



G-Technology®



G-Technology® and the CrossFit Games: The Best Test of the Fittest

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Ready for anything

This phrase echoes throughout the CrossFit world. Part competitive sport and part fitness philosophy, CrossFit spans disciplines from gymnastics to interval training to Olympic weightlifting. The idea is that while a specialist athlete might excel in a few select competitions, a CrossFitter will be ... ready for anything.

Every year, worldwide qualification matches sort through many thousands of competitors, finding only the fittest hundred or so who will compete in the CrossFit Games. However, contestants often go into matches with no idea what test lies ahead of them until minutes before starting.

The same is true for the video crews covering the event. While this unpredictability is part of what makes the CrossFit Games such a rising, riveting phenomenon, it also poses some insane challenges on the video production crews tasked with showing the event to the world. This year, though, one CrossFit group decided to overhaul its on-site data storage in an attempt to add more muscle and stamina to its operations. The results were downright inspiring.



G-RAID® Studio
with Thunderbolt™

G-SPEED® Studio
with Thunderbolt™

The Problem: Overcoming an Aged Workflow

The CrossFit Games determine champions across several age categories, even crowning one man and one woman in the “60+” Masters Division. Three-time winner in this group Scott Olson advises others in his age bracket to “get off the couch and start movin’.” The same advice could be given to the broadcast industry, which adopts new technologies at a notoriously slow pace. At a time when extreme resolutions and frame rates are filling storage pipelines to bursting, much of the industry remains stuck on legacy systems and processes that drag on production teams like 150-pound medicine balls. Modern crews need to be more nimble.

“We certainly don’t get time to rehearse like you would in a normal TV sports operation, where you know who’s going which direction and how long they’re going to be doing it,” said Joe Novello, the coordinating producer at his third CrossFit Games. “We have to do all that on the fly. So the more our systems are built to be ready for anything, the better off we’re gonna be.”

You wouldn’t guess at first glance that Novello’s team lacked for anything. They might not have had the luxury of a Super Bowl-style production setup, but for the 2014 Games, CrossFit brought in four 53-foot expando trailers, the same NEP EN1 units used for Monday Night Football, each filled with the latest in fully integrated broadcast equipment. At any given time during the event’s four days, between 20 and 25 cameras would be shooting, backed by 185 technicians. In addition to these, seven cameras belonged to “floaters,” a special crew tasked with capturing “documentary” footage, meaning the content that wouldn’t broadcast live but would instead get used for bumpers, teasers, 90-second athlete profiles, 30-second promos, and so on. Some of this edited content might get sucked up into the ESPN broadcast system, but the floaters’ job was to capture the Games in 4K or high frame rate slow-motion — the “artsy, sexy” camera work, as Novello put it.

“Our job for live coverage is to make sure that the competition is covered correctly and we don’t miss anything,” he said. “We don’t have all of the fancy camera capabilities you might see in the World Series, but we get a lot of the feel of that by virtue of our documentary stuff, specifically looking for a different way to present the competition. We got a lot more of that kind of great footage this year in part because we could move content more quickly into the production system.”

The 2014 CrossFit Games event was attended by over 61,000 people but has been viewed by millions around the world. Footage broadcasts to all three ESPN channels as well as YouTube, CrossFit’s own site, and several other outlets. Fifty-eight hours of live Games footage streamed to ESPN3 and YouTube alone.

In prior years, the floater camera operators, most of them freelancers, would arrive with their own laptop and preferred card reader. Some would have their own portable hard drives, and some would need to borrow equipment. Either way, there was no set schedule or procedure for offloading. Because everyone was an independent contractor, ten videographers would have ten different methodologies. Eventually, a technician would make the rounds with a multi-drive enclosure and try to collect everyone's footage.

Naturally, chaotic workflow created all sorts of problems. Drives could be of any speed or type, causing excessive waits and unexpected failures. Mismatched ingest procedures led to problems with managing content. Content was more likely to hit production in random waves rather than a predictable rhythm. CrossFit got its content, but the questions always remained: How can we do this better, and what would it mean to the group and the organization if we did?

In 2014, the documentary production crew got answers.

The Solution: G-Technology from Notebook to NAS

This year, CrossFit producers were determined to get smarter with their workflow, in part because more pressure was piled on their shoulders than ever before. The CrossFit Games competition spanned four days, but camera crews were on the ground working for nine. In the frenzy of the main event, video crews had to crank out live production, two different Web productions, and another webcast specifically for international markets — four live outlets plus all of the documentary content from the floater team. In the nearby hotel, two ingest stations captured content for athlete profiles, where they could be immediately edited into preview clips for teasers and social media content. The arena's media room handled more ingest from waves of cards and drives dropping in throughout the day. All told, CrossFit came ready to store over 100 TB of event footage.

To cope with their own frenzy within this storm, the documentary team used both mobile and network-attached storage (NAS) products from G-Technology. Floaters on the field needed more stability and speed from their storage, so they received rugged, pocket-sized USB 3.0 G-DRIVE® ev units. In production centers, managers and editors relied on various G-SPEED® models for high-performance, high-capacity storage that could interface with but not be limited by the production trailers' existing infrastructure.

From start to finish, new procedures mandated how this storage would be used for maximum benefit, and the form factor of the ev drives played a role in this. Different users might need different drive capacities. Some might need the SSD model's added performance. But because of the common design across ev models and their ability to plug quickly into the G-DOCK® ev for ingest, floaters suddenly had a more unified, efficient process via the two dock enclosures in the production trailer than anything they'd experienced before.





