

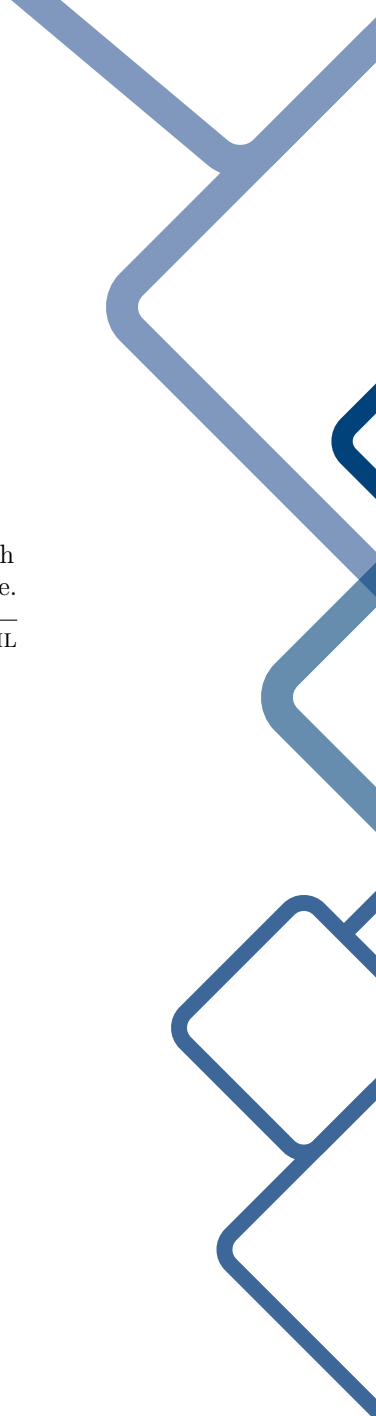
# *The VCP Guide to Lighting*

Program lighting for someone, you have a show. Teach  
how to program lights, Brian bows down to you in awe.

---

HUSSEIN ESMAIL

Hussein Esmail  
Technical Director of Lights and Sound  
HusseinEsmailContact@gmail.com





# The VCP Guide to Lighting

Hussein Esmail

April 10, 2022

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# Part I

## Introduction

This PDF is a guide for operating and managing the lighting system at Vanier College Productions. It mainly focuses on operating VCP’s lighting board, the Strand Lighting 550i, but also discusses the gel inventory, types of lights, and other helpful information. This guide is written for future Lighting Technical Designers and interested Lighting Designers.

At the time of writing this document, all URLs in this document are correct. Should you have any issues, please feel free to send me an email at [HusseinEsmailContact@gmail.com](mailto:HusseinEsmailContact@gmail.com). You can access this PDF at <https://husseinesmail.xyz/guides/all/VCP-Lighting-Strand-550i-Guide.pdf>.

### 1 How This Guide is Formatted

This guide is made using L<sup>A</sup>T<sub>E</sub>X, a typesetting document format, which is mainly used for large documents like STEM documents, theses, and research papers. To read more about what I think about L<sup>A</sup>T<sub>E</sub>X, you can go to <https://husseinesmail.xyz/articles/is-latex-better.html>, or go to their project page at <https://latex-project.org>.

When you see text like this: “Halliday [2]” or “Halliday [2, Section 1.1]” without the grey background, that indicates a citation that links to the end of the document. You can click these within the document, and it will take you to the appropriate citation in the References section (Section 10).

#### 1.1 Lighting Board Command Formatting

When you see bolded capitalized text in brackets, that means that it is a command that can be typed into the lighting board. If the command is surrounded by square brackets ([ ]), that means it is a physical button on the lighting board. You can see all the locations of the buttons in section 3.1 on page 3.

When commands like **{LOAD SHOW}** are in curly brackets, it indicates a softkey button on the lighting board. You can see all the active set of softkey buttons on the LCD screens right above the turquoise buttons.

On the lighting board, there is a command line input (like the Terminal application on a computer), which will appear at the bottom of the main monitor. In this guide, an example command will appear like this: [2] [Ⓜ] **{FULL}** [\*], where each piece of text is its own button.

When “[#]” is typed inside an example command, it usually is a placeholder for whatever numbers you are planning to use, whether it be channel numbers, intensities, or any other number type. It will be specified what it is talking about when used.

## 2 Accessing This Guide

### 2.1 At VCP

A copy of this guide should always remain in the booth at VC 258.

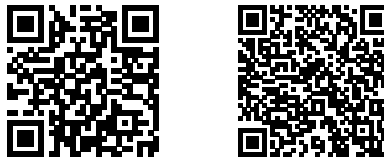
### 2.2 Online

You can access this guide online at <https://huseinesmail.xyz/guides/vcp/>, as well as other guides that I’ve written such as how to auto-generate a closed captioning presentation for Accessibility performances in L<sup>A</sup>T<sub>E</sub>X using the “Accessibility Performance Captions Template”, how to operate Streamyard for online performances using the “Streamyard Manual”, and how to send QLab audio cues to Streamyard for online performances with the “Using QLab with Streamyard Presentation”.

The URLs for the QR codes below are:

1. <https://huseinesmail.xyz/guides/vcp/>
2. <https://huseinesmail.xyz/guides/all/VCP-Lighting-Strand-550i-Guide.pdf>

Figure 1: QR Codes for Seeing this Guide Online



## Part II

# The Lighting System As A Whole

At Vanier College Productions, the lighting board used is the Strand Lighting 550i. The 550i has a computer monitor and a PS/2 keyboard (not USB) connected to it in the booth. There are also many Fresnels, and other lights onstage.

