

BENTI <small>DIGITAL AUDIO R&D</small>	DEMOCRACY DEV BOARD SOFTWARE	heig-vd
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Authors :	Michel Starkier, Florian Vaussard	

Democracy DEV Board Software

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1. Democracy DEV Board Software Set up

1.1. Creating a new image for your SD Card

A script to create a new image for the SD card of the Raspberry Pi is available in the /software folder of the USB stick. Please take the following steps:

- Insert a microSD card of at least 4GB in your Linux computer
- Identify the /dev entry of the SD card using dmesg
- Copy the /software folder from the USB stick into a local directory of your computer
- Make sure your computer is connected to the internet
- Run the `setup-sdcard.sh` script as root (assuming /dev/sde is your SD card)

```
$ sudo ./setup-sdcard.sh /dev/sde
```

```
-----
Creating SD Card for Morpheus Board on /dev/sde
-----
```

```
Do you really want to erase the drive /dev/sde? [yN] ? y
-> Local copy of Raspbian OS found
-> Copying Raspbian OS to the card. This will take a while...

-> Copying files into boot partition...

-> Copying userspace files...
-> Done!

-> Synchronizing I/O operations on SD card...

SD card successfully created for /dev/sde !
```

This script will:

- Download Raspbian OS if it does not find any local copy
- Unzip and perform a raw copy of the OS onto your SD card
- Mount the partitions (boot and rootfs)
- Copy the kernel, device tree, config file into the boot partition
- Copy kernel modules and some userspace scripts/program into the rootfs partition
- Sync and umount

After that, at the first start-up of your new SD card, you will need an internet connection on the board to complete the installation.

By default, the IP address is static (169.254.0.2). Depending on your internet connection configuration, you may need to enable DHCP. To do so, please edit "interfaces" file under the software/sd-card/rootfs/etc/network folder, as follows:

```
iface eth0 inet dhcp

#address 169.254.0.2

#netmask 255.255.255.0

#network 169.254.0.0
```

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When switching on the board, the Green LED will blink. The second LED lighting up in blue will notify the installation is running.

When the second LED (in blue) switches off, the installation is complete.

You can switch off the board and configure back to a static IP address by editing the interfaces file as follows:

```
iface eth0 inet static
```

```
address 169.254.0.2
```

```
netmask 255.255.255.0
```

```
network 169.254.0.0
```

You can now run again the board.

First of all, you will need to configure the alsamixer with the right parameters:

```
# cd morpheus/cirrus-scripts
```

```
# alsactl --file asound_morpheus.state restore
```

The SD card is now ready to use with default parameters.

1.2. Creating an image from your SD card

You can create an image from your SD card by following the steps below:

- Insert the SD card in your computer.
- Identify the /dev (/dev/sdX) entry of the SD card using dmesg
- Unmount the SD card with the command: `sudo umount /dev/sdX`
- Create the img: `sudo dd if=/dev/sdX of=SD_card_Mboard.img bs=1024 count=5000000`

The image size is 5GB. If needed, you can increase the size by changing the value: count=5000000.

1.3. Copying an image on your SD card.

If you want to create a new SD card with the image (SD_card_Morpheus_2016_11_16.img) available in the USB stick, under the /image folder, you can follow the steps below:

- Insert the SD card in your computer.
- Identify the /dev (/dev/sdX) entry of the SD card using dmesg
- Unmount the SD card with the command: `sudo umount /dev/sdX`
- Copy the img: `sudo dd if=SD_card_Morpheus_2016_11_16.img of=/dev/sdX bs=1024`

The image is now available on your SD card, and the SD card is ready to be used with default parameters.

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2. Configuring the Cirrus Audio

You can find configuration scripts inside the home folder of the Raspberry Pi under `/home/pi/morpheus/cirrus-scripts/`.

```
pi@raspberrypi:~/morpheus/cirrus-scripts$ ls
Playback_to_Headset.sh  Record_from_Headset.sh      SPDIF_playback.sh
Playback_to_Lineout.sh  Record_from_lineIn_Micbias.sh SPDIF_record.sh
Playback_to_Speakers.sh Record_from_lineIn.sh
Record_from_DMIC.sh     Reset_paths.sh
```

Each script enables you to configure a specific audio path. For example, you can perform the following actions to reset the audio paths, and then enable playback to LineOut and capture from LineIn.

```
./Reset_paths.sh
./Playback_to_Lineout.sh
./Record_from_lineIn.sh
```

3. Configuring the Audio Bypass

The audio bypass is used to redirect Guitar In directly to Amp Out without being processed by the Democracy DEV board.

You thus have to disable the audio bypass before doing any processing on the Democracy DEV board. This is done by setting a GPIO. A script is available to simplify this process.

```
# ./set-passthrough.sh -h
```

Usage:

```
./set-passthrough.sh <enable-passthrough>
```

enable-passthrough:

```
0 -> Passthrough is disabled (audio is going in/out of Cirrus)
1 -> Passthrough is enabled (guitar in goes to amp out)
```

```
# ./set-passthrough.sh 0
Passthrough GPIO: 507
Exporting GPIO 507 to 507
Setting GPIO 507 to 507 as out
Setting GPIO 507 to 507 as 1
```

4. Configuring the Expression Controller

You can find a configuration script inside the home folder of the Raspberry Pi under `/home/pi/morpheus/scripts/`.

The script `adg2188-set-active.sh` enables you to select which mode is used by the expression pedal (passive TRS, passive TS or active).

Here is an example to set the mode to Passive TRS (tip expression). Note that you must run the script as root.

