

NewTek Magazine

The Official Creative Resource For NewTek Product Users

VOLUME 1 - NUMBER 2 : 2010

LightWave® 10

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Image created by LightWave artist Luis Santos.

Visit www.newtek.com/lw/creature to download this sample from our LightWave 3D® creature kit.



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FIRST WORDS

A FEW WORDS FROM OUR EDITOR-IN-CHIEF

The Near Future Prophecies – Revisited PREDICTIONS FOR 2010 AND BEYOND by dthomas

It's hard to believe that it was a decade ago that I last wrote this editorial column in NewTekniques. At that point, everyone was caught up in the new millennium – whether it actually was that year or not – and in particular, the millennium bug (aka the Y2K problem). Clearly, and thankfully, the human race survived that pending disaster. Next we only have to hog-tie Planet X (Nibiru) in 2012 and we should all be safe and sound for a while longer. But in the mean time...

A Time For Revelation

I made a prediction in that Jan/Feb 2000 issue, that “NewTek will continue to astound us all with new, improved, better, faster, more powerful, progressive, and increasingly creative tools.” There’s no doubt about it, they’ve certainly continued to do that. But, that shouldn’t come as a surprise to anyone really; NewTek has been doing that since their start in 1985. Look how far they’ve come since the “NEW Video Toaster”... three channel high definition recording, high quality instant replay, live animated virtual sets, multi-camera live broadcasting, switching, and streaming – and all in a couple boxes portable enough to tuck under your arm.

So what’s next? Will it be the HexCaster 3D? A six camera angle, stereoscopic 3D, wireless, live production tablet ... or perhaps this is another device altogether that just casts hexes on clients that don’t pay their bills. Or maybe, I’m sure hoping, it’ll be the HoloCaster... a device that not only lets you playback and interact with Star Trek Next Generation episodes, but also broadcasts holographic television on the galacticnet. Maybe. We’ll see.

I also predicted then, that “NewTekniques will find more and more of its readership is overjoyed by increased productivity and artistic success.” That prediction continues to inspire me to this very day. It’s so wonderful to see that many of the writers I worked with on the magazine back then have continued to evolve towards bigger and better careers, and on to creating Hollywood-impressive work.

Congratulations: 25 Years

So, it’s official. I’m renewing both of my original predictions again for this new decade. And along with that, I’m sending out my warm congratulations to NewTek on its 25th anniversary!

dthomas
editor-in-chief

LightWave™ 10

LOS ANGELES — SIGGRAPH — July 27, 2010 — NewTek, worldwide leader of 3D animation and video products, today announced NewTek LightWave™ 10, the next generation of its Emmy® award-winning professional 3D modeling, animation, and rendering software. LightWave 10 will combine ground-breaking CORE Technology with enhanced Modeler and Layout to deliver the most extensive upgrade in years to LightWave's production-proven workflow.

NewTek continues to innovate with LightWave 10, offering powerful new features and benefits to LightWave artists, including an amazingly photoreal real-time version of our award-winning renderer, VPR (Viewport Preview Renderer) and advanced, real-time CG hardware viewport shading, delivering Anaglyph Stereo, Ambient Occlusion, Transparency, Refractions, and Bloom.

LightWave 10 will also offer extensive, new immersive real-time virtual cinematography and game development tools. These solutions evolved as a result of the virtual cinematic production techniques that were pioneered by leading Hollywood artists and technicians for films like "Avatar," "Tintin," and "A Christmas Carol." For production studios and more advanced individuals, this immersive technology includes integrated support for the InterSense VCam™, virtual camera system. The individual artist gains a similar immersive experience with LightWave 10 and its integrated support for 3Dconnexion's complete line of 3D mice. This powerful combination provides directors and artists with the ability to interact in real time within a 3D set.

"As a LightWave HardCORE member, I love the power and flexibility that I get with the preview builds of LightWave 10," said Lino Grandi, feature film creature rigging and visual effects supervisor. "VPR allows me to see the complex creature rigging deformations in a beautiful real-time render. It's incredible to be able to work on a character rig and get this advanced level of visual feedback. Interactive lighting, procedural textures, reflections, transparency, radiosity, it's all there."

LightWave 10 is ideal for all production pipelines—from large production facilities to small specialized studios. It offers the following new elements:

Interactive Display and Rendering Tools:

Viewport Preview Rendering (VPR) - See instant results with realistic view of scenes and objects with interactive light, nodal shading and scene set up
CG hardware real-time viewport shading - Real-time OpenGL view of Ambient Occlusion, Bloom, Stereoscopic Anaglyph and HDRI background images
Linear workflow - Supports consistent gamma, color space, and custom Look Up Tables (LUTs) for more realistic lighting, and to maximize compositing flexibility in a professional pipeline

Flexible Data Interchange Enhancements:

MDD with new enhancements and support for the Autodesk® Geometry Cache - Freedom to move deformations and transforms between applications allowing for an extremely flexible, extensible pipeline for animation, dynamics, effects, and rendering
COLLADA™, FBX®, and ZBrush® interchange - Transfer, load and save camera data, lighting, objects, UV and image maps, plus parenting hierarchies, etc.

New Immersive, Real-Time and Game Tools:

Support for InterSense VCam, virtual camera system - Virtual production capabilities all for real-time interaction with 3D scenes
Support for 3Dconnexion line of 3D mouse - Move through the virtual world and interact with models and scenes, controlling cameras and lights in real time

Bullet Rigid Body Dynamics:

Integrated dynamics and simulations - Create dynamics, calculations and simulations for effects such as collapsing buildings, breaking glass, etc.



Advanced UV Mapping Tools:

Enhanced LightWave workflow with powerful new UV tools such as Transform, Scale Rotate, Move, Separate, Stitch, Relax, UV Unwrap, Front, Cubic, Spherical and Cylindrical projections, plus cameras with both UVs and an automated texture node

"The imagery created by LightWave users and studios and the yearly awards and recognitions for that work speaks for itself," said Rob Powers, vice president, 3D development, NewTek. "LightWave has an indisputable track record in the industry and allows studios and individuals to continually turn out award-winning work on time, on schedule, on budget and with a profit. If you are doing feature film effects, prime time TV, commercial work, music videos, or a science fiction project and you're not using LightWave in your pipeline, you should reconsider your approach."

About LightWave

NewTek LightWave 3D® combines a state-of-the-art renderer with powerful, intuitive modeling, and animation tools. Tools that may cost extra in other professional 3D applications are part of the product package, including 999 free cross-platform render nodes, support for Windows and Mac OS X 64 and 32-bit operating systems, free technical support and more. LightWave is enjoyed worldwide, as a complete 3D production solution for feature film and television visual effects, broadcast design, print graphics, visualization, game development, and Web. LightWave is responsible for more artists winning Emmy® Awards than any other 3D application.

Pricing and Availability

LightWave 10 will begin shipping in Q4 2010. Artists may gain access to preview builds of LightWave 10 immediately through NewTek SIGGRAPH special offers.

LightWave v9 for US\$895 which includes a free upgrade to LightWave 10 and membership in LightWave HardCORE with immediate access to preview builds of LightWave 10

LightWave v9 upgrade for US\$495 which includes a free upgrade to LightWave 10 and membership in LightWave HardCORE with immediate access to preview builds of LightWave 10

LightWave HardCORE membership for US\$495 which includes a free upgrade to LightWave 10 and membership in LightWave HardCORE with immediate access to preview builds of LightWave 10

When LightWave 10 ships in Q4 2010 it will be available for a suggested retail price of US\$1,495.00 LightWave 10 upgrades will be available for US\$695. Educational pricing is also available. For more information, please visit or call NewTek Sales at 800-368-5441. International callers dial +1-210-370-8000.



Virtual Filmmaking in 2020

BY ROB POWERS

Technology has often been the partner of creative expression as seen with previous advancements like the invention of the camera, or the sound recording process. Often, entire new industries can emerge from such an innovative technological breakthrough. More importantly, individual artists are given a new means of expressing their ideas.

As the founder of the film industry's first Virtual Art Department on James Cameron's blockbuster movie *Avatar*, I had the unique opportunity of helping develop cutting edge technologies which emphasized a virtual real-time director-centric workflow. Utilizing a diverse suite of tools that included LightWave 3D as the main asset creation software, MotionBuilder as the real-time display environment software, and InterSense tracking hardware, a very efficient pipeline was established which allowed a powerful immersive design experience. The immediacy directors experience with live-action filmmaking is suddenly now a reality for visual effect heavy films and animated projects. Driven by the needs of one of the industry's leading innovative directors, the integration of current technologies and several significant new advancements produced something greater than the sum of the individual parts. The result gave audiences a taste of worlds never before seen in a very engaging and dynamic way.

Performance capture is the combination of detailed body motion capture, facial expression capture, and performance sound. The concept is to fully capture the "heart and soul" of an actor's performance so that all the unique nuances transition all the way through the process to affect the audience in a very human way. A great example of the success of this is the scene in *Avatar* where the fully

computer generated nine foot Na'vi alien character Neytiri (Zoe Saldana) holds the body of the human Jake Sully (Sam Worthington) and tears begin to flow from her eyes. This moving performance emanated from the screen and created a very touching and human moment. Currently, this technology is primarily used in a performance capture work space or on a motion capture stage with motion capture cameras and meticulously aligned grids of coverage.

With such already exciting technologies blossoming, it's fascinating to think about how this and related technologies will mold the future of film production as we move through the next decade. The performance capture actor in 2020 will no longer be forced to work exclusively in unnatural environments, but instead will be liberated and fully capable of performing in any real world location or on any live-action set without having to be tethered to a computer system. Far from the strange clown-like body suits with iridescent balls positioned all over the actor's body, the actor will have an unintrusive wireless body suit that can be worn under regular clothing. A variation on that would even allow costumes to incorporate performance capture sensors. Special makeup will replace awkward facial tracking markers and allow extremely precise facial tracking with the least amount of distraction to the other performers. Have you ever tried having an emotionally intense conversation with

someone wearing bright green dots all over their face? It can easily ruin the dramatic moment, to say the least.

In addition to the actors being liberated from the confines of a motion capture stage, so too will the director and his virtual camera. A director will be able to shoot stereoscopic live action and virtual elements seamlessly at any location with minimal setup. The exact position, motion, and settings of the camera will be fully tracked and tied to a detailed worldwide high resolution GPS positioning system that will allow for the camera to be precisely positioned in a virtually simulated version of the location at any time. One of the technologies developed on *Avatar* was the simulcam system which merged completely virtual environments with live action stereo cameras, all with real-time motion tracking in conjunction with green screen technology. In 2020, this will evolve even further and accurately calibrated GPS information will be combined with real-time image tracking and rotoscoping technology to eliminate cumbersome green screen setups for simulcam and set extension work. Once the virtual set has been calibrated with a worldwide GPS system, it will appear in its proper location and be tracked in real-time by a stereoscopic camera with full high dynamic range imaging or raw high definition digital image acquisition. This capture data will have an extremely wide latitude range from the darkest blacks to the brightest whites, for the ultimate control in digital finishing.

The entire production process will have a huge emphasis placed on real-time feedback far beyond what is possible today. Computing will have moved far beyond even 16 core processors, and hardware will continue to enhance performance with blazingly fast, massive

sized storage. Graphics processor based real-time photorealistic rendering will be used from the concept design phase and continue right through post-production. Real-time lighting and shading advancements will finally closely resemble real world lighting that has long been standard in the production and cinematography fields. The director of photography will work within this workspace effortlessly placing virtual fresnel lighting, gels, and cucoloris to the scene in much the same way they would on a live-action set without all the effort and lack of standardization currently experienced.

With emerging nonlinear virtual production workspaces the line will increasingly blur between pre-production, production, and post-production. Real-time soft and hard body dynamics will also move beyond their current cutting-edge position to become a common and expected part of the workflow. Emphasis on most technological evolutions will increase immediacy for artists and designers, and as a result the level of detail and the quality level will continue to rise.

Ultimately, the progress achieved as we move forward will be to increase the sophistication and capabilities of the tools while at the same time removing the often unnecessarily technical and alienating user interface which can create significant obstacles for the end user. As the barriers fall, the technology will continue to become more immersive and responsive and less of a rigid and often imposing dictatorial influence on the creative process. As the film *Avatar* has proven, technology can be a brilliant partner in human creativity and expression. As we head toward 2020, fasten your seat-belts! We've left the uncanny valley and the journey is really starting to get exciting. 🎬



IMAGES © TWENTIETH CENTURY FOX

COMPARTO VIA LARGA



By Ben Vost



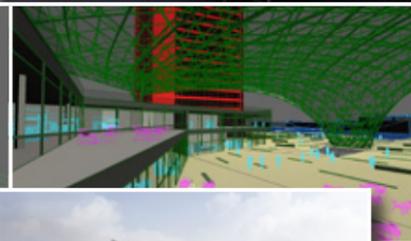
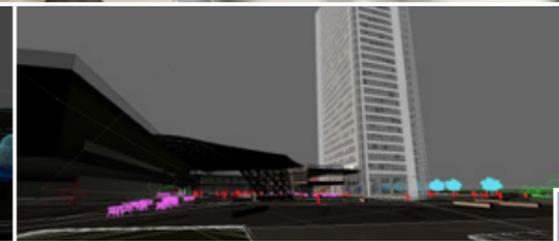
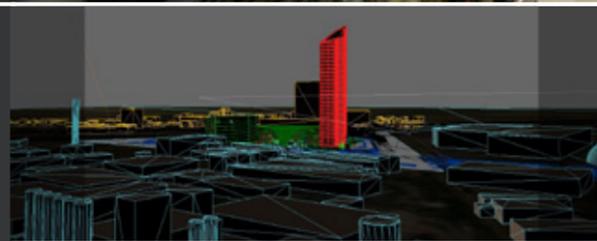
Mir have worked on projects all over the world, so a project a little nearer to home in northern Italy was a welcome change. The project, a building complex on the outskirts of the city of Bologna, would include a hotel, shopping mall, training centre, and an insurance company office in the central tower.

Although in some cases Mir are tasked with creating 3D visualizations for such projects from scratch, based on architectural plans, in this case Openproject, the architecture and engineering company responsible for the job, supplied them with a basic 3D starting model. As with all CAD models, there was a small amount of cleanup necessary to convert it into a usable LightWave model - the main part of which was assigning surfaces to polygons according to LightWave methodology. In addition, the design brief included a description of the building's facade that differed from the model that was provided. Openproject sent along some AutoCAD (DWG) sections and Mir refined the model further. Some random blinds and curtains were also added based on simple polygons with alphamaps. I asked the Mir team member charged with this project, Jan-Erik Sletten, if that was all. He paused for a moment and added, "We put lights into the roof with simple maps onto polygons too; and added more structural detail and a double glass facade to give it more depth."

Mir. Jan-Erik used LightWave's SkyTracer to find the right time of day and marked the exact camera locations on a map, using Google Earth to roughly find the right camera angle for the tower. "Bologna centre has some famous buildings that you can see in Google Earth," said Jan-Erik. "It was important for us to make sure the aerial would show this skyline as an important symbol of Bologna. Google Earth helped us making a rough sketch for our customer's acknowledgement. Then we made a specific description for the photographer with information like position, time of day and lens angle. Unexpected weather is also a factor taking the photos. Sometimes this can turn out in a positive way, giving the image new qualities that really suit the project."

Then once the models were cleaned up and surfaced; and the location pinpointed with SkyTracer, what remained was to create the renders you can see on the pages here. The obvious question remains. What is Mir's secret to such consistently good-looking renders, and Jan-Erik's reply is equally obvious: "People often write to us and ask for render settings, etc. We use LightWave the same way as anyone else - there are no magic tricks or anything. Even if the application helps you a lot, you still need a basic knowledge of photography, composition, lighting, colour, just as you would if you were a photographer or a painter."

But the thing that sets good architectural visualization (archviz) apart from plain archviz the most is the human element. Do Mir use images mapped to planes, 2.5D RPC imagery, or 3D models from Poser or other software? "We don't use 3D people much.



We have some XYZ models for animation, and a set of 10-15 people that no one remembers purchasing. I use them more for distance or as guidance for the clipart people to put people in in Photoshop", replied Jan-Erik. "In general, we try not to use 3D people unless they are far away because I haven't seen any really good ones yet that don't blow out my scene's polygon budget," he continued.

LightWave's rendering is a great start to a final image, but it isn't the last step. "Using Photoshop enables us to control the image the way we want it. We then have freedom to completely change the atmosphere and feel of a rendering. Also vast amounts of clipart is often needed, and all of that is added in post-processing. In many cases the pictures lack the contrast and right colours, etc. straight from the render. We see that many problems are more easily solved by quick tweaking in Photoshop, than test render after test render."

Jan-Erik worked on the project by himself over a period of about a month - although the rest of the Mir team was ready with comment and feedback at every step of the way. Even though Mir did their work over a short period of time, the architects them-

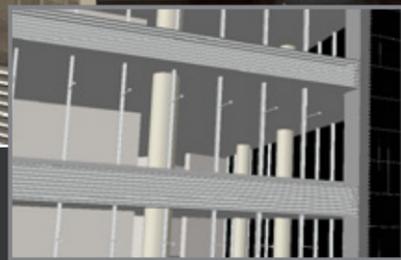
selves are still making changes to the plans before construction actually starts. This brings up another interesting point: Does Mir ever follow up on the projects it has worked on to see how they turned out compared to the renders supplied to the architects? Jan-Erik replied "Sure. It is amazing to see how similar some of them turn out. One of our clients came back with photos from the same angle we had produced the renders from just to show us how similar it turned out. He actually used the render as part of the contract with the builder to ensure that it turned out as similar as possible."



ABOUT MIR Mir is based in Bergen, Norway, and was founded in 2000. Since then they have specialized in describing unbuilt architectural designs, spaces, and concepts thru images and animations. You can view more of Mir's work at www.mir.no

The pictures used as the dramatic backgrounds for the renderings were taken by the architects based on a very detailed brief from

Explore this project location further in Google Earth, or on Google Maps
Longitude: 11.39136720836438 Latitude: 44.49589322751909



SIMPLIFIED LIGHTING USING TEXTURE PRESETS

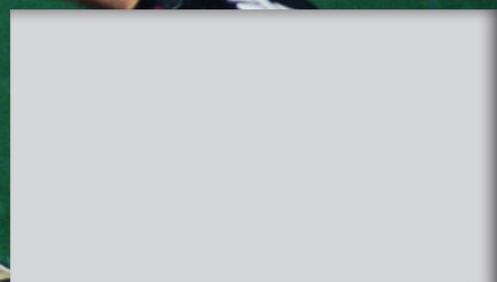
Our architect clients do the modeling themselves in almost 100% of our projects. Still, 99% of the time we have to edit those models, either because of modeling by the customer that is not suited to our needs; flaws due to format conversion; or simply because we want to raise the level of detail. Here's an easy trick to add interior light fittings in a quick way and keep the polygon count low (Figure 1).

