



openmoko



Openmoko is dead.

Long live OpenPhoenix!

Nikolaus Schaller, Lukas Märdian
LinuxTag, Berlin, May 26th, 2012

Agenda

Part one: some history



Part two: a long way home

Part three: rising from the ashes

Part four: flying higher

Part five: use it as daily phone –
software

Q&A

Some history – Past iterations

- FIC GTA01 – Neo 1973
 - Roughly 3.000 units sold
 - Production discontinued
- Openmoko GTA02 – Neo Freerunner
 - Roughly 15.000 units sold
 - Hardware revision v7
 - Production discontinued



Some history – The End (of part I)

- FIC and Openmoko got out
- Strong community continues development
- Golden Delicious taking the lead
 - Excellent support for existing devices
 - Shipping spare parts and add-ons
 - Tuned GTA02v7++
 - Deep sleep fix (aka bug #1024) -> Improved standby time
 - Bass rework -> Improved sound quality

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A long way home

How do we get to a new open mobile phone?

- open kernel for big $\{\text{BRAND}\}$ – reverse eng.
- order from some $\{\text{MANUFACTURER}\}$ – hope for openness
- DIY, “Use the source, Luke!”

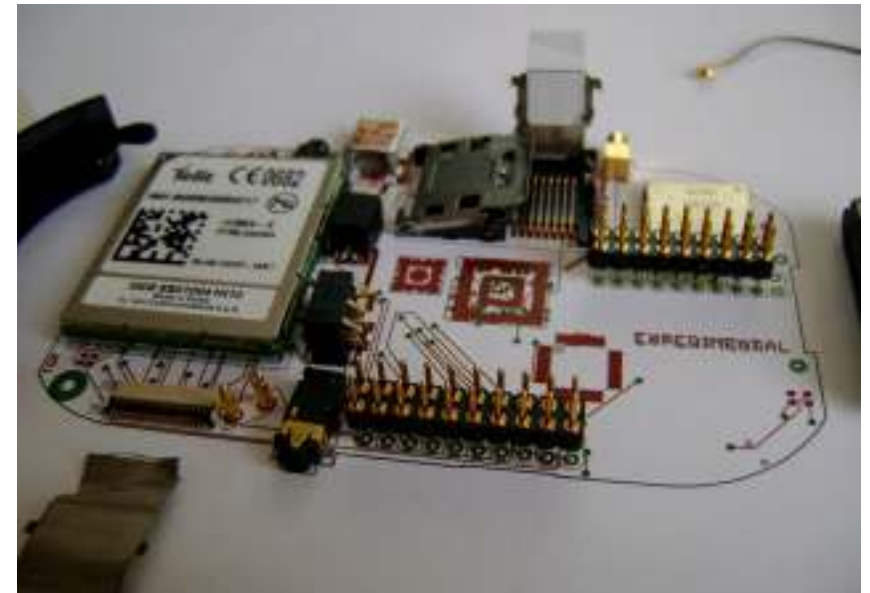
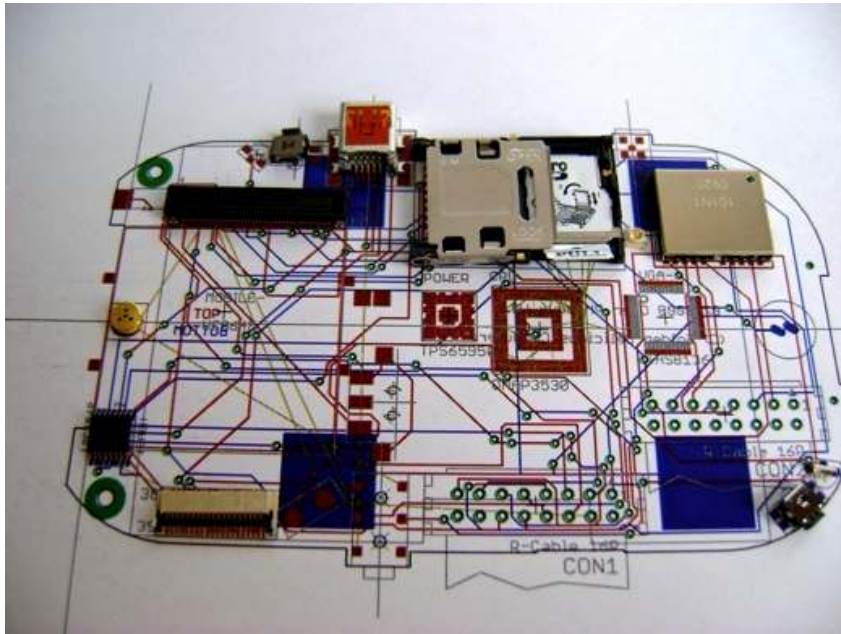
Using the source: Beagleboard