## 3 The Strand Lighting 550i

The 550i has 54 submaster<sup>1</sup> faders and 6 supermaster faders<sup>2</sup> *GeniusPro and Lightpalette Operator’s Manual* [1, Section 1.4.1], and was released around 1998.

<sup>1</sup>See section 3.11 for what a submaster is.

<sup>2</sup>See section 3.11.4 for what a supermaster is.

The floppy disk that stores the show files should be replaced every 10 years *GeniusPro and Lightpalette Operator's Manual* [1, Section 17.4.2]. The location of the floppy disk drive on the board should be below where the keyboard is kept.

The software the 550i uses is the GeniusPro and Lightpalette software. Other boards that use this are the Strand Lighting 520, 520i, 430, 530, 530i, 550, 300, and 310. These software names are here if you need to refer to other manuals.

### 3.1 Lighting Board Button Locations

This part is going to be an image of all the locations of the buttons, preferably searchable so that you could find the button location more clearly.

Note: I split these up because the full diagram wouldn't fit nicely on this page without rotating it.

Figure 2: Buttons of the Lighting Board

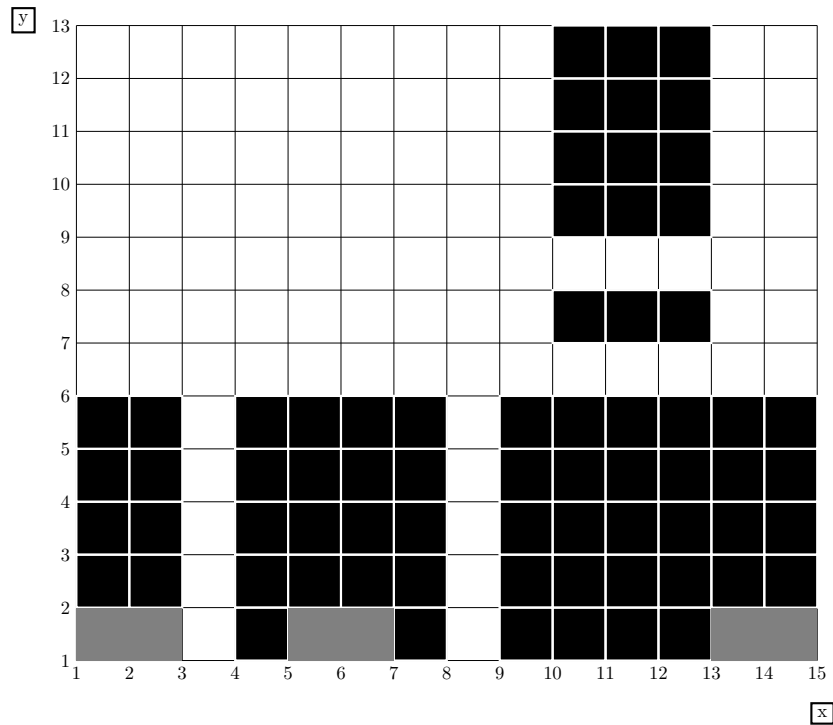




Figure 3: Button Names (relating to their x, y coordinates)

(1, 1) FX Step	(10, 4) 7
(1, 2) FX Go	(10, 5) Last
(1, 3) FX Lead	(10, 7) Page Down
(1, 4) FX Time	(10, 9) Pre-view
(1, 5) FX Sel	(10, 10) Group
(2, 2) FX Stop	(10, 11) Arch
(2, 3) FX Pause	(10, 12) MORE
(2, 4) FX Type	(11, 1) 0
(2, 5) FX Dir	(11, 2) 2
(4, 1) Macro	(11, 3) 5
(4, 2) Delay	(11, 4) 8
(4, 3) PB	(11, 5) Next
(4, 4) Bump Mode	(11, 7) Page Up
(4, 5) Rec Mode	(11, 9) Sub
(5, 1) Q Only/Track	(11, 10) Patch
(5, 2) Wait	(11, 11) Setup
(5, 3) Prof	(11, 12) REPORT
(5, 4) Sub Page	(12, 1) .
(5, 5) Rec Time	(12, 2) 3
(6, 2) /	(12, 3) 6
(6, 3) Text	(12, 4) 9
(6, 4) Goto	(12, 5) On
(6, 5) Rec-Sub	(12, 7) Last Scrn
(7, 1) Shift	(12, 9) Live
(7, 2) Time	(12, 10) FX
(7, 3) Hold	(12, 11) Macro
(7, 4) Update	(12, 12) HELP
(7, 5) Record	(13, 1) *
(9, 1) Cue	(13, 2) @
(9, 2) Group	(13, 3) +
(9, 3) Sub	(13, 4) -
(9, 4) FX	(13, 5) Thru
(9, 5) Dimmer	(14, 2) @Att
(10, 1) Clr	(14, 3) Rem Dim
(10, 2) 1	(14, 4) User
(10, 3) 4	(14, 5) Undo

### 3.2 During a Show

During a show, ideally you only need to know about 2 buttons if you are solely relying on cues: the “GO” and “Back” buttons. These are pretty self-explanatory.

When the “GO” button is pressed, it starts the fade time for the next cue.

If it is accidentally pressed twice during the fade time of the first cue, the 2 cues will be “running” but the later cue will take over overtime, but the lighting changes will be noticeable. Each time you press “GO”, make sure the board starts running the cue by looking for if the timer for the next cue is decreasing before you press “GO” again.

If you do happen to press “GO” twice, that’s where the “Back” button comes in. If you press it while the two cues are both running, the lights as you go back may not be what you wanted. Instead, you need to wait for both cues to finish their fade times, then press “Back” as needed. When everything goes perfectly in a show, you shouldn’t have to press “Back” at all. On that note, you should also never intentionally rely on the “Back” button if you have the exact same cue repeated times. You should have exact copies of the cue in sequential order.

