Installing Armbian on $20 X96Q TV Box: Develop / Deploy with the Singkong Programming Language

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What You'll Need

**The "X96Q" branding covers a wide range of hardware revisions and configurations.
While this guide works for the Allwinner H313, please be aware that compatibility can vary across different batches.
If you encounter issues—such as a blank screen on boot—check your specific board version.**

- **An X96Q TV Box (Allwinner H313):** This tutorial uses the 2GB RAM / 16GB eMMC model**.**
- **A microSD card:** This tutorial uses a Class 10 A1 16GB model.
- **A USB Wi-Fi Adapter:** This tutorial uses a TP-Link TL-WN722N.

Note: The onboard Wi-Fi chip on this specific X96Q unit was not detected by Armbian. Using a supported USB adapter is a reliable way to ensure you have a stable network connection.

- **A computer:** Running any OS that supports writing an Armbian disk image to the microSD card. This tutorial uses Windows 10 and Raspberry Pi Imager.
- **A physical keyboard and mouse:** Necessary for interacting with the X96Q TV Box during installation, configuration, and software development tasks (in addition to the keyboard/mouse required for the computer).
- **An HDMI cable and display:** Necessary to connect the X96Q to a monitor or TV. The same display used by the computer can be shared by switching the input source.
- **A wooden toothpick:** Required to press the reset button hidden inside the AV port to trigger the TV Box bootloader.

**Context: You might notice this differs from our previous X98H tutorial. The X98H (based on more modern chipsets) benefits from a more standardized, mainline-compatible ecosystem.
In contrast, the H313 chipset found in many budget X96Q devices is highly sensitive to specific internal board layouts, Wi-Fi chips, and RAM timings—
meaning a single image is often less "universally compatible" than it is on newer, high-end boards.**

Downloading the Armbian Disk Image

At the time of this writing, the X96Q TV Box is not officially supported by Armbian. This tutorial utilizes a community-maintained image.

- **Repository**: github.com/NickAlilovic/build/releases
- **Version**: 20250306, Armbian 25.05.0, Kernel 6.12.11
- **File Name:** Armbian-unofficial_25.05.0-trunk_X96q-ddr3-v5-1_bookworm_edge_6.12.11_xfce_desktop.img.xz

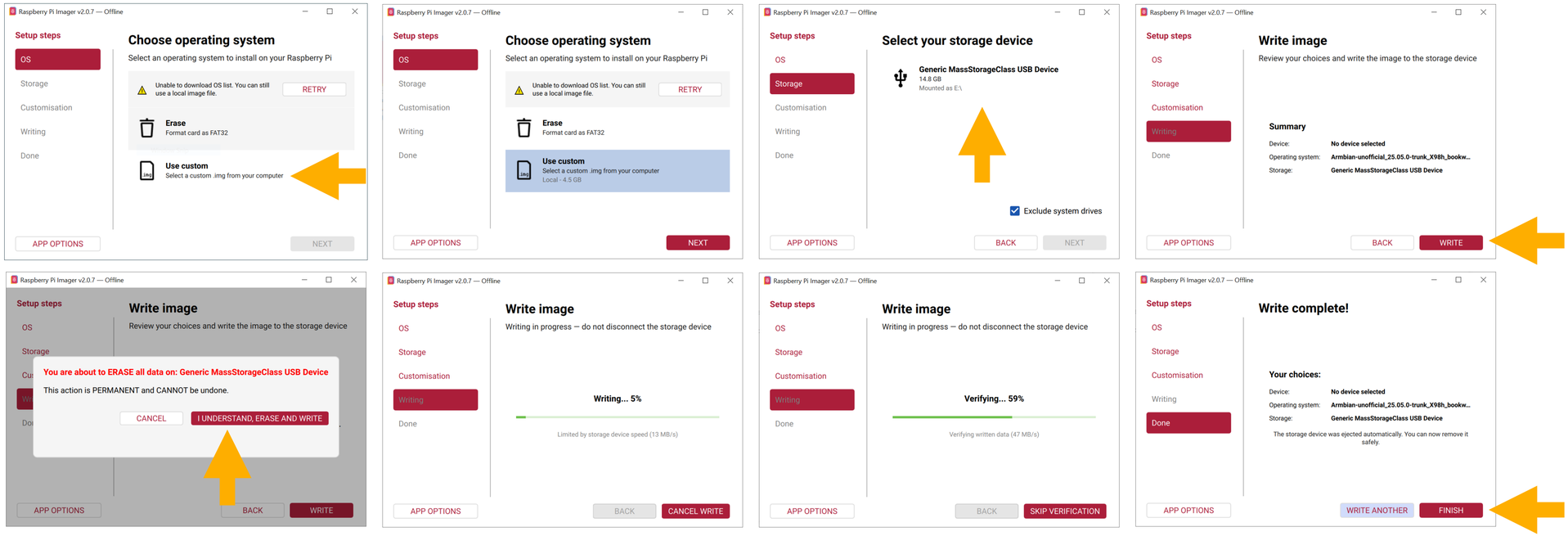
Important Note on Selecting Your Image: You will see several files with "X96Q" in the filename.
These correspond to specific hardware revisions (such as **DDR3** or **LPDDR3** RAM, and board version v5.1).
After some trial and error, the specific image that worked for my 2GB RAM / 16GB eMMC unit
(which is a v5.1 board with **DDR3** RAM) is as mentioned above.

