
Stage Lighting Design

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PART 4 - Professional Lighting Procedure

- 4.01 Design Responsibility
- 4.02 Design Procedure
- 4.03 Design Concept
- 4.04 Design Communication
- 4.05 Design Planning
- 4.06 The Lighting Section
- 4.07 The Lighting Plot
- 4.08 The Hook-up
- 4.09 The Instrument Schedule
- 4.10 The Magic Sheet
- 4.11 The Focus Session
- 4.12 The Level Session
- 4.13 The Cue Sheet

4.01 - DESIGN RESPONSIBILITY

1.) THE PRODUCER & DIRECTOR

Usually, it is the 'Producer' that is responsible for all aspects of a professional stage production. The Director is usually engaged by the Producer. The Producer will usually impose restrictions on the Director, who must work with available time, budgets and resources.

2.) THE DESIGNERS

The DESIGNERS (Set, Costume, Lighting and Sound) are generally selected by the Director, to provide a cohesive team able to work well together on a particular production. Sometime the designers may be selected by the Producer, however usually with the Directors' approval.

3.) THE LIGHTING DESIGNER

The LIGHTING DESIGNER is responsible for the design of all production lighting (and usually, special effects). This designer will prepare a LIGHTING DESIGN, consisting of drawings and schedules and all information necessary for the lighting crews to fully install and connect all equipment. Further the lighting designer will supervise and direct all the artistic elements of the lighting design up until the opening of the production.

4.) THE HEAD ELECTRICIAN

The HEAD ELECTRICIAN, (sometimes; Master or Chief, electrician) heads and supervises the lighting crews during the set-up and 'running' of a production. The Head Electrician will generally also run the lighting control console for each performance.

5.) THE PRODUCTION ELECTRICIAN

A PRODUCTION ELECTRICIAN is sometimes engaged by the Producer, to facilitate the lighting set-up. This individual will assist with the ordering of all lighting equipment, coordination of crews and budgets and provide general problem solving, up until ' opening night' .

6.) THE LIGHTING CREW

The LIGHTING CREW are under the supervision of the Head Electrician. Under his direction, they are responsible for the installation, hanging, cabling, plugging and coloring of all equipment. During the ' focus' they are responsible for the precise aiming and adjustment of all fixtures, as directed by the lighting designer.

7.) THE RUNNING CREW

The RUNNING CREW is responsible for the nightly operation of all production lighting. The Head Electrician will usually operate the lighting console, while the running crew electricians are usually responsible for followspot, projection or special effect operation. It is also the running crew, (& Head Elect.) that generally perform any lighting related maintenance, during the run of the production.

4.02 - DESIGN PROCEDURE

1.) DESIGN PROCEDURE - (OUTLINE CHECKLIST)

The following, outlines a procedure useful for the comprehensive and responsible lighting design, of a professional stage production. This applies to theatre, dance, opera, musical or other entertainment productions.

1.) SCRIPT ANALYSIS: Read the script (score) several times, once for enjoyment and then again to determine; the times of day, seasons, type and direction of sources, moods and other intellectual and emotional stimulus.

2.) TALK WITH THE DIRECTOR: Meet with director and other designers. Determine their interpretation of the script. What is the proposed style of design? What are their expectations regarding the lighting?

3.) SET & COSTUME DESIGN: Gather together and familiarize yourself with the set drawings, renderings, costume sketches and the model. If there is a model, take a ' Polaroid' photo of each scene, to help you during the design process.

4.) STUDY THE THEATRE: Visit the venue or study the plans. Get to know the lighting and rigging positions. Get a complete inventory of any permanent fixtures, circuits, dimming and control equipment. All other lighting equipment will need to be rented. If the production is to tour, determine and study the details of all theatres.

5.) TIME/CREW/BUDGET: Will the lighting budget allow you to meet the needs of your anticipated design? Determine exactly how many hours you have in the theatre, for all aspects of the design. Determine exactly how many crew members you will have available and when. Finally determine what budget is available for additional rented equipment.

