

Lighting “Design” Software

While paper and pencil were the preferred method of many designers even ten years ago, today, designers are expected to use computer-based programs to support their design work. Current lighting technology has also increased the need for a diverse body of computer software applications. When one hears the term, “lighting design software” most thoughts reside in drafting or lighting visualization software. However, applications used by designers can run the gamut from office suites and drafting software used on PCs and Macs, all of the way to specialized lighting software used on mobile devices such as iPhones, iPads, Android phones and more. The purpose of software is two-fold. First, software can help the designer create or keep track of thoughts for him/herself. Secondly, designers can use software to communicate with members of the creative and/or production team.

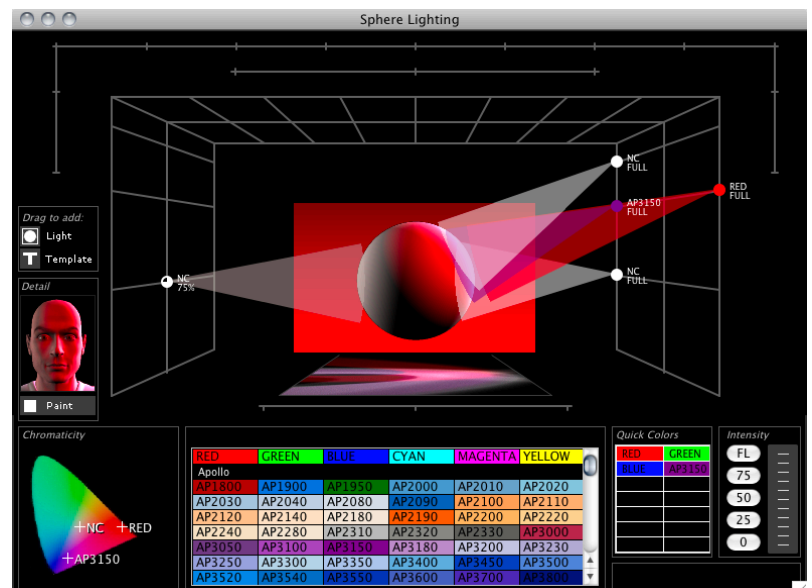
The plan for this article is to discuss software that helps support the lighting designer in his/her process. My previous two articles have covered much of the creative process from the first read of the script through to drawing up paper and pencil versions of light plots. Computer software covered within the second article included standard office type programs like word; excel, as well as others.

I have decided to use the design process as an organizer for this software discussion. My own series of steps in the design process include: (1) completing a script analyses and developing a shopping list; (2) gathering visual research; (3) composing lighting sketches and renderings; (4) drawing little magic sheets; (5) assigning preliminary channels; (6) drafting light plots and sections; (7) assembling color charts; and (8) creating instrument schedules, shop orders and dimmer hookup. It is important to note that these steps are not always in order, as many times, the design process requires movement in many directions. At the end of the design process discussion, I will offer suggestions as to how teachers and students can incorporate applications into co-curricular educational programs.

Lighting sketches and color experimentation via a virtual light lab.

The best way to experience lighting is by standing in it, touching it, feeling it, and playing with the shadows. Many schools will have enough equipment to allow students to set up simulated scenes and/or light labs to obtain hands on experience. Students that have access to an actual lighting lab and the freedom to move equipment around are lucky indeed.

Figure 1 This is a sphere under the same lights used for the Lucy example above.



Eric Cornwell's Virtual Light Lab allows you to explore angle, intensity, and color and produce images such as these. The demonstration version is free and includes the sphere shown in figure 1. We also the working grid with five lights attached. Each light can be individually gelled from a selection of over 700 standard colors from the major gel manufacturers. Keep in mind that your computer screen will not completely represent the accurate colors, as they would be seen on stage.

The paid version allows additional functionality and models including our Lucy shown in Figure 2.

