K2 DYNO

REPLAY SYSTEM

Leadership powered by innovation.™

grass valley

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FEATURING CHANNELFLEX®


REPSOL
26
46
FIAT
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FIAT

Dyno Replay Stations, Dorna International Feed

EASY TO USE, AFFORDABLE, HD REPLAY

That's the Grass Valley® K2 Dyno® Replay System.

But the K2 Dyno Replay System is so much more.

You expect any system from Grass Valley to be **easy to use**.
K2 Dyno Replay System delivers.

You need your replay system to have an **open, file-based** architecture.
K2 Dyno Replay System delivers.

You want your replay system to have the best system **channel flexibility available**.
K2 Dyno Replay System delivers.

K2 Dyno is the industry's fastest growing HD and SD replay system, with customers ranging from major league sports teams to outside broadcast production trucks located the world over.

See how the K2 Dyno Replay System can **take your productions to a higher level,** while keeping your budget on the ground.

THE SYSTEM

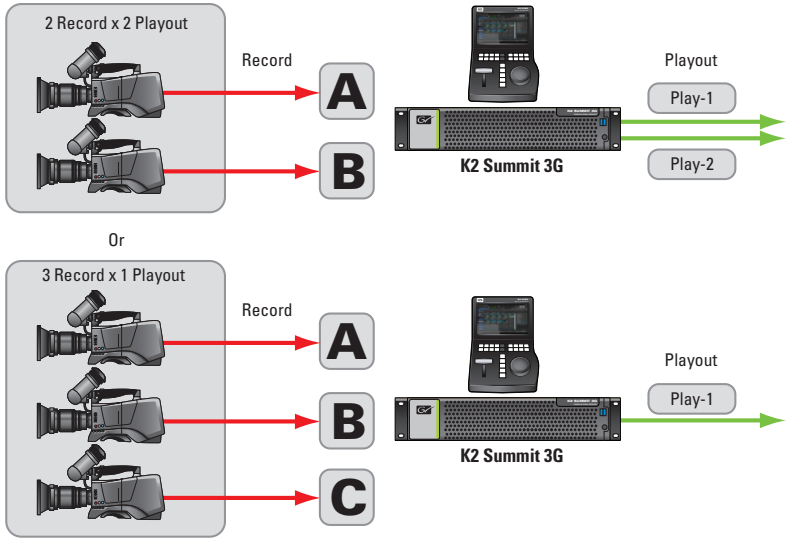
The K2 Dyno Replay System consists of three elements: The K2 Dyno S Replay Controller, AppCenter software, and either a 4-channel K2 Summit® 3G Production Client or a 2-channel portable K2 Solo® 3G Media Server.

Unlike legacy systems that were developed for use with standard-definition videotape, the K2 Dyno Replay System has been **specifically optimized for file-based HD production** with absolutely no compromises.

We've made sure that no matter what your application—HD, 2X/3X slow-motion HD, or 3D HD—the K2 Dyno Replay System delivers the affordability, scalability, and flexibility that you demand.

As the world leader in HD file-based workflows, Grass Valley designed the K2 Dyno Replay System to work in today's real-world production environments and workflows. While the control interface is familiar to almost all replay operators, the enhanced functionality gives you the opportunity to **totally re-think how you present replays and highlights to your audiences.**

For the ultimate in portability and flexibility, footage can be taken off-site for rough-cut editing by simply storing the files on a USB hard drive, or copying them across an Ethernet network. You can then review the material on Grass Valley STRATUS™ or EDIUS® software on a laptop—or on Avid, Apple, and Adobe editors using DV100, AVC-Intra, MPEG-2, or DNxHD.



Standard configurations for K2 Dyno with K2 Summit 3G

Combine the K2 Dyno Replay System with the K2 Dyno Production Assistant (PA) content management system, and you'll have a centralized view of all content on multiple K2 systems with high-resolution browse, enhanced metadata management, playlist generation and playout capability, and powerful rules-based file management.

