

ROSS *virtual solutions*



Dynamic Solutions for an Evolving Industry

ROSS
Production Technology Experts

Extensively Practical

Ross Video offers a range of Virtual Solutions that enable media production organizations to tell better stories, gain viewership, increase revenue, and reduce costs through the use of Augmented Reality and Virtual Sets, with a focus on blended environments that combine the best of traditional physical design and virtual design.

Ross can implement virtual solutions for limited budgets as well as for the most demanding of production applications. This includes the most complete product portfolio in the industry with diverse third party component integration, and comprehensive virtual design services.

Why Use Virtual Sets and Augmented Reality?

Tell Better Stories

- Meet viewer's expectations for a more sophisticated presentation.
- Extend the story telling tool set with multiple virtual monitors, floating augmented reality elements, and customizable virtual sets.
- Use augmented reality and virtual sets to exceed the limitations of traditional studio environments.
- Create more polished productions for applications such as weather, sports, news, elections, talk and variety shows, sponsorship, and more.

Retain and Increase Viewership

- Present information in new and innovative ways to captivate and inform audiences.
- Get viewers to tune in longer showing segments with content such as augmented reality weather.

Realize Sponsorship Opportunities

- Gain new income sources through sponsorship of specific virtual elements.
- Add a sponsor logo designed into a virtual monitor or have logos spray painted in a virtual manner on a virtual wall to deliver in-show sponsorships.
- Apply advertising and sponsorship in the same manner for a variety of programming such as weather, traffic, sports, talk, and variety on an annual, daily, or show by show basis.

Lower Set Costs

- Utilize "blended" environments that combine the best of traditional physical design and virtual design to eliminate the need for video walls and on-set monitors.
- Deploy virtual sets at a fraction of the cost of traditional physical sets.
- Secure capital investment with complete solutions that offer superb system integration, enhance revenue streams, and lower operational costs.

Reduce Real Estate Requirements

- Operate and deploy virtual solutions in small spaces that require substantially less facility costs.
- Save on the reduced size of studios.
- Use less storage space due to needing fewer physical set pieces.

Increase Staff Flexibility

- Implement augmented reality and virtual set solutions that combine robotic cameras, production switchers, motion graphics, signal processing, routing, and automated production control systems that are intuitive and effective to use without the need for complicated technical knowledge.
- Easily move staff resources around and use them for a variety of tasks and program production rather than having to be dedicated for single tasks.
- Utilize agile production teams that are more efficient and contribute to lower overall operational costs.





A Choice of Solutions for a Range of Requirements

You can deploy Virtual solutions in various ways including Virtual Set Extensions, Virtual Weather, Virtual Advertising, Virtual Social, and more. For example, The Weather Company, an IBM Business, works with Ross to deliver augmented reality weather solutions. The Weather Company has recently found that 64% of those surveyed indicated they would tune in longer if their augmented reality weather presentations branded Max Reality, were to be part of an upcoming segment.

Augmented reality can do more than impress; it can also help grow your profits. The cost of branding a sports segment by embedding a logo directly into the set or the floor is the cost of dragging a graphic into a file folder. When a sponsorship ends or is replaced, it can instantly be changed. You can now deliver in-show sponsorship leveraging both augmented reality and virtual sets.

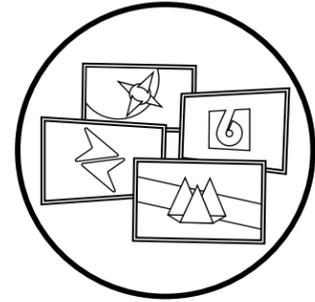
Virtual solutions also reduce your costs of set design, staffing, space, and operation. Virtual studios can easily be installed in standard building spaces by leveraging a total Ross solution in a small footprint. Virtual solutions can be deployed in ways only limited by your imagination.

In addition to providing industry leading end to end tracking solutions using XPression graphics and rendering, Ross Robotics, UX and UXVCC control and management, and jib kits, Ross even offers Ross Trackless Studio for cost-effective virtual production without camera tracking.

Ross can make the virtual become reality with total system solutions, design, and support. Building virtual studios used to require multiple vendors to create a solution and multiple contacts if there was a problem. Ross is the only company that can deliver single supplier turn-key solutions for virtual studios including design, graphics, robotics, keying, switching, signal processing, routing, and automated production control. Ross also provides robust integration with third party products to insure everything works well together. To supply solutions that meet all the necessary requirements, Ross works with key third parties to deliver lenses, green screens, lighting, jibs and manual heads. Ross offers the best virtual designers in the world to deliver top quality augmented reality and virtual set designs with Ross Virtual Design services.

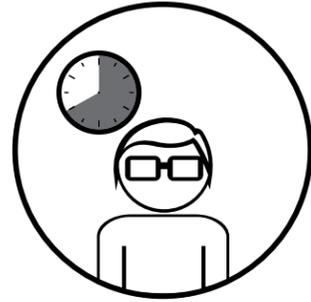
Key Benefits

Tangible Financial Incentives



Grow profits with advertising and sponsorship within weather, traffic, sports, talk, and variety through enabling the development of new revenue sources.

Hold Viewer Attention



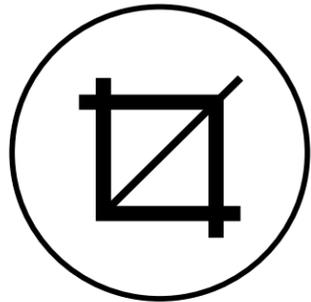
Present information in new and innovative ways to captivate and inform audiences like never before.

Cost Effectiveness



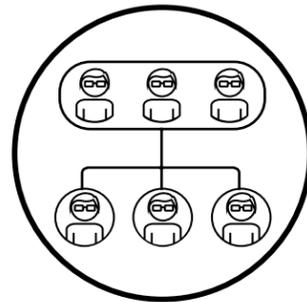
Typical costs are a tiny fraction of the cost of traditional physical sets. The need for \$100,000 dollar and more video walls and on-set monitors can be eliminated.