Select the bottom polygon of each floor and copy this into a new layer (Figure 2). Then move this new geometry roughly 30cm down and assign a surface name, like "Lighting_ceiling" (Figure 3). To save from recreating this for every floor of our building we make a texture preset. We'll next add a map (Figure 4) to the luminosity channel for the "Lighting_ceiling" surface. Make sure your luminosity and transparency channels are enabled under Display Options (d) in Modeler to see the map – but be aware that moving the model, if you are texturing in Modeler, can change the position of your texture if you are not

using UV mapping. Scale and position the map so that it looks right. Then copy the surface luminosity texture layer and paste it into the transparency channel of the same surface. Invert the layer so that the lamps are visible and the rest of the plane is invisible - in the transparency channel, white is transparent and black visible. You can then adjust the color channel to get a warmer/colder mood from the lamps.

Lastly, save the preset. In Modeler, open the Presets window (F9) and double-click on the preview in the Surface Editor window to add a new preset. Right click on the new preset and set its name (Preset > Set Name) to something recognisable like "Light_Office1" or "Light_Spots_strong".

Making variations in luminosity, colors, and shapes can help describe a building's inner atmosphere (Figure 5) better. 



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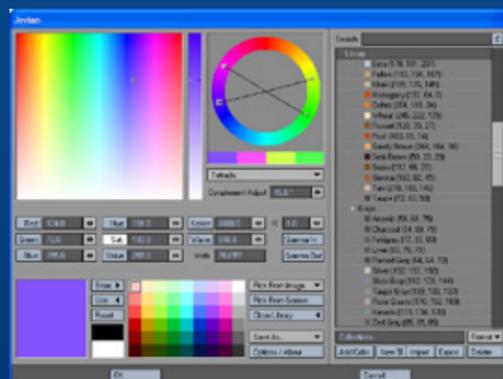
Essential **FREE** Plugins for LightWave

By Ben Vost

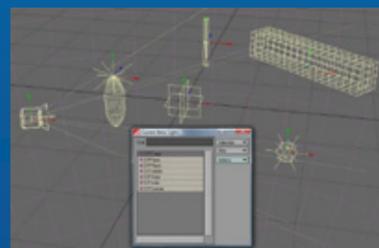
One of LightWave's major advantages is an open software development kit (SDK) that allows programmers, tinkerers, and artists to dig deeper than the standard toolbox. This has led to a large selection of free tools for very specific problems. We'll have a look at just a tiny selection of what could be widely considered essentials.

db&w tools As Michael Wolf says, db&w tools initially grew out of a personal need for such tools, but has since grown to include a lot of user suggestions. The included nodes add a lot of functionality to Layout, not only in surfacing. In addition to the all-important tools for getting more from Materials, be sure to play with the Extended Spot Info with its ObjectID output, and the Render Audio Notifier (Growl on the Mac) that makes Frame End Beep actually useful. Other tools include: Material Blender, Channel Blender, Single Light Lambert, Simple Colour Corrector, Cache, Material Booster, Colour Booster, Scalar Booster, Time Info, Sequencer, Command Statistics, and Revenge of the Lenscap.

Jovian Jovian is a replacement colour picker. In its free version it offers superb functionality with colour picking from images and interfaces, complementary colour indications, and a lot more.



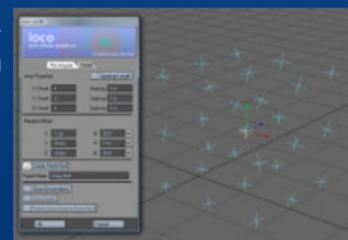
DP Lights The DP Lights pack contains seven new light types. Most are evolutions of the standard lights with things like soft shadows for lights that traditionally don't have them, but one – the Custom Light can transform geometry into a light, including geometry animated by displacement, giving you very dynamic lighting.



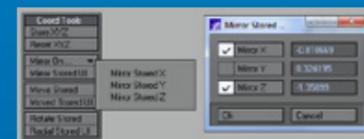
Lightbit** Probably not a politically correct name for a plugin, but if you don't want to use lights at all, LightWave can use images to illuminate a scene that uses radiosity. However, rendering this way is heavy on processing time. Lightbit** takes HDR images and creates an adjustable lighting rig to surround your scene – giving you radiosity-like photorealism at a fraction of the render time.



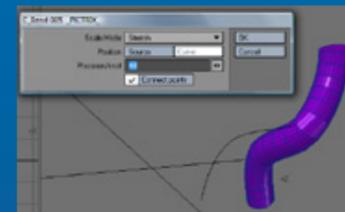
Loco An older plugin to be sure, but Loco allows amazing control over cloning and making arrays of items, and includes the ability to jitter and randomly rotate an array. It's perfect for duplicating light arrays or arranging seats in an auditorium, for example.



Coord Tool Pack This set of tools does a lot, but perhaps the most important thing is to copy "triplets", that being the individual X/Y/Z numbers used when you move or rotate something. Make sure you watch the provided video tutorial to fully understand how this works.



C_Bend Pictrix is well-known for some downright innovative tools and C_Bend is just one of many. C_Bend allows you to bend geometry around a spline to give you complex shapes that would be very difficult to achieve using standard modeling tools, such as Spline Extrude.



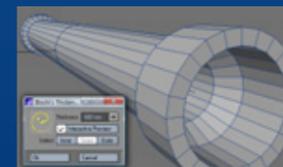
TrueFillet This tool is simplicity itself, allowing you to round the corners on geometry easily. Unlike the built-in Rounder tool, it prefers to be used on two-dimensional planes.



Align and Distribute Artur Wawrzonkiewicz was inspired by Illustrator's Align and Distribute tools and so made this 3D version. Although originally a Modeler plugin, he also made a version for Layout too, which works on the same general principle.



Thickener This tool takes 3D geometry that is a single polygon thick and adds thickness to it. You can of course do this yourself, but this tool makes it so easy why go through all the steps you need to do it manually.



How to install plugins

When you download a plugin, often you get an archive that has little in it other than a file with extensions such as: .p, .ls, .lsc, .plugin. So what to do?

LightWave's directory structure includes a folder called Plugins, which contains all the built-in plugins. It's a good idea to create a new folder in here to put all your downloaded plugins. If LightWave is already running, you can still add new plugins without needing to restart. Once you have copied the plugin file to your directory, you can press Alt-F11, whether you are in Modeler or Layout, and the Edit Plugins window will appear. Here you can either choose Scan Directory, which will scan the whole directory and subfolders you choose and find all plugins, or you can choose to Add Plugins, which may be quicker depending on how many you are adding. With Add Plugins, you can multiselect (Ctrl-Left Click) in the file requester.

These methods will add plugins to Layout and Modeler, you do not need to be in the one appropriate to the plugin you are adding.

Where to find more plugins

There are two websites that stand out for finding plugins. The first website is the venerable www.flay.com, online since 1997. Christopher Stewart, the site's owner, started the project as a self reminder of where he found the plugins he needed.

The second website is the much newer www.lwplugindb.com created by Ken Nign. It is a lot easier to search and more modern, but it doesn't have the quantity of plugins that are referenced on Flay. It has the added benefit that you can add new plugins yourself.

One final resource is the NewTek forums at <http://www.newtek.com/forums>. Users on the forum are eager to help and have all kinds of suggestions to solve your problems and needs.

Where to find the FEATURED PLUGINS

- >> **DB&W TOOLS**
www.db-w.com/content/view/137/715
- >> **JOVIAN**
www.joviancolorpicker.com/
- >> **DP LIGHTS**
pagesperso-orange.fr/dpont/plugins/lights/Additional_Lights.html
- >> **LIGHTBITCH**
www.hdrilabs.com/lightbitch/index.html
- >> **LOCO**
www.kevinmacphail.com/resources/pixelpot.html

- >> **COORD TOOL PACK**
www.newtek.com/forums/showthread.php?t=105887
- >> **C_BEND**
www.pictrix.jp/lw/Cbend/
- >> **TRUEFILLET**
www.trueart.pl/?URIType=Directory&URI=Products/Plug-Ins/TrueFillet
- >> **ALIGN AND DISTRIBUTE**
www.artssphere.com/plugins/alignanddistribute.php
- >> **THICKENER**
www.blochi.com/gfx/thickener_en.html

A Product of its Environment

Creating a photography style product shot

By William Vaughan

3D has been slowly creeping into the world of photography over the years and one area that it seems to have a firm hold on is product marketing. With millions of items on the market today, there is quite a bit of work available for CG artists interested in using their skill sets to showcase company products.

In this tutorial, we'll explore setting up a basic product shot from start to finish. We'll be creating all the elements from scratch so let's get started. Note that menu accesses or keyboard shortcuts are contained within brackets.



▶ Creating the product

We'll use a simple wine bottle as the "talent" of our product shot today. There are several ways we can go about modeling a wine bottle, but I've chosen a route that involves very few steps and will allow us to get to the more interesting aspects of our creation. Go ahead and launch LightWave Modeler and select your curve tool of choice. I prefer working with Spline Draw, which is located under the Create tab in the Curves section (Create > Curves > Spline Draw).



Figure 1: Wine bottle reference image



Figure 2: Finished curve

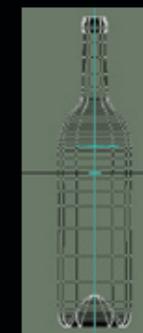


Figure 3: Result after the Lathe operation

Make a copy of the bottle in Layer 2, and paste it into Layer 3. Use the Tab key to activate SubD Surfaces (sub-patches) which will avoid any faceting that may appear on a polygonal object. Unless we want to create a basic glass bottle, we'll want to break our object into separate surfaces. Let's create three surfaces for the bottle with the names and surface at-

tributes below (Figure 4). To do so, select the appropriate polygons in the Back view (Multiply > Select Sel Polys) and use the Change Surface panel (q) to assign the surfaces. Note that the Surface Attributes will change once we get into the texturing phase, but this will be a good starting point. Tip: Hold down the Shift key while selecting any polygons you may have missed.

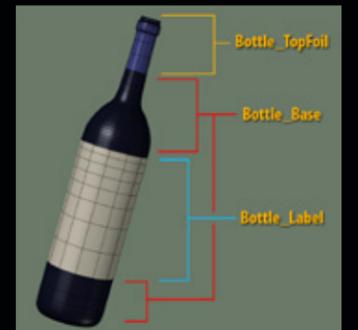


Figure 4: Bottle with three surfaces defined for texturing

Bottle_Base:	Bottle_TopFoil:	Bottle_Label:
Color: RGB: 17 / 19 / 37	Color: RGB: 63 / 68 / 129	Color: RGB: 198 / 192 / 175
Specularity: 80	Specularity: 60	Specularity: 30
Glossiness: 40	Glossiness: 40	Glossiness: 40
Smoothing: On	Smoothing: On	Smoothing: On

“Between two products equal in price, function, and quality, the better looking will out sell the other.”

- Raymond Loewy

▶ Take a quick breather. After all, a fine wine needs to breathe

Now would probably be a good time to save. We'll use this save as a resource file, containing all the source pieces for our bottle. Copy the bottle in Layer 3, create a new Object (File > New Object) and paste the bottle into Layer 1 of the new object. Save this object using a different name than the last. We'll use this object to create our final render.

I like to work as clean as possible so let's go ahead and raise our bottle so that it sits flush with the origin. A quick way to do this is to use the Rest on Ground command (Modify > Translate > More > Rest on Ground) (F3). We now have our final product model and we're ready to move on.

▶ Creating a surrounding environment

Next, we need to create an environment for the bottle to exist in. Most photographers use an infinity cyclorama or what is commonly referred to as a "cyc". A cyc is a background that curves smoothly at the bottom to meet the studio floor, so that with careful lighting and the corner-less joint, it gives the illusion that the studio floor stretches on to infinity. Cycloramas also refer to the use of white backdrops to create no background, or green-screens to create a masking backdrop.

Cycloramas are quite easy to create and allow us to mimic what photographers have been using for years to create those amazing product shots. Let's build our cyc in Layer 2 starting with a simple flat plane that rests on the origin underneath our bottle. Return to the Create tab, and use the Box tool to create your plane (Create > Primitives > Box). Don't worry about exact dimensions.

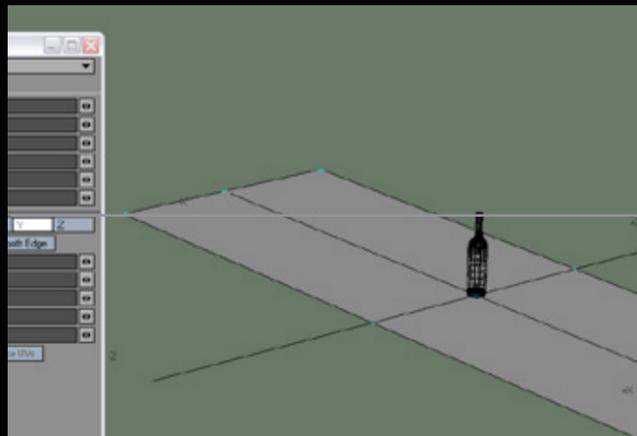
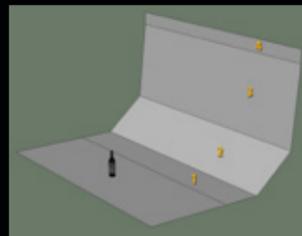


Figure 5: The start of a Cyc using a simple flat plane

We need to build upon this floor geometry so that we can create the curved backdrop. Select the back two points of the plane and extend the edge four times (Figure 6) using Extender Plus (e) and the Move tool (t).



6: The backdrop after extending and moving the back edge

We'll want to use sub-patches on our cyc to insure a smooth curved backdrop, but first we need to make sure our edges will stay nice and tight. Use the Knife tool (Multiply > Subdivide > Knife) to slice just inside the two sides and the front of the cyc. Once you have your new edges, activate SubDs (Tab). These new edges help hold the corners of our cyc from becoming too curved (Figure 7). Let's go ahead and give our cyc a surface name (q) of "Backdrop", change the Color to RGB: 255 / 255 / 255, and make sure that Smoothing is active. We now have the elements we need to move our objects over to Layout, so it's time to save all the work we have done.

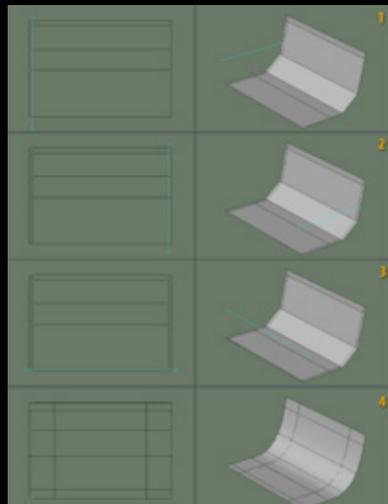


Figure 7: Added edges to the sides/front of the Cyc, are then converted to sub-patches

The Photo-shoot

Launch Layout and load the objects you just created into a fresh scene (Items > Load > Objects). Select the Camera and move it closer to our product.

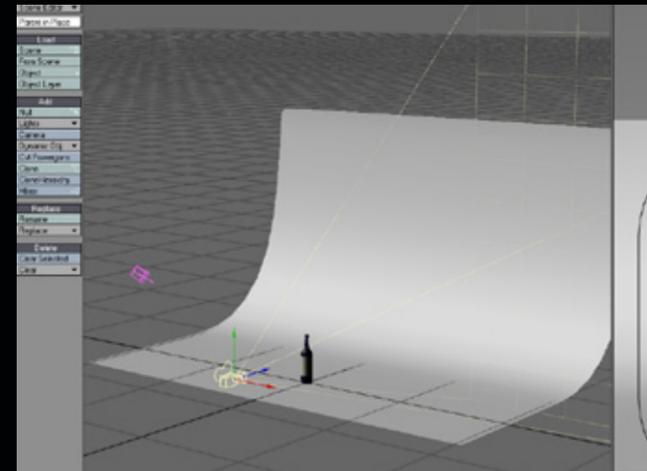


Figure 8: Objects loaded into the scene with the camera moved into place

The Camera dimensions aren't ideal for our vertically oriented bottle, so let's change the size to something more suitable. With the Camera selected, open the Camera Properties panel (q) and change the Width to 600 and Height to 900.

Before we get too deep into setting up our photo-shoot, let's go ahead and set up our render options. Access the Render tab in the Render Globals panel (Render > Options > Render Globals) and activate Raytrace Shadows, Raytrace Reflections, Raytrace Transparency and Raytrace Refraction.

Our set currently consists of our cyc and a black void. This can be an ideal setup for a car photo-shoot, but I want to introduce something more than just black for the bottle to reflect so let's add a fake environment that can surround our set by using an Image World. I won't be using an HDRI to light the scene, so I'll just use an image that I took of my dog Jack as he relaxed after a hard day doing nothing (Figure 9). Feel free to use the provided image ("Jack.png") or any other source image you'd like to inspire the bottle's world with.



Figure 9: An Image World reflection source

Access the Backdrop tab of the Effects panel (Windows > Backdrop Options) and select Image World from the Add Environment drop down menu. Add your image as the Light Probe Image and change the Heading Offset to 30 degrees. It's not a necessity to change the heading; it's more a personal preference.

We're getting very close to being able to render. We just need to light our scene and work on the textures. Let's set up our lights first so that we can judge our surface attributes better under the final lighting setup.

Lighting

I'm not a fan of lighting these kinds of shots with Distant light, so let's use a few Area lights instead. Select the Distant light in the scene and open its property panel (p). Change the Name to "Overhead", the Light Type to Area, and keep the rest of the settings at default (Figure 10). Move the light so that it sits over the bottle, increase it to about 5 times its current size, and rotate it so that it is pointing down at the bottle as follows:

Position: X: -18.6mm, Y: 4.91m, Z: 309.95 mm
Rotation: H: 0, P: 90, B: 0
Scale: X: 5, Y: 5, Z: 5

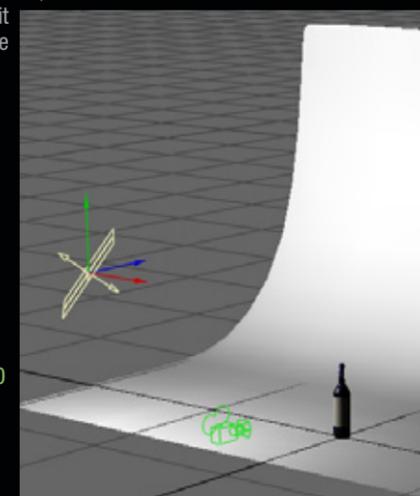


Figure 10: Default light properties

Note that with this light, and the others that follow, there is no need to use these exact settings as long as you get the light placed somewhat similarly, feel free to experiment. We'll add (Items > Add > Lights > Area) two additional Area lights. One, named "Key" and configured as follows:

Light Intensity: 80%
Position: X: -2.37m, Y: 1.16m, Z: -1.35m
Rotation: H: 48.90, P: 20.80, B: 0
Scale: X: 5, Y: 5, Z: 5

And the other, named "Fill", with the following settings:

Light Color: 82 / 114 / 255
Light Intensity: 30%
Position: X: 1.82m, Y: 1.9m, Z: -1.23m
Rotation: H: -59, P: 23.70, B: 0
Scale: X: 5, Y: 5, Z: 5

This gives us a basic light setup (Figure 11). Now, would be a good time to save, and then do a quick test render to see how things have progressed so far (Figure 12).

