

Setting up a basic lighting grid

John Black discusses some of the basic lighting design theories for creating a flexible lighting grid

IF YOU'VE TAKEN THE TIME TO look at the lighting positions in a variety of facilities, you may have noticed several similarities despite the venues looking completely different architecturally. This is because these lighting positions were first considered in relation to the stage and lighting design theories as to how to effectively illuminate presenters or scenery on it. Depending on the architecture of the auditorium, final lighting positions may be determined by 'best fit

MEET THE AUTHOR

John Black serves as the theatre manager for Seoul Foreign School in Seoul, South Korea. Holding a degree in Theatre Design, he provides technical production support and design in three state-of-the-art performance venues on campus for over 40 major concerts and productions a year in the areas of sound, lighting, video and staging. John especially enjoys sharing his passion for entertainment technology with high school students each year through his student production team, *Crusader Live!*, giving students the opportunity to learn and work with professional-level technologies in a demanding production environment.



John Black, theatre manager for Seoul Foreign School

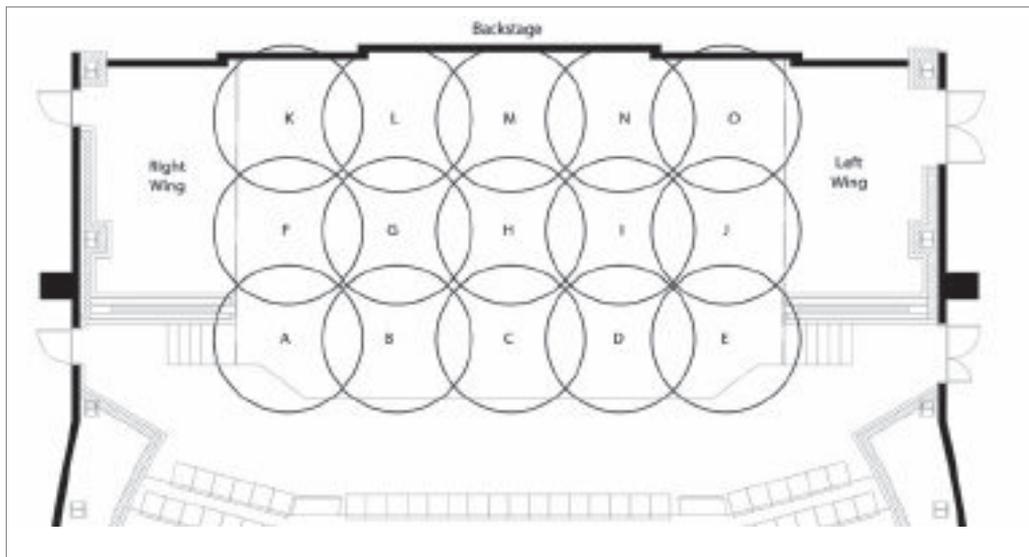


Fig. 1 Robb Hall Theatre – lighting areas

possible' to lighting design theories, choosing positions that work as best as possible given the constraints or limitations of the room itself.

Perhaps you are approaching an auditorium renovation, conversion or new build and you have been tasked with looking after the lighting rig, including the placement of lighting positions and what should be included in the house plot. This article lays out some of the basic lighting design theories, as well as providing some tips when approaching such a project so that an effective and flexible basic lighting grid can be achieved.

Zoning your stage

Before beginning to think about the fixtures or the placement of them,

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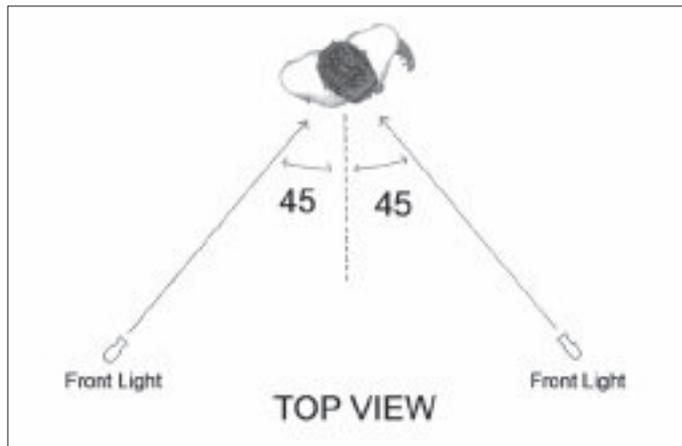
the first step I would recommend is that you zone your stage (see Fig. 1).

What do I mean by this? Grab a copy of the floorplan for your auditorium stage (or the area that you intend to light) and subdivide the stage into overlapping circles of zones between 8–12 feet in diameter. The diameter of these zones is determined according to the diameter of the pool of light produced by a single fixture. The quantity of lighting zones that you have for your stage will be determined by the size of your stage – there is no exact number.

with a higher degree of flexibility and creativity than simply lighting the stage as a whole.