Size to Fit



Virtual Studios can be designed to look as big or as small as is needed. Virtual studios can easily be installed in standard building spaces. Additionally, fewer physical set pieces means less storage space as well.

Resource Friendly



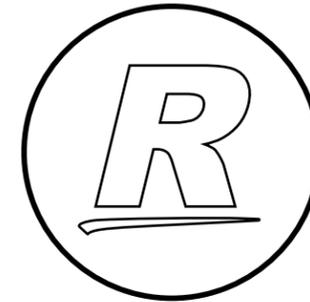
Using augmented reality and virtual sets along with robotic cameras, switchers, and automated production systems enable more flexibility in staffing for on-air productions.

Efficiency



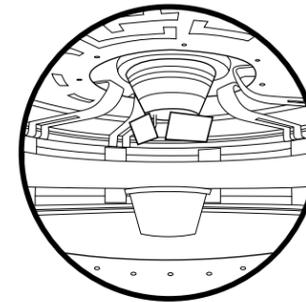
A smaller studio with less storage space, staffing, and associated factors also results in reduced operational overhead.

Complete Solutions



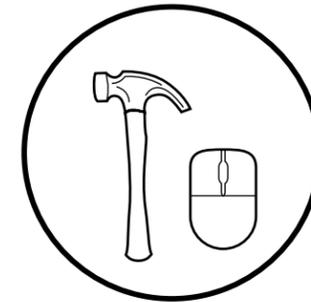
Single supplier turn-key solutions for virtual studios including design, real-time motion graphics, robotic pedestals and dollies, control and operation software, news and social media systems, productions switchers, signal processing, routing, keying, and automated production control.

Best Possible Designs



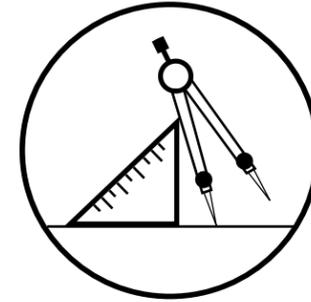
With over 20 years of virtual experience in the broadcast and film industry, a world-class design team and design process includes both Ross and industry partners to support all solution requirements.

Flexibility



Due to the intersection of technologies, performance, costs, and workflows, virtual solutions can be created as blended environments that combine the best of traditional physical design and virtual design.

Alternative Implementations



A Ross Virtual Studio can be implemented in small footprints. This permits virtual solutions to be placed in standard structures with limited space.

Trackless Vs. Tracked

With Ross Video products and systems, you can create the highest quality virtual productions that can scale to suit your organizational needs – all with solutions from a single reliable supplier.

But how do you create virtual productions? There are two primary methods of combining virtual and physical elements when operating in virtual environments: Trackless and Tracked.

There are some core differences between Trackless and Tracked systems in the requirements of how the various elements interact. In a Trackless system, the cameras are fixed/locked down, while in a Tracked system, the cameras are free to move about. In a Trackless system the talent remains mostly stationary and the virtual world is built around them. In a fully Tracked system, talent can move around in the set and tracking keeps them properly aligned to the changes in the physical and virtual world. Of course the two methods have different set, hardware, and software requirements.



Trackless

Trackless virtual systems are all-in-one engines that require no external action on the part of the camera in order to create movement. They use a stationary physical camera, with all the camera movement being done within the graphics engine. This eliminates the need for physical tracking equipment.

This is an exciting new avenue for low cost virtual productions. Ross is proud to offer its own cutting edge version of this tool.

- motion cameras
- virtual camera movement
- single render engine
- low cost
- great for smaller cost constrained studios

Tracked

Traditional tracked virtual systems rely on some sort of camera tracking to manage the movement of the cameras and talent in the set. This requires data encoders, infrastructure, and a tracking management system to track the camera's movement and position. The coordinates of the cameras are then identified as 3D-coordinates for the graphics rendering engine in the virtual space.

For this purpose Ross offers the UX Virtual Tracking System as a system that covers the three needs of tracking, keying, and rendering for virtual production.

With UX, users integrate the tracking capabilities of Ross Furio and CamBot Robotics or a wide variety of other tracking devices, to create some truly stunning productions. This can be combined with OverDrive Automated Production Control to combine complex virtual and camera moves into one button events. This is an environment designed for non-engineering users with a very accessible ease-of-use.

Ross supports an agnostic approach for tracking, and supports all leading tracking companies in the industry. Users have a choice of which tracking implementation offers the best possible solution to their production needs.

- motion cameras within tracking
- render engine per camera
- full range of camera movements
- higher cost
- excellent solution for higher flexibility

Trackless Virtual Systems

Ross Trackless Studio is an all-in-one virtual production tool that fits almost any budget. Built on the XPression Real-Time Motion Graphics System with an intuitive purpose-built interface, Trackless Studio leverages Ross Video's years of experience with virtual sets and augmented reality to bring quality virtual sets to even the most basic productions.

Cost-effective virtual productions are made possible with Ross Trackless Studio. Using stationary cameras, virtual camera moves, and the same high-quality virtual sets as tracked implementations, Trackless Studio provides incredible results while staying on budget.

Budgets and studio real estate often necessitate a different approach to production. Ross Trackless Studio opens up new opportunities for virtual sets.

The Trackless Approach to Virtual

Trackless Studio uses stationary physical cameras – instead of robotic camera systems, encoded camera heads/lenses, or optical tracking hardware. All camera moves are done virtually inside of the XPression scene, eliminating the need for a large studio space.

Where To Use Trackless

In addition to being the entire set for a program, trackless virtual sets are a cost-effective way to add production value to other content. Since trackless doesn't require much space, it is also possible to take the studio on the road with a portable green screen and light kit.