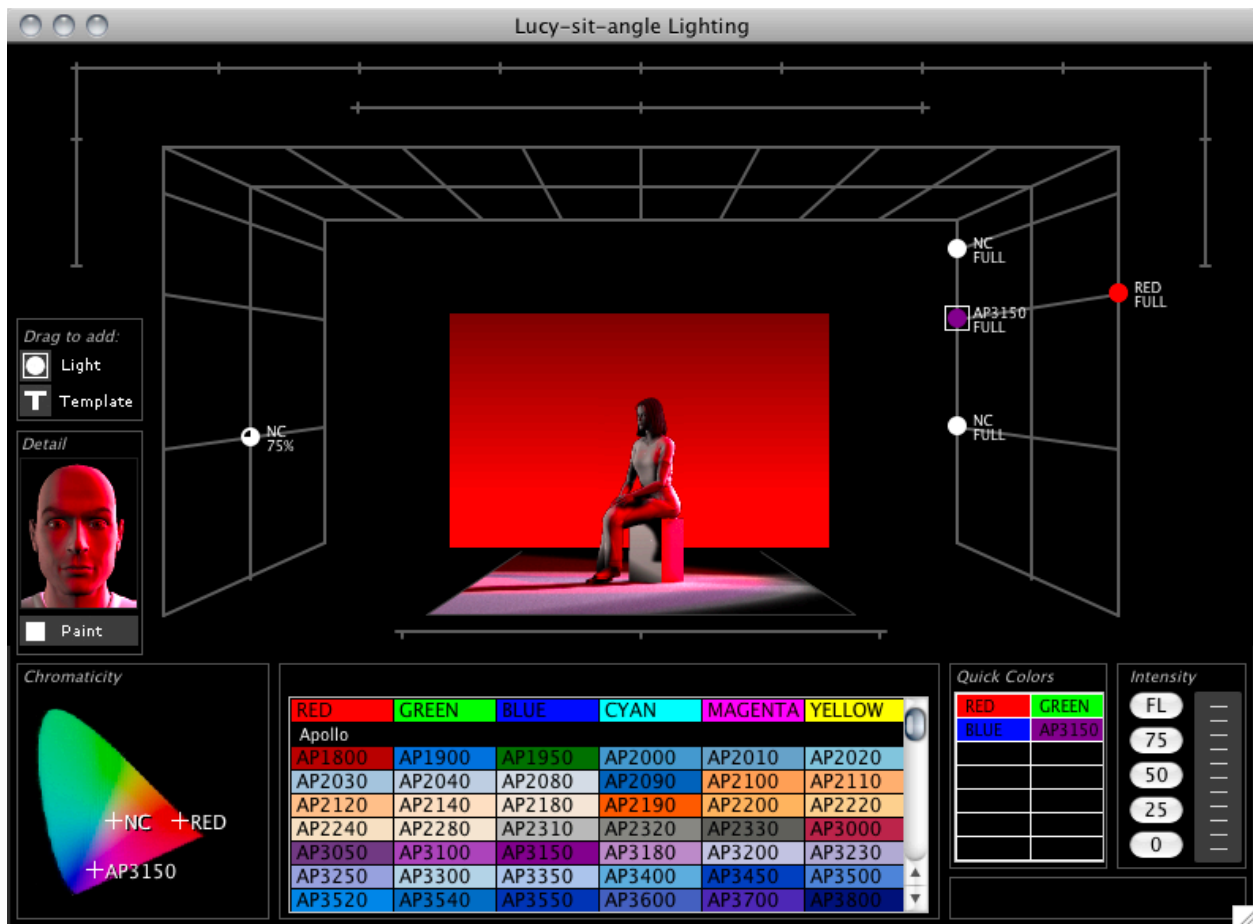


Figure 2 Lucy basking in the glow of five lights.

The currently available version 2010 of the program has the ability to import an image to create a custom background and light it as if it were backdrop. You may also have more than one model at a time on your simulated stage. The backdrop can be treated like a cyc lit from the top, the bottom, or both.

One item that I miss from version two is a stage with a set of several three-dimensional geometric shapes. Other colleagues have also expressed missing this feature. Hopefully it will return in the future.

Several other software packages allow you to play with angle and color, but many lack the simplicity, speed, and ease with which Virtual Light Lab sets up and has you playing with light. The demo version is limited to using two lights at a time and will not print or save settings.



Figure 3 More people plus a gradient-lit backdrop.

Lighting sketches and renderings using Photoshop-type programs.



Figure 4 The designer's rendering for the robbery scene in Carousel.

In the first article of this series, we spent considerable time discussing the importance of presenting visual ideas and/or research at production meetings to support the lighting designers creative ideas. The above rendering was created using the program called Photoshop, from Adobe; it is the professional industry-standard for photograph manipulation, editing, and enhancements. The steps used to create this rendering can be found on page 31 of Dramatics, January. Photoshop is available for both Windows and Macintosh computers. Fortunately, there are many FREE open-source software packages that will accomplish just about everything that Photoshop has to offer. The most popular cross-platform package is called “gimp” and can be found at www.gimp.org.

