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

https://deb.debian.org/debian/dists/bookworm/main/installer-arm64/current/images/netboot/SD-card-images/

https://deb.debian.org/debian/dists/bookworm/main/installer-arm64/current/images/netboot/SD-card-images/firmware.rock64-rk3328.img.gz
https://deb.debian.org/debian/dists/bookworm/main/installer-arm64/current/images/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 **1056767** for the last sector, then type **a**
then type **n**, then **p** for primary, **2** for the second partition on the drive,
1056768 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 500M for /boot, 12.9GB for / and 1GB for swap)

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

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

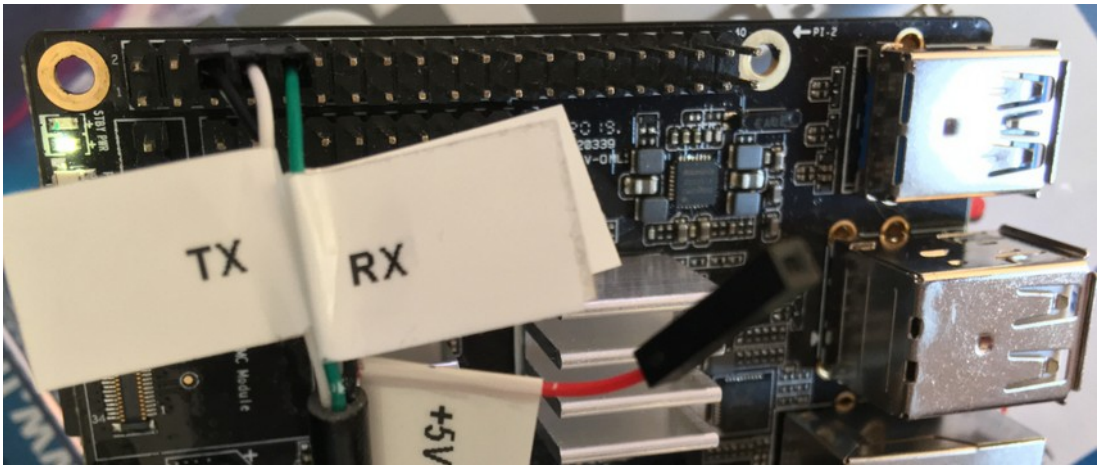
```
lsblk                                                  find device name of your eMMC

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

With the Debian Installer at the "[! !] Partition disks" stage, select Partitioning method: Manual and format the partitions we created at Step 5 as listed below.

The 500M partition format as ext2 and set mount point to /boot and set Label to boot.
The 12.9GB partition format as ext4 and set mount point to / and set Label to root.
The 1 GB partition format as swap.

The Debian Installer might 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 non-free-firmware
deb-src http://deb.debian.org/debian/ bookworm main contrib non-free non-free-firmware

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

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

```
apt update
apt install firmware-misc-nonfree
```
contains –> rockchip/dptx.bin

9.) Enable filesystem check at boot and enable sudo for your user

```
lsblk                                   find correct block device for Tune2FS

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

apt install sudo
adduser youruser sudo
```

10.) 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 end0 for success
```

11.) 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.