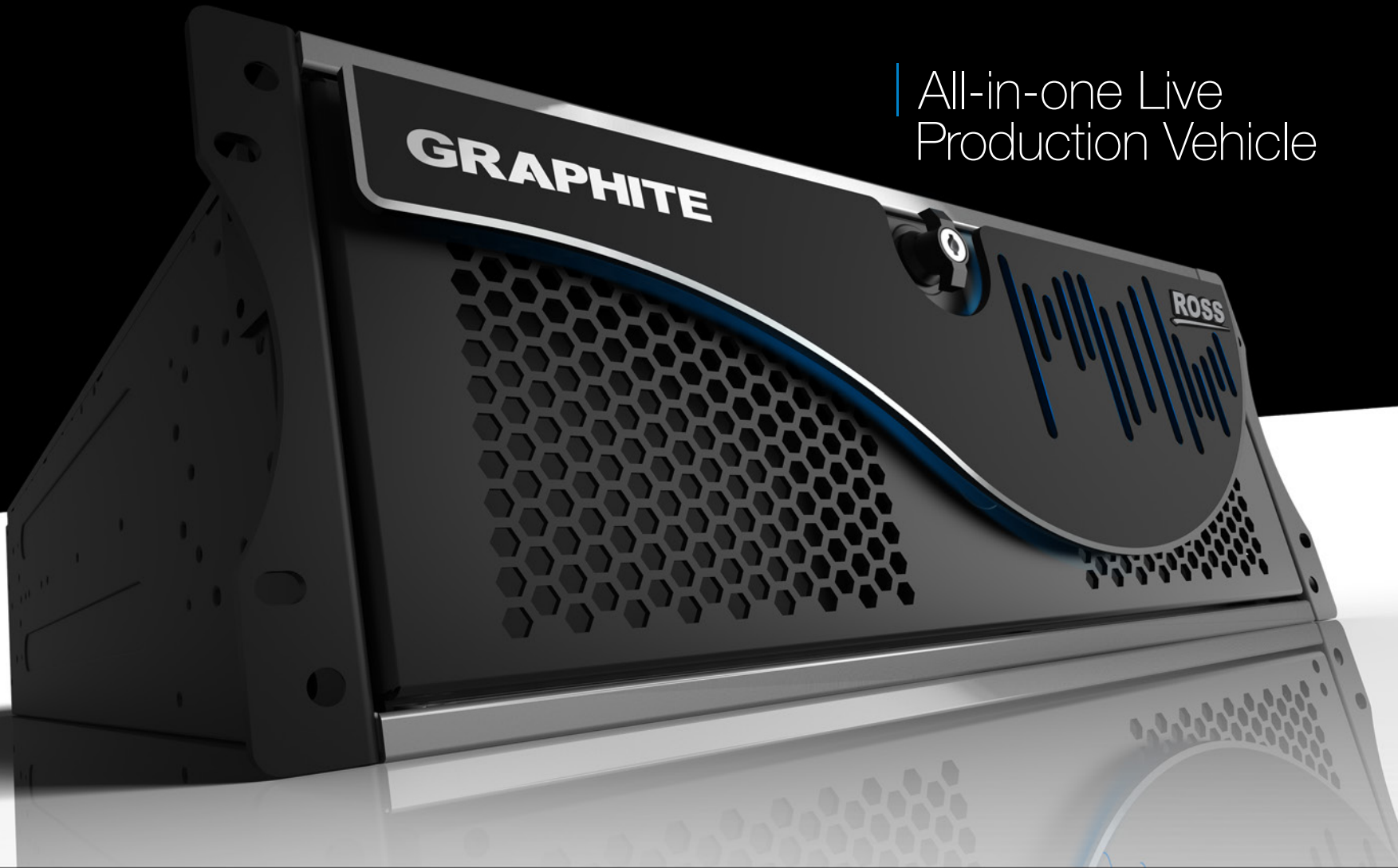


GRAPHITE

| All-in-one Live
Production Vehicle



ROSS

Production Technology Experts

GRAPHITE

Switch. Mix. Serve. Fly.

