How Technology Has Changed the Role of a Theatrical Lighting Designer

Justin Thomas Poruban Norwalk, Connecticut

Bachelor of Fine Arts in Theatre Design and Technology, University of Connecticut, 2016

A Thesis presented to the Graduate Faculty of the University of Virginia in Candidacy for the Degree of Master of Fine Arts

Department of Drama

University of Virginia April, 2020

> <u>Thesis Committee</u> Richard Lee Kennedy, MFA Steven Warner, MFA

<u>Acknowledgements</u>

I would like first and foremost thank my graduate school mentor, R. Lee Kennedy, for all of the knowledge and guidance I have been able to receive over my three years here at the University of Virginia. I have seen a remarkable change in my overall artistic abilities and knowledge of our craft. The tools I have received will never be forgotten.

I would also like to thank my reader, Steven Warner, for all of his support during my three years here. Having you as an instructor was a pleasure, and being able to come to you for technical advice was a blessing.

I would finally like to thank undergraduate mentor, Michael Chybowski, for all of the instruction and support I received during my four years at the University of Connecticut. You helped lay the foundations of my design career. You constantly challenged and pushed me to be the best designer and theatre practitioner I could be, and for that, I am eternally grateful.

To my graduate cohorts, Julie Briski and Lauren Duffie. I would like to thank you for everything you've done for me over the three years together. Collaborating with both of you has allowed me to gain a better understanding of my abilities both as a designer, and my work in everyday life. I look forward to working with both of you as we all step out into our professional lives.

Finally, my graduate collaborators, Joel Chroscinski, Matthew Kornegay, Kevin Minor, Batul Rizvi, and Priyanka Shetty, I am blessed to have met and worked with you all throughout my time in graduate school. I will cherish all of the interactions I had with each you. No matter how small or large of a role you played, I grateful for allowing me to exercise the skills and fundamentals instilled in me.

Table of Contents

Acknowledgements

Table of Contents

Figure References

The History

The Job of a Lighting Designer

Lighting Design and My Process

Seven Guitars

Lungs

Closing Marks

Figure References

Figure 1. Urinetown preliminary image board at the University of Virginia. Spring 2018.

Figure 2. Digital Storyboard of the "Secret Hideout" in Urinetown at the University of Virginia. Spring 2018.

Figure 3. Photo of the "Secret Hideout" in Urinetown at the University of Virginia. Spring 2018.

Figure 4. Light Plot and Channel Hookup, examples of typical show paperwork, from *Urinetown* at the University of Virginia. Spring 2018.

Figure 5. Show file from Urinetown at the University of Virginia. Spring 2018.

Figure 6. Script from Urinetown at the University of Virginia. Spring 2018.

Figure 7. White Model from Seven Guitars at The University of Virginia. Fall 2017. Designer: Tom Bloom.

Figure 8. Drawing of the White Model from Seven Guitars at The University of Virginia. Fall 2017. Designer: Tom Bloom.

Figure 9. Texture test for Scene Transitions for Seven Guitars. Fall 2017.

Figure 10. Scene Transitions for Seven Guitars. Fall 2017.

Figure 11. Front Light Photometrics for Seven Guitars. Fall 2017.

Figure 12. Vectorworks Front Light Photometrics for Seven Guitars. Fall 2017.

Figure 13. Magic Sheet for Seven Guitars. Fall 2017.

Figure 14. Focus Points for Seven Guitars. Fall 2017.

Figure 15. Production photos from *Seven Guitars*. Fall 2017. Direction by Theresa Davis, Scenic Design by Tom Bloom, Costume Design by Dorothy Smith, Projection Design by Mona Karsa, and Sound Design by Siyang Wang.

Figure 16. Lighting Plot, Magic Sheet, and Channel Hookup from Seven Guitars. Fall 2017.

Figure 17. Three proposed Scenic Designs for Lungs. Fall 2019.

Figure 18. 3D Model for Lungs. Fall 2019.

Figure 19. Ground Plan for Lungs. Fall 2019.

Figure 20. Lighting renderings Lungs. Fall 2019.

Figure 21. Virtual Magic Sheet for Lungs. Fall 2019.

Figure 22. Pixel Map Preview for Lungs. Fall 2019.

- Figure 23. Light Plot for Lungs. Fall 2019.
- Figure 24. Story Boarding and Production photo of the last Scene of Lungs. Fall 2019.

Figure 25. Story Boarding and Production photo of the first Night Scene of Lungs. Fall 2019.

The History

Some of the earliest playwrights, including Aeschylus, Sophocles, Euripides, and Homer made references to the Sun, and other light sources that would illuminate an otherwise empty stage, such as fire and stars. They could not have conceived of how light as an element of live performance would be revolutionized by technology and that it would be able to transform the atmosphere of a play, scene, or dance a thousand different ways in the matter of seconds with just a few clicks of a button.

Throughout history, theatre artists have strived to enhance the appearance of a stage to help tell a story. One of the earliest notations comes from the writings of Valerius Maximus from 78 B.C., where he noted Greek and Roman dramas were performed during stark day light. In an attempt to better the story, they draped red, yellow, and blue fabrics over the stage, and the sunlight that passed through was tinted¹. For another fifteen hundred years, humans continued on their quest to transform stages and scenery. In the year 1551, an Italian Architect named Sebastiano Serlio started to solidify the role of the light as a design element. At that point, during the Italian Renaissance, scenic designers began setting up hundreds of candles and gas lamps to fill rooms and illuminate their beautiful sets. Serlio was truly ahead of his time, establishing some of the fundamentals we still use today. He recognized that there needed to be three systems of light in order to have a seamless production flow: lighting for both the audience and actors, lighting for the scenery, and dramatic lighting to enhance the change in actions. Some of the techniques he used included setting up mirrors behind candles, and placement of colored liquid in front of them to shine saturated colors onto the actors. He also toyed with the idea of constricting oxygen flow to candles, by adding glass covers, to suppress the light output of the

¹ Edison Company. The History of Stage and Theatre Lighting

flames he was using². As years progressed, scenic designing continued to make use of the available lighting technologies such as the wax candle, gas lighting, the lime light, and ultimately electric light. It was the introduction of incandescent electrical lighting technology to the theater in the early 20th century that solidified the role of the Lighting Designer. By the 1950's, ground-breaking Lighting Designers like Peggy Clark, Tharon Musser, and Abe Feder paved the way for lighting design as a specialty as they transformed their visions onto the stage. From their processes, approaches, and creative use of the available technology, the basis of standards that we still follow today emerged.