Your mileage may vary: These boxes are highly fragmented. If your unit has LPDDR3 RAM or a different board revision, you may need to select a different image from the list. Always double-check your RAM type before flashing.

Note: I tested the current official images from Armbian.org, but they were not compatible with this X96Q unit.

Flashing the Armbian Disk Image

- Insert the microSD card: Plug the card into your computer.
- Run Raspberry Pi Imager: Select the downloaded file, choose the microSD card, and click Write to begin. Unplug the card once the process is complete.

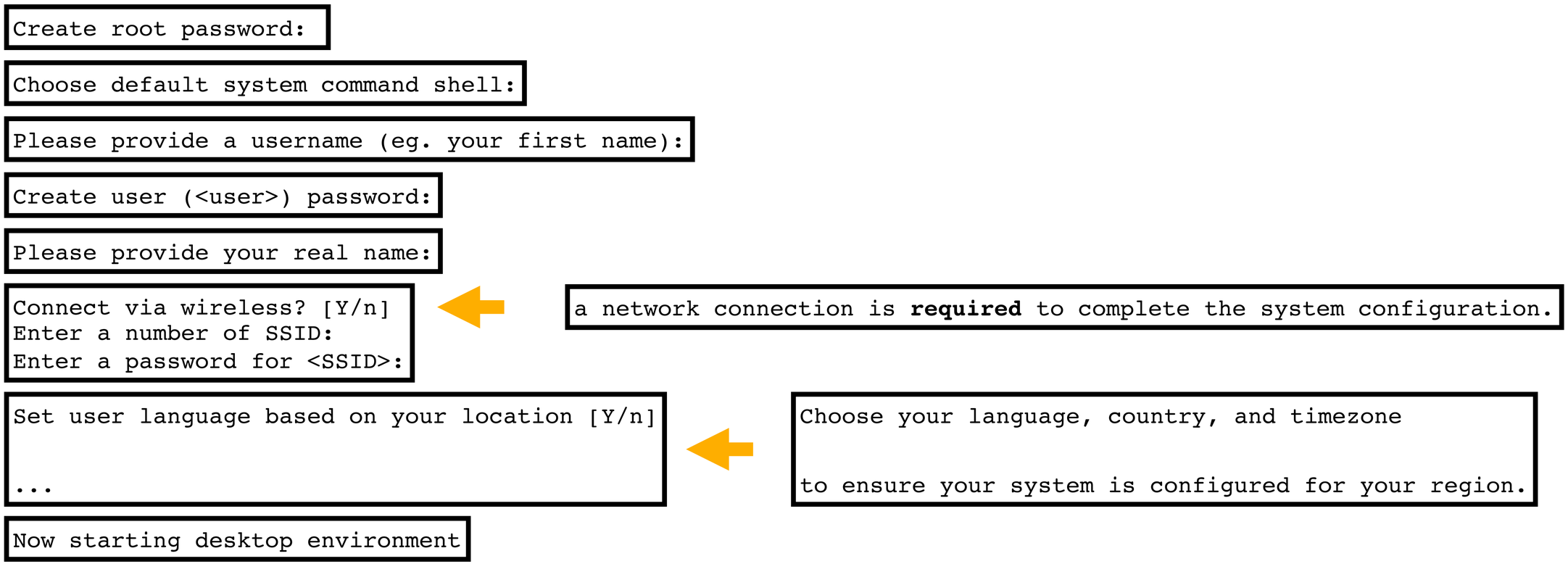


Booting from the microSD Card

- **Power off:** Ensure the TV Box is completely powered down.
- **Insert:** Slide the prepared microSD card into the slot.
- **Wi-Fi**: Plug the USB Wi-Fi adapter into one of the available USB ports. (Doing this now ensures the system detects the adapter during its first boot sequence.)
- **Press and Hold:** Insert the toothpick into the AV jack until you feel the button click; continue holding it firmly.
- **Power on:** Connect the power cable while continuing to hold the button.
- **Release:** Remove the toothpick once the Armbian logo appears on the screen.

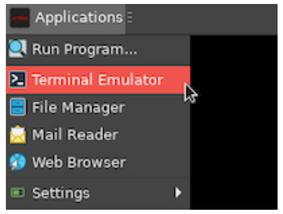
Completing the Setup

Carefully complete every prompt to ensure your system is configured correctly.