Graphite is an all-inclusive Video, Graphics, and Audio live event production system like no other. Designed and built with the quality and reliability you have come to expect from Ross Video. Built to never. Ever. Let you down.

Graphite combines the capabilities of an industry leading Carbonite production switcher with a comprehensive version of XPression 3D Motion Graphics including clip server channels, and an advanced audio processing, mixing, and production tool - all within a single 4RU chassis.

All-in-one
Live Production Vehicle.



COMPLETE THE VISION

- Perform the full range of functions found in the proven Carbonite production switchers.
- Rely on a purpose built system that provides continuous operation even if the graphics system or other PC functions suffer an interruption.
- Operate the system through a Ross DashBoard soft panel with local control, and via multiple network connected clients for maximum flexibility, as well as through independent connection to any Carbonite control panel.

ACHIEVE THE LOOK

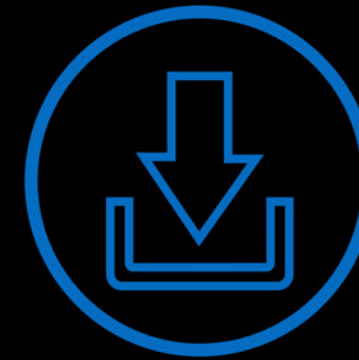
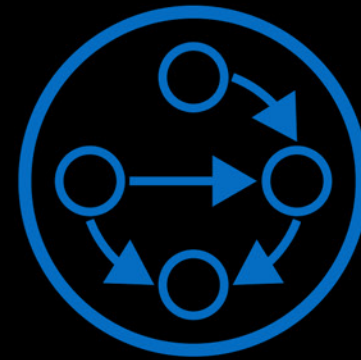
- Design advanced multi-layer 3D animated graphics with a single channel of XPression Graphite.
- Play out complex content with two channels of XPression clip server.
- Link between XPression Graphite and Carbonite to provide split-second transfer and display of individual still graphics, as well as an XPression preview channel on Carbonite media stores.

HEAR THE DIFFERENCE

- High-quality audio with routing from embedded sources within video inputs, or from internal PC audio sources.
- Implement audio enhancements using the 29 input mixer for different production requirements.
- Add additional audio capabilities with optional discrete Analog and Digital audio I/O, together with Microphone pre amps and phantom power.

GRAPHITE

| Key Benefits



PREMIER SWITCHER

Use the full features of the world's most popular mid-sized switcher – Carbonite – found in this all-in-one system.

POWERFUL GRAPHICS

Gain a great look from one of the most powerful graphics systems to ever be included in such a system – XPression.

INTEGRATED CLIP SERVER

Creatively utilize video clips or store created graphics for later usage with XPression Clips

UNMATCHED AUDIO

Handle demanding onsite live productions with no compromise audio capabilities.

ULTRA RELIABLE

Rely on the system that uses an innovative PCIe card which contains the switcher engine and unique operating systems to prevent software-based failures.

FLEXIBLE WORKFLOW

Configure systems in a number of ways that suits different workflows and purchase additional options that suit specific needs.

INCREMENTAL GROWTH

Expand on the system by integrating with other equipment.

SPACE CONSCIOUS

Fit within size-restricted production spaces with an entire system in a single 4RU frame.

DURABLE BUILD

Withstand the rigors of mobile productions with a strong all-metal body.

SOFTWARE UPGRADES

Grow from added features and enhancements with ongoing software version downloads included for the life of the product.

ROCKET STADIUM

RAGE 33 **QUARTER** 2 **14:37** **Outlaws** 35

BALL ON 40 **DOWN** 1 **TO GO** 10 **17**



SAMPSON SOUR SODAS

RAGE	Outlaws
118	RUSHING YARDS 90
197	PASSING YARDS 104
315	TOTAL YARDS 194
21	1ST DOWNS 11
5	SACKS 7

TEMP 23° WIND NW 13 MPH

Software Flexibility / Hardware Reliability



THE WHOLE IS GREATER THAN THE SUM OF ITS PARTS
Graphite offers the production power of combining the components needed to deliver a sophisticated production - concentrated into one compact 4RU package.

