



# Memory and Storage Unleashed: Fueling Creativity in Entertainment



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## Foreword and Contents

In the last ten years, the hardware landscape has shifted dramatically. Just a decade ago, an SSD beyond 1TB would have been hard to find, and those that did exist would have cost thousands. Today there are hundreds of options from SATA to NVMe-based flash storage, along with memory. And with technology that's constantly evolving comes greater expectations for what is delivered—and how fast. As a result, higher demand is being placed on storage in today's high-speed world of media and entertainment (M&E).

But what other challenges do M&E businesses face when it comes to managing memory and storage? How is the role of memory and storage evolving in this industry? And to stay ahead of the curve, what should M&E professionals consider in terms of optimization? These are just some of the questions this eBook addresses, answered by some of the industry's leading experts.

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# Memory and Storage Unleashed: Fueling Creativity in Entertainment



## Contributors

This eBook has been created by three industry experts in Media and Entertainment.



### **Daniel Sharp, Dash Pictures**

Daniel is a three-time Emmy-nominated director and producer based in London and Los Angeles. He has worked as an executive, series producer, and director for SVOD, national, and cable networks on scripted and unscripted episodic U.S. and international shows.



### **Jake Bentley, Mission Digital**

Jake started his video production career as junior editor and camera operator. In a position that combines his love of technology and film, Jake handles all kinds of day-to-day and preventive maintenance, managing networks, storage, labs, and providing support to technicians in the field when it comes to tech.



### **Mark Noland, Kingston Technology**

Mark has an extensive background in VFX for film and television as well as experience with architectural, design, and engineering visualization. He has been working as a storage solutions technologist for over a decade and is an active member of the Visual Effects Society.



As the industry shifted from analog to digital workflows, the need for more storage vastly increased overnight. Today's software tools are memory hungry. And from original camera files to the final deliverables we consume on our favorite streaming service, everything is now within the digital realm. Technology is constantly evolving, keeping M&E companies on their toes. And with the resolution of footage moving from HD to UHD, data bandwidth requirements have quadrupled.

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This has pushed the industry to look to the future and how we work. One way in which this is being accomplished is looking much more closely to the cloud for its mass scalable storage and computing power.

**Jake Bentley, Mission Digital**

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The speed of technology allows us as an industry to do more. We find it allows us to change how we shoot. We can have multiple angles and focus on making our shows the best they can be without compromise and having concerns over not having the speed/capacity to do so.

**Daniel Sharp, Dash Pictures**

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# Pressure on M&E Businesses to Deliver More, Faster, and for Less



When managing storage, the proliferation of streaming services is a key driver behind many of the challenges today's entertainment businesses face. This has increased demand for higher-quality content, more complex deliverables, and higher-quality capture. In addition, there is more pressure within the industry to deliver more—and faster.

Cost is another key factor. Even the biggest productions would rather spend less on storage and more on what can be seen on screen. This results in the need for solutions that are affordable, fast, and have the required capacity. Just as important is the need for maximum reliability.

But something that is often overlooked is the OPEX cost of slower media. For context, slower HDDs may be cheaper at the point of purchase—but if they are causing slowdowns in both transfer and creative processes, then the price advantage of HDDs is quickly eroded. For production houses that rely on hyper-efficient workflows, this can make a huge difference in the commercial success or failure of media projects.