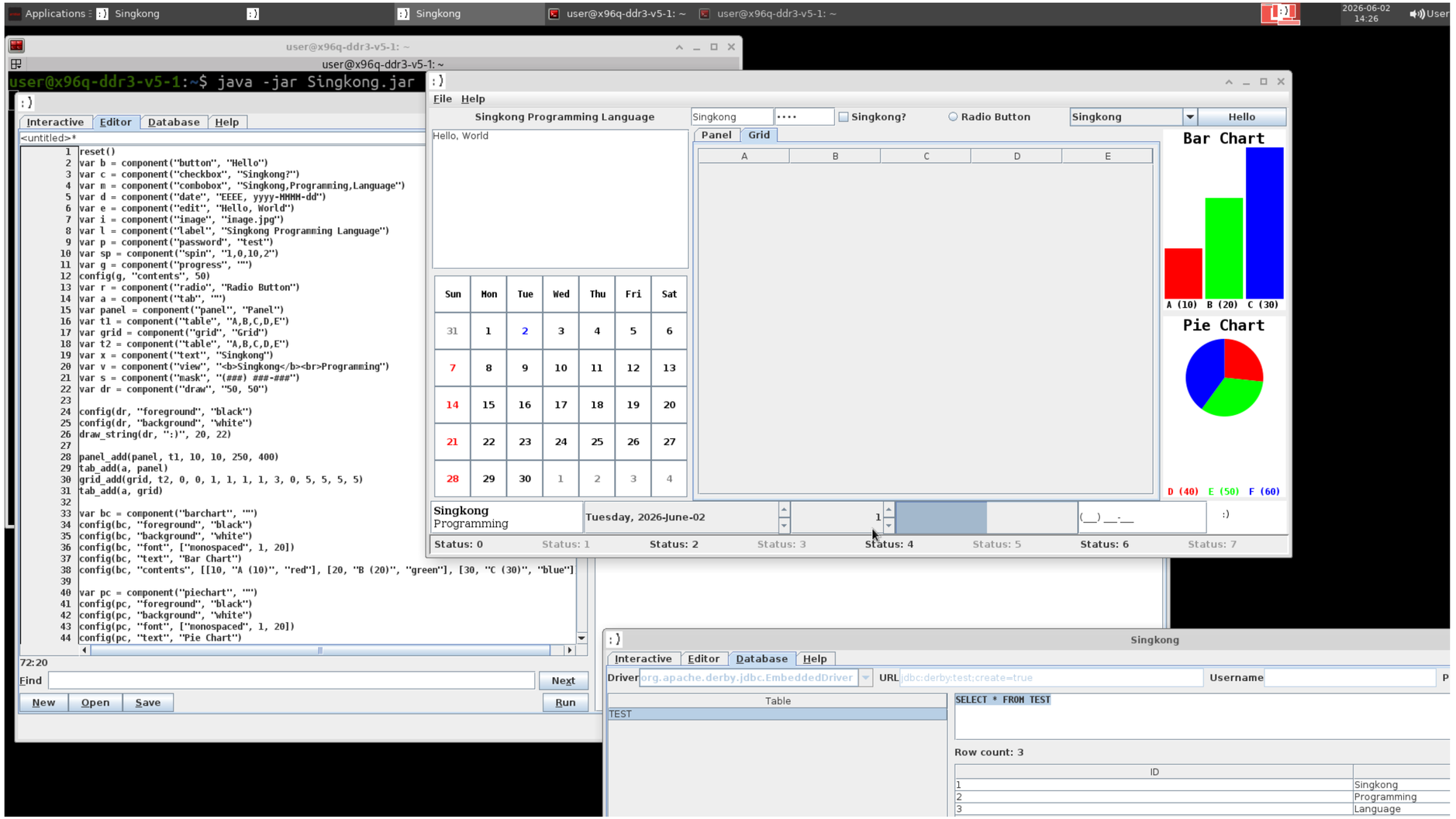
Installing Required Software

Follow the steps below within the Terminal Emulator to prepare your environment.



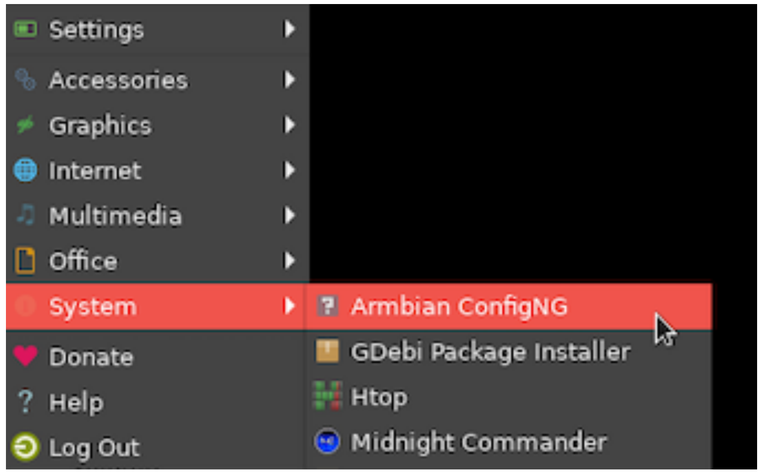
Singkong in Action

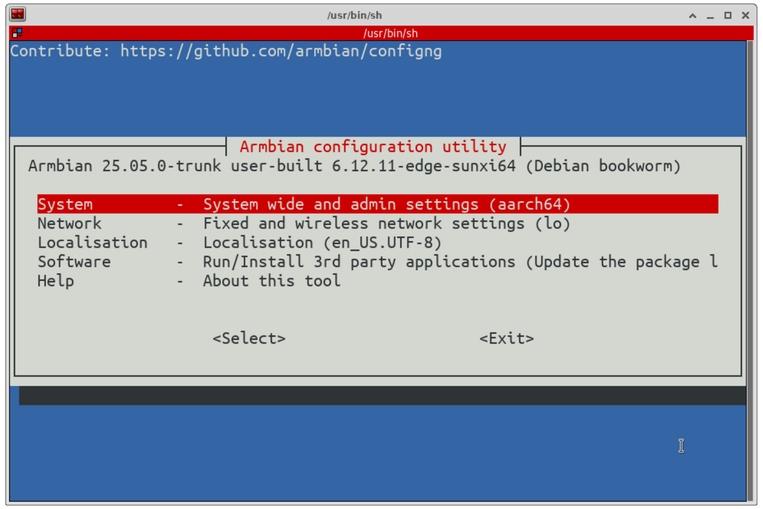
From development to production—leverage your device for both building and running your projects.