CARBONITE PRODUCTION SWITCHER

Graphite contains Ross Video's most successful product of all time, the Carbonite production switcher. Enjoy the high-end production power of the world's most popular mid-sized switcher in a compact software-based production system.

XPression 3D MOTION GRAPHICS

Further augmenting the production power, is XPression Graphite. With a powerful integrated graphics system, scenes, and templates are designed, built, and saved for later use, or immediately sent to frame buffers for keying over video inputs.

XPression CLIPS

Without any additional hardware or software, the two channels of XPression Clips production clip server adds another layer of production sophistication. Users are able to simultaneously record, manage, and play-out video clips. Graphics created in XPression can be utilized in these channels much like an external video source.

POWERFUL AUDIO PROCESSING

Graphite breaks the mold of uninspired audio capability in an all-in-one production system. Graphite systems include a large audio routing, shuffle, and de-embed / embed section. This system handles up to 16 channels from each SDI feed for a total of 192 channels. There is a dedicated 29 input audio mixer. Graphite can also send and receive audio with the system-host PC, and use the speaker outputs for monitoring.

* For more rigorous audio needs, an optional external audio breakout panel is available > 8 analog balanced mic inputs with mic pre-amps and phantom power.

Under The Hood.



PROVEN PERFORMANCE

At the heart of Graphite, is a Carbonite engine built onto a PCIe card that runs on its own embedded OS and software system. This a massive development, as it eliminates the critical vulnerability of purely software-based production systems, namely PC / OS based slow-downs, reboots, crashes, and updates. As long as the power is running, your production will run smoothly and without interruption.



CARBONITE GUI

2 POWERFUL MES

Carbonite packs major effects and keying power into 2 MEs. Each ME has 4 powerful keyers with luma, linear, chroma, and DVE key types as well as an additional 5th hidden keyer for animated Media Wipe and DVE transitions. Each ME can access the 2 advanced Ultrachrome chroma keyers. Two advanced pattern generators per ME are available for wipes, pattern masks and color washes. Each ME also provides a clean feed output.

MiniMEs

Powerful effects modules that include an independent mixer and 2 Keyers: 1 standard Keyer and 1 specifically for DVE boxes. MiniME modules do not reside in a fixed position in the signal flow, they 'float' and can be used anywhere in the signal path. There are 4 MiniMEs in the system, which can be assigned to multiple locations and used simultaneously.

MultiViewers

Two configurable MultiViewers (up to 32 windows) are included in the Carbonite feature set. These clean, low latency MultiViewers have access to all external and internal sources. Source naming and tally assignment automatically follow window routing selections. Each MultiViewer has user selectable layouts with the individual choice of border, tally and UMD label display for each source.

GRAPHICS INTEGRATION

Using RossLinq functionality, XPression has a direct connection to Carbonite's media stores. Individual still graphics are transferred in a few seconds and displayed live. It is also possible to use switcher media stores as a preview channel for the single channel XPression Graphite application.

3G PRODUCTION

No other system of this size and price point can offer 3G processing. 3G signals contain twice the data of standard HD and as a result some resource reduction such as DVEs and MultiViewer windows occurs. However, all other resources, including MiniMEs and MultiScreen, are always accessible.

Up Converted UHD Output

The MiniME's in MultiScreen mode can be set to upscale HD productions to a UHD quad split. This is a powerful feature when sending outputs to large displays for concert and event production.

4K PRODUCTION

The Carbonite powerhouse can also manage the very latest production format – UHD. In 3G mode Carbonite's MiniMEs can be used for basic UHD production. Simply turn on MultiScreen mode and all four MiniME controls are locked together, providing mixes, cuts and keys to be applied to UHD quad link inputs.

EFFECTS MEMORY WITH MemoryAI

Carbonite's powerful and truly unique intelligent resource management system permits stored keys and backgrounds to be recalled to preview without disturbing what is currently on-air. This system enables multiple 'scenes' to be stored and recalled in a manner that would normally require a much larger multi-ME switcher.