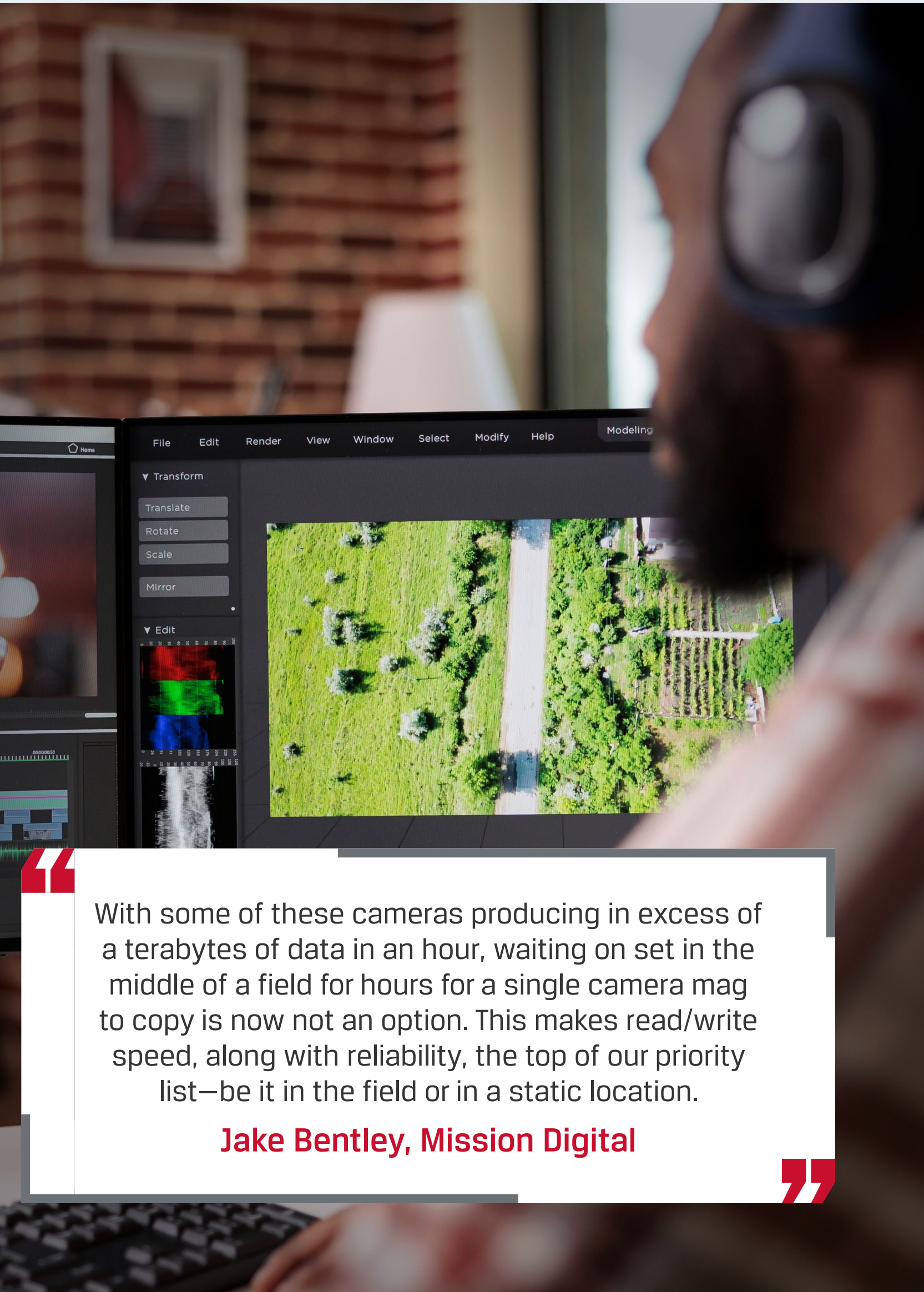
Our biggest challenge was with bandwidth of HDDs when on location. With the sheer volume of data we have to take from multiple cameras and Go-Pros, all with multiple cards, we were finding ourselves having to make compromises when it came to what we could shoot.

**Daniel Sharp, Dash Pictures**



Trading out the HDDs in the production server for NVMe SSDs enables more users to access the footage simultaneously as well as providing much more bandwidth, which allows the team to work directly on the 4K plus footage over the network.

**Mark Noland, Kingston Technology**



With some of these cameras producing in excess of a terabytes of data in an hour, waiting on set in the middle of a field for hours for a single camera mag to copy is now not an option. This makes read/write speed, along with reliability, the top of our priority list—be it in the field or in a static location.