Determining fixture placement

The next step is to use your stage zone drawing to determine where to optimally place your lighting fixtures (see Fig. 2). I say 'optimally' because it isn't always possible to place fixtures in these positions due to various constraints or limitations that exist within the architecture of the

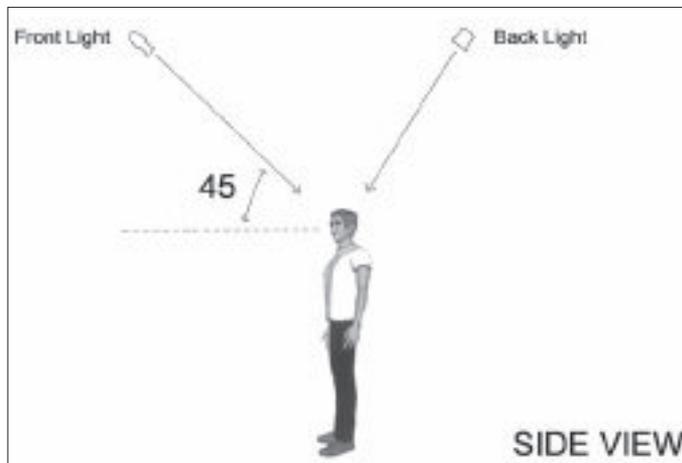


Three-point lighting – front lighting, top view

Zoning your stage will help to ensure that you have even lighting coverage of your entire stage space when all of the zones are illuminated. Additionally, it allows you to draw focus to specific areas as and if needed without always illuminating the entire stage area. For example, if you would like to focus on the pastor and dim the area of the stage where the praise band is set up, you can adjust the intensities of the various zones to only illuminate the area used by the pastor. Creating lighting zones that are individually controllable will enable you to operate

space. The most basic and simplest lighting theory is the McCandless method, which states that each zone should be lit by two lights, each from a position 45° above and 45° to either side of the centre of that position. By adding a third fixture in a top or slightly back position, a basic three-point lighting theory system is achieved.

Why these positions? The goal of the McCandless method was to fully front-light an actor (or other subject) but also to provide some natural sculpting of his or her features. When lighting only directly from



Three-point lighting – side view

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the front, the subject appears flat or two-dimensional, whereas front lighting from an angle will create depth through the natural highlights and shadowing created by the subject's natural features. There are many other angles from which to light a subject, as well as additional lighting methods for further sculpting a subject as well as creating a particular dramatic effect. For the purposes of this article and creating a basic lighting grid, however, we will stick with these three fixtures as they will provide good, natural lighting in most circumstances.

From your stage zone map that you drew, you would then draw these three fixtures for each of your zones. For example, if your stage is subdivided into six zones, your basic lighting grid would be composed of 18 fixtures. If your stage is subdivided into nine zones, your basic lighting grid would be composed of 27 fixtures. Grab your protractor and ruler and, from the centre of each position, measure 45° to the left and right and then draw a line out from the centre point at that angle to determine where you should place a fixture.

If you are in a facility that already has lighting pipes or truss installed, hopefully these lines will intersect with one of those lighting positions where you can then actually place a fixture. For whatever reason, it may be that you have to work with slightly narrower or wider angles for each lighting zone. Keep in mind that the narrower your horizontal angle

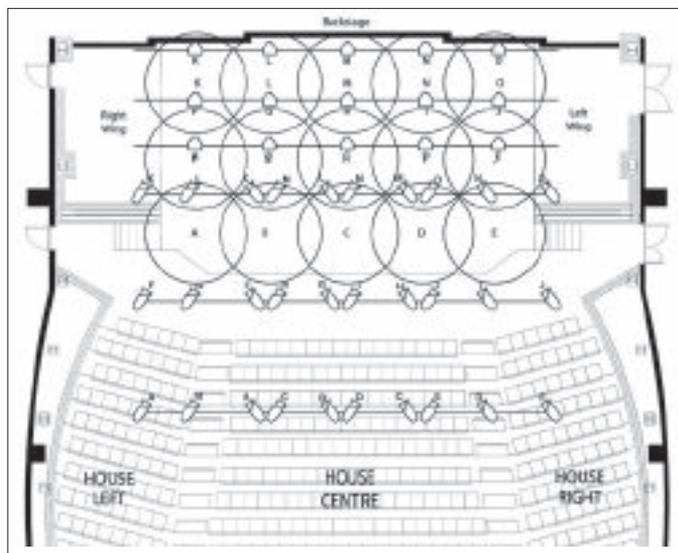


Fig. 2 Robb Hall Theatre – three-point lighting plot

becomes, the flatter your subject will appear. The wider your horizontal angle becomes, the more unnatural the highlighting and shadowing of your subject's features will become. If this is the case, it may be that you need to add yet another fixture closer to hitting the zone directly from the front to combat the harsh shadows produced.