6.) ATTEND REHEARSALS: Watch for blocking, and other mechanics. See if there is a particular

style to the direction, (there should be). Are there specific conventions being used? Get exact measurements for furniture and ' specials' .

7.) **PREPARE THE LIGHTING DESIGN:** Form a verbal ' concept' for the lighting. Next form a visual image as to how you expect the production to look, moment by moment. Next produce the **LIGHTING PLOT** and all related paper work (including: the **SHOP ORDER, HOOK-UP, INSTRUMENT, FOCUS** and **COLOR** schedules).

8.) **SUPERVISE THE FOCUS:** Although your attendance at the **HANG** may not be required, your attendance at the **FOCUS** session is mandatory. During this session you must aim, focus & document each fixture, one by one.

9.) **SUPERVISE THE LEVEL SETTING:** Build each lighting picture one at a time so as to fulfill your design criteria. You must also establish exact ' counts' for the transitions from one cue, to another. Provide the Stage Manager with exact script locations (**GO** point) for each cue.

10.) **LIGHTING REHEARSALS:** Supervise and refine all lighting levels and transitions as needed. Instruct your electricians as to ' running' maintenance and provide them with all final documentatio

4.03 - DESIGN CONCEPT

1.) **LIGHTING CONCEPT**

At some point prior to producing the actual ' lighting design' , the designer must form a **LIGHTING CONCEPT**. Typically, this is a statement of what the designer hopes to achieve with the lighting design, and how he hopes to achieve it. It may be written, or verbal only, but the concept must exist, at the very least in the designers' mind.

The concept should be fundamental. It should capture the intrinsic qualities in the play and relate and describe them in terms of light. If properly developed, the concept will assist the designer with every step of the lighting design process. It will be used constantly to justify the designer' s choice of style, lighting methods, directions of light, use of intensity, distribution, color and movement, etc.

Often the concept may become clear after the first meeting with the director and the other designers. At other times, the concept may develop slowly over a period of weeks and may not become evident until the designer has had the opportunity of watching several rehearsals.

The lighting concept is generally based on the emotional qualities developed by the playwright and indicated by the script. The concept will also be influenced by the directors' and the other designers' interpretation of the script. Everyone must be on the same page at the same time, when it comes to the design concept.

The lighting concept may sometimes be as simple as: ' to provide a feeling of warm, muted, sunlight over the entire stage, with a strong dramatic sense of motivation from stage left' .

Often the concept will be far less simplistic and will relate more to the production on various emotional or metaphoric levels. As the designer analyzes the play, he will often find; contrasts, conflicts, juxtapositions, metaphors, symbolism, irony, and other dramatic devices. How he relates these images to the physiological of design, is an important part of the design process, and is usually defined as part of the concept.

Example: A stylized play about a couple that are diametrically opposed to each other and are always

fighting - might be seen as a 'cat and mouse game'. So the designer will use 'cat and mouse colors' (maybe pink from one side and gray from the other). He may show the contrast between the two characters with contrast in the lighting. The 'cat' may be illuminated with sharp, threatening lighting, while the 'mouse' may be sympathetically illuminated with soft warm light. So every thing regarding choice of intensity, color, direction and movement of light, can all be justified by the concept.

Good lighting can and often does exist, without a concept. However, the lighting designer that takes time to develop a strong overall concept is ultimately better equipped to make rapid design decisions, as there is now complete justification and direction for all of his choices.

4.04 - DESIGN COMMUNICATIONS

1.) COMMUNICATION

The lighting designer must be able to VISUALIZE his proposed design in three-dimensions. Further he must have the necessary skills to VERBALIZE or describe the proposed design in words and visual images. Finally, he must be able to DOCUMENT the proposed design on paper and DIRECT the design in practice. Communication is fundamental in design. The art of stage lighting relies on the art of communication.