### 3.3 Turning On The Board

Here are the steps to turn on the lighting board and logging in:

1. Turn on the monitor connected to the board.
2. Press the power button in the top right corner of the board.
3. When the login screen appears on the monitor (should take about 30 seconds), press the “Log in” softkey, which will show on the LCD screen. This will lead you to the Archive Screen, which shows which parts of the show will be loaded. Make sure “WHOLE SHOW” on the top-left is checked using the scroll wheel on the right side of the board. You can use the trackball (to the right of the scroll wheel) to move the red cursor around.
4. If the show name at the top of the window on the monitor is different from the show you want, follow the rest of these steps. If it is the show you want, you can press the **[LIVE]** button to see your cues, and you’ve turned on the board properly.
5. On the Archive Screen, the lower half of the screen is called the “Show List” window. This is where you can select which show file to open. These should be named following the format discussed in section 3.5. To get to that, press the **{BROWSE FILES}** (softkey #9) button. When you are on that window, you can use the keyboard up and down buttons to select the show you want to open.
6. When your cursor is on the show you want to open, press the **[\*]** button. Press it again to confirm. This loads that show you are hovering over.
7. After the show you want is loaded, press the **[LIVE]** button to see its cues.

### 3.4 Creating a Show

At the time of writing this document, I don’t know how to “create” a show, but I do know how to copy one. Because of this, I made a template show file called

“**TEMPLATE-2022-HUSSEIN**” on Thursday, March 24 2022<sup>3</sup>. In this file, I have starting and ending cues that all shows should have, such as the house lights on at the beginning and at the end of the show for the audience to enter and exit, etc.

### 3.4.1 Steps to Copy a Show

Instructions to copy a show (including from the template file), after you powered on the board:

1. [**Arch**] → Goes to Archive screen. If you just logged in, you are already here.
2. Make sure “WHOLE SHOW” on the top half (left side) of the monitor is checked by using the scroll wheel.
3. **{BROWSE FILES}** (softkey #9) → Gets you to the lower half of the screen to select which file you want to open.
4. Move up and down the files list using the keyboard up and down keys and hover the cursor on the file you want to load. The scroll wheel makes bigger jumps here, which is not helpful.
5. Press [**\***] **twice** to confirm your selection. This loads the show.
6. [**TEXT**] → Used to set the new file name of your show. This button shows “SHOW TEXT” on the screen. On the same command, type the name of what you want to name the show file using the keyboard. When you’re done typing, press [**\***] to finish the command.
7. Press **{SAVE SHOW}** (softkey #7) **twice**. → Saves the show with a new name to the files list. The show has now been successfully copied.
8. Wait for the “MEMORY LOCKED” message to go away at the top of the monitor and then for the bottom of the monitor to say “Save Completed”.

Steps 1-5 are if you also want to load a show, followed by the **{LOAD SHOW}** softkey (softkey #8).

### 3.4.2 What’s in the Template File?

This section is what exactly is in “**TEMPLATE-2022-HUSSEIN**” in case it gets accidentally changed, or you need to check if it has a specific attribute.

**Cues** : These are the cues that are in the template file. When you record your cues, your first one would be at Cue 4.

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<sup>3</sup>In case any time travellers want to know.

Figure 4: In the Template File: Cues

CUE	TEXT	Lights in Cue
0	N/A	EMPTY <sup>1</sup>
1	<b>BLACK</b>	*@OFF
2	<b>PRESHOW</b>	40@FULL
3	<b>START</b>	*@OFF
—		<b>Your cues here</b>
998	<b>POSTSHOW</b>	40@FULL
999	<b>BLACK</b>	*@OFF

<sup>1</sup> must be here, cannot record over it

**Dimmers** : The dimmer<sup>4</sup> mapping is the same as what it says in this guide.

**Submasters** : The submaster mapping that is in the template file.

Figure 5: In the Template File: Submasters

SUB	TEXT	Lights in Sub
1..48	N/A	EMPTY
49	<b>HOUSE</b>	40@FULL
50	<b>SPOT</b>	6, 13, 29@FULL
51	<b>PINK</b> <sup>1</sup>	21, 22, 25, 31@FULL
52	<b>BLUE</b> <sup>2</sup>	24, 26 ,27, 30@FULL
53..54	EMPTY	EMPTY

<sup>1</sup> At the time of making these submasters, these channels have pink gels on them.

<sup>2</sup> At the time of making these submasters, these channels have blue gels on them.

### 3.5 Recommended Title Format

The recommended title format is as follows: “[YEAR]-[MONTH]-[NAME]” Example: “2019-11-spellingbee” This would be for Spelling Bee that took place in November 2019.

This way, show file titles stored in the lighting board won’t be confusing to understand which performance it came from in the future.

<sup>4</sup>See section 3.6.1 for what a dimmer is.

## 3.6 Dimmers

### 3.6.1 What is a Dimmer?

A dimmer is the number a light is connected to on the lighting rig. Between show files, you can change the channel numbers that turns a specific light on, but a dimmer is what power slot the light is physically plugged into on the lighting rig.

The only time you're really dealing with dimmer numbers is if you're changing what a channel does, or if you're adding/removing/changing a light on the lighting rig.

### 3.6.2 Dimmer Mapping

On the lighting rig, there are dimmer numbers labelled at the top of the connected wire<sup>5</sup>. When you create a new show, you have to map dimmers to channels or else the channels won't do anything. The channels are the numbers you set the percentages of when inputting your cues.

To open the menu to patch lights, press the **[PATCH]** button to get to the "PATCH" screen.