**Jake Bentley, Mission Digital**





# Pressure on M&E Businesses to Deliver More, Faster, and for Less



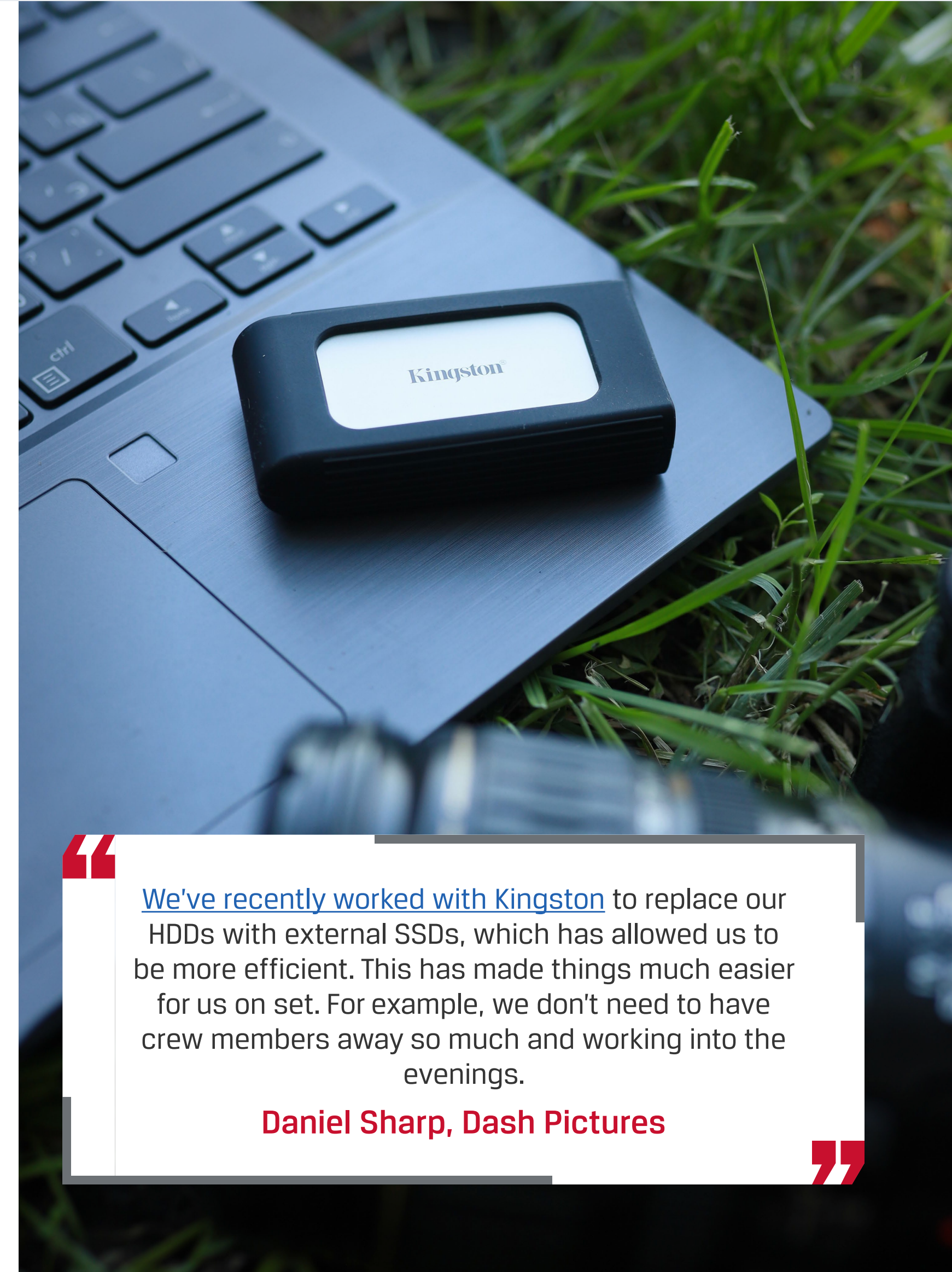
From a portability perspective, size and weight are key considerations. Production teams need to get from set to post-production quickly and easily. For those who shoot in challenging or extreme locations, heavy and cumbersome drives—or HDDs, which tend to be bulkier and much slower—are simply not an option.

