

Product Numbers: 1838, 1839

Tegra 2 tablet, possible kernel name (from schematics, not used as-is): PHJ00

Board markings: LA-746

PHJ00LA-7561P

Rev:1.0

2011-06-03

schematics: [compal_la-7461p_r0.3_schematics.pdf](#)

File: 0x82698a0 [0, 0]

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links

- https://forum.xda-developers.com/wiki/Lenovo_ThinkPad_Tablet
- https://www.gsmarena.com/lenovo_thinkpad-4444.php

Review:

- <https://www.notebookcheck.net/Review-Lenovo-ThinkPad-Tablet-18382DG-Tablet-MID.64965.0.htm>

dock connector

<https://web.archive.org/web/20150108184014/http://rootzwiki.com:80/topic/8523-reverse-engineering-the-dock-connector>

Posted 31 October 2011 - 03:09 AM #1

I got my desktop charger today and unpacked it only to rip it apart to check whats inside. By first view these are the highlights:

The dock connector is 40 pins

Dock connector is on a separate small pcb with a 40 pin board to board connector to a larger board. On this small pcb is a 12 pin MLF package marked:

AAU

NAD

Probably has a ground pad underneath.

The main pcb has a few more circuits and connectors on it.

There is a micro usb, a full size master usb, audio out and microphone jacks. A bit more exiting there is room for a HDMI connector as well there with unpopulated spaces for line filters and a hdmi circuit. By first look it seems to be a displayport or MHL to HDMI bridge chip of some kind. I is TQFP-48 package.

edit:

It seems to be a PI3VDP411LS from pericom

<http://www.pericom.com/c...PI3VDP411LS.pdf>

It is a displayport levelshifter / bridge to HDMI. It is the only 48 pin package I have found to match the input with the differential pairs.

The power supply is 20 VDC 65 Watts. It does not seem like the center connector is connected. The connector is the standard "IBM" charger, outer case ground, inner case + 20 vdc, center pin power diag.

There is a fet transistor between the dock connector and the psu marked FA1K18 and it is controlled by some regulator marked 920A4 in a SOT-223 package. The 20 VDC goes in on pin 2 and the tab on it.

the HDMI chip has differential pair inputs on pin 47,48 - 44,45 - 41,41 - 38,39

I will do my best reversing the whole schematic for this unit and split it into parts so we can make other chargers and hopefully add HDMI to the dock.

Pinout Docking Connector Thinkpad Tablet

1	charge	2	gnd
3	charge	4	hdmi pin 44 In D3-
5	Charger control (to pq2)	6	hdmi pin 45 In D3+

7	hdmi VDD 3.3V	8	gnd
9	gnd	10	hdmi pin 47 In D4-
11	USB Micro D-	12	hdmi pin 48 In D4 +
13	USB micro D+	14	gnd
15	USB Master D-	16	nc
17	USB MAster D+	18	nc
19	gnd	20	hdmi pin 29 SDA
21	gnd	22	hdmi pin 28 SCL
23	hdmi pin 41 IN D2-	24	hdmi pin 7 HPD Source
25	hdmi pin 42 In D2+	26	gnd
27	gnd	28	audio out L
29	hdmi pin 38 IN D1-	30	audio out R
31	hdmi pin 39 IN D1+	32	headset inserted switch
33	gnd	34	mic inserted switch feed
35	USB micro +	36	mic inserted switch
37	gnd	38	mic tip
39	+ 5V to usb master	40	mic ring

Pinout AAU chip AAU chip is audio amp.

audio out
pin 10 ring
pin 11 tip
pin 2, 7 gnd

Charger stuff :

The supplied DC apater is 20Volt 3.25Amps

In the dock there is a voltage regulator PV1. It is a 3.3 V LDO Tab has 20 volts in and pin 3 gives 3.30 Volts out.

There is also a FET in SSO8 (?) package. It is controlled by 2 transistors and works only as a switch.

On the base of PQ2 (pin 1, I guess it is the base) there is a float of 3.30 volts when there is nothing in the dock. The FET is OPEN and no voltage to the charger pins.

When grounding PQ2 pin1 (dock pin 5) the FET CLOSSES and the charger outputs 20,5volts which basically is the same as dc power into the dock.

Now I am just waiting for the TPT to get fully charged so I can measure if there is any difference when fully charged.

Note:

By charging at 20 volts instead of 5 volts I understand why the charger only uses 2 pins into the TPT.

At 20 volts you can transfer 4 times the energy instead of just charging at 5 volts from USB powers. There is no need for step ups to charge the LI-Po battery as it would need more than 5 volts.

