



grass valley

50 Years of On-Air Innovation

*It's Gotta Be A **Grass!***

LEADERSHIP POWERED BY INNOVATION

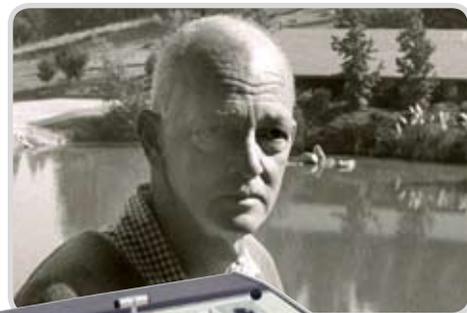
In 1959, a physicist turned audio engineer, Dr. Donald Hare, won a big order from Cinerama, then building out a chain of new widescreen movie theaters. He took the profit and bought 80 acres in the small California town of Grass Valley – and one of the broadcast business's biggest and most successful companies was born.

Dr. Hare later recalled Grass Valley's first big break in 1964, with a call from Harry Jacobs, then chief engineer of KGO in San Francisco:

KGO was to broadcast the Republican national presidential convention, and the supplier of some vitally needed video equipment had just told them that they couldn't deliver on time. Harry told us if we could deliver 10 processing amplifiers and 30 DAs in a month, he would get us an order. Bill Rorden, (Grass Valley's chief engineer at the time) and I said simultaneously "What in hell is a processing amplifier?"

Well, Harry's call was on Monday morning, and that same Wednesday we called him and told him to come up and see the 711 processing amplifier. He couldn't make it until Friday, saw the gear and we got the order! This I think was an all time record for Grass Valley, and maybe for a lot of other firms.

That was in 1964. By 1968 the company was ready to launch the product that really made its name, and which changed the way television is made. With the model 1400 production switcher, cutting a live broadcast stopped being an engineering exercise in maintaining a stable image and became a creative process.



Doc Hare and
the Model 1400
Production Switcher

That really was a step change in the history of television: it is no surprise at all that more than 400 model 1400 switchers were sold in the first year alone; and the Grass Valley™ name became absolutely synonymous with production switchers.

50 years from its inception, Grass Valley is an industry leader: it is the only company that spans the entire content chain from cameras and switchers all the way to digital compression and transmitters, innovating in every sector. Like many businesses, it has seen some changes in ownership, and has grown through strategic acquisitions as well as through its own creative developments.

As the company celebrates its 50th anniversary its ethos is just the same as it was in Dr. Hare's day: listen to the customer, and build something that exceeds their expectations. We can expect to see many more decades of success because, for innovative technology, **"It's Gotta Be A Grass!"**

A HISTORY OF LEADERSHIP

At Grass Valley, we build upon past success as we prepare for the future. It is a strategy that has helped Grass Valley maintain undisputed market leadership for 50 years. Turn the page and follow 50 years of Grass Valley innovation.



| 1959 |

Company founded by
Dr. Donald Hare. First major
delivery of panoramic sound
system to Cinerama Inc.

1950's

K2™ DYNO INSTANT REPLAY SYSTEM

RETURN OF THE KING.



For years, our LVS Live Controller reigned as the ultimate in replay control. Today we're proud to announce the next-generation of replay controllers, the Grass Valley™ K2 Dyno. This replay controller, coupled with the new K2 Summit production client, allows producers to capture live events in crystal-clear HD and instantly replay them at variable speeds for critical analysis during fast-paced events.



It's Gotta Be A Grass!

For more information, visit us on the web at

www.grassvalley.com/K2



Jeff Rosica
Senior Vice President,
Grass Valley



Q & A WITH JEFF ROSICA

Q 50 years in what is still a young industry is quite an achievement. How do you account for this?

A It is something that we are very proud of, naturally, but it is not something we take for granted. The DNA that makes up Grass Valley today is rooted in companies that have brought to the market revolutionary technologies which have changed the way the industry works.

That is not just in production switchers, it is right across the board. Think about the Profile® server, super slo-mo cameras, or our pioneering work in digital compression and multiplexing.

Q Where has this innovation come from?

A It comes from listening to our customers, of course. The Grass Valley brand is incredibly strong and resonates with our large and loyal customer base, but we have to have the products to back it up. So we spend a lot of time talking to them about the way their businesses are going and how we can help them on their journey.

As recent examples, they told us that they needed more flexibility and file-sharing for multiple replays in live production and asked us for an affordable production server, so we launched the K2™ Dyno replay control system and Summit production server.

They told us that it was time for a new layer of power in production switchers, so we created the new Kayenne switcher.

We developed a revolutionary CMOS sensor for the Infinity™ digital media camcorder, which we are ready to introduce in new HD system cameras. In the lab we have achieved a stunning 23 stops of latitude from the Xensium™ sensor, yet its further development will enable our system cameras to exceed in performance, pricing and feature set.

