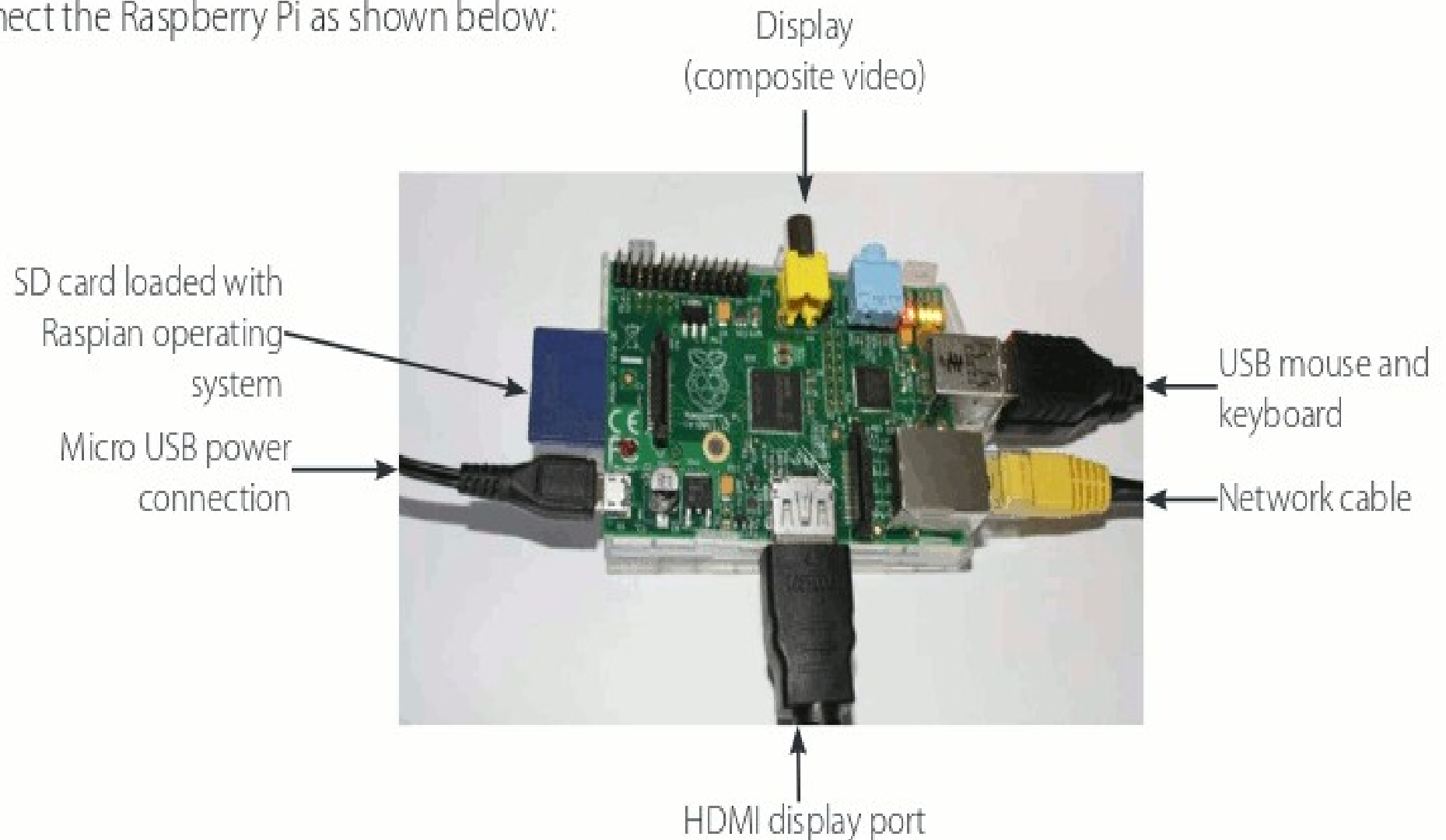


Introducing the Raspberry Pi

Initial setup
Hardware

Connecting the Pi in the lab

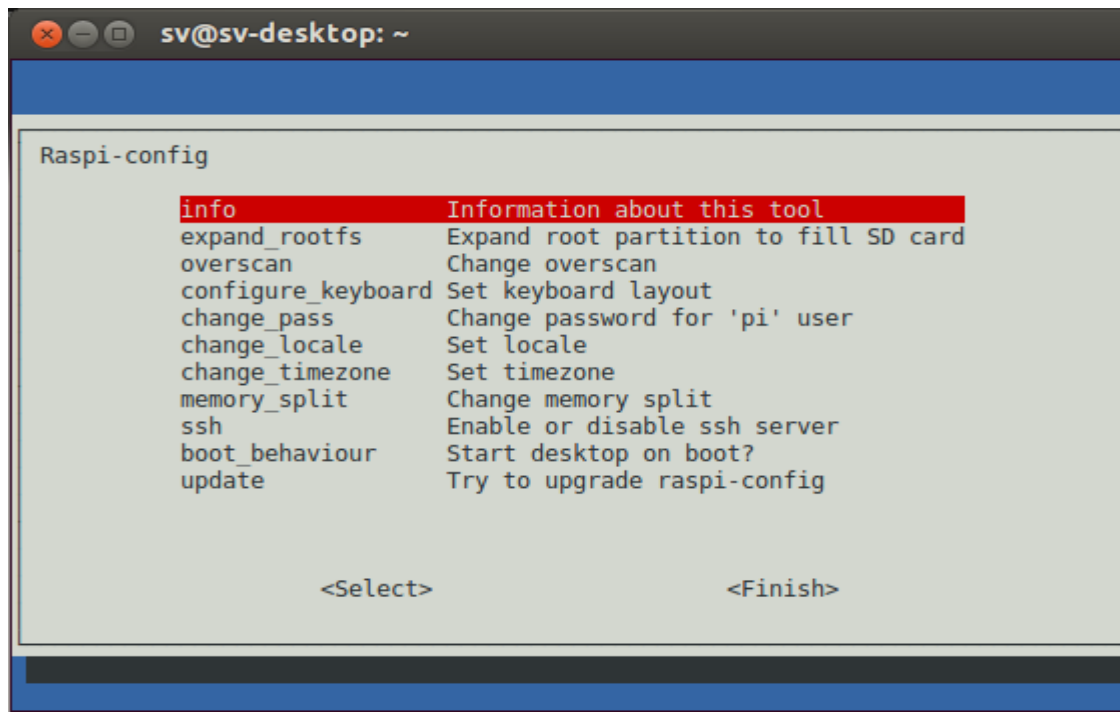
Connect the Raspberry Pi as shown below:



A setup tutorial

Configuring the Pi

- After Raspbian is installed on your SD card
 - Bootup the RPi
 - Login as *pi* with password *raspberry*
 - Wait for the Setup options screen to appear or type:
 - `sudo raspi-config`



The screenshot shows a terminal window titled "sv@sv-desktop: ~" with the "Raspi-config" utility running. The utility displays a list of configuration options, with the "info" option highlighted in red. The options are:

Option	Description
info	Information about this tool
expand_rootfs	Expand root partition to fill SD card
overscan	Change overscan
configure_keyboard	Set keyboard layout
change_pass	Change password for 'pi' user
change_locale	Set locale
change_timezone	Set timezone
memory_split	Change memory split
ssh	Enable or disable ssh server
boot_behaviour	Start desktop on boot?
update	Try to upgrade raspi-config

At the bottom of the screen, there are two navigation options: "<Select>" and "<Finish>".