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```
$ ./adg2188-set-mode.sh -h
```

Usage:

```
./adg2188-set-mode.sh <mode> <digipot>
```

mode:

```
1 -> Passive TRS (tip expression)
2 -> Passive TRS (ring expression)
3 -> Passive TS
4 -> Active
```

digipot:

```
10 -> Use the 10k potentiometer
50 -> Use the 50k potentiometer
```

```
$ sudo ./adg2188-set-mode.sh 1 50
```

```
Setting mode: Passive TRS (tip expression) 50K
adg2188: open chip on adapter 1 at address 0x70
adg2188: open chip on adapter 1 at address 0x70
adg2188: open chip on adapter 1 at address 0x70
adg2188: open chip on adapter 1 at address 0x70
```

4.1. Getting Values from Pedal In

Go into the directory **/sys/devices/platform/soc/3f804000.i2c/i2c-1/1-0036**.

There should be a folder called iio:deviceX, where X can be any number (defined by Linux, 0 in this case).

```
# cd /sys/devices/platform/soc/3f804000.i2c/i2c-1/1-0036/iio:device0
root@raspberrypi:/sys/devices/platform/soc/3f804000.i2c/i2c-1/1-0036/iio:device0# ls -l
total 0
drwxr-xr-x 2 root root    0 Jun 24 10:35 buffer
-r--r--r-- 1 root root 4096 Jun 24 10:35 dev
-rw-r--r-- 1 root root 4096 Jun 24 10:35 in_voltage-voltage_scale
-rw-r--r-- 1 root root 4096 Jun 24 10:35 in_voltage0-voltage1_raw
-rw-r--r-- 1 root root 4096 Jun 24 10:35 in_voltage0_raw
-rw-r--r-- 1 root root 4096 Jun 24 10:35 in_voltage1-voltage0_raw
-rw-r--r-- 1 root root 4096 Jun 24 10:35 in_voltage1_raw
-rw-r--r-- 1 root root 4096 Jun 24 10:35 in_voltage_scale
-r--r--r-- 1 root root 4096 Jun 24 10:35 name
lrwxrwxrwx 1 root root    0 Jun 24 10:35 of_node ->
../../../../../../../../firmware/devicetree/base/soc/i2c@7e804000/max11644@36
drwxr-xr-x 2 root root    0 Jun 24 10:35 power
drwxr-xr-x 2 root root    0 Jun 24 10:35 scan_elements
lrwxrwxrwx 1 root root    0 Jun 24 10:35 subsystem ->
../../../../../../../../bus/iio
drwxr-xr-x 2 root root    0 Jun 24 10:35 trigger
-rw-r--r-- 1 root root 4096 Jun 24 10:32 uevent
```

You can read the file `in_voltage0_raw` to get the current measure.

Here is an example script to read out the result at about 10 Hz:

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```

root@raspberrypi:/sys/devices/platform/soc/3f804000.i2c/i2c-1/1-
0036/iio:device0# while true; do cat in_voltage0_raw ; sleep 0.1; done
190
188
184
182
180
177
176
173
171
169
167
165
...

```

If you want more flexibility, you can use libiio (<https://github.com/analogdevicesinc/libiio>) from a program written in C.

4.2. Setting Values for Pedal Out

Go into the directory `/sys/devices/platform/soc/3f804000.i2c/i2c-1/1-00xy`, where xy is **2e** for the 10k potentiometer and **2f** for the 50k potentiometer.
There should be a folder called `iio:deviceX`, where X can be any number (defined by Linux).

For example, for the 10k potentiometer:

```

# cd /sys/devices/platform/soc/3f804000.i2c/i2c-1/1-002e
root@raspberrypi:/sys/devices/platform/soc/3f804000.i2c/i2c-1/1-002e# ls -l
total 0
lrwxrwxrwx 1 root root    0 May 26 22:13 driver ->
../../../../../../../../bus/i2c/drivers/mcp4531
drwxr-xr-x 3 root root    0 May 26 22:13 iio:device2
-r--r--r-- 1 root root 4096 May 26 22:13 modalias
-r--r--r-- 1 root root 4096 May 26 22:13 name
lrwxrwxrwx 1 root root    0 May 26 22:13 of_node ->
../../../../../../../../firmware/devicetree/base/soc/i2c@7e804000/mcp4561_10k@2e
drwxr-xr-x 2 root root    0 May 26 22:13 power
lrwxrwxrwx 1 root root    0 May 26 22:13 subsystem -> ../../../../../../../../../../bus/i2c
-rw-r--r-- 1 root root 4096 May 26 22:13 uevent
root@raspberrypi:/sys/devices/platform/soc/3f804000.i2c/i2c-1/1-002e# cd
iio\:device2/
root@raspberrypi:/sys/devices/platform/soc/3f804000.i2c/i2c-1/1-
002e/iio:device2# ls -l
total 0
-r--r--r-- 1 root root 4096 May 26 21:08 dev
-r--r--r-- 1 root root 4096 May 26 21:08 name
lrwxrwxrwx 1 root root    0 May 26 21:08 of_node ->
../../../../../../../../firmware/devicetree/base/soc/i2c@7e804000/mcp4561_10k@2e
-rw-r--r-- 1 root root 4096 May 26 22:10 out_resistance0_raw
-rw-r--r-- 1 root root 4096 May 26 21:08 out_resistance_scale
drwxr-xr-x 2 root root    0 May 26 21:08 power
lrwxrwxrwx 1 root root    0 May 26 21:08 subsystem ->
../../../../../../../../bus/iio
-rw-r--r-- 1 root root 4096 May 26 21:08 uevent

```

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Then write any number between 0 (min resistance) and 256 (max resistance) into `out_resistance0_raw`.

