BENCHMARKING THE PI 3B+

The promise of improved performance is one thing, but there's only one way to get to the truth of the matter: benchmark testing

With an upgraded processor boasting impressive new packaging and improved networking capabilities, the Raspberry Pi 3B+ should sit head and shoulders above its predecessor the Raspberry Pi 3. To determine whether these improvements are noticeable in the real world, the Pi 3B+, along with the Pi 3 and a range of other board models, have been put through a series of benchmark tests, measuring everything from raw CPU performance to power draw and WiFi signal quality.

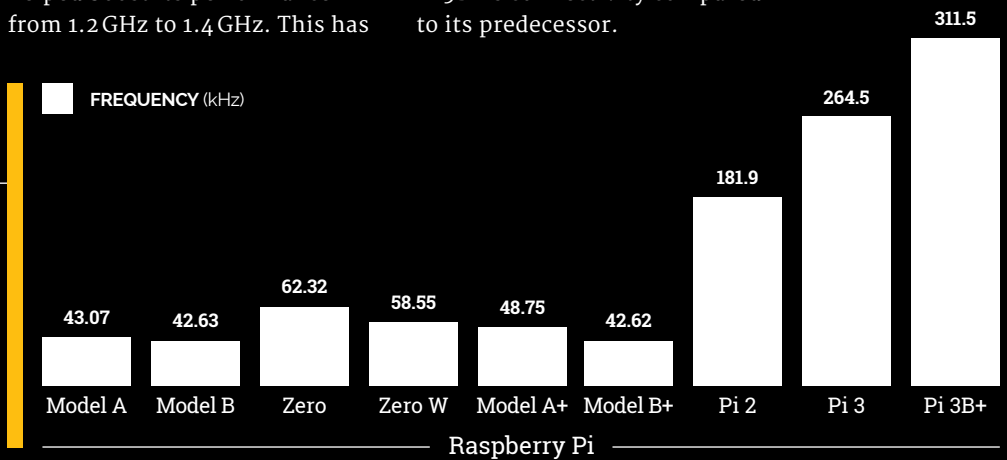
Spec comparison

Although it's the same underlying design as on the Pi 3, the Pi 3B+'s BCM2837 system-on-chip (SoC) is now in spin B0 and features improved packaging alongside a heat-spreader, which have helped boost its performance from 1.2 GHz to 1.4 GHz. This has a knock-on effect on memory performance, too, while the new USB Ethernet controller offers Gigabit connectivity at a theoretical maximum throughput of 300 Mbps, due to its use of a single USB 2.0 channel. Finally, a switch to a new dual-band radio module and antenna design inspired by the Pi Zero W improves the Pi 3B+'s connectivity compared to its predecessor.

PYTHON GPIO

Higher is better

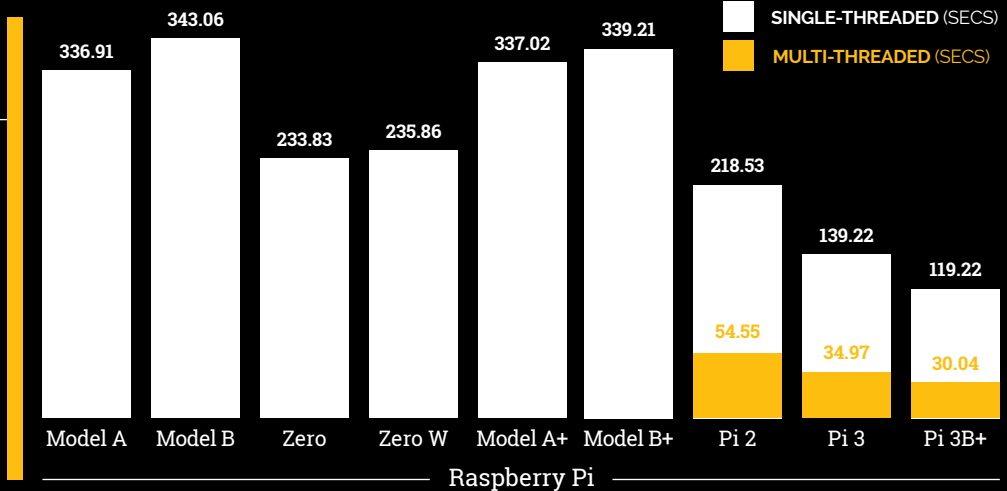
Driving the GPIO pins via Python can result in a CPU bottleneck, as demonstrated by this simplest of programs: a pin is switched on and off as quickly as possible while connected to a frequency counter. Note that updates to the GPIO driver and Python itself will alter these results.



