The Production Process: A Behind-the-Scenes Look into the Live Video Production Industry

by

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Dedication

To the live production students and crew I have been a part of through Media Arts Productions, your hard work deserves to be documented.

Acknowledgments

Thank you to Bob Gordon for mentoring me throughout this project. Your knowledge of this industry provided great resources and perspective. I would also like to thank my parents and brother for their unconditional support of my video production endeavors. To Ben, thank you for your constant encouragement and kind words as I spent hours on this project; I am so grateful for your presence in my life. Finally, my deepest gratitude goes to my fellow crew members from Blue Raider Student Television, Media Arts Productions, and the Advanced Multi-camera Production classes. Without you, this project would not be here, nor would the countless productions we have put together over these past semesters. Thank you.

Abstract

This project examines the live video production workflow. It explores the different crew positions and breaks down the production process into three phases. I photographed multiple productions that took place with Media Arts Productions, Blue Raider Student Television, and the Advanced Multi-camera Production classes at Middle Tennessee State University. Through this behind-the-scenes photographic documentation, the elaborate production process that brings live events to screens is illustrated in this creative project. The final photos were compiled into a photo book that is intended to highlight the people and general process that make viewing live events in homes and on phones possible.

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Introduction

Live events are a staple of the entertainment industry. Whether it is a sporting event or a music performance, people gather to experience these events simultaneously. Live events can be anything from sports, award shows, music performances, or even newscasts. These events are important to their respective communities and fans, so when experiencing live events in the same space is not possible for an entire community, live video production saves the day.

Live video programming is captivating because audiences get to experience something simultaneously without having to be together (Bourdon). Many people are familiar with watching live sports from the comfort of their living room, but what makes that possible? It is the work of many crew members broadcasting the game from a production truck outside of the stadium. What about the late-night studio shows that broadcast live interviews, performances, and skits? In a room adjacent to the studio is a crew of people calling each shot that appears on screens at home. In each situation, these crews have prepared for the show days beforehand. Once the program ends, the crew still has work to do as well. No matter the type of event, every video production adheres to a similar process. This process is often made up of three stages: preproduction, production, and postproduction (Owens, *Television Production*). Arguably the most important stage, the planning and preparation for an event takes up most of the production timeline (Owens, *Television Production*). The production is the part most people are familiar with, as it involves the show or event itself. Finally, postproduction involves any corrections needed before the final video content is distributed. In this project, I created a photo book

called *The Production Process* that documents the process of executing a multi-camera video production throughout these three stages.

The Crew

To understand the workflow of live video production, one must understand each member of the crew and their unique roles. The production crew is what makes live production possible. Each crew member takes on specific tasks to ensure every aspect of the production is covered. If a production is going to be large and the budget of the production allows it, the size of the crew will increase proportionately. Crew can be divided into "above-the-line" crew and "below-the-line" crew. Above-the-line crews are characterized by those who have a creative role in the production, like the producer and director, while below-the-line crews have a more technical role in production (Owens, *Video Production Handbook*). Each crew member reports to different people, depending on where they are in the line of command, with the above-the-line crew often having more control than below-the-line.

First in the line of command is the producer. The producer develops the concept of a show. A producer's top priorities are the coordination and business of the production. A producer's role includes making budgets, selecting crew, and scheduling the production (Owens, *Video Production Handbook*). They are with a specific project from day one, heavily involved in the planning of the project. For scripted productions, producers may delegate the scriptwriting process to a writer, but they would still be responsible for approving the final scripts. Their planning process also includes creating a rundown, a document that details the content of a show by breaking it down into

segments. Producers lead production meetings about the show and make sure everyone understands their role in the rundown. During production, the producer uses the rundown to time the show, and any changes that must be made on the fly ultimately come down to the producer's final say (Utterback). In live sports or news broadcasts, the producer's job would also include communication with talent, especially since the talent executes the story of the production (Utterback).