Applications

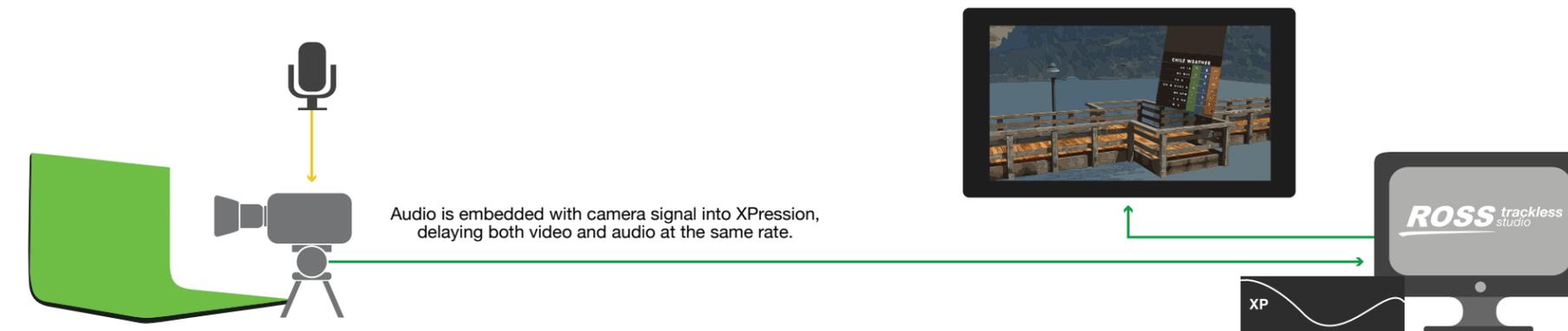
- Specialty sports segments
- Enhanced weather broadcasts
- News studio on a budget
- Mobile/OB production
- Corporate communications
- Distance learning

Trackless Studio using SDI Video and AES Audio sources:



* If using AES audio an MUX-8258-A (or -B) Would replace the MUX

Trackless Studio using SDI Video and Embedded Audio:



Audio is embedded with camera signal into XPression, delaying both video and audio at the same rate.



Trackless Studio

Benefits

Trackless Studio has established itself as one of the most economically valuable virtual offerings in the industry. Quality virtual set production that delivers on the core financial benefits of going virtual:

Cost Effective:

Does not require tracking hardware or software, just uses stationary cameras.

Intuitive Interface:

Approachable and easy-to-use UI designed specifically for trackless virtual sets.

Space Requirements:

Small studios or even portable green screens are all that is needed.

One-Box Solution:

Multiple cameras, internal chroma key, live inputs, clips, stills, and 3D graphics in one system.

Integration and Remote Control:

Integrated with other Ross products with several methods of remote control.

Key Features

- Real 3D virtual sets with full 3D motion capabilities
- Internal Chroma Keyer
- Multi-camera support (1, 2 or 4 depending on hardware configuration)
- Dramatic camera moves (crane or jib style)
- On-demand static previews of talent composited in scene
- Transitions
- Live inputs
- Video clips and still images
- Events (macros)
- 6 stock virtual sets
- Control from touchscreen, Ross switchers, Ross DashBoard, optional X-Keys panel, keyboard, and web server
- Use as an additional XPression engine for graphics when not in use

Tracked Virtual Systems

Ross Tracked Studio really delivers on extensive ease-of-use that includes an operator environment designed specifically for the non-engineering user. An important aspect of this endeavor is User Xperience (UX), as the software application for these solutions to integrate the technical components required for keying, tracking, and rendering to insure the illusion of the integration of the real and virtual worlds. As a preproduction tool, UX manages camera tracking and enables full control of virtual elements, and UX Events combines complex virtual moves and camera moves into one button events that can be triggered by Ross production switchers and Ross OverDrive through RossTalk.

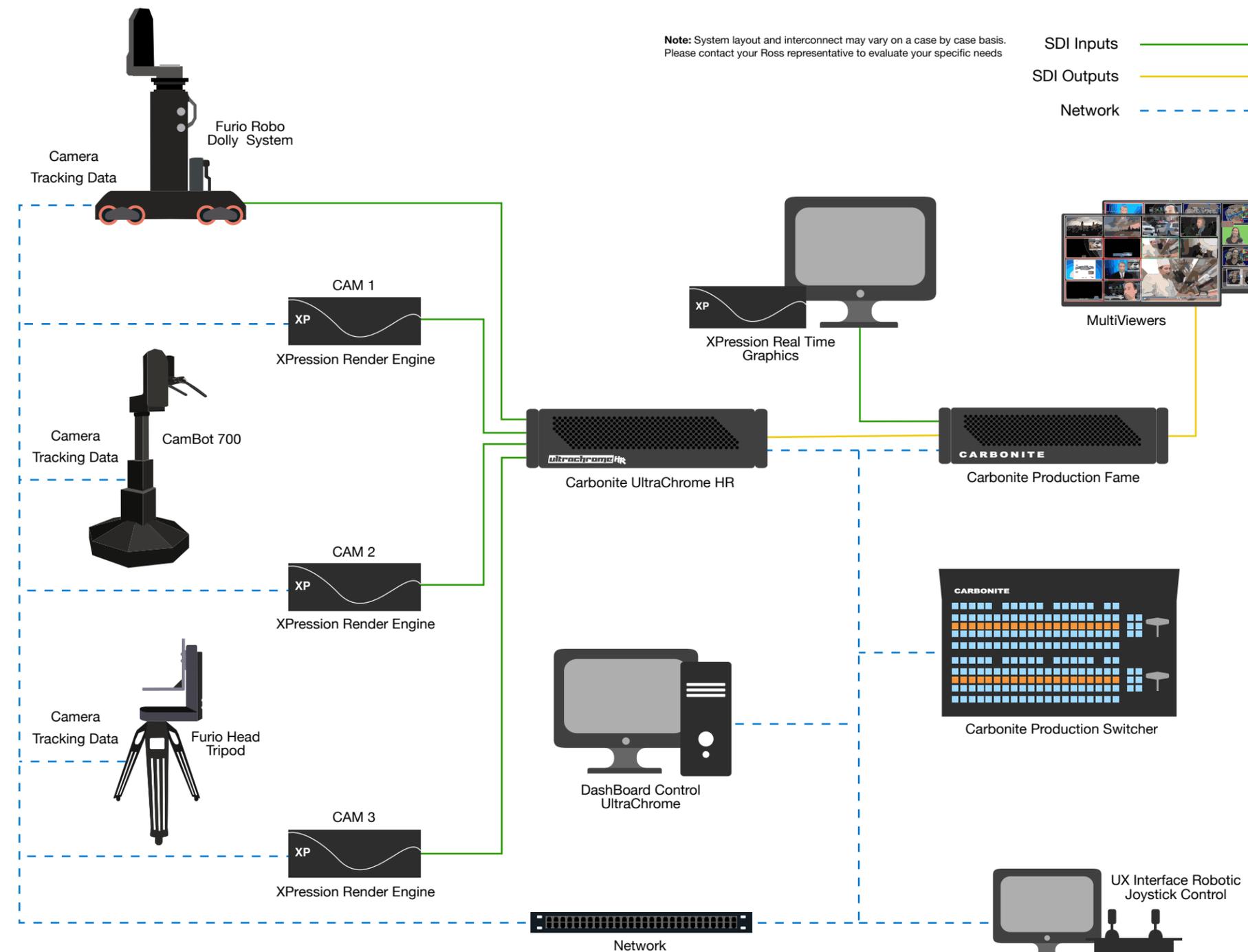
UX Virtual Camera Control (UX VCC), is a version of UX designed to enable the Ross proprietary virtual camera control and tracking capabilities for use in applications not requiring the full UX User Xperience control and operation by providing virtual camera control for non-Ross graphics engines and user environments.

