

Schematics and service manual for i9250: [Samsung_i9250_schem_sm.rar](#)

t=0x0fad01x0 [0,0]

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```
127|root@maguro:/ # cat /proc/cpuinfo
Processor      : ARMv7 Processor rev 10 (v7l)
processor      : 0
BogoMIPS      : 1194.24

processor      : 1
BogoMIPS      : 1194.24

Features       : swp half thumb fastmult vfp edsp thumbee neon vfpv3
CPU implementer : 0x41
CPU architecture: 7
CPU variant    : 0x2
CPU part       : 0xc09
CPU revision   : 10

Hardware       : Tuna
Revision      : 0009
Serial        : 014994b30201c013
```

BLE

- <https://github.com/metc/galaxy-nexus-ble>

GSM modem over serial port

- <https://github.com/2b-as/xgoldmon>

HID keyboard

- <https://github.com/pelya/android-keyboard-gadget>

Unlegacy Android

ASOP for OMAP4 devices:

<https://forum.xda-developers.com/galaxy-nexus/development/rom-omap4-aosp-project-t3334574>

<https://github.com/Unlegacy-Android/>

kernel

<http://unlegacy-android.cf/>

https://github.com/Unlegacy-Android/android_kernel_samsung_tuna

```
dpavlin@klin:/virtual/android/galaxy-nexus$ git clone https://android.googlesource.com/platform/p
dpavlin@klin:/virtual/android/galaxy-nexus/omap$ git checkout -b asop-7.1 unlegacy/aosp-7.1
dpavlin@klin:/virtual/android/galaxy-nexus/omap$ make tuna_defconfig ARCH=arm
dpavlin@klin:/virtual/android/galaxy-nexus/omap$ cp include/linux/compiler-gcc4.h include/linux/c
dpavlin@klin:/virtual/android/galaxy-nexus/omap$ make -j9 ARCH=arm CROSS_COMPILE=arm-none-eabi-
```

OMAP4 USB boot

Somewhat interesting things that I can take a look at some time in the future:

- <https://github.com/swetland/omap4boot>
 - ◆ newer(ish) version is on <https://github.com/dmitry-pervushin/usbboot-omap4>

To compile it needs following change:

```
dpavlin@nuc:/nuc/Galaxy-Nexus-i9250/usbboot-omap4$ git diff
diff --git a/Makefile b/Makefile
index 2d10c73..9ea9461 100644
--- a/Makefile
+++ b/Makefile
@@ -38,7 +38,7 @@ BINDIR ?= $(DESTDIR)/usr/bin
  DATADIR ?= $(DESTDIR)/usr/share/usbboot
  DOCDIR ?= $(DESTDIR)/usr/share/doc/usbboot

-BOARD ?= panda
+BOARD ?= tuna

  TARGET_CC := $(TOOLCHAIN)gcc
  TARGET_LD := $(TOOLCHAIN)ld
diff --git a/tools/usb-linux.c b/tools/usb-linux.c
index e3492a1..09c40de 100755
--- a/tools/usb-linux.c
+++ b/tools/usb-linux.c
@@ -10,7 +10,7 @@ int linux_usb_init(void)
     r = libusb_init(&ctx);
     if (r != 0)
         return r;
```

```

-     libusb_set_debug(ctx, 0x1);
+     //libusb_set_debug(ctx, 0x1);
return 0;
}

