

Safety First!

Production work for theater and live arts and entertainment can be exciting, challenging, tedious, rewarding, inspiring, exhausting, a lot of fun, and dangerous.

The safety of our students and workers is our first and greatest priority.

The environment in which we work is inherently unsafe. We work with sharp objects, with tools made to cut wood and metal, with heavy objects hanging overhead or moving across the stage, with electricity and loud sounds. We often do this work at heights, or in the dark, or in an unfamiliar space, or all those things and more. We exercise every precaution we can to minimize the risk of injury, but the most important mechanism of defense and protection is your own awareness.

You must be the first line of your own defense. It is imperative that when you are engaged in this work that you are mentally present, focused on your task, and aware of as many hazards as possible. You should also feel empowered to point out things that may not be as safe as they can be. As hard as we try, we can miss something. If you notice a problem that we haven't addressed, let us know!

It is also imperative that you fully understand the task that you're working on. If you have *any questions at all, ask them!* We're all here to learn, so you should never feel embarrassed to ask for more information or clarification. The more thoroughly you understand the goals and processes of a task, the better prepared you'll be should unexpected challenges occur.

There's an old show biz adage that you're probably familiar with: "The show must go on!" This phrase has grated on me for years. It's the underpinning of a culture that values getting the work done at any cost, rather than valuing the irreplaceable humans doing that work. Too much of this industry exists in an environment of close calls and near misses. Around here, the humans are our priority.

While we can't eliminate all hazards, we can minimize their effects by establishing a culture of awareness, precautions, and open discussion. If we do that, we can get to all those good things listed above and be able to tell the stories in the years to come.

Introduction

In this class we explore and learn the fundamental skills necessary to work in various theater tech departments. But the skills learned in a technical theater education are quite portable and do not lock one in to working only in a “theater” environment. There are jobs in a wide range of the entertainment industry which share some common background with what you’ll be learning in this class.

We will most often be referring to the regional theater model (which will be further explained later in the text) because I find it the model which gives us the fullest picture of the various departments. However, careers available on the technical side of the entertainment industry include regional, educational, summer, and community versions of theater, dance, opera and other music organizations around the world. There are also more specialized performance venues (theme parks, cruise ships, other interactive experiences like renaissance faires and haunted houses), that commonly employ theatrical technicians.

Companies commonly referred to as “commercial shops” include entertainment technology companies which build or supply scenery, video, lighting and sound systems for Broadway shows, national theatrical tours, regional theaters, as well as touring concerts and arena shows, and even more un-theatrical-type projects like large art installations, product launch events for retail companies, keynote speeches, and on and on.

Theater consulting generally refers to the building or renovation of performance spaces. The consultant advises the end user on lighting, sound, and video equipment, room usage and access, and various other infrastructure projects related to the buildings themselves. This is another opportunity open to one with a background in technical theater.

As you can see there are many employment paths open to someone who has training in this field. But many of the skills that we’ll learn are also useful outside of a theatrical or entertainment context. Want to know how to use tools to hang curtains in your apartment or fix a wobbly chair or table? How about being able to troubleshoot a flickering lamp? Or maybe you just want to be able to firmly tie down a load in a truck the next time you move. We’ll learn the basic skills needed for these tasks among other day-to-day challenges.

What is a regional theater?

Regional theaters can be found all over the country and take many forms. We will be using what I consider to be a typical model found in throughout the country, although it is important to realize that *every* theater is different. What is being presented is not an absolute, but a version that will have similarities to the majority of regional theaters in the US.

In this model, the company produces a season of shows annually. The theater has a full-time technical staff and facilities such as lighting and audio gear, and scene, costume, prop and paint shops. The staff and facilities allow the company to produce all (or most) of the technical elements for the shows in-house.

Seasons are generally decided upon about a year in advance. The artistic director, sometimes with the input of a board of directors, artistic committee, or guest directors, will choose the season. The artistic director may or may not direct all of the shows in a season. Most of the time the artistic director will direct a portion of the season and other staff or guest directors will helm the other shows. Season selection is one of the earliest elements of the phase known as **preproduction**.

Preproduction phase

During preproduction the company chooses the shows for the season and the artistic staff for each. This includes not just deciding who will direct but also who are the various designers. Most regional theaters will have at least a partial design team on staff. Any open positions will be filled by guest artists. Theaters with particularly dense seasons – lots of shows with minimal downtime in between – may choose to supplement their resident design staff by bringing in guest designers.

At this point the **production manager** comes to the center of the process (however, the production manager is almost certainly involved in season selection as well). The production manager works with both the artistic leads (director, designers, stage manager) and production department heads to plan and execute the technical elements of the production. At this point in the process the PM looks at the season and considers the resources each production will require. This is known as **rough budget allocation** and is the first best guess of the required material and labor costs for each department on each production.

Let's look at two of the productions in our hypothetical theater's hypothetical season – Imagine our theater is planning to mount both *Waiting for Godot* and *Hello, Dolly!* Assuming that we're producing these shows as they are most frequently performed, we know that *Godot* has a small cast with a stark setting and relatively simple costuming. *Dolly!* on the other hand, is a large musical, with a large cast, multiple scenes and is a period piece (taking place in late 19th century New York) which will drastically

affect the cost of the costuming. From this, we know that we are going to allocate far more resources for *Hello, Dolly!* than we will for *Waiting for Godot*. The production manager will usually make those assessments or, at the very least, lead the conversations about those assessments.

Design phase

As stated before, every theater does things differently and the design process is certainly a frontrunner for having the most differences from organization to organization. Presented here is what I consider an idealized version of the process but conceptually it should stand as a good example. The design phase starts with the presentation of a production concept from the director. At this point, the director and design team brainstorm about how each production area fits into that concept.

During the rest of the design phase the designers each work on more and more fleshed out versions of the design and present them to the group, discussing and evolving each of the elements as they go. These discussions could be visual research from the scenic, costume, lighting and video departments in the form of pictures, objects or video clips. The sound designer may present sound effects or music that represent the tone of the envisioned final work.

Ultimately, each design area will continue to be massaged and refined and discussed until the scenic designer can submit drawings and usually a scale model, the lighting designer will likely also submit drawings indicating the placement of lighting instruments in the space and the video designer and sound designer may present both drawings and sample content. Each designer will likely have additional paperwork that adds detail to the design. We now move into the budgeting phase.

Budgeting phase

With final designs in place, now it's time to figure out what the show is really going to cost. We start by working from our rough budget allocation and we work element by element to determine the materials and labor needed for each piece (exactly how we do this will be covered in later sections). Each department will do this and develop a **first-pass budget**. Although there are certainly exceptions, most of the time our first pass will be more than the budget assigned.

This is, in many ways, a perfectly fine, and arguably preferable, way to design. It represents a design philosophy in which the designers are allowed to entertain their wildest creations and can lead to some truly spectacular work. I often tell designers not to consider whether or not something can be done – that's the production team's job – just design what works best for the piece. While we are still ultimately bound by the reality of time, resources, and money, this approach allows us to find the things that are most artistically important to the project, director, and designers.

Now it's time for a second pass at the budget – This is when the entire production team, including the director, designers, production manager, the heads of each production department (in this idealized scenario) sit around a table together and, in-person, determine which elements are vital as designed, which can be altered, and which can be cut (eliminated). At this meeting everyone should have a copy of each department's budget and the discussion should be lead by the director and production manager, but the directors artistic vision should be the guiding force.