This is the schematics of the charger part:

www.r-888.com/tpt/schema.pdf

I am not sure of the 2 transistors if they are pnp or npn yet but the rest is how it is.

The original mosfet is a P-channel AON7403.

The regulator is just any 3,3 volt LDO.

The TPT charger control pin 5 gets a 3,3 volt float via the resistor to the left in the schematic. When it is connected the TPT grounds the pin and the FET lets current through.

Edited by ZebCrs, 05 November 2011 - 12:56 PM.

adb

```
[Tue Oct 9 14:12:34 2018] usb 2-4: new high-speed USB device number 9 using xhci_hcd
[Tue Oct 9 14:12:34 2018] usb 2-4: New USB device found, idVendor=17ef, idProduct=7494, bcdDevice=1.00
[Tue Oct 9 14:12:34 2018] usb 2-4: New USB device strings: Mfr=2, Product=3, SerialNumber=4
[Tue Oct 9 14:12:34 2018] usb 2-4: Product: ThinkPadTablet
[Tue Oct 9 14:12:34 2018] usb 2-4: Manufacturer: LENOVO
[Tue Oct 9 14:12:34 2018] usb 2-4: SerialNumber: MP1YCPF
```

```
dpavlin@klin:~$ adb devices
List of devices attached
MP1YCPF device
```

```
dpavlin@klin:~$ adb shell
shell@android:/ $ df
Filesystem      Size  Used  Free  Blksize
/dev            357M  32K  357M  4096
/mnt/asec       357M   0K  357M  4096
/mnt/obb        357M   0K  357M  4096
/sqlite_stmt_journals  4M    0K    4M  4096
/system         755M 310M  445M  4096
/data           56G   1G   54G  4096
/cache          885M  81M  804M  4096
/mnt/pia        492M 233M  258M  4096
/mnt/persdata   19M   8M   11M  4096
/storage/sdcard0 56G   1G   54G  4096
```

```
shell@android:/ # uname -a
Linux localhost 2.6.39.4-g40c7636-dirty #1 SMP PREEMPT Thu Feb 7 20:07:37 CET 2013 armv7l GNU/Linux
```

```
1|shell@android:/ # cat /proc/cpuinfo
Processor       : ARMv7 Processor rev 0 (v7l)
processor       : 0
BogoMIPS       : 996.14

processor       : 1
BogoMIPS       : 996.14

Features        : swp half thumb fastmult vfp edsp vfpv3 vfpv3d16
CPU implementer : 0x41
```

```
CPU architecture: 7
CPU variant      : 0x1
CPU part         : 0xc09
CPU revision     : 0

Hardware        : ventana
Revision        : 0000
Serial          : 0000000000000000
```

```
shell@android:/ # free
              total          used          free          shared          buffers
Mem:          731896          720924          10972           0             18392
-/+ buffers:          702532          29364
Swap:          0              0              0
```

```
shell@android:/ # cat /proc/partitions
major minor #blocks name
179      0    62520320 mmcblk0
179      1         6144 mmcblk0p1
179      2         8192 mmcblk0p2
179      3    786432 mmcblk0p3
179      4    921600 mmcblk0p4
179      5         2048 mmcblk0p5
179      6    524288 mmcblk0p6
179      7    20480 mmcblk0p7
259      0    143360 mmcblk0p8
259      1    20480 mmcblk0p9
259      2    60071936 mmcblk0p10
```

APX mode

- turn off tablet
- press rotation button and hold it
- press power button for 2 seconds

```
[Tue Oct  9 14:30:41 2018] usb 2-4: new high-speed USB device number 16 using xhci_hcd
[Tue Oct  9 14:30:42 2018] usb 2-4: New USB device found, idVendor=0955, idProduct=7820, bcdDevice=1.00
[Tue Oct  9 14:30:42 2018] usb 2-4: New USB device strings: Mfr=1, Product=2, SerialNumber=0
[Tue Oct  9 14:30:42 2018] usb 2-4: Product: APX
[Tue Oct  9 14:30:42 2018] usb 2-4: Manufacturer: NVIDIA Corp.
```

nvflash

<https://forum.xda-developers.com/showthread.php?t=1745450>

```
dpavlin@klin:/virtual/android/tegra/linux4tegra/nvflash$ LD_LIBRARY_PATH=. ./nvflash --bl ../preb
Nvflash started
rcm version 0X20001
System Information:
  chip name: t20
```

```
chip id: 0x20 major: 1 minor: 4
chip sku: 0x8
chip uid: 0x0a8051c743dfd457
macrovision: disabled
hdcp: enabled
sbk burned: false
dk burned: false
boot device: emmc
operating mode: 3
device config strap: 0
device config fuse: 0
sdram config strap: 0
```

```
downloading bootloader -- load address: 0x108000 entry point: 0x108000
sending file: ../prebuilt/fastboot.stock.bin
| 936016/936016 bytes sent
../prebuilt/fastboot.stock.bin sent successfully
waiting for bootloader to initialize
bootloader downloaded successfully
failed executing command 19 NvError 0x120000
command failure: get partition table failed
```