A production manager works closely with the producer. Production managers assist the producer with the managerial parts of the production. Their responsibilities include communicating with and caring for the production crew. Part of their communication with the crew is the creation of a "tech pack." This document includes all information the crew might need for the production: schedules, crew contact information, maps of cable runs, and diagrams of equipment setups. The production manager makes sure the crew is where they need to be, when they need to be there. During a load-in and in the hours leading up to a show, a production manager keeps everyone else on task and on time. Production managers need to be organized since they are dealing with the orchestration of the entire crew.

The director is another above-the-line crew member who works closely with the producer. The director's job is to technically execute the producer's vision (Utterback). Directors must be able to lead a crew through clear communication and coordination, such as when they lead rehearsals with camera operators and instruct the technical crew on their show cues (Owens, *Television Production*). During the show, they watch a multiview, a collection of all visual inputs often spread across multiple monitors. As directors watch the production through a multiview, they call for cameras, graphics,

video playback, and audio cues, using the rundown and script provided by the producer. Because clear communication is one of the most important qualities directors should have, they often have a specific way of calling the show, using as few words as possible while still being clear. Although directors have control over the technical crew, they still listen and report to the producer.

Directors may also have an assistant director. Depending on the production, this role can take multiple functions. In entertainment, the job of an assistant director is to take notes during the rehearsals held by the director. During the show, they would help set up camera shots and ensure graphics and playback content are ready to be called by the director (Owens, *Television Production*). For live music performances, assistant directors may count bars and warn the director of upcoming solos in the performance. In live sports, their role is centered around a commercial format, keeping the production on time by counting time in and out of breaks. Ultimately, the assistant director takes some of the workload off the director by preparing the crew for the planned cues of the production.

The technical director, or TD, often sits next to the director because this role executes whatever the director calls out. In front of a TD is a switcher, which allows them to cut to any camera with any graphics layered on top (Owens, *Television Production*). Depending on the needs of the production, a switcher may vary in size. The basics of a switcher is transitioning between video sources. A director may tell the TD to “Take 6!” or “Dissolve Blue!” during a production. These cues communicate to the TD that camera 6 needs to cut onto the screen, and the “Blue” playback machine needs to dissolve onto the program feed. The buttons on the switcher allow these changes to be made. Graphics

are often keyed onto the screen rather than being taken as a source, which means that the graphics layer over the existing video feed when a keyer is activated. Another responsibility of the technical director is completing a “facs” check, or facilities check. A facs ensures all equipment is operating the way it should, and communication can be made to each crew member. For a broadcasted production, the transmission feed must be checked as well. The broadcaster can view the video feed of a production before the show is live. The technical director would show every camera on the screen, test that the graphics work, test the mics, and test lip sync with either prerecorded video content or talent microphones. Once these tasks are completed, the technical director punches the show as the director calls it.

The graphics operator creates different kinds of graphics using computer programs. For example, lower thirds that exhibit a person’s name or a headline are created, stored, and fired from a computer operated by the graphics op (Utterback). Graphics operators works with the producer to add correct and relevant content to their graphics. In sports production, graphics supply player and team statistics, as well as in game statistics on a graphic know as a “bug”. Because sports graphics are elaborate at times, either additional graphics operators or a graphics producer might be added to the crew. A graphics producer would work with the graphics operator to be ready for their segments in the rundown, allowing the producer to attend to other things. In studio shows, graphics is a less intense role, but a lot of preproduction is still necessary to have the right content ready for the show.

Live productions are not always made up of live shots. Prerecorded video content called “packages” are occasionally scheduled in a show’s format. These packages are

played live by a playback operator, sometimes called a tape operator or a replay operator specifically in live sports. There can be multiple playback machines depending on the need of the production, and each video output must be called something unique to differentiate from camera numbers (Utterback). Some facilities call playback machines letters like X and Y, while others use colors like Blue and Green. The playback operator is also responsible for recording the show (Owens, *Television Production*). Even in productions where there is no playback content, a tape operator may still be employed to ensure the program is recorded properly. At the end of a show, the files recorded are organized and backed up on a secondary storage device by a media manager. After the production ends, an editor is sometimes employed to correct any mishaps from the live program feed. To do this, at least one isolated camera feed is often needed in addition to the program recording.