4 CHANNEL MEDIA-STORE

Four independent media player channels are available switcher-wide. Stills, logos and animated graphics generated from XPression are played out from the on-board 8GB memory and can also be loaded via USB storage devices. The Media-Store can also be managed directly over Ethernet via Carbonite's browser-based graphic tools.

MediaWipes WITH AUDIO PLAYBACK

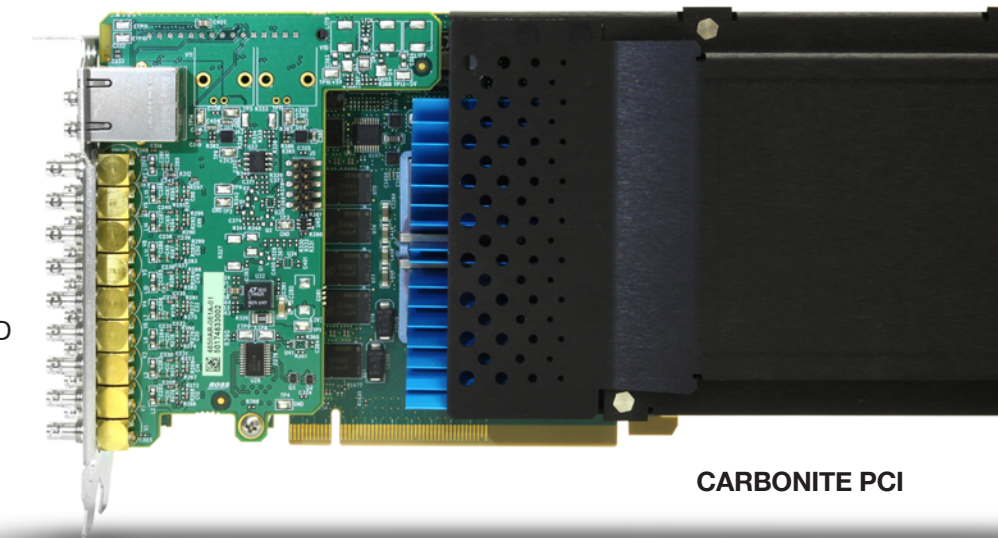
MediaWipes add powerful animated transition capabilities with audio playback from the Carbonite Media-Stores. Create compelling, animated graphic transitions and control them simply from a dedicated ME transition area selector.

Ultrachrome ADVANCED CHROMA KEYING IN EVERY ME

Ultrachrome chroma keyer uses advanced Ross technology to perform detailed keying in the most demanding of conditions.

4 CHANNELS OF DVE

4 high quality 2D DVE channels are available system-wide. The DVEs 'float' within the system architecture permitting them all to be assigned to a single ME or distributed across MEs and MiniMEs as the production demands. These DVEs are also available for ME DVE transitions and have dedicated selection in the ME transition area.



CARBONITE PCI

Loaded with Standard Features

XPression REAL TIME 3D MOTION GRAPHICS

XPression Graphite is a single-channel entry-level XPression software edition without 3D model support, but still makes 3D primitives and text available. This is a powerful turnkey package featuring:

2D & 3D TEXT

XPression's font engine has the tools to type in any language in any orientation, while toggling between 2D and 3D text for ultimate flexibility. Both TrueType and OpenType fonts are supported with Unicode compliance, making XPression ideal for any kind of text. XPression Private fonts do not need to be installed in Windows and travel with the project, so there is never any worry about recalling graphics with the wrong fonts when moving from system to system.

VIRTUAL CAMERAS

Achieve even more complex 3D animations by animating Virtual Cameras along with objects in XPression. These virtual cameras also enable virtual set and augmented reality functionality when they are combined with external tracking data. Both perspective and orthogonal cameras are available. Easy manipulation in the Viewport is possible with mouse camera control that allows you to zoom and orbit objects on a grid that toggles on and off.