Imagine...now all your replay servers have their content available in one place. **Everything that a replay director or highlights editor could possibly want,** literally at their fingertips. Best of all, K2 Dyno PA keeps **all that content manageable.**

K2 DYNO S

REPLAY CONTROLLER

THE REPLAY CONTROLLER YOU'VE BEEN WAITING FOR

No other replay controller comes close to giving you the ease of use and features provided by the K2 Dyno S Replay Controller.

With full support for 2X and 3X slow-motion cameras, multicam operations, 3D, key and fill, and standalone or SAN-attached K2 Summit 3G/Solo 3G clients, the K2 Dyno Replay Controller is ideally suited for HD or SD sports production trucks and production facilities.

The controller boasts a modern industrial design, and a full-color, gesture-based, touchscreen interface. It features support for one or two external optional displays, audio monitoring, high-speed Gigabit Ethernet connectivity, and USB connectors. Yet with our Grass Valley Karrera® T-bar and switcher-quality, dimmable backlit full spectrum color buttons, it's instantly familiar: easy to use and quick to learn.

The K2 Dyno S Replay Controller provides a variety of features and capabilities for live event production, including **speed control, editing, effects, multi-user operation, an efficient user interface, and immediate content packaging.** Interface tools include thumbnail icons, status indicators, specialized windows, and drag-and-drop operations for speedy and easy use.

This full-featured, **ergonomic controller is tuned for operators** to perform immediate playback, input switching, previewing, logging, browsing, shot-box operation, building of highlights and playlists, slow-motion control, file transfers, and consolidation of content to various removable media.

How did we know what you wanted in a replay system?

We listened. Grass Valley is continuously updating the K2 Dyno S Replay Controller software and many of our updates are suggested by those in the know—operators who want more.

CASE STUDY

ARIZONA CARDINALS

Application: **Enhancing the Fan Experience During Cardinals Games at University of Phoenix Stadium**

Client: **NFL's Arizona Cardinals, US**

The production team for the NFL's Arizona Cardinals has three K2 Dyno Replay Systems configured for a total of twelve record and six playback channels. This configuration gives directors tremendous flexibility. With multiple camera angles, transitions, highlight packages, and even videoboard effects showing simultaneous isolation shots of multiple players, the production team can really enhance the fan experience.

"The ability for all of the Final Cut Pro editors to grab any of the marked angles, edit features, and then play the package out to the fans from the K2 Dyno Replay System results in a production flow that is fast, easy, and very powerful. Melt reels have become a snap and managing clip storage has entered a whole new dynamic with some very robust digital asset management tools."

Mike Conner
Arizona Cardinals

CASE STUDY
ORF

Application: **Tapeless Production Studios**

Client: **ORF, Austria**

ORF, the national public broadcaster in Austria and a long time K2 server user, now has one of the largest K2 server installations in the world with approximately 320 K2 channels operational located in its Vienna headquarters and in its ten regional studios.

ORF continues to streamline production costs through the use of new technology, which includes moving as quickly as possible to tapeless production and file-based workflows.

For the production of the Austrian version of the ballroom dancing competition show, *Dancing with the Stars,* the K2 Dyno Replay System was used to build shot lists and replay clips of the dancers' performances straight to air, without the need for an editor.

"We have the K2 Dyno Replay Controller for those productions which need it, and it has the flexibility and portability to move it from studio to studio as required."

Wolfgang Gärtner, ORF

FEATURING CHANNELFLEX®

K2 SUMMIT 3G

4-CHANNEL PRODUCTION CLIENT

POWER, PERFORMANCE, AND FLEXIBILITY OPTIMIZED FOR REPLAY

K2 Summit 3G is powerful. **Immediate record to play for instant replays.** Continuous high-bandwidth streaming while file transfers—even of HD material—take place in the background. Effects and multiple format playout on a single channel. Automatic up/down/crossconversion of resolutions and aspect ratios per channel.

