

postmarketOS

Google Nexus 7 2012 (asus-grouper)



This page is supplementary to the [Nvidia Tegra armv7 \(nvidia-tegra-armv7\)](#), refer to it before attempting to install postmarketOS.

This page documents the status of mainline Linux on the Nexus 7. This document should cover all tablets from first generation (codenamed grouper and tilapia).

Currently all supported features should work as they're supposed to, no known bugs except few not-yet supported features (3D, GPS, cameras and modem).

Hardware revisions

- grouper rev. PM269 - without GSM (older, less frequent)
- grouper rev. E1565 - without GSM (modern)
- tilapia rev. E1565 - with GSM

Do I have grouper or tilapia?

```
TWRP (adb shell) $ grep
androidboot.baseband=unknown /proc/cmdline && echo
grouper || echo tilapia
```

Which hardware revision of grouper do I have?

```
TWRP (adb shell) $ find /sys/devices/ | grep -c
max776 && echo You have E1565
TWRP (adb shell) $ find /sys/devices/ | grep -c
tps6591 && echo You have PM269
```

Flashing

When flashing (flashing the kernel or rootfs) the target device must be in flash mode.

How to enter flash mode

Google (ASUS) Nexus 7 (2012)



Google Nexus 7

Manufacturer	Google (ASUS)
Name	Nexus 7 (2012)
Codename	asus-grouper
Released	2012
Category	community
Pre-built images	yes
Original software	Android
Original version	4.1.2 on Linux 3.0

Hardware

Chipset	Nvidia Tegra 3 (T30L)
CPU	Quad-core 1.2 GHz Cortex-A9
GPU	ULP GeForce
Display	800x1280 IPS
Storage	8/16/32 GB
Memory	1 GB
Architecture	ARMv7
Type	tablet

- Connect a USB cable
- Power the device off
- Hold **Power** + **Volume Down**
- fastboot should work when the green android appears on the screen

Hardware status (mainline)

There is **multiple hardware revisions**, so this status may not apply to all of them. This status apply for tilapia (Bach revision).

Generic port used	<u>Nvidia Tegra armv7</u> <u>(nvidia-tegra-armv7)</u>
Unixbench Whet/Dhry score	1364.3

Features

<u>USB Networking</u>	Works
<u>Flashing</u>	Works
<u>Touchscreen</u>	Works
<u>Display</u>	Works
<u>WiFi</u>	Works
<u>FDE</u>	Works
<u>Mainline</u>	Works
<u>Battery</u>	Works
<u>3D Acceleration</u>	Partial
<u>Audio</u>	Works
<u>Bluetooth</u>	Works
<u>Camera</u>	
<u>GPS</u>	Partial
<u>Internal storage</u>	
<u>USB OTG</u>	Works
<u>NFC</u>	Works

Sensors

<u>Accelerometer</u>	Works
<u>Magnetometer</u>	Works
<u>Ambient Light</u>	Works
<u>Hall Effect</u>	Works
<u>Barometer</u>	
<u>Power Sensor</u>	

Misc

<u>Built-in DVB</u>
<u>Camera Flash</u>
<u>Touchpad</u>
<u>USB-A</u>
<u>HDMI/DP</u>
<u>Ir RX</u>

Stylus**Memory Card****Haptics****Ethernet****FOSS bootloader**

Works

U-Boot**Primary Bootloader**

Works

Secondary Bootloader

Works

Mainline

Works

Internal Storage

Works

USB Host

Broken

USB Peripheral

Works

Display

Works

Buttons

Works

This device is based on the Tegra 3.

See the SoC page for common tips, guides and troubleshooting steps

Status	Hardware	Info
Y	Bootimg	... but when is kernel larger than approx 4MB, initfs must be packed directly inside kernel (not into boot.img as usual), otherwise kernel won't boot. Older downstream kernels was smaller, so no issue there.
Y	Touchscreen	Works.
Y	USB & USB OTG	Works.
Y	SDHCI	Works.
Y	NFC	wired, not tested yet. Please update if it'll work for you.
P	GPS	<u>Broadcom BCM4751 GPS</u> is unsupported by the kernel and gpsd. Pangelo works on it.
Y	WiFi and Bluetooth	Wi-Fi works (best with IWD daemon: apk add iw; rc-update del wpa_supplicant; rc-update add iw; and <u>HOWTO</u> (https://wiki.archlinux.org/index.php/NetworkManager#Using_iwd_as_the_Wi-Fi_backend)), Bluetooth does work as well (tested with BT 4.2 and 5.0 devices).
Y	GPIO keys	There is 3 keys on GPIO: Power, Volume up, Volume down.
Y	Battery and Charger	Battery status and charging works as expected.
Y	Sound	Works, ALSA UCM configs are included into alsa-ucm-conf package