Here is a simple command to test with a linear sweep between min and max values:

```
# for i in `seq 0 256`; do echo $i; echo $i > out_resistance0_raw; sleep 0.05;
done
0
1
2
3
4
5
6
7
8
9
10
...
```

If you want more flexibility, you can use `libiio` (<https://github.com/analogdevicesinc/libiio>) from a program written in C.

5. Reading Footswitches

Footswitches are connected to GPIOs on the Raspberry Pi 3. A script is available to easily read their state.

```
# ./read_footswitch.sh
Footswitch 1
1
Footswitch 2
1
Footswitch 3
1
Footswitch 4
1
```

6. Changing the LEDs Color

The color of each RGB LED can be set using a simple helper script. It takes as first argument the LED's name (level or power).

The color is then given as a R/G/B triplet, each value between 0 and 255. Due to the limited number of PWM steps (32), several triplets will lead to the same final color.

```
# ./set-rgb-led.sh -h
Wrong number of arguments!
```

```
Usage:
./set-rgb-led.sh <led> <R> <G> <B>
```

```
led:
level
power
```

```
root@raspberrypi:~/morpheus/scripts# ./set-rgb-led.sh level 140 200 50
```

You can also directly use the `sysfs` interface from Linux, under `/sys/class/leds/`.

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Appendix - Kernel Log



The default log in is:

Username: pi

Password: raspberry

The current kernel logs are as follows:



```
[ 0.000000] Booting Linux on physical CPU 0x0
[ 0.000000] Initializing cgroup subsys cpuset
[ 0.000000] Initializing cgroup subsys cpu
[ 0.000000] Initializing cgroup subsys cpuacct
[ 0.000000] Linux version 4.4.8-v7+ (florian@a23pc05) (gcc version 5.2.1 20151010
(Ubuntu 5.2.1-22ubuntu1) ) #18 SMP Fri May 27 15:06:10 CEST 2016
[ 0.000000] CPU: ARMv7 Processor [410fd034] revision 4 (ARMv7), cr=10c5383d
[ 0.000000] CPU: PIPT / VIPT nonaliasing data cache, VIPT aliasing instruction cache
[ 0.000000] Machine model: Raspberry Pi 3 Model B Rev 1.2
[ 0.000000] cma: Reserved 8 MiB at 0x3a800000
[ 0.000000] Memory policy: Data cache writealloc
[ 0.000000] On node 0 totalpages: 241664
[ 0.000000] free_area_init_node: node 0, pgdat 808e3800, node_mem_map b9fa6000
[ 0.000000]   Normal zone: 2124 pages used for memmap
[ 0.000000]   Normal zone: 0 pages reserved
[ 0.000000]   Normal zone: 241664 pages, LIFO batch:31
[ 0.000000] [bcm2709_smp_init_cpus] enter (9520->f3003010)
[ 0.000000] [bcm2709_smp_init_cpus] ncores=4
[ 0.000000] PERCPU: Embedded 13 pages/cpu @b9f61000 s22592 r8192 d22464 u53248
[ 0.000000] pcpu-alloc: s22592 r8192 d22464 u53248 alloc=13*4096
[ 0.000000] pcpu-alloc: [0] 0 [0] 1 [0] 2 [0] 3
[ 0.000000] Built 1 zonelists in Zone order, mobility grouping on. Total pages:
239540
[ 0.000000] Kernel command line: 8250.nr_uarts=1 dma.dmachans=0x7f35
bcm2708_fb.fbwidth=656 bcm2708_fb.fbheight=416 bcm2709.boardrev=0xa02082
bcm2709.serial=0x2ca3e3a2 smsc95xx.macaddr=B8:27:EB:A3:E3:A2 bcm2708_fb.fbswap=1
bcm2709.uat
[ 0.000000] PID hash table entries: 4096 (order: 2, 16384 bytes)
[ 0.000000] Dentry cache hash table entries: 131072 (order: 7, 524288 bytes)
[ 0.000000] Inode-cache hash table entries: 65536 (order: 6, 262144 bytes)
[ 0.000000] Memory: 938940K/966656K available (6417K kernel code, 435K rwddata, 1776K
rodata, 476K init, 764K bss, 19524K reserved, 8192K cma-reserved)
[ 0.000000] Virtual kernel memory layout:
vector : 0xffff0000 - 0xffff1000 ( 4 kB)
fixmap : 0xffc00000 - 0xfff00000 (3072 kB)
vmalloc : 0xbb800000 - 0xff800000 (1088 MB)
lowmem : 0x80000000 - 0xbb000000 ( 944 MB)
modules : 0x7f000000 - 0x80000000 ( 16 MB)
.text : 0x80008000 - 0x808086ac (8194 kB)
.init : 0x80809000 - 0x80880000 ( 476 kB)
.data : 0x80880000 - 0x808eccf0 ( 436 kB)
.bss : 0x808ef000 - 0x809ae294 ( 765 kB)
[ 0.000000] SLUB: HWalign=64, Order=0-3, MinObjects=0, CPUs=4, Nodes=1
[ 0.000000] Hierarchical RCU implementation.
[ 0.000000] Build-time adjustment of leaf fanout to 32.
[ 0.000000] NR_IRQS:16 nr_irqs:16 16
[ 0.000000] Architected cp15 timer(s) running at 19.20MHz (phys).
[ 0.000000] clocksource: arch_sys_counter: mask: 0xffffffffffffff max_cycles:
0x46d987e47, max_idle_ns: 440795202767 ns
[ 0.000007] sched_clock: 56 bits at 19MHz, resolution 52ns, wraps every
4398046511078ns
```