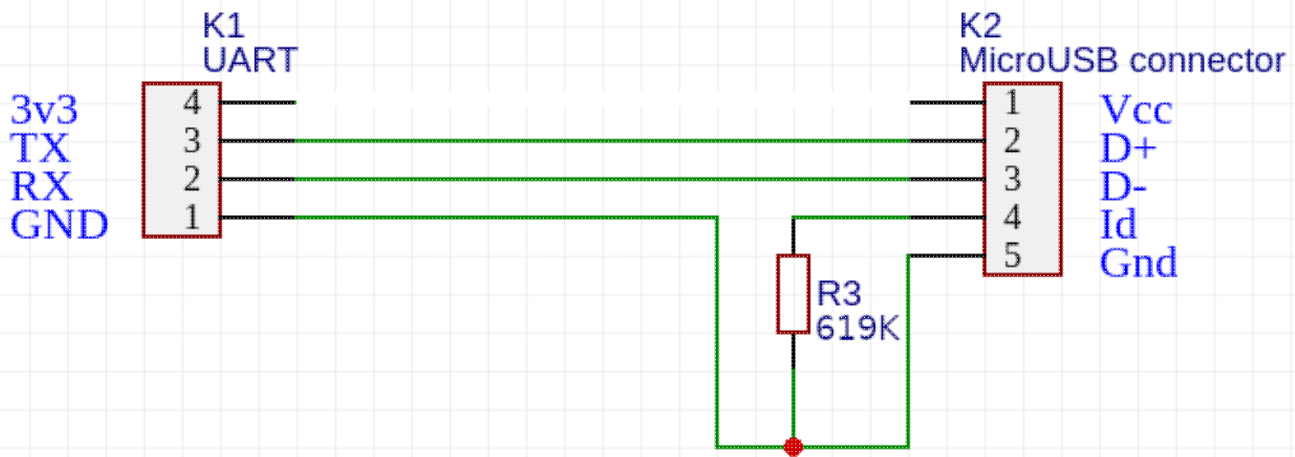
```

Odin

- <http://glassechidna.com.au/heimdall/>

serial

- https://wiki.postmarketos.org/wiki/Serial_debugging#USB_debug_cable



t=0x9fb5100

Device	Codename	Resistor (R3)	Connected VCC
Google Galaxy Nexus (GSM)	samsung-maguro	619K ohm	No
Samsung Galaxy Mini 2	samsung-s6500d	530K ohm	No
Samsung Galaxy S4 Mini LTE	samsung-i9195	619K ohm	No
Samsung Galaxy S5	samsung-klte	619K ohm	No

It seems that other suggestion is 150k from

<https://redmine.replicant.us/projects/replicant/wiki/SamsungSerial> - I will have to test which value works

UART modes

- https://wiki.postmarketos.org/wiki/Micro-USB_Interface_Controller

t=0x9fb74c0

Resistance	Jig	Boot	cell=0x9fb7608 [0,2]
150k	Inactive	Inactive	cell=0x9fb7608 [1,2]
523k	Active	Inactive	cell=0x9fb7608 [2,2]
619k	Active	Active	cell=0x9fb7608 [3,2]