One example is the concept of tracking. It is one of the most powerful ways of controlling the cue structure of a lighting design, and one that is still employed by the most sophisticated contemporary lighting consoles. A simple explanation of tracking, is that when you make a change to an individual cue, that level change will continue until it encounters another level change. This concept stems from the use of Piano Boards, where a lever would stay up until it was physically changed, allowing levels to track through different cues.

Other standards were developed around how to setup and manage paperwork, as well as document a lighting design. While everything in the 1950's was tracked on paper, we now use software that allows us to keep track of changes as they occur. Having digital access allows us to distribute information more quickly to all the parties involved with the design process, rather than using white out, or having to re-write paperwork.

My first experience in a professional theatre environment was in 2012. It was my first year of college and I was tasked with programming and running the lighting console for a production of *Romeo and Juliet*. One of Shakespeare's most popular plays, it was first performed

² Boston Edison Company. The History of Stage and Theatre Lighting

in 1595, and has undoubtedly been staged and designed thousands of time before I began my job as the programmer. I had no idea what the process of designing a show consisted of, let alone all the design and technological experiments that had been conducted since the first time a flame was used onstage. Since that first time I sat at a lighting console, I have been amassing a knowledgebase of what I believe it truly means to be a Lighting Designer and how the ongoing creative application of technology is essential.

The Job of a Lighting Designer

There is no manual written on how to design a given production. In my experience, the joy of designing for theatre is that there will never be two identical processes, or even two nearly the same. I believe designers are a group of creative artists that are gathered by a director and work towards a common goal: to produce a new and relevant piece of art that will hopefully make a statement towards society either past or present. Ideally, a production process begins with a director's strong vision. Along with the Lighting Designer, a typical design team consists of a Scenic Designer, Costume Designer, and Sound Designer. Drawing on visual design skills and the creative use of technology, the lighting designer tries to not only capture the essence of the script, but also enhance the vision of the director, all while successfully collaborating with the other designers. From the first design meeting to the opening night of the show, invariably things in the process will change; sometimes significantly.

Throughout this process, I find that the bulk of my work is concentrated into two periods. The first starts with all my research, and finishes with the creation of all paperwork. This usually happens slightly before time when the plot and paperwork need to be turned in order for the crew to be able to hang all of the lights and set everything for tech rehearsals. From that point on until tech rehearsals, I find I have a little bit of a lull where aside from being present in the design meetings, my process pauses until the start of technical rehearsals. The second concentrated period for me is tech. Once tech rolls around, the magic really starts to happen. As I add lighting elements to the production, they begin to enhance the actors story telling. When all of images onstage match the research and ideas proposed earlier in the process, I have a sense of accomplishment in a successful collaboration. My creative use of technology throughout my process plays a major role in how I achieve that goal.

Research is where the process begins. Whether imagined, discovered on the internet, or scanned from books, visual research images can be arranged into successful image boards. Like other designers with whom I have worked, I will typically look to art for inspiration. Having access to vast digital image libraries and collections, we are all able to gather a large quantity of images to share with the rest of the design team quickly. I can take these images and import them into to programs such as Vectorworks, Photoshop, and Illustrator to enhance, edit, and present.



Figure 1. *Urinetown* preliminary image board at the University of Virginia. Spring 2018.

Designers of the 20th century were limited to public libraries, and mailing documents, which seems comparatively limited in terms of the ability to quickly update and change designs.

Once the research phase of the design process is complete, I begin the theoretical design process. At this point, I have taken all my research findings and begin to compose lighting for each moment of the show. It is important at this point to make sure I have read the script thoroughly. I notate every mention of light, and every mention of time, space, and location. Without knowing every detail, I find there is great room for error. Lighting a nighttime scene like a bright morning, could be confusing to an audience. This is also the time when I begin to frame what systems of color and texture I will use predominately through the design.

With image research in place, and initial system thoughts about color and angle in mind, I can begin to make renderings, sketches, or drawings to show how I intend to light and shape each scene. There are many techniques for doing this, I usually create digital storyboards that show angles of light, color, and texture for each scene. I begin by creating a digital, three-dimensional model of the set using Vectorworks. Once it is fully constructed, I add people and textures to the model to make it as realistic as possible. I then add lighting instruments into the file that can create color, shadows, and texture. Exporting images like Figure 2, I can compile a package to share with the rest of the design team. Designers of the 20th century often created foam board models lit with flashlights, which achieved their goal at the time. By using digital tools, it allows me to put lights at the exact angles at which they will be in the theatre. This is helpful in creating a near perfect idea of what is to be expected.



Figure 2. Digital Storyboard of the "Secret Hideout" in *Urinetown* at the University of Virginia. Spring 2018.



Figure 3. Photo of the "Secret Hideout" in *Urinetown* at the University of Virginia. Spring 2018.

Once I present the storyboards and get responses from my collaborators, I get a better understanding of how to plan out my design. Next, I create the lighting plot (see fig. 4) based off the information I gather from the story boards. Vectorworks allows me to do schematics and math based on the height of the pipes in the space to figure out what lighting instruments will accomplish the overall system design I am looking for. As the paperwork develops, each lighting idea is divided into systems. "Systems" are a group of lights that are aligned and hung in the theatre at a similar angle. Typically they are the same color and/or texture breakup so that anywhere performers go onstage, they can be lit according to the designer's concept. As I begin to assemble all of the systems, I will then input vital information including the position, channel numbers, color, and texture. Vectorworks makes this simple, by allowing quick entry of lighting instruments information. I am then able to link Lightwright, an industry standard paperwork program, to my Vectorworks file and all the information will populate. This way I can easily generate reports such as the channel hookup.



