCL	5	6	0v		
7	4	GPIO7	7	8	TxD	14	15
		0v	9	10	RxD	15	16
0	17	GPIO0	11	12	GPIO1	18	1
2	Rv1:21 - Rv2:27	GPIO2	13	14	0v		
3	22	GPIO3	15	16	GPIO4	23	4
		3.3v	17	18	GPIO5	24	5
12	10	MOSI	19	20	0v		
13	9	MISO	21	22	GPIO6	25	6
14	11	SCLK	23	24	CE0	8	10
		0v	25	26	CE1	7	11
WiringPi Pin	BCM GPIO	Name	Header		Name	BCM GPIO	WiringPi Pin

flasing

```
dpavlin@blue:~/Arduino/RF433_Sockets$ scp /tmp/build*.tmp/*.hex pi@rpi.tv:/tmp/
RF433_Sockets.cpp.hex                                         100%   19KB  18.6KB/s   00:00

pi@raspberrypi ~ $ cat avrdude.sh
#!/bin/sh
hex=`ls -t /tmp/*.hex | head -1`
echo "flash hex: $hex"
```

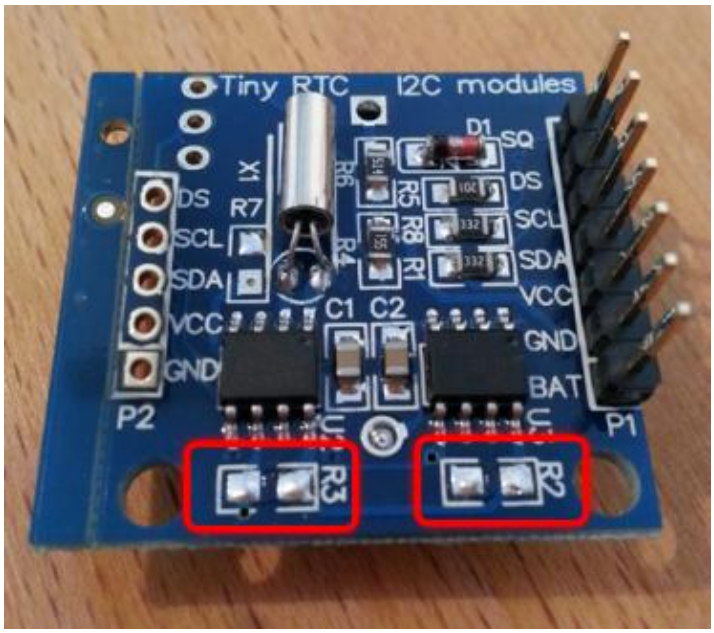
```
sudo /home/pi/avrdude-rpi/avrdude-autoreset -C /home/pi/avrdude.conf -v -v -patmega328p -carduino

pi@raspberrypi ~ $ ./avrdude.sh
flash hex: /tmp/RF433_Sockets.cpp.hex

avrdude: Version 6.1, compiled on Sep 17 2014 at 05:41:35
         Copyright (c) 2000-2005 Brian Dean, http://www.bdmicro.com/
         Copyright (c) 2007-2014 Joerg Wunsch

         System wide configuration file is "/home/pi/avrdude.conf"
         User configuration file is "/root/.avrduderc"
         User configuration file does not exist or is not a regular file, skipping

         Using Port                    : /dev/ttyAMA0
         Using Programmer              : arduino
         Overriding Baud Rate          : 57600
done with autoreset
strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe
strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe
         AVR Part                      : ATmega328P
         Chip Erase delay              : 9000 us
         PAGEL                         : PD7
         BS2                           : PC2
         RESET disposition             : dedicated
         RETRY pulse                   : SCK
         serial program mode           : yes
         parallel program mode         : yes
         Timeout                       : 200
         StabDelay                     : 100
         CmdexeDelay                   : 25
         SyncLoops                     : 32
         ByteDelay                     : 0
         PollIndex                     : 3
         PollValue                     : 0x53
         Memory Detail                 :

                                  Block Poll               Page                       Polled
           Memory Type Mode Delay Size  Indx Paged  Size   Size #Pages MinW  MaxW   ReadBack
           ----------- ---- ----- ----- ---- ------ ------ ---- ------ ----- ----- ---------
           eeprom        65    20     4    0 no       1024    4      0  3600  3600 0xff 0xff
           flash         65     6   128    0 yes     32768  128    256  4500  4500 0xff 0xff
           lfuse          0     0     0    0 no          1    0      0  4500  4500 0x00 0x00
           hfuse          0     0     0    0 no          1    0      0  4500  4500 0x00 0x00
           efuse          0     0     0    0 no          1    0      0  4500  4500 0x00 0x00
           lock           0     0     0    0 no          1    0      0  4500  4500 0x00 0x00
           calibration    0     0     0    0 no          1    0      0     0     0 0x00 0x00
           signature      0     0     0    0 no          3    0      0     0     0 0x00 0x00

         Programmer Type : Arduino
         Description     : Arduino
         Hardware Version: 2
         Firmware Version: 1.16
         Vtarget         : 0.0 V
         Varef           : 0.0 V
         Oscillator      : Off
         SCK period      : 0.1 us

avrdude: AVR device initialized and ready to accept instructions

Reading | ################################################## | 100% 0.01s

avrdude: Device signature = 0x1e950f
avrdude: safemode: lfuse reads as 0
avrdude: safemode: hfuse reads as 0
avrdude: safemode: efuse reads as 0
avrdude: reading input file "/tmp/RF433_Sockets.cpp.hex"
```

```
avrdude: writing flash (6770 bytes):

Writing | ################################################## | 100% 1.98s

avrdude: 6770 bytes of flash written
avrdude: verifying flash memory against /tmp/RF433_Sockets.cpp.hex:
avrdude: load data flash data from input file /tmp/RF433_Sockets.cpp.hex:
avrdude: input file /tmp/RF433_Sockets.cpp.hex contains 6770 bytes
avrdude: reading on-chip flash data:

Reading | ################################################## | 100% 1.49s

avrdude: verifying ...
avrdude: 6770 bytes of flash verified

avrdude: safemode: lfuse reads as 0
avrdude: safemode: hfuse reads as 0
avrdude: safemode: efuse reads as 0
avrdude: safemode: Fuses OK (E:00, H:00, L:00)
strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe
strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe
strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe
strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe
strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe

avrdude done.  Thank you.

strace: |/home/pi/avrdude-rpi/autoreset: Broken pipe
```