Kingston's SSDs are one solution designed to support the high demands of M&E companies. Measuring 0.5 by 1.3 by 2.7 inches (HWD) and weighing barely an ounce, the [Kingston XS2000 SSD](#), for example, is rough-and-tumble ready. Built for durability thanks to its removable rubber sheath, this small but mighty SSD is IP55 rated, providing security against sand and rain. XS2000 delivers enhanced productivity with little interruption, and high-speed storage options to offload and edit high-res images, 8K videos, and large documents in a flash with up to 4TB of portable capacity.



In post-production, having a team of editors, motion graphics, and VFX artists all needing to access the same footage simultaneously makes an HDD-only server system obsolete. On location, using the XS2000, the combination of the large capacity (up to 4TB) and tremendous speed (up to 2000MB/sec) make it an easy choice to shoot higher resolution footage—and more of it, since we don't have to worry about transfer times and running out of drive space.

**Mark Noland, Kingston Technology**



[We've recently worked with Kingston](#) to replace our HDDs with external SSDs, which has allowed us to be more efficient. This has made things much easier for us on set. For example, we don't need to have crew members away so much and working into the evenings.

**Daniel Sharp, Dash Pictures**





# Storage Optimization Cuts Turnaround Times for Media Companies



Picking the right memory and storage solutions can have a huge impact on M&E projects. One such case is when Mission recently worked with Amazon Studios on the series '007 Road to a Million,' a production shot on location around the world. This required all equipment to be powerful, lightweight, and highly mobile. As the production progressed and moved to a more remote location, they realized the RAID array they started with was too big and not mobile enough. They turned to an SSD solution; a RAID array made up of NVMe SSDs. The size and weight were no bigger than a laptop and the speed was unmatched compared to the old RAID. In fact, the solution was so fast it required two Thunderbolt ports to fully utilize its bandwidth. Turnaround times were greatly decreased, allowing Mission to give clearance of camera mags at a rate not possible in the past, reducing the need for rented hardware.



Equally, we've been working with Kingston on post-production SSD storage—allowing multiple editors and articles to truly collaborate without the typical challenges faced in terms of speed and efficiency.

**Daniel Sharp, Dash Pictures**



From SATA to NVMe, laptop to server, [Kingston SSDs](#) provide the speed and reliability M&E companies need. We take portability, capacity, and reliability even further, adding an arsenal of enhanced features and extreme speeds where it's needed most. Our team offers the technical know-how, skills, and direct support needed to deliver a successful outcome for the long run with the performance you need.



We now utilize storage technologies like SANs and NASes, which are shared storage technologies, alongside high-speed shuttle drives that use NVMe SSDs to ensure nothing is being throttled at any point in the pipeline. This has ensured we can easily keep pace with backing up a production's data, be it to LTO tape, SAN, or Cloud. All this before production has started filming the next day!

**Jake Bentley, Mission Digital**



With so many options now available for both on-prem and cloud-based storage solutions, choosing between the two can be overwhelming. But fundamentally, tools should support where the media sits, not the other way around.

It is also worth considering if you've already invested in vast amounts of on-prem storage, taking a hybrid approach is still an option. The last thing anyone wants is the connection to cloud storage dropping in the middle of a grading session in a color suite. Keeping some on-prem storage, which acts like a cache for content stored in the cloud with enough processing power locally, is a good way to guarantee business continuity.