It is said that the number one reason why people should be using computer software to do the work we do is to make our lives easier and to accomplish our tasks faster. Creating the image for Carousel was relatively quick and painless. However, it has taken several hours of hunting and pecking for the appropriate function in the myriad of menu options to create this rendering. If you are like me, you will end up being distracted by all the wonderful tools, gadgets, and special effects the program offers whilst you struggle to produce a rendering/drawing before a looming deadline. Once you have obtained a certain level of competency with a program like Photoshop, it will allow you to offer your creative team colleagues several different versions of your design ideas. Photoshop, Gimp, VectorWorks (to be discussed next), AutoCAD and many other graphics programs offer a function called layers. You can create many, many layers that can be turned on and off with the click of your mouse. Each layer can hold different versions of your design ideas that can be called up or hidden as needed. Additionally, you could use layers to separate out each scene of your production that will allow you to discuss blocking choices with your director.

Computer Aided Design & Drafting

Computer Aided Design & Drafting, aka CADD, applications have been around for a very long time. Just about any of these computer-drafting programs can be used by theater professionals and students alike. They range from simple pixel drawing programs up to very powerful three-dimensional rendering virtual-reality programs. A quick look on Wikipedia shows approximately 100 different CAD packages available for various general or special industrial needs. Those that meet the theatrical lighting designer specific needs include MacLux Pro, LXFree, Softplot, WYSIWYG, AutoCad (additional plug-ins and symbols required), LDAssistant (a version of AutoCad with built in stage lighting tools) and VectorWorks Spotlight. As I currently use a full version of Vectorworks, it is the program I will use for this article.

In my second article of this series on page 36 of the May 2010 issue of Dramatics, I showed a detail section of a hand drafted light plot. The information was relatively sparse by today's computerized standards; it included a symbol for each unit, a unit number, and a dimension to show the distance between those units on their respective pipes. Additional information, including channel number, color choices, template choices, etc. could have been included; but would have added several hours/days to the drafting process. Using a computer-drafting program, I am able to draft the light plot with greater speed and accuracy. I am also able to easily include much more information with a simple click of a mouse. Several versions of the light plot are easily printed for those requiring certain sets of information. A copy for the technical director doesn't necessarily need color or template information. The TD will likely be interested in keeping any moving scenery from hitting any lighting equipment that is in the air or on the stage deck. It is wise to keep everyone involved up to date with your plans as they might just build an object that gets in the way of the ladder you need to place in order to reach that crucial light during focus call.

An experienced draftsman can create a light plot with hundreds of lighting units in just a few hours. That same light plot could take days to draft using paper, pencils, and erasers. When I draft using a computer, I am likely to include channel numbers, color numbers, template numbers, and, if I know them, dimmer numbers.

In either case, the distance between units is always notated. When using the appropriate tools, placing dimensions on the CAD version takes all of 12 seconds per pipe.