Audio is half of a show. A crew could work on a production with stunning visual elements, but without audio, the show would not make sense to the viewer. An audio mixer, known as the "A1," programs and operates the audio board during a show. The A1 and audio board are often in a separate but adjacent room from the main control room (Utterback). The A1 is responsible for determining where microphones need to be set up and ensuring their signal makes it to their board. Sometimes, the A1 is also responsible for the intercom system in a production (Owens, *Television Production*). The main goal of an A1 is to deliver a balanced mix to the live feed. Audio assistants, or "A2s," set up microphones according to the A1's plan and operate any field microphones during the production (Owens, *Television Production*).

Camera operators build their camera and operate their camera as the director instructs them to during the show (Owens, *Video Production Handbook*). Camera operators listen to the director's instructions for a show. A good camera operator should understand basic image composition and the different commands that may be requested of them, such as pan, tilt, zoom, and focus (Utterback). Cameras can be built in various configurations. The most common way to mount a camera is on a tripod, but it is also common to see handheld cameras. In studios, cameras are often already built on pedestals, or tripods that have wheels. Other camera configurations include the jib, Steadicam, robotic cameras, drones and SkyCams. Some of these configurations not only need operators but also camera utilities. Utilities, also known as grips, are responsible for assisting a camera operator by helping them manage their camera cables and keeping them safe during the production (Owens, *Video Production Handbook*). Camera operators need to communicate with their grip anytime they want to move, and the grip must communicate with the operator anytime they are in trouble.

Most productions use multiple cameras, so a shader is often hired to make the camera feeds look as similar as possible color-wise. Broadcast cameras are operated by camera control units, or CCUs, which allow cameras to be white balanced, black balanced, and exposure with iris operation (Utterback). Sometimes the shader is the same person as the video engineer on smaller shows. With a separate shader, the video engineer's responsibilities are to ensure video and audio equipment is working properly. This includes routing video signals into the switcher and video and audio to the record decks. If anything goes awry, it is the engineer's job to patch it back together.

A lighting director designs the lighting plan for a show, maybe operating a board if lighting changes (Utterback). This position is more common for studio shows that have an abundance of lights to be operated in a grid. A lot of times, the lighting director does not exist in mobile production because the lighting is whatever is at a location. The teleprompter operator is a necessary role when the production is scripted, which is not always the case. If it is, prompter is responsible for getting the script into the program used to prompt, and they operate it during the show according to the talent's cadence. This role is also more common in a studio setting. Often studio cameras have teleprompters attached to the front of the camera lenses so that prompter program outputs directly to the camera the talent will be looking into. Prompter can also be outputted to a monitor if smaller monitors are not mounted to the cameras.

For just one production, a crew can be very large. Even basic shows need a team of people to make sure every job is covered. Every role is created to work together, and the final image seen on the screen at home is the combined work of each and every person apart of the production.

The Venue

Live video production can look different depending on the venue of the project. A television studio is a common place for production to be held, such as for scripted shows or studio performances. When the location of an event is essential to the show, like for live sports or live concerts, productions can also be mobile. The different venues each have their appeals, but some kind of set up is required for both productions.

Television studios often have permanent camera set ups and sets. Studios also have lighting grids, so the production has creative control over the environment. Although all cameras and lighting are prebuilt, the set of a studio can still be reimagined if desired. The backdrops and set for the talent must be put together before a show. Where there is a studio, there is also a control room. The control room is where most of the crew operate during a live production. The technical crew of a show only operate equipment since most equipment exists in a permanent set up.

Mobile production is done with production trucks, which are semis with expandable parts. For mobile productions, most of the set is fixed, and the set up involved in these shows is purely the video and audio equipment. The truck functions as a storage for all this equipment, as well as the control room for the production (Owens, *Television Production*). Technical crews now must run cables on site to ensure communication between the truck's control room and an event's venue.

The production process is very similar, no matter the venue. In a studio, technical gear is already set up, while in a mobile production, all technical gear must be built and cabled from scratch. By contrast, set design is more of a factor in a studio than in a mobile production. The venue is an important consideration for how the production will be executed physically, but every project requires preparation, whether it is shot in a studio or on site.

