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.none.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.none.img.gz partition.img.gz > h64_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=h64_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.)     Prepare the eMMC-Module for the Pine64 H64B 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, 12.9GiB for / and 1GiB for swap)


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

        The 500 MiB partition format as ext2 and set Mount point to /boot and set Label to boot.
        The 12.9 GiB partition format as ext4 and set Mount point to / and set Label to root.
        The 1 GiB partition format as swap.


5.)     Install Cross Compiler for building U-Boot on our  x86_64 Debian Host

        sudo apt install device-tree-compiler build-essential libssl-dev python3-dev bison
        sudo apt install flex libssl-dev swig gcc-aarch64-linux-gnu gcc-arm-none-eabi
        sudo apt install gcc make bc git


6.)     Build U-Boot on our  x86_64 Debian Host

        cd /home/youruser/assets

        git clone https://github.com/ARM-software/arm-trusted-firmware

        cd arm-trusted-firmware
        git tag                                 remember last stable (v2.8.0)

```
git checkout v2.8.0
make CROSS_COMPILE=aarch64-linux-gnu- PLAT=sun50i_h6 bl31
cd ..

git clone git://git.denx.de/u-boot.git

cd u-boot
git tag                                    remember last stable (v2022.10)
git checkout v2022.10
ln -s /home/youruser/assets/arm-trusted-firmware/build/sun50i_h6/release/bl31.bin bl31.bin
make CROSS_COMPILE=aarch64-linux-gnu- BL31=bl31.bin pine_h64_defconfig
make -j4 CROSS_COMPILE=aarch64-linux-gnu- BL31=bl31.bin

cp -r /home/youruser/assets/u-boot/u-boot-sunxi-with-spl.bin /home/youruser/assets/
cd ..
```

**7.)**    Flash U-Boot (Bootloader) onto the SD-Card for the Pine64 H64B SBC

```
lsblk                                      find device name of your SD-Card
sudo dd if=u-boot-sunxi-with-spl.bin of=/dev/sdX bs=1024 seek=8 conv=notrunc
                                           replace X with the device letter of your SD-Card
                                           once finished, unmount the SD-CARD
```

**8.)**    Flash U-Boot (Bootloader) onto the eMMC-Module for the Pine64 H64B SBC

```
lsblk                                      find device name of your eMMC
sudo dd if=u-boot-sunxi-with-spl.bin of=/dev/sdX bs=1024 seek=8 conv=notrunc
                                           replace X with the device letter of your eMMC-Module
                                           once finished, unmount the eMMC-Module
```

**9.)**    Install the eMMC-Module onto your Pine64 H64B SBC, insert the SD-Card, connect HDMI,
           Mouse and Keyboard, USB to serial (UART) adapter, USB to Ethernet adapter and power it up,
           now follow the Debian Installer.  (build in Ethernet, WiFi and USB3 do not work during installation)

```
sudo screen /dev/ttyUSB0 115200                    connects you to the serial output of the Pine64 H64B
                                                   CTRL a k exits screen
```
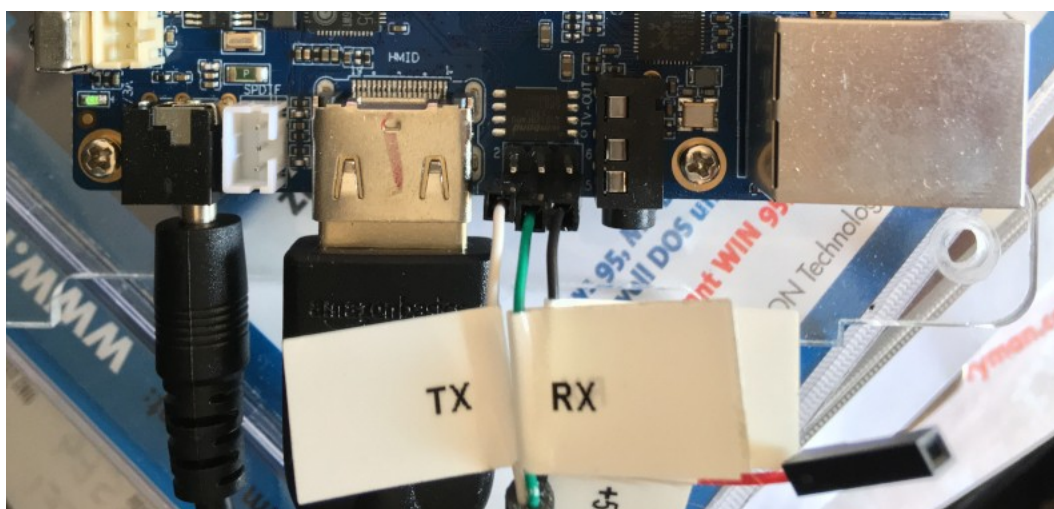


```
EXT Connector:        Pin 1    –> TX
                      Pin 3    –> RX
                      Pin 5    –> Ground
```

Select the USB Ethernet Adapter as primary network device for the installation.

Select Manual partitioning and format the already created partitions as mentioned in Step 4.

In "Software selection" select only SSH server and standard system utilities

Ignore the "No boot loader installed" warning and <Continue>

At the "Finished the installation" prompt select <Go Back> and from the
"Debian Installer main menu" select Execute a sell and <Continue> and now continue with step 10.

10.)    Create essential but yet missing files

chroot target

DTB file handling

mkdir /boot/dtbs

nano /etc/kernel/postinst.d/copy-dtbs            create as below

#!/bin/sh

set -e
version="$1"

echo Copying current dtb files to /boot/dtbs....
cp -a /usr/lib/linux-image-${version}/. /boot/dtbs/

chmod +x /etc/kernel/postinst.d/copy-dtbs

/etc/kernel/postinst.d/copy-dtbs `uname -r`

Bootloader configuration

mkdir /boot/extlinux

nano /boot/extlinux/extlinux.conf            create as below

TIMEOUT 2
DEFAULT debian

LABEL debian
        MENU LABEL Debian
        KERNEL /vmlinuz
        INITRD /initrd.img
        FDT /dtbs/allwinner/sun50i-h6-pine-h64-model-b.dtb
        APPEND console=ttyS0,115200 console=tty1 root=LABEL=root rw rootwait

11.)    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

**12.)** Set primary network interface back to internal Ethernet Port

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
auto end0
allow-hotplug end0
iface end0 inet dhcp
```

**13.)** Return back to the Debian Installer

exit

exit

From the "Debian Installer main menu" select Finish the installation and <continue> and now continue with step 15.

**14.)** Once installation is finished, add missing WiFi/Bluetooth firmware for RTL8723BS Chipset

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-realtek

**15.)** Perform system update, remove unnecessary packages, enable filesystem check and enable sudo

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

tune2fs -c 1 /dev/mmcblkXp1                    use lsblk to find correct block device
tune2fs -c 1 /dev/mmcblkXp2

```
apt install sudo

adduser youruser sudo
```

Done, enjoy your setup.