

- 1.) Download the firmware file and partition image from Debians Server

<https://d-i.debian.org/daily-images/arm64/daily/netboot/SD-card-images/>

<https://d-i.debian.org/daily-images/arm64/daily/netboot/SD-card-images/firmware.rock64-rk3328.img.gz>
<https://d-i.debian.org/daily-images/arm64/daily/netboot/SD-card-images/partition.img.gz>

- 2.) Merge the firmware file and partition image into bootable Debian image

```
zcat firmware.rock64-rk3328.img.gz partition.img.gz > rk64_debian.img
```

- 3.) Flash bootable Debian image onto SD-Card

```
lsblk                                     find device name of your SD-Card
sudo dd if=/dev/zero of=/dev/sdX bs=446 count=32770    wipe the Boot Sector of your SD-Card
sudo dd if=rk64_debian.img of=/dev/sdX bs=4M conv=fsync  flash Debian image to your SD-Card
```

replace **X** with the device letter of your SD-Card

- 4.) Download the U-Boot package from Debians Server

<https://packages.debian.org/bookworm/arm64/u-boot-rockchip/download>

extract the **idbloader.img** and **u-boot.itb** files from the package,
both files are located in **u-boot-rockchip_X_arm64.deb/data.tar.xz/./usr/lib/u-boot/rock64-rk3328/**

- 5.) Prepare the eMMC-Module for the Rock64 SBC (16GB eMMC module (30310400 sectors))

```
sudo fdisk /dev/sdX
```

type **o** this will clear out any partitions on the drive
type **p** to list partitions, there should be no partitions left
type **n**, then **p** for primary, **1** for the first partition on the drive,
32768 for the first sector, and **647168** for the last sector, then type **a**
then type **n**, then **p** for primary, **2** for the second partition on the drive,
647169 for the first sector, and **28213246** for the last sector, then type **n**,
then **p** for primary, **3** for the third partition on the drive, **28213247**
for the first sector, and **30310399** for the last sector, then type **t**, and
3 for the third partition, and **82** for the Hex Code, then write the
partition table and exit by typing **w**

(steps above create 300M for **/boot**, 14.7GB for **/** and 1GB for **swap**)

We will format the newly created partitions later with the Debian Installer.

The 300M partition format as **ext2** and set mount point to **/boot**.

The 14.7GB partition format as **ext4** and set mount point to **/**.

The 1 GB partition format as **swap**.

- 6.) Flash U-Boot (Bootloader) onto the eMMC-Module for the Rock64 SBC

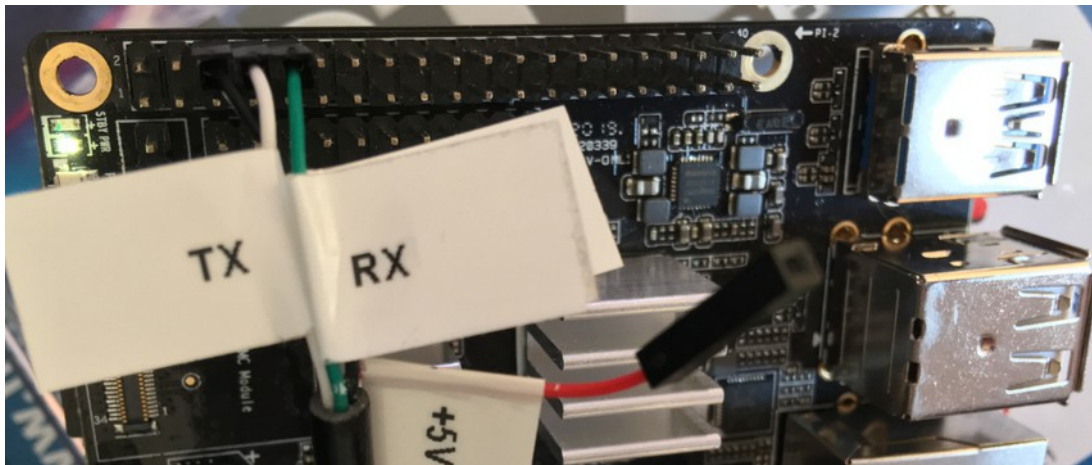
```
lsblk                                     find device name of your eMMC
sudo dd if=idbloader.img of=/dev/sdX seek=64 conv=notrunc  replace X with the device letter
sudo dd if=u-boot.itb of=/dev/sdX seek=16384 conv=notrunc  of your eMMC-Module
```

once finished, unmount the eMMC-Module

- 7.) Install the eMMC-Module onto your Pine64 Rock64 SBC, insert the SD-Card, connect HDMI, Mouse and Keyboard, USB to serial (UART) adapter, power it up and follow the Debian Installer.

`sudo screen /dev/ttyUSB0 1500000`

connects you to the serial output of the Rock64
CTRL a k exits screen



Pin 6 → Ground
Pin 8 → TX
Pin 10 → RX

The Debian Installer will fail at "Making the System bootable", ignore this and continue with the next step to finish the installation. (u-boot is installed already)

- 8.) Once installation is finished, add Firmware for Rockchip CDN DisplayPort Controller

`nano /etc/apt/sources.list`

amend as below

`# deb http://deb.debian.org/debian bookworm main`

`deb http://deb.debian.org/debian bookworm main contrib non-free`
`deb-src http://deb.debian.org/debian bookworm main contrib non-free`

`deb http://deb.debian.org/debian-security bookworm-security main contrib non-free`
`deb-src http://deb.debian.org/debian-security bookworm-security main contrib non-free`

`#deb http://deb.debian.org/debian bookworm-updates main contrib non-free`
`#deb-src http://deb.debian.org/debian bookworm-updates main contrib non-free`

← do not use yet
← do not use yet

`apt update`

`apt install firmware-misc-nonfree`

contains → rockchip/dptx.bin

- 9.) Perform system update, enable filesystem check at boot and enable sudo

`apt update`
`apt upgrade`
`apt full-upgrade`
`apt autoremove`
`apt autoclean`

`tune2fs -c 1 /dev/mmcblkXp1`
`tune2fs -c 1 /dev/mmcblkXp2`

use **lsblk** to find correct block device

`apt install sudo`

`adduser youruser sudo`

10.) Hide kernel messages during boot

```
nano /etc/sysctl.conf
```

amend as below

```
# Uncomment the following to stop low-level messages on console
kernel.printk = 3 4 1 3
```

11.) If you operate more than one Rock64 on the same network, you may need MAC address spoofing

```
ip link show end0
```

shows current MAC address

If the same MAC address is present multiple times on the same network, then do steps below or the network will not work !

```
sudo nano /etc/network/interfaces
```

amend as below

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).
```

```
source /etc/network/interfaces.d/*
```

```
# The loopback network interface
auto lo
iface lo inet loopback
```

```
# The primary network interface
allow-hotplug end0
iface end0 inet dhcp
    hwaddress ether da:74:87:XX:XX:XX
```

change the **last 3 bits** to your liking,
DO NOT change the first 3 bits (reserved for Manufacturer)

```
reboot
```

once board is up, check with `ip link show eth0` for success

12.) Install U-Boot onto your Rock64 to keep U-Boot up-to-date

```
apt install u-boot-rockchip u-boot-menu
```

(flash-kernel is already installed)

```
u-boot-update
```

```
nano /boot/extlinux/extlinux.conf
```

check boot menu config

```
lsblk
```

find correct block device for U-Boot

```
u-boot-install-rockchip /dev/mmcblkX
```

flash U-Boot onto block device

```
reboot
```

Done, enjoy your setup.