ARMARI MAGNETAR MC16R7

A strikingly fast workstation for the money, dominating most performance tests in this price category

SCORE ★★★★★
PRICE £3,748 (£4,497 inc VAT)
from armari.com

Armari's lower-cost system is something of a technology showcase, exhibiting the latest options in processor, graphics and storage. The combination is one of the most powerful workstations you could buy for £4,500 inc VAT.

At the centre of the Magnetar MC16R7 is AMD's range-topping Ryzen 9 7950X. This potent 16-core processor uses AMD's latest Zen 4 architecture and is manufactured on the 5nm process. This enables an incredible base clock of 4.5GHz, which is the boost clock for AMD Ryzen Threadripper Pro processors. The 7950X's boost clock of 5.7GHz is only a few hundred megahertz behind the best Intel has to offer, and only with the latter's P-cores, so it's good to see that Armari makes the most out of the Ryzen 9 via its own customised CPU liquid cooling.

Armari has also taken full advantage of the fact that the AMD Ryzen 7000 series supports DDR5 memory by supplying 64GB of 6,000MHz RAM in two 32GB modules, leaving two DIMM slots free for upgrades. This is the fastest-clocked memory of any system this month.

So the Magnetar MC16R7 has a cutting-edge processor, some of the fastest system memory available, and its graphics acceleration is bleeding edge, too. In the past, choosing AMD professional GPUs might be a good choice to keep within a budget, but it rarely beat the Nvidia alternative for performance. The AMD Radeon Pro W7800 is a different matter. It's in the same price category as the Nvidia RTX A5000 and offers 4,480 unified shaders (which aren't equivalent to CUDA cores) on AMD's latest RDNA 3 architecture. It also boasts 32GB of GDDR6 memory on a 256-bit bus, offering 576GB/sec bandwidth.

Armari is notable in the UK market because it's one of the few local PC integrators that designs its own chassis. However, these cases come at a premium so the Magnetar MC16R7

has been built into a Fractal Design Meshify 2. This is still a great basis for a workstation, with plenty of room inside for airflow and storage upgrades. There are six spaces for 3.5in or 2.5in drives included, and there could optionally be up to 14. On top of this there are two 2.5in-only spaces as standard, but up to four are possible.

You may want to build upon the single M.2 NVMe SSD Armari supplies, but what a great foundation it provides. It's a 2TB Crucial T700 drive, which supports PCI Express 5, as does the Asus ProArt B650-Creator motherboard. The Crucial SSD delivers incredible throughput from a single drive. CrystalDiskMark recorded sustained reading at 12,373MB/sec and writing at 11,807MB/sec, which were close to twice as fast as some of the PCI Express 4 NVMe SSDs in other workstations this month.

Considering all the powerful components in the Magnetar MC16R7, it's no surprise that it produced some stunning test results. *PC Pro*'s media-focused benchmarks are the Intel Core i9's forte, but the Armari system's overall result of 772 is still incredible, significantly beating the other system this

month based on an AMD Ryzen 9 7950X. Its Cinebench R23 multithread rendering result of 38,611 was the fastest in the £4,500 category, and the Blender rendering time of 265 seconds was also top in this class. The OpenCL-accelerated Adobe Media Encoder time of 105 seconds beat every other system this month.

The AMD Radeon Pro W7800 graphics may be around the same price as Nvidia's RTX A5000, but its performance with SPECviewperf 2020 v3.1 is in a different league as well. The results of 235 in 3dsmax-07 and an unbelievable 846 in maya-06 imply this will be a consummate accelerator for 3D animation. Likewise, 155 in catia-06, 235 in creo-03, 622 in snx-04 and 460 in solidworks-07 show strong abilities with product development, CAD and engineering.

Its LuxMark 3.1 result of 14,919 is a little behind the RTX A5000, but GPU rendering in Blender took just 141 seconds, which is ahead.

Overall, the Armari Magnetar MC16R7 provides the best possible performance for the money in most areas. If you need a powerful all-round workstation, this system should be top of your list.
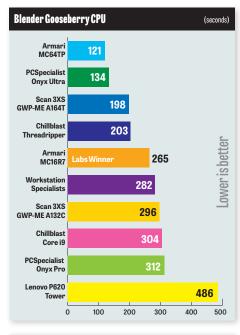
We wanted to give the broadest possible workstation advice, so we used a wide variety of software for testing – as
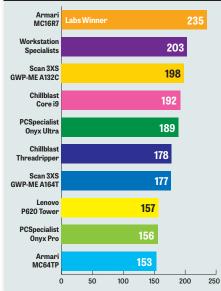
We include tests specifically aimed at a range of higher-end workstation tasks. To test 3D modelling in all the main content creation workloads, we used SPECviewperf 2020 v3.1, which runs OpenGL viewsets (and in some cases Direct3D) based on popular 3D content creation, engineering and medical applications. These include Autodesk 3ds Max and Maya, plus PTC's Creo .