Technically speaking, it really doesn't matter how a designer communicates his design intentions to others, just as long as he does so clearly and effectively. In professional situations, certain conventions and expectations of the designer have been established over the years. Crews expect clear, concise, detailed information, so that they can work efficiently and within time restraints. It is the responsibility of the lighting designer to ensure that the lighting crews receive whatever direction and information necessary, to ensure that all details of the lighting installation, are absolutely clear.

The lighting designer must develop verbal and other skills, necessary to fully describe and illustrate the artistic components of his proposed lighting design. He must be able to visualize his design intentions and then clearly communicate them to the director and to other designers. The designer must be able to describe lighting styles, painting styles, architectural styles, detail and periods, atmospheric conditions, moods, emotions and feelings. The use of renderings may often help. Sometimes paintings from the 'Old Masters' are immensely usefully in discussing and illustrating styles and qualities of lighting.

Once the designer has a full understanding of all the ingredients, a rough 'lighting concept' drawing is usually prepared for each scene. These sketches summarize the actor's blocking and provide other important lighting details including; mood, atmosphere, time of day, and indication of any natural or artificial light sources.

2.) DRAWINGS

Ultimately, the lighting designer must produce a PLAN drawing, showing all the required lighting fixtures, precisely located in scale and in relationship to the stage. This is the LIGHTING PLOT, (or LIGHTING PLAN) and it is this drawing that the stage electricians will use to install, cable, plug and color all fixtures. The designer should take great care and pride in the quality of drawings and paperwork produced for the lighting crews. Often if the crew sees that the designer cares about the production, they will also.

3.) SCHEDULES

Any information that cannot be shown CLEARLY on the light plot must be shown in the form of separate schedules. Further, the electrical crew will expect summary schedules showing, fixture; hook-up, color, focus and accessories. These schedules will facilitate both the set-up and daily maintenance of the production lighting. Take pride in your work.

4.05 - DESIGN PLANNING

Lighting design is a two part process. First the designer must create the lighting in his mind. Next he must create it in the real world.

Any lighting design process begins with having a complete understanding of just what it is you are lighting - from the physical point of view. This only comes from a through understanding of the stage scenic design and how it integrates with the theatre and relates to the audience. All of this is very important! The lighting designer must be able to accurately visualize the proposed production - in the actual performance space or venue. He must intimately understand the scale of the theatre and the distances and angles to the permanent lighting positions. Without this understanding, at best the lighting designer will only be able to ' fumble' through his design. Maybe things will work, but if th do it won' t be because of planning.

In order to allow the lighting designer to fully visualize the practical real world factors that he has to work with, he must rely on a number of different tools.

Usually, the set designer will provide a rendering and plan of each scene. These are tremendously useful to the lighting designer and will show each scene both drawn from the front (elevation) and from the above, (plan view). The lighting designer must be able to ' place' these scene plans accurately on the stage and be able to visualize the location of all of the lighting positions. This is no easy task as the designer has to think in 3 dimensions! Typically the stage plans are superimposed on the theatre plans to provide a ' composite' drawing of the stage and all adjacent lighting positions. Needless to say it is important that both the scene plans and the theatre plans must be drawn at the same scale. In Canada and the USA, common scales used for lighting drawings are: 1/8", 1/4" and 1/2" = 1.0 foot.

For professional productions a 3-D, scale model of the set is often provided (accurately painted). The model is worth it' s weight in gold and should be monopolized by the lighting designer at all times. This is the best design aid the lighting designer will ever have. He can position the model on a drawing of the theatre and easily determine the distances and angles to any lighting position. It doesn' t get much better than this.

Today many different computer aided design (CAD) programs exist to help the lighting designer visualize the performance space in 3-D. Modern programs allow accurately rendered models to be ' rotated in space' and viewed from any angle. Some programs have excellent light rendering capabilities and are great visual aids.

Regardless of how he does it, the lighting designer must quickly be able to visualize a particular production in a specific venue. He must also be able to accurately determine the distance and angle to any lighting position. The designer not equipped with this basic information is poorly equipped to proceed with any lighting design.