partition table

```
dpavlin@nuc:/nuc/Tegra/nvflash$ LD_LIBRARY_PATH=. ./nvflash --bl ../04.EBT.img --getpartitiontable
Nvflash started
rcm version 0X20001
System Information:
  chip name: t20
  chip id: 0x20 major: 1 minor: 4
  chip sku: 0x8
  chip uid: 0x043c71c3433f8497
  macrovision: disabled
  hdcp: enabled
  sbk burned: false
  dk burned: false
  boot device: emmc
  operating mode: 3
  device config strap: 0
  device config fuse: 0
  sdram config strap: 2
```

```
downloading bootloader -- load address: 0x108000 entry point: 0x108000
sending file: ../04.EBT.img
/ 6291456/6291456 bytes sent
../04.EBT.img sent successfully
waiting for bootloader to initialize
bootloader downloaded successfully
Successfully updated partition table information to partitiontable.txt
```

backup

```
dpavlin@nuc:/nuc/Tegra/nvflash$ grep PartitionId partitiontable.txt | cut -d= -f2 | tr -d '\r' |
# even better version which removes biggest partition (15)
dpavlin@klin:/klin/Tegra/nvflash$ grep PartitionId partitiontable.txt | cut -d= -f2 | tr -d '\r'
```

BCT - Boot Configuration Table

<https://http.download.nvidia.com/tegra-public-appnotes/bct-overview.html>

compiler: <https://github.com/NVIDIA/cbootimage>

```
dpavlin@klin:/klin/Tegra/tegrarcms$ ./src/tegrarcms readbct --bct tpt.bct
```

```
[Wed Oct 10 14:31:05 2018] usb 3-1.1: new high-speed USB device number 23 using ehci-pci
[Wed Oct 10 14:31:05 2018] usb 3-1.1: New USB device found, idVendor=0955, idProduct=7820, bcdDev
[Wed Oct 10 14:31:05 2018] usb 3-1.1: New USB device strings: Mfr=1, Product=2, SerialNumber=0
[Wed Oct 10 14:31:05 2018] usb 3-1.1: Product: APX
[Wed Oct 10 14:31:05 2018] usb 3-1.1: Manufacturer: NVIDIA Corp.
```

```
bct file: tpt.bct
device id: 0x7820
uid: 0x0a805185415fc1d7
RCM version: 2.1
downloading miniloader to target at address 0x40008000 (132976 bytes)...
miniloader downloaded successfully
reading BCT from system, writing to tpt.bct...done!
```

serial

From android:

```
shell@android:/ # cat /proc/cmdline
tegraid=20.1.4.0.0 mem=1022M@0M android.comchip=2685344 vmlloc=256M androidboot.serialno=0a8051
```

```
shell@android:/ # lsof | grep tty
rild          103      radio      13          ???          ???          ???          ??? /dev/ttyACM1
brcm_patc    330    bluetooth    3          ???          ???          ???          ??? /dev/ttyHS2
sh            1789      shell      24          ???          ???          ???          ??? /dev/tty
sh            1795      root       24          ???          ???          ???          ??? /dev/tty
```