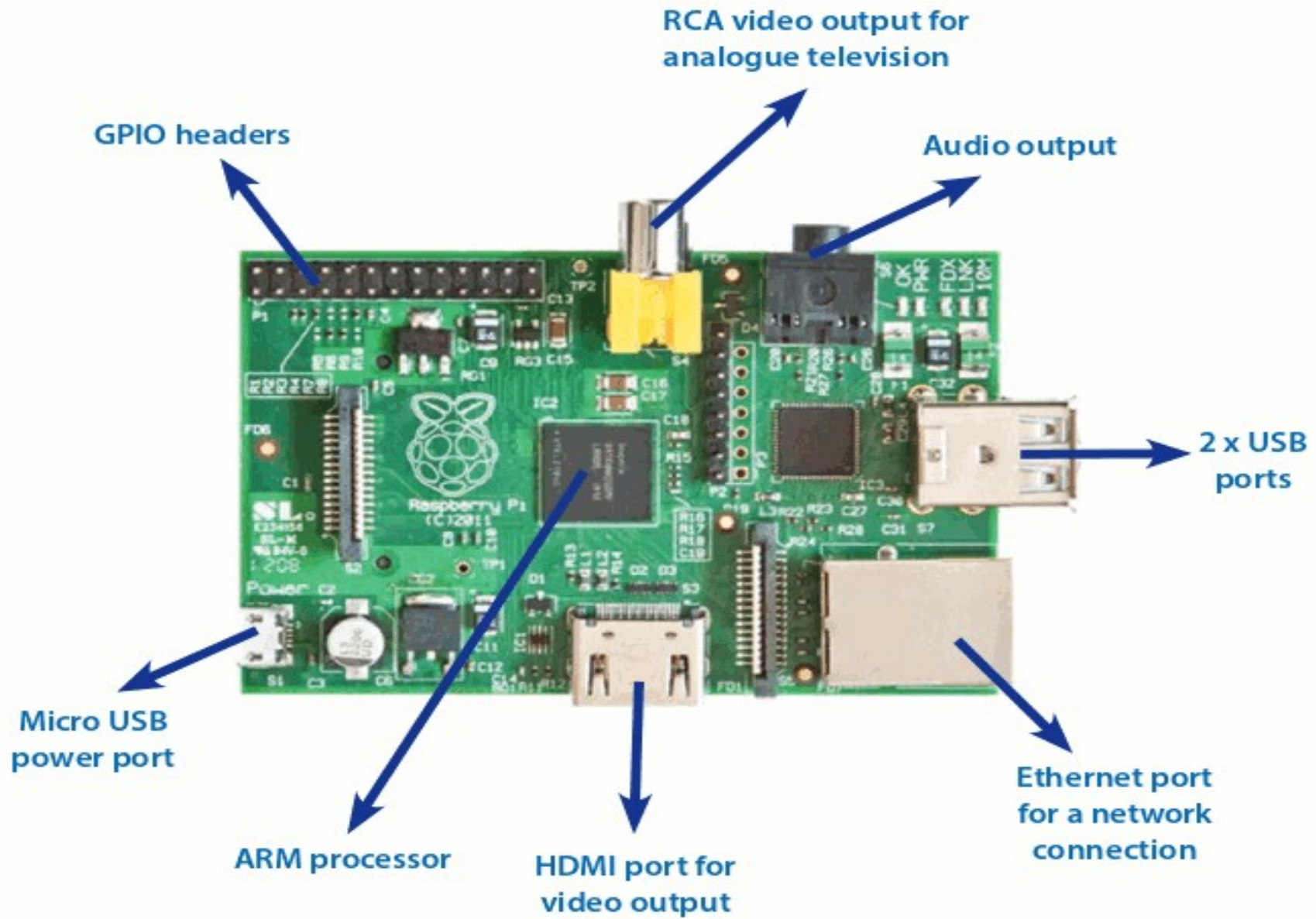
Initial Configuration

- Navigate the Setup Options Screen
 - Press arrow keys to position the highlight on the desired setup option and press enter to select the option
- Change the following:
 - Choose Expand Filesystem option to reformat your SD card to make all of its space available for storage.
 - Select a new password (optional)
 - Change Locale
 - Select ***en_US.UTF-8***
 - Use the spacebar to select and deselect
 - Use tab key to move to ***ok***
 - Change Keyboard
 - Select a generic US keyboard
 - Default selections are usually good
 - Select a time zone
 - Choose Eastern time zone
 - Turn on SSH (under Advanced Options)
- You can also *Americanize* your RPi as described [here](#)

Updating the Software

- After updating your configuration reboot the RPi
 - *sudo reboot*
- Update the OS
 - `sudo apt-get update`
 - `sudo apt-get upgrade`
- This could take a long time...
- Launch the desktop:
 - `startx`
- Shutting down:
 - `sudo halt` or `sudo poweroff`

Focus on Hardware



Architecture Challenge

Hardware Exercise

- In the [ORC Hardware Challenge](#), do the activities entitled ***CPU Speed*** and ***Memory Allocation*** under ***Task 2***. Show me your answers to receive credit. You will need a stop watch to do these exercises.

Selecting a Microcontroller

<http://www.edn.com/electronics-blogs/embedded-basics/4411480/10-steps-to-selecting-a-microcontroller>

- Things to consider:
 - Identify required hardware interfaces
 - Identify software requirements
 - Identify memory needs
 - Identify cost and power constraints
 - Check availability
 - Select a development kit
 - Investigate software and tools
- Identify instructional support

Design Exercise

- Read [this article](#), and then formulate a few entries in the table below.

Microcontroller	Pros	Cons
BeagleBone Black		
Raspberry Pi (RPI)		
Arduino		
PCDuino		
PIC processor		