The 4-channel K2 Summit 3G records and plays industry-standard files, including AVC-Intra and DNxHD files. You can **import and export MXF, GXF (SMPTE 360M), or QuickTime** files directly without extra equipment—a USB 2.0/3.0 device will suffice. This makes the K2 Summit 3G perfect for highlight reels when footage may be coming from a third-party archive—and these different formats can play back-to-back seamlessly. You can also mount NLEs directly to the K2 Summit 3G and access content as an event is happening live without the need for transfer—the first such system to offer the capability to handle a live event combined with the openness and performance to enable edit-in-place.

Under the hood, the K2 Summit 3G is a 2 RU platform with redundant hot-swappable power supplies, redundant Ethernet ports, and an operating system that boots from solid-state media for quick start-up and reliability. Two iSCSI, or optional Fibre Channel, ports provide a backup data path in case of failure, giving you a cost-effective way to design a no-single-point-of-failure system.

To this architecture we've added **Grass Valley's Emmy® Award-winning core server technology.** Each channel is built around a high-performance RISC processor with a real-time operating system and performs video and audio processing in the robust and secure manner needed for a 24/7, fast-paced environment. There is also a customized programmable chip per channel to perform operations such as effects and format conversions on the fly.

FEATURING
CHANNELFLEX®

K2 SOLO 3G

2-CHANNEL HD/SD MEDIA SERVER

SO SMALL, YET SO POWERFUL

Smaller than a briefcase, the K2 Solo 3G media server is the perfect combination of **portability, performance, and price.** K2 Solo 3G is engineered for tight spaces, with built-in mix effects, playlists, and multiviewer mode for live monitoring.

It's fully compatible with a host of Grass Valley applications and products, including the K2 Dyno Replay System and world-famous Kayenne®, Kayak™, and Karrera® switchers as a multi-channel key/fill source. And with **ChannelFlex®** technology as an option, you can take a server on set, or on location, that is half the size of other servers but with twice the performance!

K2 Solo 3G provides two bidirectional channels in the base model, with DV and MPEG-2 format support included. Software license options are available for AVC-Intra and DNxHD formats. Additional channel capabilities—such as multicam record, super slow-motion, and 3D—can also be enabled by ChannelFlex software.

You also get **extensive connectivity** with multiple USB ports on the front and rear panels, IEEE 1394 (FireWire) on the rear panel, a front panel ExpressCard slot for removable media, and four Gigabit Ethernet ports on the rear panel.

CHANNELFLEX®

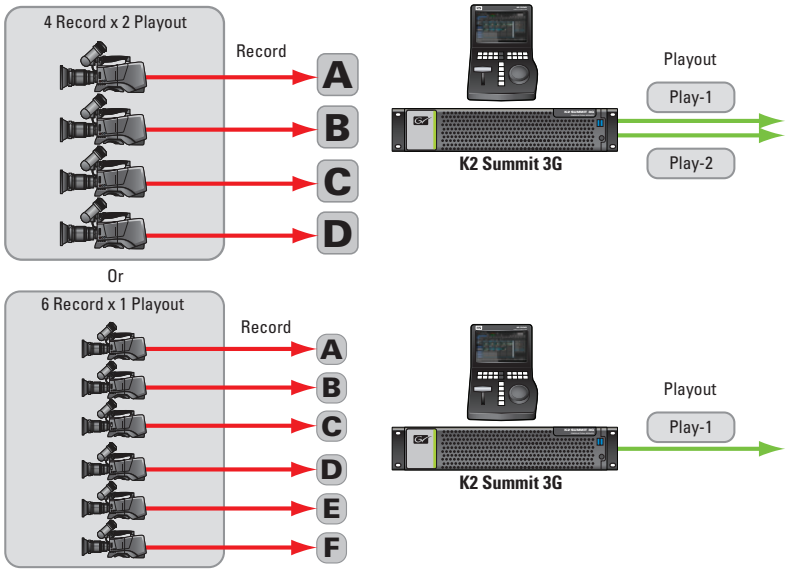
AND YOU THOUGHT A 4-CHANNEL SERVER ONLY HAD 4 CHANNELS?