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[ 0.000025] Switching to timer-based delay loop, resolution 52ns
[ 0.000275] Console: colour dummy device 80x30
[ 0.001322] console [tty1] enabled
[ 0.001377] Calibrating delay loop (skipped), value calculated using timer frequency..
38.40 BogoMIPS (lpj=192000)
[ 0.001446] pid_max: default: 32768 minimum: 301
[ 0.001762] Mount-cache hash table entries: 2048 (order: 1, 8192 bytes)
[ 0.001805] Mountpoint-cache hash table entries: 2048 (order: 1, 8192 bytes)
[ 0.002748] Disabling cpuset control group subsystem
[ 0.002805] Initializing cgroup subsys io
[ 0.002856] Initializing cgroup subsys memory
[ 0.002916] Initializing cgroup subsys devices
[ 0.002959] Initializing cgroup subsys freezer
[ 0.003002] Initializing cgroup subsys net_cls
[ 0.003071] CPU: Testing write buffer coherency: ok
[ 0.003160] ftrace: allocating 21434 entries in 63 pages
[ 0.057004] CPU0: update cpu_capacity 1024
[ 0.057070] CPU0: thread -1, cpu 0, socket 0, mpidr 80000000
[ 0.057104] [bcm2709_smp_prepare_cpus] enter
[ 0.057252] Setting up static identity map for 0x8240 - 0x8274
[ 0.058882] [bcm2709_boot_secondary] cpu:1 started (0) 18
[ 0.059074] [bcm2709_secondary_init] enter cpu:1
[ 0.059117] CPU1: update cpu_capacity 1024
[ 0.059123] CPU1: thread -1, cpu 1, socket 0, mpidr 80000001
[ 0.059497] [bcm2709_boot_secondary] cpu:2 started (0) 17
[ 0.059662] [bcm2709_secondary_init] enter cpu:2
[ 0.059683] CPU2: update cpu_capacity 1024
[ 0.059689] CPU2: thread -1, cpu 2, socket 0, mpidr 80000002
[ 0.060044] [bcm2709_boot_secondary] cpu:3 started (0) 17
[ 0.060175] [bcm2709_secondary_init] enter cpu:3
[ 0.060195] CPU3: update cpu_capacity 1024
[ 0.060201] CPU3: thread -1, cpu 3, socket 0, mpidr 80000003
[ 0.060261] Brought up 4 CPUs
[ 0.060361] SMP: Total of 4 processors activated (153.60 BogoMIPS).
[ 0.060391] CPU: All CPU(s) started in HYP mode.
[ 0.060417] CPU: Virtualization extensions available.
[ 0.061054] devtmpfs: initialized
[ 0.071769] VFP support v0.3: implementor 41 architecture 3 part 40 variant 3 rev 4
[ 0.072140] clocksource: jiffies: mask: 0xffffffff max_cycles: 0xffffffff,
max_idle_ns: 19112604462750000 ns
[ 0.072857] pinctrl core: initialized pinctrl subsystem
[ 0.073809] NET: Registered protocol family 16
[ 0.078966] DMA: preallocated 4096 KiB pool for atomic coherent allocations
[ 0.086818] bcm2709: Mini UART enabled
[ 0.086878] hw-breakpoint: found 5 (+1 reserved) breakpoint and 4 watchpoint
registers.
[ 0.086926] hw-breakpoint: maximum watchpoint size is 8 bytes.
[ 0.087122] Serial: AMBA PL011 UART driver
[ 0.087295] uart-pl011 3f201000.uart: could not find pctldev for node
/soc/gpio@7e200000/uart0_pins, deferring probe
[ 0.087507] bcm2835-mbox 3f00b880.mailbox: mailbox enabled
[ 0.157673] bcm2835-dma 3f007000.dma: DMA legacy API manager at f3007000, dmachans=0x1
[ 0.159302] SCSI subsystem initialized
[ 0.159482] usbcore: registered new interface driver usbfs
[ 0.159588] usbcore: registered new interface driver hub
[ 0.159702] usbcore: registered new device driver usb
[ 0.166555] raspberrypi-firmware soc:firmware: Attached to firmware from 2016-05-06
13:53
[ 0.193759] clocksource: Switched to clocksource arch_sys_counter
[ 0.240582] FS-Cache: Loaded
[ 0.240894] CacheFiles: Loaded
[ 0.253163] NET: Registered protocol family 2
[ 0.254055] TCP established hash table entries: 8192 (order: 3, 32768 bytes)
[ 0.254192] TCP bind hash table entries: 8192 (order: 4, 65536 bytes)



```

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```

[ 0.254403] TCP: Hash tables configured (established 8192 bind 8192)
[ 0.254520] UDP hash table entries: 512 (order: 2, 16384 bytes)
[ 0.254588] UDP-Lite hash table entries: 512 (order: 2, 16384 bytes)
[ 0.254834] NET: Registered protocol family 1
[ 0.255176] RPC: Registered named UNIX socket transport module.
[ 0.255208] RPC: Registered udp transport module.
[ 0.255236] RPC: Registered tcp transport module.
[ 0.255264] RPC: Registered tcp NFSv4.1 backchannel transport module.
[ 0.256308] hw perfevents: enabled with armv7_cortex_a7 PMU driver, 7 counters
available
[ 0.257665] futex hash table entries: 1024 (order: 4, 65536 bytes)
[ 0.270996] VFS: Disk quotas dquot_6.6.0