So we invest heavily in R & D, but it is not invention for invention's sake: it is invention to get and keep customers on the air.

Q Can you maintain that investment in the current economic situation?

A One of the benefits of being a 50 year old business is that you have seen it all before. Just think about the changes since 1959.

Back then there were just three networks in the US. Television was standard-definition and color was just coming in. Concepts like digital compression and the Internet were unimaginable. Movie-makers had no contact with our industry—when the Grass Valley 1600 switcher was used to create otherwise impossible effects shots in *Star Wars* in 1977 it was headline news.

And we have been through some economic downturns in 50 years, too. This one is tough, certainly, and the electronic media industry is going to look very different on the far side for sure. But Grass Valley had the strength and stability to weather recessions in

| 1964 |

First video products, the 700 Series DA and 711 Proc Amp, developed for KGO



| 1968 |

Introduction of Model 1400 video switcher (400 sold first year)



1960's

the past, and those same qualities are sustaining us successfully today.

This year's NAB product launches are as exciting as any in the last few years—and we are already forming our plans for IBC in September and next year's NAB as well.

Q Can a specialist manufacturer survive when commodity IT hardware is so capable?

A If you are going to succeed in this business—if you are going to be trusted the way that Grass Valley is trusted—then you have to understand what it means to be on air: not just on air 24/7, but not missing a single frame of video 24/7. When IT companies talk about high availability systems their goal is 98% or 99%. Broadcasters demand five nines: 99.999%.

It takes detailed knowledge and experience to achieve that. Our K2™ media server is a great example: at first glance it is a bunch of commodity hard drives linked with off-the-shelf technologies like CIF and gigabit Ethernet. What Grass Valley brings is the secret sauce that takes standard hardware and software and gives it the level of performance and reliability that our customers expect.

Q Is the market changing?

A We have all recognized that, for the last few years, our traditional markets have been expanding as they meet new challenges. A broadcaster that used to transmit one channel is now delivering multiple channels, and to multiple platforms, from the same basic infrastructure and with roughly the same resources.

But the market is expanding rapidly in new directions, too. Let me give you just one example: digital signage. This has moved so fast from electronic posters to what are effectively private television channels. Businesses from retailers to banks are looking to deliver more creative content on their screens. I recently stopped at a fast food restaurant, and while waiting for my burger I watched part of a concert, which the restaurant chain had shot itself, in high-definition, on the in-house “digital signage” system.

The demands for content creation, storage, and delivery are only going to grow.

Q Sum up Grass Valley as it looks forward to the next 50 years.

A The word I would use is “passion.” Since its foundation, the company has always cared about everything it does, going right back to Dr. Hare choosing the town of Grass Valley because it offered the perfect working environment to attract the best people.

Today we are passionate about helping our customers—we know they are hurting in this tough economic climate, and we want to help them compete more effectively. And we are passionate about being at the leading edge of technology to do that.



| 1970 - 73 |

GVG moves to making large, sophisticated studio switching systems, creating a major place for itself in the television industry



| 1977 |

E-MEM developed. For the first time, technical directors could create complex multi-layer transitions and sequences, and initiate them at the touch of a button.



1970's

MEDIAFUSE™ AUTOMATED CONTENT REPURPOSING

CONTENT ONLY PAYS WHEN IT'S DISTRIBUTED QUICKLY.



In today's marketplace, people decide when, where and how they consume content. For forward-thinkers who see this as a revenue opportunity, we offer the Grass Valley™ MediaFUSE solution—an extension of the Ignite™ system that is revolutionizing automated production.

MediaFUSE is a streamlined software and hardware platform that allows broadcasters to automate the re-purposing of content within minutes, including alternate stories that did not make it to air.

MediaFUSE—Create Once, Publish Everywhere.

For more information, visit us on the web at

www.grassvalley.com/mediafuse



*It's Gotta Be A **Grass!***



grass valley

50 Years of On-Air Innovation

50 YEARS OF ON-AIR INNOVATION

The heritage of Grass Valley is still at its core today: it is an innovator. That means not just taking a product and making it better, but creating new categories of products... new user paradigms to make the industry and its workflow better.