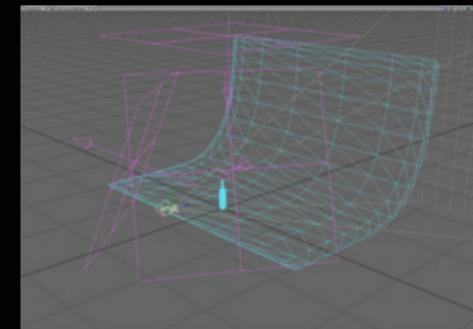


Figure 11: Basic three light setup



Figure 12: Test render with lighting

Texturing: Bottle_Base

All that's left to do is a little texturing to our surfaces and we should be good to go. Let's start with the main surface. Open the Surface Editor (F5) and select Bottle_Base. For Color, to give a little more life to the glass, let's use more than one RGB value. Open the Texture Editor for the Color channel by clicking the "T". Change the Layer Type to Gradient, and the Input Parameter to Incidence Angle. Then place 4 keys on the gradient as follows:

Key 1:	Key 2:	Key 3:	Key 4:
Color: 0 / 0 / 0	Color: 16 / 12 / 24	Color: 56 / 43 / 88	Color: 0 / 0 / 0
Parameter: 0	Parameter: 18	Parameter: 70	Parameter: 90

Also set the following:

Luminosity: 0% Diffusion: 70% Specularity: 90% Glossiness: 60%.

To create a slightly more realistic reflectivity for the glass, we'll make the edges of the bottle slightly more reflective than the center. Open the Texture Editor for the Reflection channel, change the Layer Type to Gradient, and the Input Parameter to Incidence Angle. Place 2 keys on the gradient as follows:

Key 1:	Key 2:
Value: 10%	Value: 10%
Parameter: 0	Parameter: 90

Similar to reflection, we want to create a gradient, set to Incidence Angle with the center being slightly more transparent than the edges of the bottle. This will allow us a slight glimpse of the dimple at the base of the bottle. Open the Texture Editor for the Transparency channel, change the Layer Type to Gradient, and the Input Parameter to Incidence Angle. Place 2 keys on the gradient as follows:

Key 1:	Key 2:
Value: 2%	Value: 5%
Parameter: 0	Parameter: 90

Also set the following:

Refraction Index: 1.2
Translucency: 0%
Bump: No Bump needs to be added since we want our glass to be nice and smooth.
Smoothing: On
Double Sided: On

► Texturing: Bottle_TopFoil

We're not going to change all that much for the Bottle_TopFoil surface. Keep all the settings the same except for the following:

Specularity: 80% Glossiness: 60% Reflection: 5%

► Texturing: Bottle_Label

What would our wine bottle be without a proper label. We'll want to map an image of a label onto our Bottle_Label surface. Open the Texture Editor for the Color channel, change the Projection to "Cylindrical, the Width Wrap Amount to 2.2, and load "Label.jpg" (Figure 13) or similar size image (900 x 1122) into the Image drop down.

To size and position the label, use the following settings:

Scale: X: 201.0972, Y: 354.1896, Z: 201.0972 mm
 Position: X: 0, Y: 317.3829, Z: 0 mm
 Rotation: H: 96.83°, P: 0, B: 0
 Luminosity: 0%
 Diffusion: 80%
 Specularity: 30%
 Glossiness: 12%
 Reflection: 2%

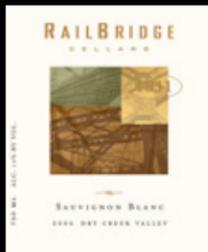


Figure 13: Wine bottle label

Let's create a test render to see where we're at (Figure 14).



Figure 14: Test render with texturing

I think we're pretty close on the texturing, but there are a few things that are bothering me about the cyc that I think we should address. There are some shadows in the top portion of the render that I'd like to remove. One quick solution is to change the Cyc's object render options. Select the Cyc and open its property panel (p). Select the Render tab and uncheck the Self Shadow and Cast Shadow options.

Looking at this new render I think we should increase the intensity of our Key light to 140%. The original setting of 80% was a bit too dim in my opinion. As I mentioned earlier, the backdrop in our product shot doesn't seem to be working for me. I think if we really want to dress this product up we should make a few tweaks to our Cyc's surface.



Figure 15: Test render with a cleaner backdrop

► Texturing: Backdrop

I think what would really make the bottle pop is if we changed the cyc's base color from white to black. Change the RGB values of the Backdrop surface to 0 / 0 / 0 and create a test render.



Figure 16: Test render with a black cyc

The project is coming together now. The black background really seems to be working, but we've introduced a new problem. Before we changed the cyc from white to black we had a nice soft shadow that grounded our bottle and made it look a bit more like a photo. Since the shadows are black they aren't showing up in the render. If this were a real photo shoot the photographer would probably choose to add a reflective floor to help ground the product. Let's do the same!

If we make the entire surface of the Cyc reflective we'll introduce all sorts of noise on the back wall and we really only need it on the floor portion of the cyc. We could go back into Modeler and give the floor polygons a separate surface, but that isn't necessary. Lets use a gradient to separate out the floor.

Open the Texture Editor for the Reflection channel. Change the Layer Type to Gradient, the Input Parameter to "Y Distance to Pivot" and create a new key on the gradient for a total of 2 keys. Use these settings:

Key 1:	Key 2:
Value: 80%	Value: 0%
Parameter: 0	Parameter: 250 mm

Let's make sure the reflections on the cyc's floor don't compete too much with the bottle by blurring the reflection just a bit. Under the Environment tab of the Surface Editor, change the Reflection Blurring to 30%.

Create a test render so we can see where we stand (Figure 17). Not too shabby! We have a clean render that shows off our product but it seems to be missing that photo studio look that I see in a lot of product shots.



Figure 17: Test render with floor surface reflections

If you study traditional photos of reflective objects photographed in a studio, they all seem to have nice crisp highlights that really give the surfaces a slick look. These highlights are the lights being reflected in the surface. LightWave lights don't show up in a render and are also not seen in reflected materials so we have to come up with a way to fake it. Let's go back to modeler and create our fake light and see if that does the trick.

► Creating and using a light card

In Modeler, create a single polygon plane centered at the origin in the Back view (Figure 18) sized as Width: 2.5m, Height: 5.5m, Depth: 0.

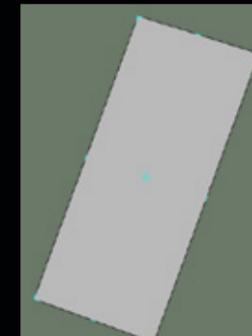


Figure 18: Light card creation

Assign a new surface to the light card with the name "LightCard", change the color to 255 / 255 / 255 and change the Luminosity of the surface to 100%. Save the object and load it into your scene. Open the Object Properties for LightCard and switch to the Render tab. Uncheck Self Shadow, Cast Shadow, Receive Shadow, and activate Unseen by Camera.

Now we just need to move our card into place as follows:

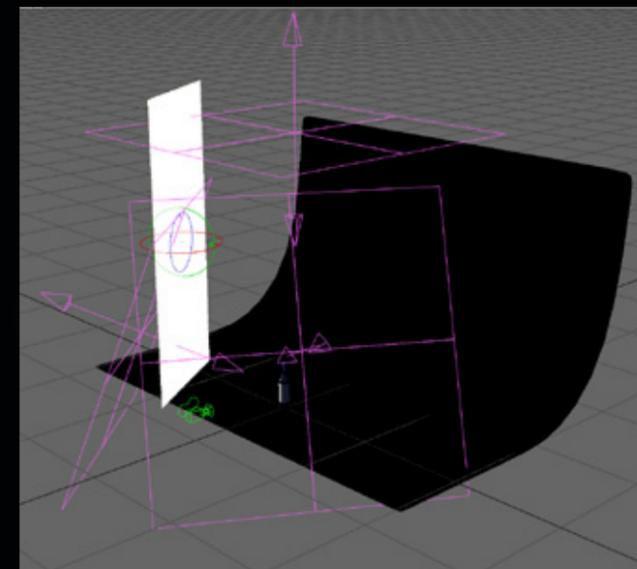


Figure 19: Light card placement

Position: X: -2.151, Y: 2.75 m, Z: -550 mm
 Rotation: H: 58, P: 0, B: 0

Create a test render. As you can see, the light card has made quite a bit of difference. Not only does our wine bottle look more realistic, the render looks more professional and a bit more like a traditional studio shot.



Figure 20: Test render with a light card

► That's a wrap!

Hopefully this has given you some insight into setting up a traditional product shot. There are many things we could do to further improve the render using an array of features LightWave has to offer like Final Gather Radiosity, Caustics, Photo-Real Material Nodes, and many others. Spend some time playing with the surface and lighting settings in this scene as well as adding additional light cards of various shapes and sizes to explore the endless possibilities. Enjoy! 🎉

“The key part of your brand is a quality product. Creating exceptional content is the number one thing.”
 – Raymond Loewy



Adding a 3D Perspective to 2D Art... or Vice-versa

A Philosophical Look at Birthing a Dragon

by Graham Toms

Goals, Philosophy, Virtuality, Reality

One of my personal goals in working with LightWave, and other graphic applications, is to foster techniques to better visualize the (often) huge mural paintings I create. This is important for progressing my own vision(s), but equally so to secure commissions I am tasked with by clients who expectedly find it impossible to see into my mind.

In addition to achieving that, my explorations have revealed that the 3D virtual world is conducive to the discovery of a great deal of knowledge that comes from designing a project from the inside out.

One such project I'm currently working on is that of the creation of a dragon. I decided to choose this idea because, from a character design point of view, the dragon is a fun assimilation of a lot of different animal types – plus I am always doodling these creatures on napkins. The most interesting part for me was trying to figure out the reins and where to put the luggage. I like studying history and thought it would be fun to put two gun crows nests at the back.

The process of a project like this, for me, involves an adventure along a path of discovery, knowledge, sometimes frustration, but always a sense of completion.

While most 3D artists today have taken a very different path, I was a 2D artist long before 3D virtual technologies even existed. And the skills I bring to this new virtual world grew out of that traditionally learned knowledge. But, I'm not alone in this old-school progression and there are many artists out there that would benefit in various ways from exploration of this perhaps strange new world.

Adjusting to the 3D mindset

But how do you transfer skills from traditional artistry to a virtual 3D world, and into a software application like LightWave?

The problem that generally arises when transitioning from traditional 2D to virtual 3D is one of realizing that there is a bridge between the two, and understanding what that bridge is. What happens when that concept is ignored, lost, or undiscovered, is that the artist when using the computer application becomes too dependent on the tool to manufacture an end product.

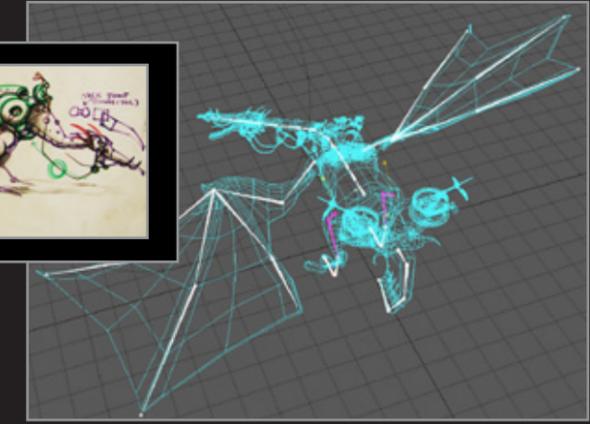
The problem here is machines do not create art... humans do. And while computers can create art, they do so under the control of a human using the computer as a tool. Not the other way around. Any 3D application is just another tool at the disposal of the user. The artist's aesthetic development will be greatly enhanced through an understanding and practice of traditional methods and knowledge of how they will be used to help them problem solve more efficiently when coming to a tool such as LightWave.

LightWave is a 3D application that is unique in that it is pretty much an all-in-one solution. The user is allowed to explore the effects of particle systems, how to texture those particles, and how to model geometry in three dimensional space using X, Y and Z. And it can do so more traditionally through the use of other tools such as the Wacom tablet/pen products – the tool of choice for me when using not just LightWave, but any digital visual tool.

There are no real tricks to help a traditional artist to change or adapt techniques to a 3D application. More importantly and likely, they will have to implement a change in philosophy. While a computer can be considered to be a very expensive pencil, it is merely one of many possible tools. It's not a dark art for the realm of the computer geek, but rather simply... another tool.

I believe that if Leonardo or Michelangelo were alive today, they wouldn't be turning their noses up at such technologies; they'd be saying, "Wow... this is where science meets art." We are in exciting times, where technology is becoming more and more accessible to traditional artists. Computers are obviously not going away. With regard to traditional practices, an artist's professional survival may only be a question of adapting expression to another tool, rather than stubbornly insisting that because they are a traditional artist they have become, or are becoming, obsolete.

My preparatory approach when using pen and paper, is to problem solve by scribbling and doodling. My initial interest is not in creating a pretty picture. The novice or drawing-phobic concept of making images with a pencil, is to make it look pretty and refined. Unfortunately, this thinking is usually fostered at an early age when educators instruct that you color within the lines, so as to not make mistakes. The reality is that successful problem solvers make thousands and thousands of mistakes. They understand that it is an important part of the process, before you can achieve success.



Having a good solid foundation in visual art

The problem with many art colleges and schools is that educators often teach a clumsy or irrelevant approach. In some cases, their advice and instruction can be harmful because of a philosophy that is not applicable to the students desired career destination. A classical approach to art, however, gives the student a springboard to explore various options with a visual vocabulary that will not restrict them to a specific artistic medium, be it oil, water color, pencil, or a software application such as LightWave. A classical approach gives you a philosophical understanding to translate or problem solve in a visually coherent manner, for it speaks in a universal language. Or using financial words, it improves a student's chances of being employed in their field of choice.

The importance of science

I have stressed aesthetic considerations; but there is also the practical scientific perspective. Basically, that is found in the good observational skill of determining what physical actions you will transfer, omit, or exaggerate into your virtual 3D creation. It becomes immediately apparent whether or not an artist has done their homework in regards to capturing the essence of a subject's motion. Sometimes, even the most basic questions have not even crossed the artist's mind, "Do I use realistic motion that imitates live action, or instead use classical principles of character animation?" It is one thing to understand one, or both, of the principles for the appropriate use of realism vs exaggeration. It's quite another to make use of the tools to construct the rigging to create motion in the first place. When we delve into the realm of visual effects in LightWave's layout, the more we understand the behavior of elements in the physical world, the better qualified we will be to translate those attributes to the virtual world. One of LightWave's strengths in visual effect areas such as particle emitters and texturing with Hypervoxels, are in the relatively easy learning curve and related options of these tools.

Becoming a good problem solver

The artist, or problem solver, must understand the basic fundamentals of the art; and having a basic grasp of science will be a huge plus. The exciting aspects of a 3D application such as LightWave, are personified in our ability to explore so many different areas, or concentrate on one and have a myriad of parameters to tweak to our heart's content. I once heard a lecturer say that the key philosophy to understanding and utilizing virtual tools is to approach it like a renaissance rather than an industrial revolution. In other words, the renaissance concept is one of re-discovering or grasping fundamental principles that already exist and applying them to a modern tool. An industrial revolution approach, is trying to reinvent a whole new infrastructure of understanding the tool. It's important to recognize that the end result of this project, like others I create with this process, will be a return to the 2D world from which my early sketches were born. The 3D world in which I projected will remain that of virtuality, while my dragon will find its wings spread into a reality that spans a six foot canvas, dressed in an oil painted skin, adorned in a succulent turpentine lotion. 

About Graham Toms

Graham Toms' family roots originate in County Down, Ireland. He attended the University of Ulster in Belfast, where he obtained his Bachelor of Arts majoring in illustration and animation. After graduating and working as an animator/illustrator in Ireland, he accepted a position at the Disney Institute in Orlando, Florida in 1995. He moved to the United States with his wife Helen, and taught animation at the institute for five years, also assisting with development of the curriculum for their animation classes.

It was there that he started exploring 3D applications in search of software that was easy to learn and instruct. And it was in LightWave in which he found that, and a lot more.

He now works as a 3D Educational Specialist at New-Tek, where he fondly expresses, "I love being an artist, and getting to play with all the new tools."

“ I HAVE NOT FAILED. I'VE JUST FOUND 10,000 WAYS THAT WON'T WORK. ”
THOMAS EDISON

Filing Teeth, Sharpening Skills

Ant & Len: A Short Film by Plastic Milk

By Ben Vost

Plastic Milk is an independent design and animation studio based in South West London, founded in 2006, and their latest project is a short about a couple of mischievous characters named Ant and Len. The company specializes in devising imaginative, stimulating, and entertaining ways to communicate ideas and information. Learn more about them, and watch Ant & Len, at: www.plasticmilk.co.uk

“Plastic Milk was effectively formed to create the first series of [the BBC Cbeebies children’s show] Numberjacks in 2006,” explains Duncan Raitt. “David [Raitt] had been freelancing in TV graphics for a long time and I had worked for him on and off for several years, both before and during university. Jon [Marsh] and I set up a partnership when we graduated in 2005, then in early 2006 we all joined up to work on Numberjacks, and Plastic Milk was born – although actually the name came a bit later. We’ve worked very successfully together on quite diverse projects ever since.”

What was the inspiration for Ant & Len?

The characters were originally created for a portfolio website that never got finished. The site’s menu was made up of old TVs on a set of shelves in a store room. When you clicked a TV the characters would run up to it and push it off the shelf, the TV fell towards the camera, then popped open a new window with a

video in it. If the mouse was left idle, the characters would entertain themselves by doing star jumps or hopping up and down on one foot while chewing the other foot. The web site ultimately proved too inflexible, but we fell in love with the characters and wanted to give them a new lease on life.

Was the film commissioned by the BBC?

No, it was originally intended as a viral video, to promote Plastic Milk. Although to date, it’s had more success at film festivals than on the internet – but that’s no bad thing. Jon and I wanted to try out some new techniques, work up the characters and get some practice writing and directing. I think projects like this are important because they allow us to keep moving forward in areas we want to explore.