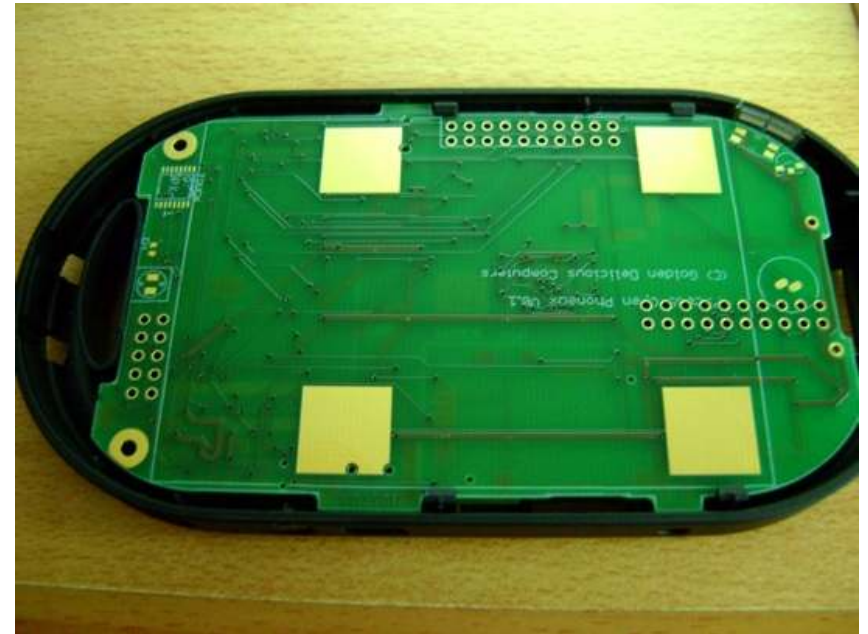
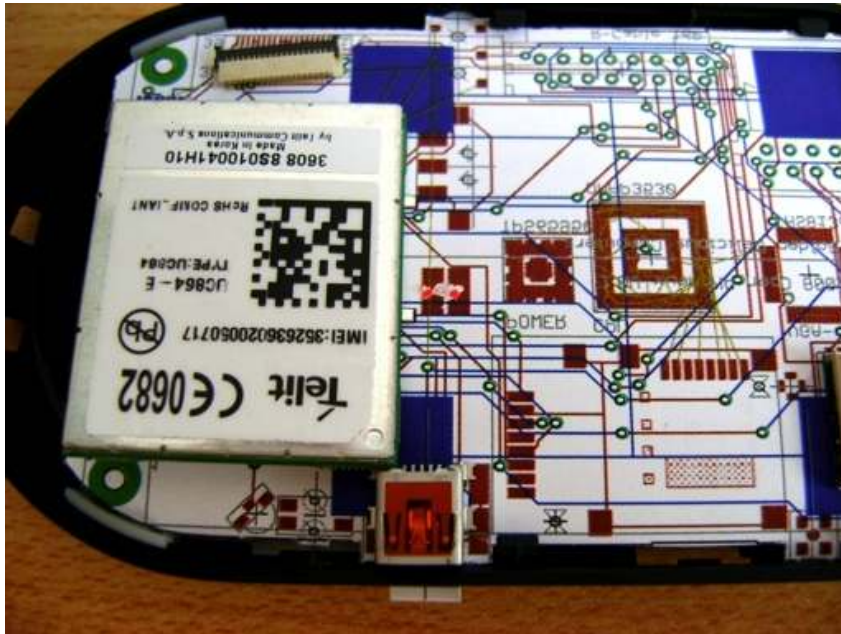
Beagleboard

- Full Linux support
- Open schematics
- Open layout
- Expansion connectors
- Lots of documentation
- Components available

In theory it could fit (Aug. 2010)



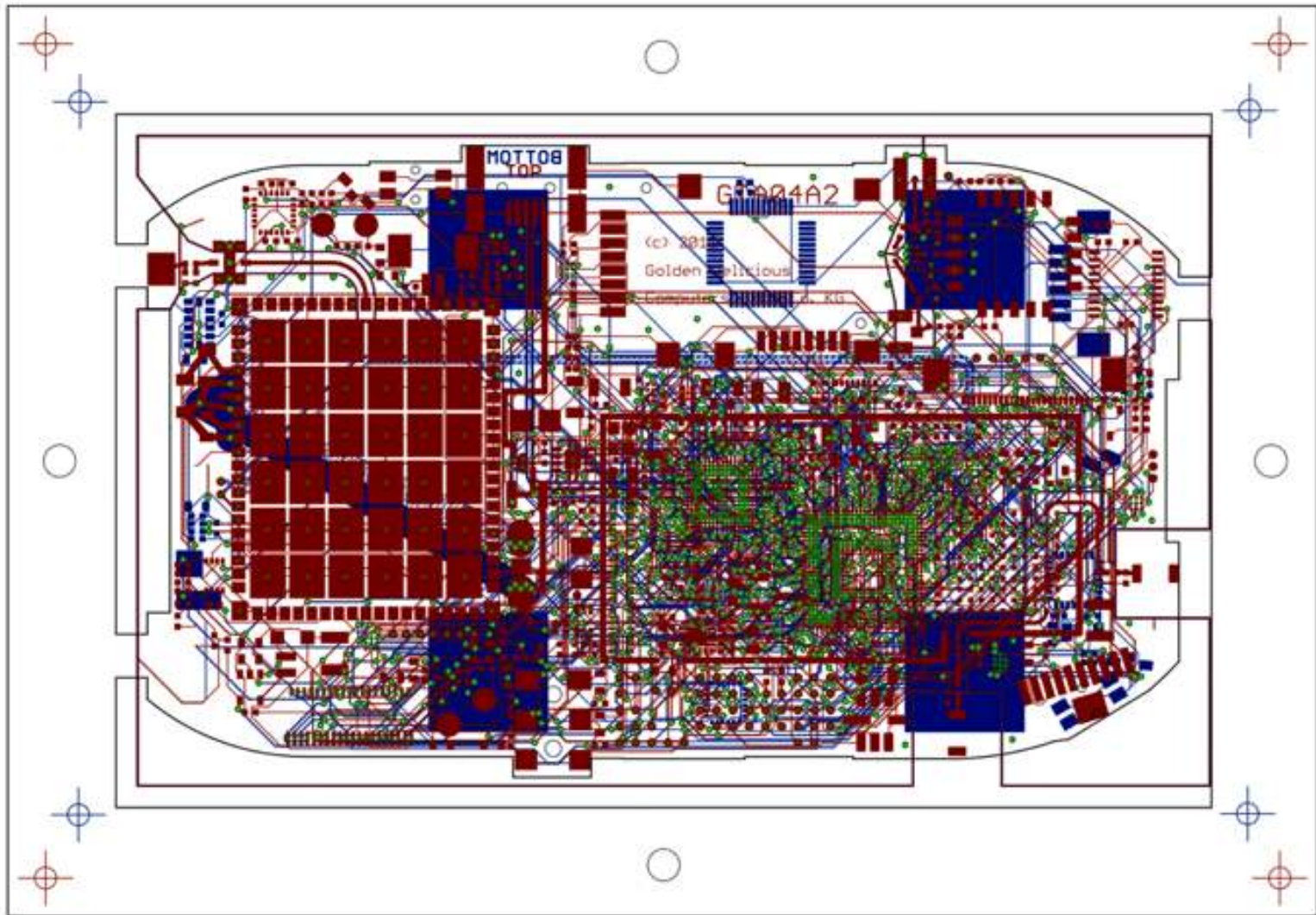
GTA04A1 (Okt. 2010)