The reason that I find this format ideal is that it allows the fullest use of the resources available. By having everyone at the same table with the same information, the director gets to hear debate on the merit of the various elements and determine how important each may be to their final vision for the production. When budgeting is done in isolation, department heads may determine that a certain element is crucial to the design without knowing how important that element is to the director and the final project.

Example: The scenic design includes a full stage lifting platform that will be used for one scene to raise the entire set eight inches. This unit will require about half of the available scenic budget (materials and labor). The costume design includes elaborate costuming for a dream sequence which has been the centerpiece of the director's vision. Unfortunately, there is not enough costume budget to cover this as well as the other costume needs for the piece. If we evaluate the designs without sharing information between production departments, perhaps the director – being told that there is not enough money in the costume budget – decides to compromise their vision for the dream sequence. Then in technical rehearsals, when the director sees the effect of the raised stage, they decide to cut it for timing reasons, and those resources have been wasted when they could have been otherwise assigned.

This is an extreme (though not unrealistic) example, but it illustrates the benefit of having a candid discussion about the available resources and the importance of *all* of the elements with the director, designers and production department heads.

Through these discussions, the designs are refined to achieve the artistic goals while most efficiently using the allotted resources which also typically leads to altering the designs to fit the new goals and budget. By the end of budgeting we should have solidified final designs, final budgets and cost estimates, and a clear idea of the technical design for all of the elements.

Technical design, planning, and the build phase

– by department

The concept of technical design and planning is basically figuring out exactly how each element will be achieved physically. Whether that's coming up with a construction approach for a piece of scenery, calculating loads on a rigged (hung) object, or arranging equipment rentals – it all falls under the umbrella of technical design and planning. Next, we'll try to walk through the tech design and build processes department by department. In the following discussion we'll be delving more into specific departments and personnel. Figure 1.1 shows an example organizational chart that you can reference to get an idea of how the staff members interact with each other.

Scenery

In most theaters the **technical director** is primarily responsible for construction and installation of the scenic elements and may also act as a bit of a traffic cop when determining placement of equipment for other departments. For example, the TD may point out interferences between a lighting batten and a piece of scenery or advise the sound engineer on the best way to place a speaker inside a piece of scenery.

Example Regional Theatre
Production Organizational Chart

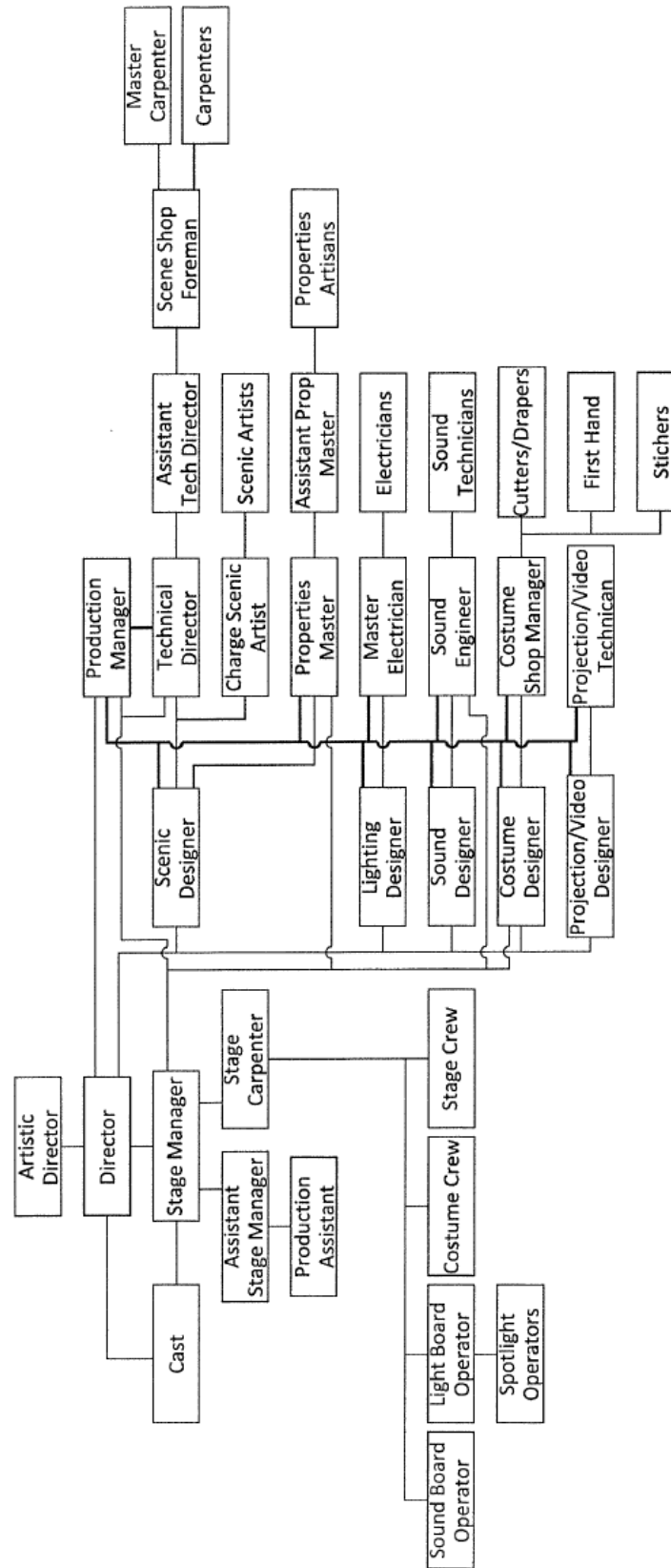


Figure 1.1 - Example Production Organizational Chart

For the scenic department, tech design is present in a couple of different processes. During budgeting some tech design is done when deciding on a construction approach and determining the kinds and amounts of materials that will be used to construct the units. Upon completion of the budgeting phase, the technical director and their team should have a pretty solid idea of how the scenic elements will be built. This typically does not include fleshed-out construction plans but may include sketches or written descriptions of the planned approach.

Most TDs do the bulk of the tech design (or at least refine the details thereof) during the drafting phase. This is when the TD team develops the construction drawings to give to the carpenters who will build the scenery. At some point during the drafting phase, material for construction will be ordered. In a perfect world, this would happen once all of the drawings have been completed and thoroughly analyzed for material needs. Unfortunately, that is almost never the case and materials may need to be ordered in batches to ensure the correct quantities.

A scene shop may have all, none, or some of the positions represented in Figure 1.1, but let's discuss them:

The **assistant technical director**, of whom there may be one or many depending on the size of the organization, typically takes on some of the drafting duties. The TD oversees this team and gives them direction, but much of the actual drawing and tech designing is done by the ATDs. The ATDs will also usually shepherd the units that they've designed through construction – answering questions, making adjustments, etc. – and may also be responsible for leading installation of the units during load-in.

Some shops may have a **shop foreman** or manager whose job it is to manage the flow of the work on the shop floor. This person may assign carpenters to specific projects according to their strengths, they may also be there as an aid to the ATDs to advise on construction or productivity techniques, answer specific construction questions, and in general – ensure smooth operation during the build phase.