Documenting the Production Process

Although live video content is abundant and accessible, there is a lack of content portraying the process of recording or broadcasting live productions. To draw inspiration for my project, I found everything I could that documented a behind the scenes perspective of live video production. My search was successful on YouTube, where I found a couple of existing video documentaries that shine a light on the process. First, a short film created by technical director Paul Overacker features a quick look at a video switcher being used for a sports talk show. The almost minute and a half video aims to show how a technical director can change camera feeds and make graphic effects happen on screen. This content could be interesting to someone who knows a little bit about video production, but because of the lack of additional context, this video does not give the viewer a greater understanding of the production. The video only portrays the work of one position out of the many required to put a production on.

Another video that showcases a similar perspective was created by television director Hamish Hamilton. Hamilton's video includes a recording of the video control room during the Super Bowl 50 Halftime Show. Alongside this recording, the viewer gets to see the script of planned camera shots as they are being called out, as well as the video program as the Super Bowl audience would have seen it live. Although it only documents a portion of the live show, this video shows a glimpse of the preproduction stage, as well as the production stage. Because each camera shot is scripted, it can be inferred that there was a significant amount of preparation put into covering the show. This behind-the-scenes footage is more compelling to the average viewer, as it documents a popular event

that many people watched live and are familiar with. Even though it exposes more about the production process, it hardly touches the surface of what happens behind-the-scenes.

Live video production starts well in advance of the show day, and a video created by The Verge tackles revealing that preproduction process. The video shows footage of equipment and production trucks being set up in preparation for an NFL game. The video explains how different roles work together to tell the story of the football game on the screen. Through the accounts of the crew members, this video specifically highlights how time-intensive the live production industry is.

An even greater example of a time-intensive production process comes from the creator of one of the most beloved live studio shows, Lorne Michaels's *Saturday Night Live*. In the series "Creating Saturday Night Live," an episode about live broadcast walks through the days of preproduction leading up to Saturday night. After the script is written, the producers and director begin to put the script to the screen. Sets are built specifically for certain episodes, and each segment is roughly rehearsed and blocked in the studio. The producers and stage managers explain in the documentary that the show is constantly rearranging, even while on air, as segments are sometimes moved or cut to adhere to the strict timing of the broadcast. Their accounts capture the unpredictable nature of live entertainment, as well as the prep work essential to the flow of the show.

The intent of my creative project is to expand on this already available content regarding video production. My photo book explores video production through a different medium, photography, than these existing perspectives do. This project medium was chosen not only because of my interest in both photography and live production, but also because the subject of my project is a fast-paced environment. By capturing still images

of the moving and chaotic atmosphere that is live production, the viewer gets an unlimited amount of time to take in details of the photos. After looking at the content already made about live production, I decided that I wanted my photo book to involve the entire process of producing a show: preproduction, production, and postproduction. While the venue and size of the production do change details about the show is set up, the overarching production process is the same. This project documents a variety of productions, highlighting the similarities in workflows across different events.

Planning

When scheduling this project, I planned to bring my camera with me to a couple of shoots I would be working on with my thesis advisor. I attempted to balance entertainment events with sports production events. I ended up photographing seven different productions. The first production I photographed was an MTSU volleyball game on October 30, 2022. Next, I photographed a load-in for a concert held at MTSU on March 22, 2023. I photographed a load-out for a softball game at MTSU that took place on April 1, 2023. Over the summer, I brought my camera to Bonnaroo Music and Arts Festival to photograph the MTSU production I was a part of. On September 29, 2023, I photographed an MTSU volleyball game. These productions were all crewed by the Advanced Multi-Camera Video Production class. I also worked with two studio shows made with Blue Raider Student Television: *The Wave* and *Sportsballin.* These shows met weekly, so I was able to flexibly photograph their productions.