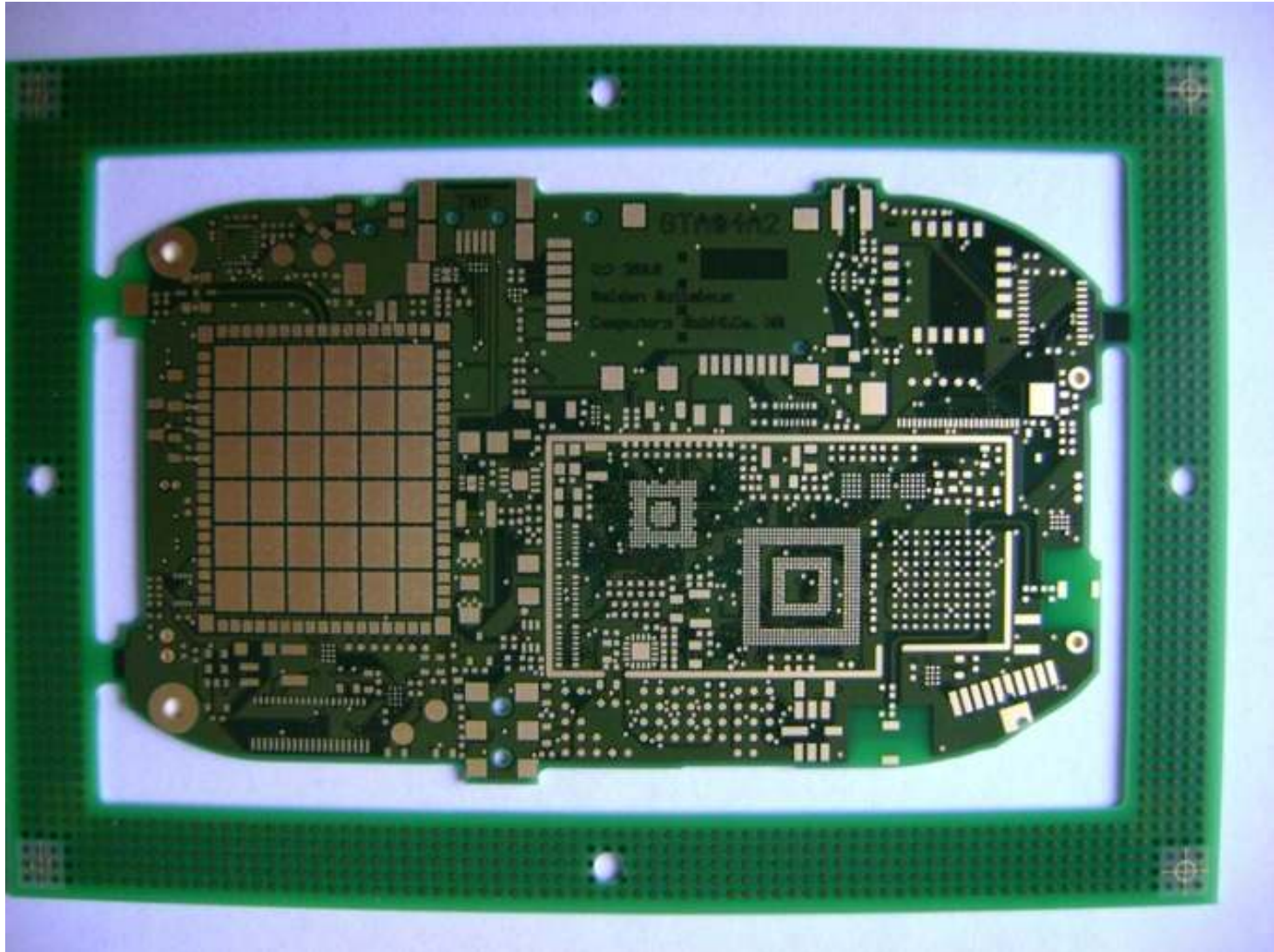
OM-beagle-hybrid (Dec. 2010)



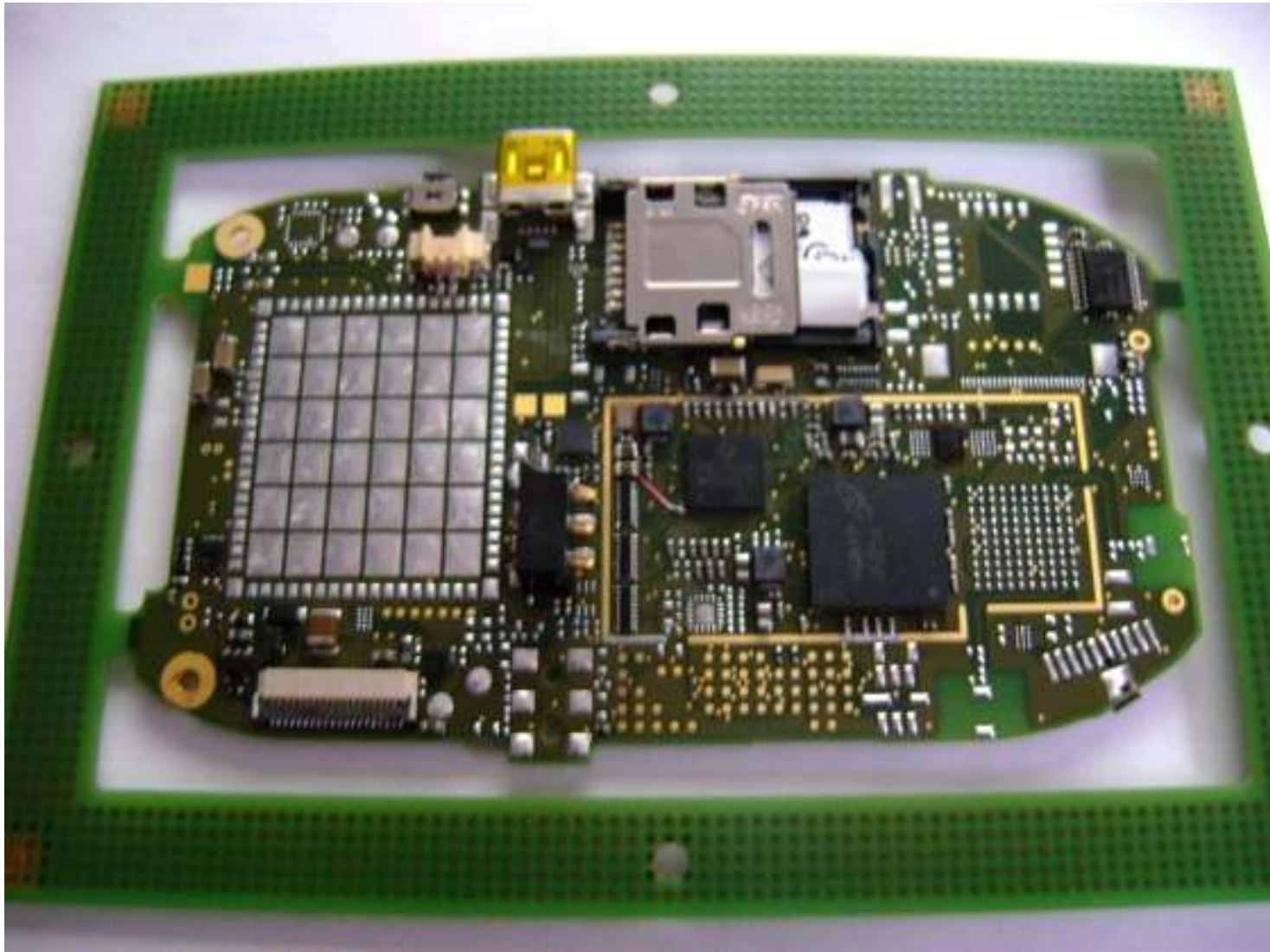
GTA04A2 (Jan. 2011)