The **master carpenter**, while not present in all organizations, is usually someone who, as the title indicates, has high-level carpentry skills. They may be tasked to build the most complicated or crucial pieces of scenery. In some organizations, they may take on some of the responsibilities described for the shop foreman and function as a hybrid of the two positions.

Finally, we have the **carpenters**. The carpenters are the folks who construct, move, and install the scenery. “Carpentry” in the world-at-large tends to refer to construction or craftwork built from wood. While wood is a major element in theatrical construction, carpenters in theater are just as likely to work with metals, plastics, foam, fabric – any material used to construct a scenic piece. Carpenters also typically transport the scenery from place to place, install the scenery in the theater, and may even be responsible for moving set pieces during performances.

Once the drawings have been generated and the materials ordered, we move fully into the **build phase** of the process. (In truth, it's likely that the TD team is still drawing and ordering things, but at this point the bulk of that work should be finished.) During this time shop management (TD, ATDs, shop foreman, master carpenter) assign projects to the shop staff and manage the progress of those projects. The main concern for the shop management team is hitting deadlines or milestones. Many scenic pieces interact with other technical departments. Therefore, any missed deadlines push timelines later for anyone else who needs to work on the project that is running behind.

A typical scenic element will go through a few stages of construction. The first stage is **general structural construction** during which time the framing and support elements of the piece are cut and assembled. Next, the surfaces of the piece that will receive scenic treatment (paint, etc.) are installed and trim or ornamentation is added. This is typically referred to as **finish carpentry**.

Often large scenic pieces are constructed from smaller components which then attach to each other. Figure 1.2 (p. 8) shows the scenic façade for a two-story building in its assembled form. Figure 1.3 shows the same piece in its component form. If there are multiple components that need to fit together precisely, the next step in the build process is to do a **fit-up**. The carpenters will fit everything together and check all of the connection points to make sure that they align and that the finished piece is correct according to the scenic design.

The fit-up is preferably done prior to any scenic art. It's a real bummer when you send the pieces to the paint shop where they are beautifully painted only to realize, when you get them back, that they don't fit together quite right necessitating physical adjustments which then affect the meticulously applied scenic finish.

The scenic art finish is the next step in the process. This is when the scenic pieces are sent to the **paint shop** (which may or may not be in a different physical location) where they receive a scenic treatment. This may be paint, fabric covering, wallpaper, or any other element needed to achieve the look described by the designer.

A paint or scenic art shop is usually lead by the **charge scenic artist** (sometimes this person's title is lead scenic artist or something similar). The charge artist interacts directly with the scenic designer and the technical director on a number of goals. The most primary, is that they work with the designer to establish the techniques to achieve the look that the scenic designer wants. This may be by discussing different paint techniques or combinations thereof, it may be by advising for certain surface finishes or materials (wood vs. fabric vs. plastic, etc.). The charge artist is also crucial during the budgeting phase. They will advise the TD on material costs associated with the finishes and also estimate the time necessary to paint or treat each piece.

The charge will often have several **scenic artists** working under them. Some of whom may be second leads or assistant charges. The charge functions in a very similar way to the shop foreman. They will assign tasks and projects to the various artists in the shop according to their individual talents.

Following completion of the scenic finish, the pieces are sent back to the scene shop to do a final fit-up. This is done to make sure that none of the connections have been obscured (taped over or covered in fabric, for example) and to check that the finishes have not affected the insallability of the unit. Once the units have been re-checked, they will be packaged for transit to the space or prepped for installation if transit is not required.

Many theaters have scene shops that are located blocks or miles away from the performance facility. Once the pieces are show-ready, they must be handled with great care to avoid damaging the structure or the finish before they are installed. Carts, cushioning, protective coverings, and secure strapping or tie-downs in transit are all things that help to protect the finished product.