For this photo book, I planned what equipment I needed for each shoot. A Canon EOS M50 is the camera I used throughout this process. I switched between the kit lens,

which is an EF-M 15-45 mm, and a Sigma 18-35mm f/1.8 DC HSM Art Lens. The subject matter of most of my photos are in a darker environment, so I chose the Sigma lens because it does well in low light with a f-stop of f/1.8. This f-stop indicates that the iris of a camera is wide open, so more light hits the camera's sensor and the images I capture will have a shallow depth of field (Figure 1). While the camera's kit lens does not compare with a f-stop between f/3.5-6.3, it is a wider lens, allowing me to capture more in my frame when in a smaller space (Figure 2).

Execution

As I photographed each event for this project, I backed up the photos onto my computer and hard drive. In total, I sifted through 411 raw photo files I had taken and narrowed it down to the 71 photos I ended up edited and placed into the book. I used Lightroom to edit the photos, then I exported them into a software called BookWright that allows the user to format pages of photo books to later be printed on blurb.com.

Preproduction

This first phase of production is where a show is conceptualized, visualized, and prepared. Every show begins with an idea. The producer of a show either comes up with that idea or creatively brings a concept to life. As that idea is brought to life, a production manager gathers a crew. Production meetings are led by the producer and the equipment load in is scheduled. The production manager also creates a tech pack of all information the crew needs to know for production, like schedules, crew lists, a manifest of all equipment, and maps of where things will go on site. A producer is responsible for creating a run of show for the crew to follow. The goal of everything done in this phase is

to prevent problems during production. As it is famously stated in the industry: "All production problems are really just preproduction problems."

When composing the preproduction section of the photo book, I knew it would be the most involved. First, I wanted to document the interactions that happen between the producer and the production crew. Before every production, the producer holds production meetings with the crew to get everybody on the same page. I photographed this event with a wide-angle lens to emphasize that the whole crew is involved in this meeting (Figure 3).

The next part of preproduction I wanted to capture was the load-in. For the rest of this section in my photo book, I highlighted the how the video gear is set up. Before every show, the crew comes in many hours prior to set up equipment. Camera cables are organized and run (Figure 4), and all video equipment needed for the production is assembled (Figure 5). The preproduction documents created by the producer outline where assembled cameras need to go in the studio (Figure 6) or venue space. After equipment is assembled, the video and audio signal are plugged into Input/Output panels, commonly known as I/O panels (Figure 7), and these panels pass video and audio signals to their respective control rooms (Utterback). In the control room is often a patch bay (Figure 8) that allows an engineer to route those signals wherever they need to go. In the photo book, the images I took to represent preproduction are organized based on how set up happens chronologically. Then, I highlighted a few crew members more involved in preproduction and what they complete before a show begins. For example, I photographed a technical director preparing the switcher for a show (Figure 9), as well as an A1 preparing their workstation and audio board (Figure 10).

Production

Production is where the magic happens. Once the show is live, there is no turning back. Each crew member has specific jobs and focuses during a show. The following photos document these roles, starting with the director. During a show, the director takes charge over executing everything the producer conceptualized. If a show is thoroughly prepared for, the production environment created is one that functions like a machine. Each part works together for the benefit of the final show.

During the second phase of my photo book, I wanted to highlight individual roles in production, so all the photos in this section are on their own pages. Each page features a person or piece of equipment integral to the production. As I took photos during a live show, I thought about how that crew member viewed his or her role in the show. In Figure 11, I photographed a director working on a sports broadcast. I used the lens I had with the longest focal length to take this picture, and doing so brought the background closer to the foreground. This technique resulted in a photo that looked like the director's silhouette was enveloped in a multiview monitor, mirroring how a director's job is to be focused on calling different camera shots and graphics during a game. In another example, I photographed a camera operator as their camera shot was live. In Figure 12, you can see the red tally light on top on the camera's viewfinder, indicating that camera feed is live. In this moment, the camera operator must be especially attentive to the composition of their shot because any sudden movements of the camera are easily seen by viewers. For the production section of my book, I chose the most artistic shots I had that provided insight to what the crew member might be paying attention to in each moment.

Post-production

Once the recording or broadcast stops, the work of a production crew is not over just yet. The crew must strike, or pack up, all equipment. In a studio, things do not have to be disassembled, but they do need to be put back into place. In mobile production, everything must leave the location with the production truck. Depending on the size of the production, load out can take minutes or multiple hours after the event has ended.