Well, it does...but **let's talk streams.**

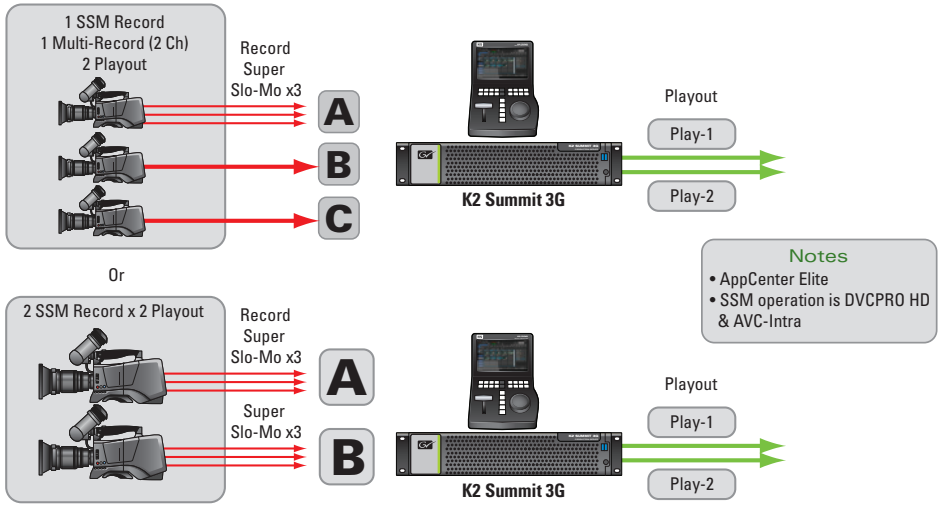
With ChannelFlex, a 4-channel K2 Summit 3G can process up to eight video streams. So, what does that mean for you? **The ultimate in server flexibility** for a variety of applications:

- **Multicam** – up to three K2 Summit 3G channels can ingest two camera streams per channel for a total of six cameras.
- **Key/Fill** – a key and fill stream can be ingested in one channel and stored as one asset with two video tracks. This can then be loaded on one channel and played back as two video streams.
- **3D** – one channel can record left-eye and right-eye and save it as one asset with two video tracks and common timecode and Anc data. This 3D asset can be loaded on one channel and played out as two synchronized video streams.
- **Super Slo-Mo** – the two or three phases of a super slo-mo camera (such as the LDK 8300) can be ingested into one K2 Summit 3G or K2 Solo channel and the phases are multiplexed into one stream and saved as a single, standard file.

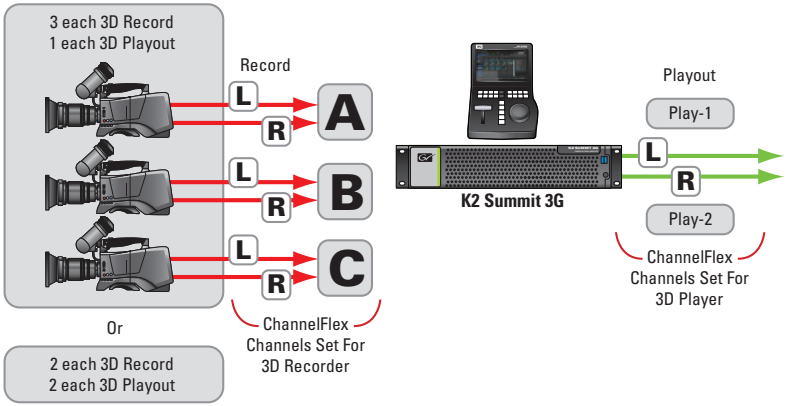
ChannelFlex is a software option that is accessed through **AppCenter Elite,** a K2 control application. All capabilities are enabled with a single software license. All the necessary hardware connections and controls are already in place.