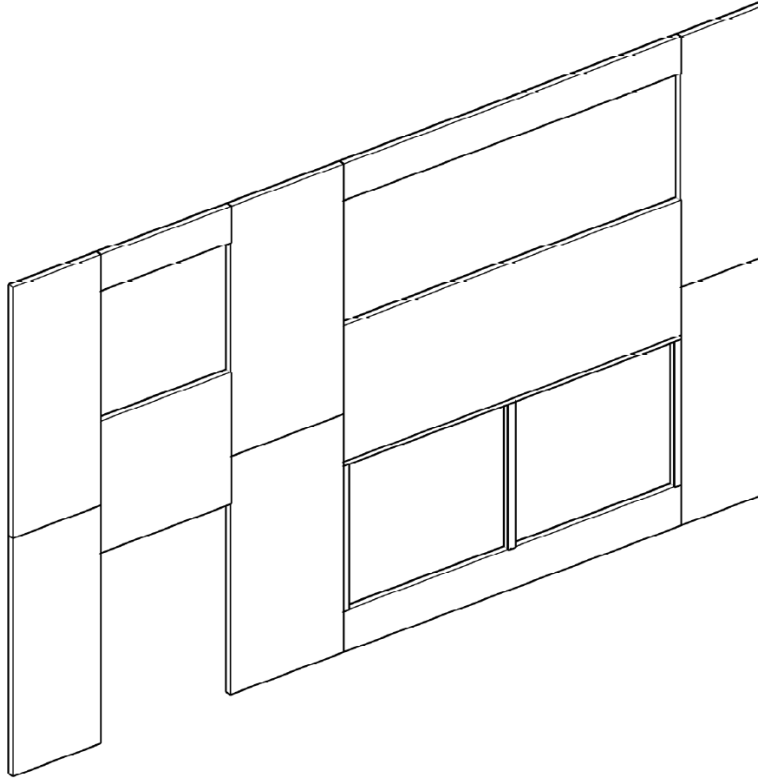


Figure 1.2 - Scenic building façade, assembled

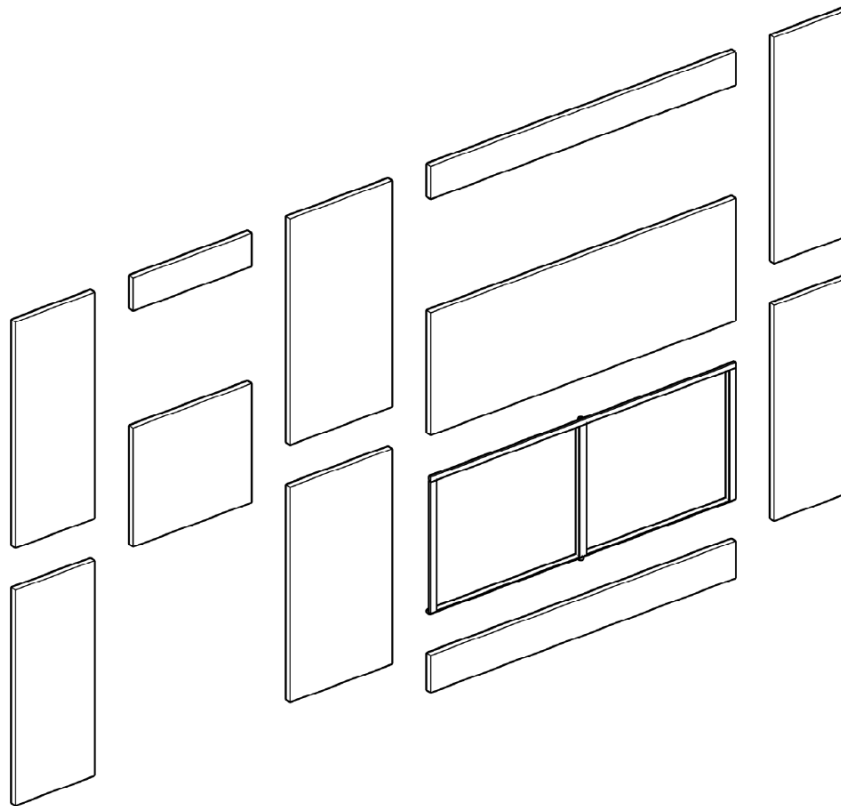


Figure 1.3 - Scenic building façade, exploded

Lighting/Electrics

The **lighting department** in theater is often referred to as **electrics**. The **master electrician** is usually the head of this department, though large theaters with multiple spaces may have multiple master electricians who report to a **lighting director** or someone similarly titled.

The master electrician is the person who leads budgeting process for the electrics department. They work with the designer to help solidify the gear and processes needed to achieve the artistic goals. Budgeting for the electrics (and sound) departments is less straightforward than it is for scenery and can, at times, even be a bit speculative. During budgeting the ME will have estimated the various equipment required, including lighting instruments, cable, color (gel or filters), power distribution – anything that is physically required to achieve the design goals. Some MEs will also deal with any necessary rigging design or other physical placement challenges (interactions with scenic elements, for example).

The master electrician is also responsible for implementing the lighting design. This is the person who evaluates the design documents and plans for the acquisition of equipment and plans the installation process. The ME will typically have a staff of **electricians** who perform maintenance, hang, and focus the lighting plot.

The major challenge to budgeting for lighting is that the design is, in reality, only partially finished at that time and continues to evolve during the rehearsal process. As the lighting designer visits rehearsals and sees how the director is using the spaces and the staging that is being created, they often adjust the physical parameters of the design to include this changing content. Usually, lighting designers who work in the somewhat rigid budgeting process described above allow themselves some flexibility by building in additional units for use later in the process.

The tech design process for electrics is largely revisiting the estimates, adjusting as necessary, and securing the necessary gear. If there are lighting elements that interact with the scenery, the ME will work with the TD team to nail down the technical details of that interaction. During this time the ME is also ordering color and other expendables that are unique to the production as well as finalizing the details on any rental gear agreements. Towards the end of the tech design phase the designer will publish the finalized plot and the ME will use this plot to generate a cabling plan.

The “build” phase for electrics is much different than scenery’s. The electricians may be physically building things – installing lighting into scenic items or building custom lighting positions (though in some theaters the latter may fall into the carpenters’ sphere), or they may be executing repairs or refurbishment on their gear. The goal of the build phase for electrics is to be as prepared as possible for load-in when the gear will be installed in the theater.

Sound/Audio

The **sound department**’s process is actually quite similar to the lighting department. The sound design, too, continues to develop during rehearsal through interaction with the director and the cast. During this time the **sound engineer** works with the sound designer to assess the effects of these changes and adjusts the gear needs as necessary. The sound engineer is analogous to the master electrician in that it is their job to manage the process of coordinating and installing the physical sound system to meet the designer’s specifications.

Similar to the ME, the sound engineer will use the tech design and build periods to identify and acquire any rental gear that is needed, interface with the TD team regarding any scenic interaction, figure out any rigging or cabling needs, and repair or refurbish gear as necessary.

The sound engineer will also likely have a team of **sound technicians** who they will manage to install, focus, and maintain the sound system. Like lighting, the main goal of the build phase for the sound engineer is to be as prepared as possible for load-in.

A brief aside about sound and lighting design: Though the build phase for the ME and sound engineer are quite similar, the build periods for their respective designers is quite different. The lighting designer will spend time visiting rehearsal and getting an idea for the ultimate look of the design and may pre-visualize some of their cues. Unfortunately for the lighting designer, there is usually no way to see how the cues they've planned will really look until they are in the space with their system in place and the cues on the stage. The sound designer has the benefit of being able to generate their content and try it out in real time with the rehearsal. They can listen to the underscoring for a scene while the cast rehearses or runs it. They can provide the stage management team with a playback system allowing the SM team to run cues so that both the sound designer and director can hear the timing, tone, and effect the proposed sound design has on the final product. Even if the rehearsal audio system is not truly representative of the final system, the sound designer can often enter technical rehearsals with a very detailed idea of what the show will sound like. The lighting designer will likely have a strong, but more conceptual, plan upon entering technical rehearsals.

Properties

Props is arguably the most complicated department in the technical process. The definition of what is or is not a prop changes from theater to theater. The prop department has a lot of overlap with both costumes and scenery. Also, with the exception of costumes, props usually has the most direct interaction with the cast. The world of props encompasses everything from large pieces of furniture, to the plants which may dress a set, to a sandwich that an actor makes and eats on stage. Being a prop master is a complicated confluence of working with designers and directors, making sure actors are comfortable and safe with the props provided, historical and speculative research, and essentially being a detective with increasingly unique mysteries to solve.

A very basic definition of a prop is anything that an actor handles. Obviously, this is a very wide net. Things like hats, watches, rings, perhaps handbags or backpacks straddle the line between prop and costume. And things like sconces (lamps attached to a wall), curtains, etc. have crossover with scenery and electrics. Thus, every theater – and really every production – may define the responsibility for these items in different ways.

Regardless, being a **prop master** or **prop artisan** is a job that requires an incredibly diverse set of skills. One needs to be a skilled researcher, be able to talk descriptively with the designer and director, be relentless about making phone calls to strangers to ask for weird things that will be used in ways never imagined by their manufacturer, and frequently to be a skilled artisan in various forms of craftsmanship. Beyond this, it is the prop master's responsibility to manage their budget and staff and to interact daily with the stage manager and cast.

Prop design and creation is a vast and complicated subject worthy of its own text (of which there are many). Our treatment of the department from this point forward will be somewhat generic, but know that they operate on a schedule alongside the other departments and work through the same phases as we approach load-in and technical rehearsals.

During budgeting, the prop master will do their best to assemble a prop list which represents all of the props known or speculated about at that time. Depending on the show and the way that the director/designers/theater works this may be a relatively simple task of flipping to the prop list at the back of a script and discussing the list with the designer and director. Another method is to read through the script and generate a list from that reading. Both of these methods should also include reviewing the scenic designer's drawings and renderings to check for things which may not be represented in the text (set dressing elements for example). Frequently, if the production is staging the play in a less traditional fashion or developing the text of the piece through rehearsal, the prop list is generated mostly through discussion with the director and designer and is almost never a complete picture of the props needed until late in the rehearsal process.

Adding to, subtracting from, and general fluidity is common in prop planning. Props budgeting represents the best estimates that we can develop with the available information. That's what the prop master does – interpret the information that they have from the text, discussions with the designer, director, and stage manager – and then add in a bit of their own intuition and experience and put forward a budget that they believe is as accurate as it can be.