GTA04A2 (Feb. 2011)



GTA04A2 (Feb. 2011)



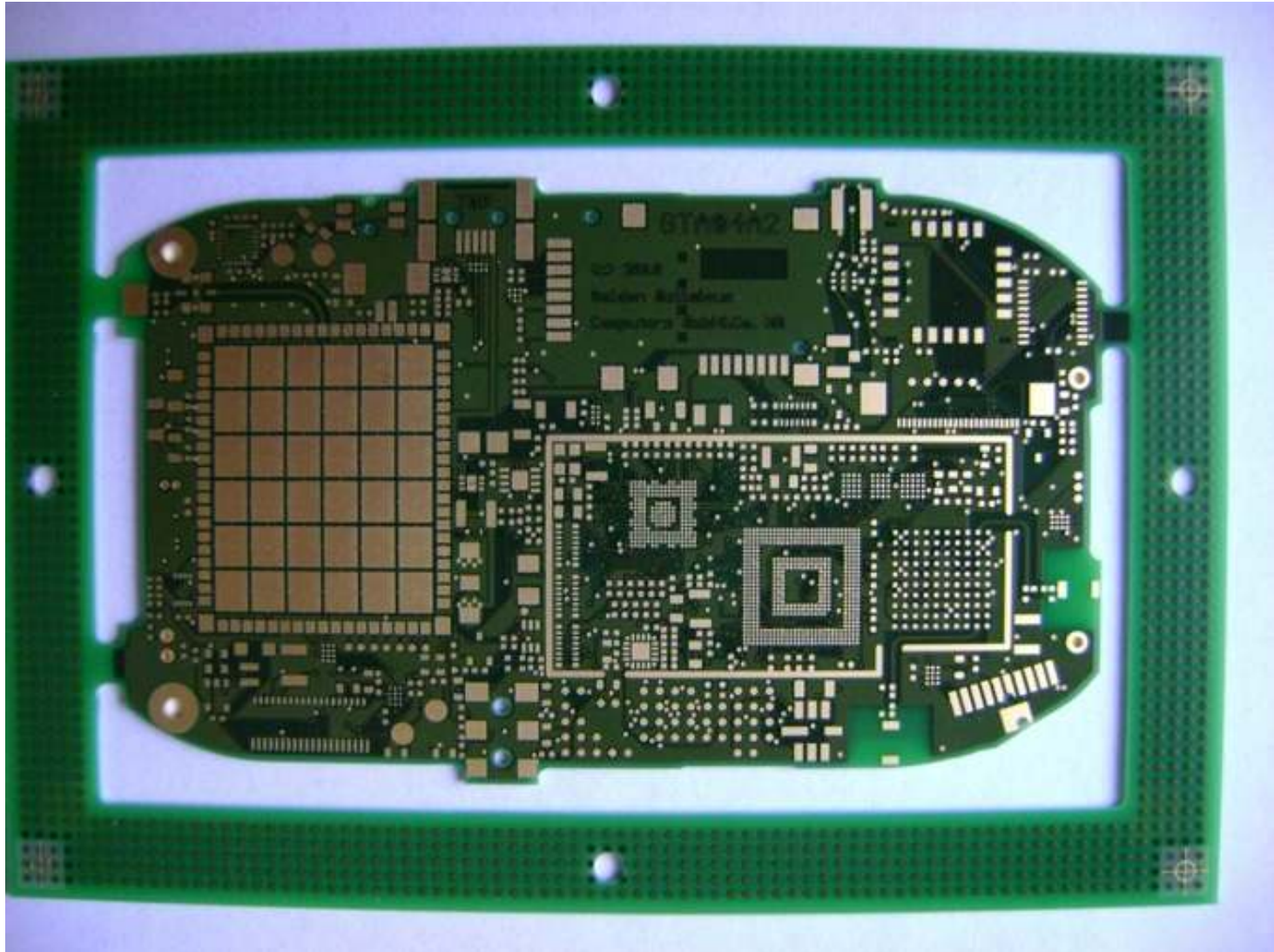
How do we get to a new open mobile phone?