[ 0.271283] VFS: Dquot-cache hash table entries: 1024 (order 0, 4096 bytes)
[ 0.273493] FS-Cache: Netfs 'nfs' registered for caching
[ 0.274478] NFS: Registering the id_resolver key type
[ 0.274541] Key type id_resolver registered
[ 0.274569] Key type id_legacy registered
[ 0.276881] Block layer SCSI generic (bsg) driver version 0.4 loaded (major 251)
[ 0.277042] io scheduler noop registered
[ 0.277080] io scheduler deadline registered (default)
[ 0.277153] io scheduler cfq registered
[ 0.279717] BCM2708FB: allocated DMA memory fac00000
[ 0.279764] BCM2708FB: allocated DMA channel 0 @ f3007000
[ 0.284994] Console: switching to colour frame buffer device 82x26
[ 0.289564] Serial: 8250/16550 driver, 1 ports, IRQ sharing disabled
[ 0.291964] console [ttyS0] disabled
[ 0.293436] 3f215040.uart: ttyS0 at MMIO 0x3f215040 (irq = 59, base_baud = 31250000)
is a 16550
[ 1.025797] console [ttyS0] enabled
[ 2.030287] bcm2835-rng 3f104000.rng: hwrng registered
[ 2.037105] vc-cma: Videocore CMA driver
[ 2.042472] vc-cma: vc_cma_base = 0x00000000
[ 2.048618] vc-cma: vc_cma_size = 0x00000000 (0 MiB)
[ 2.055431] vc-cma: vc_cma_initial = 0x00000000 (0 MiB)
[ 2.062441] vc-mem: phys_addr:0x00000000 mem_base=0x3dc00000 mem_size:0x3f000000(1008
MiB)
[ 2.088114] brd: module loaded
[ 2.101028] loop: module loaded
[ 2.106389] vchiq: vchiq_init_state: slot_zero = 0xbac80000, is_master = 0
[ 2.116124] Loading iSCSI transport class v2.0-870.
[ 2.123025] usbcore: registered new interface driver smsc95xx
[ 2.130276] dwc_otg: version 3.00a 10-AUG-2012 (platform bus)
[ 2.337749] Core Release: 2.80a
[ 2.342304] Setting default values for core params
[ 2.348573] Finished setting default values for core params
[ 2.555981] Using Buffer DMA mode
[ 2.560676] Periodic Transfer Interrupt Enhancement - disabled
[ 2.567955] Multiprocessor Interrupt Enhancement - disabled
[ 2.574935] OTG VER PARAM: 0, OTG VER FLAG: 0
[ 2.580667] Dedicated Tx FIFOs mode
[ 2.585820] WARN::dwc_otg_hcd_init:1047: FIQ DMA bounce buffers: virt = 0xbac14000 dma
= 0xfac14000 len=9024
[ 2.598547] FIQ FSM acceleration enabled for :
Non-periodic Split Transactions
Periodic Split Transactions
High-Speed Isochronous Endpoints
Interrupt/Control Split Transaction hack enabled
[ 2.628160] dwc_otg: Microframe scheduler enabled
[ 2.628208] WARN::hcd_init_fiq:413: FIQ on core 1 at 0x8044f4c4
[ 2.635632] WARN::hcd_init_fiq:414: FIQ ASM at 0x8044f828 length 36
[ 2.643375] WARN::hcd_init_fiq:439: MPHI regs_base at 0xbb922000
[ 2.650886] dwc_otg 3f980000.usb: DWC OTG Controller
[ 2.657306] dwc_otg 3f980000.usb: new USB bus registered, assigned bus number 1
[ 2.666130] dwc_otg 3f980000.usb: irq 62, io mem 0x00000000


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[ 2.673159] Init: Port Power? op_state=1
[ 2.678475] Init: Power Port (0)
[ 2.683218] usb usb1: New USB device found, idVendor=1d6b, idProduct=0002
[ 2.691477] usb usb1: New USB device strings: Mfr=3, Product=2, SerialNumber=1
[ 2.700165] usb usb1: Product: DWC OTG Controller
[ 2.706267] usb usb1: Manufacturer: Linux 4.4.8-v7+ dwc_otg_hcd
[ 2.713600] usb usb1: SerialNumber: 3f980000.usb
[ 2.720383] hub 1-0:1.0: USB hub found
[ 2.725514] hub 1-0:1.0: 1 port detected
[ 2.731220] dwc_otg: FIQ enabled
[ 2.731229] dwc_otg: NAK holdoff enabled
[ 2.731237] dwc_otg: FIQ split-transaction FSM enabled
[ 2.731275] Module dwc_common_port init
[ 2.731519] usbcore: registered new interface driver usb-storage
[ 2.739107] mousedev: PS/2 mouse device common for all mice
[ 2.746748] bcm2835-cpufreq: min=600000 max=1200000
[ 2.753220] sdhci: Secure Digital Host Controller Interface driver
[ 2.760840] sdhci: Copyright(c) Pierre Ossman
[ 2.766892] sdhost: log_buf @ bac13000 (fac13000)
[ 2.843790] mmc0: sdhost-bcm2835 loaded - DMA enabled (>1)
[ 2.852940] mmc-bcm2835 3f300000.mmc: mmc_debug:0 mmc_debug2:0
[ 2.860217] mmc-bcm2835 3f300000.mmc: DMA channel allocated
[ 2.900825] mmc0: host does not support reading read-only switch, assuming write-
enable
[ 2.903872] sdhci-pltfm: SDHCI platform and OF driver helper
[ 2.904305] ledtrig-cpu: registered to indicate activity on CPUs
[ 2.904414] hidraw: raw HID events driver (C) Jiri Kosina
[ 2.904592] usbcore: registered new interface driver usbhid
[ 2.904595] usbhid: USB HID core driver