3D PRIMITIVES

Build graphics from XPression's 3D primitives. Animate, resize, and re-skin elements for final output.

VISUAL LOGIC

Automate and add intelligence to XPression scenes with Visual Logic. It is no longer necessary to use complex scripting to create "smart templates". With visual logic, simply drag parameters to the workspace and connect them with functions and other parameters by drawing lines from output to input. Live data can be applied to change the outcome of the logic.

PLAYOUT SEQUENCER

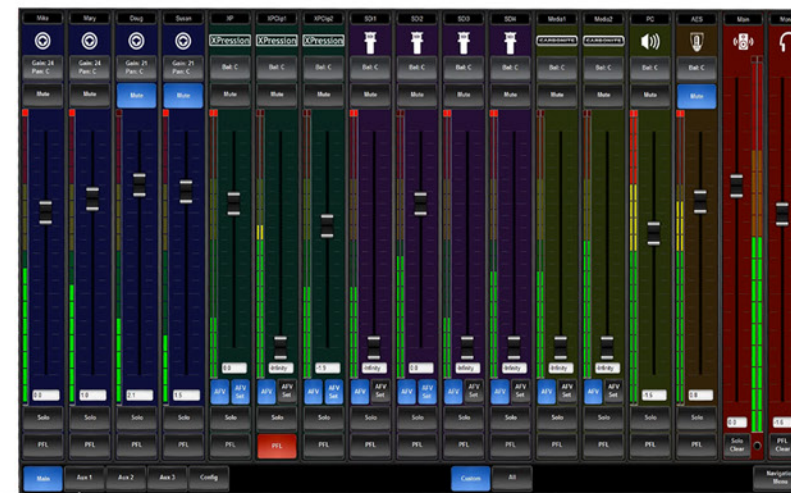
Add scenes as take items by dragging them directly into the Sequencer. XPression's template-based workflow replaces text, stills, clips, and modifies data hooks, while playing out to air. Only published parameters are exposed to the operator, ensuring brand consistency. In fast-paced productions, Fast Recall mode recalls Take Items by "page number".

XPRESSION CLIPS FUNCTIONALITY

The included XPression Clips functionality provides a full database to browse, catalog, and output clips directly to air on any channel or layer. Built on the industry-leading XPression real-time graphics platform, XPression Clips offers you instant recall times and back-to-back clip transitions from DashBoard control or Graphite's internal Carbonite switcher.



XPression



RAVE

RAVE AUDIO MIXER

Graphite features powerful audio production mixing and channel management with SDI embedding / de-embedding that is only matched by dedicated audio mixing devices. Simply put, Graphite's audio capability cannot be matched by other all-in-one production systems.

HIGH QUALITY 24 BIT PROCESSING

Graphite offers crisp 24 bit audio at a sample rate of 48 kHz.

EMBEDDED AND INTERNAL AUDIO SOURCES

Utilize audio with routing from embedded SDI within video inputs, or utilize sources from internal PC audio.

SOFTWARE CONTROL

Utilizing dynamic DashBoard control technology, Graphite contains a full 29 input audio mixer that can be operated from a PC. Containing all the features of a standard audio mixer, Graphite's DashBoard-based audio mixer features input management, level monitoring, volume and gain adjustment, and other desirable audio production features.

CARBONITE CONTROL

Simplify show set-ups, as well as the execution of critical audio moments, with direct Carbonite control. Save audio set-ups as recallable memories in the switcher's memory banks and trigger audio level adjustments with the switcher's custom control macros.

MULTI-CHANNEL SDI FEEDS

Graphite handles up to 16 channels from each of the 12 SDI feeds. This makes for a total of 192 channels of available audio.



DashBoard CUSTOM CONTROL

DashBoard is an open platform from Ross Video for facility control and monitoring that enables users to quickly build unique, tailored CustomPanels that make complex operations simple. DashBoard provides control and monitoring to hundreds of products from over 50 partners within the openGear and DashBoard Connect ecosystem, and of course most Ross Video products. Its ability to craft application specific solutions across this breadth of products is what makes DashBoard so special.