“The ev gear was a huge player this year,” said post-production supervisor Will Duncan. “It was really nice to just streamline the hardware and have that docking station back at the truck. They were averaging, like, 400 megs a second on a job, just as fast as the ev drive could go. Instead of taking an hour on the old FireWire stuff like the TV crews still have to use, because their process is different, we were dumping drives into the G-RAID® Studio over Thunderbolt in about two minutes. It was like, done, next, done, and we just keep turning ‘em out.”

Sometimes, though, content is needed before it ever gets back into production. Every floater received a 15-inch MacBook® Pro and a bus-powered, 512GB G-Technology G-DRIVE® ev SSD for field use since there was no way of knowing if or when a power outlet would be nearby. The ev SSD’s performance proved essential since floaters might only have five minutes before the next event, and in that time they would need to dump footage out from their camera cards and rush out a quick Instagram video or some similar snippet for social media. Every floater carried two ev drives, one that could get handed off to a runner and a second that could stay in the with the floater for on-the-fly editing. Additionally, 2TB G-DRIVE® ev 220 hard drives circulated among the floaters who most needed to clone their outsized footage in order to maintain a “working dump.”

On top of all that, CrossFit also had six photographers cover the games. All told, they captured 110,000 images over nine days, amassing roughly 3TB of still content. Photographers poured this data into a dedicated G-SPEED® Studio back at one trailer that served as a command base for floater content.

Duncan couldn’t help but reflect how, only a few years ago, the same 24TB of storage fielding offloads from floater drives would have cost \$100,000 and had to be trucked in on server racks. Today, he carries the 24TB Studio in a Pelican case and can go from unboxing to a ready-to-work RAID 5 in five minutes.

While the content flowing into the G-SPEED® Studio units obviously couldn’t be used in a real-time, live workflow for broadcast, the ESPN teams would often ingest specific footage for end-of-day highlight packages. Documentary technicians kept three editing stations connected into the G-Technology RAIDs, preparing clips throughout the day. ESPN techs, in turn, needed to be able to sort and process these clips at maximum speed in order to hit their daily targets, a feat made far easier thanks to the Studio’s Thunderbolt™ 2 interfaces.

The powerlift from their old Games workflow into a new one fueled by G-Technology can’t be measured by on-the-spot metrics. It will take months to fully appreciate how much more usable video was retained because of these storage improvements. But managers already agree that the sheer volume of storage



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tasks they were able to accomplish, especially with 4K content entering into the mix, could not have been done with their equipment of prior years — and the work definitely could not have been managed as smoothly. Any production manager will verify that fewer headaches and more hours for sleep in the midst of a make-or-break project are essentially priceless.

Training for Tomorrow

Much as Will Duncan and Joe Novello loved their new G-Technology-fueled workflow in 2014, there are always ways to improve for next year. Already, they know that all of the 2015 event will be shot in 4K, which means that the floater footage alone will mushroom by at least 5X if camera counts stay the same. Cutting transfer times will be critical, so they expect to add at least two more G-DOCKs. However, Duncan doesn't anticipate changing his primary high-capacity storage. "The G-SPEED Studios work perfectly," he said. "I really can't think how we could possibly improve them."

Duncan did note that he would like to improve data protection by stepping up to an even safer RAID level, such as RAID 10 (also supported by the G-SPEED® Studio). This would be far more cost-effective than the approach he took this year of having one 24TB Studio back up to an identical clone. When pressed, he admitted that this practice was more of a routine precaution than a proven need. In past years, the CrossFit production team would experience at least one or two drive failures, but this year, with G-Technology, they experienced no drive problems whatsoever — a fitting first in an arena devoted to the fittest.

"Turn-around time is critical," says Novello. "Making the assets available to be utilized so we can maximize their usefulness to the productions is essential. We depend on everything to be ready, and we can't always predict how much or how often we're going to need more, better, faster. Again, we have to be prepared for anything."

Neither producer could estimate how the move to G-Technology this year impacted CrossFit's bottom line with the Games, but both agreed that the number of man-hours saved through the new G-DOCK and Studio workflow was "huge." Beyond tangible numbers, though, they stressed that the main impact of G-Technology storage on the Games had yet to be felt. The increased work efficiency would pay dividends over time through having more and better content than could have been obtained with prior storage solutions.

"In the end, stock footage supplies our year," said Will Duncan. "Our entire year is based off this one four-day event, and G-Technology was our biggest platform for everything we shot. This footage is what's going to fuel the company all the way to the next Games."



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G-Technology Gear at the Games

3 x G-SPEED® Studio (24TB)

2 x G-SPEED® Studio (16TB)

2 x G-SPEED® Studio (8TB)

2 x G-DOCK® ev

12 x G-DRIVE® ev SSD

2 x G-DRIVE® ev 220 (2 TB)

2 x G-DRIVE® Mobile (1TB)

4 x G-SPEED® Q (w/quad interface)

games.crossfit.com



youtube.com/CrossFitHQ



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One GB is equal to one billion bytes, and one TB equals 1,000 GB (one trillion bytes). Actual capacity will vary depending on operating environment and formatting. G-Technology external hard drives serve as an element of an overall backup strategy. It is recommended that users keep two or more copies of their most important files backed up or stored on separate devices or online services.

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