Where To Use Tracked Systems

To properly implement augmented reality in studios, venues, or any other environment requires precise tracking of the cameras to keep all the elements properly aligned. In virtual sets camera tracking is needed where the talent moves around the set and where virtual elements such as virtual walls and windows are incorporated in the set design.

Applications

- Augmented Reality weather, social media, transportation, and sponsorship/branding
- Sports Studios/Venues Augmented Reality
- Virtual windows, walls, ceilings, and displays
- Virtual Studio Sets
- Virtual Set Extensions



Tracking with Ross Camera Systems

Ross Robotics

For studio productions, Ross has both free-roaming pedestal and track based robotic systems designed with virtual and augmented reality in mind. These systems feature built-in real-time absolute positioning systems to deliver best-in-class tracking accuracy.

All Furio systems provide complete 3D tracking data for virtual applications using absolute encoders on all axes to instantly provide accurate position data, while the leveled rail system ensures accuracy, and delivers silky smooth on-air travelling shots to highlight the realism of 3D virtual elements.

The CamBot 700XY provides complete 3D tracking data with the highest accuracy and repeatability of any free-roaming pedestal.

The SmartShell control system can be used to control all robotic movements, including zoom and focus on the lens. In addition to joystick control, it allows shots to be stored, recalled, or strung together to create complex sequences, called Moves, that take full advantage of the Furio's unique on-air capabilities. UXTrack collects and translates camera tracking data.

CamBot

- Free-roaming XY-pedestals for virtual applications along with standalone pan-tilt heads and Pan-Tilt-Elevation (PTZ) systems.
- Employ unique, patented technologies to provide unmatched accuracy and payload capacity, enabling users to deliver higher quality productions at dramatically lower operational costs.

Furio

- High quality track-based robotic camera solutions for broadcast and live performance applications.
- Provides cinema-quality on-air movements that produce dramatic, signature shots that capture and hold viewer attention.

Camera Jib Kits

Jibs permit cameras to be moved vertically, horizontally, or a combination of the two. A jib can be mounted on a tripod or a dolly. A jib is useful for getting high shots, or shots which need to move a great distance horizontally or vertically, without the expense of a camera operator on a crane.

The Jimmy Job Encoder Kit is designed to attach to the Jimmy Jib Triangle with no modification to the jib.

The CamMate Encoder Kit is designed to attach to the CamMate Travel Series Jib, a slight modification for mounting the Swing and Boom encoders is required.



UX Virtual Operating Environment

Benefits

UX Xperience functions as the control center for virtual solutions and features extensive ease-of-use that takes the technical complexity out of deploying and operating virtual environments.

Intuitive Interface:

Highly flexible and customizable UI designed for tracking with virtual sets and augmented reality

Extensive Integration:

Works with other tracking systems, keying products, and real-time 3D rendering engines

Remote Control:

Combines complex virtual moves and camera moves into one button events

Cohesive Functionality:

Combines all the technical components required for keying, tracking, and rendering

Comprehensive Management:

Handles camera tracking and enables full control of virtual elements

Key Features

- Easy-to-use intuitive touchscreen graphical user interface
- Installed on a touchscreen PC for virtual set camera calibration, scene manipulation, media replacement, event triggering, animation control, robotic camera move control and more
- Seamless integration with tracking, keying, and graphics rendering engines such as XPression and Frontier
- Preproduction management of camera tracking and control of virtual elements
- Combines complex virtual moves and camera moves into one button events triggered by Ross production switchers or OverDrive Automated Production Control
- UX Virtual Camera Control (UX VCC) version designed to provide virtual camera control for non-Ross graphics engines and user environments