In the post-production section, I wanted to highlight the load-out process that takes place after an event is over. After the recording stops, camera crews either move cameras back to their storage location in a studio or completely disassemble them to store in the production truck. No matter the venue, one of the most time-consuming post-production tasks is wrapping cable (Figure 13). In the photo book, I dedicated an entire page to the many photos I had accumulated of crew members wrapping cables. Cables must be wrapped and stored in an organized fashion for the benefit of the next production to use them. In a studio, set pieces are moved back to where they are normally stored, and in a production truck, all equipment is put back in its place (Figure 14). In this section, I lastly touched on the editing and file storage of a recorded show. Depending on the production, sometimes the recording just needs to be backed up to a hard drive. In other cases that require editing, the live cut and isolated camera recordings would be put into an editing software to fix any mistakes made live.

Conclusion

This thesis thoroughly examines the roles of individual crew and the circumstances of a production. These understandings provide context for the photo book I also created. The final photo book includes seventy-one images, organized in the chronological order of a production. Taken across seven different events, these photos tell one cohesive story about how live video production is conceptualized and executed. Overall, this project increased my understanding of the industry I have studied over the past three years. In my labs and extracurriculars, I gravitated towards specific roles in the control room and production truck. Instead, this project forced me to look at individual roles in a production crew from each of their perspectives. Utilizing the knowledge I gained about the production process in this thesis and my photography composition skills, this photo book came to be.

I faced a few difficulties throughout this process. Being involved in the productions I wanted to photograph proved challenging. I had to balance prioritizing my role in production over documenting the process because of the demanding nature of any live video environment. Ultimately, I overcame these challenges as best as possible, and the final project is what I hoped it would be.