Duncan Raitt, Head of Animation



Jon Marsh, Head of Interactive

Did you use LightWave completely for the animation?

All the animation is done in LightWave, the lighting uses HDRI and radiosity so we used HDR Shop to create the map for that. The compositing was all done in After Effects, as are the effects.

How was the LightWave workload divided up?

Jon is a bit newer to LightWave than me, he was teaching himself surfacing at the time, in particular the new node based system. He concentrated on that while I did the rigging and animation.

Was the set 3D?

[No.] it’s a walkway above the platforms at my local train station. The station is an old art deco building and the walkway joins the lifts that come up from the platforms. Most people use the steps so it’s pretty quiet. When I first saw the location it had the most amazing bright green algae on the floor below where the roof had been leaking, and I really liked the lighting. Unfortunately, by the time we got around to the shoot they had cleaned it, but it was still a great spot.

How long was the project in gestation?

It took a long time to make, maybe a year or two? I’m not really sure. We didn’t have a budget for it, so it was all done in our spare time and with favours from friends. The only thing we had to pay for was the HD tape transfer for the festivals. At times, we had to put it aside for long periods, 6 months or so, whilst we were busy.

Is it a genetic oversight that Ant & Len can reach their own feet to eat, yet can’t reach a stone on the top of their own heads?

Or indeed, that they have such big sharp teeth that they would struggle to talk or chew. I have always found the eyes, mouth, and eyebrows to be the most important features in character animation; they do most of the communication. I wanted to exaggerate these features, a bit like a cartoonist does with a caricature of a person.

There is always a temptation to make characters perfectly symmetrical; I think this comes from human instinct. Apparently it’s

what we look for subconsciously in a mate, because it means they are healthy. Generally, good looking people have very symmetrical faces. I find that if you break away from this, you start to get much more interesting looking characters and expressions.

What’s Ant’s interest in papier-mache?

He is an artistic kind of chap, he just likes to be creative. In contrast Len is, on the whole, a pretty destructive character. This touches on the character back stories, not much of which is shown in the film. The film is more of a first episode than anything else, although obviously we wanted it to work as a stand alone piece too. We have outlines for some more episodes that we would like to make, although I’m not sure we will do any more unless we can find funding for them. This one was pretty time consuming and we have loads of other things we want to do too. Spare time is not in abundance when you work in animation.

How did you build the rat?

Jon made the rat out of bits of rubbish he found lying around, it’s real. He’s more of a traditional artist than I am, he loves stuff like that. It only took him half a day, maybe we should have done the whole film with papier-mache, it might have been a lot quicker.



TriCaster TCXD850



A Sneak Peek at the Newest TriCaster Model

by *dthomas*

The TCXD850 is the newest model in the TriCaster series. It builds on the already very powerful TCXD300 design, adding an increased number of audio and video inputs/outputs as well as implementing other enhancements. This article will focus on the differences in this model, while a comprehensive review of the TCXD300 is provided on the following pages. At the time of writing, the TCXD850's feature set and user interface had not been finalized – therefore, some images in this article are mock-ups only and subject to change. While we have made every possible effort to insure the information provided here is accurate and complete, please refer to the latest product information and specifications for this model.

This is the first, and currently only, TriCaster model to be offered in a standard 19" rackmount enclosure – four rack spaces tall. The new design accommodates a plethora of audio and video connections, and allows for much simpler integration into existing studio cabinets and other setups. It has approximately 32 hours of 1080i recording capacity (2 TB) – easily expanded via three hot-swap SATA-2 drive bays on the front of the unit. Redundant power supplies are provided for increased reliability.

AUDIO AND VIDEO



Video input and output connections, located on the back of the unit, are very similar to that of the TCXD300, increasing to eight simultaneous (HD/SD) inputs, and maintaining the three session defined simultaneous analog/digital outputs. An HDMI program output has been added for video projection or other use, in addition to the VGA output. Tally light connectors and a genlock input are also included.

Sixteen analog XLR audio inputs, with options for mic/line impedance, variable gain, pan, and phantom power, can be configured in a variety of ways to provide mono, stereo, and/or quad inputs as needed. Eight AES/EBU digital inputs (4 channel) are available as well. The eight digital SDI video inputs can also carry embedded audio (4 channel).

Primary program audio output is offered through four analog XLR connectors (4 channel), and two (2 channel) digital BNC connections. Additionally, four analog XLR outputs are provided for external audio processing, secondary monitoring, or isolated output. These are user-configurable to send

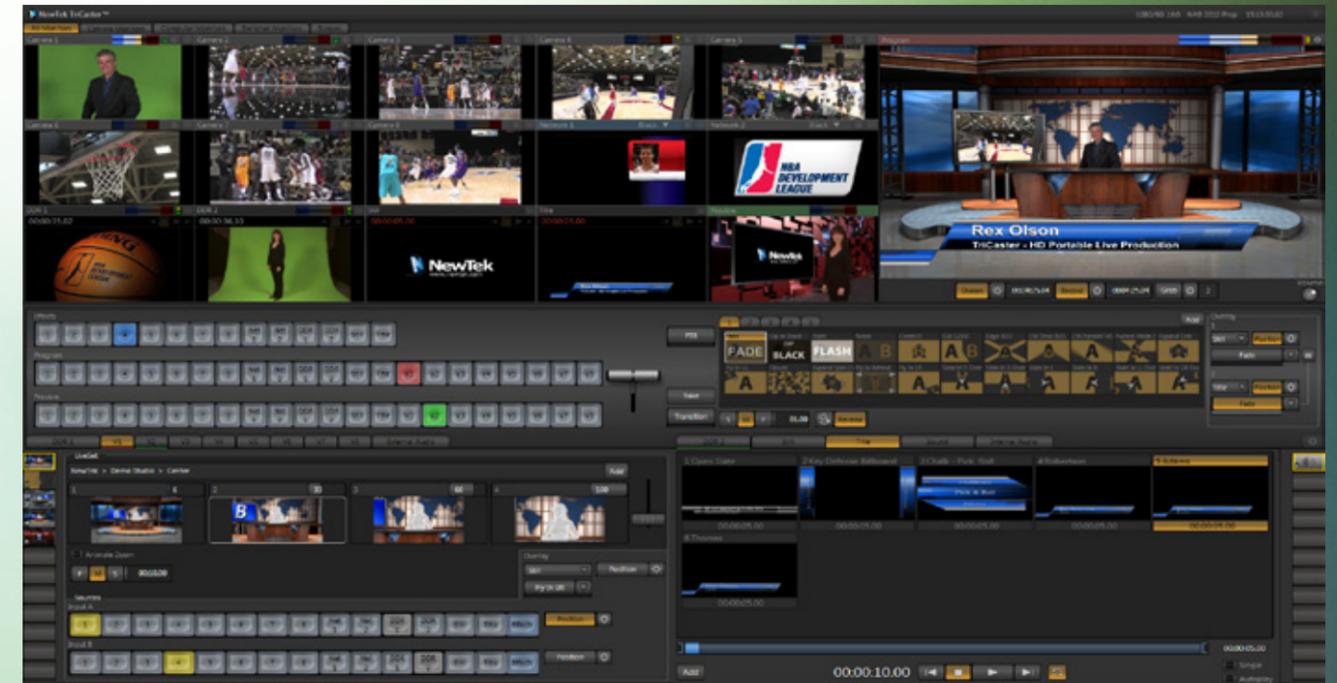
output from the various internal sources (DDR, Sound, etc), main audio output, and other modules. A 1/4" stereo headphone output is also provided.

To simplify use of the increased number of audio inputs and sources, the audio mixer interface has been split into internal and external audio sections. These can be displayed independently or locked together for simultaneous view. Additionally, a quad input mode is provided for merging two adjacent input pairs (2 channel) into a single four channel input. A preset bin is shared between the two sections; and a clever new feature will gradually transition between the settings for gain, balance, and pan from the current preset into the newly selected preset.

SWITCHER



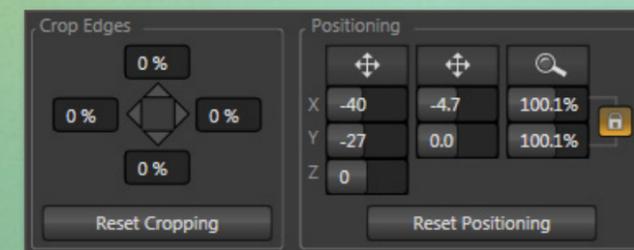
The switcher has grown to 22 inputs – now including dual DDRs, dual network sources, and eight virtual inputs. Particularly useful is the ability to customize the name of inputs and sources on the monitors and source selector popup menus. For example, 'Camera 1' could be labeled as 'Close-up Left' or 'VT[5]R Deck 1' – depending on your use of the inputs. An abbreviated nickname can also be defined for use in limited space display areas, such as the switcher's source selection buttons.



INPUT AND SOURCE MONITORING

The monitoring section has been expanded and reworked to allow at-a-glance views of related groups of sources. The All Monitors view includes small displays for: Inputs 1-8, DDR 1-2, Stills, Titles, Network 1-2, and Preview. External Sources: Has medium displays for each of the eight video inputs. Internal Sources: Has medium displays for DDR 1-2, Stills, Titles, and Network 1-2. Switcher Monitors: Has large displays for Effects, Preview, and Program. The Preview Scopes view is no longer specifically tied to the preview bus, and instead can monitor any of the standard external inputs and internal sources. These can also be set to show in full color or a specified monochrome color.

Similarly, in dual monitor mode, the expanded desktop display provides additional monitor views in several configurations offering everything from individual program, preview, or effects; to all-in-one monitoring of internal, external, and network sources, plus timecode and a clock.



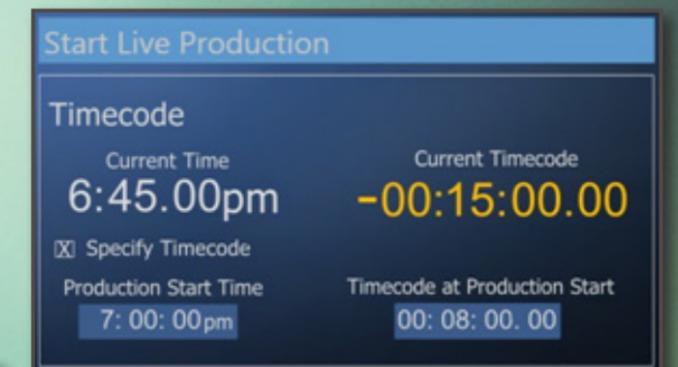
OTHER ENHANCEMENTS

The overlay system has been enhanced to include edge cropping and 3D Rotation (X/Y/Z) in both the standalone overlays and the virtual input overlays. The related effects menu has been simplified to include the five most recently used effects, and access to a browser for selecting others. Cross-fade and cut effects are also immediately accessible here.

The already very impressive LiveMatte keyer has had its spill suppression improved for even better quality – particularly with blue-screen backgrounds.

The virtual LiveSets have a new Cue Auto-Zoom feature which, when activated by a switcher take or transition (on or off), will automate a zoom to/from the currently active preset, respecting the currently established zoom timing.

Proc amp settings include a simplified white balance method which allows direct selection of the color parameter from a monitor. As well, all proc amp settings are now stored for each connection type, so switching assignments will recall the previous settings.



Sessions now have associated timecode which is recorded into video files, and displayed on the live desktop. This can also act as a countdown timer for production start.

The ability to play audio files was previously provided through the stills module – this has now moved to a new sound module.

New functionality has been added to simplify webstreaming – allowing configuration and connection testing, as well as the creation of presets for specific streaming services and content delivery networks (CDN). Stream profiles are provided for various formats; but, they can also be imported. Support has also been added for cropping 16:9 video to stream in 4:3.

CONCLUSION

The TCXD850 catapults the TriCaster into an even higher level of professional broadcast production. In particular, the expansion to eight video and virtual inputs, dual DDR and network sources, and 3D rotatable overlay enhancements add to the already established mighty force that is the TriCaster.

TRICASTER TCXD300

Simplicity, Flexibility, Creativity

AN IN-DEPTH LOOK AT THE NEXT GENERATION TRICASTER

by dthomas



I'm not your typical video production guy, or maybe these days I am? That is to say, rather than focus my work in one specific area, I've chosen an approach that allows me to do a lot of different things all the time. This has a lot of benefits, but also some drawbacks. For example, it tends to mean that I don't have a lot of time to spend figuring things out when taking on a spur of the moment project. So, in order to get the most out of such an approach, I endeavor to surround myself with rock solid reliable, and simple to use, but powerful in functionality, tools. The TCXD300 is the latest such device in my studio.

As a user of earlier TriCaster models, I was a bit thrown off initially by the workflow of the new design. But, once I poked around a little it began to make sense. In all likelihood, if I'd never seen a TriCaster before this model, I'd have fallen right into the workflow as quickly as I did when I first used an earlier model. When it seems like you can't do something you want to do, it's usually just a matter of finding a nearby gear button – under which all kinds of fun can be found. While not necessarily obvious at first glance, this approach allows a lot more functionality to be offered into a less cluttered and less confusing user interface. Simplicity and flexibility.

But, I'm ahead of myself, so let's back up a bit here and explore what the next generation TriCaster XD300 has to offer.

SESSIONS



Previous models used an integrated tabbed interface including Live Production, Capture Media, Edit Media, and Edit Text within the main application. This has been replaced by a new session management system with those tasks separated into independent modules.

Sessions, at their very lowest level, are based on a resolution selection from one of: HD 1080i, HD 720p, SD 16:9, or SD 4:3. Additional options are also available on the multi-standard version. This in no way limits the cameras you can connect or file resolutions you can work with within the session, it simply defines the main format in which the system will operate (recording, video output, etc).

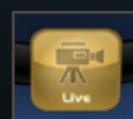
All resolutions can be intermixed in projects with automatic scaling/cropping/letterboxing to fit the specific session format. For example, if you are in an SD 4:3 session and play an HD 16:9 video file, it will be automatically scaled and cropped appropriately – with very high quality conversion.

A session stores a complete setup of media content and settings for each of the system modules (Live Production, LiveText, SpeedEdit, etc). This means, for example, that you can customize the system environment for a specific broadcast location, or specific presentation, or even for different users of the system. It is similar to the concept of user logins on the Windows OS, where each user can customize their favorite desktop background, fonts, etc.

Sessions also include backup and restore functionality. This is particularly great for off-lining projects, moving a session to another TriCaster, or for just making sure all your hard work is safe on a secondary storage system. The backup function allows you to specify whether to backup all data, including non-local media files, or to only backup the local data.

Once you define a new session, or select a previously created one, you are presented with access to four modules: Live, Graphics, Edit, and Manage.

LIVE PRODUCTION



The Live Production module is where all the input/output connections and internal modules are brought to life – and where all the action happens. It includes everything you need to produce a high quality broadcast, bringing together external connections (cameras, video playback devices, remote laptop presentations, etc) with switching, digital recording, stills and titles display, audio mixing, overlay generation, keying, webstreaming, video effects, as well as waveform and vectorscope monitoring.

INPUTS / OUTPUTS



Video inputs are supported through three simultaneous (HD/SD) connections: SDI digital video, component, svideo (Y/C), or composite. Tally connectors are provided with program/preview led indicators, and a genlock input allows for external reference signal sync. As with previous TriCasters, iVGA technology allows for video input of the screen from a remote networked computer.

Video outputs depend on the type of session that you are using. When in an HD session, two channels of HD video and one channel of SD video can be output simultaneously. Since digital (SDI) and analog output (component) are both possible, this provides a total of six simultaneous outputs. In an SD session, three channels of SD video are output, and each can be set to component or svideo + composite output. This allows for a possible total of six or nine simultaneous outputs.

Three independent audio inputs (4 channel) are provided through digital SDI (embedded) and AES/EBU, or analog XLR (2 channel with/without phantom power) and 1/4" balanced phone jacks (4 channel). Outputs are similar, with the exception that there are no XLR outputs. 1/4" balanced auxiliary outputs (4 channel) are available for external sound processing (EQ, reverb, etc), and a 1/4" headphone connection is also provided.

A VGA output connector on the back can be used to feed the program output to a VGA projector, or similar device, with up to 1920x1200 resolution.

Firewire (IEEE1394) is available for video capture only. It can not be used for a live video feed.

INTERNAL SOURCES

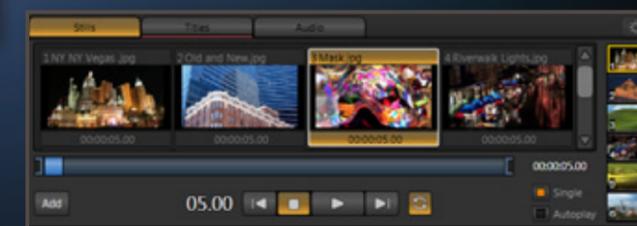
In addition to a multitude of external input source options, several internal sources are integrated into the system, including modules for multimedia playback, image display, and overlay titling.

One exciting feature that is common with all these elements is the quick access preset bins. After configuring the module, whether it's a sequence of media files playing in slow motion, a slideshow presentation, or a complex virtual input, a single left-click on the preset bar (located on both sides of the lower section of the user interface) adds it as a preset with a thumbnail image and, by default, a number. Presets can be exported for use on

another TriCaster, to another session, or imported back into another preset in the same session. They can also be renamed and deleted.



The DDR provides the ability to play individual or sequences of video clips. Controls are included for looping, speed (25% to 400%), and setting in/out points of each clip. A progress bar indicates the play position within the current video clip. An autoplay mode plays the current clip when transitioning to the DDR, automatically returns to the preview bus selection when it finishes playing, and then cues the next video clip in the DDR.



The Stills section acts similarly to the DDR, displaying images (with/without alphachannel) for assigned durations individually or in sequences. Stills can be easily grabbed from the live switcher's program out into the current stills bin. Audio files can also be played by this module – providing an easy way to add background music, ambience, or other sound.



The Titles area is for displaying customizable templates, typically used in conjunction with the overlay system for lower thirds and other such graphics. Templates of a variety of styles are provided, but new ones can be easily created. Customization options include image insertion, font selection, point size, and styles (bold/italic/underline). Particularly helpful is an automatic spell checker/dictionary to help prevent accidental typos when making quick changes in a live production.

Stills and titles can be intermixed in the Stills/Titles/DDR sections, so you're not restricted to the specific type in each section.