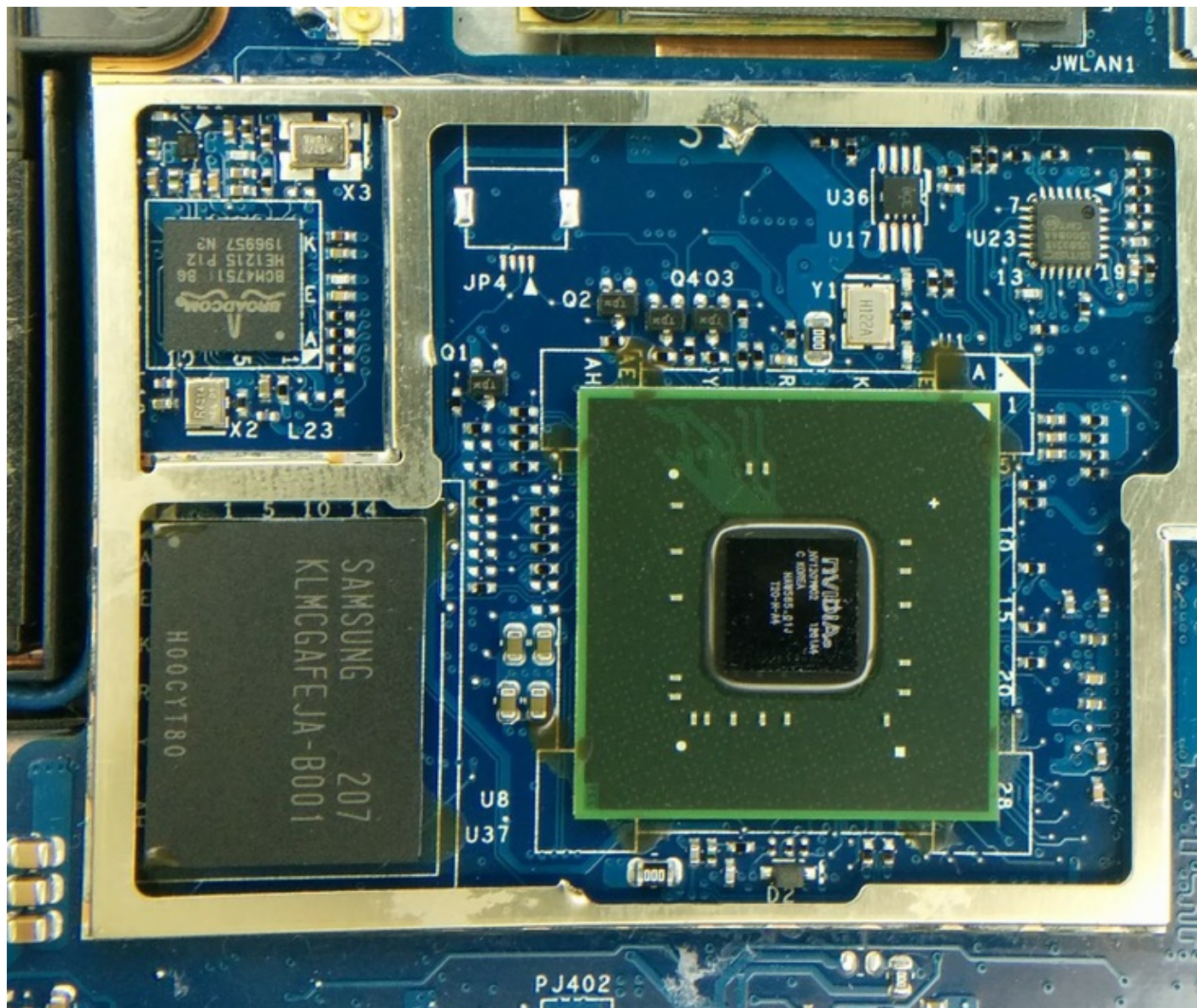
```
shell@android:/ # dmesg | grep tty
<6>[ 6.290150] serial8250.0: ttyS0 at MMIO 0x70006300 (irq = 122) is a Tegra
<6>[ 6.290475] tegra_uart.1: ttyHS1 at I/O 0x0 (irq = 69) is a unknown
<6>[ 6.290727] Registered UART port ttyHS1
<6>[ 6.290873] tegra_uart.2: ttyHS2 at I/O 0x0 (irq = 78) is a unknown
<6>[ 6.291115] Registered UART port ttyHS2
<6>[ 7.056012] cdc_acm 1-1:1.1: ttyACM0: USB ACM device
<6>[ 7.067323] cdc_acm 1-1:1.3: ttyACM1: USB ACM device
<6>[ 7.137758] cdc_acm 1-1:1.9: ttyACM2: USB ACM device
<4>[ 15.154176] ttyACM1: Entering acm_tty_open.
```