SYSBENCH CPU

Lower is better

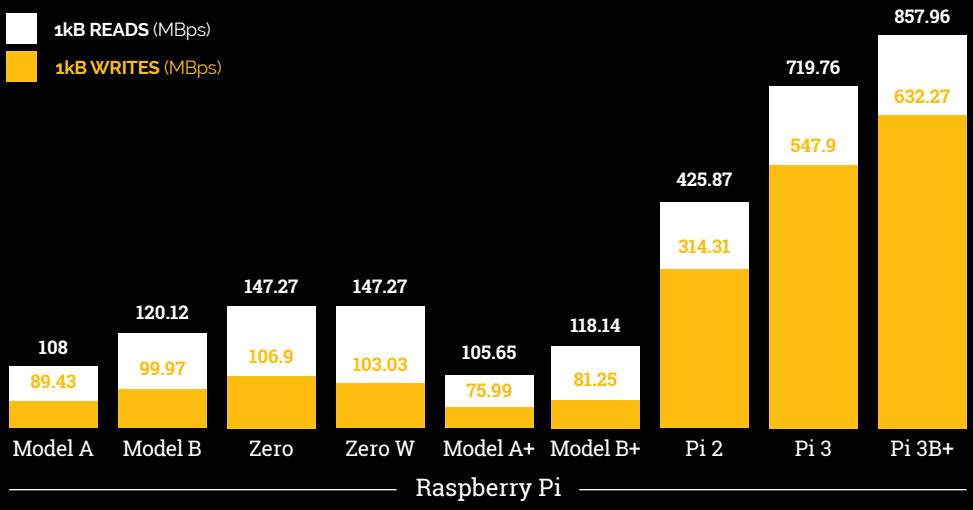
A synthetic benchmark designed to stress the central processor, SysBench's CPU test highlights the performance gains available to CPU-bound applications – in particular those which can take advantage of the multiple processing cores available on the Pi 2, Pi 3, and Pi 3B+.



SYSBENCH MEMORY THROUGHPUT

Higher is better

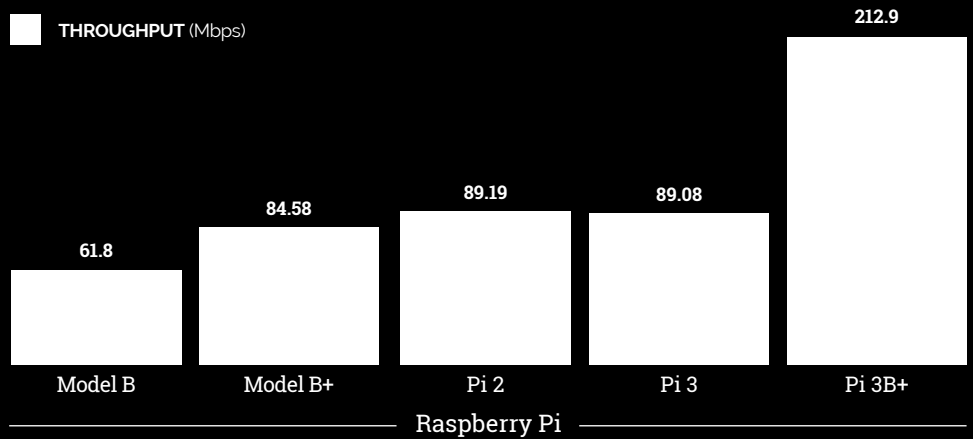
Not all applications are limited by available CPU performance, with some reliant on memory throughput – the speed at which data can be written to and read from RAM. The SysBench memory test carries out repeated 1kB reads and writes then reports the throughput in megabytes per second (MBps).



ETHERNET THROUGHPUT

Higher is better

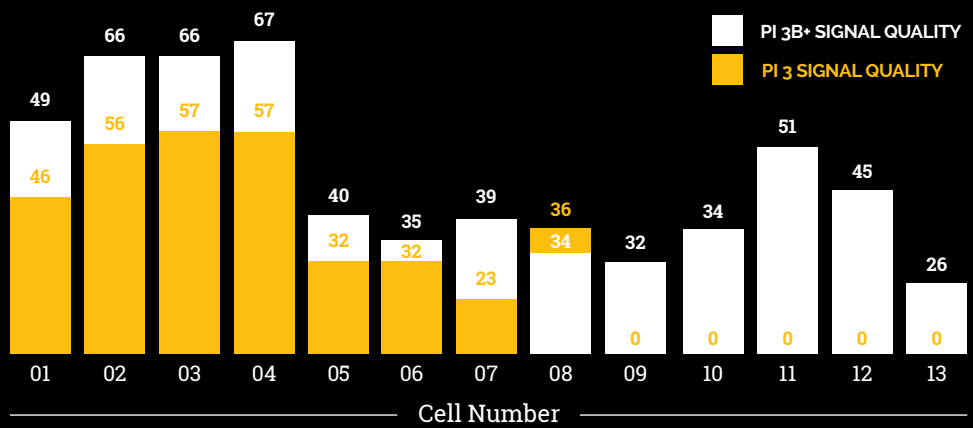
The Ethernet port, which connects via a shared USB channel, has been the last feature of the Raspberry Pi design to receive an upgrade. This test copies an incompressible 100MB file to each Pi on test, and there's no surprise in seeing the Pi 3B+'s Gigabit Ethernet topping the chart.



WIFI SIGNAL QUALITY

Higher is better

A head-to-head shoot-out between the Pi 3's single-band 2.4 GHz WiFi radio and chip antenna and the Pi 3B+'s new dual-band 2.4 GHz and 5 GHz radio with ground-plane antenna offers a look at the improvements you can expect in both signal quality and number of visible access points.



POWER DRAW

Lower is better

More performance is always welcome, but there's no such thing as a free lunch. This test, which measures power draw at the desktop with an HDMI display, wireless keyboard, and – where applicable – Ethernet connected, shows how an older model of Pi may be better suited to battery-powered and embedded applications.