Optional Equipment



RAVE - 1RU AUDIO BREAKOUT PANEL

For users that have more rigorous audio needs, Graphite offers an optional 1RU audio breakout panel that adds discreet Analog and Digital audio I/O, together with microphone pre-amps and phantom power.

Analog to Digital Conversion

The breakout panel transfers analog audio to the Graphite's mixer via an SDI connection, putting each input onto one of the 16 channels on the SDI feed. This allows mixing of audio through Graphite's interface. Graphite also transfers AUX feeds to the breakout panel by use of an SDI connection.

Analog Balanced Microphone Inputs

The audio breakout panel features 8 microphone inputs. These inputs are accessible in the DashBoard audio mixer to implement audio enhancements.

Microphone Pre-amps

Simply plug your microphone in and let Graphite's audio breakout panel ensure that the resulting audio is at the correct signal level.

Phantom Power

For higher quality microphones that require it, Graphite's audio breakout panel allows for toggle-able phantom power to all microphone inputs. The phantom power is offered in industry-standard 48V format.

AUX OUTPUTS

Customize and route three separate AUX outputs with the audio breakout panel. This is an excellent feature for productions that require specific audio outputs, such as multi-lingual productions or anchor headset feeds.



CARBONITE PANELS

Some users just need that switcher panel feel. So for users that need something with a more physical touch, it is easy to add the various Carbonite panels into the mix.

MIRA REPLAY

Sporting events happen fast, which is why your audience needs a second look at those pivotal moments throughout the game. Replay capability is a must-have during sports productions and thanks to the complete production system that Graphite provides, is the only addition you need to make.

All Mira Replay Systems easily connect with Graphite to form a total sports production solution. Boasting multiple channels for record and play operation, Mira is built with a straightforward user interface and control surface that any operator can master with ease. Enjoy a complete two-piece solution and make sure your audience doesn't miss a second.

MIRA EXPRESS

Mira Xpress is the newest iteration of Mira Replay, it is the perfect solution for adding rapid instant replay to fast-spaced sport productions, at a remarkable price point. Mira Xpress is built on a solid platform that won't let you down and is a truly reliable alternative to traditional budget replay systems.

Mira Xpress is an SSD-based replay system, with the same industry-leading control surface and intuitive user interface as the standard Mira Replay.



Performance Specifications



Graphite Frame Specifications	
13 EXTERNAL INPUTS	12 HD SDI / 1 HDMI Single Channel XPression with multiple key layers 2 channels of XPression Clip playback
9 INTERNAL INPUTS	PC Video Playback PC Audio Playback 4 Channels of Media Storage (Stills & Animations w/ audio) 29 Channels of Stereo Audio (from internal routing)
8 OUTPUTS	6 SDI / 2 HDMI

Carbonite Engine Specifications	
Number of MEs	2
Number of MiniMEs	4
Number of MultiViewers with Tally And Source Names	2 (up to 32 windows)
Internal Format Converters / Frame Synchronizers	6
Number of Floating DVEs	4
Number of GPI / O	34
Number of Tallies	34
Reference Input	Black or Tri-Level
Internal Reference Generator	✓
Operational Features	
Number of Keys Per ME	5 (4+1 Transition Key)
Number of Keys Per MiniME	2 per MiniME
Number of Keys on Half ME	2 DSK + MediaWipe
Total Keyers in Minime Mode	18
Total Keyers in 2.5 ME Mode	13
Ultrachrome Keyers (Floating)	2
Number Of MediaStores (8 Gb Capacity)	4
Supported Media File Types	Stills: BMP Stills & Animations: .JPG, .JPEG (no Alpha), TGA & PNG (with Alpha) & 48k WAV audio
Browser-Based Graphics Management	✓
Pattern Generators	2 per ME
Animated Mediawipes	✓
Direct Mediastore Render Via Ethernet	✓
Liveedl (Generates an Edit Decision List for use in Post-Production)	✓
Control Interfaces	
Dashboard LiveAssist	✓
ViewControl – Visual Production Control	✓
Robotic Camera Control	✓
Signal Processing Standards	
Standard Definition	480i/59.94, 576i/50
High Definition	720p & 1080i 50/59.94
1080 PSF	23.98, 25 & 29.97
1080P	29.97 (1.5Gb) & 50 / 59.94 (3Gb)
UHD Up Conversion for Output	4x Quad Link (MultiScreen Mode)