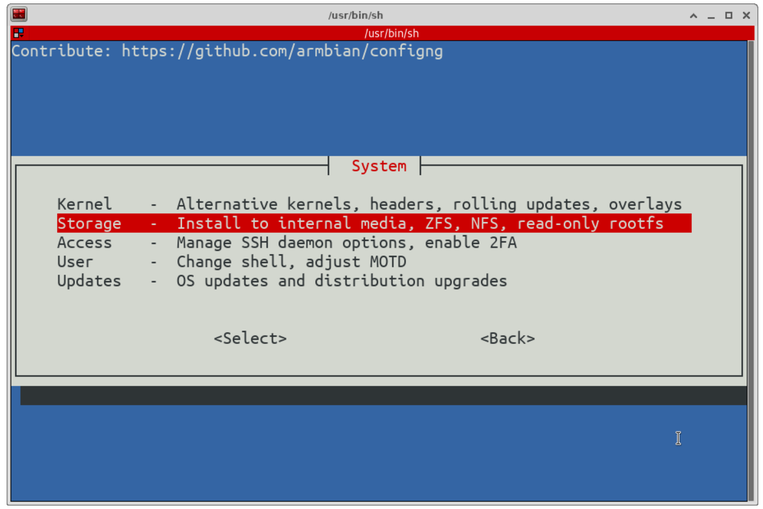


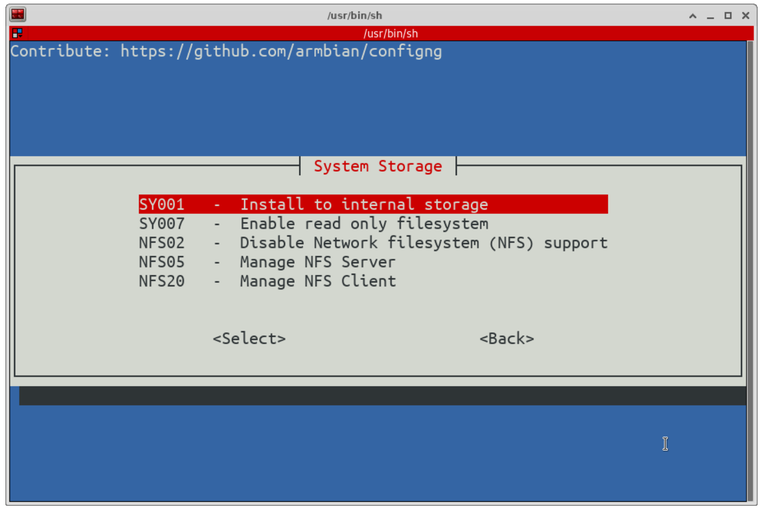
Installing Armbian to the eMMC (Optional)

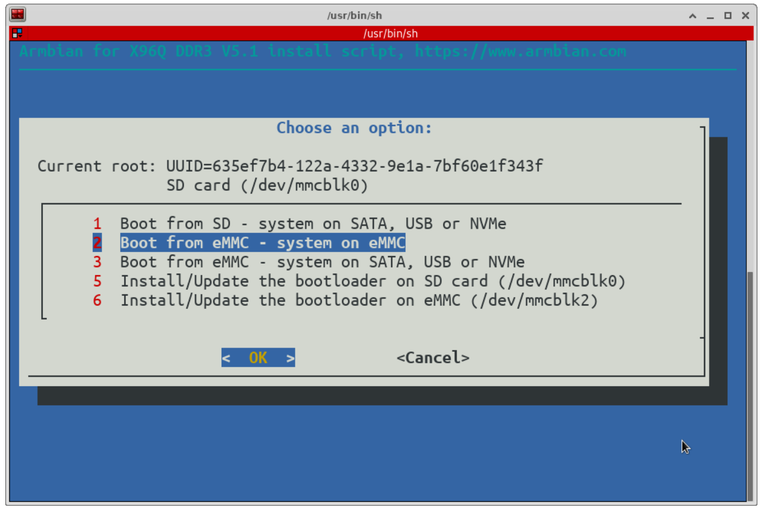
Warning: This process will permanently overwrite your original OS. Once finished, the microSD card will no longer be required for booting