```

RID_USB_OTG_MODE,          /* 0 0 0 0 0      GND          USB OTG Mode          */
RID_AUD_SEND_END_BTN,     /* 0 0 0 0 1      2K          Audio Send_End Button*/
RID_AUD_REMOTE_S1_BTN,    /* 0 0 0 1 0      2.604K      Audio Remote S1 Button */
RID_AUD_REMOTE_S2_BTN,    /* 0 0 0 1 1      3.208K      Audio Remote S2 Button
RID_AUD_REMOTE_S3_BTN,    /* 0 0 1 0 0      4.014K      Audio Remote S3 Button */
RID_AUD_REMOTE_S4_BTN,    /* 0 0 1 0 1      4.82K       Audio Remote S4 Button */
RID_AUD_REMOTE_S5_BTN,    /* 0 0 1 1 0      6.03K       Audio Remote S5 Button */
RID_AUD_REMOTE_S6_BTN,    /* 0 0 1 1 1      8.03K       Audio Remote S6 Button */
RID_AUD_REMOTE_S7_BTN,    /* 0 1 0 0 0      10.03K      Audio Remote S7 Button */
RID_AUD_REMOTE_S8_BTN,    /* 0 1 0 0 1      12.03K      Audio Remote S8 Button */
RID_AUD_REMOTE_S9_BTN,    /* 0 1 0 1 0      14.46K      Audio Remote S9 Button */
RID_AUD_REMOTE_S10_BTN,   /* 0 1 0 1 1      17.26K      Audio Remote S10 Button */
RID_AUD_REMOTE_S11_BTN,   /* 0 1 1 0 0      20.5K       Audio Remote S11 Button */
RID_AUD_REMOTE_S12_BTN,   /* 0 1 1 0 1      24.07K      Audio Remote S12 Button */
RID_RESERVED_1,          /* 0 1 1 1 0      28.7K       Reserved Accessory #1 */
RID_RESERVED_2,          /* 0 1 1 1 1      34K         Reserved Accessory #2 */
RID_RESERVED_3,          /* 1 0 0 0 0      40.2K       Reserved Accessory #3 */
RID_RESERVED_4,          /* 1 0 0 0 1      49.9K       Reserved Accessory #4 */
RID_RESERVED_5,          /* 1 0 0 1 0      64.9K       Reserved Accessory #5 */
RID_AUD_DEV_TY_2,        /* 1 0 0 1 1      80.07K      Audio Device Type 2 */
RID_PHONE_PWD_DEV,       /* 1 0 1 0 0      102K        Phone Powered Device */
RID_TTY_CONVERTER,       /* 1 0 1 0 1      121K        TTY Converter */
RID_UART_CABLE,          /* 1 0 1 1 0      150K        UART Cable */
RID_CEA936A_TY_1,        /* 1 0 1 1 1      200K        CEA936A Type-1 Charger(1) */
RID_FM_BOOT_OFF_USB,     /* 1 1 0 0 0      255K        Factory Mode Boot OFF-USB */
RID_FM_BOOT_ON_USB,      /* 1 1 0 0 1      301K        Factory Mode Boot ON-USB */
RID_AUD_VDO_CABLE,       /* 1 1 0 1 0      365K        Audio/Video Cable */
RID_CEA936A_TY_2,        /* 1 1 0 1 1      442K        CEA936A Type-2 Charger(1) */
RID_FM_BOOT_OFF_UART,    /* 1 1 1 0 0      523K        Factory Mode Boot OFF-UART */
RID_FM_BOOT_ON_UART,     /* 1 1 1 0 1      619K        Factory Mode Boot ON-UART */
RID_AUD_DEV_TY_1_REMOTE, /* 1 1 1 1 0      1000.07K    Audio Device Type 1 with Remote(1) */
RID_AUD_DEV_TY_1_SEND = RID_AUD_DEV_TY_1_REMOTE, /* 1 1 1 1 0 1002K    Audio Device Type
RID_USB_MODE,            /* 1 1 1 1 1      Open        USB Mode, Dedicated Charger or Accessory

```

Binary Value ⁽⁴⁾	ID_CON resistance to GND			Access
	Min.	Typ.	Max.	
00000	GND	GND	GND	DC
00001	1.9kΩ	2kΩ	2.1kΩ	Audio S
00010	2.47kΩ	2.604kΩ	2.73kΩ	Audio Re
00011	3.05kΩ	3.208kΩ	3.37kΩ	Audio Re
00100	3.81kΩ	4.014kΩ	4.21kΩ	Audio Re
00101	4.58kΩ	4.82kΩ	5.06kΩ	Audio Re
00110	5.73kΩ	6.03kΩ	6.33kΩ	Audio Re
00111	7.63kΩ	8.03kΩ	8.43kΩ	Audio Re
01000	9.53kΩ	10.03kΩ	10.53kΩ	Audio Re
01001	11.43kΩ	12.03kΩ	12.63kΩ	Audio Re
01010	13.74kΩ	14.46kΩ	15.18kΩ	Audio Re
01011	16.4kΩ	17.26kΩ	18.12kΩ	Audio Re
01100	19.48kΩ	20.5kΩ	21.53kΩ	Audio Re
01101	22.87kΩ	24.07kΩ	25.27kΩ	Audio Re
01110	27.27kΩ	28.7kΩ	30.14kΩ	Reserv
01111	32.3kΩ	34kΩ	35.7kΩ	Reserv
10000	38.19kΩ	40.2kΩ	42.21kΩ	Reserv
10001	47.41kΩ	49.9kΩ	52.4 kΩ	Reserv
10010	61.66kΩ	64.9kΩ	68.15kΩ	Reserv
10011	76.1kΩ	80.7kΩ	84.1kΩ	DC
10100	96.9kΩ	102kΩ	107.1kΩ	DC
10101	115kΩ	121kΩ	127kΩ	TT
10110	143kΩ	150kΩ	157kΩ	U
10111	190kΩ	200kΩ	210kΩ	S
11000	242kΩ	255kΩ	268kΩ	Factory Mo
11001	292kΩ	301kΩ	316kΩ	Factory Mo
11010	347kΩ	365kΩ	383kΩ	DC
11011	419.9kΩ	442kΩ	464kΩ	S
11100	507kΩ	523kΩ	549kΩ	Factory Mo
11101	588kΩ	619kΩ	650kΩ	Factory Mo
11110	750kΩ	1000kΩ	1050kΩ	Audio Typ
	750kΩ	1002kΩ	1050kΩ	Audio Type

PostmarketOS