The acquisition of props is a combination of building, purchasing, finding, borrowing, altering and just general ingenuity and stick-to-itiveness. For props, the tech design and build periods are frequently one in the same. Early in the process they will acquire rehearsal props for the cast to use in rehearsal. These may be pieces of furniture or hand props (those directly handled by the actors). They may be the real thing or stand-ins until the real thing can be created or acquired (affectionately known as “do-fer” props).

During the tech design and build phases, rehearsals are taking place and prop master and their team are creating all the props that are called for from the script, scenic designer, and requests coming from rehearsal. They are bringing new items to rehearsal for the cast to try and get used to and are altering and refining according to the notes coming from rehearsal and from the scenic designer.

As the production draws closer to load-in and tech, the prop department finalizes all of the individual pieces with the stage manager and scenic designer and ensures that they have enough **perishables** (things that are consumed or destroyed during performance) for the technical rehearsal to opening performance timeframe. At this point they are also planning the prop load-in which is when the prop team moves things from a combination of the prop shop and rehearsal facility to the performance space.

Load-in

The opening night performance is often viewed as a kind of finish line for much of the technical production staff in many theaters. The final push to opening night, and the place where all of the planning and work of the tech design and build phases pays off (hopefully) is **load-in**. This is when all of the technical departments install the elements of the production in the performance space.

Load-ins typically happen during a relatively compressed timeframe. Therefore, it is important that they are well planned and choreographed. All of the departments need access to the space and have different demands – The scenery department frequently needs a lot of space and light, and may make a lot of noise. Lighting, eventually, will need dark time to check, troubleshoot and focus. Sound will need quiet time to focus and tune the system. The scenic painters will need time for finishing and touch-ups when paint can dry undisturbed. These are just a few examples of intricate dance of load-in.

The main goal of a smooth load-in should be figuring out how each department can work as unimpeded as possible while allowing other departments to work around them. The following is a very generic view of what a typical load-in could be, but each load-in needs to be tailored to the production goals and constraints of the performance space.

Typically, the lighting and sound departments will be the first in the space. In a traditional counterweight theater, lighting instruments are hung on lighting pipes (also, somewhat confusingly referred to as electrics) a few feet off the ground at a comfortable working height and then these pipes are flown (raised) up to their show positions (trim height). Lighting instruments are hung on the pipes and plugged in to existing electrical infrastructure or temporary electrical cable is run for the production. The sound department too, may be doing rigging and cable installation if they are hanging speakers over the main playing area.

The **rigging** team may be in at this time as well. Riggers may be part of the scenic/carpentry staff or may be an independent department. They will work on installing lifting and hanging points for scenery and possibly lighting and sound if necessary.

In theaters that have overhead catwalk structure and do not operate with a counterweight rigging system, the overhead work of the lighting, sound, and rigging departments may happen simultaneously to the stage-level work of the scenic department.

While the order of the scenic load-in is highly dependent on the design of the show a typical order is presented here. The first goal is to get any hanging pieces into the air and, if not fully installed, at least hung above the scenery to be installed below them. This allows the scenic team to work with an unobstructed stage.

Next on the list is usually any kind of floor treatment. Whether the design calls for a thin painted skin on the floor or a raised show deck which houses machinery to move scenic wagons, it is generally wise to get the base laid down early in the process so that the vertical scenery – walls, raised platforms, etc. – can be installed on top of it.

The walls, wagons, and other vertical scenery, as mentioned above, will come next. Once that scenery is installed and tested, it is mated with the rigged elements (if necessary) and the scenic artists can begin applying finishing touches and touch up. The prop department loads-in furniture and begins to dress the set. They may also at this point, in conjunction with stage management, set up **prop tables** (basically where the props live when they're off stage) backstage. **Lighting practicals** – lighting units that operate in the world of the production (lamps and sconces for example) are installed, wired, and tested.

Once the scenery load-in is complete, lighting focus takes place. This is when each of the lighting instruments is aimed and adjusted to create the system that the lighting designers has envisioned. This, understandably, needs to happen in mostly darkness so it is preferable that little or no other work happens

during focus. Additionally, the lighting designer needs to communicate with the electricians manipulating the lighting instruments, sometimes at somewhat long distances (60-80 feet), so it is crucial that the environment is quiet enough for that communication to happen without wearing out the designer.

The sound department also needs time to focus and tune their system. Due to the volumes and tones and otherwise relative quiet environment necessary to do this, sound focus frequently happens late in the evening. During sound focus, the overall loudness of the system is tested and balanced. The speakers are also focused to adequately cover the audience and the system balance is tested again. Usually, the goal of the sound system is to provide the same aural experience to every member of the audience and the system is designed, tuned, and focused to achieve this.

The above are very rudimentary descriptions of scenery, lighting, and sound load-in and focus procedures. The specific processes of each is outside the scope of this text, but the above should serve as a basic description of the process.

Stage Management

Thus far, stage management has been referred to only in passing, but the stage management team is integral to the success of the production and operates as the link between the cast and every technical department in the production. During the rehearsal period, the **stage manager** facilitates rehearsals with the director and communicates changes and requests that arise throughout rehearsal as well as integrating new props, costume, sound and other elements as the rehearsal facility allows.

Most regional stage management teams consist of the stage manager and at least one assistant, who may be referred to as an **assistant stage manager** or a **stage management production assistant** (commonly referred to as a PA), depending on the theater and the contract under which they operate. Stage management teams may have multiple ASMs or PAs. Some larger theaters have a **production stage manager** (PSM) who manages a team of SMs in addition to stage managing some productions in a season.

As the production moves towards technical rehearsals, the stage manager becomes the nucleus of the process. The SM is responsible for managing the integration of the various technical elements with the cast.

Technical rehearsals

Once all of the technical departments have completed their load-in and focus procedures, the production moves into **technical rehearsals** (or just **tech**). We should cover at this point what the stage manager does when the show is in performance and what they are aiming to achieve during tech. When the show is in performance the stage manager **calls** the show. That is, using their **prompt book** as reference, as the show runs, they tell the various operators when to execute their cues. Whether this is lighting, sound, video, moving scenery, or even cuing actors for an entrance, the SM controls when each cue happens and is responsible for the technical rhythm of the show and its smooth operation. Tech is the time when the stage manager gets to learn how the various cues and technical elements interact with the show that they are bringing from the rehearsal room and is also the time when they get to mold the show into a final product, as guided by the director's vision.

The first step in the official technical rehearsal process is frequently a session called **paper tech**. A paper tech is when the director, designers, and the stage manager sit down with the stage managers prompt book (a current script that has details of the staging from rehearsal and other notes) and decide where in the script each cue – lighting, sound, video, scenic – will be placed. This session may or may not occur in the theater as the main goal is to get everything into the prompt book and usually doesn't require the full technical infrastructure.

Following paper tech (and occasionally in lieu of), comes a session known as **dry tech**. This session is held in the theater with (ideally) fully operational sound, lighting, video, and any moving scenery but without the cast. The goal of this session is to look at or listen to every cue in the show. This allows the lighting designer to write cues (the process of deciding which lights will be on and their intensity for each look) and the sound designer to hear and adjust the cues that they have and get feedback from the director. The group will frequently run batches of cues in order to check timing, functionality, and continuity. Dry tech is done without performers for two reasons – First, in a situation where the organization is paying the performers – it saves money. Second, it streamlines the process. The priority of dry tech is to look at and assess the technical elements and that is more easily done in a small group for whom the technical efficiency is the main goal.