chan	VWFcPt	Purp	Position	Type & Acc & Load	Color	U
(1)	1	HL C/W	Apron Pipe	Source4 50° 575w	R99+R119+HS	12
(2)	3	HL C/W	Apron Pipe	Source4 26° 575w	R99+R119+HS	10
(3)	5	HL C/W	Apron Pipe	Source4 26° 575w	R99+R119+HS	7
(4)	6	HL C/W	1 Electric Taildown SR	Source4 36° 575w	R99+R119+HS	1
(5)	7	HL C/W	1 Catwalk	Source4 26° 575w	R99+R119+HS	16
(6)	8	HL C/W	1 Catwalk	Source4 26° 575w	R99+R119+HS	14
(7)	9	HL C/W	1 Catwalk	Source4 26° 575w	R99+R119+HS	12
<u>(8)</u>	10	HL C/W	1 Catwalk	Source4 26° 575w	R99+R119+HS	10
(2)	11	HL C/W	2 Electric Taildown SR	Source4 36° 575w	R99+R119+HS	1
(10)	12	HL C/W	2 Electric	Source4 36° 575w	R99+R119+HS	31
(11)	13	HL C/W	1 Electric	Source4 36° 575w	R99+R119+HS	24
(12)	14	HL C/W	1 Electric	Source4 36° 575w	R99+R119+HS	19
(<u>13</u>)	15	HL C/W	1 Electric	Source4 36° 575w	R99+R119+HS	14
(<u>14</u>)	17	HL C/W	2 Electric	Source4 36° 575w	R99+R119+HS	19
(15)	20	STAIR C/W	3 Electric	Source4 50° 575w	R99+R119+HS	20
(16)	101	HL C/W	2 Catwalk	Source4 26° 575w	R99+R119+HS	3
(17)	102	HL C/W	2 Catwalk	Source4 26° 575w	R99+R119+HS	2
(18)	103	HL C/W	2 Catwalk	Source4 26° 575w	R99+R119+HS	1
<u>(21</u>)	1	HR C/ W	Apron Pipe	Source4 26° 575w	R99+R119+HS	6
(<u>22</u>)	3	HR C/ W	Apron Pipe	Source4 26° 575w	R99+R119+HS	3
(23)	5	HR C/ W	Apron Pipe	Source4 50° 575w	R99+R119+HS	1
(24)	6	HR C/ W	1 Catwalk	Source4 26° 575w	R99+R119+HS	7
(<u>25</u>)	7	HR C/ W	1 Catwalk	Source4 26° 575w	R99+R119+HS	5
(<u>26</u>)	8	HR C/ W	1 Catwalk	Source4 26° 575w	R99+R119+HS	3

Figure 4. Light Plot and Channel Hookup, examples of typical show paperwork, from *Urinetown* at the University of Virginia. Spring 2018.

Justin Poruban / Lightwright 6

Once my ideas are solidified in the paperwork, there is then a bit of a break in my process while the crew hangs and preps all the fixtures designated in the paperwork. The next concentrated part of the process for me begins with a lighting focus. "Focus" is a long and tedious process where the Lighting Designer stands onstage and directs the electricians to focus each fixture, (the direction to aim it) and any other adjustments, such as color, texture, or shutter cuts to keep light off of set pieces or walls. Following Focus, technical rehearsals begin. Tech entails long rehearsal hours where cue by cue, I create lighting for each moment in the show. This is the first time the creative team gets to see the show onstage with all elements in place. The director begins to see my vision and collaborate with me on the visual shape of each scene. I spend each tech rehearsal looking at the stage, diligently writing cue information in my script, (see fig. 6) and changing the levels of the lights scene by scene to balance the brightness and color ideas for the production. Along the way, I may need to change color, texture, or focus of existing fixtures, or possibly add new ones. While changes and additions can be challenging to accomplish in such a short time frame, the results can be rewarding to the designers. For example, if I wanted to add a new color system to a scene, I would have to look through all of the existing cues I have written to make sure the visual continuity of the scene is still intact, all while seamlessly incorporating the added elements into the design moving forward.

Following the technical and dress rehearsals and previews, is the opening night of the show. At this point, the show is frozen and there are no more changes to be made to the lighting. However, my job isn't fully over at that point. I must go through, and make sure my script is accurate, and update all of my paperwork with any changes that occurred through the process. Complete documentation isn't always required, but some shows will be remounted with the same design, so it is crucial that my work is preserved.



Figure 5. Show file from Urinetown at the University of Virginia. Spring 2018.



Figure 6. Script from Urinetown at the University of Virginia. Spring 2018.

Lighting Design and My Process

In the subsequent sections, I will be discussing the specific elements of my Lighting Design for two productions at The University of Virginia, *Seven Guitars* and *Lungs*. *Seven Guitars* was the first show I designed in 2017, and I will discuss the completely analog process I used to design the show. I designed *Lungs* at the beginning of my third year and will discuss the fully digital approach to the process I took on it.

For each, I will focus on examples of how I incorporated technologies familiar and unfamiliar to me, or applied in new or creative ways.

<u>Seven Guitars</u>

The University of Virginia's Department of Drama produces three mainstage plays and a musical each year. The structured process for each production begins with seven weekly design meetings, with the intention of constructing a collaborative design. The process varies slightly for each of the design departments; Lighting, Scenic, Sound, Costume, and Projection. Each area generally has different deadlines, with the scenic and costume designs being completed first.

On my first day of graduate school, I was handed the script for *Seven Guitars* by August Wilson. I was tasked with being ready for the first design meeting, which was in two days, and to be prepared for every consecutive Thursday for next seven weeks.

When I walked into the first design meeting, I had read the script twice, had all the scenes broken down in my notes, and was eager to hear and interpret the ideas of Theresa Davis, our ecstatic director. She began by reading us some famous quotes from Amari Baraka, and a speech that August Wilson gave in 1996. She also stressed the importance of Blues being integrated into the show and ended with a final statement about the main character, saying: "It is not so important who kills Floyd, but why."

The director set the scene for us, saying that the play happens late spring 1948, during the post war boom, though the boom hasn't fully reached the neighborhood in which she was imagined the play is set. She described the poor neighborhood in the Hill District of Pittsburgh, as a melting pot of ethnicities. She suggested that although the play is set in the North, many themes make you feel like you're in the South, including the addition of the character Headley who is clearly from Haiti.