Optional XPression Workflow Tools and Applications

- Project Server
- openMAMTM Connectivity
- Ross Streamline Asset/Order Management
- DataLinq Server
- XPression Gateway
- MOS Plug-in
- NLE Plug-in
- Template Builder
- CII Gateway
- AMP/VDCP Gateway
- Desktop Preview Server

XPression Clips Features

- Multi-channel ingest and playout
- 2 channels of baseband video ingest
- 2 channels of playout (user-definable fill / fill or fill / key configuration)
- No pre-roll
- Back-to-back transitions
- Multiple clips on the same output
- Clip Browser with searching
- Clip trimming and looping
- VDCP, AMP, P-bus, and RossTalk automation protocols
- P-bus Manager for intelligent clip assignment
- Clip Manager application with user rights or database management and synchronization setup

XPression Graphite Specifications	
Template Designer	√
Playout Sequencer	√
2D / 3D Fonts	√
Arabic, Asian & Scripted Language Support	√
3D Primitives	√
Video Clip Support (within a template)	√
XPression Video Codec License	√
XPression Video Coder Application	√
Automated File-based Ingest, Transcoding & Publishing	Optional
Animation Timeline	√
Graphical Keyframe Editor	√
Continuous Animations	√
Stagger Animations	√
Visual Logic	√
Virtual Cameras	√
Seamless Continuous Tickers	√
TrueD! Anaglyphic Stereoscopic Preview	v
Render to Disk	√
Output Framebuffer Layers	Unlimited
Virtual Preview Channels (up next & look-ahead)	2
High Definition Formats (HD)	√
Standard Definition Formats (SD)	√
Project Video Format Conversion	√
Custom Resolution Video Formats (DVI Out)	√
Audio Channels for XPression Content	16
Audio Channels for Embedded Pass-Through	16
RossTalk (TCP/IP Strings)	√
P-bus	√
Custom Keyboard	Optional

Graphite / RAVE Audio Mixer	
Audio Channels per SDI Feed	16
29 Inputs	12 Stereo SDI 1 Stereo HDMI 4 Stereo XPression 2 Stereo Carbonite MediaStores 1 Stereo PC Audio Input 1 Stereo AES input 8 Mono Analog inputs
Output Controls	
Fader Volume	-∞db to +20db
Post-Fade Audio Meter	√
Post-Fade Peak Indicator	√
Solo Clear	√
Output Controls	
Fader Volume	-∞db to +20db
Pre-Fade Audio Meter	√
Pre-Fade Peak Indicator	√
Balance Control on Stereo Inputs	√
Pan Control on Mono Inputs	√
Mute	√
Solo	√
Pre-Fade Listen	√

RAVE Audio Breakout Panel	
Microphone Inputs	8
Phantom Power	48V
MAIN Channel	1
AUX Channels	3

ROSS VIDEO

Production Technology Experts

MOTION GRAPHICS

XPRESSION | Studio, BlueBox, Prime, Go!, Designer, Developer, Quad
XPRESSION CLIPS
XPRESSION TESSERA
XPRESSION MAPS
XPRESSION TELESTRATE
XPRESSION TOUCH FACTORY
XPRESSION BRAND IT
XPRESSION TICK IT