Appendix: Photographs

Figure 1

Figure 2

Appendix: Photographs

Figure 3

Figure 4

Appendix: Photographs

Figure 5

Figure 6

Appendix: Photographs

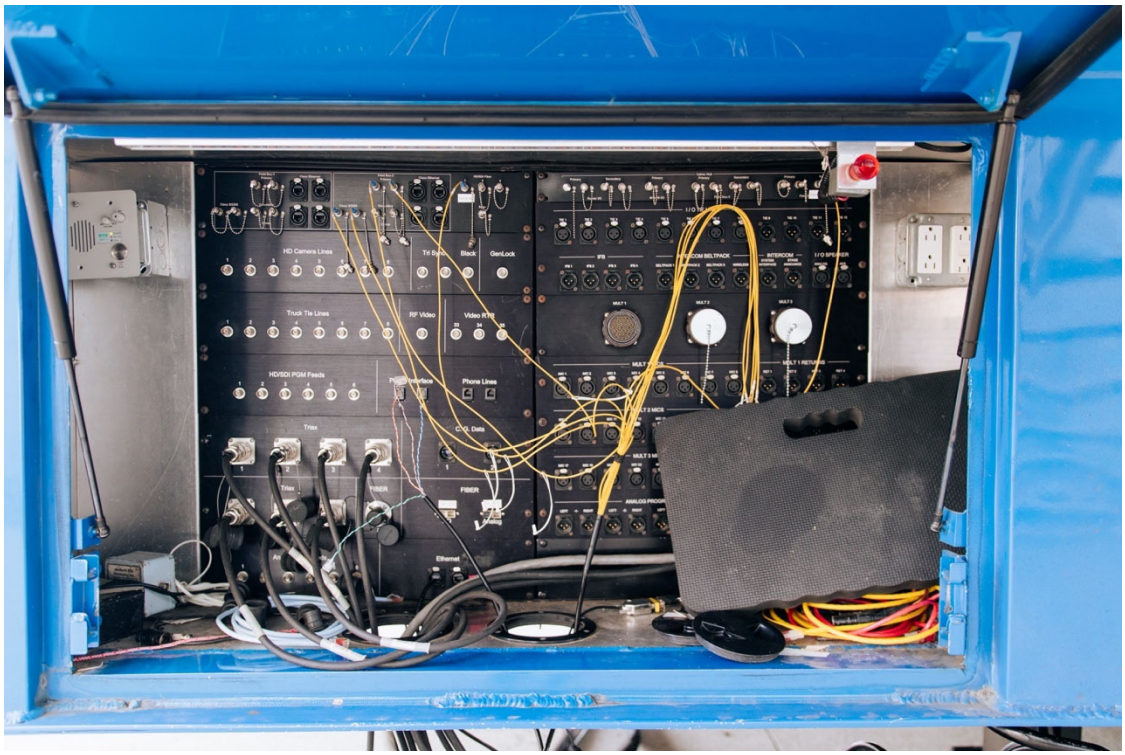

Figure 7

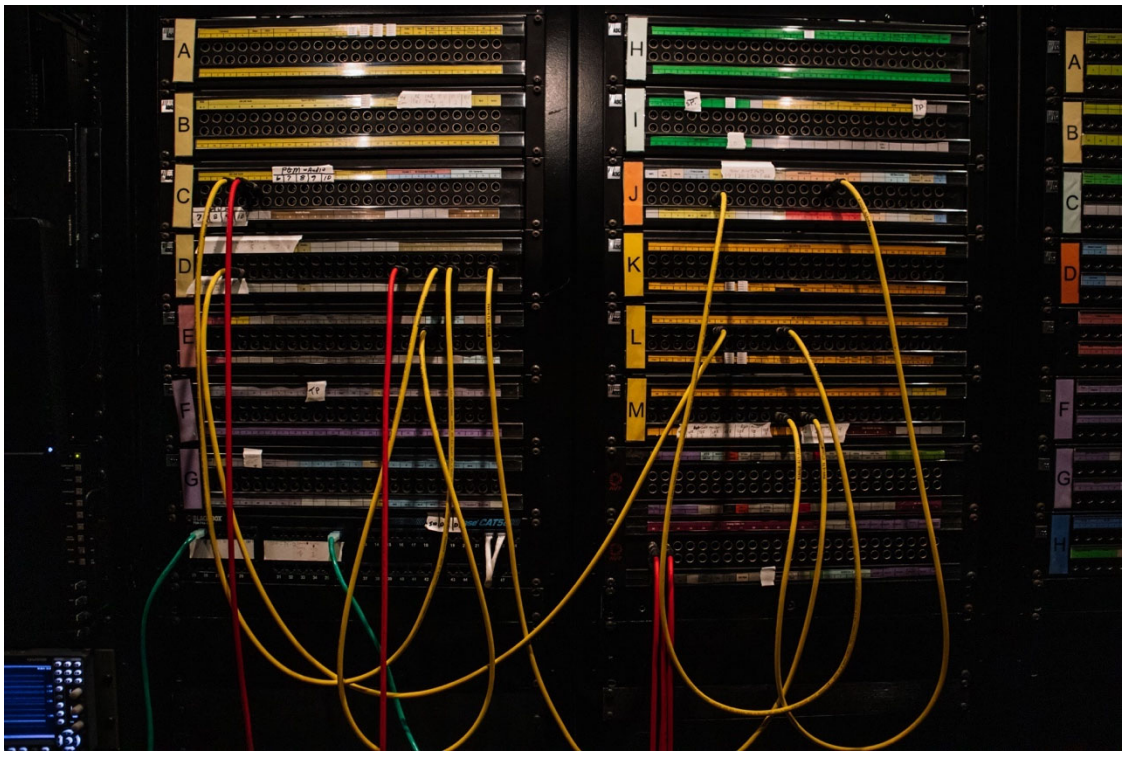

Figure 8