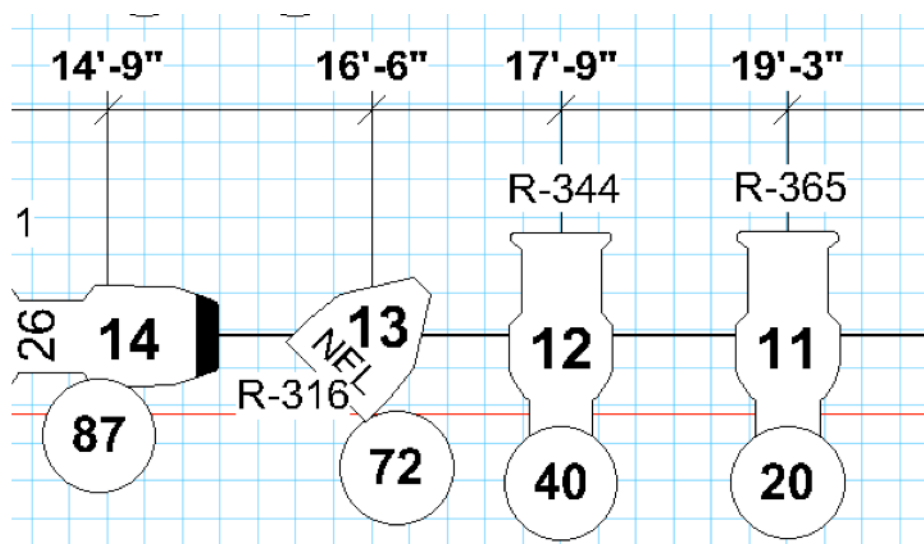
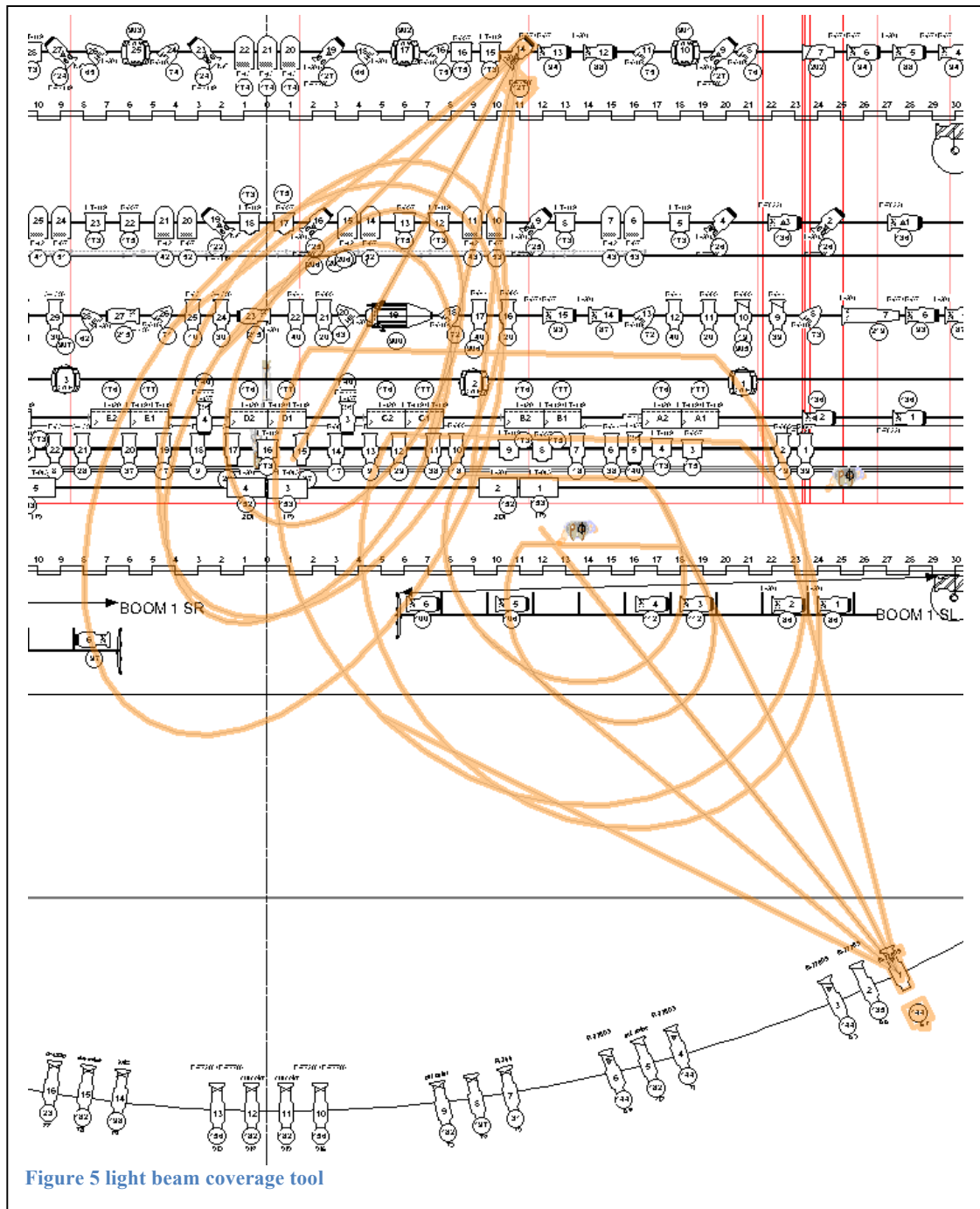


Figure 4: Detail from Computer Drafted Light Plot

CAD programs have become useful tools to designers during the preproduction process.

VectorWorks has a "beam" tool that allows you to see the approximate coverage of your chosen lighting units. Figure 5 shows two lights set to show beams. The beam tool even has shutter cut settings. Here the front light has a shutter cut and is showing where the beam will hit the stage. These tools allow designers to double-check their choices of units to make sure that coverage is adequate to appropriately light the given scene and/or stage.



Working in three dimensions.