Y	Temperature sensor	temperature sensor works
Y	Proximity sensor	(tilapia only) Disabled, but works (boolean state, on/off). Would be nice to have this driver work with IIO framework (https://01.org/linuxgraphics/gfx-docs/drm/driver-api/iio/index.html) (TODO)
Y	Light sensor	Driver Dyna-Image AL3010. Brightness regulation works (https://floss.social/@okias/103371284828595026), install iio-sensor-proxy . It's slightly <u>oversensitive</u> (https://gitlab.com/alpine-mobile/pmaports/issues/3).
N	Front camera	
P	3D support	See Nvidia_Tegra_2_(tegra20)#Graphics
N	Modem	(tilapia only) contribution welcome, no work done yet.

User Interfaces

Multiple, but due to not yet implemented HW acceleration, some of them are currently unavailable (like Phosh)

Recommended [interfaces](https://wiki.postmarketos.org/wiki/Category:Interface) (<https://wiki.postmarketos.org/wiki/Category:Interface>):

- Phosh: Purism Librem 5 compositor and GNOME based environment, needs performance optimization, but works.
- Xfce4: GTK-based desktop environment aiming to be fast and lightweight. Follow the guide at <https://wiki.postmarketos.org/wiki/XFCE4> for adjustments.

Development Notes

Bootloader

- There is some progress on u-boot for Tegra devices. Check [u-boot repository](https://github.com/clamor-s/u-boot) (<https://github.com/clamor-s/u-boot>)
- The default images for android provided by google have the bootloader broken, meaning it can't be flashed. It does not seem to affect the install process of postmarketOS, but is something to take into account. If you need a working bootloader image version 4.23 can be found [[here](https://drive.google.com/file/d/1eV EQJtrByuAYRmS924-BAMGQcRXuBj7C/view?usp=sharing%7C) (<https://drive.google.com/file/d/1eV EQJtrByuAYRmS924-BAMGQcRXuBj7C/view?usp=sharing%7C>)], or can be 4.18 can be grabbed from the factory images for KitKat

Kernel

Currently used mainline kernel:

- [Grate kernel](https://github.com/grate-driver/linux) (<https://github.com/grate-driver/linux>), where tegra development ongoing. It does follow official linux-next branch.

References to older kernels:

- Old Android kernels: [LineageOS kernel sources \(https://github.com/LineageOS/android_kernel_asus_grouper\)](https://github.com/LineageOS/android_kernel_asus_grouper) [Unlegacy kernel sources \(https://github.com/Unlegacy-Android\)](https://github.com/Unlegacy-Android)
- [Ubuntu Nexus 7 Kernel wiki \(https://wiki.ubuntu.com/Nexus7/Kernel\)](https://wiki.ubuntu.com/Nexus7/Kernel) (old, last updated 2012)

Graphics

- The touchscreen input device is named `elan-touchscreen`.
- (legacy) `CONFIG_VT` had to be enabled for graphics to work. In `menuconfig` this is located under Device Drivers -> Character devices -> Virtual terminal.
- (legacy) `/sys/class/graphics/fb0/mode` is empty on boot, it must have `U:800x1280p-0`. This uses the same `initfs` hook as many other devices. **Update:** Seems to be correctly set now
- (legacy) `weston` with `fbdev-backend.so` uses `pixman-type=3 (PIXMAN_TYPE_ABGR)`, which now does not require configuration.