4.06 - THE LIGHTING SECTION

1.) CROSS-SECTION

Although the various scenic plans are of great use to the lighting designer, it is only with the CROSS-SECTION drawing that this designer can fully visualize the stage setting, in 3-Dimensions.

The ' section' typically is drawn as a ' slice' along the center line, from the back wall of the stage to the back wall of the auditorium. It shows in section; the stage floor, the ceiling, (or grid) audience seating, the stage set and all lighting positions (both above the stage and in the auditorium). Often the section will show the stage scenery at the center line as well as portions of the set, right and left of the center line. This is a ' composite' section, and is typically required when scenery isn't placed parallel in relationship to the lighting positions.

Alternately, additional section drawings are often produced showing cross sections at the far stage left or stage right walls of the stage and auditorium. All of these drawings are invaluable in allowing the designer to fully understand and visualize the three-dimensional relationships between the audience, the stage, the setting and the lighting positions.

It is only with this drawing, (the lighting section) that the designer will be able to accurately ' measure' the throw distances from any particular lighting fixture, to the stage. The plan view drawings, alone, are of no use in this regard. The lighting cross-section is always prepared prior to the ' lighting design' , and is a most important tool to check lighting angles, sight lines and masking. A scale model is also invaluable.

The lighting section is generally prepared by the set designer, the technical director or the lighting designer, depending on the exact nature of the production, venue, or producing company. Regardless of who produces it, someone must, before the lighting designer is able to produce a responsible lighting design. Further the lighting section will show the ' trim' heights of all electric pipes and all masking borders. This information is necessary so that the stage crew will install the masking exactly as indicated, so as to ensure no interference with the lighting equipment.

The section is always drawn to scale, and this is typically the same scale as the theatre ground plans and the set designer's drawings. Typical scales are 1/4"=40", 1/2" = 1'-0' , 1:25 and 1:50. Any section can be rotated 90 degrees to align with its floor plan view.

Although the lighting section is an essential drawing for the proper planning of a lighting plot, it seldom progresses past the ' working drawing' stage. Once the heights of all lighting pipes, masking borders and other scenic elements have been drawn and checked, this information is usually transferred to a HANGING SCHEDULE, for use by the set-up crew. This eliminates the need for the crew to continue to scale or measure the drawings during the actual set-up.

4.07 - THE LIGHTING PLOT

1.) LIGHTING PLOT (LIGHT PLOT)

The ' physical' lighting design is typically drawn as a single drawing, commonly referred to as THE LIGHTING PLOT, (or the Light Plot). This is a scale drawing of the theatre and auditorium, with all lighting fixtures drawn exactly in their required location. The light plot must show all information necessary to allow the electricians to install all lighting, including fixtures, special effects, projectors and practical sources, in their exact location. In the world of professional theatre: "If it ain't on the page, It ain't on the stage"

The LIGHTING PLOT must be drawn clearly in order to provide specific information. Superfluous

information is not required and serves only to provide less clarity. Remember, this drawing is to clearly communicate information to others, not to show off your drawing skills. The following are conventions used internationally:

The PLOT is usually a horizontal ('landscape') drawing, with the stage running right to left. Common scales include $1/4" = 1'$ and $1/2" = 1'$. Pick a useful scale. Try and use the same scale that the theatrical architectural drawings and the stage designs use. An inappropriate scale can result in a drawing that is far too large to readily handle or far too small to show the required information and detail, clearly.

2.) LIGHT PLOT DETAILS

- A.) Outline of THEATRE & AUDITORIUM WALLS - (heavy solid line)
 - B.) Outline of STAGE SCENERY - (light dot line)
 - C.) Center line of stage - (dot-dash line)
 - D.) All lighting POSITIONS (pipes) - (light solid line)

 - E.) FIXTURES, draw in exact POSITION - (include a.- h.)
 -
 - a.) TYPE & WATTAGE (shown by standard template fixture symbols)
 - b.) UNIT # (shown by 'number' in body of fixture symbol)
 - c.) COLOR # (manuf'rs filter number (#xx) in front of lens)
 - d.) ACCESSORIES (barn doors, gobos, iris, color wheels, etc.)
 - e.) CIRCUIT # (a 'circle' to be filled in by electrician)
 - f.) DIMMER # (optional)
 - g.) CHANNEL # (optional)
 - h.) FOCUS (optional)