```
dpavlin@nuc:/nuc/pmbootstrap$ ./pmbootstrap.py install --no-fde
[17:54:17] *** (1/5) PREPARE NATIVE CHROOT ***
[17:54:18] *** (2/5) CREATE DEVICE ROOTFS ("samsung-maguro") ***
[17:54:23] (rootfs_samsung-maguro) install
[17:54:27] (rootfs_samsung-maguro) install
[17:54:30] (rootfs_samsung-maguro) write /etc/os-release
[17:54:30] (rootfs_samsung-maguro) mkinitfs samsung-maguro
[17:54:34] *** SET LOGIN PASSWORD FOR: 'dpavlin' ***
New password:
Retype new password:
passwd: password updated successfully
[17:54:43] NOTE: No valid keymap specified for device
[17:54:46] *** (3/5) PREPARE INSTALL BLOCKDEVICE ***
[17:54:47] (native) create samsung-maguro.img (361M)
[17:54:47] (native) mount /dev/install (samsung-maguro.img)
[17:54:47] (native) partition /dev/install (boot: 31M, root: the rest)
[17:54:47] (native) format /dev/installp2
[17:54:48] (native) mount /dev/installp2 to /mnt/install
[Tue Sep 25 17:55:21 2018] EXT4-fs (loop0p2): mounted filesystem with ordered data mode. Opts: (n
[17:54:48] (native) format /dev/installp1 (boot, ext2), mount to /mnt/install/boot
[Tue Sep 25 17:55:21 2018] EXT4-fs (loop0p1): mounting ext2 file system using the ext4 subsystem
[Tue Sep 25 17:55:21 2018] EXT4-fs (loop0p1): mounted filesystem without journal. Opts: (null)
[17:54:48] *** (4/5) FILL INSTALL BLOCKDEVICE ***
[17:54:48] (native) copy rootfs_samsung-maguro to /mnt/install/
[17:54:53] *** (5/5) FLASHING TO DEVICE ***
[17:54:53] Run the following to flash your installation to the target device:
[17:54:53] * pmbootstrap flasher flash_rootfs
[17:54:53]   Flashes the generated rootfs image to your device:
[17:54:53]   /nuc/pmbootstrap-work/chroot_native/home/pmos/rootfs/samsung-maguro.img
[17:54:53]   (NOTE: This file has a partition table, which contains /boot and / subpartitions. Th
[17:54:53] * pmbootstrap flasher flash_kernel
[17:54:53]   Flashes the kernel + initramfs to your device:
[17:54:53]   /nuc/pmbootstrap-work/chroot_rootfs_samsung-maguro/boot
[17:54:53]   (NOTE: fastboot also supports booting the kernel/initramfs directly without flashing
[17:54:53] * If the above steps do not work, you can also create symlinks to the generated files
[17:54:53] NOTE: chroot is still active (use 'pmbootstrap shutdown' as necessary)
[17:54:53] Done

dpavlin@nuc:/nuc/pmbootstrap$ alias pmbootstrap=/nuc/pmbootstrap/pmbootstrap.py
dpavlin@nuc:/nuc/pmbootstrap$ pmbootstrap flasher flash_rootfs
[17:57:10] (native) flash rootfs image
< waiting for any device >
[Tue Sep 25 17:59:17 2018] usb 2-3.1: new high-speed USB device number 22 using xhci_hcd
[Tue Sep 25 17:59:17 2018] usb 2-3.1: New USB device found, idVendor=18d1, idProduct=4e30, bcdDev
[Tue Sep 25 17:59:17 2018] usb 2-3.1: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[Tue Sep 25 17:59:17 2018] usb 2-3.1: Product: Android 1.0
[Tue Sep 25 17:59:17 2018] usb 2-3.1: Manufacturer: Google, Inc
[Tue Sep 25 17:59:17 2018] usb 2-3.1: SerialNumber: 014994B00C01A013
target didn't report max-download-size
Erasing 'system'...
OKAY [ 0.047s]
Sending 'system' (369664 KB)...
OKAY [ 50.498s]
Writing 'system'...
OKAY [ 26.436s]
Finished. Total time: 77.024s
[18:00:02] NOTE: chroot is still active (use 'pmbootstrap shutdown' as necessary)
[18:00:02] Done
dpavlin@nuc:/nuc/pmbootstrap$ [Tue Sep 25 19:24:27 2018] usb 2-3.1: USB disconnect, device number
[Tue Sep 25 19:24:27 2018] usb 2-3.1: new high-speed USB device number 23 using xhci_hcd
[Tue Sep 25 19:24:27 2018] usb 2-3.1: unable to get BOS descriptor
[Tue Sep 25 19:24:27 2018] usb 2-3.1: New USB device found, idVendor=0451, idProduct=d010, bcdDev
[Tue Sep 25 19:24:27 2018] usb 2-3.1: New USB device strings: Mfr=33, Product=37, SerialNumber=0
```

```
[Tue Sep 25 19:24:27 2018] usb 2-3.1: Product: OMAP4440  
[Tue Sep 25 19:24:27 2018] usb 2-3.1: Manufacturer: Texas Instruments  
[Tue Sep 25 19:24:30 2018] usb 2-3.1: USB disconnect, device number 23
```

u-boot

- <https://github.com/Ksys-labs/u-boot-tuna>