

3D Print of the month.

November 2018

### 3D Printing without a computer

Not everyone owns a computer. Even those that do own a computer do not always 'get on' with said computer. Even those among us who work, or worked, daily with computers may like to get away from the damn things when they are on their 'me time'. That, I assume, is why I am regularly asked if it is possible to 'do' 3D printing without a computer.

Long answer short, it is very possible to use a 3D printer without using, needing, or even possessing a computer. As long as you have some device like a smart-phone or tablet to let you connect to the wireless world. If you can access the internet, you can control a 3D printer.

**Internet enabled Printers:** Many printers now come 'internet enabled' this means that the printer's main board has a wee wifi modem attached or built in. The problem with this is that no real standard has emerged for speaking to these. They are part of the emerging 'Internet of Things' or IoT debacle. Everyone thinks that their standard is best and that everyone else will give up what they're developing to flock to this standard. It aint happening, and the upshot is that each IoT printer comes with it's own app for your smartphone. This can be a bit of a bind, because if you get a newer sexier phone in a couple of years, or if somebody goes out of business (hello Maplin customers), or even if Apple or Google decide to change the OS on your existing phone, you may find yourself stuck with a 3D printer that you can't readily use. There is a similar situation with all the various flavours of quadcopter drones currently being bought for Christmas. However, unlike drones, for 3D printers all is not lost. Unlike drones 3D printers can always be accessed via an SD card or a USB connection.

**SD Card:** The Secure Digital or SD card has been with us now for some time. It was originally used in cameras and portable audio players, and has now largely been superseded by the TF or micro-SD card. This is about the size of a fingernail and comes in sizes up to 512GB. These new standards are still routinely referred to as SD cards, and most micro-SDs come with a little adapter like an after-dinner mint. As long as you have a browser you can get designs from the likes of thingiverse

<https://www.thingiverse.com/>

By downloading and installing one of the many 3D printing apps that are available, it is possible to develop and slice designs on your phone. These can then be transferred on SD card to your 3D printer. Some 3DPs don't have screens, but these will always search the SD card and print a file with a certain file-name so as long as you rename the file before you save it, it will print. There is a good selection of 3D printing apps for both Apple and Android here:

<https://www.lifewire.com/3d-printer-apps-2247>

**OctoPrint  
& OctoPi**

OctoPrint was originally an open source project to allow 3DP enthusiasts to control a complete 3D printer farm from a single PC. It simply imitates an SD card by dripping the gcodes that the printers need at an appropriate rate, thus the PC becomes a virtual SD card, but a virtual SD card for up to 8 printers simultaneously. It has thrived and developed over the years.

One of it's most successful products has been OctoPi. Octopi is a version of OctoPrint that runs on the raspberry pi. The raspberry pi (rpi) is a educational machine which is the size of credit card at it's largest, although a pi zero is also available that's about a third of that size. The biggest and most powerful raspberry pi costs about £27, the pi zero costs about £4.50. It was given away on the front of a magazine a couple of years ago as a promotion. That's how wee and light and insignificant it is. It makes the Arduino look beefy! All raspberry pis come as bare boards, no cases. They need, as a minimum, a SD card containing an operating system and a micro USB power supply, basically an old mobile phone or kindle charger. An additional usb cable is needed to connect to the 3D printer. OctoPi can then simply be downloaded and copied onto a microSD or SD card. This card is then plugged in to the raspberry pi along with power and a printer cable. The pi wakes up, runs automatically and provides a web page on the local network that controls the printer. Files can be uploaded to the webpage for printing, the printer can be manipulated (move up/down etc, load/unload filament, change speeds, etc etc ) via the webpage and if the optional raspberry pi camera or a webcam are fitted to the pi, then the progress of the print can be watched from anywhere. Additionally the octopi will contact your phone when a print finishes or if there is an error.

Of course if you have more than one printer then it can control them all simultaneously and independently. It's marvellous!

The main octoprint page shows details and animations of how it works  
<https://octoprint.org/>

The octopi page of the octoprint page shows in great detail how to set up, and also includes a video that goes through every step along the way.  
<https://octoprint.org/download/>

Although Thomas's video includes using a laptop to set things up, it can be done just as easily from a phone or tablet.

If you are interested in setting up a pc-less 3D printer, or need more info on anything here, just give me or one of the guys a shout, either by email or in person at any of the meetings. We'll gladly do it with you, for you, to you, in person or by remote control. Just ask! :)