The first thing the director wanted us to consider from a design standpoint was "ritual, repetition, and call and response." Those are two significant elements in the play, and my initial thought was to establish a convention to show the progression, and rather distinctly differentiate the memory scenes from the modern-day scenes by establishing a convention of color, texture, and angle for each.

An added challenge to my process was that the scenic, costume, and projection designers were all professors in the department, and had the ability to have informal conversations regarding the design through the summer. With the scenic design being in a state of almost full completion, and the costumes and projections already in process, I had to figure out how to incorporate my ideas in a way that maintained the visual integrity of all the other designers work. After doing copious amounts of image research, and looking at art and painting, I found inspiration to influence my design similar to how the artist Leonid Afremov paints; including broad brush strokes and saturated color during the memory scenes in order to show the significant difference from the harsh and sterile first and final scenes. To be short, the concept I chose was "energy and color fade with death". After preparing printed image research of many paintings, I was ready to walk into the second meeting and inform the rest of the team of my concepts and ideas. The scenic model was available early on (see fig. 7), which allowed me to begin my process of story boarding right after finishing my research phase.

My approach to the story boarding process was a non-intuitive route of using hand drafting and CAD software. First, I took a photo of the model, which allowed me to draw over it, in order to create a blank template for my story boarding. Originally, I had drawn it by hand (see fig. 8). This was a time-consuming process in which every different angle or time of day that I wanted to achieve, required me to trace out a new master sketch. Each took several minutes to draw, and then I had to eventually put the image into Vectorworks. I was able to draw a few simple lines and was then able to mass produce the template, which was the first time I discovered how technology could change my process as a whole.



Figure 7. White Model from *Seven Guitars* at The University of Virginia. Fall 2017. Scenic Designer: Tom Bloom.



Figure 8. Drawing of the White Model from *Seven Guitars* at The University of Virginia. Fall 2017.

At the second design meeting, my design ideas were well received by the rest of the team. I presented the image research that I had photocopied out of art books from the library, and a few of the hand-drawn storyboards I had done. The rest of the team understood my approach and were interested to see how I would develop the design from there. Following the meeting and additional conversations with the director about the structure, I knew scene transitions would play a large role in this show. It was confirmed that I needed to establish a visual convention about how to indicate the passing of time, and how light would support the visual transitions from scene to scene. I took my ideas and concepts and the CAD Line Drawings I created from the scenic model and made color pencil sketches that detailed my choices about colors and angles of light for each. The sketches I created were good for quickly getting basic ideas onto a paper but weren't fully fleshed out because they only showed my best guess of shadows and color mixing that light would create.

Following the second design meeting, I met with the director to talk through the ideas I sketched. The show has fourteen scenes, including the intermission. The first and last scene are present day and eleven others are internal memory scenes that shift to different times of day. I needed to talk through with the director about how we would navigate those, including when the scenic transitions needed to happen. I proposed an idea about hanging seven bare light bulbs in the center of the of the set that would draw the audience's attention during the transitions. They were to be a metaphorical reflection of the main character Floyd's heartbeat, who dies and remains onstage for all the scenes, except the first and last. The seven light bulbs would provide a visual focus during each scenic transition by pulsing like a heartbeat, until the last transition when the bulbs wouldn't turn on, to reflect Floyd's death. Along with that, I showed her the hand-drawn storyboards and explained the angles, texture, and color ideas I had for each scene.

The director responded positively to the bare light bulb idea and was receptive to my scene-byscene design ideas. I then had a meeting with scenic designer Tom Bloom, and he also accepted the heartbeat light bulb idea. We then talked through a way to accomplish that visually. He wanted to make sure that the light bulbs were low enough to be visually present, but not so low that the audience would wonder why light bulbs were hanging in the middle of a backyard. We discussed the trim height as well as two additional set pieces that needed to be electrified. These included a chandelier to hang in the kitchen, and a decorative light bulb string above the yard that is mentioned in the script.

I followed up those meetings with a few test trials in the light lab to test the texture and color ideas for the scene transitions and took photos to present at the next meeting. At the third design meeting, I presented the transition texture photos along with additional sketches and research. The design team was responsive and eager to see how my transition ideas would transfer to the production on-stage (see fig. 9).



Figure 9. Texture test for Scene Transitions for Seven Guitars. Fall 2017.



Figure 10. Scene Transitions for Seven Guitars. Fall 2017.

The following four design meetings were focused more on the other departments. At this point my concepts and ideas were solidified, along with the scenic design. The costume designer and projection designer began showing more detailed research, and with each meeting our process took steps towards a finalized design. As this was happening, I was at the point in my process where I had identified all my required lighting ideas and started drafting out where lights were needed in the space. I began with gathering CAD drawings of the Caplin Theatre, which I edited to my needs in order to do the photometric calculations for each lighting fixture. I needed a ground plan, a section, and a front elevation in order to do the appropriate figuring. At that point in time, I didn't know how to use Vectorworks for making photometric calculations, so I

had to take the time to draft each lighting beam by hand. This is the most time-consuming aspect of an analog design process. Without being able to use software to calculate position, focus, and distribution of each fixture, I had to rely on math and manual drafting. Figure 11 is an example of how I calculated a zone of front light for Seven Guitars. I started by figuring out the location of each fixture in the theatre, and the number of areas of coverage I wanted for each system. From there, I computed the distance from the fixture to six feet above the stage. Six feet is the standard height designers use when doing photometrics. Once I know the distance from the center of the beam at six feet to the fixture itself, I looked at the beam spread of available lighting fixtures to identify best choice for full-body coverage and blending between areas. After identifying which fixture type's beam spread would work best, I drew what the beam would look like in ground plan view to make sure there was enough overlap of the beams, and figure out what shutter cuts would be necessary at focus. Because each fixture's throw distance varies slightly, and each beam must be individually calculated and drawn, each fixture's photometrics took anywhere from one to three minutes to calculate. For Seven Guitars, I had approximately two hundred fixtures, coming in at various angles, which ended up taking around seven hours for me to calculate. Doing light calculations by hand was a long and tedious process. As an experiment, I used Vectorwork's beam calculations tool of those same three lights (see fig. 12), and what previously took seven minutes, only took a minute and a half. At that point, I was ready to start plotting fixtures in Vectorworks. The primary reason to draft a light plot in CAD is so that it can be easily disseminated and updated. Light plots are typically sent electronically to the electricians hanging the show, and there are constant updates and changes that quickly need to be accessed by all members of the lighting team.