serial port

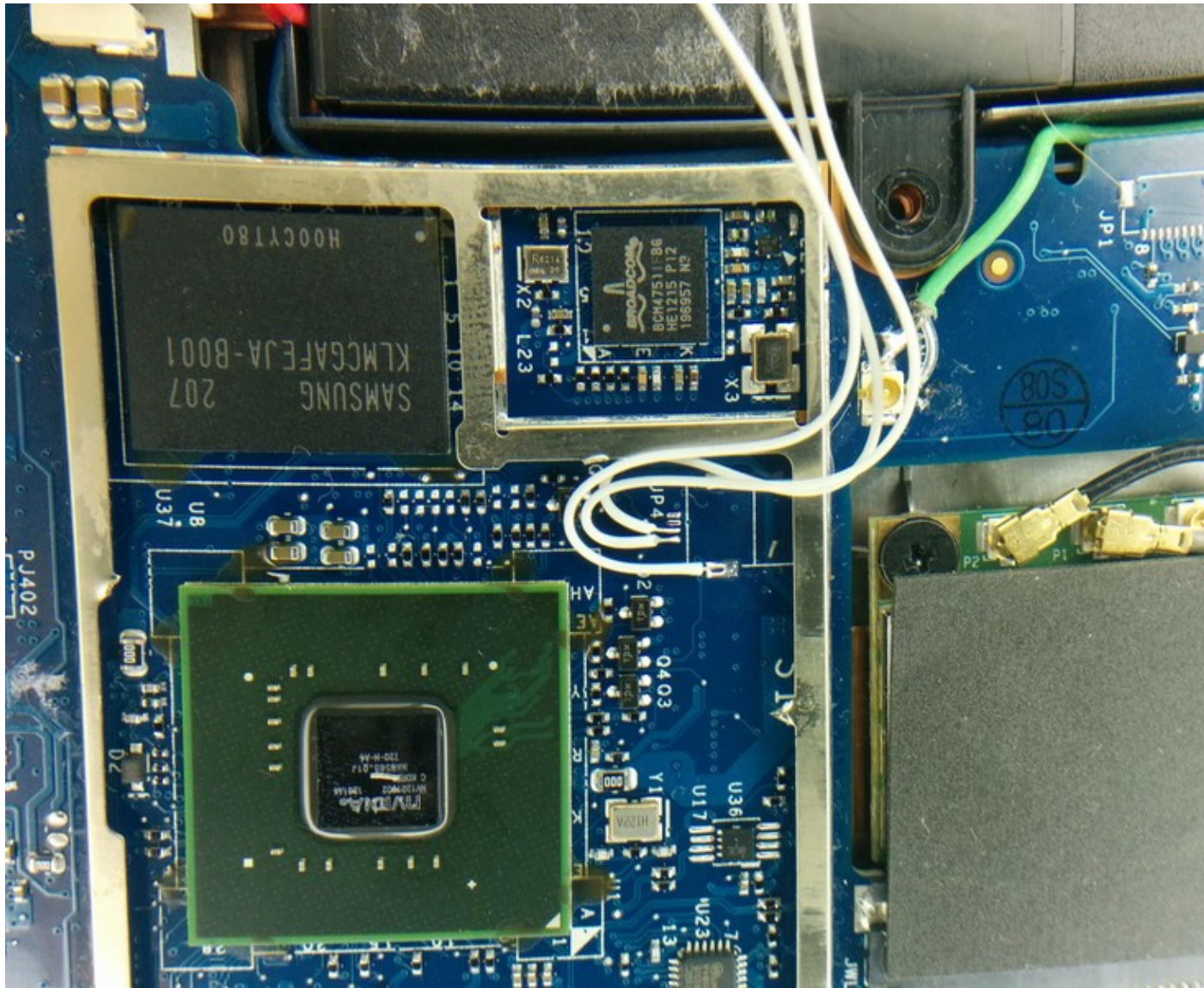
Schematic has 4 pin debug connector with serial on it.

There are three 4-pin connectors on this side of board, and from pictures other side doesn't seem to have connectors.

Skip JLTE1 and JLTE2 connector (under ribbon to front-facing camera), they are wrong connectors, and pop rf shield off Tegra compartment and locate JP4:



solder pin 1 and 2 and ground



JP4 pinout from schematics:

- 1 - UART4_RXD
- 2 - UART4_TXD
- 3
- 4 - GND

Pins 1 and 2 are 1.8V when device is turned on. so far, so good.

u-boot

```
dpavlin@klin:/klin/Tegra/u-boot-tegra$ export CROSS_COMPILE="arm-none-eabi-" ARCH=arm
dpavlin@klin:/klin/Tegra/u-boot-tegra$ make ventana_defconfig
```