Something to note when you are editing patches, is that it follows the dimmer numbers, not the channel numbers. If you want to change the lights assigned to channel 3, you wouldn't start with the number 3 on the command line, you would have to find what dimmer goes to channel 3, and clear that number<sup>6</sup>.

**Clear All Patches** : To clear the entire Patch menu and reset to default, you would type **[1] [THRU] [2] [0] [4] [8] [@] [\*]**. **This deletes all current patches.** 2048 is used because that's the maximum number of dimmers you can have in a DMX Universe<sup>7</sup>. Of course, using this you could also clear a smaller range of patches if you make a mistake or something. If you want to clear dimmers 2 to 10, you would type **[2] [THRU] [1] [0] [@] [\*]**. To clear a single dimmer, you would type **[#] [@] [\*]**, where "**#[#]**" is the number of the dimmer you want to clear. An example would be **[1] [@] [\*]**, which clears the channel associated to dimmer 1.

**Patching a Dimmer to a Channel** : To patch a dimmer to a channel, you would follow this format: **[Dimmer #] [@] [Channel #] [\*]**. If you want to add the same dimmer to multiple channels, you have to use decimal numbers at the end of the channel numbers. For example, if you want to patch Dimmer 2 to Channel 5 and that channel alone, you can type **[2] [@] [5] [\*]**, but if you want to put Dimmer 2 to Channel 5 and Channel 6, you would type **[2] [@] [5] [. ] [1] [\*]** and **[2] [@] [6] [. ] [2] [\*]** in that order. When adding the first

<sup>5</sup>See section 4.3 about finding dimmer numbers.

<sup>6</sup>See Figure 10 on page 13 for what the default numbers currently are.

<sup>7</sup>You don't need to worry about what a DMX Universe is too much, because that's out of the scope of this document.

channel, you would start with “.1”, then “.2”, and so forth. Format: [Dimmer] [Channel] [.] [Decimal] [\*]

It’s also possible to do [2] [5] [\*] then [2] [6] [.] [1] [\*] along with [2] [6] [.] [2] [\*] with a different channel to have the same light in 2 different channels.

To change a dimmer-channel relationship that has already been made, simply rewrite it with the same decimal value. [2] [5] [.] [1] [\*] can be overwritten by typing [2] [7] [.] [1] [\*] if that’s what you want to set it to instead. There’s no need to clear that Patch in between.

**Warning** : Please do not map any dimmers to channels 41 or 43, as there is an issue with the submaster faders, which will make them be anywhere from 3% to 98% all on their own. The reason there shouldn’t be channels there is because the default submaster mapping on the board is the number of the submaster (channel 1 to sub 1, channel 2 to sub 2, etc.).

### 3.6.3 Dimmer to Channel Chart

These diagrams are what channels and dimmers the lights were set to during *The 25th Annual Putnam County Spelling Bee* in November 2019, and *All Together Now* in November 2021. You can also use the same values if you want or make your own. I recommend if you do use your own document it in a way you can understand if you come back to it so your Tech Week is a bit easier. I recommend having at least one visual diagram like Figure 6 (does not have to be 100% accurate) if you plan on making a table that lists what light is pointing to USL, USR, etc.

You’ll notice on Figure 8 on page 12 that there is a blank copy of how the lights are currently hung if you do decide to change the channel numbers. This way, you can photocopy that page and write them on your copy instead of draw an entirely new diagram<sup>8</sup>.

There are other ways of documenting how lights are arranged. In the past, there have been digital plots made using the Lightwright<sup>9</sup> software. These older files can be found at these file locations:

- VCP Data Files > Other Folders > VCP Essentials > Lighting and Sound Information

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<sup>8</sup>If the direction of the lights change, it may be preferable to make a new diagram.

<sup>9</sup><https://lightwright.com>, requires a paid subscription.

Figure 6: Channel Diagram (Visual)