The first part of the plotting process in Vectorworks was to make sure there weren't conflicts with fixtures physically overlapping in space. Once I adjusted for space conflicts by moving fixtures to new locations and recalculating their photometrics, I had to enter the new fixture placement back in Vectorworks. If I had had the ability to perform photometrics in Vectorworks, and not have to first draft the fixtures on paper, and then input them, I would have been able to work more efficiently. If I had the technical knowledge at the time I was designing *Seven Guitars*, I could have saved countless hours that I could have used to organize other paperwork.



Figure 11. Front Light Photometrics for Seven Guitars. Fall 2017.



Figure 12. Vectorworks Front Light Photometrics for Seven Guitars. Fall 2017.

The next most time-consuming piece of paperwork I had to create was a magic sheet. A magic sheet is a cheat sheet that designers use to remember what lights are focused in which area and the control channel numbers associated with them. The typical format designers use has a small ground plan with a diagram of lighting areas on top of it, each with a corresponding channel number. On a magic sheet there are typically several lighting systems per page, with other information that includes the gel, texture, and direction of light. There are many computer programs that can be used to create a magic sheet, which can be easily edited should channel numbers or other information change. These include: Adobe Illustrator, Power Point,

Vectorworks, as well as the EOS lighting consoles built in virtual magic sheets. When I designed *Seven Guitars*, I was unaware of these great options. I instead drew them by hand, and was forced to white-out any mistakes or changes (see fig. 13).



Figure 13. Magic Sheet for Seven Guitars. Fall 2017.

Once completed, I sent the paperwork to the Master Electrician (ME). The ME is the individual tasked with realizing the design by managing the crew to hang fixtures and configure all the electrical and networking information in order for all the fixtures to turn on as the designer intended them. The ME figures out all the circuiting, and then implements it, so that when the designer walks into the building for focus all the equipment is hung, configured, and working properly. One of the biggest reasons a lighting designer's paperwork must be so precise is because the designer is typically not present during the hang process. There will undoubtedly be some situations when that that will occur where, for example, fixtures cannot be hung in its

designated location because of obstructing pipe structures. The designer must have virtual access to the plots and paperwork to respond to these problems and make changes quickly and send them back to the crew in order to not delay the process.

The lighting hang process for *Seven Guitars*, was relatively smooth. I was able to quickly resolve small issues that arose. A few days into the set installation, there were conversations between the director and scenic designer, that resulted in the decision to move the entire set downstage 1'-6". This was the largest obstacle I encountered. I had to go back to all my paperwork and lighting calculations in order to make sure the angles at which I had picked to light the actors weren't too steep. When light comes in at a steep angle, it tends to cause unwanted shadows around eye sockets and under necks. In the end, I moved a few fixtures, and thus had to recalculate a few photometrics, and then re-plot them in Vectorworks. This unfortunately took a little bit of time to figure out, which ultimately held up the lighting crew. This is another example of how using Vectorworks to calculate photometrics would have undoubtedly saved precious time.

Thursday night before the lighting focus for *Seven Guitars* was our "designer run" rehearsal. The designer run is the first time the designers see the cast run the show, usually in a rehearsal space. Even though it is not performed on the actual stage, the set is taped out on the floor of the rehearsal room so that blocking can be approximated. This is extremely helpful, as it allows me to notate the actors exact position for each moment in every scene. As I watched the run, I also carefully notated all the lighting shifts I needed. Watching the designer run and in discussion with the director, I realized the importance of adjusting lighting to heighten the audience's understanding of why Floyd was killed, and the importance of finding the perfect

moments to slowly expand the stage in order to have light for the entrances of new characters throughout the play.

Focus for *Seven Guitars* was on Saturday, October 28th. I worked with my ME and a crew of six electricians for an eight-hour call. Focus typically starts with the designer taping out a grid of focus points on the ground that are determined during the drafting process. Then the designer adjusts one fixture at a time, standing on designated points on the stage and directs the focus.

For *Seven Guitars*, I had twenty-five focus points. Eighteen were on the main stage level, and seven were on the back porch and stairwell to the second level (see fig. 14). Except for some wrong color and a few wrong fixture types, focus went smoothly. Upon finishing, I went to sit at the lighting consoles and turned on and examined my systems one by one. I was eager to see the actor run through on stage in order to start framing the bare bones of my design.

The following Tuesday, October 31st, I began programming in preparation for tech. Tech began on Thursday, November 2nd. The first day of tech is typically a slower one because it is the first time the cast is on stage. They must get used to being on the set and under lights and adjust to the actual spacing of the scenery. I was able to program the lighting while the actors were acclimating to the space, which was extremely helpful. This was also the first time I got to see an actor onstage under the lights I had previously programmed. I was finally able to start shaping the looks in order to achieve my design goals. Tech proceeded smoothly. Each day, we worked through another section of the show until we were able to run through the entire production. Monday, November 6th was the first time the cast was in costume onstage, which presented another set of challenges. I had to double check that my lighting choices worked with the costumes and the visual choices of the production. Overall, we very successfully achieved our desired concepts, and the final product was a seamless collaboration.

The biggest challenge I had during the tech process was programming without knowing the full capabilities of the lighting console we used, the ETC Ion. I had some experience with the Ion but wasn't sure the best way to organize the different tabs on the monitors. I ended up with a lot of unnecessary information on the screens and spent a lot of time scrolling to find the information I needed. Quick file and information management is crucial during tech, and I unfortunately didn't understand how to work efficiently with the console until after the production. Regardless, I was able to successfully program the show and the performances went off without a hitch.



Figure 14. Focus Points for Seven Guitars. Fall 2017.



Figure 15. Production photos from *Seven Guitars*. Fall 2017. Direction by Theresa Davis, Scenic Design by Tom Bloom, Costume Design by Dorothy Smith, Projection Design by Mona Karsa, and Sound Design by Siyang Wang.