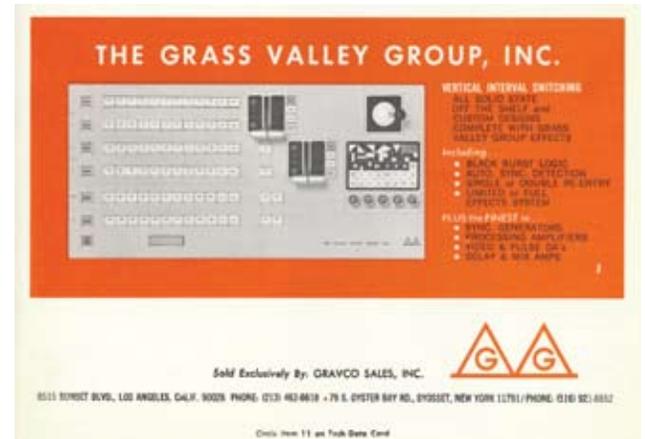
The 1400 switcher put creative control, including mixes and wipes, right in the hands of the technical director. In 1979, Grass Valley won the first of its many Technology and Engineering Emmy® Awards for switchers, for its E-MEM technology which allowed the technical director to create complex multi-layer transitions and sequences, recalled and initiated at the touch of a single button.

The Grass Valley Kalypso™ switcher, launched at IBC in 1999, took the concept another quantum leap forward, becoming the video production center, putting still stores (and later clip stores) and graphics file conversion right into the switcher, along with multiple effects banks and other creative power.



“Now with the Kayenne™, we are taking another huge step forward, with more revolutionary features and power,” said Ray Baldock, Grass Valley CTO.

Servers are now everywhere, but it must be remembered that it was the Grass Valley Profile® that made the video disk recorder practical and popular. “We had to figure out how to bring IT technologies into the broadcast environment,” Baldock recalled. “We developed Motion-JPEG compression and opened up the system to developers with a new API for control. Then, with the introduction of the PDR-200, how to exchange file based



content and to network with other systems.”

“We won two Emmys for that: one for the Profile, one for the GXF format,” he continued, adding “Today we are continuing to advance the state of the art, with widening applications and price points.”

The list of step changes in technology developed by Grass Valley businesses to remain at the leading edge is almost endless: the Klystron IOT transmitter; dynamic pixel management in camera sensors for native imaging in multiple formats; advanced compression algorithms; the triax camera system.

“Triax was a joint development between the Philips camera team and CBS,” Baldock explained. “Later, when HD came along, people said HD Triax could not be done. But we made it happen, so broadcasters could shoot HD using existing infrastructures—a real boost to HD adoption.”

Thomson was the pioneer in digital compression and communication technology, building Studio Numerique, the first complete component digital studio in Rennes in the mid-80s. Together with the EDIUS® team based in Kobe, Japan, Grass Valley has built a complete

Continued on next page

| 1980 |

Model 300 first used by ABC at Lake Placid Olympics. Wavelink used for transmitting video over fiber during opening ceremonies



| 1987 |

Launched first CCD cameras, the LDK 90 and LDK 900



GRASS VALLEY

10 THINGS YOU DIDN'T KNOW

- 1 Grass Valley was originally founded in 1959 as a research and consulting firm.
- 2 Grass Valley (the company) isn't actually located in Grass Valley (the town in California), but in Nevada City, four miles away.
- 3 The idea for the 711 Processing Amplifier came in 1964 from Harry Jacobs, then chief engineer at ABC/RKO in San Francisco. He called Grass Valley on a Monday, the 711 was developed by that Wednesday, Harry saw it on Friday and placed his order.
- 4 In 1961, with profits from a \$400,000 deal with Cinerama, Grass Valley purchased 80 acres of land in Nevada City. They were a new company with a new home with no business, no products, no customers, but a lot of optimism.
- 5 Grass Valley's first big order came from ABC in 1969. Julie Barnathan placed a \$500,000 order for an A/V routing switcher. It ran continuously for 13 years until NYC power company Con Edison cut the power.
- 6 In 1984, Grass Valley was awarded its biggest contract up until that time: A \$4.3 million deal with NASA for a 192x512 routing switcher, to support the Space Shuttle program.
- 7 In the 1977 film *Star Wars*, a Grass Valley 1600-7K production switcher was used as a prop that fires the Death Star's planet-destroying weapon. Further proof that Grass Valley makes the most powerful switchers available. You can see it here: http://www.youtube.com/watch?v=J_Wag38elbo
- 8 In the Christina Aguilera music video *Keeps Gettin' Better*, Christina controls her world using a Grass Valley Kayak switcher. And yes, we thought it was odd that SONY BMG MUSIC ENTERTAINMENT would use a Kayak instead of one of their switchers. You can see it here: <http://www.youtube.com/watch?v=EI9Rdn2-ETA>
- 9 Grass Valley shared an Emmy® Award (as Philips BTS) with CBS Laboratories in 1991-2 for pioneering efforts in the development at the PCP 90, the world's first commercially available Triax television camera.
- 10 Grass Valley's cameras include the letters "LDK" in the model number and are made in The Netherlands. "LDK", it's been said, stands for Luxury Dutch Kamera...in an odd Dutch-to-English sort of way. ;-)

matrix of compression algorithms and processing platforms for every application, from very high-efficiency emission encoders to the ability to freely mix DV, MPEG-2, MPEG-4, JPEG 2000, and other codecs, natively, on an editing timeline.