press left-most button and power (top-right of tablet)

```
[Sun Oct 21 16:29:05 2018] usb 1-3.4.1: pl2303 converter now attached to ttyUSB3
[Sun Oct 21 16:29:22 2018] usb 1-3.4.4: new high-speed USB device number 105 using xhci_hcd
[Sun Oct 21 16:29:22 2018] usb 1-3.4.4: New USB device found, idVendor=0955, idProduct=7820, bcdDevice=0000
[Sun Oct 21 16:29:22 2018] usb 1-3.4.4: New USB device strings: Mfr=1, Product=2, SerialNumber=0
[Sun Oct 21 16:29:22 2018] usb 1-3.4.4: Product: APX
[Sun Oct 21 16:29:22 2018] usb 1-3.4.4: Manufacturer: NVIDIA Corp.
```

```
# backup bct
```

```
dpavlin@nuc:/nuc/Tegra/tpt-broken$ ./tegrarc/src/tegrarc --bct broken.bct readbct
bct file: broken.bct
device id: 0x7820
uid: 0x0a805185415fc1d7
RCM version: 2.1
downloading miniloader to target at address 0x40008000 (132976 bytes)...
miniloader downloaded successfully
reading BCT from system, writing to broken.bct...done!
```

```
# try u-boot
```

```
dpavlin@nuc:/nuc/Tegra/tpt-broken$ ./tegrarc/src/tegrarc --bct broken.bct --bootloader /

bct file: broken.bct
bootloader file: /mnt/klin/klin/Tegra/u-boot-tegra/u-boot-tegra.bin
load addr 0x108000
entry addr 0x108000
device id: 0x7820
uid: 0x0a805185415fc1d7
RCM version: 2.1
downloading miniloader to target at address 0x40008000 (132976 bytes)...
miniloader downloaded successfully
Chip UID: 0x00000000000000000000000000000000a805185415fc1d7
Chip ID: 0x20
Chip ID Major Version: 0x1
Chip ID Minor Version: 0x4
Chip SKU: 0x8 (t20)
Boot ROM Version: 0x1
Boot Device: 0x2 (EMMC)
Operating Mode: 0x3 (developer mode)
Device Config Strap: 0x0
Device Config Fuse: 0x0
SDRAM Config Strap: 0x1
sending file: broken.bct
- 4080/4080 bytes sent
broken.bct sent successfully
sending file: /mnt/klin/klin/Tegra/u-boot-tegra/u-boot-tegra.bin
/ 496836/496836 bytes sent
/mnt/klin/klin/Tegra/u-boot-tegra/u-boot-tegra.bin sent successfully
dpavlin@nuc:/nuc/Tegra/tpt-broken$
[Sun Oct 21 16:39:58 2018] usb 1-3.4.4: USB disconnect, device number 108
```

Complete nfsroot with u-boot is documented in [u-boot](#) page.

screen

LG LP101WX1 - datasheet - <https://datasheetspdf.com/pdf-file/788219/LG/LP101WX1-SLN2/1>

and screen seems to work with changes ported from 2.6!

```
display-timings {
    timing@0 {
```

```

/* XXX tegra_dc_mode ventana_panel_modes */
clock-frequency = <72072000>;
hactive = <1280>;
vactive = <800>;
hback-porch = <72>;
hfront-porch = <48>;
hsync-len = <32>;
vback-porch = <22>;
vfront-porch = <3>;
vsync-len = <7>;
hsync-active = <1>;
};
};

```

flash u-boot to emmc

based on

https://github.com/Stuw/ac100-self-installers/blob/master/switch-to-u-boot/install_bootloader.sh

```

root@tegra20:/home/dpavlin# dd if=/dev/mmcblk2boot0 of=mmcblk2boot0 bs=4080 count=1

root@tegra20:/home/dpavlin# echo 0 > /sys/block/mmcblk2boot0/force_ro
root@tegra20:/home/dpavlin# echo 0 > /sys/block/mmcblk2boot1/force_ro

root@tegra20:/home/dpavlin# bct_dump mmcblk2boot0 > bct.cfg

root@tegra20:/home/dpavlin# scp dpavlin@klin:/klin/Tegra/u-boot-tegra/u-boot-tegra.bin .

```

Rest of procedure is based on my changes for phj00:

<https://github.com/dpavlin/cbootimage-configs/tree/phj00>

```

root@tegra20:/home/dpavlin/cbootimage-configs/tegra20/nvidia/phj00# make
cbootimage -t20 phj00-emmc.img.cfg phj00-emmc.img
Image file phj00-emmc.img has been successfully generated!

root@tegra20:/home/dpavlin/cbootimage-configs/tegra20/nvidia/phj00# dd if=phj00-emmc.img of=/dev/

```

modify u-boot boot.cmd to boot from mmc

```

root@tegra20:/boot# cat boot.cmd

setenv bootargs root=/dev/mmcblk2p1 panic=60
ext2load mmc 0 ${kernel_addr_r} /boot/zImage
ext2load mmc 0 ${fdt_addr_r} /boot/tegra20-ventana.dtb
ext2load mmc 0 ${ramdisk_addr_r} /boot/uInitrd

bootz ${kernel_addr_r} ${ramdisk_addr_r} ${fdt_addr_r}

# mkimage -C none -A arm -T script -d boot.cmd boot.scr