SOURCE CONFIGURATION

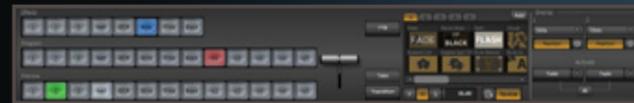
All video sources include configurable settings for brightness, contrast, hue, saturation, and white balance. Additionally, the LiveMatte keyer provides controls for color selection, tolerance, smoothing, and spill sup

pression. These parameters make simplify keying out your green screen, for example. Garbage matte settings make it easy to crop out unwanted areas of the source. A variety of green screen video, playable in the DDR, is included for experimenting with positioning for your own green screen setups.



For audio, a basic mixer is included which provides controls for vu meters, volume, gain, panning, mono, and mute. Equalization, available in previous TriCaster models, is no longer provided. The follow feature automatically crossfades audio between whatever is currently on the program bus and the source that is selected next. A convenient talkover mode automatically dips all the other audio channels to allow a voice-over to be the prominent focus. Master volume can be accessed within the mixer, or directly on the program out monitor for when the mixer is out of view. As with the internal sources, preset bins provide a way to store configurations for quick access.

SWITCHER



The switcher is the main area for routing external (1 / 2 / 3 / Network) and internal sources (DDR / Stills / Titles / Black / V1-V5) into the program, preview, and effects busses. The names of these sections have changed several times through previous versions of the TriCaster (Live/Next, Main/Preview, Program/Preview) but the functionality has remained the same.

To spice up transitioning from one source to another, you can easily integrate a variety of digital video effects, selectable from five banks, which can be customized to your specific needs. These include a lot of the standard wipes, spins, fades and such as well as some more unusual, and probably rarely used, effects such as clouds and sheep. Transitions are variable speed and they can be optionally set to play in reverse or to ping-pong (fly in, fly out).

The switcher also includes a dual downstream overlay system, an exciting bonus for users of previous TriCasters where only one overlay was possible. A lot of new functionality has also been added here too. Instead of just fading or immediately displaying the overlays, they can now be independently animated in and out of view with a variety of preset transition styles. Particularly powerful is the new ability to zoom and position each overlay. This makes creating picture-in-picture displays very simple. A needed, but missing feature here is the ability to add a border around the overlay to make such displays look more professional. This could be achieved using the second overlay, but it would seem a common need that could be simply included. Any source can be assigned to an overlay, with or without an alphachannel present. They can also be set to feed from the effects bus, which makes overlay sources single-click simple to change.

The overlays can be manipulated independently or locked together to appear/disappear simultaneously. While dual overlays is powerful in itself, it's actually possible to have five – we'll discuss that a little further along.

VIRTUAL INPUTS



One of the more interesting new features is virtual inputs. Some of this functionality existed in previous TriCasters, but this new approach is simpler to use, and offers a lot more flexibility and creativity. Five virtual inputs are provided, allowing you to combine any two switcher sources with independent zoom and positioning.

Particularly exciting is improvements to the LiveSet virtual sets, which is now integrated into the virtual inputs. These include network television style anchor desks, chat show sets, double box (picture-in-picture), and split screen displays. The functionality offered previously has been reorganized so that you no longer have direct access to multiple angles of a set (Center / Left / Right) in the same user interface section. Instead of multi-angle access, the virtual inputs now provide immediate access to four definable zoom positions. However, if you want to use more than one angle, or variations of the same set, you can place them each on a different virtual input, and switch between them instantly. One added benefit of this approach is that you can now transition between angles. The preset bins can be used similarly, offering a lot more virtual input configurations; but, since they are not cached, changes don't appear on the program output with the same immediacy.

LiveSets now also provide the ability to do live variable-speed zooming. This feature really has to be seen to be appreciated. As with other new zoom functionality, this is very high quality, top-notch fun. Zooming is independent of each virtual input, so it is possible to transition from one in progress zoom, directly into another.

A third (upstream) overlay is also provided here with the same features as the switcher's (downstream) overlays. And if that isn't enough... the default LiveSet (A over B) allows for two more – which makes for the somewhat amazing capability of five simultaneous overlays.

Using multiple virtual inputs you can create more complex camera sets. For example, by using the same virtual set on two or more virtual inputs you can easily switch from a two person shot to a one person shot. Or you can use different virtual sets for each virtual input to give the impression of a much larger studio environment. Different configurations of virtual set themes are also provided, so you can select a desk set and combine it with a picture-in-picture close-up shot of the same style.

I'm not a big fan of the behind-the-desk style virtual sets. The realism for me is lost in the fact that there's no interaction possible with the desk. Alternatively, some other options are included; my favorites are City Loft and Sky Box, which are more casual and offer space for positioning furniture as part of your green screen set. But, everyone has their preference, and there's something for everyone here I should think.

MONITORING



With so much going on, and so much power at your finger tips, it's important to be able to keep everything in check. Several display setups are available for monitoring the inputs and preview/program busses. The user interface provides for a single or dual monitor display with options for an all-in-one display or a two monitor expanded desktop display (with monitoring displays on the second monitor). Note that when this dual monitor mode is used, the program output to VGA is not possible.

With either setup, there are three monitoring display configurations to choose from. All Monitors: Has small displays for Inputs 1-3, Network, DDR, Stills, Titles, and Preview; as well as a large display for Program. Switcher Monitors: Has large displays for Effects, Preview, and Program. Preview Scopes: Has medium displays for Waveform, Vectorscope, and Preview; as well as a large display for Program. In all modes, audio vu meters are displayed along with the video.

When making use of the dual monitor display, the main monitor section can be collapsed out of view, giving the switcher and other source areas the full screen.



Vectorscope and waveform monitors are also provided for fine tuning your video. Unlike standard monochromatic monitors, these displays are provided in full color. One great use for this is assisting with green screen adjustments. You can easily see unwanted green, spilling onto the people in the shot for example, and while adjusting settings in LiveMatte easily suppress it.

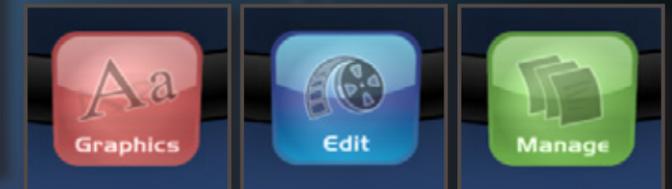
RECORDING / STREAMING

In addition to various external connections that the program output can be routed to through the front panel, it can also be simultaneously recorded to hard drive and streamed online. Video recording is in full resolution MPEG-2, with an approximate capacity of 18 hours at 1080i HD. The format is determined by the session definition. You can optionally record a separate audio track in mp3 format, or record audio without video. Particularly

handy, when you want to be able to quickly recall a recorded live event, is the "Add to DDR Playlist" function which upon ending a recording cues it up in the DDR for immediate playback.

Web streaming supports server push and pull, and can be output in Windows Media or Adobe Flash format with a variety of provided profiles. The stream is automatically recorded for archival video-on-demand use.

GRAPHICS, EDIT, AND MANAGE MODULES



Three additional modules fill out the main set of tools. The Graphics module is similar to NewTek's standalone application LiveText, with the main exception that it does not have the network (iVGA) live output. It is provided for designing graphic overlays, titles, scrolls, and crawls. Previous TriCaster users will recognize it as being very similar to Edit Text, or CG Designer on VT[5].

The Edit module is a compatible implementation of NewTek's standalone application SpeedEDIT 2. It provides an HD/SD non-linear editing environment with both storyboard and timeline based editing for pre/post-production workflow. It is simple to use and powerful in functionality. A more detailed overview of SpeedEdit 2 can be found elsewhere in this issue.

The Manage module is the main area for organizing and importing media files and other content related to the session. Files are organized within the current session folder, but you can easily retrieve data from other sessions. Some of the functionality here can also be accessed in similar ways within the Live module.

CONCLUSION

NewTek has gone to great lengths to insure real-time performance of the system. A perfect example is taking into account the little known fact about the Windows OS that for a period of time after booting/restarting, every task is forced to run at low priority. This means that it can't be guaranteed that applications will have the full resources they request right away. To alert you to this issue, a warning notification "Initializing TriCaster..." is presented on the Live interface until the system is fully up to speed (typically under 60 seconds). During this short period, you can still use all the features of the system – no limitations are imposed.

What particularly stands out in this model is the focus on simplicity, flexibility, and creativity. It is the special attention to detail, and a powerful feature set that put the TriCaster in a class of its own. 

TECHNICAL ASPECTS OF THE TRICASTER TCXD300/TCXD850 SIMPLIFIED

by *dhomas*

While NewTek has gone to a lot of effort to simplify the TriCaster so that you don't have to worry about the technical aspects of what's going on, sometimes it's good to know a little something about what's ticking inside. After all, the TriCaster may seem like a portable size metal box box stuffed with a dozen video production crew at your beck and call; but, in reality... wait, have you peeked inside the ventilation grate?

Let's examine a few key aspects on the technical side. Keep in mind the intention here is to drastically simplify the technical, so these discussions are not to be considered completely accurate representations of the topic; but rather basic concepts only.

FLOATING POINT AUDIO

Why is floating point audio important? The big benefit is that it allows for very high precision calculations that won't suffer from clipping (distortion) during internal processing. Imagine for instance that you have an input, you can set that input's volume to +200dB and the main output volume at -200dB, an extraordinary boost/cut that results in no actual volume change (+200 + -200 = 0dB), without worry about the signal being degraded as part of the processing chain. Basically, it gives you unlimited dynamic range.

YCBCRA 4:4:4:4

The newest TriCasters do all video processing in 32-Bit floating point YCbCrA 4:4:4:4 format. But, what does that mean? YCbCrA refers to a color space used to store image data. Y is the luma (brightness) component, and Cb and Cr are the blue-difference and red-difference chroma (color) components. The A indicates an alphachannel component.

What do all the fours mean? The numbers indicate the accuracy of the data – the higher the number, the more accurate it is. Imagine that you are applying some effect to a video image and working in 4:2:2. This means that color data is only stored every two pixels, so some quality is lost immediately. If you now have a transition that warps the image, it will get degraded further in the calculation process. Each additional step that does anything non-trivial to the image degrades it even further. So, even if your end result is intended to also be 4:2:2, there was still quality loss throughout the processing. If the processing had been done in 4:4:4 then there wouldn't have been any data loss. Also, when chroma-keying, if you work in 4:4:4 you have alpha information for every pixel. In 4:2:2 you only have it available for every second pixel.

MPEG-2: HIGH VS NORMAL

Wouldn't I always want to use high quality for the best mpeg possible? The Normal and High quality options in the record configuration refer to mpeg standard specification profiles. The Normal profile uses 4:2:0 encoding, while the High profile uses 4:2:2. Unfortunately, most non-NewTek video applications don't support the High profile format; therefore if you want to use recorded files with other applications you'll want to choose the Normal option. If you intend to stay within the NewTek video application realm (SpeedEDIT, VT[5], TriCaster) then the High option is the best choice.

COLOR VECTORSCOPE AND WAVEFORM MONITORS

What's the benefit of using color vectorscope and waveform monitors? Normally, a waveform monitor only shows the luma information. Yc scopes also exist, which show a modulated color signal with dips and peaks corresponding to the color saturation; but the modulated signal overlays more lines on the scope making it more difficult to discern what's what. If the picture has some green in it, and you don't want that (such as for green screening), it is impossible to see where that is on the scope. Having a color waveform monitor resolves this difficulty.

The exact same problem exists for the standard vectorscope. Normally, all you see is the chroma information, luma is lost entirely. So, black, grey, and white all share the same center spot on the vectorscope. Having a color display lets you see more clearly where different components of the image actually end up on the scope so that you can correct them.

64-BIT NATIVE ARCHITECTURE

What is the benefit of 64-Bit over the previous 32-Bit standard? There are two areas of significant benefit. First, memory is no longer limited to a maximum of 3 GB. Secondly, while 64-Bit in itself is not inherently faster, the 64-bit instruction set allows more complex software programming. This results in about a 45% speed improvement in MPEG encoding, for example.

UPSTREAM AND DOWNSTREAM OVERLAYS

What's the difference between upstream and downstream overlays? Upstream overlays are within an input, so you can put them over a video source – a news anchor's name, for example. When you transition to another source, the overlay is transitioned out too. Downstream overlays sit above everything, so no matter what you are doing with transitions, they continue to show. An example use of this is for a station logo, news ticker, or clock overlay.

MORE, BETTER, FASTER

AN OVERLOOK AT SPEEDEDIT 2

BY *BOHUŠ BLAHUT*

SpeedEDIT has made its mark as an editing powerhouse, and has remained a secret weapon for a lot of us editors. It's back with version 2, so it's now even better. There are a lot of options out there in the realm of editing – costing anything from free to several thousand dollars, so let's take a close look at the new and previous features and see why it's a deserving choice. Like other NewTek products, SpeedEDIT 2 is easy and fast to get into – even for your first project. There is a lot of power under the hood. Getting through the basics of editing is zippy fast – you'll make fast work of razoring and shifting footage around to build your edit.



User interface flexibility

A particularly nice feature is the flexibility you get with the user interface. By default, there are two independent views, one on top of the other. In each, you can select an editor display (Storyboard, Timeline, or Spreadsheet), the Control Tree, or a Filebin. If you want two Timeline views of the same project, you can do that. If you want side-by-side views, a double-click of the mouse and you have that. If you want only one view, again just a double-click and there you are. Need to squeeze 12 layers into the view... feel free to do it. If you need to work with multiple projects at once, you can even run multiple instances of the application. There are a lot of options here, and they're quickly accessible too.

Capturing and importing video

One of the major areas of improvement in the new release is getting video into the editor in the first place. If you're importing footage from a camera, you'll see improvements in the capture window right away. The preview screen is re-sizable, displaying in both 4:3 and 16:9 as big as you need it. No more squinting at a tiny thumbnail and hoping that you grabbed the right tape!

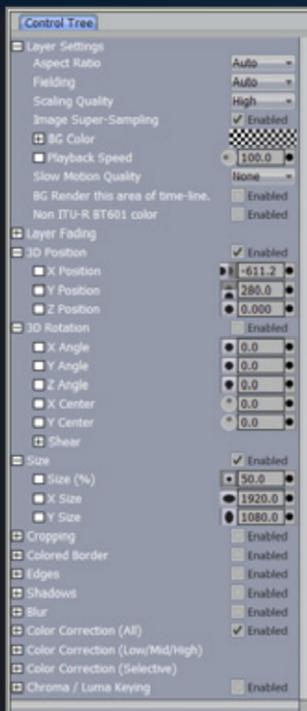
If you're importing video clips, that's even more reliable too. This is one area where the program really shines. We live in a world of many flavors of codecs, from the common, thru slightly off-kilter variants, right on into the wild and wacky oddball rarities. It is not necessary to convert your files into a single codec to be able to take advantage of real-time editing – an approach that takes a loss in both time and image quality. Just drag and drop video files of most any kind into the editor and away you go. A lot of video formats are supported in enhanced ways internally; but for those that aren't directly supported, codecs installed on the OS will be used. Enhanced support has also been added for Cineform AVI, AVCHD, JVC GY-HM100/700, QuickTime, MXF, and XDCAM HD. Also, if you need to convert or combine video clips for distribution or some other purpose, you can easily do that right in the Filebin.

In my own work, I found that MP4 and Flash videos are much more responsive. Some of my clients gather footage using their

pocket video camera or cellphone. They seem to think they're doing me a favor by providing video that's heavily compressed. Not only is the image quality not the best, but MP4's are typically difficult to edit for a number of reasons. But, SpeedEDIT is able to scrub through these heavily compressed scenes as handily as any other formats. And the real-time image correction controls do wonders to improve image quality. These days I always carry around a Kodak Zi8 HD pocket camera knowing that I can use impromptu footage from this camera in edited projects without slowing down my workflow.

Some other importing niceties are included as well. For example, the ability to load numbered sequences as a single video clip and play them instantly, regardless of resolution. Also, a new find function allows you to scan multi-level directory structures on some cameras (such as the Sony EX series) to access files more easily.

The Control Tree

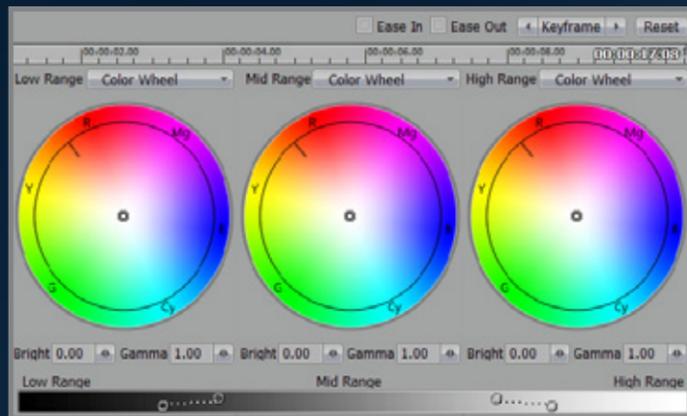


Clip settings, effects, and color correction

Once you've got your basic edit done, it's time to do those enhancements that every project longs for. The Control Tree provides easy access to a lot of real-time settings and effects. Instead of hunting around for the specific effect module to apply to a clip, they're all right there for every clip. Besides the usual resizing and positioning controls, you have access to a very extensive suite of color correction, chroma/luma keying, blurs, shadows, and more.

All these settings can be keyframed and animated over time with the help of an interactive graph illustrating chosen effects and their keyframed values on every frame.

You'll find that keyframing is a great way to achieve speed-ramping effects, for example. Your clips can gradually and gracefully go from full speed to slow motion. The speed effect has received a makeover as well. Few video cameras out there shoot at anything other than 30 frames per second, so for slow motion effects we need to generate more frames to slow the action down when played back at 30 fps. Rather than simply repeating frames, new frames can be generated based on interpolated



3-Band Color Correction

motion between frames. This creates a much smoother look. There is also an option for enhanced sharpness which is very useful for sports, nature videography, or other detail-oriented work.

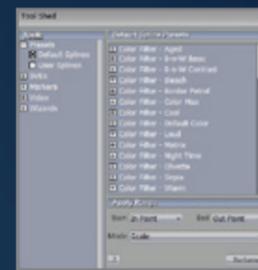


Keyframable clip settings

I have a lot of stock production elements that are SD quality, but are still useful because of how they can be handled here. Typically, upscaling these to HD resolution, without a loss in image quality, requires some rather elaborate plug-ins; but here you get excellent scaling algorithms built-in, along with controls for sub-sampling the image to maintain integrity. Overall, this can help an SD shot pass in an HD project. Obviously, it's always best to work from the start with HD source material in an HD project, but the inclusion of such high quality upscaling preserves my longtime investment in SD stock footage.

There's also a collection of video effects you can drop into the editing views, including: color tinting, patterns, solid colors, transitions, crawling and scrolling text, and titling. Audio effects, such as: Compression, Delay, Reverb, EQ, Warmness, and support for standard VST audio plugins, are also included.