SEVEN (GUITARS	LD: JUSTIN PORUBAN	SEVE	N GUITA	RS 10-06-17.lw6 Channel H	łookup	Page 1 of 11 10/6/17
FRONT WARM	FRONT COOL	FRONT WHITE	Char	VWFcP	Instrument Type & Accessory & Load	Color	Purpose
			(1)	1	Source4 36° 575w	R03 + R119	WARM F/L
11 <u>7</u> 8	31 27 28	51 47 48	(2)	2	Source4 36° 575w	R03 + R119	WARM F/L
10 - 9	30 29	50 49	(3)	3	Source4 36° 575w	R03 + R119	WARM F/L
4 5 6	24 25 26	44 45 46	(4)	5	Source4 26° 575w	R03 + R119	WARM F/L
1 53	21 23	41 43	(5)	6	Source4 26° 575w	R03 + R119	WARM F/L
HI CUMARM	HI CLOOOL	HI COWHITE	(6)	7	Source4 26° 575w	R03 + R119	WARM F/L
75 HE C/ WARM	115 116	155 156	(7)	19	Source4 36° 575w	R03 + R119	WARM F/L
70 73	110 113	153	(8)	18	Source4 36° 575w	R03 + R119	WARM F/L
71/2 10 74	11112 101114	15/152 150 154	(2)	17	Source4 36° 575w	R03 + R119	WARM F/L
67 68 69 70	107 108 109 110	147 148 149 150	(10)	9	Source4 50° 575w	R03 + R119	WARM F/L
64 65 66	104 105 106	144 145 136	(11)	21	Source4 36° 575w	R03 + R119	WARM F/L
61 62 63	101 102 108	141 142 148	(21)	1	Source4 36° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
HR C/ WARM	HR C/ COOL	HR C/WHITE	(22)	2	Source4 36° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
		- frent have	(23)	3	Source4 36° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
90 91 92 93	130131 132 133	170171 172 173	(24	5	Source4 26° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
87 88 89	127 128 129	167 168 169	(25)	6	Source4 26° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
84 85 /86	124 125 126	164 165 166	(26)	7	Source4 26° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
83	128	168	<u>(27</u>	19	Source4 36° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
81 82	121 122	161 162	(28)	18	Source4 36° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
HL HIGH SIDE	HR HIGH SIDE	FLOOR REIN	(29)	17	Source4 36° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
Thur	Thur	Thur	(30)	9	Source4 50° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
Iton I	Hory /	(ton)	(31)	21	Source4 36° 575w	R362 + R119 + HEAT SHIELD	COOL F/L
183 184	187 188	192 192	(41)	1	Source4 36° 575w	G885 + R119	WHT F/L
182	186		(42)	2	Source4 36° 575w	G885 + R119	WHT F/L
181	185		<u>(43</u>	3	Source4 36° 575w	G885 + R119	WHT F/L
TOP WARM	TOP COOL	FLOOR REIN	<u>(44</u>	5	Source4 26° 575w	G885 + R119	WHT F/L
			(45)	6	Source4 26° 575w	G885 + R119	WHT F/L
403 404	413 414	191 191	<u>(46</u> Justin I	7 Poruban / Ligi	Source4 26° 575w	G885 + R119	(1) thru (46)
401	VECTORWORKS EQUCATIONAL VERSION						

Figure 16. Lighting Plot, Magic Sheet, and Channel Hookup from *Seven Guitars*. Fall 2017.

Before I started graduate school, I had learned quite a bit about design theory and implementing a design but wasn't experienced with technology. In retrospect, I could have saved much time during my process if I'd had more experience with the software versions of the analog process I had been using. In the lighting design field, good practitioners must have talent, and excellent time management skills. Although an academic theatre process is quite relaxed, by comparison, a professional lighting designer is expected to be contracted and have a plot ready sometimes within a few days. Being able to work as quickly and effectively as possible is vital. This is particularly true when companies don't own the theatre in which they are producing. Time is money, and the longer a tech process takes, the higher the production costs. I have seen a massive improvement in my productivity, as well as the overall product of my work since I've incorporated a range of technologies in my process.

The other production I will consider is *Lungs*. I designed this production in the fall of my third year of graduate school. Over the two years between *Seven Guitars* and *Lungs* I became well versed in technologies with which I was unfamiliar before.

As I began *Lungs*, I was able to apply the technologies to my process, and able to work digitally, yielding my smoothest design yet.

<u>Lungs</u>

When I first found out I was designing the lighting and scenery for *Lungs* by Duncan Macmillian at the University of Virginia, I couldn't have been more ecstatic. Our wonderful director, Dave Dalton, has a unique approach on what are seemingly straight forward productions. Having worked with him several times before, I knew that as a director, he is interested in seeing realistic visualizations beforehand of how the lighting will ultimately look in the production. Drawing on skills I have acquired since designing *Seven Guitars*, I drafted the space in 3D, and lit it virtually using a combination of Vectorworks and Photoshop.

Our design process was unique because rather than having the traditional seven consecutive weeks of design meetings, we met once on May 1st of 2019, and then the design team left for the summer. Before that initial design meeting, I met with the director twice. Since I was also going to be the scenic designer for the production, I planned for my lighting to serve as a major scenic element. The director wanted the audience to walk into a theatrical scenic and lighting environment, and not hide any equipment or walls with masking or curtains. He wanted the show to be almost like an art installation, putting strong emphasis on the relationship between the two characters in the show. The play is written in a way that didn't name the characters, or provide any specifics regarding their lives such as illnesses, or family members names, or any geographic locations. In the script, the playwright states that there should be no scenic pieces or any lighting except general illumination to make the actors visible. The hardest part of my design process was paying respect to the playwright's requests, while still designing a production as fully as the director and I envisioned.

Following our initial meetings, I created some basic set and lighting renderings that would create the neutral environment the director wanted to achieve. Even with only a period of about twenty-four hours, I was able to digitally render three set options, complete with lighting elements (see fig. 17). At the first and only formal design meeting, I presented three designs and the team settled on the one that had the strongest visual lighting element. The chosen design put the black box theatre in an ally configuration with a runway-style platform and a full bank of stage lights mounted on one end. The entrance doors to the physical theatre were the only actor entrances. The two actors would stay onstage the entire time, and only use the doors when they both died at the end of the play.