```

Victory: booting from mmc

wifi

```
dpavlin@tegra20:~$ dmesg | grep brcm
[ 13.971076] brcmfmac: brcmf_fw_alloc_request: using brcm/brcmfmac4329-sdio for chip BCM4329/3

apt-get install firmware-brcm80211

# it seems to need some non-free parts

root@tegra20:/home/dpavlin# cd /lib/firmware/brcm/
wget https://raw.githubusercontent.com/armbian/firmware/master/brcm/brcmfmac4329-sdio.txt
```

And to make it work on 5.0 kernel you also need specific symlink for device:

```
root@tegra20:/lib/firmware# dmesg | grep firmware
[ 5.748888] platform regulatory.0: Direct firmware load for regulatory.db failed with error -2
[ 14.614802] brcmfmac mmc0:0001:1: Direct firmware load for brcm/brcmfmac4329-sdio.nvidia,ventura
[ 447.338018] brcmfmac mmc0:0001:1: Direct firmware load for brcm/brcmfmac4329-sdio.nvidia,ventura

root@tegra20:/lib/firmware/brcm# ln -sf brcmfmac4329-sdio.txt brcmfmac4329-sdio.nvidia,ventura.txt
```

battery and EC

without any config with ventana dts battery isn't charging which is annoying for development because you need to charge tablet often.

- The Power-Supply Subsystem - Sebastian Reichel, Collabora
<https://youtu.be/MdgmyOHldZg>

according to schematics charger is: ISL9519HRTZ-T_TQFN28_4X4

<https://www.intersil.com/content/dam/intersil/documents/isl9/isl9519.pdf> (too short, not useful)

There seems to be patch to add isl9519q to kernel back from 2011:

<https://lkml.org/lkml/2011/8/29/312>

which judging from one datasheet that google can find [ISL9519C-Intersil.pdf](#) is roughly correct.

However, it's connected to KB930QF-A1_LQFP128_14X14 which seems to be bios controller chip based

on 8051 core with custom firmware and 2.6 driver is

https://github.com/dpavlin/linux/blob/thinktabletopensource-2.6.36/drivers/power/EC_battery.c

embedded controller i2c

turn charging on

After connecting usb, issue following command to start charging battery:

```
i2cset -y 5 0x58 0x5b 0x0001 w
```

turn watchdog off

```
root@tegra20:~# cat /home/dpavlin/ec-disable-watchdog.sh
#!/bin/sh

# i2c_smbus_write_word_data(EC_Bat_device->client,0x46,0

i2cset -y 5 0x58 0x46 0x0000 w

root@tegra20:~# cat /etc/systemd/system/phj00-disable-watchdog.service
[Unit]
Description=phj00 watchdog disable
After=local-fs.target

[Service]
User=root
Type=oneshot
ExecStart=/home/dpavlin/ec-disable-watchdog.sh

[Install]
WantedBy=multi-user.target
root@tegra20:~# systemctl enable phj00-disable-watchdog.service
root@tegra20:~# systemctl start phj00-disable-watchdog.service
```

shutdown, reboot

```
root@tegra20:~# cat /lib/systemd/system-shutdown/phj00-shutdown.sh
#!/bin/sh

echo "DEBUG $0 -- $*"

case "$1" in
    halt|poweroff)
        # shutdown
        i2cset -y 5 0x58 0x52 0x0000 w
        ;;
    reboot)
        # restart
        i2cset -y 5 0x58 0x55 0x0001 w
        ;;
    *)
        echo "WARNING: $1 ignored"
        ;;
esac
```

kernel 2.6 drivers

custom drivers: <https://github.com/dpavlin/linux/tree/thinktabletopensource-2.6.36/drivers/phj00>

i2c

mainline 4.19

```
root@tegra20:~# i2cdetect -l
i2c-3  i2c          7000d000.i2c          I2C adapter
i2c-1  i2c          7000c400.i2c          I2C adapter
i2c-4  i2c          i2c-1-mux (chan_id 0) I2C adapter
i2c-2  i2c          7000c500.i2c          I2C adapter
i2c-0  i2c          7000c000.i2c          I2C adapter
i2c-5  i2c          i2c-1-mux (chan_id 1) I2C adapter
```

```
root@tegra20:~# i2cdetect -y -r 0
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:          -- -- -- -- -- -- -- -- -- -- -- -- -- --
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```

```
root@tegra20:~# i2cdetect -y -r 1 # very slow
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
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```
root@tegra20:~# i2cdetect -y -r 2
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
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```
root@tegra20:~# i2cdetect -y -r 3
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
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```
root@tegra20:~# i2cdetect -y -r 4
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
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root@tegra20:~# i2cdetect -y -r 5
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
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70: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --

```