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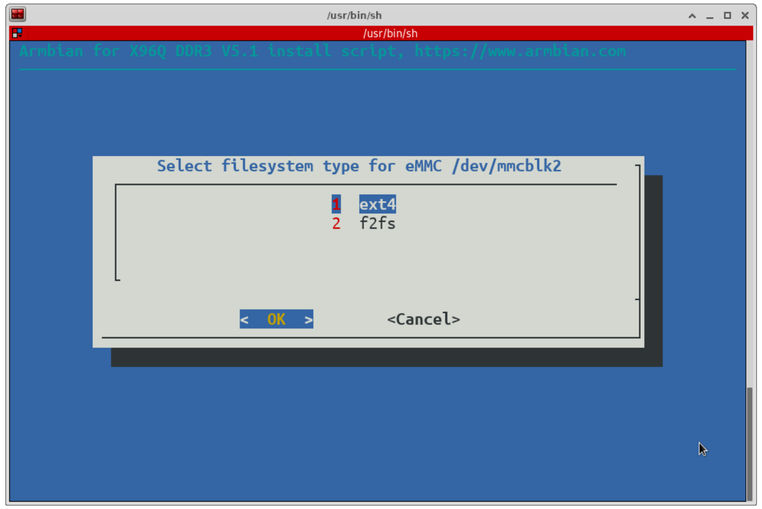