Appendix: Photographs

Figure 9

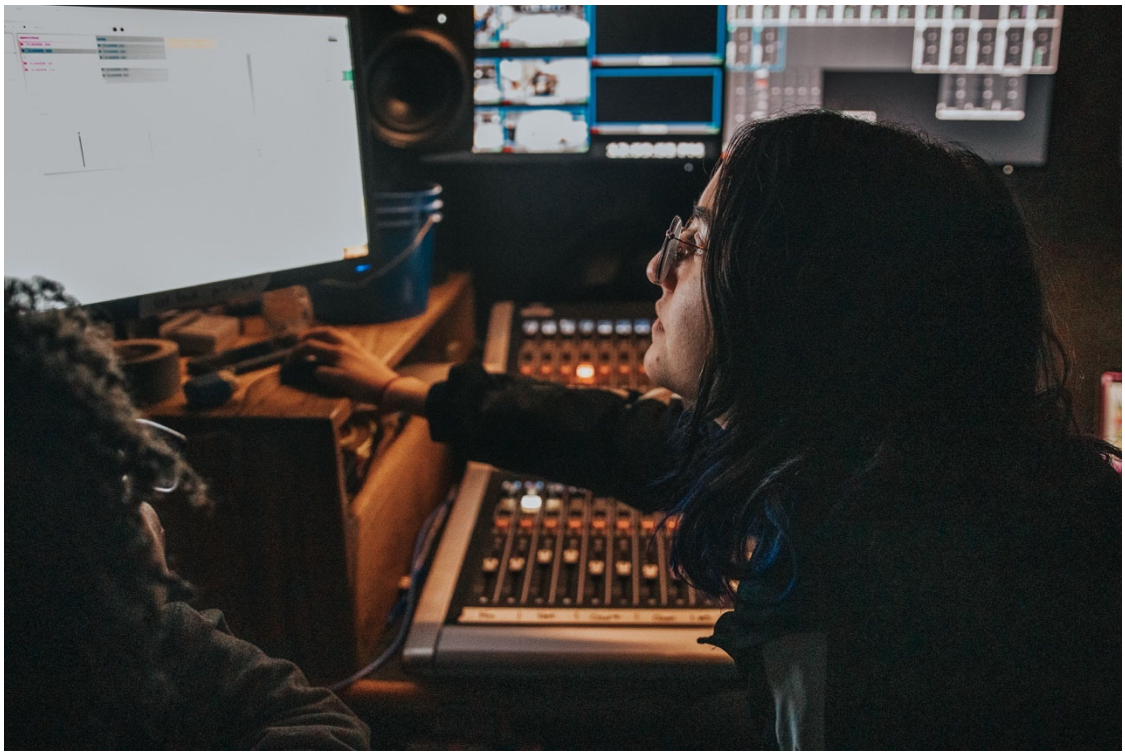

Figure 10

Appendix: Photographs

Figure 11

Figure 12

Appendix: Photographs

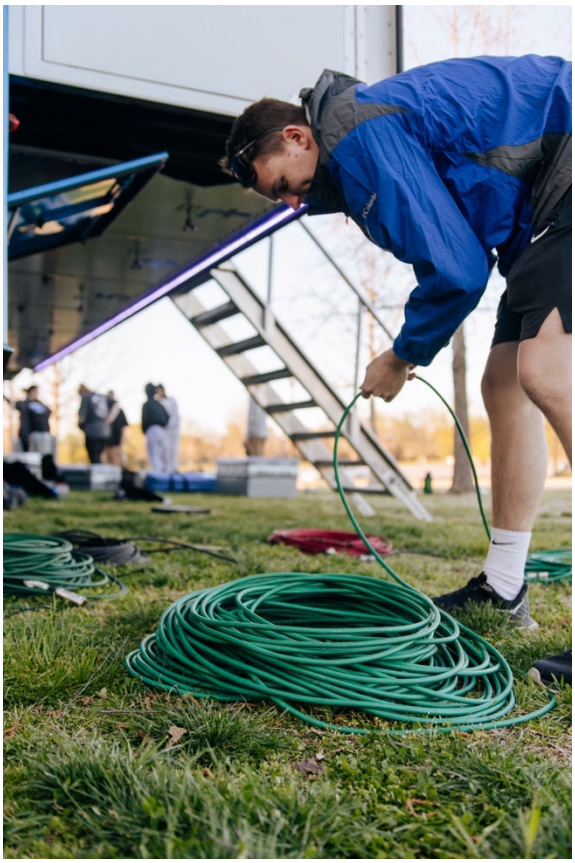

Figure 13

Figure 14

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