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 3D rendering using the popular Blender (version 3.5.1 at the time of testing) and a frame from the *Cosmos Laundromat* animated movie, codenamed Project Gooseberry. This is a gruelling, lengthy render that taxes cooling and can cause core throttling if this isn't sufficient.
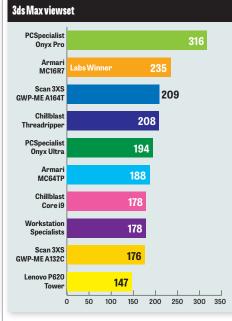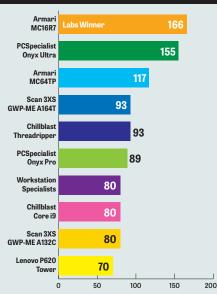
GPU rendering is increasingly being used in live production, particularly since AMD introduced its ProRender system. We tested GPU-accelerated 3D rendering with the OpenCL-powered Luxmark 3.1. We also tested GPU rendering with the same Blender frame, using CUDA acceleration for the Nvidia cards and HIP for the AMD ones.
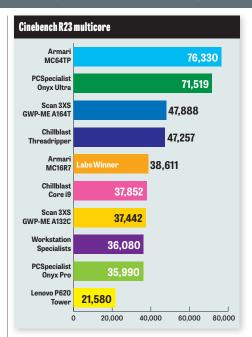
To assess professional-grade video encoding, we rendered the Blender *Tears of Steel* movie from UHD (3,840 x 2,160) to a YouTube-optimised 4K file using H.264 compression. For this test, we employed Adobe Media Encoder CC 2023, and ran the encode with GPU acceleration both enabled and disabled. We also tested the raw performance of workstations' SSDs and hard disks with the CrystalDiskMark 8.0.4 benchmark.
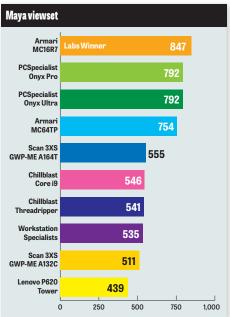
We ended up with a comprehensive set of results showing which type of content-creation software and activity each workstation is best suited for.

Cinebench R23 multicore

Workstation	Score
Armari MC64TP	76,330
PCSpecialist Onyx Ultra	71,519
Scan 3XS GWP-ME A164T	47,888
Chillblast Threadripper	47,257
Armari MC16R7 (Labs Winner)	38,611
Chillblast Core i9	37,852
Scan 3XS GWP-ME A132C	37,442
Workstation Specialists	36,080
PCSpecialist Onyx Pro	35,990
Lenovo P620 Tower	21,580

Blender Gooseberry CPU (seconds) — Lower is better

Workstation	Score
Armari MC64TP	121
PCSpecialist Onyx Ultra	134
Scan 3XS GWP-ME A164T	198
Chillblast Threadripper	203
Armari MC16R7 (Labs Winner)	265
Workstation Specialists	282
Scan 3XS GWP-ME A132C	296
Chillblast Core i9	304
PCSpecialist Onyx Pro	312
Lenovo P620 Tower	486

3ds Max viewset

Workstation	Score
PCSpecialist Onyx Pro	316
Armari MC16R7 (Labs Winner)	235
Scan 3XS GWP-ME A164T	209
Chillblast Threadripper	208
PCSpecialist Onyx Ultra	194
Armari MC64TP	188
Chillblast Core i9	178
Workstation Specialists	178
Scan 3XS GWP-ME A132C	176
Lenovo P620 Tower	147

Maya viewset

Workstation	Score
Armari MC16R7 (Labs Winner)	847
PCSpecialist Onyx Pro	792
PCSpecialist Onyx Ultra	792
Armari MC64TP	754
Scan 3XS GWP-ME A164T	555
Chillblast Core i9	546
Chillblast Threadripper	541
Workstation Specialists	535
Scan 3XS GWP-ME A132C	511
Lenovo P620 Tower	439

Creo viewset

Workstation	Score
Armari MC16R7 (Labs Winner)	235
Workstation Specialists	203
Scan 3XS GWP-ME A132C	198
Chillblast Core i9	192
PCSpecialist Onyx Ultra	189
Chillblast Threadripper	178
Scan 3XS GWP-ME A164T	177
Lenovo P620 Tower	157
PCSpecialist Onyx Pro	156
Armari MC64TP	153

Medical viewset

Workstation	Score
Armari MC16R7 (Labs Winner)	166
PCSpecialist Onyx Ultra	155
Armari MC64TP	117
Scan 3XS GWP-ME A164T	93
Chillblast Threadripper	93
PCSpecialist Onyx Pro	89
Workstation Specialists	80
Chillblast Core i9	80
Scan 3XS GWP-ME A132C	80
Lenovo P620 Tower	70

Energy viewset

Workstation	Score
Armari MC16R7 (Labs Winner)	137
PCSpecialist Onyx Ultra	134
Scan 3XS GWP-ME A164T	128
Chillblast Core i9	126
PCSpecialist Onyx Pro	122
Armari MC64TP	98
Scan 3XS GWP-ME A132C	97
Chillblast Threadripper	97
Workstation Specialists	95
Lenovo P620 Tower	69