Virtual Operating Environment

Ross Control and Operations Components

Ross UX | Virtual Operating Environment

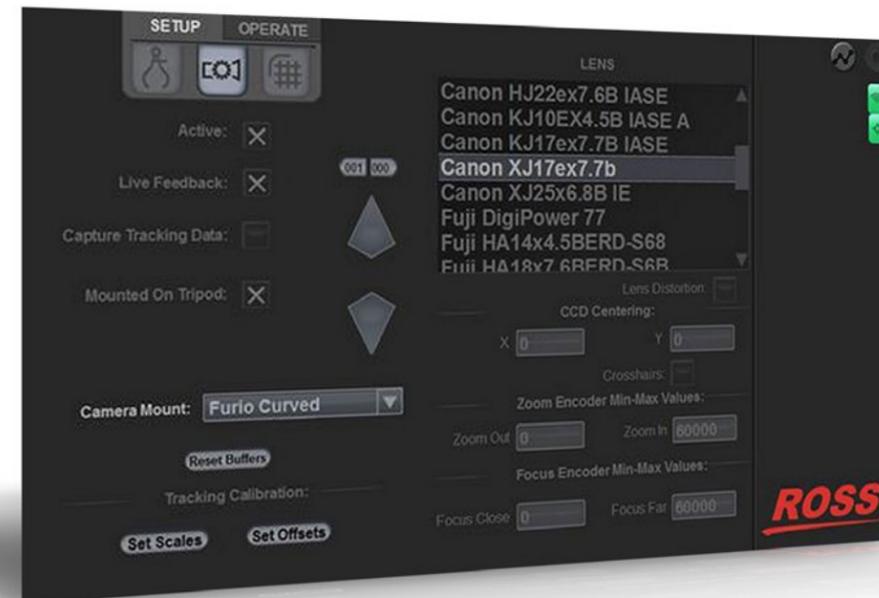
Ross offers an operator environment designed specifically for the non-engineering user providing extensive ease-of-use by taking the technical complexity out of deploying and operating virtual environments.

User Xperience, or UX, is a software application that integrates the technical components required for keying, tracking, and rendering to ensure the illusion of the integration of the real and virtual worlds. UX manages camera tracking and enables full control of virtual elements that can be triggered through RossTalk.

Your virtual content can be produced using a variety of methods — automation, an MOS Workflow environment, a production switcher, or through the UX control application.

Key Elements

UX Server is a software camera router that enables UX to be configured to work with various XPression render engines for multiple uses. UX Server can be used to quickly enable a backup renderer, set up render priority swaps, or enable multiple cameras per renderer. The UX interface is broken into four quadrants that can be customized for the user.



UX Track

UX Track offers calibration tools for virtual cameras to real-world cameras with controls for six different sections: Camera, Garbage Mattes, Offsets, Setup Calibrate, Setup Camera, and Studio Set-up.

UX Config

UX Config controls the configuration of your project files and network settings and provides the status of cameras, tracking, and network connections via color coded icons.

UX Position

UX Position enables you to move, rotate, scale, save positions of elements and create tween animations of objects in the scene.

UX Router

UX Router enables images, videos, or live sources to play in virtual monitors using a simple drag and drop approach. Click the content and then the target — it's that easy.

UX Events

UX Events is a powerful yet easy to use tool that combines all of the above to create complex virtual moves and camera moves into one button events. External devices can be added through RossTalk.

UX 3.0 Compatible Camera Mounts

Furio Straight rail
Furio Curved rail
Furio Tripod
Cambotics Pad
Egripment
Jib CamMate
Jib Jimmy Jib
Motion Analysis
NCAM
Spidercam
Talon
Vinten 250E
Vinten 430i
Vinten 750i
Vinten FHR-35
Vinten Fusion
Vinten Quatro SE

UX 3.0 Compatible Tracking Protocols

FreeD
Kuper
MoSys
NCAM
Orad
Spidercam
Telemetrics
Trackmen

UX 3.0 Compatible Lenses List

Canon HJ11ex4.7B IASE
Canon HJ14ex4.3B IASE
Canon HJ17ex6.2B IASE
Canon HJ17ex7.6B IASE
Canon HJ17ex7.7B IASE
Canon HJ18ex7.6B IASE S
Canon HJ21ex7.5B IASE A
Canon HJ22ex7.6B IASE
Canon KJ10EX4.5B IASE A
Canon KJ17ex7.7B IASE
Canon XJ17ex7.7B IASE
Canon XJ22x7.3B IE
Canon XJ23x7B IE
Canon XJ25x6.8B IE
Fuji DigiPower 22
Fuji DigiPower 77
Fuji HA14x4.5BERD-S6B
Fuji HA18x5.5BERD-S6
Fuji HA18x7.6BERD-S6B
Fuji HA19x7.4BERD-S6
Fuji HAs18x7.6BZD-T5DD
Fuji UA22x8BERD-S8
Fuji ZA12x4.5BERD-S6
Fuji ZA17x7.6BERD-S6
Fuji ZA22x7.6BERD-S6

Ross Graphics Components

XPression | Real-Time Motion Graphics

Sophisticated graphics systems are crucial to virtual solutions. They must calculate everything in 3D, together with positioning data and some creative input. When displaying an over the shoulder graphic, a camera move using Ross Robotics systems can show the viewer an amazing world where the graphics are literally hovering over the talent's shoulder, or data can emerge out of the floor, wall, ceiling, or virtual monitors on the set. The big difference between a simple key and sophisticated augmented reality is camera motion, so the combination of systems like CamBot or Furio with XPression graphics rendering makes complex looks possible repeatedly and effortlessly.

Virtual solutions using UX and XPression can create airy spaces with realistic textures, variable lighting, natural depth of field, and live outdoor camera shots viewable through virtual windows. Studios can be reconfigured at the touch of a button for different shows without wearing out, breaking down, or showing the clutter. Additionally, there is no longer a requirement to have a large space to achieve a large look. Support pillars and room shapes no longer matter.

XPression includes the latest generation graphics engine which is also suitable for your virtual sets and augmented reality. Built-in virtual tools like depth-of-field, lens distortion, image centering and sizing, and a global camera make XPression ideal for your toughest virtual applications. Support for Ross Robotics, Egripment Cranes, as well as tracking and calibration interfaces for third party camera systems via Ross UX software means that XPression will work in nearly any virtual or augmented reality environment. For more cost-effective virtual sets, XPression works with Ross Trackless Studio when tracking data is not present.