The three-dimensional capability of many of the currently available CAD programs is where the exceptional benefits to using computer-aided design shines. With that said, it is important to note that many leading Broadway lighting designers using CAD programs today are still drafting in 2D. The primary drafted paperwork they supply to their production electricians includes a light plot, a section and any needed detail drawings. Personally, I switched to the 3-D methods discussed here years ago. Though it takes a while longer to set up your theater and load in your virtual set, the benefits quickly become apparent.

A section is a side view of the stage. In other words, it is as if you stand in the wings of one side of the theater and look across the stage to the other side. Lighting Sections are primarily used to figure out three very important pieces of information: (1) sightlines from the lighting unit's point of view to see how the light will hit the actors, the scenery, and the stage; (2) sightlines from the audience's point of view to see how high the lighting pipes need to be flown so they are not in view; and (3) desired trim heights for both the lighting pipes and overhead masking.

Section work is required regardless of whether designers are using paper and pencil or CAD.

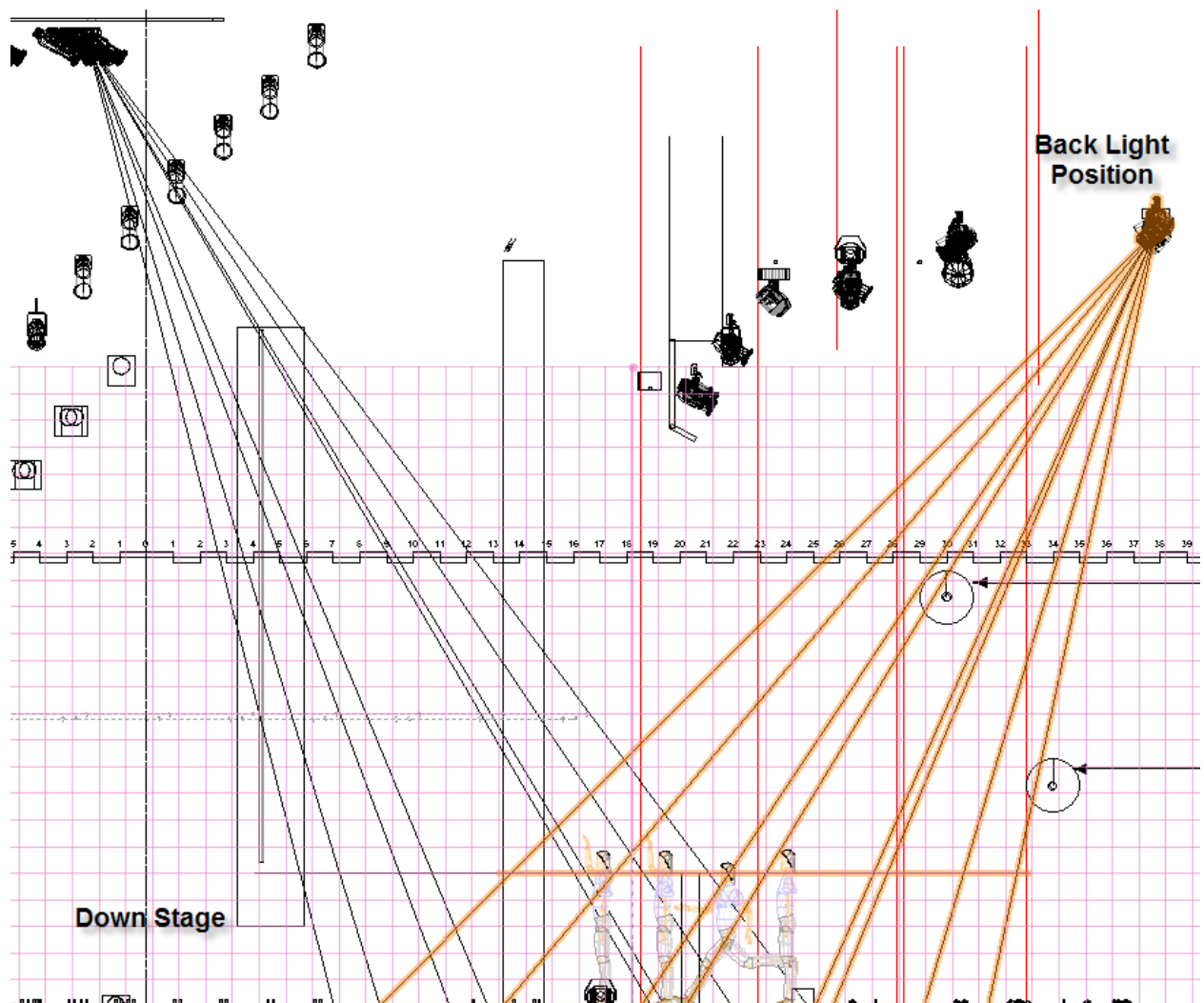


Figure 6: Section View with lighting angle work

In Figure 6, we see that the actors have a relatively free range of movement while still being covered by the backlight from the upstage pipe.