 - F.) KEY TO SYMBOLS (Show each symbol, with fixture type & wattage)

 - G.) TITLE BLOCK, with:
 -
 - a.) DRAWING NAME: LIGHT PLOT
 - b.) NAME OF PRODUCTION
 - c.) NAME OF THEATRE/VENUE
 - d.) NAME of DESIGNERS & DIR)
 - e.) SCALE of drawing
 - f.) DATE of drawing

 - H.) SPECIAL NOTES or SCHEDULES
 -
- Provide an area for 'numbered' notes, and details when required.

4.08 - THE HOOK-UP

1.) HOOK-UP

Somehow all of the lighting symbols shown on the lighting plot must be connected via their electrical circuits to dimmers and then to control channels at the control console. It is only the channel numbers that the lighting designer is ultimately interested in. He will usually assign or 'patch' specific dimmers to specific channels, in a logical and organized sequence. Some older systems require circuits to be plugged first to a dimmer through a manual 'patch panel'. In this case may be possible to assign more than one circuit to a dimmer. In some older control systems, the dimmer number is also the channel number. In newer systems, each dimmer may be assigned to any channel by a 'softpatch'. So the Hookup must clearly and logically show the relationship between circuit numbers, dimmer numbers and channel numbers. Again, the sequence of plugging or patching should be logical and organized.

THE HOOK-UP, (or CHANNEL SCHEDULE) is a numerical list of all channels used in a particular

production. Not only does this schedule contain; circuit, dimmer and channel assignments, it also shows a summary of all fixture details, shown on the lighting plot. A typical HOOK-UP will show the CHANNEL#, DIMMER#, CIRCUIT#, FIXTURE#, and (Type, Watts, Purpose, Accessories & Color filters, for all units). This schedule is invaluable to both the lighting designer and to the electrical crew.