The Tool Shed



Tool Shed Color Filter presets and much more

The Tool Shed is your mighty macro workshop – and you don't even have to be a programmer. Included here are several pre-built animated effects as well as some cool visual looks. Want your video to look like The Matrix? Or how about the grainy blown-out look of bleach processed film? It's all in there, and you can create plenty more of your own. Even more powerful are functions

like automatic image stabilization, and building a music video or audio slide show with just a few mouse clicks. While listening to a track of music, simply tap out the beat on the keyboard to drop edit markers. Tool Shed will take your video clips, trim to the right lengths, and insert them on the beat with your choice of transition. Instant music video!

You can also snapshot the Control Tree settings of any clip, and apply them instantly to any number of selected clips. Simply adjust a single clip until you like what you see, and create your own custom Tool Shed preset. Then, just apply your color correction, position, FX, and other settings to any clip(s) in a project in just a few seconds. See the results immediately in real-time.

Sub-Projects

Because my editing style tends toward a multi-layered composited look, my timelines can stack up pretty quickly. To keep your editing space tidy and thus easier to navigate, there is the Sub-Project. Simply select multiple clips, click Sub-Project, and they'll be grouped together as a single clip. You can still expand the sub-project to make adjustments to the individual components. The Control Tree can be used to modify your entire sub-project in real-time... everything that you can do on individual clips you can also do to a sub-project.

Real-Time Creativity



Easy multiple video picture-in-picture

Being able to preview all of these elements at play together in real-time is a huge asset. This kind of immediate feedback encourages experimentation, and we all know that the best projects come from having time to try out a few creative things non-destructively.

Of course, the number of video layers and effects you can adjust in real-time is determined by the specifications of your computer. Machines with more oomph will be able to handle more layers of video in real-time. For those sections of a project that your machine can't quite handle in real-time, there's an intelligent background rendering system. In the Preferences, you can specify only to render when you have more than four HD streams on top of each other. Or you can force background rendering of specific sections on the timeline to improve playback. You can also deactivate background rendering altogether when you don't need it.

Resolution Independence

Today we are all editing for multiple end uses, so resolution independent workflow makes it easy to create projects at any size and with in any codec. I shoot and edit primarily in HD, but sometimes need to output an SD 4:3 version, and reduced size versions for handheld devices. I've found that it's often better to reframe for smaller devices such as phones and iPods. This used to involve a lot of unnecessary duplication of work, but a real-time design lets editors experiment freely to find what works for specific displays. You can dial in your own specs for your end product, or use one of many easy presets for saving out to specific aspects and formats. So now you can edit your project once, and then just save out master videos for Blu-Ray, iPod, YouTube, and even transcode to PAL!

In the End...

There are a lot of options out there for editing video. In my own work I've used a lot of them, but I find myself relying on Speed-EDIT more and more. This is the first time in a long time that I've felt re-energized about editing; like some of the fun is back. I've been disappointed by other software's generous definition of real-time. Having to sink hours into transcoding everything into a single codec, and losing visual quality in the process, isn't my idea of getting things done quickly. Absolutely, there are features I'd still love to see in this application; but, I can say that about every program I use. This works as fast as the ideas I throw at it, and that instant feedback, even on complex projects, is a huge asset that's changing what I expect from editing software. In the end... SpeedEDIT continues the NewTek tradition of empowering editors to say yes to taking on more projects, yes to more creative exploration, and yes to the fun that lured us into this kind of work in the first place.

TIPS AND TRICKS

FOR LIVETEXT, IVGA, TRICASTER, AND VT[5]

The Second Overlay Layer by John Powell

If you have a TriCaster, or VT[5], with LiveSet technology, you may not have realized that in addition to the powerful virtual sets it provides, it also has a not-so-obvious feature that provides a method for adding an overlay on individual inputs. In combination with the switcher overlay, this gives you two overlay layers.

Here's how to use it on the TriCaster... Go to the 'Edit Text' tab and create a single or multi-page overlay. When you're finished, click 'Export Project for Live'. If you've done this before, you'll be presented with the option to Replace or Append. Choose whichever



option suits your needs. Next, return to the 'Live Production' tab, and select the 'Input Setup' tab to access the LiveSet features. Choose any Input and enable LiveSet. Then in the Scene selector, choose 'Edit Text Desktop'. The Shot selector will now list pages ordered numerically starting with 'Text Page001' and thumbnail previews are shown for each. These are the overlay pages you just created. Select whichever overlay you want for this input. Now, whenever you use that input on the switcher, the chosen overlay will also automatically appear.

On VT[5], the process is the same, except that you use 'CG Designer' to create the overlay, and 'File > Export Project to LiveSet', to save it. In the 'Input Setup' module, select 'CG Designer' as the Scene, and the overlays appear under the Shot selector, numerically listed starting with 'CG Designer001'.

Using LiveText on a Netbook BY COLIN SANDY

The recent introduction of low cost, ultra portable netbooks have offered some interesting possibilities for production workflow – particularly with applications like LiveText. Most netbooks can handle LiveText's minimum system requirements; the biggest

challenge though is screen resolution. While the CPUs in most netbooks are powerful enough to handle LiveText, the installer won't run unless the computer has a minimum resolution of 1280 x 800.

I use LiveText on an Acer AspireOne netbook. Its 8.9 inch screen has a maximum resolution of 1024 x 600 – but there's a way around that. The graphics chips built into many netbooks can typically handle display sizes as high as 1920 x 1080. If the physical screen can not display that resolution, the desktop will allow you to pan/scroll to reveal the off-screen areas. Here's how to do this with Windows XP, which is the typical netbook OS: Right click on the desktop and choose Properties, then select the Settings tab. If you can't increase the Screen Resolution setting here, click Advanced in the lower right corner to access additional options.



Additionally, you need a CD/DVD drive from which to do the install. Because netbooks generally don't have these drives, you will either have to copy your installation files onto a USB storage device from another computer, or find a USB CD/DVD drive to attach to your netbook.

Using iVGA over FireWire BY COLIN SANDY

iVGA can be a particularly intensive network bandwidth hog, particularly with standard 100 Mbit/s networks. Not too many people realize that networks can also be run using FireWire (IEEE1394) connections available on most computers. And typically, it's enabled by default in the OS. On Windows XP, settings for this are located under Control Panel > Network Connections > 1394 Connection.

This is an easy solution, requiring only a standard FireWire cable and two computers with FireWire ports. This method is ideal for creating a high-speed network connection between a computer running an iVGA application and a TriCaster or VT[5]. This can alleviate issues with network flooding, allowing the bandwidth to be used for live webstreaming, and can also simplify issues related to firewalls.



If you have Gigabit ethernet on both your main and iVGA systems and you're able to use them – that would be your best bet. For other scenarios where you want the best throughput possible (for example: scrolling/crawling titles in LiveText), give the FireWire network option a try. ☺

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Show Me That Again, Fast, But Slow

On the Road With 3PLAY *by John Strauch*

I could start this article with some cliché comment like... slow motion is to sports what blah blah is to blah blah, but if you have ever watched a sporting event, you already have a good grasp of the significance of slow motion replay in sports.

NewTek has been building TriCasters now for a number of years. But, there was still one thing that continued to plague the sports producer, and that was the affordability of slow motion instant replay. NewTek's initial solution was the TimeWarp accessory, but it was limited to single camera capture and SD resolution. These days, the expectation is for multi-camera recording and HD resolution. And thus 3PLAY was born – a low-cost, portable, standalone box, with up to 3 camera non-interrupted HD or SD recording, and high quality slow motion instant replay.

A lesson about gender

The first “big show” that 3PLAY appeared at was in the Alamodome in San Antonio for the U.S. Army All American Bowl Game. This is the high school bowl game for the best football players our nation has to offer. I was tasked with instructing a group of students how to use 3PLAY at this event. I did the first quarter

while they looked on, putting the results on the big screens overlooking the field. When it was time for the second quarter, the first young man stepped in. I think he was just a tad intimidated that his work was going to be viewed by thousands of people there at the stadium on two monster jumbo monitors on ends of the field. He had me with him for five minutes and then was anxiously pushing me away. I was a bit concerned at first, but I sensed the light bulb going off in his head – he did the rest of the quarter without me having to hover over him... that easy. Third quarter came and it was a young lady's turn. She caught on right away. Girls often do with things like this, if given the opportunity to do so. Girls have no preconceived ideas of what is supposed to happen. They take direction and do it. Just that simple. Guys often want to make a point of showing off how much better they are before even knowing what is going on. When that doesn't go so well, they get humbled a bit and then come around soon after. Of course, I'm the father of three daughters; the oldest has a Sports Television Production degree with a minor in Coaching. She has been working with me in TV trucks since she was 10, and is now one on the best shoulder camera operators I've seen. I know that right now there's some guy reading this saying to himself, “Well, he's never seen me!”, which takes us back to what I said earlier. Macho kills. Performance rules. Get over it... she's good. You can be too... its okay.

One key press does it

The next big event was on court with the NBA All Star Jam – D League where 3PLAY was launched to a secondary public audience via an internet live stream. I was set up on the end of the court overlooking the court on a riser. This event allowed me to really show off how effective 3PLAY can be. Case in point was a break-time slam dunk competition. I was on headset. I tell the director I'll give him replays of the slam dunks as soon as they happen. I hear him say something like, “Do your best.” So I did.

The 3PLAY's one key method of marking an event is a huge benefit. For one thing, you're recording all three camera inputs continuously without the need to stop to go back and play the replay. After all, you can't miss a play. So then something exciting happens, you 'Mark Out' when it's done, and you immediately have a 4 second clip that is timed back from that moment. If you need a little more, simply press the -1 or -2 key to add a second or two to the clip, but still maintaining the selected 'Mark Out' point. Why is this so important? Well, let's talk about some different sports.

Football is a sport with some very obvious starts and stops. It's very easy to 'Mark In' as you anticipate the throw of the ball. And, it's very easy to know when someone gets plowed down, runs out of bounds, or calls for a fair catch... 'Mark Out'. Other sports like this are baseball, softball, and track & field. The pitcher readies to wind up, 'Mark In', he throws, the batter swings and misses again... he's out! 'Mark Out'. But what about sports that don't have an obvious 'Mark In'? Sports like soccer, tennis, volleyball, and of course basketball. That significant point in time doesn't make itself known until it happens. With some other slo-mo devices you have to 'Mark In' repeatedly, while the system continues to replace the previous 'Mark In' until you eventually 'Mark Out'. 3PLAY can do this, too. But, who wants to get carpal tunnel pressing the same key over and over... So don't do it. Just 'Mark Out' when that slam dunk is done, or when the player finishes that shot on goal. And remember that just because you did a 'Mark Out', you didn't stop recording anything. The recording continues beyond the 'Mark Out' and can be easily re-positioned if you make a mistake on the first attempt.

3PLAY steals the show

So back to basketball and the NBA event... a player sets up for a slam dunk. Ready, set, GO! BAM! Slam Dunk! 'Mark Out'! I'm ready to run the replay. I did this three times in a row, but the director never asked for the replay. He didn't believe I had it I guess. Finally, I hear one of the camera men speaking through

the headset saying, “Can you not hear him saying he has your replay?” The director says, “Huh?” and looks at his monitor. I tell him again, “As soon as it happens... I have it for you”. Next dunk the director finally asks for the replay. I immediately put it up, and the crowd goes nuts. Three more times, and now the court-side host with the microphone sees us getting the replays up as quick as they happen. So now HE starts calling for the replay. Now I'm part of the show. Philip Nelson, NewTek's Senior VP of Strategic Development, who is also there for this debut, comes over to me and says, “Are you seeing this? 3PLAY is part of the show!” It's all good.

The long and short of this is that the replay operator can provide replays to the director faster than he or she can even use it. This creates a whole new dynamic where the replay operator can learn the kinds of shots the director will want and offer replays that the director didn't even know were available.

“Are you seeing this?
3PLAY is part of the show!”

Beyond sports

Now for a little brain storming. We all know the value of slow-motion replay in sports, but what else can this thing be used for? I was on a major feature film set not that long ago. The way they verified stunt shots was to put a wireless video transmitter on the camera, send the signal back to a Hi8 Sony deck, and play back the shots to the director after some rewinding and cueing. Hmm. This kind of thing is child's play for 3PLAY. Send the same signal to 3PLAY, even if it's a multi camera stunt shot with only one chance to get it, and you can have three different camera angles in perfect sync to show the director. You're a hero. Can we all say, “Cool”?

So you see, we shouldn't limit our thoughts to just sports. I'm thinking there are so many other uses for 3PLAY that we are just scratching the surface of possibilities. 🎧



Live Sports Broadcastings for Schools

by Paul Lara

While television broadcasting has changed a lot, the one thing that has remained constant for decades is the powerful draw of live sporting events. Sports have long been a central unifying aspect of school life, and in smaller towns can even be the central focus for the entire community. Alumni and family members out of town want to be able to monitor the action as closely as possible, when being able to view the game in person isn't an option. So it is natural that this keen interest translates into a need to maximize viewership potential beyond the school.

► Multi-Cam production

The best way to give television or online viewers a feel for the scope and pace of the ongoing action is with multi-cam production. In fast-paced events such as football, basketball, and hockey, positioning multiple cameras around the arena allows the viewer an opportunity to witness game play from a wide angle, up close, and through other camera angles. This multiple perspective can be further enhanced with the replays... showing critical actions, such as goals being scored, from two or more angles while color commentators discuss the action. When done right, a live broadcast can be even better than the experience of being right there.

This kind of production was traditionally produced with racks of equipment:

- A switcher to cut or fade between each camera
- A video effects generator to dynamically transition graphics and video
- An audio mixer to integrate numerous microphones in the booth and on field
- Processing amplifiers for each camera to match colors and brightness
- A titler to display on-screen player stats, scores, and more
- Numerous tape decks to play pre-produced segments during the show
- Additional tape decks to record the game as it is switched
- ... and the list goes on

This set-up is rather involved and even today many productions of this type are created in a special truck with all sorts of equipment installed throughout, using numerous stations set up to handle each element. Unless a school is NCAA Division I, there probably isn't a budget for a dream production vehicle, since mobile production vans can range in price from \$250,000 to millions of dollars. For public primary schools, such an option will never be a financial possibility.

► Affordable options

If owning a broadcast truck is out of reach, there are still ways you can create a compelling sports production. At its most basic approach, you can shoot a multi-camera event with 2 cameras, a low-end consumer video switcher, an audio mixer, and some titling software. But, one of the issues quickly encountered is compatibility with all of the different equipment. Do the cameras output the same video format as the switcher accepts? How will you incorporate titles or commercials in the production from an external unit?

Video equipment manufacturers tried to ease many of these concerns by integrating several functions into a single piece of equipment, such as having a switcher with built in titling, or an audio mixer that also records to an internal hard drive. Several years ago, this trend created a new class of equipment dedicated to easing the workflow, and a class of portable live production devices emerged. Several manufacturers stepped up to combine as much live gear as possible while minimizing complexity, size and weight. Notables include Sony, Broadcast Pix, Globalstreams and NewTek. As creators of desktop video, NewTek was particularly well-positioned to leverage its experience and video technology into a portable, integrated device. And thus the TriCaster was born, since having gone on to earn more than a dozen industry awards.

► Advantages of TriCaster production



John Marshall High School: Game Night

While several manufacturers provide integration, few can match the depth offered by the TriCaster. This line of portable live production appliances offers varying capability from 3 to 6 cameras, but all models share the principal of including all the components needed for professional live multi-cam production. The term "broadcast" has grown considerably in the last few years. Where it used to apply only to television stations with 1,000-foot antennas, the means of broadcasting has changed with the introduction of new technologies such as internet streaming, and the two leading stream formats: Flash and Windows Media.

The flexibility of live streaming and video archiving is of the strong suits of the TriCaster, which means sporting events can be watched live, and then uploaded to a web site for on-demand

viewing. This has resulted in a massive change where both content creation and distribution are affordably within reach of any school, from elementary to college. The Indiana High School Athletic Association (IHSAA), as an example, offers live coverage of all state finals for all sports, as well as regular-season coverage of football and basketball.

TriCaster was specifically designed for portability... a 10-pound appliance is easy to set up at the stadium. Simply connect a keyboard, mouse, and monitor. Plug in cameras, audio sources and a network connection, and the system is broadcast-ready.

▶ Tips for good live video production

Live production, like much in life, can look a lot easier than it really is. Since it's live, there are no dry-runs or rehearsals, nor the opportunity for one more try. Every shot is what it is. So, pre-production is an important step of every event broadcast.

Pre-production for each game involves videotaping interviews with key players and coaches, and editing them into short pieces that can be inserted between plays or periods. Whenever possible, it is best to try to balance the home team interviews with some comments from the opposing team.

Title overlays should be created with player names, numbers, and team positions, using TriCaster CG, or a secondary computer with titling software such as LiveText. With this done in advance, it is easy for the director to call for a specific title during the game. Pre-recorded video segments can be loaded into the TriCaster and arranged in the order of expected playback. It also helps to provide the camera operator with a list of jersey numbers of key players, along with an expected list of assigned camera shots for each. Perhaps the most important pre-game step is for all crew members to meet and go over assigned tasks before manning their positions. This is also a good time for crew members to put fresh batteries in cameras and microphones that are not plugged into A/C power.

There are some basic concepts and camera positioning approaches that everyone tries to follow, whether a network television crew or just a local high school production team. Game coverage can be handled with a single camera; but ideally two, three, or more cameras give the director a greater variety of angles. To minimize confusion, it's best to have specific reference names for camera positions. In football, for example, the

camera that is placed high to view the entire field is called the "all 22" camera. The camera on either end of the field is naturally called an "end-zone camera", or some production teams call that "camera four".

Typical of most sports, one camera is mainly used for a wide shot, zooming in only when requested by the director. A second camera stays on the action up close, pulling out when needed, such as anticipating a pass downfield. When possible, it adds a lot to the excitement of the game to provide a camera view from the sidelines, focused on coaches, team members in waiting, the penalty box, or even an excited audience.



John Marshall High School: News Production

Live sports moves quite rapidly at times, so it helps to distribute the workload. The director is at the TriCaster, viewing all camera shots and then telling the Technical Director which camera to cut to and when to bring up titles and scores. Other crew assignments can include the CG operator to create/recall graphics and titles, a replay operator, and commentators. If crew availability is at a minimum, it is often possible to get an audio feed from the local radio station, and let their narrative expertise simplify the production. Most teams already have a camera operator set to the task of video taping the game for post-game analysis. So, you can often recruit that person onto your crew and accomplish both tasks at the same time.

After the game is over, it's time to copy the show from the internal hard drive to a back-up such as DVD. This is also necessary if several people need access to the footage for analysis or editing. You will probably also want to transfer the final video to your school website for on-demand viewing.

▶ How are schools paying for equipment?

