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# INFINITYSET





# THE MOST ADVANCED VIRTUAL SET & AUGMENTED REALITY SOLUTION

InfinitySet is designed to cope with any requirement from advanced tracked virtual sets to inexpensive trackless environments. With practically infinite cameras and the industry-first TrackFree™ technology which allows combining tracking and trackless environments for further flexibility, Infinity Set is the most advanced solution available today for virtual set production.

InfinitySet can handle multiple input sources, no matter if they are live or pre-recorded feeds, and the resulting scenes can be as complex as required. In addition, InfinitySet includes a complete real-time 3D graphics toolset, allowing for the seamless integration of 3D objects within the scene, imported from a variety of third-party packages and formats.

Forget all you know about virtual studios, as the award winning InfinitySet has taken the technology to a whole new level and entirely changed the rules. InfinitySet can cope with any need from **advanced tracked virtual sets** to **inexpensive trackless** environments.

Most importantly, InfinitySet also solves your **3D graphics** needs. InfinitySet combines the power of the Brainstorm render engine with an easy-to-use interface to create a new environment for next-generation cross-media broadcast requirements.

Infinity Set is the first product taking advantage of the TrackFree technology, and as all Brainstorm products is built on eStudio, the industry's fastest 3D render engine, which provides unrestricted design capabilities for all types of real-time graphics.

## BEYOND VIRTUAL PRODUCTION

The years of the hero systems and isolated islands are gone, and broadcast solutions need to integrate into the broadcasters' workflows, which can include many different technologies and vendors. Infinity Set is not just an advanced virtual

set and augmented reality solution, but it sits perfectly in any broadcast workflow and environment, acting like a hub for a number of technologies, from Tracking and Interaction with other devices, controllers, mixers, chroma keyers, NRCS workflow for journalists and many more that configure the broadcast virtual production environment. Also, the Brainstorm engine buffers all I/O to provide consistently smooth output.

InfinitySet allows for multiple input sources, no matter if they are real cameras or video feeds, and the resulting



scenes can be as complex as required, with multiple elements interacting in the virtual world, and even matching the depth-of-field of the presenter with that of the scene. Such flexibility allows InfinitySet to perform at its best in other



environments such as drama or film production, for previz or finishing.

### ADVANCED MOTION GRAPHICS

InfinitySet not only seamlessly integrates Aston projects, but is also fully compatible with Aston, including the project's StormLogic interaction, and features a complete 2D/3D graphics creation toolset.

As most Augmented reality content requires advanced graphics features

to guarantee the accuracy and realism of the result, InfinitySet now takes advantage of the Aston graphics creation and editing toolset to achieve this.

This permits the direct editing of not only Aston projects but its elements, animations, StormLogic, data feeds, etc., as if they were in Aston. And even for the creation of new elements within the composition, changing the attributes and much more. This means that in broadcast operation, or while on-air, InfinitySet 3 operators will be able to adjust any object in the scene, even those with added properties such as animations or external data feeds.

Now InfinitySet allows the seamless integration not only of Aston projects, but also Aston graphics and templates within a virtual environment and the ability to modify them directly in Aston, Brainstorm's graphics creation, CG and playout solution. This is possible even with external data sources for data-driven graphics such as bars and pie charts, statistics and many more.

Each project comes with all the Aston capabilities, including Stormlogic, and therefore the interaction between graphics and the capability of being controlled by OnDemand or any other supported control device even though they are within the virtual set. Now that we can embed Aston projects and compositions within Infinity Set, designers do not need to work on large complex projects anymore.

This simplified collaborative workflow allows graphic designers to work on separate pieces of the same project and combine them together in InfinitySet without interfering with each other. The creation of new graphics, or changes to existing graphics, can be performed even at the very last moment.



### AUGMENTED REALITY

Augmented Reality also requires the interaction between sets, talents and virtual objects, many of them created out of external data sources such as statistics, charts, bars, and many other.

These data driven objects allow for visually engaging representations of the data which can be better explained by the presenters. During election nights, news, sports or entertainment programs, data bars and other statistics can interact with the talents creating an attractive augmented reality environment for the audience. Of course Infinity Set can import a number of 3D formats to integrate into the virtual set, such as .fbx, .dae, .obj and .3ds, to name a few.

Also, set space restrictions are no longer a problem, because, regardless the camera we are shooting is fixed, manned, tracked or robotized, InfinitySet can virtually detach the camera feed while



maintaining the correct position and perspective of the talent within the virtual scene.

### VIRTUAL SHADOWS

InfinitySet can create virtual shadows along with the real keyed shadows, and apply them to virtual surfaces, seamlessly interacting with the virtual objects on the scene.

### SELECTIVE DEFOCUS AND BOKEH

InfinitySet can selectively adjust the focus and depth of field of any object in virtual scene, including the keyed talent, matching the scene's focus to that of the footage from the camera.

