How to Set Up LCC on Raspberry Pi for Home Theater Entertainment with HifiBerry Digi+ I/O

Materials

- Raspberry Pi 4 Model B/4GB
    - https://www.pishop.us/product/raspberry-pi-4-model-b-4gb/

- USB-C Power Supply, 5.1V 3.0A, Black, UL Listed
    - https://www.pishop.us/product/usb-c-power-supply-5-1v-3-0a-black-ul-listed/

- Micro HDMI Male to HDMI Female Adapter Cable

- HighPi Raspberry Pi Case for Pi4, Black
    - https://www.pishop.us/product/highpi-raspberry-pi-case-for-pi4/

- Samsung 32GB Evo Plus Class 10 Micro SDHC card
    - https://www.amazon.com/Samsung-Class-Micro-Adapter-MB-MC32DA/dp/B00WR4IJBE

- USB keyboard

- USB mouse

- HifiBerry Digi + I/O
    - https://www.hifiberry.com/shop/boards/hifiberry-digi-io/

- 2x HDMI cable

- 1x optical Toslink cable (for audio receiver or sound bar)

Steps

Pre-setup

1. Gather all materials in the materials section.

2. Download ubuntu server image for raspberry pi

3. Plug in sd card to computer via sd card slot or usb sd card reader.

4. Flash ubuntu server image to sd card using whatever tool you are most comfortable with e.g. balena etcher, ubuntu disk image writer, rufus, dd, etc.

5. Once the ubuntu server image is written to the sd card, edit the file in the linux filesystem /boot/firmware/syscfg.txt and add these settings. This is done to enable the HifiBerry Digi+ I/O card and to make the hdmi audio pass-through work without audio dropout issues.

   ```
   dtoverlay=hifiberry-digi
   hdmi_drive=2
   hdmi_force_edid_audio=1
   ```

6. optional, skip if planning to use ethernet) Remove sd card and insert it again.

7. (optional, skip if planning to use ethernet) Edit 50-cloud-init.yaml and only replace MYSSID with ssid and MYPASSWORD with ssid password. Keep quotes.

8. (optional, skip if planning to use ethernet) In the linux partition which contains etc folder, replace file /etc/netplan/50-cloud-init.yaml with the file of the same name that you edited with your ssid and password.

Assembly

9. Assemble the Raspberry Pi device components and connect it to the TV.

    a. Place the raspberry pi device inside the case. Make sure the device is firmly locked into the case.

    b. Plug in the usb mouse and the usb keyboard into black USB 2.0 ports of the raspberry pi device.

    c. Plug in the micro hdmi adapter to the micro hdmi port of the raspberry pi device.

    d. Plug in an hdmi cable from female hdmi end of micro-hdmi adapter to hdmi input of avedo links hdmi audio converter.

    e. Plug in hdmi cable from hdmi output to hdmi input of the television set or hdmi input of audio-video receiver.

    f. Plug in the usb connector of USB-C 5V DC adapter to the raspberry pi device.

    g. Insert sd card into the sd card input of the raspberry pi device. It should fit in smoothly with little physical pushback.

    h. Plug in the HifiBerry Digi + I/O card into the pins. Make sure the mount holes are lined up well.

Software Configuration

10. Turn on the television set and set it to display the input that the raspberry pi device is connected to.

11. Plug in the USB-C power supply into an outlet. You should see text displayed in the television set.

12. At the login, wait until a message appears about cloud-init initializing ubuntu user, then, login with user ubuntu and password ubuntu.

13. Change password as prompted.

14. (optional, skip if planning to use ethernet)
    a. $ cd /etc/netplan
    b. $ sudo netplan generate
    c. Edit file 50-cloud-init.yaml if errors are found.
    d. $ sudo netplan apply

15. $ sudo apt update

16. $ sudo apt upgrade

17. (optional, do this step to install a graphical desktop environment)
    $ sudo apt install ubuntu-mate-desktop

18. $ git clone https://github.com/MeteorStudioASU/lcc.git

19. $ cd lcc

20. $ mkdir build

21. $ cd build

22. $ sudo apt-get install git cmake g++ pulseaudio pavucontrol libpulse-dev libasound2-dev

23. $ cmake .. && make && sudo make install

24. $ cd /usr/local/bin

25. $ chmod +x lcc_audio

Running the Program

26. $ lcc_audio

27. Chose **Built-in Audio Device** for input device and **Built-in Audio Device** for output device
    a. This is done because the Input and Output are both on the same audio device which is the HifiBerry Digi I/O