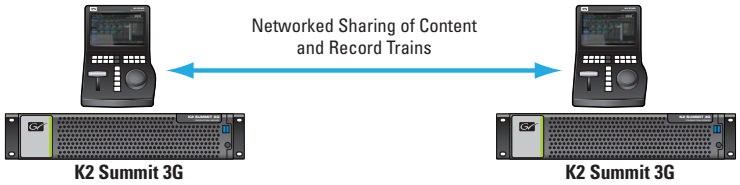
Additional K2 Dyno multi-input configurations with ChannelFlex option and K2 Summit 3G



Super Slo-Mo K2 Dyno configurations with ChannelFlex option and K2 Summit 3G



3D K2 Dyno configurations with ChannelFlex option and K2 Summit 3G



- Share highlight clips between systems
- View recorded content on a different K2 Summit 3G system locally
- Make a clip from another K2 Summit 3G's record train

- Load and play back a clip from another K2 Summit 3G
- Retrieve content from the library of a connected K2 Summit 3G
- Place a clip in a local playlist from another K2 Summit 3G

K2 Dyno network sharing of content

CASE STUDY

TELEGENIC

Application: **Stereoscopic 3D Outside Broadcast Replay System for Sports**

Client: **Sky, UK**

In Telegenic's T18 stereoscopic 3D truck, a K2 Summit Production Client is used to feed mixer animation clips, primarily for 3D graphics sequences, into and out of replays using the K2 Dyno Replay Controller. Sky's desire to get to market first with stereo 3D broadcasting meant that the Telegenic team had to complete the truck and get it into service on a tight deadline.

"We've tested the K2 Dyno Replay System in a number of other applications, and we're very impressed. Most slo-mo operators are used to another brand of server and controller, but converting to the Dyno takes just minutes, and the Dyno/Summit combination offers big advantages, not least being the price. The K2 Dyno Replay System was one of the last pieces of the puzzle for us and the simplest of all the implementations."

Peter Bates
Managing Director, Telegenic

CASE STUDY

DORNA SPORTS

Application: **Production of the MotoGP World Championship**

Client: **Dorna Sports, Spain**

When moving to HD production, Dorna Sports re-defined replay as no longer a simple manner of playing back specific clips, but the starting point for a file-based workflow that took full advantage of metadata to bring about new efficiencies in operation.

For any typical race, Dorna Sports produces approximately 15 hours of worldwide coverage during a three-day period. This means 30 to 50 replay clips created per K2 Dyno Replay Controller per race, 1,500 to 2,000 highlight clips created per day, 1,000 to 1,500 highlight clips transferred to XSAN per day, and 1,000 to 1,500 highlight clips transferred to primary K2 Dyno Replay Controller per day.

"Dyno Production Assistant adds great value for us because with that tool you have full access to, and full control of, all the servers in the network. Before we needed three or four people managing all the workflow. Now with Dyno PA, with just one person, we can manage everything."

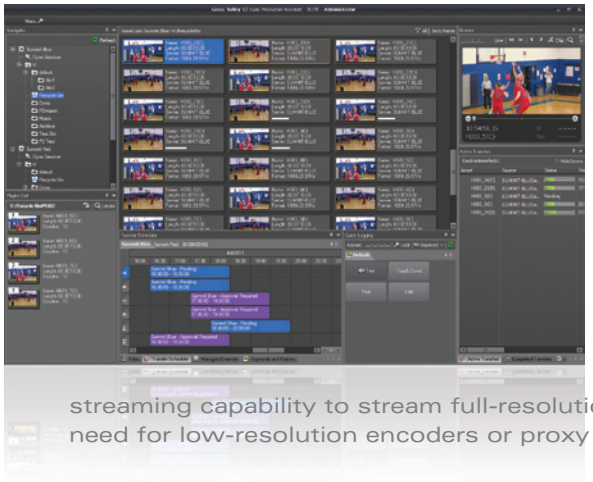
Sergi Sendra, TV Production Director

K2 DYNO

PRODUCTION ASSISTANT (PA)