Figure 17. Three proposed Scenic Designs for Lungs. Fall 2019.



Figure 18. 3D Model for Lungs. Fall 2019.



Following that design meeting, the next three months of design and conceptual conversations were all conducted electronically. Being able to quickly computer draft and render drawings became the strongest asset I had. After several email conversations with the director and my scenic advisor, Tom Bloom, I finalized the scenic design within a slightly larger deck that would accommodate more floor standing lighting positions. The larger deck would also allow for greater isolation for the actors when desired and support a greater variety of staging options for the actors during a show with ten scene locations, including two montages that jump time within monologues. Having solidified the scenic design, I was able to change hats and begin the lighting design process.

The design approach that I wanted to take overall was to view the world of the play as if it was under a microscope. Since the play presents snippets of characters' lives, I imagined taking an up-close look into their world. With a long rectangular deck, similar in shape to a microscope slide, I viewed the two characters as living cells into which the audience would be looking. One of my lighting design ideas consisted of down pools of light that had visually sharp circular edges, as if the audience was looking down through a microscope lens. I also wanted to use opposing angles of textured light that would be able to visually isolate the characters and show the fact that they have completely opposite opinions for most of the play. During the rare sections that they were united in their opinions, I would highlight them both with one angle or the other, allowing their shadows to cast the same direction.

In the next step, I created lighting renderings to help me develop ideas and show them to the director and other team members. Using a combination of Vectorworks and Photoshop, I rendered a three-dimensional model of the set and theatre, including all the lighting positions, put virtual lighting instruments into the model, and created single light renderings using a virtual camera. After modeling individual elements of the lighting for specific scenes, I captured twodimensional renderings of each element and put them into Photoshop. Combing the elements as layer screens, I was able to adjust the opacity and color of each layer until I had images that reflected the ideas I hoped to achieve on stage (see fig. 20). I sent them to the director in a package with a description that explained how I planned to light each scene. After a sequence of in-depth conversation with him, I made a few small changes based on some of his comments. I was able to quickly update the renderings and send him another virtual package, which was a significant time saver. After the director was happy with my ideas, it was time for me to take the renderings and break them down into a plot that would support the angles and color choices I envisioned. I was able to draft the light plot and all the paperwork in a three-hour period. I then sent off the paperwork to our ME, who then had plenty of time to prep, hang, and circuit the plot.



Figure 20. Lighting renderings Lungs. Fall 2019.

While the plot was being hung, I spent time working on speeding up my cuing during tech. I decided to make use of the virtual magic sheet of EOS console, that would allow me to see the channels and where they're focused more easily. Traditionally, I had either held my paper magic sheets or had them on the table next to me. I would quickly look at them and then look at the channel display on my monitor and then tell the programmer how to change them. Having all the information in the console saved me a lot of time, because as I was looking at the console monitors I could see the focus area and, the intensity of each light in that area. Being able to see all the information in one spot, as well as use the computer mouse to click on the channels ultimately saved significant time during tech (see fig. 21).

After breaking down the script into all of the locations and how I intended to light them, I had to figure out the montage scenes. These two sections jump hours, weeks, and years in the matter of minutes onstage. Having the full bank of lights, I knew I wanted to create a visual passage of time using them. I had to set up a virtual media server in the console, in order to pixel map the lights into the design I hoped to achieve. I wouldn't be able to physically show that to the team until I was in the theatre during tech, but was able to use an offline editor version of the console to create a screenshot image to show them (see fig. 22).

A new challenge that came up a few weeks before tech was that the director desired to cast six actors, each pair of male and female taking a different section of the script. That was not approved by the playwright. Having already cast six actors, he decided to have a different pair of actors play the roles every night. With a total of six performances, each pair would perform twice.

U 2 2	Lur	ngs - Madeline and Charles FINAL		P	₩ 🖸 🐺	6:30:10 PM
101 102 F F C + B +	26 27 28 29 30	36 37 38 39 40 -	72 71 70 69 68	201 202	TALS House Aisle	
iCue's 6101	21 22 23 24 25	31 32 33 34 35	62 63 64 65 66 	156 155 154 1	53 152 151 H	
51 52 53 54 55 56 57 58 59	C/B > 621 Postoococcoccoccoccoccoccoccoccoccoccoccocc		Arena G61	146 145 144 1 136 135 134 1	43 142 141 H .33 132 131 M	
41 42 43 44 45 46 47 48 49	6 7 8 9 10	- 16 17 18 19 20	91 86 87 88 89 90 80	126 125 124 1	23 122 121 S	
Designer Desk	1 2 3 4 5 hat had been higher to deep higher	11 12 13 14 15 	- 81 - 82 - 83 - 84 - 85	116 115 114 1 3U 3D 2U	13 112 111 F 2D 1U 1D	
B S Live MS 2 +	C/ > 61	C/ < 611	D/ Pools G81	Booms	6110	
Brightest Sort Hue Similar						
27 Color Picker 🗸 2 PSD List 1 "Rig" 🔪 12 Patch 🔪 1	Live Summary Patched +	Lungs - Madeline and Charles FINAL 2019-09-28 21:31:36				User 1 Offline
LIVE: Cue 1: Go To Cue Out A Red Intensity Focus Color For	Figure 21. Virtu	al Magic Sheet f	for <i>Lungs</i> . Fall 20	019.	Blue Assert g Colo	r Path ₆ More SK

🗯 Eos Family		👯 🕲 b 🕚 🐔	🖻 50% 🗊 🛛 M	on 1:17 PM	
	Eos : 1				
	Lungs - Madeline and Charles FINAL		X\ 🖸	🋱 1:17:44 PN	И
	Pixel Map 1				
	5000 /8				
		Mask	Overlay	Last Next	7
		Off	Cells		
1 Live Table Show 2 PSD List 1 "Rig" 10 Pixel Map Preview 28 Faders Page 1 5.	Lungs - Madeline and Charles FINAL				
	2019-09-28 21:31:36			User T Omin	
			Rhur		
Intensity Focus Color Form Image Shutter	Rig Rd Preview Address	Fader Ouery Snapshot 3 Hig	hlight Assert	5 Color Path 6 More S	sκ

Figure 22. Pixel Map Preview for *Lungs*. Fall 2019.