While costs have plummeted as capabilities increased, live video production still requires numerous cameras, tripods, lights, microphones and other equipment. Many schools have discovered that the passion surrounding live sports provides them an audience willing to pay for the privilege of enjoying the game. This revenue, which can sustain and grow the production, could come from several sources:

- Local sponsor videos or logos displayed on stadium scoreboards and video screens. One Texas school generates \$100,000 a year from ads on their video scoreboard
- Businesses that sponsor all or portions of a game
- Fans and family, who happily pay \$10+ for a DVD copy of the game or highlights
- Pay-Per-View webcasting at \$5 - \$10 per game

In fact, such revenues can help the district with costs associated with equipment upkeep, and allow for purchase of additional equipment to populate the campus with budding journalists who can spread live production into other areas too: musical events, plays, special rallies and more.

▶ What are the interdisciplinary benefits?

While there is much passion around sporting events, the ultimate goal for the faculty is to educate the students and provide them with knowledge for life-long success. Live video production can teach skillsets that apply across numerous disciplines

Ease of use is a principal concept in the TriCaster's design. Its simplicity is something capitalized on by media classes of all ages, from college to elementary schools, and was one of the reasons for its adoption by the fourth-grade class at Westby Elementary in La Crosse, Wisconsin. These nine and ten year-old students took on the task of broadcasting school announcements each morning, and created WES-TV. In fact, the fourth graders serve as mentors to the younger students, with third graders and even kindergarten children helping to produce the daily reports. Principal Mark Anderson relishes the growth and collaboration this has fostered, "I get to sit back and watch the

morning announcements. It's great! Everyone pitches in, taking on all positions from anchor to director as they provide their peers with everything from the lunch menu and the day's weather to high school sports scores."



Gilbert Elementary School: News Production

One of the most important life skills learned is collaboration with a larger group. Regardless of crew position, each member counts on others to create a compelling production. Students learn about time management to work to meet deadlines, and how to be good leaders as they direct their team. Tempering the students for leadership is something that Allen Brooks practices regularly. The San Marcos, California teacher at San Elijo Middle School says he was given a production space of 14 by 18 feet, where he had to fit everything – all his equipment and even his storage. "I tell people coming in... 'Sit down, put on your seatbelt and enjoy the ride. You're about to be amazed.' The students are in charge, I walk out." Brooks says the students continually amaze visitors, "It's fun to see."

Brooks says his students love working with TriCaster and its LiveSets, "They love the interface. It's got a clean flow to it. It gives us the things we want, when we want them. They just get it, and it was an amazingly easy transition from a basic Videonics switcher to this high-end production tool."

From elementary school to college, there has never been a better time for schools to get involved in live multi-camera production and help create producers, and leaders of the future. 🎥

Live Production

Getting the Most Out of Video Cameras and Green Screen

By Rex Olson and Bohuš Blahut

One of the things that has put the TriCaster on the map is how quickly you can set up a multi-camera shoot. We've all had last-minute projects where we're grateful to be able to get the show on the air in just a few minutes. At the same time, there are definite benefits to knowing more about our cameras and how to get the best possible picture out of them. After all, to get the best picture out of the TriCaster, we need to make sure that we're putting the best picture into it.

Video cameras, accessories, and lighting

Video cameras come with a variety of features and levels of quality at wildly varying prices. Despite all of these differences, there are a few standard concepts that will help you get the best out of the camera.

It also offers the least amount of control for the operator. Turning off automatic settings, and adjusting them manually, will provide for more consistency when matching cameras. These settings are found in the form of hardware switches/buttons/knobs and software menus. We'll discuss the primary settings here, but consult your camera manual for more information.

To assist with matching camera setups, some cameras allow you to save settings to a memory card which you can transfer to other identical cameras. This is the fastest way to make sure your cameras software menu settings are the same. The hardware switches still need to be set manually.

Gain

When lighting is less than optimum, increasing gain will cause the camera to compensate by amplifying the signal. The by-product of this amplification, however, is noise or graininess. For the cleanest picture, make sure the gain setting is switched to its lowest possible value while maintaining a sufficiently bright view. When shooting in daylight, or in a studio with proper lighting, low gain shouldn't be a problem. Typically this would be a value of 0 dB, but some cameras provide negative options (-3 dB). But, when shooting in low light conditions, increasing gain may be unavoidable.

Most cameras offer automatic settings that assure you will get a decent looking picture regardless of where and how you use it. While this can be a passable solution for the novice, it can cause problems particularly when working on a multi-camera produc-



Exposure

Exposure controls are usually located on the lens barrel itself, allowing you to manipulate the iris and control how much light gets through to the image sensor. Avoiding the auto-exposure setting is particularly important, especially for green screening, as it can cause a pumping effect when the camera continually adjusts exposure to handle subtle lighting changes. Some cameras have the ability to turn on auto-exposure momentarily, useful for a quick reset in adverse shooting conditions.

Focus

Since the camera doesn't know exactly what you are shooting (hopefully you do) auto-focus can often be the cause of much frustration, sometimes sending the lens into a continuous state of shifting from one object focus to another, particularly on a close-up shot. To manually focus, zoom the lens all the way into a full telephoto shot and adjust focus to optimum sharpness. Then, if the camera is set up properly, the focus will remain sharp through the entire range of the zoom backwards from that point.

TIP: When we engage in conversation with others eyes. This is a good rule of thumb for the camera view, too. When shooting a head shot or interview, zoom all the way into the primary subject of your shot and focus on their eyes. Zoom out to compose, and you'll have good focus for the whole shot.

Shutter speed

For typical video shooting situations, the shutter speed should be set to 1/60 for NTSC and 1/50 for PAL. Higher shutter speeds require more light, and the resulting video exhibits a strobed look – there is less blur from frame to frame. This is useful, for example, if you are shooting a sports event and you plan on showing the footage in slow motion. With little blur to obscure the action your slow-motion segments will be crisper - very important for play-by-play analysis.

Reducing shutter speed can be useful for getting shots in low light; though at the cost of increased blurring. Shutter speeds

of 1/30 take on a more filmic look, which can be very desirable for glitzing up a project. Reducing to a speed like 1/8 gives you dreamy, smeary footage. You will sometimes see these low shutter speeds used in music videos, or even investigative report shows where they have to acquire footage in very low light.

White balance

White balancing is important, not just for (as they say in the detergent commercials) sparkling clean bright whites, as this is how the camera builds its whole color palette. If the camera's white balance is off, the rest of the picture will be as well. Most cameras have an automatic setting, but it can be thrown off by large changes in white in the frame. In a studio setting, it's usually best to keep white balance on manual, and to set it using a white card. However automatic mode can be very useful on location, especially when the camera is moving between light sources such as going from indoors to outdoors.

TIP: When outdoors you can white balance by zooming in on a white cloud in the sky. For golden sunsets, white balance with your white card in the shade.

TIP: Tricking your camera by white balancing on something non-white, can create special coloring effects, similar to using lighting gels.

Image stabilization

This is a very handy feature to smooth out the bumps; however, this will often add latency which could be a problem with lip-sync in a multi-camera set up if not all the cameras have this feature turned on. Also, some cameras lose some resolution with use of digital image stabilization, so it's important to know whether your camera's image stabilization is digital or optical.

If your camera is on a tripod, it's best to turn image stabilization off. Some cameras will hunt for an image to stabilize at all times, even if your image is still, resulting in a pulsating image – or pans that look mushy when coming to a stop.



Lenses One of the simplest image quality issues to remedy is also the easiest to forget. Make sure that your lens is clean, and check it periodically throughout your shooting day. Keep a flashlight handy, and shine it across the surface of the lens to pick up any signs of debris. Also make sure to use proper lens cleaning solution and wipes – don't just use a tissue or the corner of your t-shirt! Checking for a clean lens is a crucial step before rolling your cameras. Finding out in the editing room that there was a smudge on your lens, and that it appears on every shot, is a disaster you don't want to experience.



LCD displays A common error is to rely too heavily on the camera's LCD display when adjusting the brightness of a shot at the camera. The brightness and color settings on an LCD are unrelated to what is actually being captured. It's important to calibrate the LCD to a standard so that what you see is actually what you get. For crucial color matching of multiple cameras in a production, all of the cameras should be output to a single calibrated monitor.



Audio Unless only used for monitoring, never use a camera's built-in microphone for anything. These microphones often pick up things like the camera operators grunting, tape motors, and other unwanted sounds, rather than what the camera is pointed at. And unlike a lens, a microphone can't really zoom away from those sounds. So for audio, external microphones are the preferred choice. A well placed lavalier microphone is ideal for one or two on-camera subjects, while the use of a shotgun microphone is ideal when on the move.

Lighting color correction Light comes in a variety of color temperatures measured in kelvin (K). Daylight ranges from 5200K to 6500K, tending towards the blue range of the light spectrum. Studio or tungsten lighting is typically around 3200K in the orange spectrum. Household light bulbs are typically in the even warmer 2800K area. These values are just a rough guide, as there are all kinds of lights in all sorts of locations. Blueness of on-camera daylight is often referred to as being visually cool, and studio lights in the amber range as being warm.

This difference in light temperature is important to keep in mind when mixing sources in a single shot. You'll see the effect on your image when mixing tungsten bulbs with fluorescent fixtures, for example. Probably the most common mismatched lighting situation is when your indoor shot includes both indoor lighting, and natural sunlight shining thru a window. This can be a challenging combination to combat. One solution is to add blue gels to your indoor lights to bring their color temperature closer to the sunlight. If, for example, indoor tungsten lights are at 3200K, using blue gel will bring them closer to 6500K daylight, however this filtering approach will also reduce the brightness of the light.

Another option is to place neutral density color correction gels over windows. This will both lower the color temperature of the daylight down to 3200K and reduce the brightness. This can be a tricky solution as it requires quite large gels, and some invisible way to rig them onto the windows. Of course the simplest solution is to re-frame the shot to avoid the window!



Camera tripods The better the tripod the better the shot. Tripods can range from free to thousands of dollars – this is definitely an area where you get what you pay for. When choosing a tripod... try before you buy. Mount your camera (or one with similar size and weight) on the tripod and move the handle slowly from side to side, then up and down. All the while, starting and stopping the motion to get a feel for smoothness. Bumping, stuttering, or stickiness will make for poor camera shots. The tripod with the smoothest feel wins!

Also be sure that the tripod has a good balance, so you avoid the camera falling forward or backwards when the tilt-lock is released. Better tripods have a camera plate that mounts to the bottom of the camera and slides into the tripod head. It can then be adjusted forward or back for center balance so it neither falls forward nor backwards when tilted slightly in either direction. Some tripod heads will have a counterweight adjustment. Counterbalance should be adjusted so that when the camera is tilted forward or backwards the camera stops, and remains, right where you left it. These tripod adjustments are crucial to achieve the smoothest operation of the camera.



Video inputs With all your cameras configured similarly, and taking into account the topics we've discussed already, we're ready to send video into the TriCaster and explore green screening.

Conclusion

At this point, the rest is up to you. While the tools in the TriCaster make it easy to set up cameras and get a live show on the air in just a few minutes, there are many benefits to making these techniques part of your standard operating procedure. Getting a better image into the TriCaster means getting a better image out as well. That image is like your business card, so get out there and make it the best that you can!



You are encouraged to explore the use of the waveform and vectorscope monitors, along with the proc amp settings for adjusting each camera to match the others. If you've never used these tools, the best way to understand them is to load a SMPTE color bar image into the DDR/Stills and view it using these monitors. Then adjust the proc amp settings and see how they affect the graphs. Color bar images are often included on video cameras, or you can find them online as well.

If you're using the TCXD300, you have the advantage of its unique color monitoring displays. This makes it even easier to see what affect your adjustments are having on individual color levels. And for people unfamiliar with these monitors, it's even easier to understand how these views represent the source image. It's also a very easy way to see if there's any green spill from your backdrop onto your on-camera talent.

Do some research on how to use these tools to calibrate your camera, and how to color-match when using two or more.

With the best signal established in the camera, we want to make sure to use the camera's best output signal. Remember that this is a color dependent process, so we want to feed the TriCaster the best color fidelity possible. If you have SDI connections on your camera and TriCaster, that's the best choice. Otherwise, use component outputs next, or at minimum, s-video. If you have no other choice but to use composite video, expect there to be a fair amount of unpleasantness with the end result. Also, keep the length of the cable between the camera and the TriCaster as short as safely possible. Long cable runs degrade image quality.



Green screening While you can use any solid color to create a key with LiveMatte, blue and green are the industry standards. Green is preferable since it's a color not present in fleshtone, and video cameras are the most sensitive to green. Blue is fine too, but it tends to require more illumination than green does.

The ideal keying surface is a green painted wall. There are many other alternatives however, including cloths for hanging, and flip-out screens that you lean up against a wall. Typically, hanging cloth can be less desirable because of shadows and unevenness caused by creases and folds. Fortunately, the LiveMatte keyer (especially in the TCXD300) is very forgiving of these kinds of issues.

Lighting for a LiveSet is similar to standard green screen shooting. Light the backdrop as evenly as possible, and light your on-camera talent separately with special emphasis on achieving separation between the people and the green background. This arrangement tends to take up a lot of space, but it can sometimes be a benefit in disguise. The further away the cameras are from the background, the more you can take advantage of depth of field of the lens, allowing the background to be slightly out of focus. This is especially helpful to de-emphasize wrinkles on a cloth backdrop.

LiveMatte is better than conventional keying technologies. Many of the time and space consuming setups associated with green screen shoots just aren't as necessary. While it's great that the TriCaster can perform miracles in adverse conditions, there are many benefits to taking the time and trouble to create a high-quality, well-composed shot. That's the sign of a professional. But when time and resources are tight, it's good to know that the TriCaster has the tools to still make your show look great.

BEYOND TRICASTER



Extending the Reach of Your Content



by Colin Sandy

It's a wrap. You've shot the best video of your life. You've used your TriCaster or VT[5] to help produce a network quality show, with top-notch production, mixed audio, animated overlays, and glossy titles. There's only one problem – getting your content to an actual audience.

There are three key components in the video streamer's workflow: production, transmission, and distribution. While the TriCaster will sail you past the production stage, it will play a limited role in the transmission and distribution stages – especially when you grow past a handful of users.

While you can have viewers connect directly to your TriCaster and pull content, this approach limits your audience size. After all, you put together a stellar production so as many people as possible could see it, right? Well, then we have to talk about distribution; but before we get there, we have to figure out how to get our video to our distributor. Here's where the second part of our workflow, transmission, comes into play.

Transmission

The easiest way to get live or pre-recorded content out of your TriCaster is as simple as plugging it into a router on your local network, or as complex as setting up a wireless satellite transmission. The beauty of the TriCaster is that you can transmit your program from anywhere to anywhere, at little cost. If you are in a location where you can access a local network, such as your studio or a client's corporate premises, finding a connection to the internet is usually very simple. If you find yourself in unfamiliar or remote territory, however, getting out to the internet can be a little trickier.

While on the road, you will likely have to rely on the internet connection of a hotel or conference services at some point. If your production requires the bandwidth and reliability of a wired connection, there is little you can do other than accept the speeds your venue offers. However, if you opt to go wireless you have some additional options.

In this realm, your choice is for either a fixed or mobile wireless solution. One example of fixed wireless is point-to-point microwave, where you set up antennas pointed toward each other to create a wireless link - this could be two sites on the ground (terrestrial), or a site on the ground and one in space (satellite). If you consistently need to stream from remote locations, TodoCast provides a satellite kit and has a referral program that matches their customers with TriCaster users. Satellite is an expensive option though because it requires sophisticated equipment that usually operates in a licensed spectrum. Terrestrial microwave, though less expensive than satellite, will likely require a license to operate as well.

The alternative is to use unlicensed spectrum such as WiFi or WiMax. You can get phenomenal range using specialized but inexpensive antennas without having to worry about special licensing. The equipment for unlicensed use is also generally easier to set up and operate. If you want to leave it up to the experts, you also have the option of using a wireless internet service provider (WISP) such as ClearWire.

Distribution

Once you have figured out how to get your content to a distribution point, you can then explore your distribution options. There are several things you need to think about in order to effectively distribute your content. How many people do you need to reach, or would you like to reach? What level of stream quality and what stream format will you use? Do you need to stream multiple formats simultaneously, or multiple quality levels? Do you want the broadcast to only be seen live? Or do you want it to be available on-demand later? Is there a preferred technology you want to use? What type of revenue model will you follow, if any at all? Is security or encryption a concern? Answering all of these questions will help you determine which service you should use.

Your quality requirements may vary from job-to-job as well. Some clients may want uninterrupted video to a variety of global locations. In this instance, you would be wise to use a content delivery network (CDN) such as Akamai or LimeLight Networks. If a best efforts approach is sufficient, a less expensive provider like AudioVideoWEB or Watershed may provide the price-to-quality ratio you need. And let's not rule out free – popular services like YouTube, Google Video, and Ustream can deliver your content to a wide audience at no cost – but try them out before going live, just to be sure you're comfortable with what they offer for free service.

If you're interested in setting up a pay-per-view system for your content, consider how easily the streaming video provider can integrate into your existing e-commerce system. Or if you don't have a current e-commerce system, evaluate which providers can help you get your pay-per-view system up and running with the least amount of hassle. There are many players in the video content delivery marketplace – and even more joining the fray like internet giant Amazon.com through its cloud computing services. Whichever route you decide to take to get your work out to the world, good luck and keep streaming! 🎥

Colin Sandy is a media consultant for his family business, Sandy Audio Visual (SAV) - based in Toronto, Canada. SAV uses TriCaster, VT[5], LightWave, and LiveText extensively in its production workflow.

THERE'S STILL A USE FOR TAPES

Let's not forget traditional distribution methods. Broadcast and cable television are still mainstays in video distribution. While time on network television can be very expensive, local affiliates usually have lower advertising and programming rates. Also, your programming may easily qualify to be cablecast over your local Public Educational and Government (PEG), or public access station.

Many years ago, municipalities struck a deal with cable companies. In exchange for giving cable providers the right of way to bring cable lines through your town and up to your house, cable providers had to pay a franchise fee, which in turn funds at least one channel on their network for public use. That's you.

While facilities are usually provided by your county/city, you have a leg up by owning your own production facility in a box. Check the websites of your local public access station to determine what their programming rules and opportunities are. More often than not, you will simply have to fill out a form and provide your content in the preferred format. You may also be able to send your content to neighboring areas. Don't rule out this option in your distribution strategy. A little time, a few tapes, and a handful of stamps can go a long way in distributing your content to a wider audience.



