

# Raspberry Pi 3 Boot to USB

This is taken from the following URL: <https://www.raspberrypi.org/documentation/hardware/raspberrypi/bootmodes/msd.md>

I have documented it here as I use this guide a lot, and I don't want to lose it :)

```
This tutorial explains how to boot your Raspberry Pi 3 from a USB mass storage device such as a flash drive or USB hard disk. Be warned that this feature is experimental and may not work with all USB mass storage devices.
```

```
<color red>USB Hard Drives seem particularly fussy.</color>
```

## Program USB Boot Mode

Before a Pi will network boot, it needs to be booted with a config option to enable USB boot mode. Enabling this config option requires special `start.elf` and `bootcode.bin` files. These can be installed by using the "next" branch on `rpi-update`.

Go to the [Downloads](#) page and install Raspbian onto an SD card using [Win32DiskImager](#) if you are on Windows, or `dd` if you are on Linux/Mac. Boot the Pi.

First, prepare the `/boot` directory with experimental boot files

```
If on raspbian lite you need to install rpi-update before you can use it:
```

```
sudo apt-get update; sudo apt-get install rpi-update
sudo BRANCH=next rpi-update
```

Then enable USB boot mode with this code:

```
echo program_usb_boot_mode=1 | sudo tee -a /boot/config.txt
```

This adds `program_usb_boot_mode=1` to the end of `/boot/config.txt`. Reboot the Pi with `sudo reboot`, then check that the OTP has been programmed with:

```
vcgencmd otp_dump | grep 17:
17:3020000a
```

Ensure the output `0x3020000a` is correct.

If you wish, you can remove the `program_usb_boot_mode` line from `config.txt` (make sure there is no blank line at the end) so that if you put the SD card in another Pi, it won't program USB boot mode. You can do this with `sudo nano /boot/config.txt`, for example.

```
sudo mkdir /mnt/target sudo mount /dev/sda2 /mnt/target/ sudo mkdir /mnt/target/boot sudo mount /dev/sda1 /mnt/target/boot/ sudo apt-get update; sudo apt-get install rsync sudo rsync -ax --progress / /boot /mnt/target
```

```
cd /mnt/target sudo mount -bind /dev dev sudo mount -bind /sys sys sudo mount -bind /proc proc sudo chroot /mnt/target rm /etc/ssh/ssh_host* dpkg-reconfigure openssh-server exit sudo umount dev sudo umount sys sudo umount proc
```

```
sudo sed -i "s,root=/dev/mmcblk0p2,root=/dev/sda2," /mnt/target/boot/cmdline.txt sudo sed -i "s,/dev/mmcblk0p,/dev/sda," /mnt/target/etc/fstab
```

```
cd ~ sudo umount /mnt/target/boot sudo umount /mnt/target # sudo poweroff
```

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