

Armari Magnetar M64TP-RW2000G3

The Threadripper Pro arrives just in time to retain AMD's crown as king of workstation processors

SCORE ★★★★★

PRICE £7,495 (£8,994 inc VAT)
from www.armari.com

Just when it looked like AMD was out, it's pulled the workstation market right back in. The end to the dominance of the AMD Ryzen and Ryzen Threadripper thanks to the 12th generation Intel Core i9 (among other things – see “What on earth happened to AMD?” on p87) has been halted by the arrival of the Ryzen Threadripper Pro 5000 series. Armari just managed to obtain a processor in time for this test, and thank goodness it did: the Magnetar M64TP-RW2000G3 shows how much potential this workstation-class Zen 3 processor has.

The exact CPU in question is the Threadripper Pro 5975WX. It might seem a little odd that this is a 32-core processor in a system costing nearly £9,000 when last year we were seeing 64-core processors in systems under £8,000, but the Threadripper Pro always was more expensive than the vanilla Threadripper, and inflation in chip prices hasn't helped. As we'll see, 32 cores are plenty, and the 5975X will run these cores at a base 3.6GHz up to 4.5GHz in Boost mode. AMD's Precision Boost Overdrive can run as many cores as fast as your cooling and motherboard will allow. And talking of cooling, this proved to be the quietest system among a very quiet bunch thanks to the custom cooler.

One area where AMD has allowed Intel to keep the lead is in memory support. The Threadripper Pro only supports DDR4, but it also enables eight channels, theoretically doubling the bandwidth over quad-channel. Armari supplies eight 16GB 3,600MHz modules for a total of 128GB. There are no DIMM slots left free, but 128GB should be enough for most workloads during the lifetime of the machine.

Armari has matched this potent processor and memory combination with a fittingly high-end GPU. The PNY Nvidia Quadro RTX A5000 goes a notch above the A4500 in most systems this month by offering 8,192 CUDA cores and 24GB of GDDR6 frame buffer running on a 384-bit bus. This enables 768GB/sec of



bandwidth – the same as the even higher-end A5500 and A6000.

The storage provision is unique this month in that, while there are two drives, the configuration isn't one for the OS and apps, with the other for data. Instead, Armari supplies a matched pair of 2TB Western Digital SN850 PCI-E Gen 4 SSDs in a RAID0 setup via a PCI-E adapter card, to improve throughput. This essentially doubled read and write speeds over a single drive, hitting 14,015MB/sec reading in CrystalDiskMark 8 and 9,989MB/sec writing. Phenomenally fast, as if Gen 4 NVMe SSDs weren't quick enough already.

Benchmark results show just how potent the 5000 series Threadripper Pro is compared to anything Intel currently has to offer above 16 cores.

An overall score in *PC Pro's* benchmarks of 753 is the highest we've ever seen, led by an incredible 948 in multitasking and 716 in video encoding. The score of 242 in image editing also shows that single-core performance isn't quite as high as the 12th generation Intel Core i9 can muster, and this is also clear from the single-core result in Maxon Cinebench R23 of 1,493.

ABOVE The Armari's Threadripper Pro will cope with any creative task you throw at it



BELOW Armari uses its own case design to house the incredibly powerful components



Multithreading is where 3D rendering is really at, though, and the Cinebench R23 score here of 50,699 blows everything we've tested before out the water. It's 27% faster than the dual 24-core Xeons in the PCSpecialist Onyx Goliath can deliver, and they have 50% more cores. Just to hammer this home, the Armari took 206 seconds to render the Blender frame while the Xeon-based PCSpecialist took 290 seconds. That's 40% longer.

So this system has amazing everyday workload and 3D rendering abilities. It's also masterful with 3D modelling, looking at the SPECviewperf 2020 results. The Nvidia Quadro RTX A5000 delivered 172 and 489 in 3dsmax-07 and maya-06, showing immense abilities with animations, while 139 in catia-04, 167 in creo-03, 492 in snx-04 and 327 in solidworks-05 illustrate great ability with CAD, engineering and product design.

Overall, this is a workstation without any weaknesses. Whichever creative task you throw it, it will deliver faster results than any other system on test this month, making it a worthy Labs Winner. AMD is back, if it even went away in the first place.

How we test & graphs

A summary of the tests *PC Pro* places workstations through, including a selection of the results focused on CPU performance

We ran our standard *PC Pro* benchmark suite to assess image-processing and video-encoding abilities, and then multitasking. Each of these categories has an individual score, which indicates speed relative to a Core i7-4760K desktop PC with 8GB of RAM. If a machine scores 150 in a test, it's 50% faster than the reference PC. All these results are combined into an overall score, giving

an indication of ability in these content-creation tasks as well as general activities.

On top of our regular benchmark suite, we added tests specifically aimed at a range of higher-end workstation tasks. Maxon Cinebench R23 contains a 3D rendering test that is run on a single core and then across all available threads, to show how much multithreaded performance the system has to offer.

We also tested CPU rendering with IndigoBench 4 and a real-world test frame created in Blender for the *Cosmos Laundromat* animated movie, codenamed Project Gooseberry. This is a gruelling, lengthy render that can cause core throttling if cooling isn't sufficient.

We also tested the raw performance of workstations' SSDs and hard disks with the CrystalDiskMark 8.0.4 benchmark.