[ 2.905355] Initializing XFRM netlink socket
[ 2.905378] NET: Registered protocol family 17
[ 2.905495] Key type dns_resolver registered
[ 2.905974] Registering SWP/SWPB emulation handler
[ 2.906740] registered taskstats version 1
[ 2.906928] vc-sm: Videocore shared memory driver
[ 2.906937] [vc_sm_connected_init]: start
[ 2.919067] [vc_sm_connected_init]: end - returning 0
[ 2.920426] 3f201000.uart: ttyAMA0 at MMIO 0x3f201000 (irq = 87, base_baud = 0) is a
PL011 rev2
[ 2.920803] of_cfs_init
[ 2.920876] of_cfs_init: OK
[ 2.923875] Indeed it is in host mode hprt0 = 00021501
[ 3.018320] Waiting for root device /dev/mmcblk0p2...
[ 3.020230] mmc0: new high speed SDHC card at address 59b4
[ 3.020839] mmcblk0: mmc0:59b4 USDU1 15.0 GiB
[ 3.034816] mmcblk0: p1 p2
[ 3.052793] mmc1: queuing unknown CIS tuple 0x80 (2 bytes)
[ 3.061140] mmc1: queuing unknown CIS tuple 0x80 (3 bytes)
[ 3.069452] mmc1: queuing unknown CIS tuple 0x80 (3 bytes)
[ 3.070445] EXT4-fs (mmcblk0p2): mounted filesystem with ordered data mode. Opts:
(null)
[ 3.070493] VFS: Mounted root (ext4 filesystem) readonly on device 179:2.
[ 3.077209] devtmpfs: mounted
[ 3.077963] Freeing unused kernel memory: 476K (80809000 - 80880000)
[ 3.103789] usb 1-1: new high-speed USB device number 2 using dwc_otg
[ 3.103922] Indeed it is in host mode hprt0 = 00001101
[ 3.124077] mmc1: queuing unknown CIS tuple 0x80 (7 bytes)
[ 3.222718] mmc1: new high speed SDIO card at address 0001
[ 3.304061] usb 1-1: New USB device found, idVendor=0424, idProduct=9514
[ 3.312291] usb 1-1: New USB device strings: Mfr=0, Product=0, SerialNumber=0
[ 3.321733] hub 1-1:1.0: USB hub found
[ 3.327101] hub 1-1:1.0: 5 ports detected
[ 3.365071] random: systemd urandom read with 45 bits of entropy available

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[ 3.377672] systemd[1]: systemd 215 running in system mode. (+PAM +AUDIT +SELINUX +IMA
+SYSVINIT +LIBCRYPTSETUP +GCRYPT +ACL +XZ -SECCOMP -APPARMOR)
[ 3.394538] systemd[1]: Detected architecture 'arm'.
[ 3.532521] NET: Registered protocol family 10
[ 3.539969] systemd[1]: Inserted module 'ipv6'
[ 3.549241] systemd[1]: Set hostname to <raspberrypi>.
[ 3.603805] usb 1-1.1: new high-speed USB device number 3 using dwc_otg
[ 3.724200] usb 1-1.1: New USB device found, idVendor=0424, idProduct=ec00
[ 3.732714] usb 1-1.1: New USB device strings: Mfr=0, Product=0, SerialNumber=0
[ 3.744526] smsc95xx v1.0.4
[ 3.807203] smsc95xx 1-1.1:1.0 eth0: register 'smc95xx' at usb-3f980000.usb-1.1,
smc95xx USB 2.0 Ethernet, b8:27:eb:a3:e3:a2
[ 3.953485] systemd[1]: Expecting device dev-ttyS0.device...
[ 3.962928] systemd[1]: Starting Forward Password Requests to Wall Directory Watch.
[ 3.974032] systemd[1]: Started Forward Password Requests to Wall Directory Watch.
[ 3.984975] systemd[1]: Starting Remote File Systems (Pre).
[ 3.994176] systemd[1]: Reached target Remote File Systems (Pre).
[ 4.002056] systemd[1]: Starting Encrypted Volumes.
[ 4.010569] systemd[1]: Reached target Encrypted Volumes.
[ 4.017872] systemd[1]: Starting Arbitrary Executable File Formats File System
Automount Point.
[ 4.032519] systemd[1]: Set up automount Arbitrary Executable File Formats File System
Automount Point.
[ 4.045721] systemd[1]: Starting Swap.
[ 4.053310] systemd[1]: Reached target Swap.
[ 4.059413] systemd[1]: Expecting device dev-mmcblk0p1.device...
[ 4.069200] systemd[1]: Starting Root Slice.
[ 4.077152] systemd[1]: Created slice Root Slice.
[ 4.083541] systemd[1]: Starting User and Session Slice.
[ 4.092465] systemd[1]: Created slice User and Session Slice.
[ 4.099905] systemd[1]: Starting /dev/initctl Compatibility Named Pipe.
[ 4.110199] systemd[1]: Listening on /dev/initctl Compatibility Named Pipe.
[ 4.118924] systemd[1]: Starting Delayed Shutdown Socket.
[ 4.127925] systemd[1]: Listening on Delayed Shutdown Socket.
[ 4.135373] systemd[1]: Starting Journal Socket (/dev/log).
[ 4.144431] systemd[1]: Listening on Journal Socket (/dev/log).
[ 4.151973] systemd[1]: Starting udev Control Socket.
[ 4.160420] systemd[1]: Listening on udev Control Socket.
[ 4.167477] systemd[1]: Starting udev Kernel Socket.
[ 4.175816] systemd[1]: Listening on udev Kernel Socket.
[ 4.182770] systemd[1]: Starting Journal Socket.