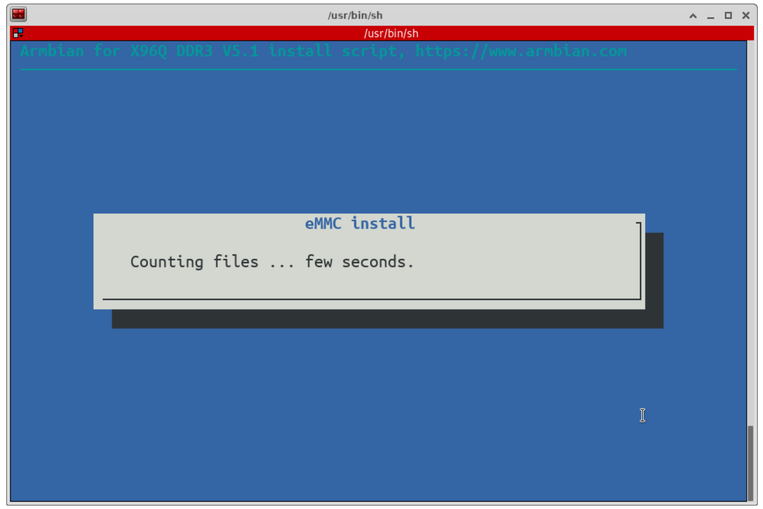

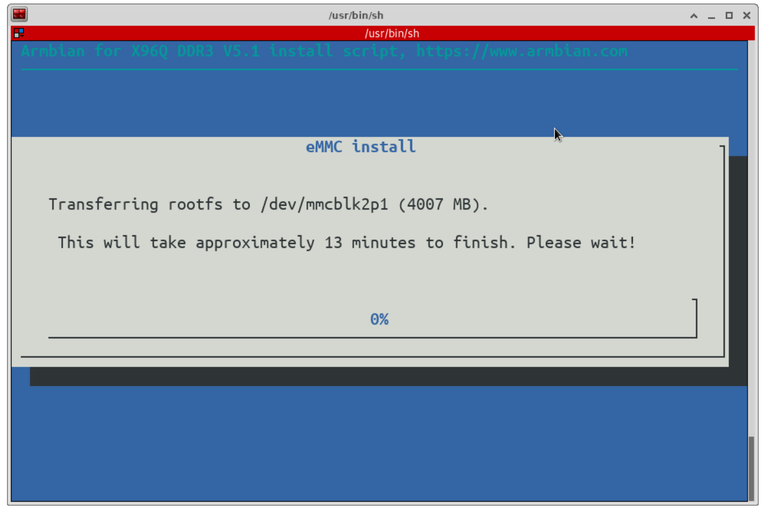

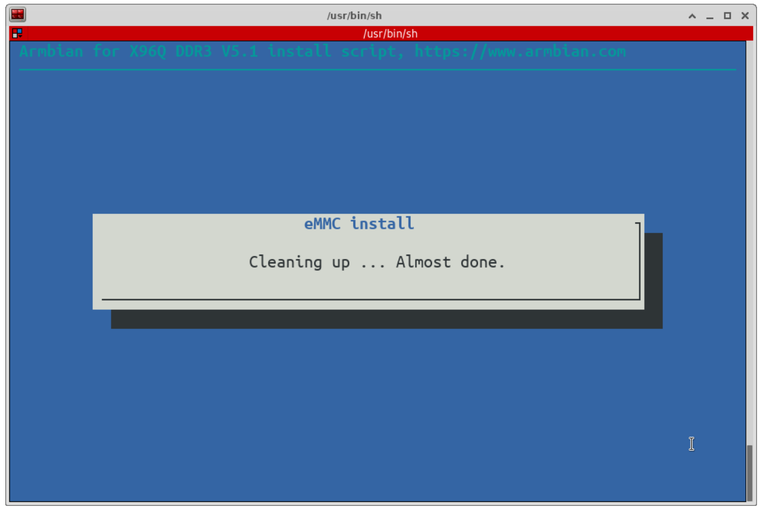