### DYNAMIC LIGHT CONTROL

InfinitySet can remotely

control and adjust in real-time external light panels via DMX, and external Chroma Keyer settings, allowing for changing the lighting conditions of the real set to match those of the virtual set.

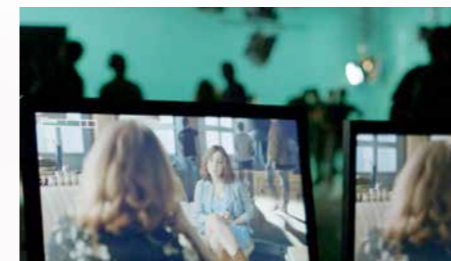
Dynamic Light Control, Virtual Shadows and Selective Defocus allow InfinitySet to create the most realistic content, while enhancing the creative possibilities of the virtual studios.

### REAL-TIME POSTPRODUCTION

Although chroma keying technology and virtual sets have been around for a long time, the latter have sometimes been criticized for the relative lack of realism compared to other non-real-time applications such as composition and VFX technologies.



The ability of InfinitySet to work as a preview hub, allows for substantial savings in the costs of filming and post-production, ensuring the different shots are adjusted (chroma, camera movements, tracking, etc) prior to enter in post-production.



For programs or TV series that do not require a significant amount of effects, InfinitySet can deliver not just a preview but a final master.

### 360 OUTPUT

InfinitySet and eStudio now have a new optional plugin to provide 360 equirectangular or dome-based content on output. This is useful for streaming or VR applications requiring 360 content to be viewed on VR glasses such as Hololens, Oculus and other similar.

This workflow represents a significant cost saving by moving to the production phase some tasks that were normally carried out in post-production, such as chroma keying, tracking or focal adjustment, along with the basic composition and virtual backgrounds. This means the scene, if it requires effects or post-production, will be already correctly composed, layered and adjusted, so that the VFX process speeds up considerably.

### VIRTUAL CAMERA CONTROLLER

InfinitySet also features a software-based production mixer for enhanced production functionality such as full control of all the virtual cameras, with non-linear transitions such as Cut-Fade-Wipes and Flies between 3D cameras, plus controlling actions and objects. InfinitySet also features an optional hardware controller for enhanced program production, including manual control of transitions.



## TrackFree

TrackFree™ is a new and advanced technology patented by Brainstorm that represents a revolutionary approach to virtual set production. It is a camera-tracking independent technology that enables broadcasters to combine the precision and high quality of tracking systems but at the cost of a trackless system, and with matching flexibility and user-friendliness.

### TELETRANSPORTER

TeleTransporter allows the insertion of real people as Augmented Reality objects into remote scenarios in real-time, making both worlds (regardless they are real or virtual) to behave as one with precise perspective matching (as



TeleTransporter

long as their perspectives are similar), to create the illusion of absolute realism and continuity. This feature seamlessly combines 3D virtual sets with real characters and live or pre-recorded video feeds, all moving accordingly with precise perspective matching. With TeleTransporter, presenters and 3D objects can be inserted into videos from remote locations.

Thanks to TeleTransporter, InfinitySet can indistinguishably use real, live or pre-recorded footage to use it as the background set for the chroma keyed talent, providing a sense of continuity regardless the technology used for the background shots.

This functionality allows a remote talent to enter any stage at any time,



3D Presenter

while seamlessly mixing real and virtual elements. In more practical terms, it allows for enhancing the corporate image of a large broadcaster, as it can reuse a single real set to be the background scenario for smaller stations in the network.

### 3D PRESENTER

This brand new feature enhances the realism of the talent inserted within the virtual set, achieved by generating a true 3D representation of the talent from a video feed, creating a real-time 3D volume that is continuously regenerated, repositioned and remapped based on the camera parameters. This means that the presenter is not a simple superimposed 2D sticker over the 3D virtual studio environment, but an actual 3D object embedded within the virtual set, casting real shadows correctly



Selective defocus and bokeh, depth of field control and virtual shadows over virtual elements

applied to the synthetic objects in the scene from the virtual lights defined on the set. 3D Presenter allows the talent to be seamlessly inserted within the 3D studio environment and to interact with both real and 3D elements within the scene, for example, shadows over a real desk and simultaneously with reflections on a virtual floor. In addition to that, it allows for advanced features such as selective defocus and bokeh or volumetric lighting for the talent.

### HANDTRACKING

Permits the triggering of events and animations just with the simple movement of the bare hands and without requiring additional devices.

### FREEWALKING

Enables talents to freely move about the green screen theatre, and making

him/her to walk in the correct direction all the time. Thanks to the FreeWalking feature presenters can move forward, backwards and sideways even though the real camera is in a fixed position.