We can also explore the same scene from the front and use the beam tool to confirm that the coverage is adequate for when the actors move side to side. The beam tool is highlighted in Orange and shows that one out of our three actors will be lit.

Just about all of the current three-dimensional CAD programs available today have the capabilities of creating colorful renderings of your design. These two images are before and after applying lighting settings to a three-dimensional representation of a room. This particular room was created during a VectorWorks workshop and resembles either a jewelry store or a museum with display cases.

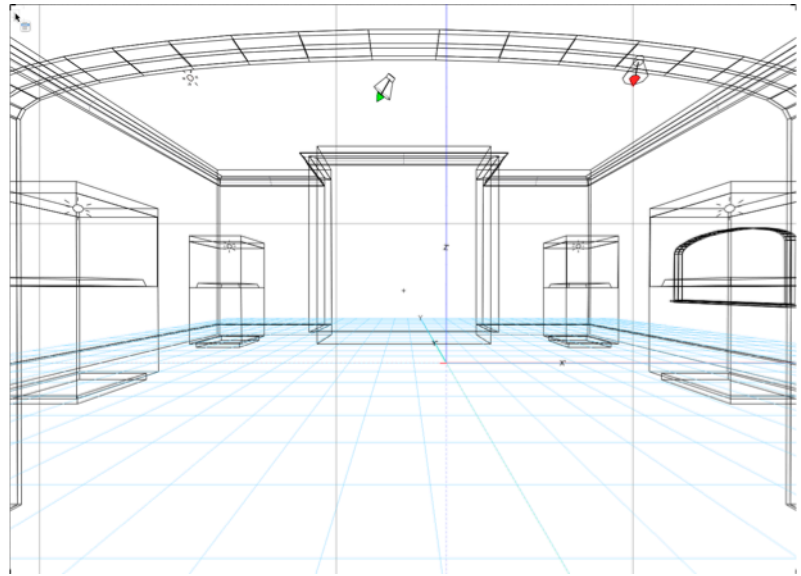


Figure 6 Wireframe view of our room.