As broadcasting and networking technologies have become more complex, so too has Grass Valley's system integration capabilities.



"This is a big value for our customers," said Hervé Dammann, General Manager, Systems Integration: "it is clear they see the reduction of risk as important."

These projects include some of the biggest investments in leading edge technology. The 2006 FIFA Football World Cup was the first global scale sporting event to be covered end-to-end in high-definition, with multi-platform delivery—and Grass Valley built the entire infrastructure. Tier 1 telecom operator Telenor is rolling out a live and on-dem and IPTV service to all the countries in the Nordic region—with compression, multiplexing and network management, plus service management, and even the set-top boxes in a turnkey project from Grass Valley. The digital transmission network in the UK is being implemented for BBC and Siemens by Grass Valley.

"These are the cornerstones of the industry—cameras, compression, production, systems integration—and Grass Valley leads the way," concluded Ray Baldock. "Today we are working on the future, whether it is in developing new standards—timing in IP-based networks; how 10 gigabit Ethernet can be used for synchronous signals—or building new platforms like the remarkable Kayenne switcher—the tradition of on-air innovation is very much alive."

| 1992 |

WETA in Washington, DC transmits the first all-digital broadcast of HDTV in the world using a Comark transmitter

| 1994 |

Introduction of Dynamic Pixel Management (DPM) CCD

| 1995 |

Entry to video server market with Profile product line under Tektronix brand



EDIUS® DESKTOP VIDEO EDITING

MOM ALWAYS SAID TO PLAY NICE WITH OTHERS.



And we've taken her advice to heart. EDIUS is the one nonlinear editor that gives you the freedom to work the way you want to. True native mixed formats. Mixed resolution editing without conversion. Direct ingest from any camera or media, including Grass Valley™ Infinity™ Series with REV PRO™, Sony XDCAM, Panasonic P2, CompactFlash and GFCAM.



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<http://desktop.grassvalley.com>



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THE NEXT STEP

FORWARD

"I was working in a motorcycle workshop, doing classes in electronics. My professor suggested that I should go to Grass Valley™ for an interview—and it changed my life," recalled Jay Shinn, now General Manager for Production Switchers and Effects at Grass Valley.

In the late 1980s Jay was selling Grass Valley products in New York. With all the networks and local stations committed to Grass Valley, he got a good feel for what users need in a switcher, and uses that knowledge today to drive through innovations.

"We won an Emmy® Award for E-MEM," he said. "I'm confident that, without E-MEM, you could not create the kind of television we expect today: it is too complicated. When we launched the Kalypso™ we included many innovations, like four keyers per M/E, and DVE, still store and RAM recorder built in, integrating a lot of products which used to be external.

"We had to figure out a way to make it possible for the operator to use all of that power," he continued. "We made the environment

Jay Shinn
General Manager,
Production Switcher
and Effects



much simpler so the TDs and directors can focus on creating a good program.

"Now we are launching Kayenne™, which is another huge step forward," Shinn said. "With today's production switchers, sports and entertainment TDs are maxed out on what they can do, so now we are giving them six keyers on each of five M/E banks with 20 channels of Full DPM —while making the switcher easy to operate.

"Kayenne includes RGB-colored buttons so operators can use color to navigate any production," he added. "There are even OLED source name displays in the panel for crystal-sharp source identity—it would be great to think that we never need marking tape on the console again!

"Only Grass Valley could come up with an innovative product like this, a company with loyalty to its people and to its customers," he concluded. "This continuity, this focus on long term relationships is what continues to make Grass Valley special.



| 2002 |

Acquired by Thomson multimedia SA, merging the company with Thomson's own Broadcast Division, the Nextream joint venture, and Philips' Broadcast division

| 2009 |

Introduction of Kayenne Video Production Center

It's Gotta Be A Grass!

2000's

KAYENNE™ VIDEO PRODUCTION CENTER

RED AND GREEN... AND EVERYTHING IN-BETWEEN.



Put an end to production missteps. With the RGB buttons in the new Kayenne Video Production Center from Grass Valley™ you can assign different colors to different M/E rows and keys, as well as functions like macros and router control. You can also configure source button colors to distinguish sources like cameras and DDRs. Whatever your workflow, more color means less hassle.

For more information, see a demonstration of Kayenne's capabilities at

www.grassvalley.com/kayenne



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50 Years of On-Air Innovation

WHEN YOU'RE WATCHING TV YOU'RE WATCHING GRASS VALLEY™



For over 50 years, Grass Valley™ has provided the world's media and entertainment companies with a rich portfolio of award-winning solutions. Whether you're watching the news or live sporting event highlights - whether on your television or your mobile phone - you're watching Grass Valley innovation at work.

It's Gotta Be A Grass!

For more information, visit

www.grassvalley.com