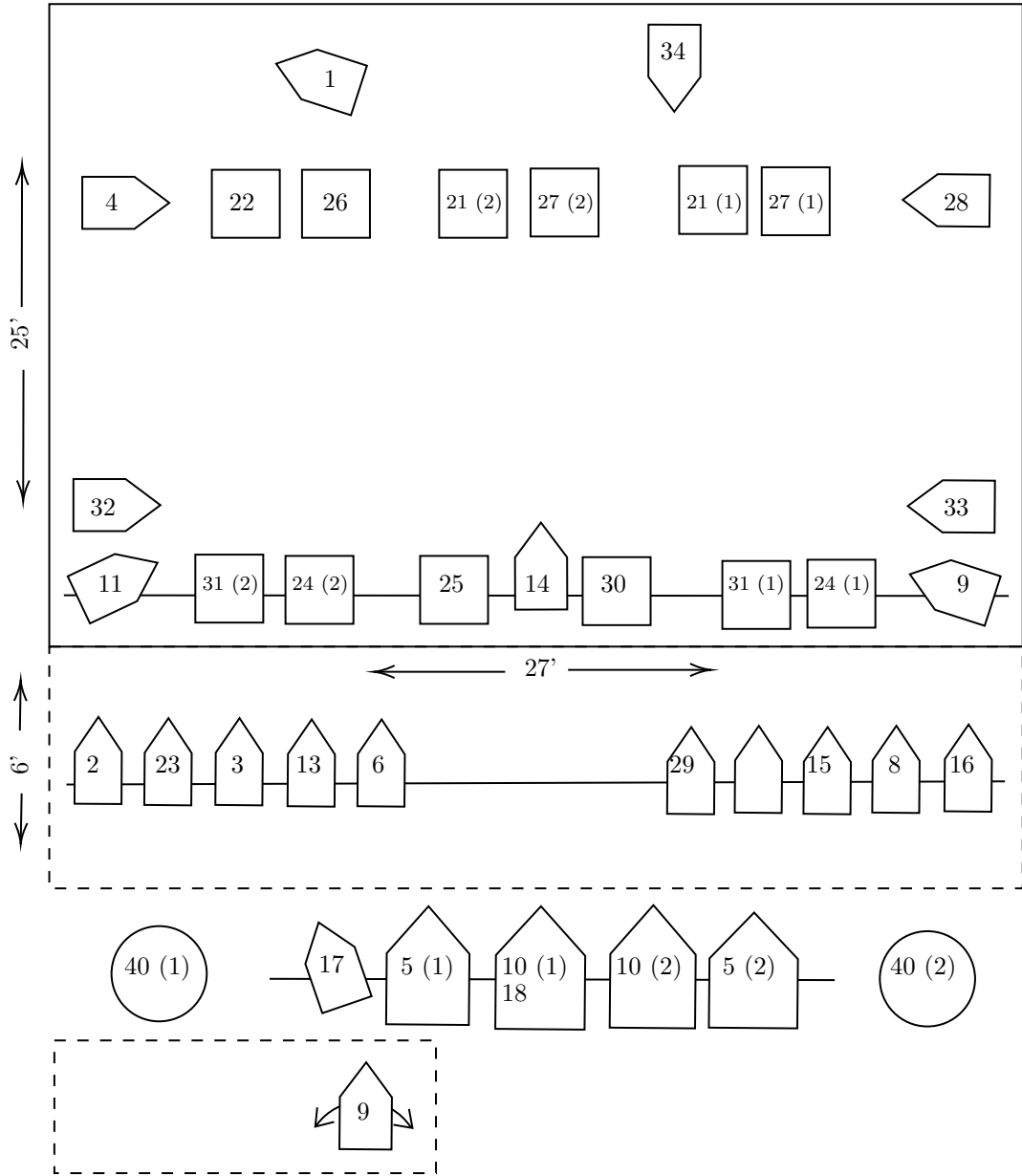


Figure 7: Dimmer Diagram (Visual)