Frontier | Hyper-Realistic Rendering

Frontier offers designers incredible levels of creative freedom combined with hyper-realistic rendering quality. Even the most complex graphical elements – from rain drops and fire, to live shadows, lens flares and dynamic highlights – can now be created quickly, easily and with unprecedented realism.

At its core, Frontier is a highly advanced video gaming engine capable of amazingly photorealistic scenery, and it has been optimized by Ross Video to work in Virtual Studio environments.

Frontier uses the cutting edge Unreal gaming engine, from Epic Games, as the render engine, which provides superior high realism scenery through state-of-the-art features such as particle systems, dynamic textures, live reflections and shadows and even collision detection. Used as a backdrop renderer, Frontier works side by side with Ross Video's XPression motion graphics system, which renders all the foreground elements. This combination with XPression guarantees the best of both worlds – photorealistic backgrounds and unparalleled creative freedom along with unmatched data connectivity, visual logic programming and full support for most major workflows.

The Frontier graphic rendering platform offers users new levels of realism and flexibility.

Cutting edge technology

The Unreal gaming engine by Epic Games provides the best possible imagery quality.

Superior graphic capabilities

The Unreal engine uses advanced graphic features like collision, particles, dynamic texture, reflections and real time shadows.

Hyper-realism

With an extensive graphic feature set, designers can achieve realistic looks with greater accuracy than ever before.

Ease of operation

The UX application provides an operator-friendly frontend, so operators are not required to learn new platforms.

Flexible workflow

By using the UX and UX VCC applications, solutions can be customized with flexibility and scalability in terms of the number of cameras and number of graphic engines.

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FRONTIER
THE FUTURE GROUP



Ross Chroma Key Components

Carbonite UltrachromeHR | Chroma Keying

Carbonite UltrachromeHR is a stand-alone multichannel chroma key processor designed to meet the challenging key requirements of multi-camera virtual environments. It is based on the Carbonite Black processing engine, and can take camera signals and internally combine them to generate full bandwidth key edges. The chroma keyer outputs standard HD-SDI 4:2:2 signals that are beautifully composited with your virtual environment

Carbonite UltrachromeHR incorporates patented and patent pending signal processing technology designed to generate high-resolution key edges from chroma channels information. It includes up to four high-resolution chroma keyers, each with full control of delay management, fill color temperature for scene matching, foreground key and fill, internal storage for animated graphics for bugs etc. and much more.

While this chroma keyer produces spectacular results from standard HD-SDI video inputs, the subtle refinements of key edges can be greatly improved when used in combination with Ross ACID camera systems. These cameras output a second signal that contains full resolution chroma information that is not available in standard 4:2:2 signals. Carbonite UltrachromeHR accepts this special full resolution chroma signal and internally combines it with the standard video input to produce high-resolution 4:4:4 key edges that are simply not possible from standard video inputs.

The Carbonite UltrachromeHR chroma key system will also produce amazing results from standard 4:2:2 camera inputs, and is probably the best chroma key ever designed. It is also equipped with features and ease of use that you will not find in any other product, but of course the combined package with Ross ACID cameras is unbeatable in the virtual environment.



ultrachromeHR



Ross Imaging Components

ACID | Cameras

ACID cameras are unique and have been designed to be not only perfect for studio production, but also offer unprecedented performance when used as Chroma Key sources for virtual productions.

There are two ACID camera versions: the AC-Z50-UCHR – a moderately priced 1080i camera with good performance that's perfect for Point of View robotic systems and small studio applications.

Then there is the top of the line AC-H200-UCHR, a very high performance Full HD 1080p camera that offers best in class sensitivity and picture quality with very low noise.

Both are 2/3" 3 sensor cameras, the Z50 is CCD based and the H200 is UAIT MOS, and they accept all B4 2/3" lenses.

Both cameras have a very unique feature invented by Ross. The HD-SDI signal format for normal production is 4:2:2 – that means the chroma channels are band limited to half the bandwidth of the Luma channel. This is fine for all normal production, but when used to create a chroma key it lacks the high frequency detail necessary to create well defined key edges. To truly create a great chroma key, it is necessary to receive the full color information from the camera.

ACID cameras have not only SMPTE standard video outputs, but also include a unique signal called UltraChromeHR. This signal contains full bandwidth color information in a patented 0:4:4 coding format. The standard 4:2:2 and UltraChromeHR outputs are received by the Carbonite UltraChromeHR chroma keying system and internally

combined to create beautiful keys from the resultant 4:4:4 signals. The result of this unique combination – astonishingly good chroma keys.

Also, the high performance ACID H200 camera has another unique feature. It has been designed with sensor gain management to enable lowering the chroma noise floor by a considerable amount as well as adding some up-front dynamic noise reduction. These two designs make the output significantly quieter than any other camera system. The result – noise free chroma key edges.

However, even if you don't use chroma keys, Ross ACID cameras are a perfect fit for your production studio. The ACID Cameras are full featured cameras that capture the very highest quality images, the H200 is a progressive 1100 Line resolution camera with high sensitivity and very low signal to noise, it is fully featured and will produce fantastic images in any environment. The Z50 Camera has great performance and moderately price for less demanding applications. They can be equipped with viewfinders and all the accessories necessary for a full studio rig and of course fit incredibly well with Ross robotic camera systems.

In addition, ACID cameras include fully integrated DashBoard controls for setup and paint, which can be fully integrated with the rest of your production system control.

Any production that includes chroma key use from standard weather sets to full virtual environments will benefit from the combination of ACID cameras and Carbonite UltrachromeHR. It is truly a package with unbeatable visual performance that you must see to believe.

acid  **cam**

4:4:4 | Own Every Pixel.