### MAGICWINDOWS: VIDEOGATE

Thanks to VirtualGate, a presenter in the virtual set can walk into a virtual screen, into the featured news and be part of the



MagicWindows: VideoGate

video itself with full realism regardless it is shown full screen or as part of the set. The talent enters and exits the video with full precise and accurately matched perspective, and once inside the clip it behaves correctly in terms of spatial reference and with the inclusion of realistic shadows, defocus etc. This feature extends the virtual scenario beyond the virtual set and creates an infinite world for the presenters to be in, allowing for better real-time content possibilities and interaction.

### MAGICWINDOWS: VIDEOCAVE

It is a Mixed Reality application using monitors in a real set performing as a CAVE multiple window, with virtual elements coming in from the virtual windows to the real scene as viewed from a tracked broadcast camera.



### ADVANCED RENDERING FEATURES

Along with advanced rendering features such as real-time ray tracing, SLI, PBR or HDR, Brainstorm also supports gaming engines like Unreal Engine, providing photorealistic scenes in any resolution.

### SLI SUPPORT

InfinitySet takes full advantage of the latest hardware developments, such as **NVIDIA SLI Dual-GPU** technology. NVIDIA's SLI technology allows for connecting several GPUs in



parallel, multiplying the performance accordingly.

### REAL-TIME RAY TRACING

Brainstorm supports **real-time ray tracing** with **Unreal Engine 4.22** and **NVIDIA RTX GPU**. Ray tracing is a



rendering technique for generating images by tracing the path of light as pixels in an image plane and simulating the effects of its encounters with virtual objects. It is capable of simulating a **wide variety of optical effects**, such as reflection and refraction, scattering and dispersion.

### HDR - HIGH DYNAMIC RANGE

InfinitySet and eStudio support **HDR**, which allows for rendering **wide-gamma pictures**. InfinitySet and eStudio can render **floating 16 bit per channel/component**, supporting for **P2020 gamma correction** output. This allows for post-rendering exposure control and **extended-range filtering**.

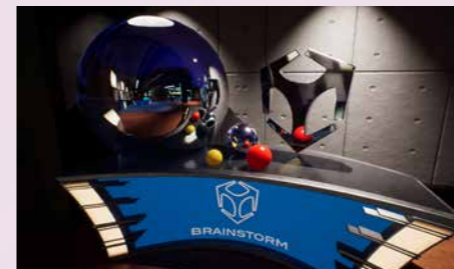
### PBR - PHYSICALLY BASED RENDERING

Brainstorm's eStudio render engine fully supports **PBR shaders as materials**, which can also be imported from external shader editing software. PBR also allows using materials from **Substance** and other **material editors** and import them into **InfinitySet**.

### COMBINED RENDER ENGINE

Brainstorm's approach to external render engine support is **unique** in the industry, as it combines its renowned eStudio render engine with the Unreal Engine **in a single machine**. This simplifies setup as it does not require studio mixers, and can be **easily integrated** into any broadcaster's installation.

InfinitySet controls Unreal Engine's parameters in real-time. Most importantly, it **merges** both engines' render parameters and buffers to make them **work as a single engine**, where InfinitySet can even create a custom GUI to control Unreal's render.



With CRE, the game engines' render is transferred to InfinitySet engine in real-time, allowing the combined engine to add the chroma keyed talent, the data-driven graphics and other elements.

InfinitySet's **TrackFree™** technology

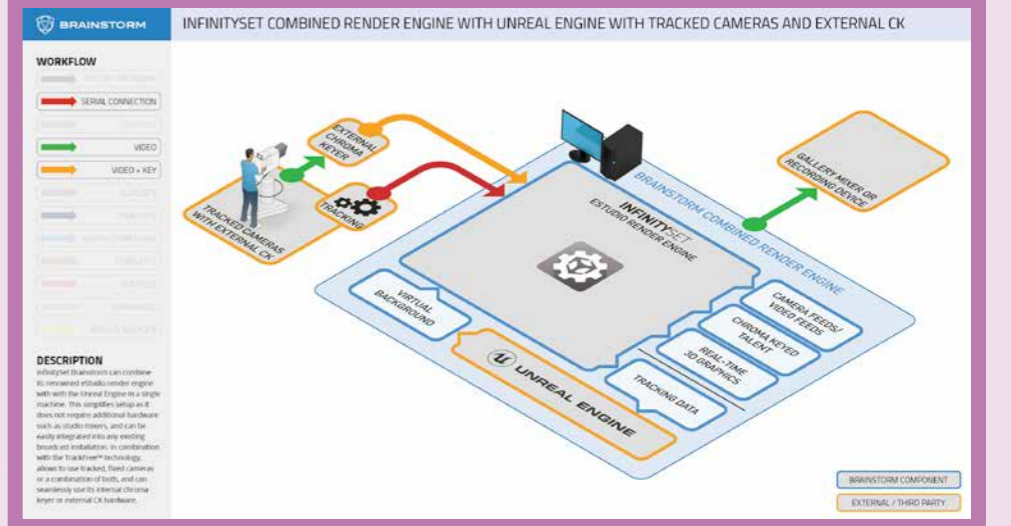
allows for using tracked, fixed cameras or a any combination of them to shoot the talent on the set, indistinctly using internal or external chroma keys. When using fixed cameras, InfinitySet can move the scene rendered by Unreal, by using its camera presets.