LIVE PRODUCTION CONTENT MANAGEMENT, THE GRASS VALLEY WAY

A powerful, cost-effective and simple-to-use content management system for the K2 family of products, K2 Dyno Production Assistant (PA) provides a centralized view of all content on multiple K2 systems with high-resolution browse, enhanced metadata management, playlist generation and playout capability, and powerful rules-based file management.



With K2 Dyno PA, you can generate and run playlists without worrying about where the content resides. A powerful rules-based file manager will move the content to the required location—automatically—in the background.

A K2 Dyno PA operator can **view content from the K2 server** with a high-resolution browse viewer and trim clips as needed. Browsing is simplified using the K2's high-speed streaming capability to stream full-resolution content over a network without the need for low-resolution encoders or proxy storage.

You can **design your own metadata schema** with almost unlimited custom fields and deploy it across all servers. A key feature of metadata management is that **all metadata is physically stored with each clip.** As clips are moved from device to device, the metadata is preserved and is easy for third-party applications to access, such as Apple Final Cut Pro 7 and Avid Media Composer nonlinear editing software.

THE POWER OF GRASS VALLEY PRODUCTS CONNECTED TOGETHER

SUPER SLOW-MOTION RECORDER WITH K2 SUMMIT AND LDK 8300

In super slow-motion (SSM) recorder mode, the K2 Summit 3G is capable of capturing every frame from a high-quality Grass Valley super slow-motion camera (such as the LDK 8300) over a 2- or 3-wire interface (referred to as phases) and then storing this data so that it can be played back at standard broadcast resolutions and frame rates.

SIMPLE METADATA LOGGING IN A COLLABORATIVE ENVIRONMENT

All tagging and logging information is shared between the K2 Dyno S Replay Controller, K2 Dyno Production Assistant, GV STRATUS, and editing applications such as Grass Valley EDIUS, Apple Final Cut Pro 7, and Avid Media Composer.

CONTENT SHARED ACROSS APPLICATIONS

According to user-defined rules, K2 Dyno Production Assistant can automatically transfer clips to different applications or sub-systems such as the EDIUS editing application or Kayenne ClipStore.

With multiple standalone replay systems or integrated with a K2 Summit Storage Area Network (SAN) configuration, all content can be immediately accessible by different users, and by connected systems such as editors and archive.

GV STRATUS MEDIA WORKFLOW INTEGRATION

You can integrate the K2 Dyno Replay System with the Grass Valley STRATUS Media Workflow Application Framework to extend metadata throughout the production process. GV STRATUS provides targeted asset management and an expandable foundation for new applications and workflows. The state-of-the-art Service Oriented Architecture (SOA) at the foundation of STRATUS delivers a highly configurable user experience. By allowing the creation of production tools, each providing a specific base function, the software guarantees exceptional performance.

This software architecture allows the creation of a varied and growing set of functional tools (as service modules), each providing a specific basic function. GV STRATUS uses the basic functional tools in an almost infinite number of combinations. With K2 Dyno, metadata entered by replay operators can immediately be shared by other GV STRATUS production users for logging, editing, playout, and archive.

NONLINEAR PRODUCTION

We believe the technology powering the connectivity boom is a prime catalyst for enabling production, post, and distribution operations to merge onto a single collaborative platform that will revolutionize the industry. We think of this as Nonlinear Production—giving producers the ultimate power to create content once and distribute it across multiple platforms faster and more efficiently than ever before. Enabling our customers to achieve Nonlinear Production through file-based workflow solutions is our strategic goal, and we are investing in significant R&D to develop products and solutions that support this initiative.

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