Ross Production Components

Carbonite Black | Production Switchers

Ross offers mid-size and larger production switchers from 1 to 4 ME. There is a wide array of control panel sizes, two MultiViewers as standard, and unique processing and integration features.

These switchers pack major effects and keying power into every ME. Each ME has 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. The superior quality of chroma keying of the switchers makes for amazingly good results when used for virtual applications. Advanced pattern generators per ME are available for wipes, pattern masks and color washes. High quality 2D DVE channels are available system-wide. The DVE's 'float' within the system architecture allowing all to be assigned to a single ME or distributed across ME's as the production demands. Independent media player channels are also available switcher-wide. Stills, logos and animated graphics can be played out from the on-board memory.

The video production engines can support SD, HD, 3G, and UHD formats. Synchronization and conversion functions provide the ability to mix some formats seamlessly into your productions.

Direct control of external devices is simple with Ross switchers. Servers, Robotic Cameras, select Audio Mixers and, of course XPression motion graphics systems can all be integrated.



CARBONITE BLACK

Ross Workflow Components

OverDrive | Automated Production Control

Sophisticated graphics systems are crucial to virtual solutions. Now that more newsrooms and studios use automated production control systems like OverDrive integrated with camera robotics, the introduction of virtual sets and augmented reality become an easy next step forward.

Automated production control systems make it possible to produce faster paced, richer, and more consistent productions with fewer errors. The system provides the greatest possible efficiencies, so that in some cases only one person is needed in the control room. OverDrive orchestrates all of the production components including the production switcher, audio mixer, graphics system, video server, audio server, and robotic cameras.

Inception | Newsroom Computer & Social Media Management

Newsroom Computer System and Social Media Management

Content and workflow management systems are the tools used to gather data from various sources, plan how to put the information together, and then schedule how and when the content will be presented. As such, they are important inputs to virtual solutions when put together with an integrated graphics system.

Inception News is a browser-based newsroom content and editorial system encourages content collaboration, and it's designed to work anywhere, from the newsroom to the field. It offers flexible and modern workflows and places social media integration right into the center of news production

Social media is a core aspect of Inception News, and for productions where social media integration is desired, but a full newsroom operation is not required, Inception Social fills this need.



overdrive



Inception

Ross Infrastructure Components

openGear | Signal Processing & Conversion

openGear modular frames and cards provide signal processing and conversion, and are based on an open standard.

These open architecture signal processing solutions offer a wide range of analog and digital products to cover A/V distribution, conversion and interface needs that are applicable everywhere, including 24/7 and live production deployments. One example typically required for virtual solutions are modules that can manage video delay.



openGear

Ultrix | Routing

Content and workflow management systems are the tools used to

Ultrix is a compact but incredibly powerful routing switcher platform capable of switching video signals from 270 Mb/s to 12 Gb/s. The small form factor saves rack space with high density, compact one and two rack unit frames. The router is easy to deploy and maintain with an integrated control system that provides configuration, soft panels, discovery, and interoperability.

Ultrix provides maximum performance and quality with standard configurations supporting data rates up to 3 Gb/s. However, users can purchase the Ultraspeed software licenses that enables 12 Gb/s performance throughout every signal path within the router. When combined with the inherent capabilities within the frame, the Ultraspeed license also enables routing of the emerging single link UHD 60Hz standard alongside current Quad link 4k signals, and seamlessly switch these signals back and forth to each other.

If more multi-viewers are needed beyond what Carbonite Black or Acuity provides, Ultriscape is a software enabled multiviewer in the frame with no special output boards, crosspoints, or multichannel connection cables needed. Simply enable the desired number of outputs to drive the monitors required, and route any input to whatever multi-viewer head is chosen.

Ultrimix provides software enabled advanced audio integration, including the ability to embed and de-embed audio on all of the inputs and outputs of the router. Users have complete flexibility to process, swap, sum, mute, or route any discrete or embedded audio input to any output.



Ultrix

Third Party Components

Canon

FUJINON

Canon and Fujinon

In order for virtual cameras in graphics systems and the real cameras viewing the real elements and talent to have the exact same perspectives, an “encoded” camera lens is required that provides the lens Focal Length (zoom) and Focus data to Ross virtual tracking applications. More importantly, the virtual lens Field of View (FOV) must be properly calibrated to match the FOV of the real lens.

Full servo digital lenses with 16-bit encoders are needed for virtual productions. Both Canon and Fujinon have low end and high end encoded lenses. A common studio lens is a 17x7.6 or an 18x7.6. Lenses with a longer zoom ratio like a 22x7.6 will zoom in tighter and are used for long shots such as a sports match on-field Augmented Reality. Lenses like a 14x4.3 are wide lenses that work well on jibs or in smaller spaces.

Kino Flo

When lighting a blue or green screen (Cyc), it's important to make sure that the screen is evenly lit with soft, broad lighting sources and the best possible color saturation. Evenness is easily achieved using Kino Flos because of the soft quality of the light and the wide beam spread. The best results are not as much about how much light is used to light a screen, but rather what produces the best saturation of reflected blue or green light.

Softlights have more light output per watt than tungsten lighting, lower power consumption, and lower heat output. The lamps along with Kino Flo's soft cool fixtures with manual and DMX light control make Kino Flo a favorite choice among lighting professionals

PROCYC

Pro Cyc

Traditionally, virtual set and augmented reality segments are shot against a completely seamless green screen background. To create the best green screen background possible, it is essential to have a good cyclorama (a.k.a. “cyc”) against which to shoot. A good cyc is one that, when properly installed and lit with proper lighting, presents a virtually seamless background to the camera, with no shadows or visible transitions from floor to wall and in the corner(s). This will enable the chroma keying hardware and/or software to operate most efficiently and with little to no “clean-up” which can affect the resolution and quality of the final output.

The most effective cyc backgrounds are generally made from modular cove parts that are pre-designed to fit together and have appropriately sized vertical and horizontal radiuses.