Typically a small scale production might require 12-24 dimmers with up to 24 channels of control. A large scale production might require more than 500 dimmers assigned to 300 control channels. Although schedules can be prepared by hand, several computer programs exist to assist the designer. 'Lightwright', a well known paperwork program (by John McKernon) produces a 'hook' similar to the following:

```

=====
CHANNEL HOOK-UP                                     DATE: 1999-12-31
=====
PRODUCTION: WAR & PEACE                             Page 1/x
=====
CH.  DIM.  CIR.  POSITION  UNIT#   TYPE           WATTS  PURPOSE  ACCES.  COLOR
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
1 |  45   45   #1 Bridge - 1   30 deg. E.R.   1000   AREA 1   Gobo5   R08
  |  65   65   #1 Bridge - 17  30 deg. E.R.   1000   AREA 1   Gobo5   R08
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2 |  46   46   #1 Bridge - 2   30 deg. E.R.   1000   AREA 2   Gobo5   R66
  |  66   66   #1 Bridge -18  30 deg. E.R.   1000   AREA 2   Gobo5   R66
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3 | 120  120   #1 Pipe   - 1   6" Fresnel     1000   AREA 3   Doors   R08
  | 132  132   #1 Pipe  -15   6" Fresnel     1000   AREA 3   Doors   R08
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
4 | 121  121   #1 Pipe   - 2   6" Fresnel     1000   AREA 4   Doors   R66
  | 138  138   #1 Pipe  -16   6" Fresnel     1000   AREA 4   Doors   R66
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
5 | 118  118   #1 Pipe   - 7   20 deg. E.R.    750   WINDOW-R   -   R88
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
6 | 119  119   #1 Pipe   - 8   20 deg. E.R.    750   WINDOW-C   -   R88
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
7 | 121  121   #1 Pipe   - 9   20 deg. E.R.    750   WINDOW-L   -   R88
--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

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4.09 - THE INSTRUMENT SCHEDULE

1.) INSTRUMENT SCHEDULE

The INSTRUMENT SCHEDULE is a detailed list of all fixtures on the light plot, shown by HANGING POSITIONS. It allows the Head Electrician to rapidly identify all the details, for any fixture.

Each fixture (unit) is given a number. As a result, any fixture can be easily identified by the POSITION and UNIT #. Examples: #1 Bridge-5, #1 Pipe-12, #1 Boom-8, etc.

Positions are typically listed in the following order:

- a.) from curtain line to rear of auditorium (overhead)(1cove, 2cove)
- b.) from curtain line to rear of stage (overhead)(1pipe, 2pipe, etc)
- c.) booms (on stands or hanging)
- d.) floor positions
- e.) special effect equipment and practical fixtures

Fixtures are typically numbered in the following order;

- a.) from stage left to stage right (overhead pipes)
- b.) from top to bottom (booms)
- c.) from down stage to up stage

This Instrument Schedule contains all the information, shown on the HOOK-UP, except the columns are simply in a different order. This schedule typically shows the following information:

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=====
INSTRUMENT SCHEDULE                                     DATE: 1999-12-31
=====
PRODUCTION: WAR & PEACE                               Page 1/x
=====
POSITION  UNIT#      TYPE           WATTS CH. DIM.  CIR.  PURPOSE ACCES.  COLOR
-----
#1 Pipe   - 1       6" Fresnel     1000 71  135  128  AREA 1  Doors  R08
-----
#1 Pipe   - 2       6" Fresnel     1000 37  136  127  AREA 2  Doors  R08
-----
#1 Pipe   - 3       6" Fresnel     1000 43  137  126  AREA 3  Doors  R08
-----
#1 Pipe   - 4       6" E.R. 20deg. 750 95  151  125  WINDOW R Gobo5  NC
-----
#1 Pipe   - 5       6" E.R. 20deg. 750 16  152  124  WINDOW C Gobo5  NC
-----
#1 Pipe   - 6       6" E.R. 20deg. 750 17  153  123  WINDOW L Gobo5  NC
-----
#1 Pipe   - 7       6" Fresnel     1000 33  135  122  AREA 1  Doors  R66
-----
#1 Pipe   - 8       6" Fresnel     1000 12  136  121  AREA 2  Doors  R66
-----
#1 Pipe   - 9       6" Fresnel     1000 72  137  120  AREA 3  Doors  R66
=====

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4.10 - THE MAGIC SHEET

1.) MAGIC SHEET

Although the INSTRUMENT SCHEDULE and the HOOK-UP are of immense use, they are created primarily to show the electricians crew the correct connection of all equipment. Stage lighting is a visual art and as such, the lighting designer must find a way to think visually.

Perhaps only twenty-five years ago, the process of the designer keeping track of all the numbers of his 'visual' components, was with the HOOK-UP. This schedule is usually nothing more than a long list of numbers with fixture, focus and color details. It in no way shows 'visually' what is connected to each channel. Often the designer could rapidly visualize; 'a blue wash from stage left', but it would take him 5 minutes to find the channel number, especially if he had several hundreds of channels to work with. Needless to say this process could be very slow during both the focus and the level setting sessions.