- ~~– open kernel for big $\{BRAND\}$ – reverse eng.~~
- ~~– order from some $\{MANUFACTURER\}$ –
hope for openness~~
- DIY, “Use the source, Luke!”**

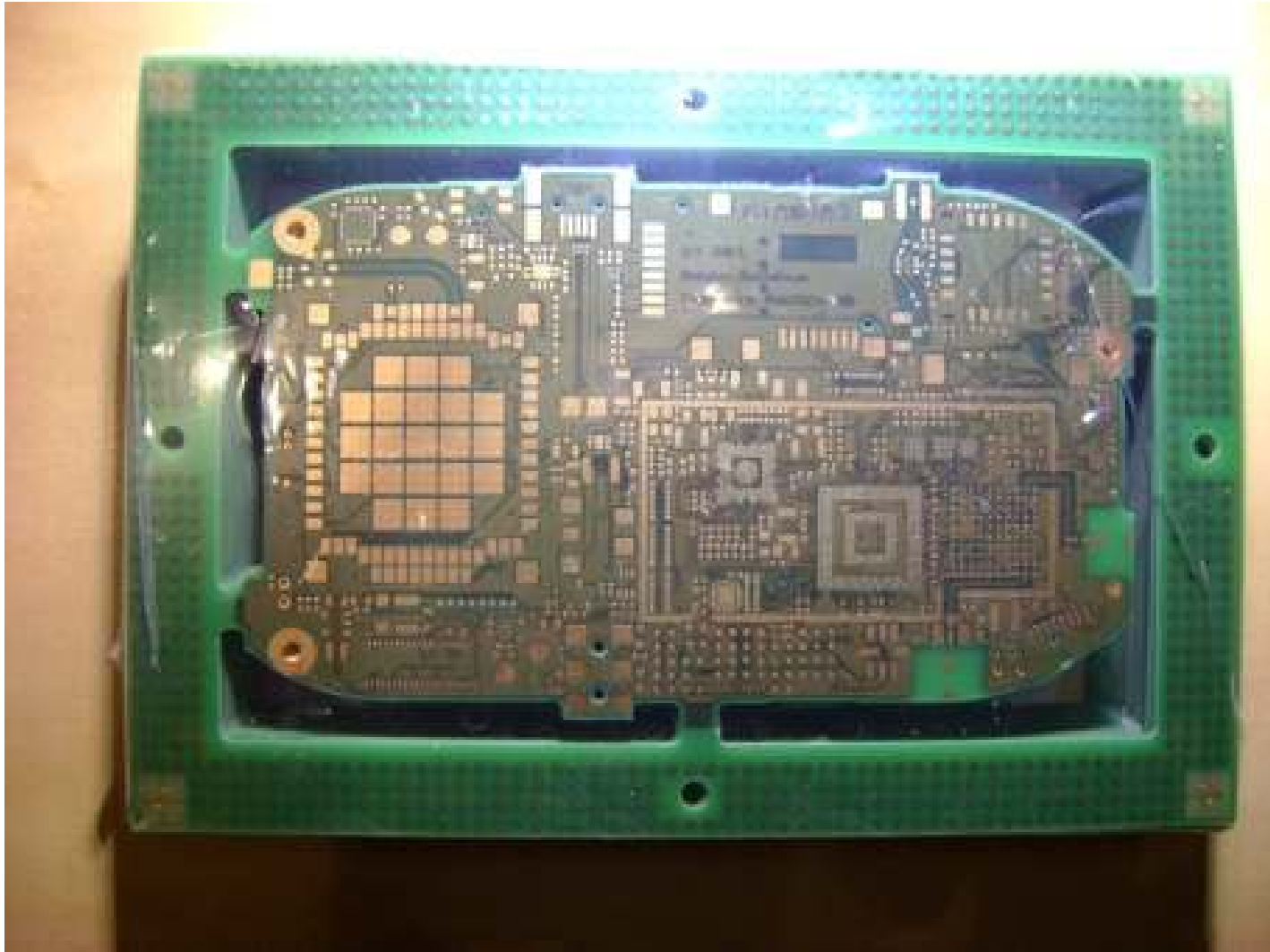
Issues, and how to resolve them

- Switching regulators are complicated
Errors cause unexpected reboots.
Solution: a proper layout (board redesign)
- Do not swap clock and data lines
I²C controls power management chip
No MMC power results in less fun.
Solution: a new board layout
- Components get discontinued
Find replacements (redesign)

Before redesign: GTA04A2 (Feb 2011)



After redesign: GTA04A3 (Mar. 2011)



GTA04A3 (June 2011)



Issues with GTA04A3 (Jul. – Aug. 2011)

- WiFi and BT did not work reliable
 - Rework power supply
 - Identify soldering issues
- Swapped Headset signals
 - Use wires as quick fix

Issues with GTA04A3 (Sep. – Nov. 2011)

- **GPS Bugs (double feature)**
 - Bug from GTA02 copied successfully!
 - Switch MMC clock off (when not needed)
 - Wrong GPS switch installed
 - Change switch chip
- **UMTS module can't be switched off**
 - Reset line did not work as expected
 - Power-On pin was hard wired
 - Requires another board redesign

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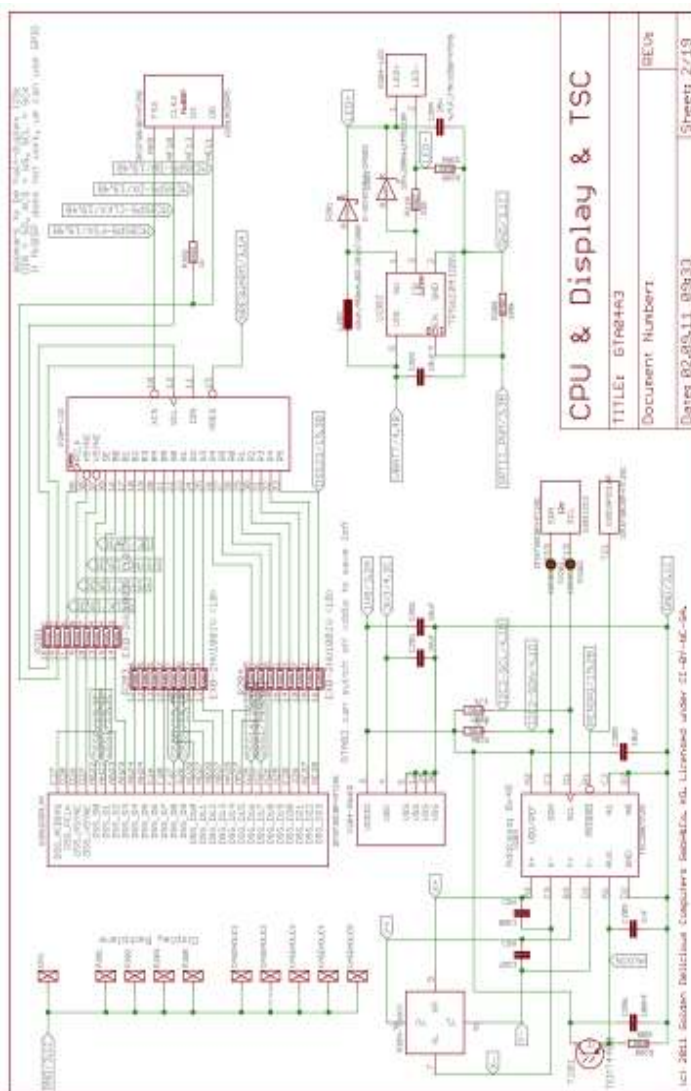
Q&A