Wifi

- There's a proper firmware subpackage now, wifi device should work out-of-the box.
- "Desktop" Linux firmware are outdated. Check [here \(https://android.googlesource.com/platform/hardware/broadcom/wlan/+master/bcmdhd/firmware/bcm4330/\)](https://android.googlesource.com/platform/hardware/broadcom/wlan/+master/bcmdhd/firmware/bcm4330/) for latest one.
- To connect follow the instructions on [this page](#).
- (legacy) It is possible to manually get wifi working by manually copying `fw_bcmdhd.bin` and `nvrnram.txt` to their kernel-specified locations and configuring `/etc/network/interfaces`. At this point, running `/etc/init.d/networking restart`, gave an error about being unable to get a MAC address. After restarting the device to find that wifi Just Worked™, it was possible to successfully scan for wireless networks and establish a connection to secured wireless APs.

Pending Issues

- [pmbootstrap#60 \(https://gitlab.com/postmarketOS/pmbootstrap/-/issues/60\)](https://gitlab.com/postmarketOS/pmbootstrap/-/issues/60): Use the system and userdata partition on Android with LVM
- [pmbootstrap#1422 \(https://gitlab.com/postmarketOS/pmbootstrap/-/issues/1422\)](https://gitlab.com/postmarketOS/pmbootstrap/-/issues/1422): The system partition is too small to hold rootfs images over 650Mb (e.g. Plasma Mobile is about 1.1Gb). Flashing to userdata partition fails.
- [pmaports#201 \(https://gitlab.com/postmarketOS/pmaports/-/issues/201\)](https://gitlab.com/postmarketOS/pmaports/-/issues/201): With legacy kernel, device seems to reboot spontaneously under heavy load. For better experience, please use mainline kernel.

Community Info

Users owning this device

- [00p513](#)
- [Antonok](#)
- [Baonks81](#) (Notes: Hw rev.E1565 no GSM - 6 tablets software 3d accelerate on ALARM with grate-driver LLVMpipe built)
- [Bczeman](#)
- [Blitztide](#)
- [BogdanTheGeek](#) (Notes: E1565 no GSM)
- [Clamor](#)
- [Ecloud](#)
- [Eloy](#)
- [GloomyJD](#) (Notes: Works, very weak battery)
- [Gull Code](#) (Notes: OK,daily use with XFCE4. See my profile if you want to have automatic rotation and light with Asus grouper sensor daemon or jump to <https://gitlab.com/gullradriel/asus-grouper-nexus-7-sensor-daemon>)
- [Hilledkinged](#) (Notes: Revived from corrupt bootloader)
- [Isot42](#) (Notes: OK PM269 version)
- [Joshaspinall](#) (Notes: PM269)
- [LongnoseRob](#) (Notes: 2x E1565 type, pmOS (edge) w/ u-boot, UI: mate, phosh)
- [Maff](#) (Notes: Multiple)
- [Misopog](#) (Notes: Like new, unlocked, stock)
- [Nergzd723](#) (Notes: emmc dead, bct partition intact, possible to fusee-gelee)
- [Okias](#) (Notes: OK, HW rev.E1565 (asus-tilapia))
- [Pangelo](#) (Notes: original grouper (non-GSM) model)
- [Pojntfx](#)
- [Progressnoize](#) (Notes: Screen broken)
- [Roboe](#) (Notes: (borrowed) variant: grouper, version-hardware: ER3; HW rev. E1565; running pmOS edge as a smart display)
- [Roboe](#) (Notes: (borrowed) variant: grouper; unknown HW rev.; broken battery)
- [Russanandres](#) (Notes: SailfishOS 1)
- [Segfault](#) (Notes: x3 - 2 16GB and 1 32GB)
- [The Arjdroid](#) (Notes: Impressive! Works with phosh & xfce4, but not daily driveable yet. It needs 3D acceleration for smoother UI, & firefox fix crashes. Great for running it as a no display server like a raspberry pi. Running with xfce4 can make it usable as a smart display like a calendar or something.)
- [Yifei](#) (Notes: bad battery)

Maintainers

- [David Heidelberg](#)

Fun Fact

grouper was the first tablet to run postmarketOS!

See also

- dmesg logs from various tegra devices <https://paste.sr.ht/%7Eokias>

Retrieved from "[https://wiki.postmarketos.org/index.php?title=Google_Nexus_7_2012_\(asus-grouper\)&oldid=56202](https://wiki.postmarketos.org/index.php?title=Google_Nexus_7_2012_(asus-grouper)&oldid=56202)"