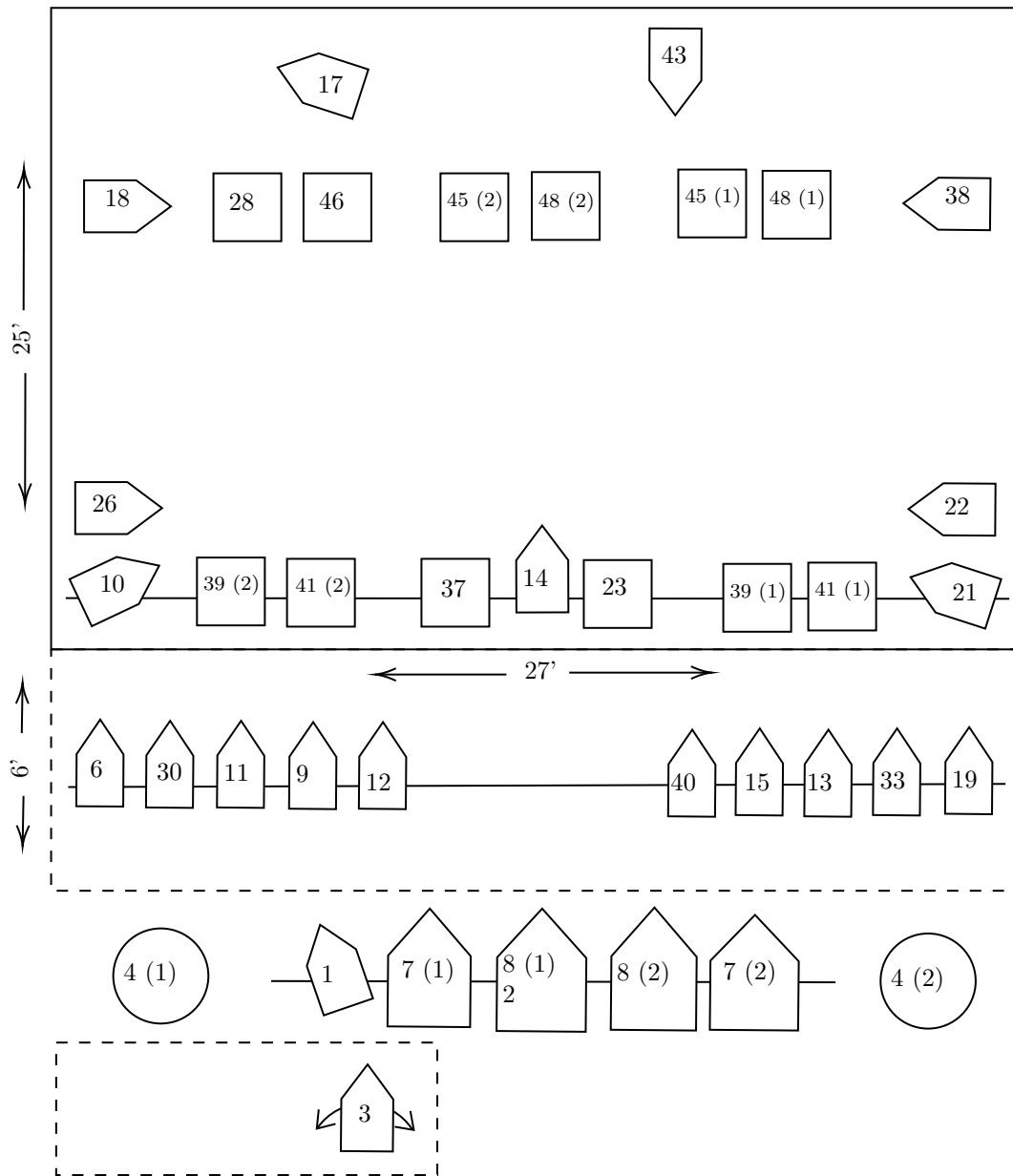
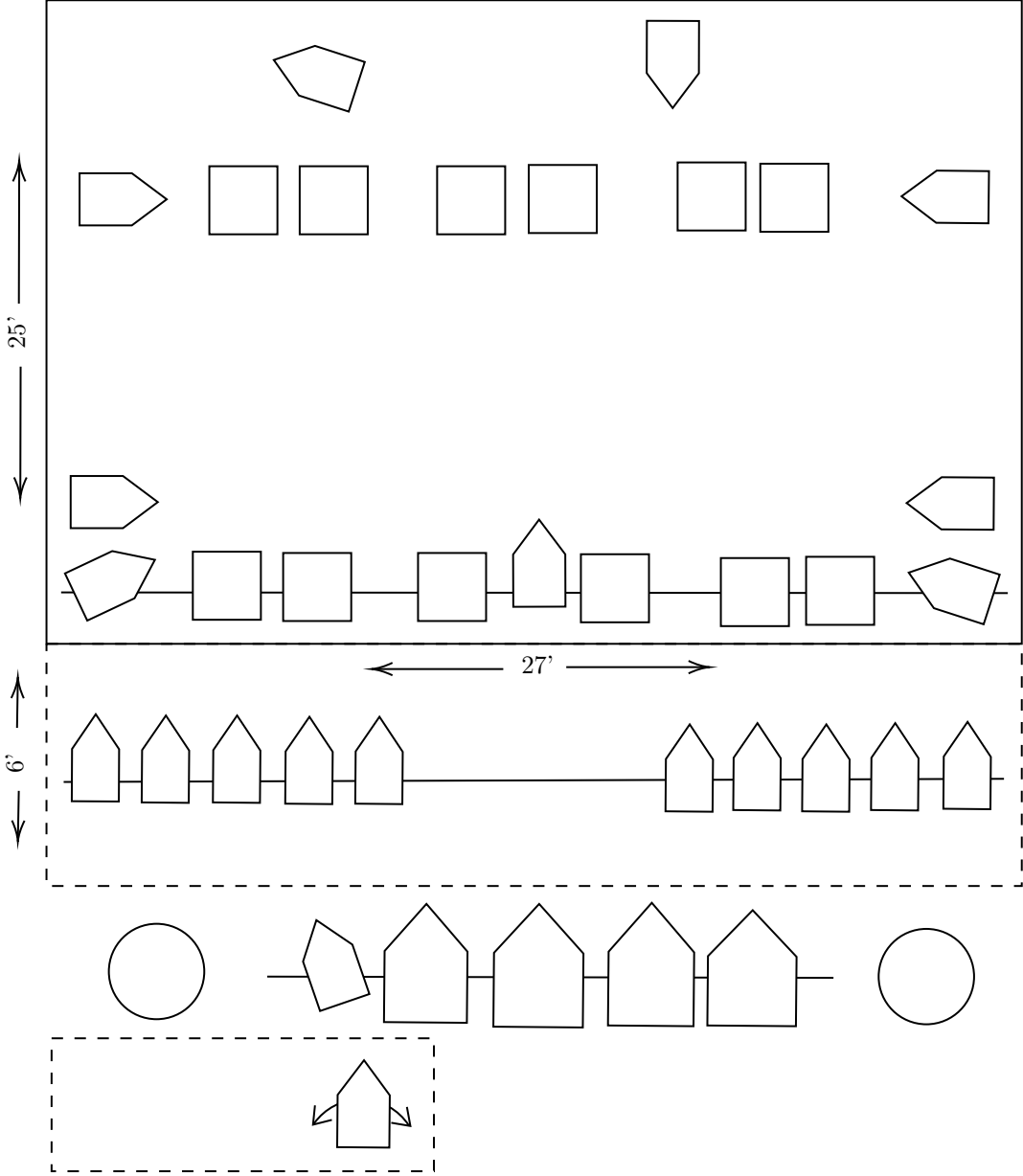




Figure 8: Light Diagram Template



### 3.6.4 Dimmer to Channel Table

This table is what lights (dimmers) are assigned to what channel. This relates to the “Channel Diagram (Visual)” diagram (Figure 6).

You’ll notice that there are 2 column types: Channels and Dimmers. This is because the board sorts the order by dimmer, but if you need to look up what is in a channel, you can use the “Channel” column instead of trying to find the channel number in the “Dimmer” column.

Figure 9: Dimmer to Channel Relationships (sorted by Channel)

1 → 17	14 → 14	27 → 48	40 → 4
2 → 6	15 → 13	28 → 38	41 → 41
3 → 11	16 → 19	29 → 40	42 → 42
4 → 18	17 → 1	30 → 23	43 → 43
5 → 7	18 → 2	31 → 39	44 → 44
6 → 12	19 → 3	32 → 26	45 → 45
7 → 15	20 → 20	33 → 22	46 → 46
8 → 33	21 → 45	34 → 34, 43	47 → 47
9 → 21	22 → 28	35 → 35	48 → 48
10 → 8	23 → 42	36 → 36	... → ...
11 → 10	24 → 41	37 → 37	2000 → 2000
12 → 16	25 → 37	38 → 38	... → nil
13 → 9	26 → 46	39 → 39	2048 → nil

Figure 10: Dimmer to Channel Relationships (sorted by Dimmer)