Rising from the ashes: GTA04A4 – OpenPhoenix (Feb. 2012)

- Golden Delicious GTA04 – Phoenix
 - PCB and ICs fit into 1973 / Neo casing
 - In production and available for ordering



GTA04 - OpenPhoenix



```
/*
 * linux/arch/arm/mach-omap2/board-omap3gta04.c
 * Copyright (C) 2008 Texas Instruments
 * Modified from mach-omap2/board-omap3gta04.c
 * Initial code: Syed Mohammed Khazin
 *
 * This program is free software; you can redistribute it and/or modify
 * it under the terms of the GNU General Public License version 2 as
 * published by the Free Software Foundation.
 */

#include <linux/kernel.h>
#include <linux/init.h>
#include <linux/platform_device.h>
#include <linux/delay.h>
#include <linux/err.h>
#include <linux/clk.h>
#include <linux/jo.h>
#include <linux/leds.h>
#include <linux/gpio.h>
#include <linux/irq.h>
#include <linux/input.h>
#include <linux/gpio_keys.h>
#include <linux/backlight.h>

#include <linux/mtd/mtd.h>
#include <linux/mtd/partitions.h>
#include <linux/mtd/nand.h>

#include <linux/regulator/machine.h>
#include <linux/i2c/twi.h>
#include <linux/i2c/tsc2007.h>

#include <linux/i2c/bmp085.h>

#include <../sound/sec/codecs/gtm601.h>
#include <../sound/sec/codecs/rt47xx.h>
#include <../sound/sec/codecs/w2ch003-ht.h>

#ifdef CONFIG_VIDEO_OV9655 || defined(CONFIG_VIDEO_OV9655_MODULE)
#include <asm/arch/v4l2-dvss.h>
#include <asm/arch/ov9655.h>
extern struct ov9655_platform_data ov9655_pdata;
#endif

#include <linux/mmc/host.h>
#include <linux/sysfs.h>

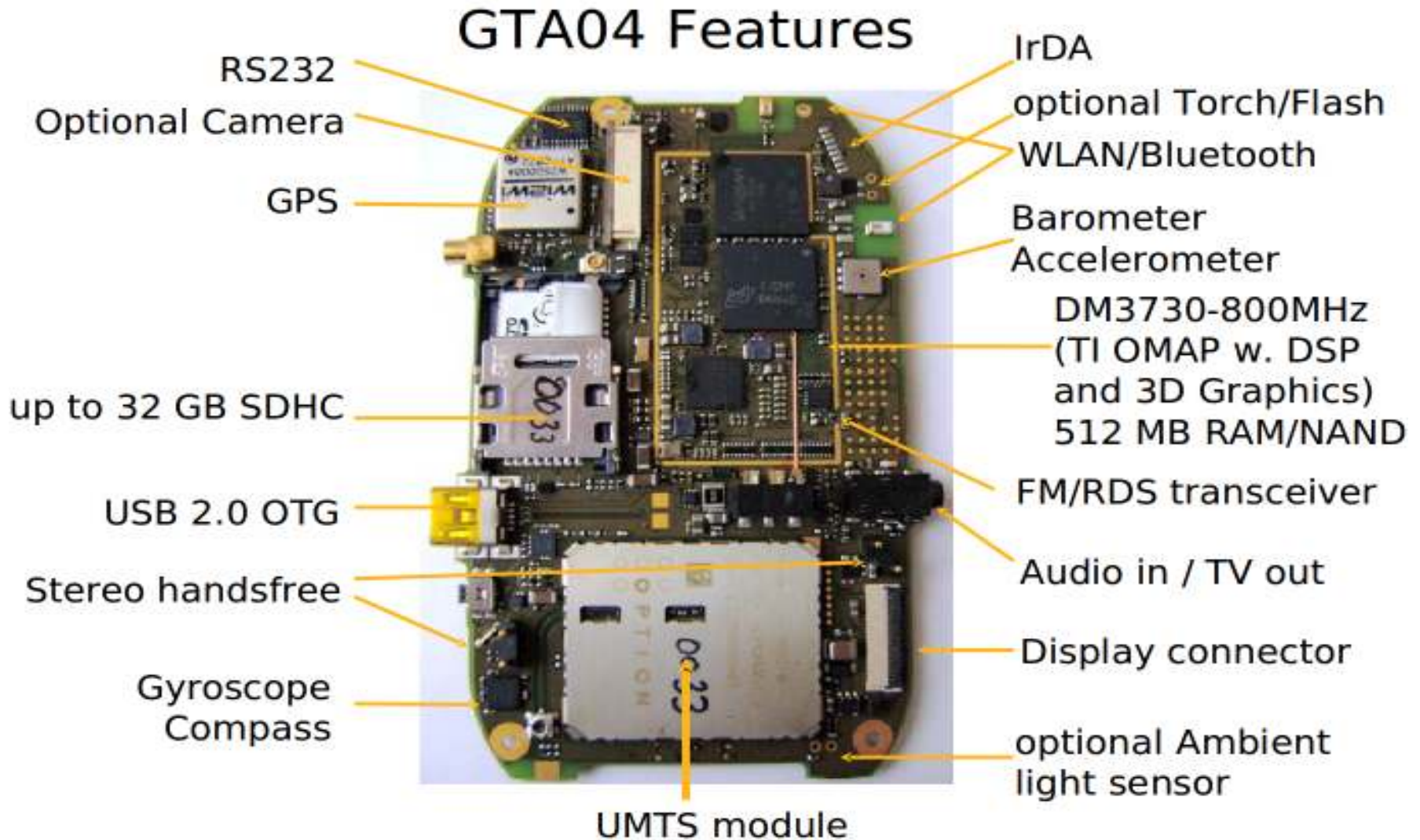
#include <mach/hardware.h>
#include <asm/mach-types.h>
#include <asm/mach/arch.h>
#include <asm/mach/map.h>
#include <asm/mach/flash.h>

#include <plat/board.h>
#include <plat/common.h>
#include <plat/display.h>
#include <plat/gpio.h>
#include <plat/nand.h>
#include <plat/usb.h>
#include <plat/time-opp.h>
#include <plat/clklock.h>
#include <plat/omap-pw.h>
#include <plat/mcspi.h>
#include <plat/control.h>

#include "mux.h"
#include "mc-twl4838.h"
#include "pe.h"
#include "omap3-app.h"

#ifdef CONFIG_PM
static struct omap_opp * _omap35x_mpu_rate_table = _omap35x_mpu_rate_table;
static struct omap_opp * _omap37x_mpu_rate_table = _omap37x_mpu_rate_table;
static struct omap_opp * _omap35x_esp_rate_table = _omap35x_esp_rate_table;
static struct omap_opp * _omap37x_esp_rate_table = _omap37x_esp_rate_table;
static struct omap_opp * _omap35x_l3_rate_table = _omap35x_l3_rate_table;
static struct omap_opp * _omap37x_l3_rate_table = _omap37x_l3_rate_table;
#else
static struct omap_opp * _omap35x_mpu_rate_table = NULL;
#endif
```

