

# Booting Android OS on Zedboard

## Quick Overview

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# 1 Requirements

In order to boot Android on the Zedboard, the following hardware is needed:

1. Zedboard;
2. Power Supply;
3. SD Card (4GB or more);
4. HDMI-Compatible Monitor;
5. HDMI Cable;
6. Micro USB On-The-Go Host Cable Adapter;
7. Mouse;
8. Keyboard;
9. Ethernet Cable;
10. USB Cable USB A to Micro B;
11. (Optional) USB Hub, if the Mouse and Keyboard doesn't share the same dongle.

In addition a Unix-Like system is needed for debugging purpose. Such system must have the following software:

- *screen* utility;
- Android SDK with ADB.

## 2 Prepare SD Card

Format the SD Card and create three partitions in this order:

- 16 MB **FAT16**: This partition will host the necessary files to setup the environment;
- **Ext4**: This partition will host Android FS;
- 512 MB **Swap**.

Let's suppose that:

- the first partition is mounted on `/mnt/boot/`;
- the second partition is mounted on `/mnt/root/`;

give permission to the two directories by doing:

```
# chmod 777 /mnt/boot/  
# chmod 777 /mnt/root/
```

Download from <http://wpage.unina.it/mario.barbareschi/zedroid/> the two archives files and untar them into the SD Card just formatted: *Partition1.tar.gz* needs to be untarred into the first partition (the FAT16 one) and *Partition2.tar* needs to be untarred into the second partition (the Ext4 one).

### 3 ZedBoard Setup

The Zedboard is able to boot from different devices such as NOR or NAND. In this tutorial we will use a normal SD Card to boot Android on the Zedboard. Set the Zedboard's jumpers as follows:



Figure 3.1: Jumper Settings

Also, do the following:

- Connect the HDMI cable to both the Zedboard and the monitor;
- Connect the USB-OTG cable to the lower micro-usb port;
- Connect Mouse and Keyboard;

### 3 *ZedBoard Setup*

- Connect PC and board through the Micro-USB cable. Insert the Micro-USB on the board's upper Micro-USB Port;
- Connect the ethernet cable;
- Insert the SD Card into the reader;
- Connect the power supply.
- Toggle the power-on switch on the Zedboard to let it start and wait until the *Done* led turns on.

## 4 Messing around with Android

### 4.1 Boot procedure

The Zedboard hosts a privileged terminal that can be accessed through UART connection. It is useful for debugging purpose and, if not needed, can be bypassed by not connecting any USB Cable on the upper USB port.

PC-side, type the command:

```
$ screen /dev/ttyACM0 115200
```

Once connected, we can submit commands to the Zedboard. To launch Android simply type:

```
# boot
```

Loading times varies from 30s up to 90s depending on the SD Card quality. Take into account that the first boot is often slower than normal.

### 4.2 ADB

The *eth0* interface should get its address automatically through dhcp. If something goes wrong, it can be obtained by typing:

```
# netcfg eth0 dhcp
```

Otherwise it can be manually adjusted<sup>1</sup> by editing the content of:

```
/etc/network.d/
```

After an address is assigned to the board, restart the adb-server:

```
# export ADBHOST=<ip_address>
# adb kill-server
# adb start-server
```

Now that the device is accessible through ADB, you should be able to upload and launch your preferred *apks*.

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<sup>1</sup>please refer to the official netcfg manual for more information