Somewhere in recent years, the process changed and the MAGIC SHEET was born. The concept is so simple that it is surprising that it wasn't developed long before. As a former student of Tom Skeleton, I learned the concept from him in New York in about 1970, and have been using it ever since. I credit Tom with the development of the concept, although others may also take credit for a similar means of visually representing their lighting plot.

The magic sheet typically consists of a single piece of paper (about 8.5" x 14") and usually divided into 15 squares (3 x 5). More squares (or paper) might be required for a very large show. Each square represents a visual group of fixtures. This allows, the designer to locate just the acting areas, front light, side light, back light, etc., very rapidly. Each channel number is shown in a circle. The number of arrows indicate the number of fixtures and the direction of the light. Often a small picture of the scenery is drawn, to show the exact focus of each channel. Partial MAGIC SHEET follows:

ACTING AREAS (LIGHT AMBER #08)				ACTING AREAS (LIGHT BLUE #66)				SIDE LIGHTS (LIGHT PINK #44)			
^	^	^		^	^	^					
(4)	(5)	(6)	US	(10)	(11)	(12)	DS	(15)->>	US	<<-(16)	
R	C	L		R	C	L					
^	^	^		^	^	^					
(1)	(2)	(3)	DS	(7)	(8)	(9)	DS	(13)->	DS	<-(14)	
BACK LIGHTING (DARK BLUE #80)				CYCLORAMA				SPECIALS			
				(21) RED	Top			UR	UC	UL	
		v (17) v		(22) GREEN	"			(27)	(28)	(29)	
		v (18) v		(23) BLUE	"						
		v (19) v		(24) RED	Bottom			DR	DC	DL	
		v (20) v		(25) BLUE	"			^	^	^	
				(26) GREEN	"			(30)	(31)	(32)	

4.11 - THE FOCUS SESSION

1.) FOCUS SESSION

The lighting designer may; analyze, discuss, plan, draw and draft for days or weeks to produce the lighting plot, and the related schedules. It is during the focus session however, that the lighting designer will see for the first time if he has selected appropriate equipment and appropriate mounting positions to accomplish his objectives.

During the focus session, the lighting designer and the lighting crew work in a darkened theatre. Usually an electrician will operate the lighting control console, either from the stage or from the control booth. The designer will usually stand on the stage and request which channel number he wishes to have active. Next, a crew member at the particular fixture will be directed by the designer in the proper aiming (focus) of the fixture. The fixture must have its pan and tilt set, then be firmly ' locked' with a wrench. Next beam adjustments (size, edge, distribution, shutters and templates) are made. Finally, the appropriate color filter (and or diffusion material is added. This process must be repeated for each fixture on the lighting plot and may take from 1-5 minutes per fixture.

Lighting above the auditorium may be accessible from fixed catwalks. Other auditorium fixtures may require ladders to access. Fixtures mounted above the stage are typically focused from an ' A Frame' ladder or a man lift. It is usually important to work quickly during a focus session, but it is also important to work safely.

It is during the focus session that the designer will generally get a sense of whether his lighting design will ' work' or not. More particularly if the designer has not done the appropriate planning, he may find during the focus session that his design may not work. For this reason, the focus session may often be rather tense. The designer will usually insist on total concentration from the lighting

crew so that he may work as efficiently as possible. In professional situations, the producer may require the lighting to be focused in 4-12 hours (usually in 4 hour calls), depending on the number of fixtures, their accessibility and the number and caliber of lighting crew. A single crew member will typically average 12-60 fixtures per hour. Often the designer may keep several electricians focusing at the same time and it is not unusual to see a 400 fixture ' rock and roll' plot, focused in 4 hours, by an experienced lighting crew.

It is mainly the responsibility of the lighting designer to insure that all the fixtures shown on the lighting plot can be focused in the allotted time. It is the irresponsible designer that order fixtures hung in a location that can not be quickly and safely accessed during the focus session. The designer must be able to realistically estimate his required focus time and the complexity of the light plot must reflect this in respect to quantity and accessibility of fixtures.

During the focus, the lighting designer (or assistant L.D.) will usually document the aiming of each fixture, necessary to insure integrity of design or for future remounting of the production.

4.12 - THE LEVEL SESSION

1.) LEVEL SESSION

Once all of the lighting fixtures have been assigned to the dimmers, and individually focused, it is time for the designer to build the lighting ' pictures' . This is the LEVEL or CUE setting session.

Typically the lighting designer may have only 4-8 hours to set all the lighting ' cues' for a production into the memory system. There may be as few as 12 cues or as many as 200 cues for a large production.

The lighting designer, will typically be in charge of this session. The director, stage manager and other designers will generally also be present. Typically this team will gather around the production table in the darkened auditorium, like moths gather around a light.