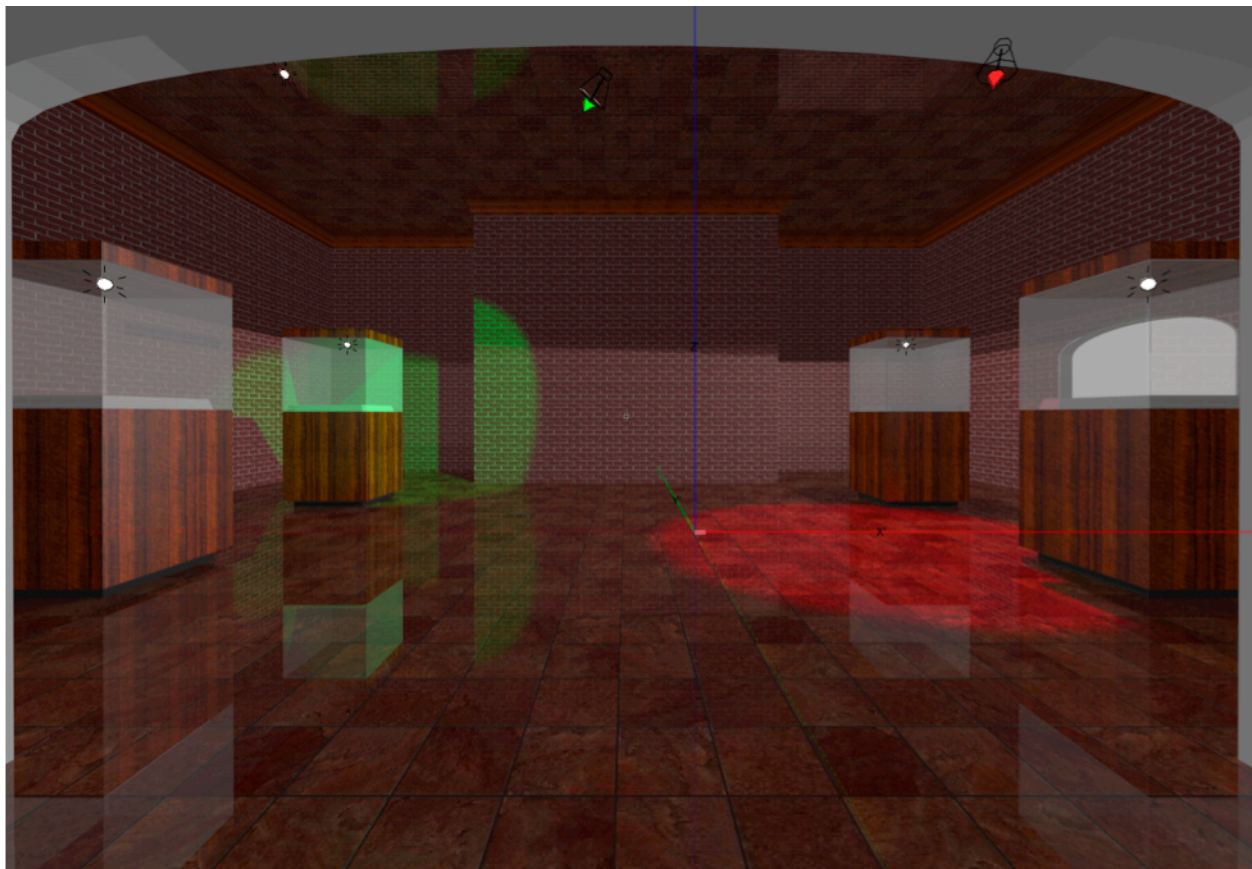


Figure 6 Fully rendered view of our room.

Lighting Support Paperwork

In addition to the drafted lighting plot and section, a collection of support paperwork is required to adequately communicate the designer's needs to the production crew. Channel hookups, instrument schedules, dimmer hookups, color cut lists, shop orders, and more may be needed depending on the complexities of the given production. Most of these CAD programs discussed come with their own versions of database functionality. The programs designed specifically for lighting designers have the capability to print out many of these required reports. Most will also be able to export to spreadsheet programs including Microsoft's Excel and others.

A program called Lightwright is considered the standard of the lighting industry when it comes to paperwork and the types of reports that

Carousel

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INSTRUMENT SCHEDULE

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CATWALK 3

U#	Type	Watts	Purpose	Template	Color	F	Dim	Chn
1	S4-10deg	750w	BREAKUPS VFSL	R-77809	N/C	●	3	(132)
2	"	"	"	"	"	●	4	"
3	"	"	"	"	"	●	1	"
4	S4-05deg	"	SHIP SCENE	R-77258	"	●	2	(154)
5	"	"	"	"	"	●	7	"
6	S4-10deg	"	COSTUMES: BLUE GREEN		R-24	●	8	(169)
7	"	"	COSTUMES: GREEN		R-88	●	5	(170)
8	S4-05deg	"	STARS ON SCRIM	R-77514	L-201	●	6	(210)
9	S4-10deg	"	COSTUMES: BLUE GREEN		R-24	●	8	(169)
10	"	"	FRONT FILL USL		R-51	●	12	(120)
11	"	"	FRONT FILL USC		"	●	9	(119)
12	S4-05deg	"	STARS ON SCRIM	R-77514	L-201	●	10	(210)
13	"	"	"	"	"	●	2	"
14	S4-10deg	"	FRONT FILL USC		R-51	●	4	(119)
15	"	"	FRONT FILL USR		"	●	1	(118)

Figure 7 Instrument Schedule from Lightwright

are used most often. While it is true that some consider Lightwright to be a glorified spreadsheet (which it is), it comes preloaded and preconfigured to deal with the many intricacies of theatrical stage lighting. Once you have specified the lighting units available and assign their parameters including gel frame sizes, wattages, etc. Lightwright will create all sorts of reports. One example is a gel cut list. Lightwright will figure the number of units using a certain gel color, the unit's gel frame size and will give you both the number of cuts needed and the number of full sheets to be ordered. Please see the resources section below for information about a demo version of the software.

Conclusion

There is nothing discussed in this article that cannot be done without a computer. It's called "going old-school." Pencils and large sheets of paper for light plots are still the norm in many places. Desktop lamps, flashlights, and small pieces of lighting gel can be substituted for on screen visualization when trying to figure out how colors will mix-and-match. Pencils, colored pencils, watercolors, or even colored chalk to help the lighting designer communicate their vision via a color front rendering of what you plan to put on stage. Lastly, the lighting support paperwork that keeps track of your channel numbers, instruments, etc. can easily be listed on an old-fashioned legal pad.