Ascending in technical and managerial complexity, the next type of rehearsal that the production is likely to engage in is called a **cue-to-cue**. Cue-to-cue rehearsals involve the technical staff, the stage management team, and the cast. In this type of rehearsal, the team runs the portions of the show surrounding each cue with the cast. For example, they may run the transitions between scenes – the end of one scene into the beginning of the next but skip the middle of the scene where there are no cues. The goal is to jump from cue-to-cue in the show to see how all of the elements, including the work that the cast is doing, come together.

Next, the production moves into full **technical rehearsals** during which the entire show is run, from start to finish, with all technical elements in place. During these rehearsals, it is common to stop and fix timing or cue issues and to work troublesome technical transitions to get to a point where they are running smoothly in show conditions.

Dress rehearsals are the final step in the technical rehearsal process. This is when the production runs under **show conditions**. Show conditions basically means that the rehearsal runs as if there is an audience. If something goes wrong technically or a scene or lines go awry, the rehearsal trundles on and deals with the problem, provided there are no safety concerns. Dress rehearsals generally only stop for issues of crew and cast safety or if a real “showstopper” of a problem occurs – the kind of thing that would require the run to stop, regardless of whether or not there's an audience.

In performance

Throughout tech the stage manager has been the person in charge of moving the process forward and working with the cast, director, designers, department heads, and the stage crew to get the show into a performance state. As the production moves fully into performance, the stage manager becomes the person fully in charge of maintaining the shows integrity and performance consistency.

The SM communicates not just with the cast and stage crew, but also with the front of house team to coordinate performances. **Front of house** refers to the audience relations staff. The box office personnel,

the ushers, and the **house manager** – who manages both of those teams – interface with the public and take care of things like ticketing, seating management, the opening and closing of the house, and audience relations in general.

In many regional theaters, some of the shows will be directed by out-of-town guest directors. In these cases, the directors rarely remain in town for the four to six week run of the show. Shortly after opening night they typically return home or move on to their next job. Even in the case where the director is local, they will frequently not come to every performance. This makes performance consistency the responsibility of the stage manager. At this point, in addition to their general show duties, the SM acts a check on the performance to ensure that every performance is as close to the director's vision as possible. Especially during long runs, performances can evolve – frequently for the worse – and it is the SM's job to give notes to the actors and technicians to steer these performances back to where they were when the director last saw them.

Strike and changeover

Once the production has reached the end of its run it is time to **strike**, or remove the production. Strike is kind of like load-in in reverse but has different nuances to its execution. As noted for load-in, planning and choreography of strike is extremely important.

Most regional theaters prefer to be in production, or performing shows, as often as possible. Therefore, the time that the theater is **dark** – or not performing – is usually minimized. This results in the time between productions being as compressed as possible. Frequently, load-in and strike are not independent activities but are both part of a process called **changeover** or **turnaround**. This is when one production is removed from the performance space and the next one is installed and enters tech.

From a workflow perspective, strike essentially follows a pattern the reverse of load-in. Props and set dressing are quickly struck, the scenic team starts to remove items starting with the vertical scenery and then moving onto the deck and rigging. Lighting and sound teams strike their gear around the carpenters and then utilize the clear stage to finish their strike. And then the load-in process begins.

The proscenium theater

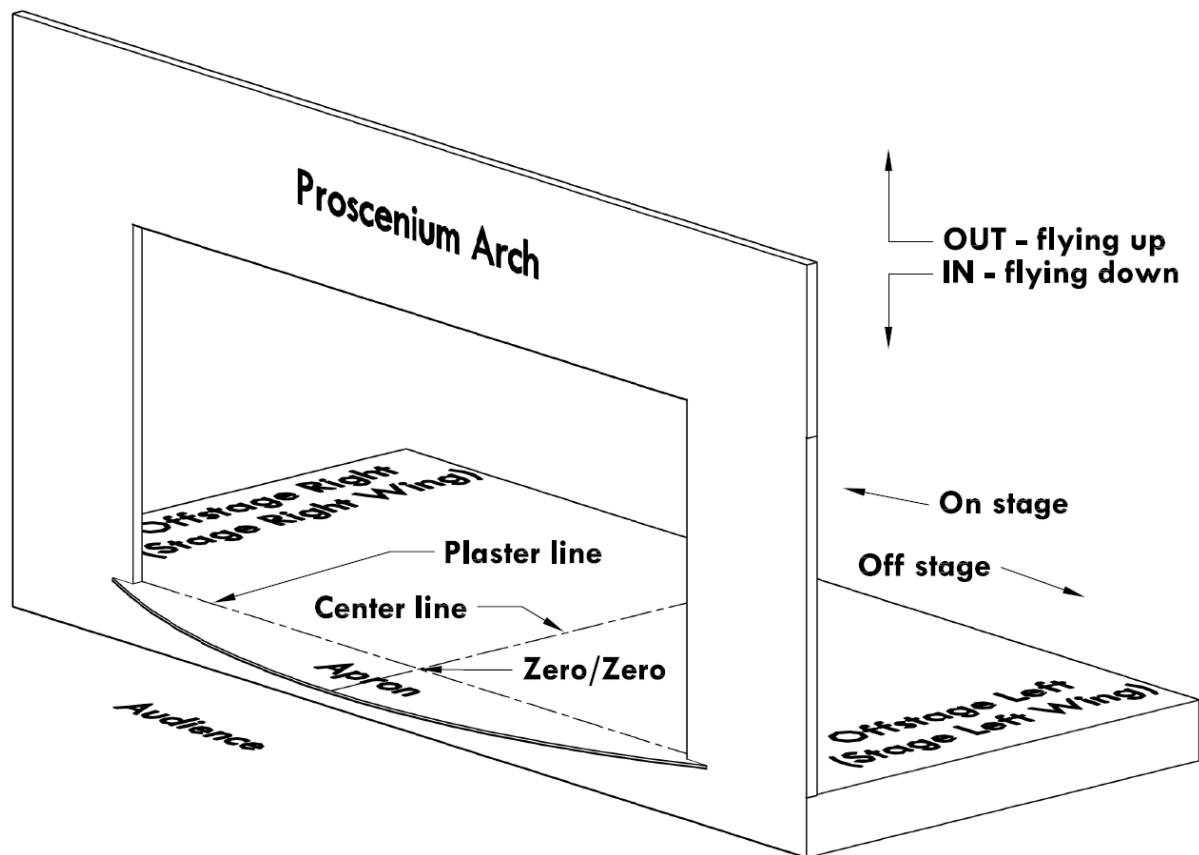


Figure 1.4 - Proscenium theater isometric

When asked to imagine a theater, it's likely that the first thing to come to mind for most people is the proscenium theater. Most high school and college auditoriums, as well as the vast majority of Broadway-style theaters qualify as proscenium theaters. In this orientation, the audience and the performers are separated by a kind of picture frame known as the proscenium arch. Since this is the most familiar orientation it will serve as our example to explain the terms used to navigate the stage.

Stage Directions

Being able to discuss and describe placement on the stage is crucial to most parts of the technical production process. Knowing stage directions and stage terminology helps us to have clear communication about the movement and design of a production.