The lighting designer will work through the show in sequence, from the first house lights going down, to the final house lights going up. He will build each lighting look, channel by channel and then when complete, will seek approval from the director and other designers. Once the look is approved, it is either recorded on a ' cue sheet' or recorded in ' memory' , by the head electrician. Generally every lighting change will be given a CUE NUMBER, (usually in sequence) and a TIME so that it may be positioned in the script by the Stage Manager.

The lighting designer is usually under great pressure to demonstrate to the others (and himself) that he is able to provide the appropriate and expected lighting. Typically the stage setting will not be finished. Props, furniture, curtains or carpets may be missing, the set or floor may not be fully painted and the actors will be missing. Any missing elements can make the lighting designers' job very difficult, if he, the director or the other designers can't fully visualize the final results when the set is finished and the actors are in place. For this reason, it is best to insist whenever possible that the Level Session not take place, until the set is fully complete, painted and dressed.

This designer learned many years ago that it is senseless to waste time trying to refine a lighting look, without the set being finished and the actors on the stage. The lighting MUST be seen in context with the rest of the production to be fully understood and appreciated. I have spent many productions, plotting the intensity of a white wall to a low level, only to plot it back up to full several days later when the wall paper finally arrived.

Although the actors are seldom present during this session, it is very valuable to have a 'walker' present, usually dressed in typical costume tones. The walker, will move as directed, through the actors' blocking, allowing the director and designer to check lighting levels on 'faces', any where the stage. Generally the lighting designer must work quickly and with confidence. Although he should not rush the director in his approval of a particular lighting look, he should do his best to be positive, remind him if they are seeing things out of context, and describe any possible solutions to any concerns.

4.13 - THE CUE SHEET

1.) LIGHTING CUE SHEET

During the Level session, each lighting 'look' is carefully built, dimmer by dimmer. It may take from one minutes to over an hour to fully balance each 'cue' or look. It is imperative that this information be properly documented for a number of reasons. The CUE SHEET is the written documentation of each lighting cue. Usually it consists of columns for each dimmer (or channel) number, across the top of the page. Each cue is given a NUMBER and TIME, and then the level information is clearly written, below the corresponding channel numbers. An additional area should be provided for OPERATION.

The CUE sheet is needed for two reasons. First, if the lighting control board is a manual system (with no electronic memory), it is the only record of the lighting. Second, even if the lighting control board has an electronic memory, a written record of each lighting cue should be kept for backup and safety reasons. Remember, the designer spends considerable time balancing the lighting to the directors' and his own approval. It would be totally irresponsible not to have a written record of this session, should for any reason the lighting control system, 'lose memory'. It is a laborious process to write Cue Sheets by hand, especially for a production with more than 100 channels. Often the task of writing the Cue Sheets can be assigned to the Assistant Lighting Designer, (as a form of penance).

Recently computer assisted control boards have become widely available and are now considered to be the norm. Most systems also come with a printer. This means that each cue can now be recorded and printed at the same time, thus always maintaining a 'hardcopy' of each cue.

During the lighting rehearsals that follow, the designer may request printouts of all cues, after a particular rehearsal, again for purposes of back-up and safety, for if the lighting control 'crashes', it may be necessary to manually type in the all the cue and level information, into a new system. This may be a tedious process, but at least it is possible with a hardcopy record. Without it, all the time spent at the lighting cue session, and subsequent rehearsals, has been wasted.

A final printout should be made just prior to the opening production (or when the designer is sure that no more changes will be made). The final printout should be retained by both the producer (theatre) and the designer, for the duration of the production. If the production is ever remounted in the form of a transfer or tour, the Cue Sheet printout will be used as a basis to reconstruct the lighting.

2.) TYPICAL CUE SHEET

Channel:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Q17 T5	80	75	75	80	45	00	45	45	00	60	60	80	30	20	65
Q18 T8	0v	75	75	80	50^	50^	45	45	45^	60	30v	60v	30	20	65

Stage Lighting Design