[ 4.190833] systemd[1]: Listening on Journal Socket.
[ 4.197516] systemd[1]: Starting System Slice.
[ 4.205413] systemd[1]: Created slice System Slice.
[ 4.211912] systemd[1]: Starting File System Check on Root Device...
[ 4.264325] systemd[1]: Starting system-systemd\x2dfsck.slice.
[ 4.274075] systemd[1]: Created slice system-systemd\x2dfsck.slice.
[ 4.282065] systemd[1]: Starting system-autologin.slice.
[ 4.291601] systemd[1]: Created slice system-autologin.slice.
[ 4.299163] systemd[1]: Starting system-serial\x2dgetty.slice.
[ 4.308904] systemd[1]: Created slice system-serial\x2dgetty.slice.
[ 4.317004] systemd[1]: Starting Increase datagram queue length...
[ 4.329101] systemd[1]: Starting Restore / save the current clock...
[ 4.367953] systemd[1]: Starting Load Kernel Modules...
[ 4.380171] systemd[1]: Starting udev Coldplug all Devices...
[ 4.392551] systemd[1]: Mounted Huge Pages File System.
[ 4.402475] systemd[1]: Starting Create list of required static device nodes for the
current kernel...
[ 4.479839] systemd[1]: Started Set Up Additional Binary Formats.
[ 4.488541] systemd[1]: Mounting POSIX Message Queue File System...
[ 4.529348] fuse init (API version 7.23)
[ 4.554614] systemd[1]: Mounting Debug File System...
[ 4.567760] systemd[1]: Starting Slices.
[ 4.576772] systemd[1]: Reached target Slices.
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[ 4.587712] i2c /dev entries driver
[ 4.595508] systemd[1]: Started Increase datagram queue length.
[ 4.615671] systemd[1]: Started Restore / save the current clock.
[ 4.626483] systemd[1]: Started Load Kernel Modules.
[ 4.638748] systemd[1]: Started Create list of required static device nodes for the
current kernel.
[ 4.654333] systemd[1]: Mounted POSIX Message Queue File System.
[ 4.664654] systemd[1]: Mounted Debug File System.
[ 4.675356] systemd[1]: Time has been changed
[ 4.684770] systemd[1]: Started udev Coldplug all Devices.
[ 4.747326] systemd[1]: Started File System Check on Root Device.
[ 4.847999] systemd[1]: Starting Create Static Device Nodes in /dev...
[ 4.904362] systemd[1]: Starting Apply Kernel Variables...
[ 4.916643] systemd[1]: Mounting FUSE Control File System...
[ 4.928986] systemd[1]: Mounting Configuration File System...
[ 4.941593] systemd[1]: Starting Syslog Socket.
[ 4.950307] systemd[1]: Listening on Syslog Socket.
[ 4.957166] systemd[1]: Starting Journal Service...
[ 4.964723] systemd[1]: Started Journal Service.
[ 5.130777] systemd-udevd[138]: starting version 215
[ 5.490031] bcm2835-wdt 3f100000.watchdog: Broadcom BCM2835 watchdog timer
[ 5.496959] gpiomem-bcm2835 3f200000.gpiomem: Initialised: Registers at 0x3f200000
[ 5.509212] snd-rpi-wsp sound: ASoC: CPU DAI (null) not registered
[ 5.511250] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.521060] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.538790] 1-0036 supply vcc not found, using dummy regulator
[ 5.542030] max1363: probe of 1-0036 failed with error -5
[ 5.543088] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.544201] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.544875] bcm2708_i2c 3f804000.i2c: BSC1 Controller at 0x3f804000 (irq 83) (baudrate
100000)
[ 5.545139] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.763120] EXT4-fs (mmcblk0p2): re-mounted. Opts: (null)
[ 5.820836] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.825323] pca954x 1-0073: probe failed
[ 5.826827] brcmfmac: brcmf_sdio_drivestrengthinit: No SDIO Drive strength init done
for chip 43430 rev 1 pmurev 24
[ 5.827469] usbcore: registered new interface driver brcmfmac
[ 5.827516] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.843277] wm8804 1-003b: revision E
[ 5.843932] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.861481] LDO1: supplied by DC_1V8
[ 5.861554] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.915362] arizona spi0.1: WM5102 revision C
[ 5.927021] Adding alias for supply MICVDD, (null) -> MICVDD, spi0.1
[ 5.927739] Adding alias for supply MICVDD, (null) -> MICVDD, spi0.1
[ 5.927753] Adding alias for supply DBVDD2, (null) -> DBVDD2, spi0.1
[ 5.927764] Adding alias for supply DBVDD3, (null) -> DBVDD3, spi0.1
[ 5.927774] Adding alias for supply CPVDD, (null) -> CPVDD, spi0.1
[ 5.927784] Adding alias for supply SPKVDDL, (null) -> SPKVDDL, spi0.1