DS1307 Tiny RTC

- http://www.instructables.com/id/Set-up-Real-Time-Clock-RTC-on-Raspberry-Pi/
- http://electronics.stackexchange.com/questions/98361/how-to-modify-ds1307-rtc-to-use-3-3v-for-ras

Check if module has 5V pull-up I2C resistors! If it does (like Tiny RTC has R2 and R3) you will have to remove them.



```
root@raspberrypi:/home/pi# apt-get install i2c-tools

root@raspberrypi:/home/pi# modprobe i2c-dev

root@raspberrypi:/home/pi# 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: 50 -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- -- -- -- -- -- -- 68 -- -- -- -- -- -- --
70: -- -- -- -- -- -- -- --

root@raspberrypi:/home/pi# modprobe rtc-ds1307

root@raspberrypi:/home/pi# echo ds1307 0x68 > /sys/class/i2c-adapter/i2c-1/new_device

root@raspberrypi:/home/pi# hwclock --systohc -D --noadjfile --utc
hwclock from util-linux 2.20.1
Using /dev interface to clock.
Assuming hardware clock is kept in UTC time.
Time elapsed since reference time has been 0.722720 seconds.
Delaying further to reach the new time.
Setting Hardware Clock to 11:53:41 = 1429876421 seconds since 1969
ioctl(RTC_SET_TIME) was successful.
```

DS18B20

```
root@raspberrypi:/home/pi# grep w1 /boot/config.txt
dtoverlay=w1-gpio

# reboot

root@raspberrypi:/home/pi# cat /sys/bus/w1/devices/28-0000043c5507/w1_slave
50 05 4b 46 7f ff 0c 10 1c : crc=1c YES
50 05 4b 46 7f ff 0c 10 1c t=85000
```

Hmm, you will also want to remove R1 pullup to make it work?

avrdude

Using Raspberry Pi as Arduino ISP programmer

- https://github.com/onandoffables/avrdude-linuxgpio

```
root@raspberrypi:/home/pi# avrdude -c linuxgpio -p atmega328p

avrdude: AVR device initialized and ready to accept instructions

Reading | ################################################## | 100% 0.00s

avrdude: Device signature = 0x1e950f

avrdude: safemode: Fuses OK (E:05, H:DA, L:FF)
```

```
avrdude done.  Thank you.
```

logic analyzer

- bare metal: https://github.com/tuxyme/metal-pi
- Panalyzer - a RaspberryPi based Logic Analyzer https://github.com/richardghirst/Panalyzer

rotary encoder

http://www.bobrathbone.com/raspberrypi_rotary.htm

SWD

http://www.disk91.com/2015/technology/programming/swd-programming-using-a-raspberrypi/
https://github.com/disk91/PySWD

```
pi@raspberrypi ~ $ git clone https://github.com/disk91/PySWD
pi@raspberrypi ~ $ cd PySWD/
```

PIC

- rpp - PIC Programmer using GPIO http://holdenc.altervista.org/rpp/
- http://mujweb.cz/tlc/rpp/
- https://www.raspberrypi.org/forums/viewtopic.php?f=44&t=14689&start=75
- https://github.com/oh7bf/PiPIC
- https://github.com/WallaceIT/picberry

esp8089

- https://hackaday.io/project/8678-rpi-wifi-hat
- https://github.com/al177/esp8089

PS/2 GPIO

- http://www.deater.net/weave/vmwprod/hardware/pi-ps2/
    - ♦ https://github.com/deater/vmw-meter/blob/master/pi-ps2/linux-kernel/pi-ps2gpio.c

GPIO header annotations

- https://github.com/splitbrain/rpibplusleaf/tree/master

Signal generator

- https://github.com/JamesP6000/WsprryPi

```
pi@rpi2 ~/WsprryPi $ sudo ./wspr --test-tone 1000000
A test tone will be generated at frequency 1.000000 MHz

Using local mbox device file with major 249.
Transmitting test tone on frequency 1.000000 MHz
Press CTRL-C to exit!
```

- http://github.com/gryrmln/RPi_Wobbulator

LCD panels

http://blog.reasonablycorrect.com/raw-dpi-raspberry-pi/

Pi Zero USB OTG

libcomposite

- http://isticktoit.net/?p=1383

PATA IDE emulation

- https://www.retrotronics.org/home-page/netpi-ide/

DPI LCD screen

- http://blog.reasonablycorrect.com/raw-dpi-raspberry-pi/
- https://www.raspberrypi.org/forums/viewtopic.php?p=1023780#p1023780

i2c clock stretching

- https://github.com/raspberrypi/linux/issues/254#issuecomment-217047171