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BUILDING A BETTER BROADCAST STUDIO

Customizing LiveSets

by Jarrod Davis

LightWave 9.6+, LiveSet Generator for LightWave, Graphics Editor (Aura, PhotoShop, etc), compatible with the standard definition line of TriCaster. The LiveSet Generator for LightWave plugin requires a 32 Bit installation of LightWave 9.6+. It can be downloaded from reg.newtek.com on the "my downloads" tab, under the "LightWave v9.x Downloads" section

One of the most powerful and innovative features of the TriCaster and VT[5] is LiveSet virtual set technology. With LiveSets, you can set up in a small physical space, drop in a green screen, add a couple of lights and you're ready to drop yourself inside anything you can imagine.

Making a LiveSet from scratch is a rather large undertaking – there are a lot of considerations, both technical and aesthetic. The LiveSet Generator includes the content for all the TriCaster sets, so we'll use one of those as a starting point. They're a simple way to get started building your own sets, or as we'll do in this tutorial, to customize one. We're going to tackle two of the most commonly needed modifications: adding a logo, and replacing a background image. But first, you'll need to get everything installed.

Installation

In order to insure that LightWave can access all the plugin's support files it is recommended that you install the plugin into the main LightWave folder, typically "C:\Program Files (x86)\NewTek\LightWave 3D 9". Note: All references to folders from this point on, will be within this main LightWave folder.

Once the installation is finished, you'll need to add the plugins to LightWave. Start Layout, then go to the Utilities tab and click Add Plugins. In the file requester, navigate to the "Plugins" folder, multi-select (Ctrl-Left Click) "magicsurface.p" and "vsfxsaver.p" and click Open. You should see a message that plugins were added successfully.

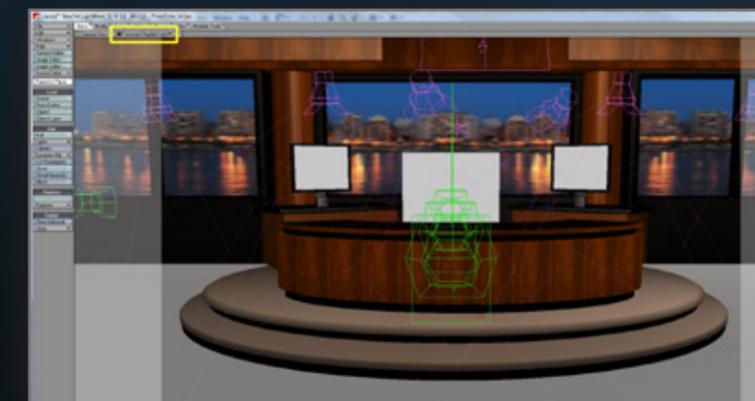
Now that the plugins are installed, we can take a look at modifying one of the sets. Note that menu accesses or keyboard shortcuts are contained within brackets.

Customizing a LiveSet

Start by loading a scene file (File > Load > Load Scene). In the file browser, navigate to the "...\LiveSet Example Content\PrimeTime\Scenes" folder, and select "PrimeTime_Set.lws". If you are prompted with a "Change Content Directory?" requester, click Yes so that LightWave can find the related files for this scene.

You'll see three instances of the LiveSet Generator interface (Right, Center, and Left) opened on top of the virtual set view. Close all three - we'll get back to them later.

Change your view mode to "Textured Shaded Solid", by selecting that option from the second popup at the top of the Layout interface, just below the tabs (Figure 1). This will give a truer representation of what the set will look like when rendered



The PrimeTime LiveSet viewed as "Textured Shaded Solid"

Replacing the background image

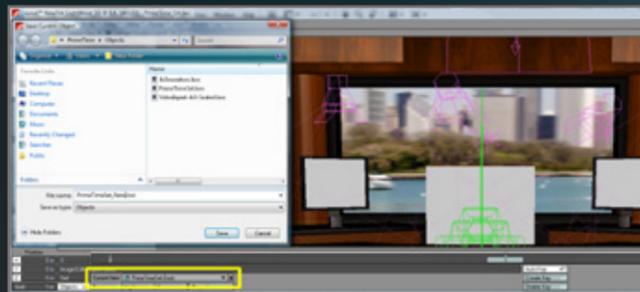
When replacing images in LiveSets, it's important to take into account how the image is used to begin with. It is best to maintain the original dimensions in creating your new image, and make consider the placement of the image within the set. It depends on the set, but in general it's good to try to match the major features of the image you're replacing. For instance, the background image we'll replace features water, sky, and buildings with a very distinct horizon and a particular scale. The set was designed to take advantage of this aesthetically, so for best results we'll want to use a replacement



(Figure 2). The replacement background image scaled/ cropped like the original

image that has that same general feel. Otherwise, the buildings might look too tall, too short, too high, too low, etc. The LightWave preview will give you a good idea what the final result will look like, so feel free to experiment.

Open the Image Editor (F6) and select “water_at_night.jpg”. In the info area you can see the dimensions of the original image. Next we need to know the location of this image so we know where to put our replacement. Click Replace, and make note of the source folder indicated in the file browser. In this case, it’s “...\LiveSet Example Content\PrimeTime\Images\”. Click Cancel in this requester, as we’re not ready to actually replace anything yet.



Saving with the altered background image

Leave Layout as it is (minimize its window if necessary), start your favorite graphics editor and open the replacement image you want to use. Remember that you want something that can be cropped/ scaled/etc to the size of the original image. It’s better to scale down to this size, rather than up, to insure the best quality possible when using the set. There’s a good alternative in the MiddayReport Live-Set that you can use for now: “...\LiveSet Example Content\MiddayReport\Images\ Fisherman_Fix.png”.

Use the standard size and crop functions of your graphics editor to alter this image to taste. The end result should be a 1600 x 235 image (Figure 2). If you need to do any other processing of the image, do it now. When you’re done, save the image to the same folder you located above, and name it as you please. I used “Background.jpg”.

Return to Layout, then in the Image Editor (which should still be open), click Replace, select the new image which should be listed in the default folder, and click Open. You should see the new image in place of the old in the preview. It’s just that simple.

Now we need to save our object so that we don’t lose the changes. In the Current Item popup located at the bottom of the interface, select “PrimeTimeSet:Desk” (Figure 3). Then save the object (File > Save > Save Current Object...). I named it “PrimeTimeSet_New.lwo” to avoid overwriting the original

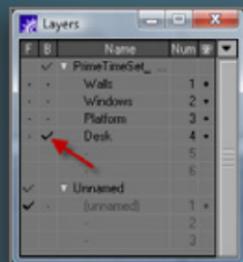
Creating a logo from scratch

Now let’s further customize the set by adding a logo to the front of the desk. Start Modeler (F12) by clicking the button in the upper

right corner of the interface to automatically load the current object in Modeler.

We first need to create an object to contain the logo (File > New Object). Next we move the desk layer to the background through the Layers panel (Windows > Layers Panel). From there, expand the PrimeTimeSet_New layer by clicking the arrow next to its Name, then click in the B column of the Desk item (Figure 4).

We’ll keep our logo simple, by just making some pretty text. Close the Layers panel, and select the Text tool (Shift-W) on the left sidebar. Open the Numeric entry panel (n) to set parameters for the text. Set the Font to “Arial Black” or any other you prefer, enter “Prime Time” in the Text field, and set Axis to Z. You should now see your text appearing in the object views.



Setting layer positions

Now that we’ve created our text object, we’re going to make some changes to it to make it more in tune with our set.

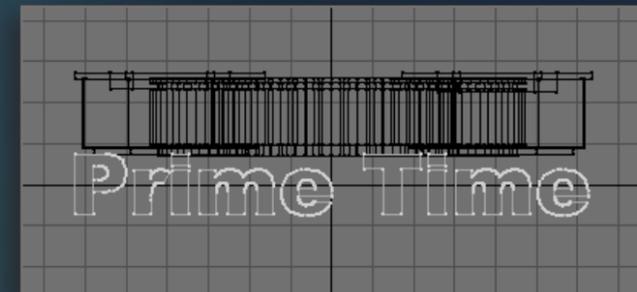
TIP: There are usually two main ways to interact with objects in the user interface. One is by using the Numeric panel to manually enter values; the other is by clicking and dragging with the mouse. In the next steps, we’ll be using the mouse method as it is the way you’ll likely be doing this in your own application of these techniques. But, if you encounter any problems getting the correct results, you may find the Numeric panel approach easier to apply the given settings.

When using the mouse to interact with objects, a status display in the lower left of the user interface provides information to help. When just moving the mouse around (without clicking) it indicates the Position: X/Y/Z in the 3D world. But, it changes based on which tool you are using.

Let’s give the text some depth. Under the Multiply tab, select Extrude (Shift-e). Then, in the Top view, left click anywhere and drag up along the Z axis to set Extent to 250mm. Use that guide to get the exact measurements: X: 0m, Y: 0m, Z: 250mm. Center the object (F2) into the view (Figure 5).

Adding extruded text

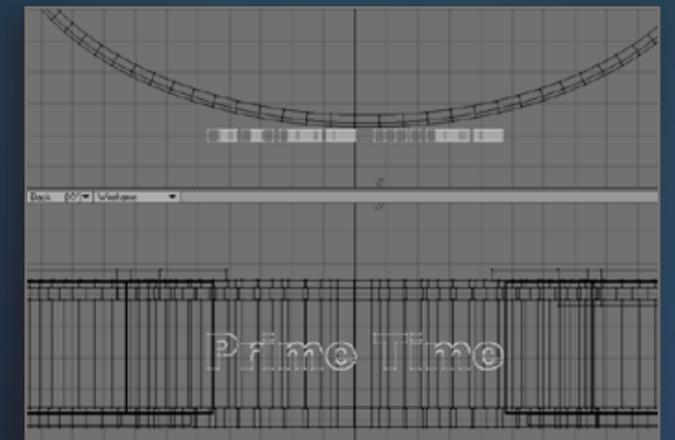
TIP: Holding down the Ctrl key while left clicking and dragging with the mouse, will constrain movement on the axis you initially drag in.



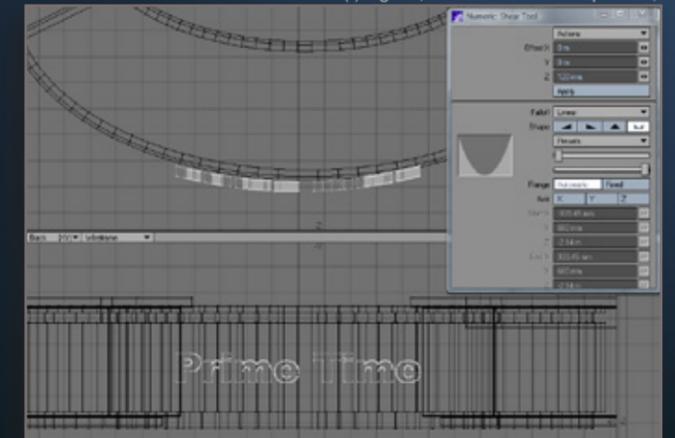
Next, we’ll reduce the size and reposition the text; but, to do that we first need to set the Mode for the interaction. This parameter is located at the bottom of the user interface under a popup Modes, set it to “Action Center: Selection” (Shift-F8). This will make any tool you select operate from the center of the bounding box of the selection – which in this case will be the entire object.

On the Modify tab, select Size (Shift-H) and left click in any view and drag to the left to set Scale to 30%. Then to reposition the text to the vertical center of the desk, select Move (t). Left click in the Back view and drag up on the Y axis to set Offset X: 0 m, Y: 850 mm, Z: 0 m. Then to bring the text to the front of the desk, left click in the Top view and drag down along the Z axis to set Offset X: 0 m, Y: 0 m, Z: -1.6 m (Figure 6).

Now we’ll get a little fancy. It would look better to make this text follow the curve of the front of the desk. To do this, select the Shear tool () and open the Numeric panel (n). Set Shape to the right-most option, and then put the top slider all the way to the left and the bottom one all the way to the right. Click Apply. These settings will shear the outermost edges of the object most, leaving the center where it is, and do so with a nice curve. With that set, left click in the Right view and drag right to set Offset X: 0 m, Y: 0 m, Z: 100 mm (Figure 7)



(Figure 6) Repositioned text



(Figure 7) Bending text to match the shape of the desk

We’re done with designing the logo object, so let’s give it a name and save it. Click Surface (q) at the bottom of the user interface and set the Name to “Logo”. Then save the object (File > Save Object As) as “...\LiveSet Example Content\PrimeTime\Objects\Logo.lwo”.

We’ll now move our logo object back into Layout and give it some finishing touches. In the upper right corner of the user interface, click the small arrow and select “Send Object To Layout”. You should now see the logo text sitting in place on the front of the desk, but it’s looking a little boring so let’s snazzy it up some.

Open the Surface Editor (F5), and set the following values:

Color: R: 170 G: 170 B: 170
Luminosity: 0%
Diffuse: 60%

Specularity: 90%
Glossiness: 40%
Transparency: 0%

Translucency: 0%
Smoothing: Enabled
Smooth Threshold: 20 degrees



Figure 8) The newly customized set

We're all done, so save the object with the new surface settings (File > Save > Save Current Object) by overwriting the "Logo.lwo" we saved previously. Then render the frame (F9) to see the end result (Figure 8)

When the rendering completes, you have your LiveSet! It'll be inside the folder you specified, within a folder named the same as your scene, in this case "Prime Time". Copy this folder to the "...User Data\Default User\VSFX\" located within your TriCaster or VT[5] install folder, and you're ready to go.

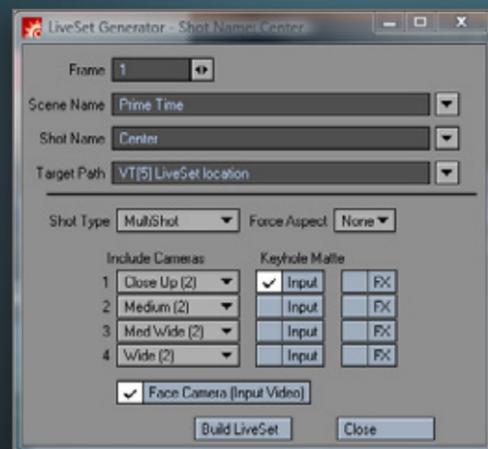
Building a LiveSet

The scenes included with the LiveSet Generator already have all the necessary assignments for the LiveSet Generator to do its thing. So the building process for this modified set is pretty simple.

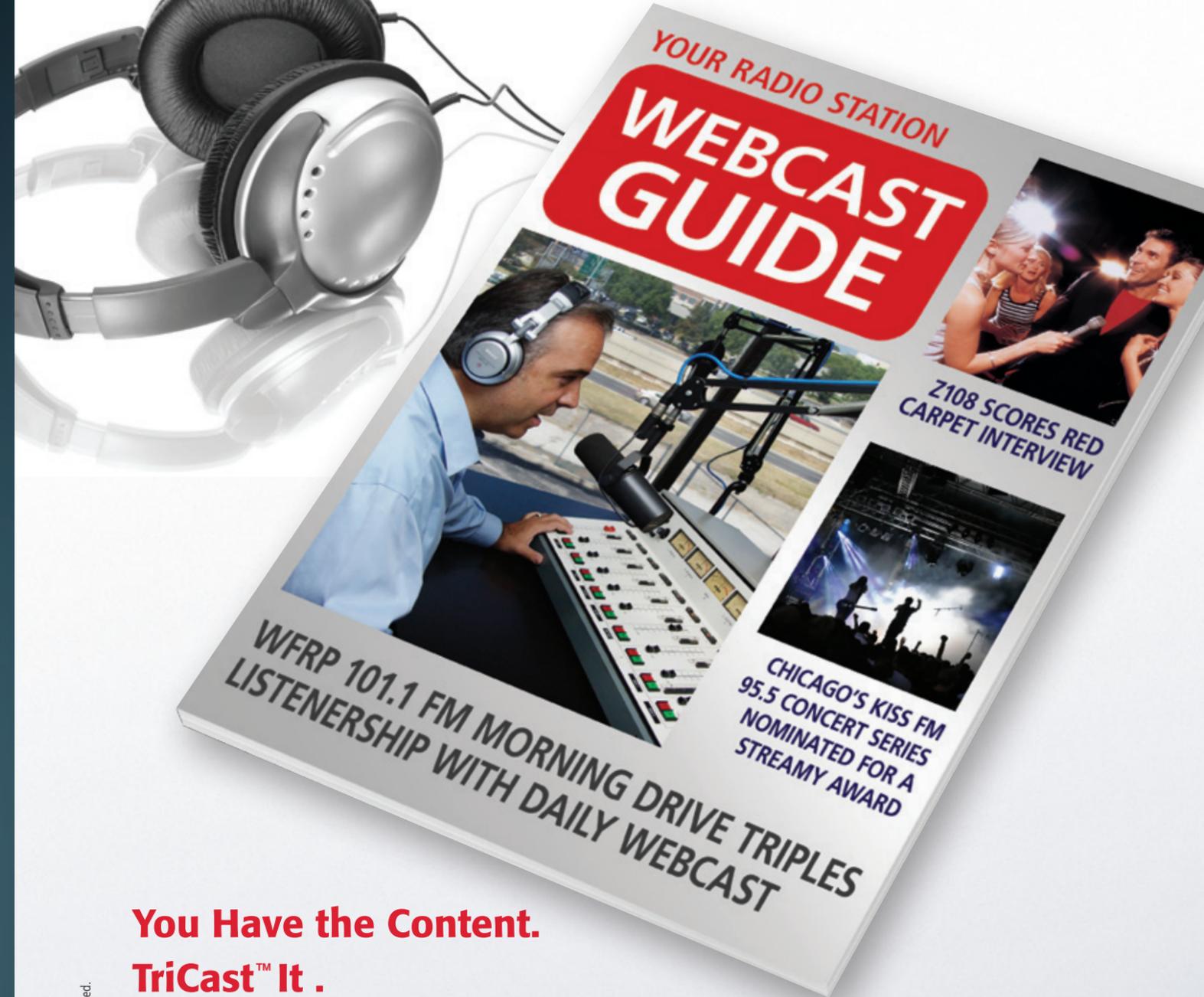
Open the Master Plugins interface (Utilities > Master Plugins), and double-click the entry for "LiveSet Generator - Shot Name: Left" (Figure 9). The only parameter we need to set here is Target Path. It's best to set this to a temporary location and then copy it over to your TriCaster or VT[5] after, just in case anything goes wrong – you don't want to end up with broken set files on your production system.

You also need to set this same path for each of Center and Right in the Master Plugins list. Once you've specified a path in one, it will be available in the Target Path popup in the others too, saving you time. When all three are set, you simply click "Build LiveSet" in any one of them, and the rendering process will begin. Note, the rendering will automatically cycle thru all the generators. So, this only has to be done once.

There are a lot of interesting things you can do with customizing LiveSets. Refer to the LiveSet Generator documentation for further details. Be creative, and have fun renovating!



The LiveSet Generator plugin interface



You Have the Content. TriCast™ It .

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