If you are in a facility that is under renovation or being planned as a new construction, use the lighting angle lines to determine where in the facility you should optimally be placing lighting positions. Hopefully, you will be able to hang pipes or truss in these positions that will provide the optimum lighting for your stage.

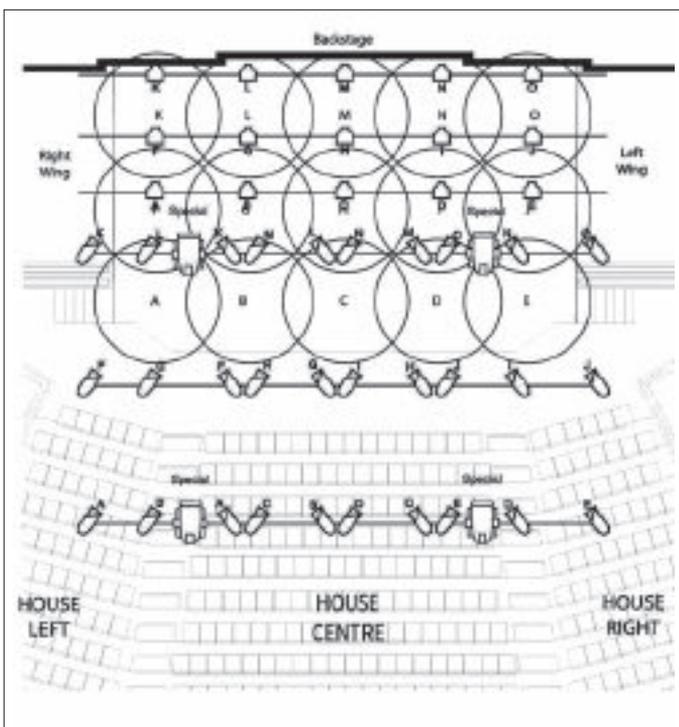


Fig. 3 Robb Hall Theatre – three-point light plot 2v2

Adding colour

Once you've ensured that your entire stage can be effectively lit and subdivided into individually controllable lighting zones, you may wish to add to your rig a number of fixtures to provide colour to your stage. Colour is perhaps the most effective method that can be used to suggest a mood or feeling, or evoke a psychological response from the audience or congregation to what is being said or presented from the stage. Colour is typically applied in a top light or back light position and can be created from either tungsten-sourced fixtures through the use of gels or through colour-mixing features present in most LED wash or automated lighting fixtures.

If your rig is composed only of conventional, tungsten-sourced fixtures, you will only be able to create a single colour from each light at a time, unless you have invested in or plan to purpose accessory colour-scrollers or colour-changers. Without these accessories, this means that if you want to colour your stage in two colours during the same service, you will need twice the number of fixtures (one set of fixtures for each colour). Colour is typically applied as a 'wash' of the stage, meaning that the fixtures used for colouring will illuminate the entire stage area in an even coverage of light.

Adding specials

The next element that I would consider when setting up a basic lighting grid would be the use of 'specials'. These are any fixtures with a specific lighting purpose other than what can be achieved through the lighting zones. For example, you may want a tight

spotlight to illuminate a particular religious symbol throughout your service, or you may want a smaller, more defined pool of light to illuminate the lead worship singer to draw more focus to them from the rest of the worship band. Again, a special can be any fixture added to the rig for any specific purpose (see Fig. 3).

I would recommend including in your lighting grid a number of special fixtures that can be re-tasked on an as-needed basis. These fixtures would always exist in your rig and therefore be quick and easy to focus as needed, rather than having to hang a special every time one is required. For example, in one of the theatres that I manage, I keep five specials hung, powered and patched from all of my front lighting positions. There are times when I am asked for a small pool of light (or up to five) as little as an hour or two prior to an event. With these specials ready to go, it is a simple task to ask the event planner to spike onstage where they need the light, and to then have it ready to go after a quick focus. I must add the disclaimer that these positions are accessible via catwalks, so access is not an issue.

In another one of the theatres that I manage, the front light positions are on pipes mounted at ceiling height (4m) and require a ladder to access. In this venue, I have placed a number of moving head fixtures that I can re-focus to accommodate these last-minute requests. Without the addition of these fixtures in both theatres, I would not be able to accommodate many of these late lighting requests.

Conclusion

Through following these steps, you will be able to set up a basic, yet effective and flexible, lighting grid for your venue. If I were to narrow down the four main functions of stage lighting to the one that would be most important in a HOW setting, it would be visibility. The congregation should be able to see exactly what you as the lighting technician or designer want them to see (or not see). The addition of colour and specials provides you with additional creative options available in your toolkit, while creating lighting zones for your stage using the McCandless method will ensure that the stage is evenly, uniformly and naturally lit. Once you have these basics down, adding additional angles and textures can then be used to further enhance the design and intended message.



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