As we moved closer to tech, the director made it clear that the blocking wasn't consistent between casts. This would prove to be the biggest challenge I would face. The actors would all have different costumes and based on the blocking differences, I would have to write light cues for three separate shows. Different blocking led to slight shifts in my original isolation ideas. Scenes that were lit in an intimate tight space with one cast, were spread out in another. I had to find ways to keep the same through line design ideas, which ultimately lead to stopping more during tech to adjust my cues. Because of the triple casting situation, by the night of the designer run, each cast only had staged blocking through page 37 of 78. We watched as each cast performed to that point in the show. This was helpful in some ways but created new challenges for my design process. Since I was only able to see the beginning half of each version of the show before it was time for my lighting focus, I wasn't sure where to focus specials and several other blocking specific system ideas. I was also in a quandary about how I would cue the shows. In a conventional approach, the lighting designer writes one set of cues based on blocking notes taken at the designer run. Based on the half of performances I had seen, it was clear to me that I wouldn't be able to use the same light cues for all three versions. Specifically, the actors timing getting from one location to another varied significantly.

Saturday, September 21st was the lighting focus for *Lungs*. I spent extra time focusing my systems to make sure they were seamless and the intensity was consistent across the deck. The paint treatment the director and I had originally settled on for the deck was a slightly golden oak finish, but the heavily grained plywood on the actual deck still had a reflective quality to it that showed every inconsistency under my lighting. We were able to focus all the lights in four hours of our eight-hour call, this allowed me time to look through all my systems to make sure

there were no visual issues created on the show deck. Having extra time to do slight adjustments afterwards was helpful as I prepared for a packed tech schedule.

Thursday, September 26th, was the first time I saw a full run of the show with one of the casts. I was able to program lights over the rehearsal, which was extremely helpful heading into tech considering I had only seen the first half of the show. I started by creating a baseline cue structure that I could alter for each of the casts. The next two days, Friday and Saturday, was our tech time that was divided between all three casts. The director really wanted to get two full runs in for each cast, which meant that I would need to make a lot of the lighting changes while the actors were working. Having the virtual magic sheet reduced the time I needed to spend looking down at the paperwork in front of me and then back up at the console and monitors. Luckily, the stage was relatively small and, only having ten focus areas, I was able to easily keep up.

There were two significant additional challenges to my tech process. The first was the difficulty I had organizing three separate show files. Whenever I had a change of idea, or needed to add or eliminate cues, I had to take specific notes and later make corresponding changes to the other two show files so that they would be consistent. The stage manager called the light cues at the same point in each of the three scripts, so I had to adjust the timing and delay certain cues when actors didn't start physical stage movements until later in their lines. Not being able to work in a single file meant that I wasn't able to polish up timing and transition cues until later in the tech process. The second major challenge was the alley configuration of the audience. I had to set up another table with a remote console so that I was able to move back and forth to watch from both audience sections. Having to do this for each version of the show was critical, because after those initial tech days, I would only see each cast perform one dress rehearsal in full costume before the show opened. As we moved into dress rehearsals, I slightly changed lighting

levels based on seeing actors in costume. Overall, the team was highly receptive of the lighting choices I made and thought my design fit the atmosphere we hoped to create.

Lungs overall proved to be the most challenging show I have designed so far. My preproduction process was relatively easy but having to split my normal technical rehearsal process into thirds proved to be challenging. I wasn't able to keep a linear workflow because whenever I needed to change something about my overarching design, I had to make those changes to all three of the of the show files.

My process has changed significantly since *Seven Guitars*; without the many time-saving technologies and techniques I've adopted, I wouldn't have been able to efficiently respond to the challenges of the *Lungs* process. Having realistic digital renderings aided my design development and gave my collaborators a good idea of how I planned to implement the lighting and scenic design. Without being able to computer draft, render, and use digital forms of paperwork, my design would not have been as successful.



Figure 23. Light Plot for Lungs. Fall 2019.





Figure 24. Story Boarding and Production photo of the last Scene of Lungs. Fall 2019.





Figure 25. Story Boarding and Production photo of the first Night Scene of *Lungs*. Fall 2019.

Closing Remarks

I used to think the most important role of a Lighting Designer was being able to problem solve quickly. However, after spending three years in graduate school, I have come to learn that the best designers are those who are able to adapt and respond to the specific challenges each production presents by making creative use of the available technologies. At the beginning of graduate study, I wasn't aware of the full capability of the technology that was available. By expanding my skills in these areas, I have come to find the overall quality of my work has substantially improved. Seven Guitars provided a place for me to begin in graduate school. I knew that I needed to focus on improving my pre-production process, by finding more efficient ways to create plots and render images that I would be able to quickly develop and share with the rest of the design team. During Lungs, I had the opportunity to design mostly remotely, which challenged my paperwork and idea organization. I needed to make sure my lines of communication and drafting were accurate for the set and lighting to be correctly built and in place when I arrived on site. As a result, I have gained a significant amount of confidence in my ability to present and execute my designs. By applying technology, I can work more efficiently and spend more time analyzing with the text and developing design ideas. Having more solidified design goals, objectives, and visuals has improved the overall quality of my work.

As I move forward in my career, I have become aware that I must keep up with the continually evolving technologies that will shape the role of Lighting Designers in the near future. Just recently, ETC announced LED fixtures that can reveal new wavelengths at the extreme ends of the color spectrum. The products, Deep Red and Deep Blue, promise to enable designers to create stage images previously not achievable. Lighting consoles are becoming even more powerful, with internal visualizers that allow offline changes to be made and viewed.

Visualizers will reduce guesswork, and allow the lighting designer to see a virtual layout of the entire stage and the effect of a lighting change on the whole picture. Although concepts of continuous wireless power, plasma source light bulbs, and new spectrum of LEDs seem like they're straight out of a science fiction movie, they're actual projects being developed and sure to be implemented through the course of my career. Without continuing to explore new technologies, and creatively adapt them to the design process, designers will fall into a comfortable cycle that will only yield the same results. We owe it to ourselves, as well as to our collaborators to explore all design and technological avenues to create new and relevant works of art.