GTA04A4 – OpenPhoenix



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Flying higher... whats next?

- Needs new clothing: DIY Cases
 - Not everyone likes the shape
 - A few people do not want to upgrade their GTA01/02, but want to have two devices
- Progress so far:
 - Mill your own case out of Wood
 - Order a complete case from Shapeways!

There will be a case kit containing the missing parts like speakers, antennas, vibracall motor, ...

Wooden case by Radek



Wooden case



Laser sintering by Shapeways

Modify 3D CAD data from Openmoko GTA01/02



Different materials and color options are available!

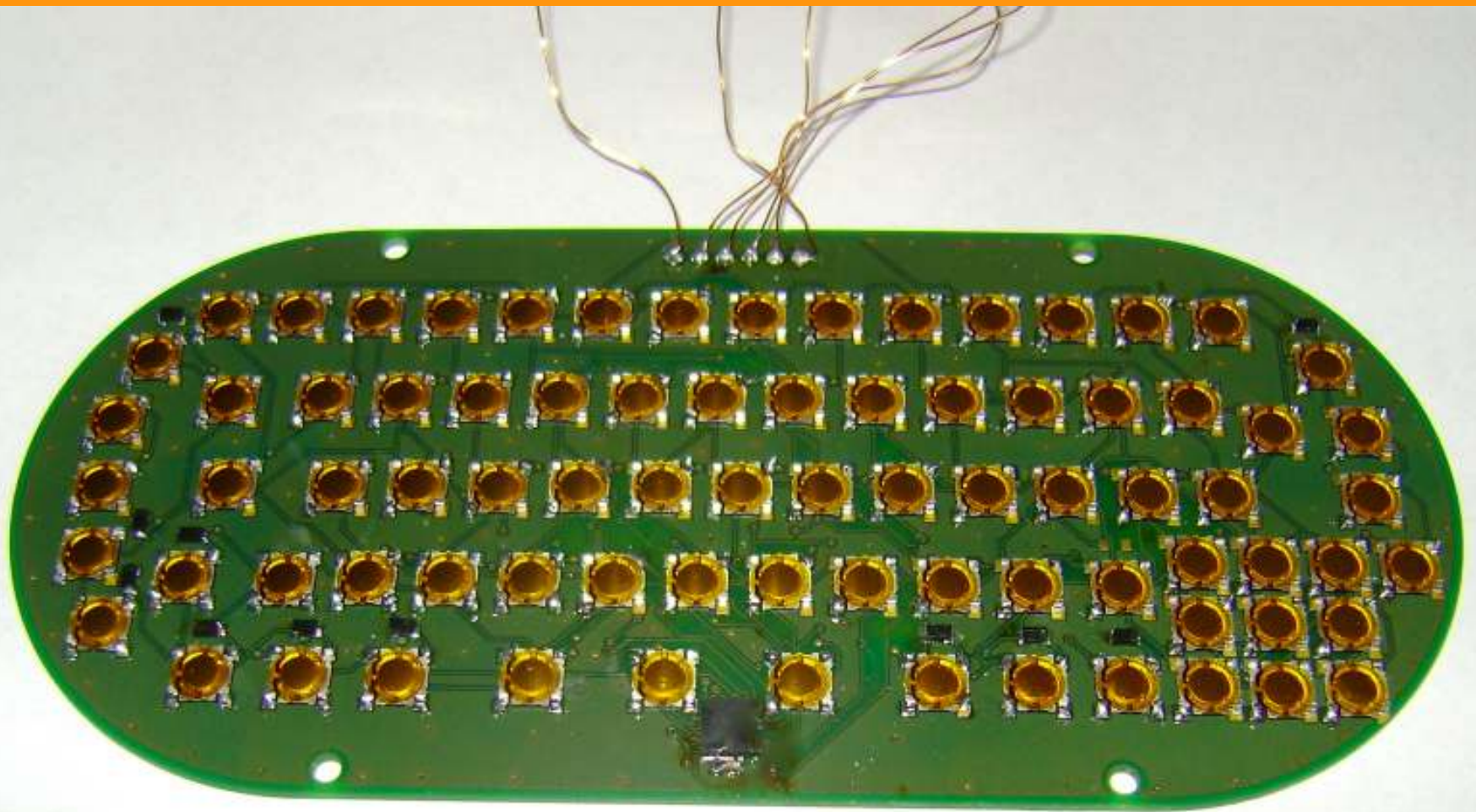
Flying higher... whats next?