CREATIVE SERVICES

ROCKET SURGERY | Graphics Creation



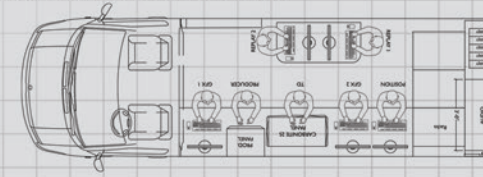
STUDIO IN A BOX

GRAPHITE | All-in-One Live Production Vehicle



OPENTRUCK

OPENTRUCK | Flight Case through 40-foot Truck Designs



PRODUCTION SERVICES

ROSS MOBILE PRODUCTIONS



ASSET MANAGEMENT



CAMERAS

ACID CAMERA | H200-UCHR, Z50-UCHR
PIVOTCAM | PIVOTCam-20



CHROMA KEYING

ULTRACHROME HR



* Carbonite Black Chassis with UltraChroma HR Software

NEWS & SOCIAL MEDIA

INCEPTION NEWS | Academic, Express, Standard, Enterprise
INCEPTION LIVE
INCEPTION SOCIAL
INCEPTION.CLOUD
HORIZON



CONTROL SYSTEMS

OVERDRIVE | Premiere, Prime, Express
DASHBOARD
LIGHTNING CONTROL SYSTEM



PRODUCTION SWITCHERS



ACUITY | Panel: A1s, A2m, A2x, A3m, A3, A4 Frame: 4RU, 8RU
CARBONITE BLACK | Panel: C1, C1s, C2, C2s, C3s, C3x Frame: 2RU
CARBONITE BLACK PLUS
CARBONITE BLACK SOLO

IP TECHNOLOGY

COVELOZ | OEM Hardware, Virtual Chip, Engineering Services



ROBOTICS

FURIO SE LIVE | Live Head, SE Dolly and SE Lift; PanBar and Joystick Controls
FURIO SE STUDIO | VR100, VR600 Heads; SE Lift and SE Dolly; SE BlackBird
CAMBOT | 520PT, 600PT, 700PT Heads; 600X & 700XY Free-Roaming Peds
SMARTSHELL | Robotic Camera Control System



INFRASTRUCTURE

ULTRIX ROUTER | 16x16-72x72
NK ROUTER | 16x4 -144x144
OPENGEAR | Modular Signal Processing
MASTER CONTROL | MC1 openGear Card, MC1 Panel



GEARLITE | Point of Use Signal Processing
AUDIO MONITORING | MB 651, MB-652
MASTER SYNC & REFERENCE | SRG-2200, SRG-4400, ACO-4400



VIDEO SERVERS & REPLAY

ABEKAS MIRA | Replay, Production Server
ABEKAS TRIA | Production Server
ABEKAS AIR CHANNEL | Profanity Delay



VIRTUAL & AUGMENTED REALITY

TRACKLESS VIRTUAL UX VIRTUAL TRACKING SYSTEM



GRAPHITE

Ross Video has a complete range of technical services available to ensure that your Graphite installation is a success.

Operational Training can be provided at Ross Video, on-site or on the web. Experienced Ross operators will teach your staff to get the most out of your new system, and enhance your productions.

Commissioning is a service to help get your production system properly configured, connected and installed. This service is performed by factory trained Ross technical staff.

Technical Training can be provided at Ross Video, on-site or over the web. Technical training will teach your engineering staff the technical details of the system you have purchased. System configuration, interfaces, databases, and routine maintenance procedures are some of the topics covered.

Graphite comes standard with a 1 year comprehensive warranty. **Extended Warranties** on hardware and software maintenance are available for an annual fee.

Technical advice is available on-line, by telephone, or email to Ross Video – **Included for the life of your system.**

Contact Us

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www.rossvideo.com

ROSS VIDEO LIVE PRODUCTION EXPERTS

SOLUTIONS

- Broadcast & Production
- Augmented Reality & Virtual Sets
- Sport & Live Events
- Legislative
- Mobile Production
- House of Worship
- Education
- Corporate

PRODUCTS

- Production Switchers
- Motion Graphics & Clip Servers
- Replay & Production Servers
- Robotic & Camera Systems
- Control Systems
- Routing Infrastructure
- Signal Processing Infrastructure
- News, Live & Social Production Management
- Media Asset Management

SERVICES

- Creative Services
- Mobile Production

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Production Technology Experts