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We believe that when standing at the crossroads deciding which route to take, you have to take a step back and look at your current workflow, see how you can fit the cloud into it, and accelerate that process. It doesn't have to be one or the other, but can be a hybrid approach that gives you the most flexibility while things transition to increasingly cloud-based workflows.

**Jake Bentley, Mission Digital**

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Cloud storage can be useful for collaborating, but it's not a "one size fits all" when taking data off cameras—on location or serving our needs in post production—where latency is key. This is why we have a local NAS with SSDs.

**Daniel Sharp, Dash Pictures**

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Many tools are also integrating AI-driven components with more to come as the technology progresses. We are seeing a rapid acceleration of such technologies, with breakthroughs being announced seemingly every other day. Machine learning can be very demanding and processor intensive; when software is running locally, it can sometimes take hours for processes to complete. This is where the cloud comes into its own.



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Obviously, the cloud is in everyone's future but having control and guaranteed access to your own data CANNOT be undervalued. A hybrid approach makes sense, with your current working data set on premises but with a backup of all data going to the cloud for insurance against the unthinkable.

**Mark Noland, Kingston Technology**

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This is where using the cloud to compute these vast amounts of processes and store these huge amounts of data just makes more sense than doing it all locally.

**Jake Bentley, Mission Digital**

Yet, there will always be a need for fast memory when it comes to production and bringing ideas to life. Production staff and editors alike need to ensure they have the capability to turn concepts into final output. This is where memory comes into play.

Kingston's DDR4 and DDR5 memory offers the speed and capacity for M&E organizations to upgrade their systems, increasing their processing power to deal with the challenges of both today and tomorrow. An example of this is the [Kingston FURY Renegade Pro DDR5 RDIMM](#), which provides creators and media professionals with high-performance memory for high-end workstations: the type of performance normally reserved for gamers, but without sacrificing the data integrity features and superior quality grade of Registered DIMMs.

In turn, this allows your production teams to focus on what is important—and not be constrained by the frustration of technical limitations.