Extend your Phone!

The GTA04 is an extensible hardware platform. Use it to build your own portable device.

- Portable measurement devices
- Tablets
- Notebooks
- You name it!

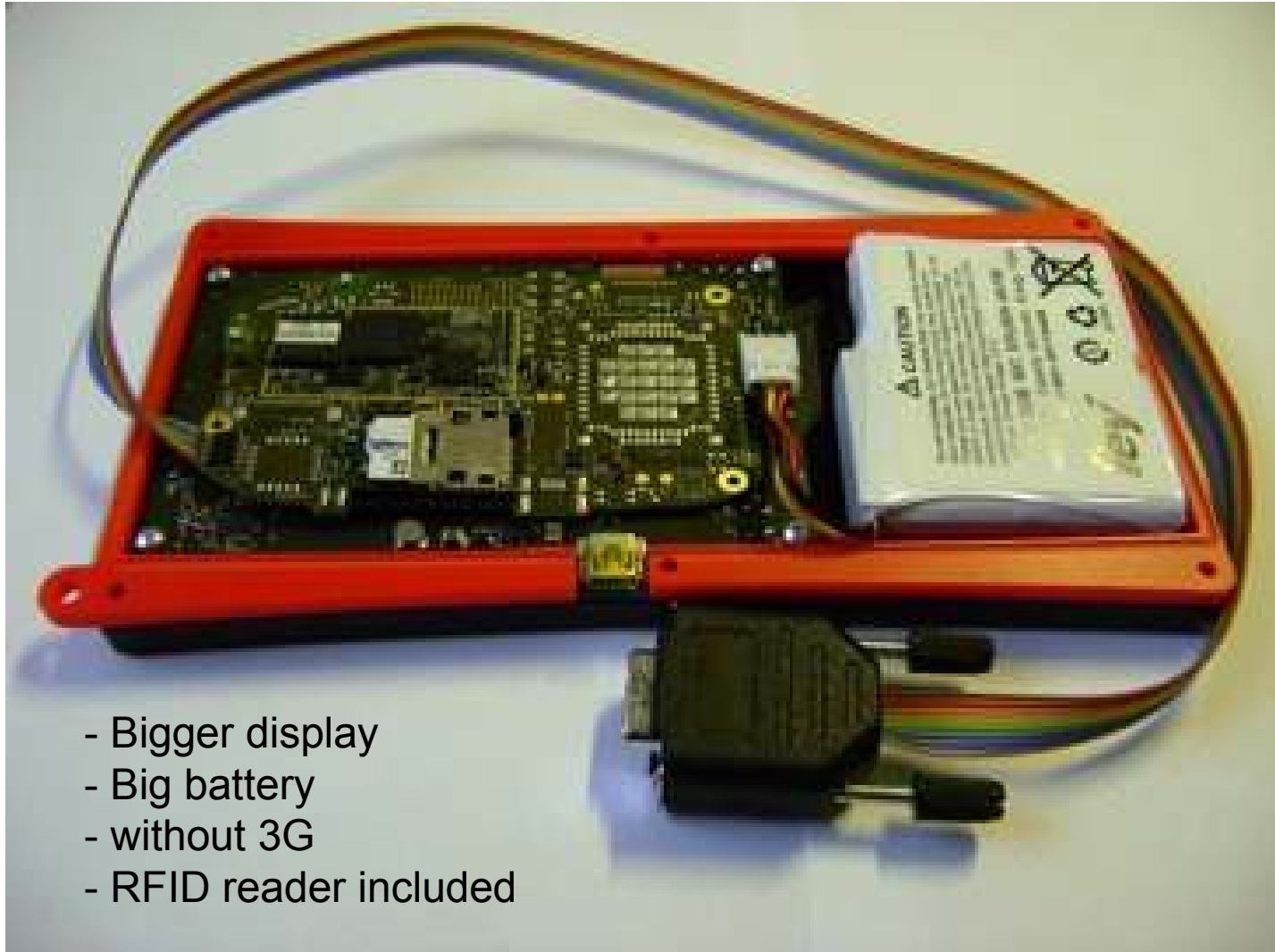
Hardware Keyboard Prototype



The GTA04 module approach



A portable terminal with WiFi/BT, RFID



- Bigger display
- Big battery
- without 3G
- RFID reader included

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Q&A

- Distros already ported to GTA04
 1. Debian/LXDE (development system)
 2. QtMoko
 3. SHR
 4. Replicant (fully free Android)



- Continuing the Qtopia/QtExtended project
- Written in Qt
- Stable and usable as daily phone
- Consistent GUI in all screens
- Most HW features are working (GSM, WiFi, Bluetooth, GPRS, GPS, USB, Headphones)
- Open to patches, ideas, new applications and contributions

- Project home
<http://www.qtmoko.org>
- Mailinglist
community@lists.openmoko.org
- Source code
<http://github.com/radekp/qtmoko>



- Freedom of choice:
 - EFL, Qt, GTK (running Xorg)
- Almost usable as daily phone
- Working: GSM, GPRS, Wi-Fi, GPS, USB, ...
- Based upon FreeSmartphone.Org and Yocto
- Running on Freerunner, Nexus S, N900
- Fully **community driven** and open to new contributors

- Project home (git, bugtracker, wiki)
<http://www.shr-project.org>
- Mailinglists
shr-user@lists.shr-project.org
shr-devel@lists.shr-project.org
- IRC
#openmoko-cdevel @ Freenode.net



Distros - Replicant



- Replicant is a fully free Android
- Current version: 2.3 (gingerbread)
- Porting started the end of March
 - Boots to lockscreen
 - Needs more work to be usable as a daily phone
 - Working as a music player already
- Project home
<http://replicant.us>



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Meet us now @ Booth 181c, Hall 7.2a

- Fr: 15:00, 17:00
- Sa: 12:00, 14:00

Visit us

- wiki.openmoko.org
- www.gta04.org
- www.openphoenix.org

Free your phone!