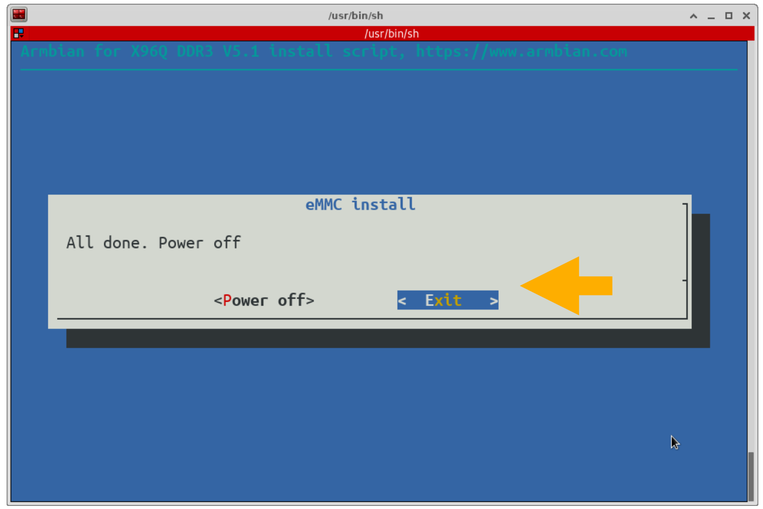

Do not Power off

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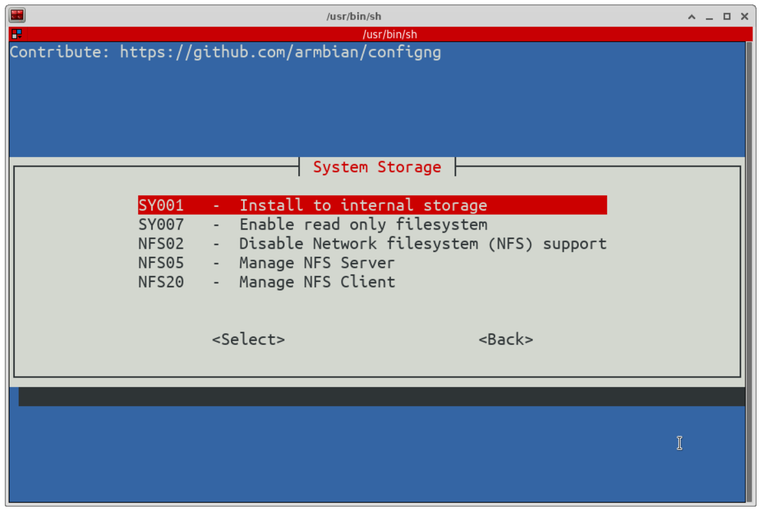