1 → 17	14 → 14	27 → nil	40 → 29
2 → 18	15 → 7	28 → 22	41 → 24
3 → 19	16 → 12	29 → nil	42 → 23
4 → 40	17 → 1	30 → nil	43 → 34
5 → nil	18 → 4	31 → nil	44 → 44
6 → 2	19 → 16	32 → nil	45 → 21
7 → 5	20 → 20	33 → 8	46 → 26
8 → 10	21 → 9	34 → 34	47 → 47
9 → 13	22 → 33	35 → 35	48 → 27
10 → 11	23 → 30	36 → 36	... → ...
11 → 3	24 → nil	37 → 25	2000 → 2000
12 → 6	25 → nil	38 → 28	... → nil
13 → 15	26 → 32	39 → 31	2048 → nil

You may notice in the diagram above that in Channel Diagram (Visual),

there are lights that share a channel but in Dimmer to Channel Relationships (sorted by Dimmer), it only has one dimmer set to it. That's because those lights share a dimmer in the physical rig where it's plugged in. In an ideal situation, each light would have its own dimmer.

You'll also notice that there are more patched channels than there are lights. A Dimmer can be patched to a Channel regardless if a light is plugged into it. Think of it like turning on a power extension bar while nothing is plugged into it.

### 3.7 Adding/Removing Lights Using the Command Line

For a quicker shorthand for the **{FULL}** and **{OFF}** softkeys, you could type **[starting channel] [THRU] [ending channel] [brightness level]** (without **@**) and **\***. This document will use the longer form.

Notice in the list below that they all follow a similar format: **<Channels> [@] <Intensity>**.

Example list of how you can structure your commands *GeniusPro and Light-palette Operator's Manual* [1]:

1. **[1] [+] [5] [@] {FULL} [\*]** → Sets channels 1 and 5 to 100%
2. **[1] [+] [5] [@] [5] [\*]** → Sets channels 1 and 5 to 50%
3. **[1] [+] [5] [@] [7] [5] [\*]** → Sets channels 1 and 5 to 75%
4. **[1] [THRU] [5] [@] {FULL} [\*]** → Sets channels 1 to 5 to 100%
5. **[1] [THRU] [5] [+] [7] [+] [9] [THRU] [1] [2] [@] {FULL} [\*]** → Sets channels 1 to 5, 7, and 9 to 12 at 100%
6. **[1] [THRU] [5] [-] [3] [@] {OFF} [\*]** → Turns channels 1, 2, 4, and 5 off
7. **[1] [THRU] [On] [12] [3] [@] {FULL} [\*]** → See paragraph below

To only select channels that have a non-zero intensity within a range (let's say 1 to 12), you can use the **[THRU] [ON]** buttons (same **[THRU]** button as before, but now you are adding **[ON]** before the ending channel. **[1] [THRU] [ON] [1] [2] [@] {FULL} [\*]** Let's say channel 2 is at 50%, 4 is at 40% and 7 is at 30%. This means all of those will now be at FULL, but the channels like 1, 3, 5, 6, 8, 9, 10, 11, and 12 will remain off if they were completely off before.

You can also change the intensities of the lights using the scroll wheel before typing the intensity, but I find it's very tiresome because you have to scroll it a lot for it to make a significant difference.

### 3.8 Brightness Levels

This is a list of what you can type in the brightness level area when typing commands.

- **{FULL}**: Sets to 100%.
- **{DOWN%}/ {UP%}**: Increases/decreases by 5% each time.
- Percentages, using 2 numbers on the keypad

## 3.9 Recording Cues

Once you're in the show and ready to record cues, you can now set the lights for each cue in the order of the show. At this point, you should already have an idea of what lights you want where.

When all your lights are ready for a cue, you would follow this command format: **[Record] [Cue] [CUE#] [\*]**, where **[CUE#]** is the cue number on the number pad of the board.

This records a cue with the default fade time of 3 seconds, and no text associated to it.

### 3.9.1 Cue Text

If you want to add text to the cue so that there are descriptors on the monitor (which is recommended), you would use this format: **[Record] [Cue] [CUE#] [Text] [CUE TEXT] [\*]**, where **[CUE TEXT]** is the text you want on the keyboard.

### 3.9.2 Fade Times

If you want a cue to be faster or longer, you would set the fade time when recording the cue. You do this by pressing the **[Time]** button, followed by the number of seconds (for an immediate transition, you would set it to 0.1).

To set the fade time while recording a cue, you would use this format: **[Record] [Cue] [CUE#] [Time] [TIME#] [\*]**, where **[TIME#]** is the number of seconds for your fade time.

### 3.9.3 Decimal Cues

You can also use decimal numbers if you want to put a cue in between 2 preexisting cues. If you prefer to only have whole numbers, see Section 3.9.4 on how to renumber cues. I recommend only doing this after you know you have all your cues so you don't have to run it a second time if you add another decimal cue later.

The way to make decimal cues is to simply type a number with a decimal when typing your **[CUE#]**, such as **[2] [.] [1]**. Your first decimal cue does not have to start at 1, you could have your cues be 2, 2.5, then 2.7 if you want, but they will save in numbered order. If you have multiple decimal digits like 2.10, it will save after 2.9, not between 2.1 and 2.2.

### 3.9.4 Renumbering Existing Cues

I want to start off this section by saying renumbering your cues is completely optional and depends on your preference. If you are using decimal cues intentionally (like having cues 1, 1.1, and 1.2 in scene 1, and 2, 2.1, and 2.2 for scene 2), all that matters is that it works for you.

After your list of cues is complete and you want to renumber your cues, you would want to use the **{RENUM}** softkey. The format to use this on cues is simply **{RENUM} {RENUM}** to renumber all cues from the beginning.