Pro Cyc systems are well designed, high quality, and customizable, to offer a proven and cost effective way to construct a cyclorama studio. Because Pro Cyc systems are all modular, they can also be used by many small studios who want the highest quality yet affordable coved wall. Whether you have 100 square feet of studio space or 10,000 square feet, Pro Cyc has a system to meet your needs.





Virtual Design Services

To offer the best available designs, Ross has established Ross Virtual Design services to bring the best virtual designers in the world to deliver top quality augmented reality and virtual set designs. The Ross Virtual Design services range from delivering a turn-key solution from show concept, to providing virtual design consultation to system integrators and users who prefer to design and implement their own augmented reality or virtual set design.

Virtual Solutions are about integrating real environments with virtual elements while retaining the illusion of reality with the audience. This is all about Design. With over 20 years of virtual experience in the broadcast and film industry, you get a world-class design team and design process that includes both Ross and industry partners to support all your needs.

Ross Virtual Design Offers:

- Consultation / Knowledge Transfer
- Design Refinement – Improve existing design
- Special Projects
- Library Sets
- Augmented Reality Elements
- Fully Custom Virtual Set Design

Consultation service provides assistance to designers on the best methods to prepare a set in 3D applications and bring it into the XPression motion graphics system. This service can be remote or face-to-face.

Design Refinement service prepares 3D files for use with the XPression motion graphics system. Consultation is provided along the way and preparation of the final XPression files is completed for installation. This service can be remote or face-to-face.

Special Projects service offers a Creative Director who is involved with larger Network and Station Group projects where design plays a significant role. The Director works with producers, directors and creative departments to help bridge the gaps and transition them into the use of virtual solutions.

Ross offers library sets from various vendors including Full Mental Jacket, Coiron, April Broadcast, and Dreamwall for both tracked and trackless applications. Library sets are the RossVideo website available for purchase and download, with new sets being added over time. All library sets and can be customized per specific requirements.

Augmented Reality elements service impacts both In-Studio and Outside-Event applications.

Full Custom Design service provides a host of services ranging from recommending camera positions to delivering the final project running in real-time. Other services can include pre-visualization shot by shot before building for real-time.

Virtual Applications

Ross Virtual Solutions enable users to deploy both augmented reality and virtual sets for a wide range of uses in many different applications.

These are just a few of the emerging virtual applications. It is only a matter of imagination that will create the next wave of virtual applications, and Ross is right there leading the way.



For Broadcast

Facilities are leveraging existing green screens to build virtual set extensions that expand and improve the looks of their studios. Broadcasters are also using Augmented Reality to incorporate virtual elements into their existing hard sets by displaying infographics, weather updates, election results, sports results, advertising, and much more.



For Sports

Many venues are adding in house studios featuring Augmented Reality and Virtual Sets, as well as using Augmented Reality within the sports stadium during events for delivering game statistics and advertising.



For Business

Leading International companies are developing broadcast studios to insure that corporate presentations are delivered at the highest quality. Corporate studios are being created both as central studios and distributed studios worldwide to provide localized content.



For Weather

Leading broadcasters around the world are providing an entirely new way to present weather. Local broadcasters can create their own custom designed Augmented Reality weather presentations or use a weather service provider such as The Weather Company who leverages Ross Video's tracking technology to deliver Augmented Reality weather.



Step by Step to Going Virtual

- 1** Fully explore the range of information about Ross Virtual Solutions at www.rossvideo.com/solutions/virtual. Here you'll find videos, white paper, and product links. You can also find videos at www.youtube.com/user/RossVideoLtd/videos.
- 2** Contact Ross Video to set up an initial discussion about your goals and needs.
- 3** Arrange a consultation with Ross Video subject matter experts to determine your project requirements, including possible design services.
- 4** Review the Ross Video proposal for your virtual project.
- 5** Plan your project deployment with Ross Video personnel after proposal acceptance.
- 6** Receive your deployment, training, and design services as agreed upon.
- 7** Test and rehearse productions with your virtual project.
- 8** Go live with your virtual solution and wow your audiences!

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



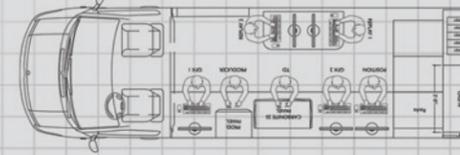
STUDIO IN A BOX

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 | Express, Prime, Premium
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 PLUS 12G
CARBONITE BLACK SOLO

INFRASTRUCTURE

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

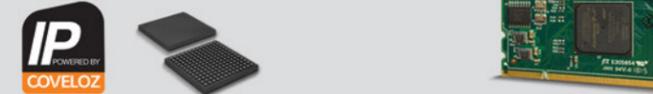


STUDIO VIDEO-OVER-IP | AIMS-compliant Gateways & Control
GEARLITE | Point of Use Signal Processing
AUDIO MONITORING | MB 651, MB-652
MASTER SYNC & REFERENCE | SRG-2200, SRG-4400, ACO-4400



IP TECHNOLOGY

OEM PRODUCTS | Market Ready Modules & System-on-Chip



VIDEO SERVERS, REPLAY & DELAY

ABEKAS MIRA | Replay Systems
ABEKAS TRIA | Production Servers
ABEKAS AIRCLEANER | Live Events Delay



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; 600 PTZ; 600XY & 700XY Free-Roaming Peds
SMARTSHELL | Robotic Camera Control System



VIRTUAL & AUGMENTED REALITY

TRACKLESS VIRTUAL UX VIRTUAL TRACKING SYSTEM FRONTIER



Ross Video has a complete range of technical services available to ensure that your Ross Virtual Solutions 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 Ross Virtual Solutions 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.

Ross Virtual Solutions come 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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Email: solutions@rossvideo.com

Technical Support

Emergency: +1 613 349-0006

Email: techsupport@rossvideo.com



www.rossvideo.com

ROSS VIDEO PRODUCTION TECHNOLOGY 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