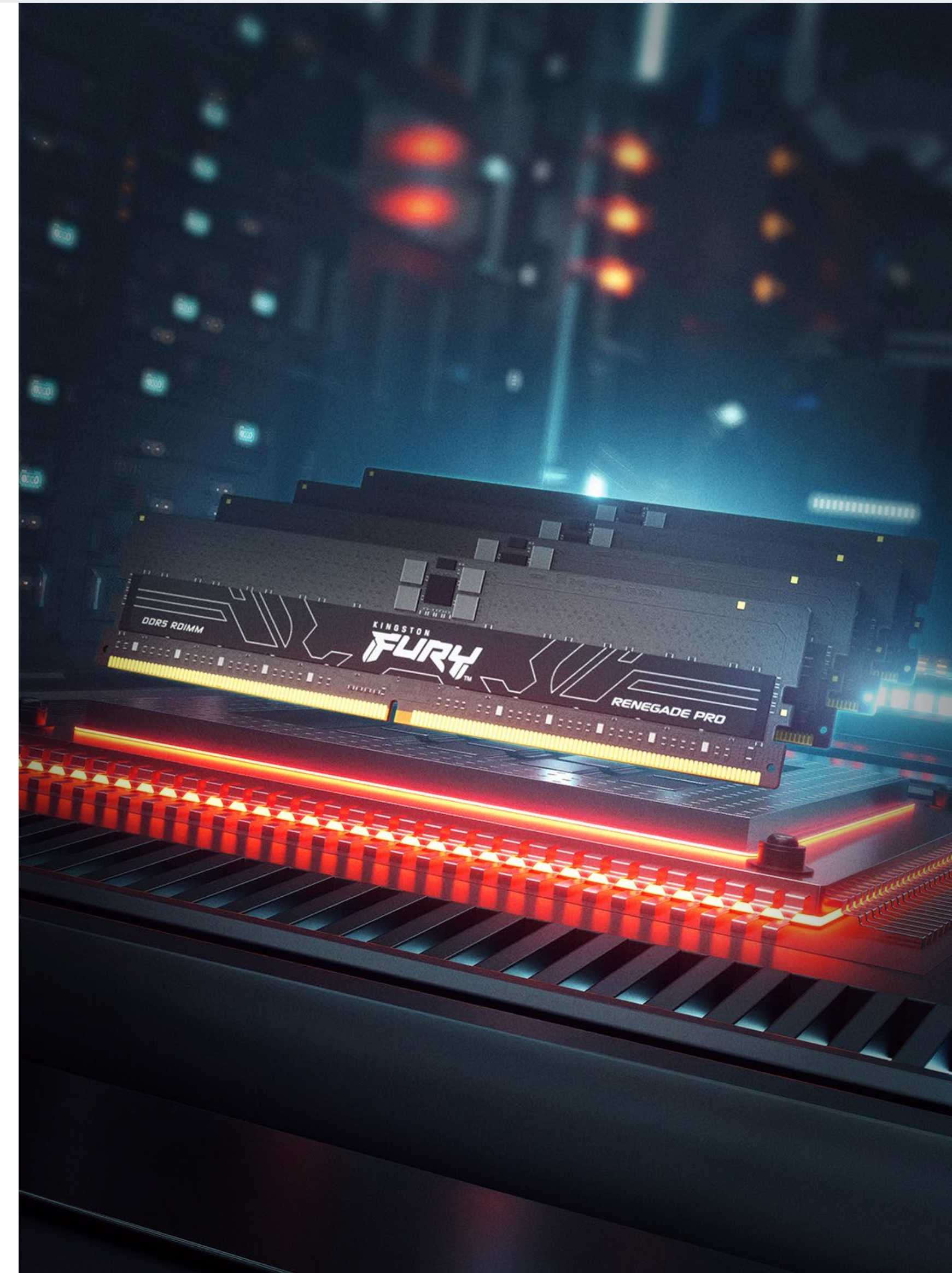
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Automating repetitive tasks is terrific; making smarter tools that can speed up production and allow more creative freedom is the hope for these new tools.

**Mark Noland, Kingston Technology**

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# Bottlenecks and User Needs: Top Priorities for Hardware Choice



When it comes to choosing hardware for media projects, there is no one size fits all. When on location—in the middle of a field, for example—a huge, high-powered PC running on batteries would be very impractical compared to a studio environment working on CGI renders that take hours, or where huge amounts of data are being captured. Software tools slowed down by underpowered hardware can also take users out of their creative mindset, so it's always worth trying out new solutions if workflows are being negatively impacted.



Look at your most painful bottleneck first and try to solve that. If it's transfer times or slow application response, you can fix one issue at a time and see if the fix improves your workflow.

**Mark Noland, Kingston Technology**



Another key consideration is user type. If you typically only run one or two creative applications at once, such as a video editing tool and email apps, then using recommended memory requirements for each specific application is adequate. However, for power users

running video editing, compositing, photo editing, and sound applications simultaneously, much more memory is needed to keep applications responsive.



The best tools are the ones a user feels comfortable with, regardless of whether it's an operating system, an editing platform, or other creative tool. There's nothing worse than using tools you dislike since it can take you out of a creative mindset.

**Mark Noland, Kingston Technology**





# From Camera to Server, Kingston is With You



As consumer demand and technology drive the need for more and better content storage, M&E organizations are increasingly turning to flash-based solid-state storage for a higher performance, mobility, and speed.

Whether you're running animation and VR (Virtual Reality) applications, working on digital conversion projects, or have multiple post-production projects running simultaneously, Kingston can help with industry leadership offering proven expertise and best practices. Our memory and storage solutions deliver what is needed to meet your M&E project requirements, while [our team offers the skilled support](#) you need to take your next steps with confidence.



## About Kingston

With over 35 years of experience, Kingston has the knowledge, agility, and longevity to enable M&E to respond to the challenges and opportunities presented by the growing demands of media.