### BEYOND GAME ENGINES

What Brainstorm offers goes far beyond what a game engine can do by itself. Broadcast graphics workflows have **specific requirements**, like database connections, statistics, tickers, social media or lower-thirds, a variety of elements that are alien to the game engine framework but **essential** for broadcast operation.

InfinitySet can effortlessly integrate

Aston **graphics as Augmented Reality** objects within the scene, with a render quality that matches that of the game engines by using the **advanced rendering features** mentioned. This allows for adding advanced audio-visual aids such as in-context typography, motion graphics, statistics, charts and many more, all perfectly integrated in the composition both in animation, tracking, perspective matching and of course image quality.



## PRESENTATIONS MODULE

Storytelling goes far beyond the news realm, even up to the point that we can consider almost any program, show or news story a presentation of any sort. Following the experience of Edison, the education application for immersive classes and presentations, Brainstorm has developed a dedicated InfinitySet module to help creating such presentations but with the highest possible quality.

The module builds into InfinitySet an additional interface, which simplifies the setup and display of the different assets that integrate the presentation/show: slides, pictures, movies, PDF or PPT presentations, 3D objects and many more, including Aston projects



and forms. Aston material can include its StormLogic and also the input data to be updated manually or via external sources, providing additional flexibility.

The Presentations module also includes

a library of assets, ready to use, such as screens, pointers and many other, that complement the presentation abilities of the system. The presentation is contained within a display, which can be purpose built or taken from any of the specific libraries for displays, pointers, trays or tables, to mention a few.

This module can also use Unreal projects, allowing for photorealistic backgrounds which can be created for a specific presentation or downloaded from the Unreal marketplace.

As the Presentations Module is built on top, and fully integrated with InfinitySet, it can take advantage of the rest of InfinitySet's features.



## INFINITYSET FAMILY - FEATURES CHART

- INFINITYSET
- INFINITYSET +TRACK
- INFINITYSET LITE

### VIRTUAL SET FEATURES

- ● ● Resolution-independent: HD, 4K and higher
- ● ● Built-in libraries of sets, materials and textures
- ● ● Editing of materials of the virtual set
- ● TrackFree™
- ● 3D Presenter
- ● TeleTransporter
- ● HandsTracking
- ● Freewalking
- ● ● FeetShade
- ● MagicWindows: VideoGate
- ● MagicWindows: VideoCAVE
- ● Virtual camera dettaching
- ● Dynamic Virtual Shadows over virtual elements
- ● High Dynamic Range (HDR) I/O
- ● Physically Based Rendering (PBR)
- ● ● Internal Chroma Keyer
- ● ● Color correction to match live sources with virtual elements
- ● ● Support for 3rd-party Chroma Keyers
- ● ● Remote control of external Chroma Keyer parameters
- ● ● Support for different external tracking hardware
- ● ● Editable internal lighting
- ● ● Remote control of external light panels via DMX (such as Arri Skypanels)
- ● ● Selective defocus with depth of field and distance control
- ● ● Custom Interface creation
- ● ● Compatible with most common 3D formats

### GRAPHICS AND AUGMENTED REALITY FEATURES

- ● ● 4K and higher resolution graphics
- ● ● Aston projects compatibility
- ● ● Aston compositions overlaid over the virtual graphics
- ● Direct editing of Aston graphics
- ● Aston StormLogic compatibility
- ● ● Object actions
- ● ● Advanced animation
- ● ● Augmented Reality graphics
- ● Tracked Augmented Reality

### PRODUCTION AND PLAYOUT FEATURES

- ● ● Playlists of movies
- ● ● Support for multiple live input sources
- ● ● Virtually infinite virtual cameras and positions
- ● ● Software Production Mixer for enhanced production
- ● ● Optional virtual camera controller hardware
- ● ● Configurable crosspoints (camera, video input or playlist)
- ● ● Embedded audio per input
- ● ● Internal audio with independent control per playlist

### OPTIONS

- ● Combined Render Engine with Unreal Engine
- ● ● Presentations Module
- ● SLI Dual-GPU
- ● ● Hardware Mixer (Virtual Camera Controller)
- ● ● PSD, AE and AI Importer plugins
- ● ● 3DMax plugin - imports scenes and animations