Figure 1.5 (p. 17) shows a 3x3 grid that is commonly used to describe the various areas of the stage. Two important concepts establish the naming conventions for each of those areas. First, moving towards the audience is known as moving downstage. Predictably, moving away from the audience is known as moving upstage.

The upstage/downstage nomenclature is often associated with the idea of a raked or slanted stage. In some earlier theater construction, stages were built to be higher at the back of the stage and lower at the front to

allow for clear sightlines from the audience to the performers at the back of the stage. In this orientation performers were actually walking up as they moved towards the back of the stage and down as they moved towards the front.

The second major concept is that left and right are defined by the point of view of the performer. This means that for people watching from the audience perspective and communicating with those onstage, the directions are reversed. The areas to the extreme right and left of the stage (preferably out of the view of the audience) are the wings. The stage area downstage of the proscenium arch (if present) is known as the apron of the stage.

Other important navigational terms are represented in Figure 1.4 (p. 16). When units or performers are moving from the wings toward the center of the stage they are moving onstage. When moving away from center towards the wings they are moving offstage.

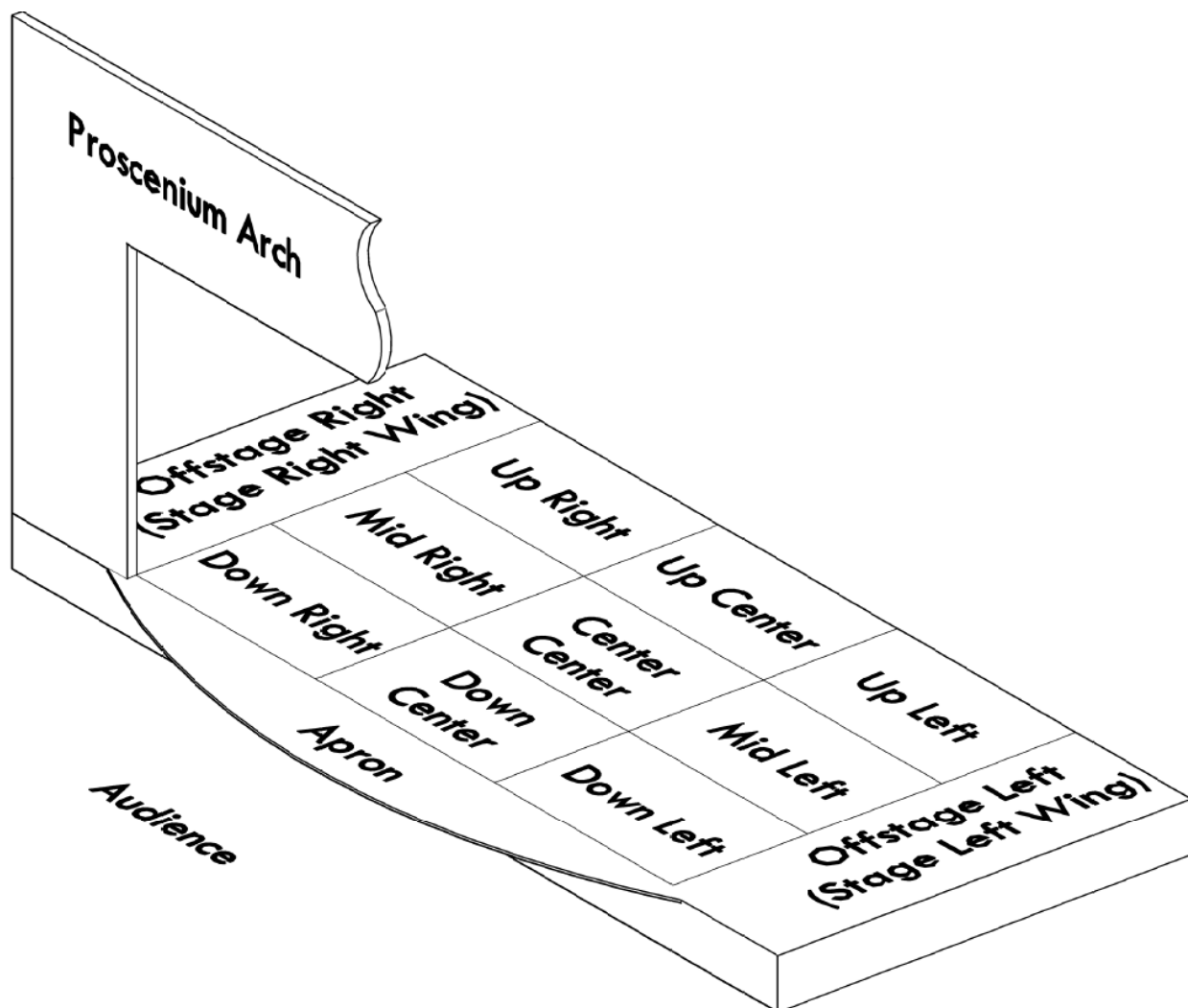


Figure 1.5 - Stage directions on a proscenium stage

When scenic pieces, curtains, or even performers move vertically in the space it is known as flying. Something that is moving up is referred to as going out or flying out, moving down as going or flying in.

Also shown in Figure 1.4 are the centerline and plaster line which frequently show up on technical drawings and are crucial for accurate placement on stage. Although these lines may be laid out with tape temporarily, they are usually not present in a physical form. The centerline runs upstage/downstage and indicates the center of the stage from right to left. The plaster line is a little less intuitive. It runs stage right/stage left and is generally located at the upstage face of the proscenium wall. The point where these lines cross is known as the zero/zero or origin.

The placement of the zero/zero is crucial because this is the point from which all of the production departments will measure from for placement of their units. If scenery, lighting, and sound all work from slightly different zero/zero points the relationship between the various items will not be correct. The description of the center and plaster lines above is the standard understanding but, particularly with the plaster line, exact placement may change from theater to theater so be sure to check to make certain everyone is using the same point. In non-proscenium theaters, the zero/zero is usually established from some other constant architectural feature of the space.

Non-proscenium theaters

The most easily recognizable distinguishing factor of the various types of theaters is the placement of the audience and how they interact with the stage. Basically, each of the following can be distinguished by how many sides of the face the audience. The proscenium theater described above has audience on one side of the stage.