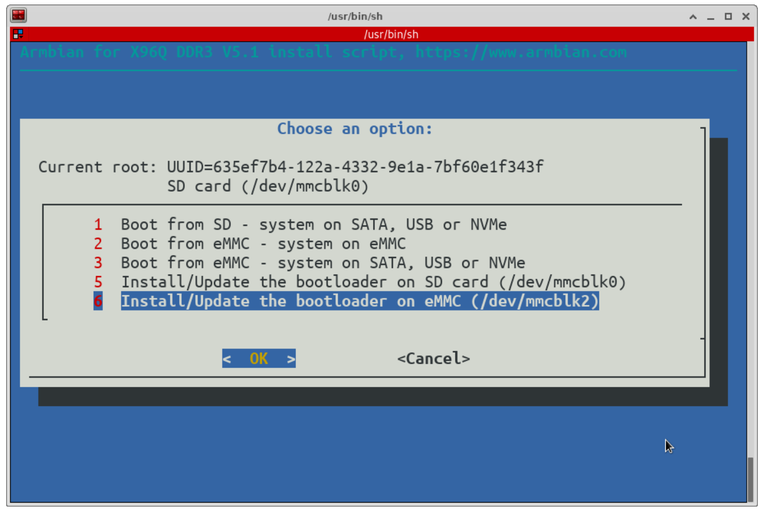

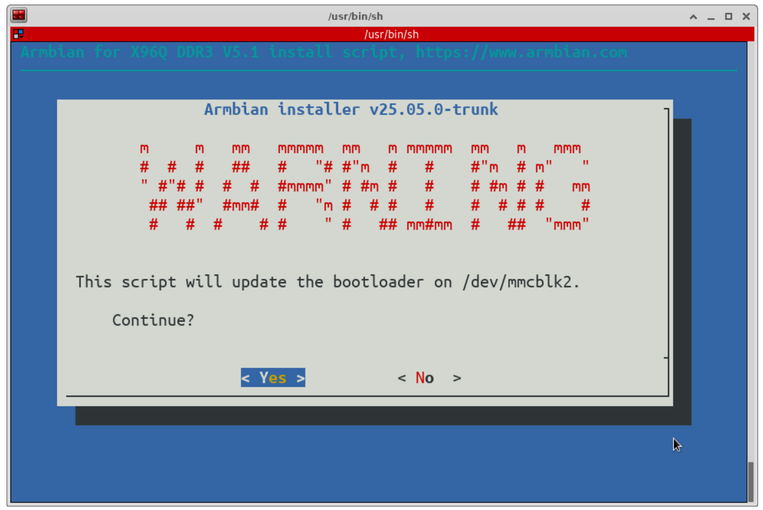

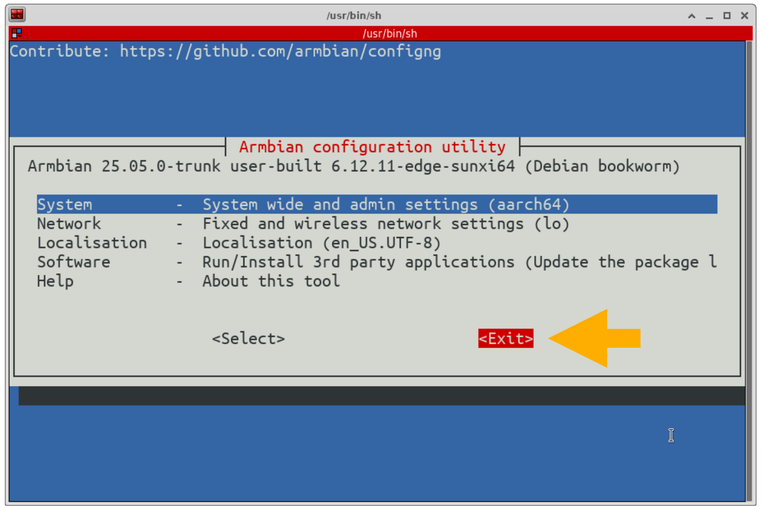

- Power off the device
- Remove the microSD card
- Power on the device to boot from eMMC

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