```

root@tegra20:~# grep . /sys/bus/i2c/devices/*/name
/sys/bus/i2c/devices/0-001a/name:wm8903
/sys/bus/i2c/devices/0-0044/name:isl29018
/sys/bus/i2c/devices/3-0034/name:tps6586x
/sys/bus/i2c/devices/3-004c/name:nct1008
/sys/bus/i2c/devices/i2c-0/name:7000c000.i2c
/sys/bus/i2c/devices/i2c-1/name:7000c400.i2c
/sys/bus/i2c/devices/i2c-2/name:7000c500.i2c
/sys/bus/i2c/devices/i2c-3/name:7000d000.i2c
/sys/bus/i2c/devices/i2c-4/name:i2c-1-mux (chan_id 0)
/sys/bus/i2c/devices/i2c-5/name:i2c-1-mux (chan_id 1)

```

kernel 2.6 (android)

```

shell@android:/ # grep . /sys/bus/i2c/devices/*/name
/sys/bus/i2c/devices/0-001a/name:wm8903
/sys/bus/i2c/devices/0-001c/name:al3000a_ls
/sys/bus/i2c/devices/1-003a/name:nvhdcpl
/sys/bus/i2c/devices/1-0050/name:tegra_edid
/sys/bus/i2c/devices/2-0050/name:phj00_lcd
/sys/bus/i2c/devices/2-0058/name:EC_Battery
/sys/bus/i2c/devices/3-003c/name:mt9p111
/sys/bus/i2c/devices/3-003d/name:mt9d115
/sys/bus/i2c/devices/4-000c/name:akm8975
/sys/bus/i2c/devices/4-000f/name:kxtf9
/sys/bus/i2c/devices/4-0034/name:tps6586x
/sys/bus/i2c/devices/4-004c/name:nct1008
/sys/bus/i2c/devices/i2c-0/name:Tegra I2C adapter
/sys/bus/i2c/devices/i2c-1/name:Tegra I2C adapter
/sys/bus/i2c/devices/i2c-2/name:Tegra I2C adapter
/sys/bus/i2c/devices/i2c-3/name:Tegra I2C adapter
/sys/bus/i2c/devices/i2c-4/name:Tegra I2C adapter

shell@android:/sys/kernel/debug # grep . clock/i2c*/rate
clock/i2c1/rate:3000000
clock/i2c2/rate:800000
clock/i2c3/rate:3000000

```

addresses from schematics

t=0x829cd28 cell=0x829ce68 [0,0]	cell=(nil) [0,1]		
PWR_I2C address			
cell=0x829cff8 [1,0]	cell=0x829d0d8 [1,1]	0x829d1b8 [1,2]	
PMU	0b0110_100	0x34	
cell=0x829d2d8 [2,0]	cell=0x829d3b8 [2,1]	0x829d498 [2,2]	
E-Compass	0b0000_110	0x06	
cell=0x829d5b8 [3,0]	cell=0x829d6e8 [3,1]	0x829d7c8 [3,2]	
Temperature sensor	0b0100_110	0x26	
cell=0x829d8e8 [4,0]	cell=(nil) [4,1]		
GEN1_I2C			
cell=0x829da08 [5,0]	cell=0x829db38 [5,1]	0x829dc18 [5,2]	
Audio Codec	0b0011_010	0x1a	
cell=0x829dd38 [6,0]	cell=0x829de68 [6,1]	0x829df48 [6,2]	
Light sensor	0b0001_110	0x0e	
cell=0x829e068 [7,0]	cell=(nil) [7,1]		
EC_SMB			
cell=0x829e188 [8,0]	cell=0x829e268 [8,1]	0x829e348 [8,2]	
BATT	0b0001_001	0x09	
cell=0x829e468 [9,0]	cell=(nil) [9,1]		
IME_I2C			
cell=0x829e588 [10,0]	cell=0x829e668 [10,1]	0x829e748 [10,2]	
G-sensor	0b0001_1111	0x1f	

does g-sensor have typo? 0b0001_111 is 0x0f and we see such device

i2c devices support

- [al3000a](#) i2c light sensor
- [phj00](#) include EC communication

memory

LPDDR: MT46H64M32L2JG-5IT-A_FBGA168

MT46H64M32L2CG-5 IT:A

2 x 1Gb DDR, x32, 200 MHz

64M32 - 64 Meg x 32 (8 Meg x 32 x 4 banks x 2)

Cycle Time: -5 = 5ns tCK CL = 3