Alley or stadium seating – audience on two sides of the stage

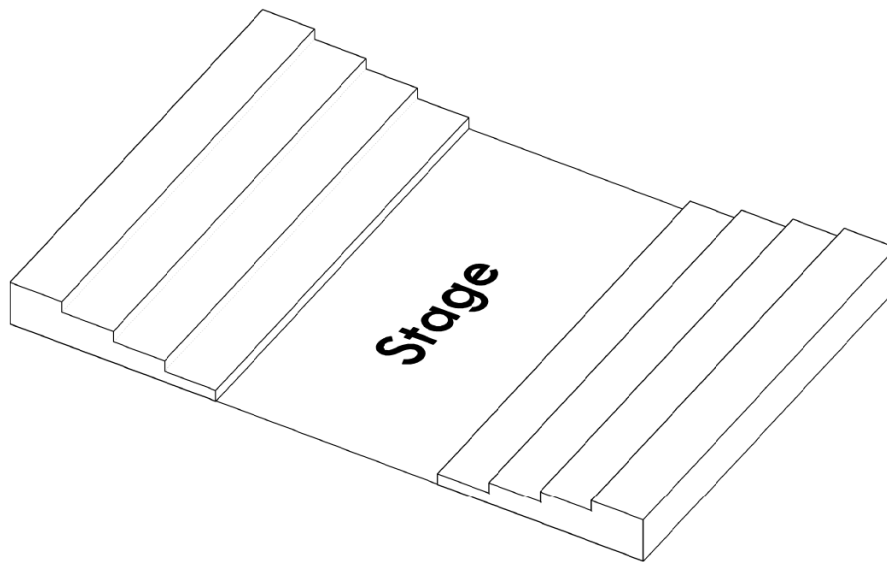


Figure 1.6 - Alley seating isometric

Thrust seating – audience on three sides

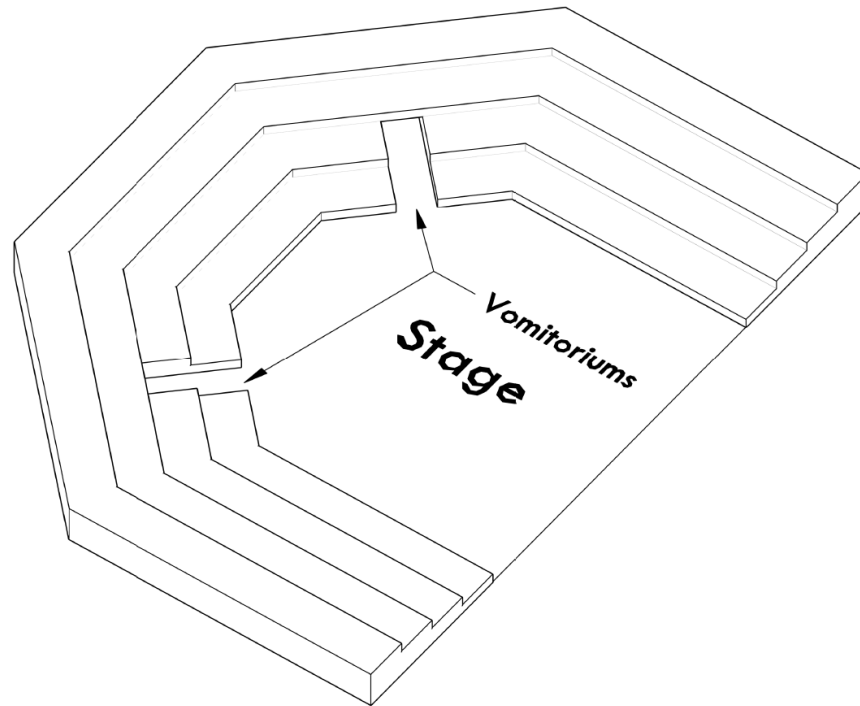


Figure 1.7 - Thrust theater isometric

Theater-in-the-round or arena seating – audience on all four sides of the stage

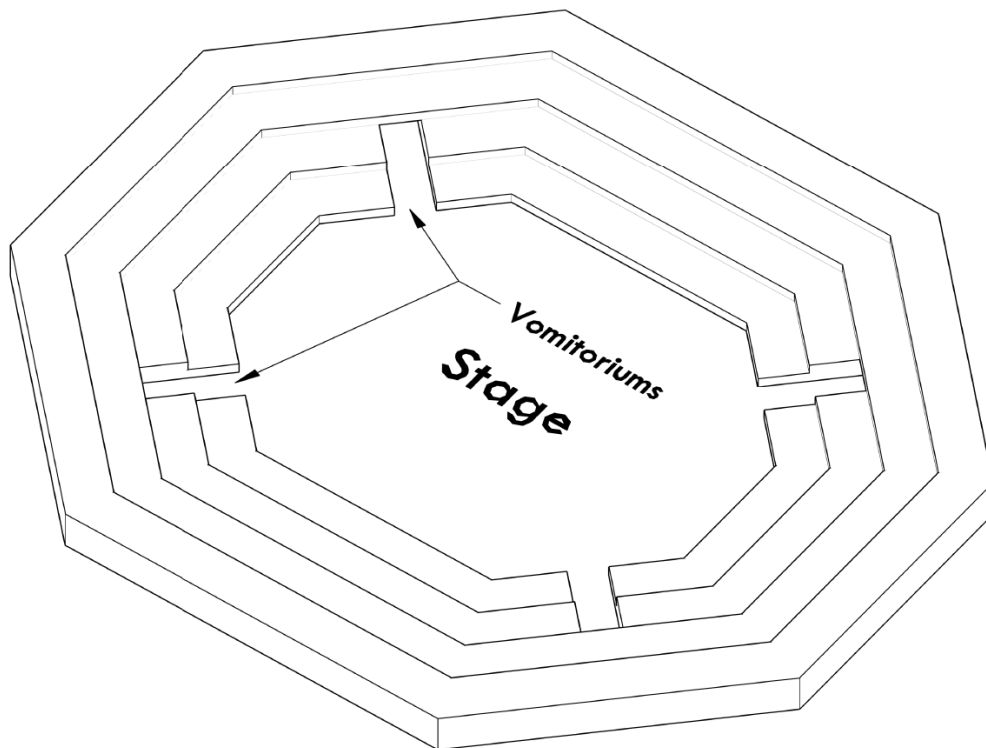


Figure 1.8 - Theater-in-the-round isometric

Standard stage directions transfer pretty easily to the thrust stage but are a little harder to define in alley and round settings. Theaters-in-the-round will frequently define the features of their spaces using clockface terms (12 o'clock, 3 o'clock, etc.) or cardinal directions (north, south, etc.). In these cases, stage direction orientation will be determined in the rehearsal room. The stage management team will often work from a table in the rehearsal room. The placement of that table frequently will represent downstage for that production and may be analogous to where the SM will be during performances, a tech booth for example.

Vomitoriums (Figures 1.7 & 1.8) are commonly found in thrust and arena and round settings. These are hallways recessed into the seating structure that allow for audience and/or performers to enter and exit.

Backstage and service areas

Productions require areas above the stage to hang various equipment. Lighting, audio, and scenic elements all may need to be hung or supported from above. Hanging anything in this industry is referred to generally as rigging. We will cover rigging in much more detail later, but the concept is necessary for this discussion.

Rigging areas will typically include some kind of grid. Grids come in a variety of types, but essentially, they are a structure from which permanent or temporary equipment can be supported.

Many theaters also have a system of catwalks and bridges to provide access to upper level work areas.

Trap rooms are found underneath the main level of the stage. This allows access below the stage for stage effects, machinery, or to provide additional storage or work space.

Audience and Front of House

The audience chamber can be divided into a number of areas the names of which can vary from theater to theater. The main audience section, on the floor and in closest proximity to the stage, is called the orchestra. Upper levels include balconies, mezzanines, dress circles, galleries and orchestra boxes. Each of these have a specific definition and characteristics, but for our discussions, it's enough to know that they are raised, upper levels of seating.

Front of house refers to the audience management side of production. This includes box office, ushers and the House Manager who usually oversees the coordination of audience services with the production and backstage personnel in tandem with the Stage Manager.