[ 5.927794] Adding alias for supply SPKVDDR, (null) -> SPKVDDR, spi0.1
[ 5.928174] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.940781] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.945900] snd-rpi-wsp sound: ASoC: CODEC DAI wm5102-aif1 not registered
[ 5.979844] brcmfmac: brcmf_c_preinit_dcnds: Firmware version = wl0: Dec 15 2015
18:10:45 version 7.45.41.23 (r606571) FWID 01-cc4eda9c
[ 6.002468] brcmfmac: brcmf_cfg80211_reg_notifier: not a ISO3166 code
[ 6.005193] MICVDD: supplied by DC_1V8
[ 6.090696] snd-rpi-wsp sound: wm5102-aif1 <-> 3f203000.i2s mapping ok
[ 6.143427] brcmfmac: brcmf_cfg80211_reg_notifier: not a ISO3166 code
[ 6.143452] cfg80211: World regulatory domain updated:
[ 6.143461] cfg80211: DFS Master region: unset
[ 6.143470] cfg80211: (start_freq - end_freq @ bandwidth), (max_antenna_gain,
max_eirp), (dfs_cac_time)

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[ 6.143485] cfg80211: (2402000 KHz - 2472000 KHz @ 40000 KHz), (N/A, 2000 mBm),
(N/A)
[ 6.143498] cfg80211: (2457000 KHz - 2482000 KHz @ 40000 KHz), (N/A, 2000 mBm),
(N/A)
[ 6.143510] cfg80211: (2474000 KHz - 2494000 KHz @ 20000 KHz), (N/A, 2000 mBm),
(N/A)
[ 6.143524] cfg80211: (5170000 KHz - 5250000 KHz @ 80000 KHz, 160000 KHz AUTO),
(N/A, 2000 mBm), (N/A)
[ 6.143538] cfg80211: (5250000 KHz - 5330000 KHz @ 80000 KHz, 160000 KHz AUTO),
(N/A, 2000 mBm), (0 s)
[ 6.143550] cfg80211: (5490000 KHz - 5730000 KHz @ 160000 KHz), (N/A, 2000 mBm), (0
s)
[ 6.143562] cfg80211: (5735000 KHz - 5835000 KHz @ 80000 KHz), (N/A, 2000 mBm),
(N/A)
[ 6.143574] cfg80211: (57240000 KHz - 63720000 KHz @ 2160000 KHz), (N/A, 0 mBm),
(N/A)
[ 6.462585] systemd-journald[136]: Received request to flush runtime journal from PID
1
[ 7.058225] brcmfmac: brcmf_add_if: ERROR: netdev:wlan0 already exists
[ 7.058237] brcmfmac: brcmf_add_if: ignore IF event
[ 7.060335] random: nonblocking pool is initialized
[ 7.061948] IPv6: ADDRCONF(NETDEV_UP): wlan0: link is not ready
[ 7.061976] brcmfmac: power management disabled
[ 7.193372] uart-pl011 3f201000.uart: no DMA platform data
[ 7.481870] Adding 102396k swap on /var/swap. Priority:-1 extents:3 across:167936k
SSFS
[ 7.568607] cfg80211: Regulatory domain changed to country: GB
[ 7.568632] cfg80211: DFS Master region: ETSI
[ 7.568642] cfg80211: (start_freq - end_freq @ bandwidth), (max_antenna_gain,
max_eirp), (dfs_cac_time)
[ 7.568655] cfg80211: (2402000 KHz - 2482000 KHz @ 40000 KHz), (N/A, 2000 mBm),
(N/A)
[ 7.568664] cfg80211: (5170000 KHz - 5250000 KHz @ 80000 KHz, 160000 KHz AUTO),
(N/A, 2000 mBm), (N/A)
[ 7.568675] cfg80211: (5250000 KHz - 5330000 KHz @ 80000 KHz, 160000 KHz AUTO),
(N/A, 2000 mBm), (0 s)
[ 7.568689] cfg80211: (5490000 KHz - 5710000 KHz @ 160000 KHz), (N/A, 2700 mBm), (0
s)
[ 7.568705] cfg80211: (57000000 KHz - 66000000 KHz @ 2160000 KHz), (N/A, 4000 mBm),
(N/A)
[ 7.665817] smsc95xx 1-1.1:1.0 eth0: hardware isn't capable of remote wakeup
[ 7.666334] IPv6: ADDRCONF(NETDEV_UP): eth0: link is not ready
[ 9.276936] IPv6: ADDRCONF(NETDEV_CHANGE): eth0: link becomes ready
[ 9.277949] smsc95xx 1-1.1:1.0 eth0: link up, 100Mbps, full-duplex, lpa 0xCDE1
[ 11.803077] Bluetooth: Core ver 2.21
[ 11.803160] NET: Registered protocol family 31
[ 11.803166] Bluetooth: HCI device and connection manager initialized
[ 11.804002] Bluetooth: HCI socket layer initialized
[ 11.804028] Bluetooth: L2CAP socket layer initialized
[ 11.804080] Bluetooth: SCO socket layer initialized
[ 12.005393] Bluetooth: HCI UART driver ver 2.3
[ 12.005409] Bluetooth: HCI UART protocol H4 registered
[ 12.005414] Bluetooth: HCI UART protocol Three-wire (H5) registered
[ 12.005551] Bluetooth: HCI UART protocol BCM registered
[ 13.812544] Bluetooth: BNEP (Ethernet Emulation) ver 1.3
[ 13.812557] Bluetooth: BNEP filters: protocol multicast
[ 13.812573] Bluetooth: BNEP socket layer initialized
[ 24.265224] bcm2835-i2s 3f203000.i2s: I2S SYNC error!
[ 24.405734] bcm2835-i2s 3f203000.i2s: I2S SYNC error!
[ 24.449813] bcm2835-i2s 3f203000.i2s: I2S SYNC error!
[ 24.459658] bcm2835-i2s 3f203000.i2s: I2S SYNC error!
[ 25.638542] bcm2835-dma 3f007000.dma: DMA transfer could not be terminated
[ 25.644159] bcm2835-dma 3f007000.dma: DMA transfer could not be terminated
```