What all this software really does for us is allows us to make quick changes to our designs with ever increasing efficiency during the creative process of putting on a theatrical production. It really is becoming like a videogame. Flick the switch over here, turn a knob over there, slide a finger across the screen is what we are doing every day. Today's young designers need to know the basics of the design process using both paper & pencil and the current flavors of computer technology.

Note to teachers

The list of software available for use by entertainment designers is exceedingly long and changes every day. With the advent of new equipment, programmers from many backgrounds are creating applications that work on devices ranging from desktop computers to smart phones to tablets. Writing this article has given me the impetus to create an online repository of web links to software packages that serve our industry. You will find it at www.hstech.org

Opportunities abound for teachers at all level to incorporate these “design” software applications into co-curricular educational programs. Joining forces with math, science, English, physics, and/or computer teachers will benefit students on a variety of levels. Not to mention allowing administrators to both accept and to encourage, not only the retention of, but also the expansion of theater, art, graphics, dance, music, etc... programs. Funding for programs that include the use of technology is often easier to come by then those whose moniker boasts “the arts’ by itself. Most of the computer programs mentioned here will run on equipment that many school computer labs currently have. Your school district IT departments may well be able to assist and some may already have site/system wide licenses for some mainstream programs. AutoCAD, from AutoDesk is the most widely known. However, other packages mentioned here should certainly be considered as many are designed specifically for stage designers.

LightWrite <http://www.mckernon.com/> The demo version of Lightwright is exactly the same as the regular version except that they have a maximum capacity of 75 lights instead of the usual 30,000, they will hold only 50 entries in each text category instead of the usual 6000, and they do not require registering with John McKernon Software. For readers of Dramatics, the demo version will likely suffice. For those with larger production needs, a student license is available that is valid for three years.

VectorWorks is my particular choice for CAD software. VectorWorks is one of the few CAD companies to hire theatrical lighting designers to join their team of programmers. <http://student.myvectorworks.com/> They offer a free version for students and teachers to install on their personal computers. Schools will have to purchase the software if they wish to install it in computer labs.

AutoCad is considered the standard of the architectural and engineering worlds. There are several renditions of the base program, as well as, several sets of macros available that are designed specifically for entertainment lighting. Overall, AutoCAD is much more expensive than VectorWorks. However, it is also free for students and teachers to use on their own computers. It is also more likely that students will find AutoCAD installed in universities that have programs other than theater. <http://students.autodesk.com/>

WYSIWYG stands for “what you see is what you get.” It is a lighting visualization program that allows you to see what light will do utilizing many added features. These features include the ability to connect to a lighting control board and having the simulated lights be controlled by the board. Additionally, WYSIWYG will simulate moving lights in real-time. There is a student version available for around \$300. This student license expires after year. <http://www.castlighting.com/>

Photoshop <http://www.adobe.com/> is the industry-standard when it comes to manipulating photographs. It has a full set of painting tools that allows one to create very effective color renderings. For students and teachers, they offer an educational version for just under \$300.

As mentioned above, a free alternative to Photoshop is an open source software package from <http://www.gimp.org/>. GIMP can do most of the things that Photoshop does; Certainly enough for our needs.

QCAD 2D drafting software is one of the least expensive CAD programs out there. It's currently selling for about \$42. It doesn't have any lighting tools built-in, but the user can certainly construct their own lighting symbols from scratch.

<http://www.qcad.org/qcad.html>

Virtual Light Lab has a demo version for both Mac and Windows machines. The demo version does not allow you to save your work from session to session, but setting it up is so quick and easy that you'll be working with the two lights and a sphere in no time.

<http://www.westsidesystems.com/>

<http://www.actlighting.com/downloads.html> GrandMA 3d visualization software. Similar to WYSIWYG, this program shows you what your lights will look like on your virtual stage using your Windows computer. This software is specifically designed to be an emulator for the GrandMA lighting control board. The manufacturer supplies the software for free in hopes that you will purchase their lighting board.

LXSeries lighting software has a lot of the same functions as the other packages but with less polish. The interface is a bit clunky, but with a price tag less than \$100 it may well be the go to choice for many aspiring lighting designers.

<http://lx.claudeheintzdesign.com/>

SoftPlot 3D <http://www.stageresearch.com/> is another Windows only software program that allows you to create paperwork and see a virtual representation of what your lighting will do.