If you want to renumber cues from a certain number, you would do: **[Cue] [Cue#] {FROM} [NewCue#] {RENUM}**, where **[Cue#]** is the cue number you want to start at, and **[NewCue#]** is the number you want that cue to be, and the rest of the cues that follow that one in the file will be renumbered as well *GeniusPro and Lightpalette Operator's Manual* [1, Section 13.10].

By doing this, your cues with decimals would be renumbered in this way:

Figure 11: How **{RENUM}** Would Renumber Cues

0	→	0
1	→	1
1.1	→	2
1.2	→	3
1.5	→	4
2	→	5
2.1	→	6
3	→	7
4	→	8
4.1	→	9
...	→	...

You can still use decimals after cues have been renumbered, but renumbering your cues after that will make those into whole numbers (while still keeping that same order).

### 3.9.5 Going to a Specific Cue

If you need to go to a specific cue immediately, you can use the **[Goto]** button. You would follow this format: **[Goto] [Cue] [CUE#] [\*]**. This is also you would go to the beginning of the show; by typing **[Goto] [Cue] [0] [\*]**.

### 3.9.6 Unchanged Lights from a Previous Cue (And Why It Causes Issues)

This section can be better explained by starting with an example. Say you are making the cues for a show, and you have channels 2, 3, 4, and 5 all at **{FULL}** for cue 3. When you change the lights for cue 4 and you want to turn add channel 6, the clear answer is to do **[6] [@] {FULL} [\*]**, which does work. You save your cue 4, and everything is fine.

Now let's say you're in a show or rehearsal, and you need to start at cue 4. After you type in **[Goto] [Cue] [4] [\*]**, only channel 6 will be on. Why?

Because that's technically the only thing in that cue, and everything else is from prior cues. We don't even know channels 2, 3, 4, and 5 will be on in cue 3 if we typed **[Goto] [Cue] [3] [\*]**, because those channels could have been turned on at a prior point.

What am I trying to say? When you are recording cues, don't just change a single light, type all the commands again even if the light is what it should be at already. This way, if you go to a specific cue, all the correct lights are there. This is also part of the reason why I say to include all the lights that should be on for each cue in the table you give to your Lighting Operator in section 6.4.

### 3.10 Deleting a Cue

When you want to delete a cue in between, you can simply type while on the LIVE screen:

1. REPORT
2. EXIT (2nd softkey on the screen on the right)
3. SAVE SHOW (last softkey on the screen on the right)
4. SAVE SHOW again to confirm

After you confirm, the board will take a minute to save. When it does this, it will say "MEMORY LOCKED" in the top right corner of the monitor. Do not make any changes until it is done saving.

### 3.11 Submasters and Supermasters

#### 3.11.1 What is a Submaster?

A submaster is a switch on the lighting board that can turn on one or multiple lights at the same time. This can be done at any point during a show, even while cues are running. This is useful if you have lights for a cue that happens at an unexpected moment where multiple cues may pass in between. For example, if someone randomly pops up onstage multiple times and you need to turn the light on quicker than you can type the command into the board, you can use a submaster.

You'll notice that each submaster also has its own button below it with its number on it. When you press it, it immediately turns on that submaster at 100%, and stays on until you let go of the button. This is called "Flashing a Submaster".

#### 3.11.2 Submaster Mapping

There are 2 ways of finding out what is inside a submaster:

1. Having everything off and that submaster at 100%
2. Using the "SUBMASTER" menu.

This guide only talks about having everything off and that submaster being at 100%. When you do this, you will see on the LIVE screen that as you turn on the submaster, some percentages will be yellow. That means that light is being controlled by a submaster and not by the command line or a cue.

To see what the Submaster Mapping for a template show is, see section 3.4.2.

### 3.11.3 How to Add/Remove a Submaster

Adding a submaster is very similar to saving a cue. Like cues, submasters are tied to a specific show. This makes sense because submasters use channel numbers, and channel numbers can change on a show-by-show basis.

**Add a Submaster** : To add a submaster, you would first have to have all the lights you want in it on when the submaster is at 100% (not using **{FULL}** because that applies to channels only, not submasters). For example, if you want channels 1, 2, and 3 at **{FULL}**, and 4 at 75%, you would have it at those percentages when you are saving the submaster.

After you have the lights you want on at the correct percentages, you would follow this command format: **[Record] [Sub] [SUB#] [\*]**, where “SUB#” is the submaster number on the number pad. If you are recording to a supermaster channel that also contains a screen below, you can set a display text by doing this format instead: **[Record] [Sub] [SUB#] [TEXT] [Keyboard-input] [\*]**, where “Keyboard-input” is the text you want displayed on the screen (above softkeys 1-6).

**Warning** Please do not use submasters 41 and 43 because they will go anywhere from 3% to 98% on their own.

**Removing a Submaster** : To remove a submaster, you would follow these steps.

1. Make sure you are on the “SUBMASTER” menu (by pressing the “Sub” button).
2. Press **{CLEAR} [SUB#]** where **[SUB#]** is the submaster you want to clear. **{CLEAR}** is on softkey #7.
3. Press **[\*]** **twice** to confirm your choice to delete this submaster.

### 3.11.4 What is a Supermaster?

A supermaster is like a submaster but has more functionality. The main difference is that the supermaster switches have LCD screens below them that can display text about what each one is for.

The supermaster switches on this lighting board are switches 49 to 54.

### 3.12 Saving the Show

To save a show, you would do these steps, assuming you are on the Live screen:

1. Press **[REPORT]** to get to the Report screen.
2. Press **{SAVE SHOW} twice** (softkey #12)
3. Wait for the board to save the show. When it shows you the Report screen after it goes blank, it is saved.

### 3.13 Turning Off The Board

To turn off the board, you would follow these instructions after you save your show:

1. Set the master faders that in the top right corner of the board to 0%.
2. **[REPORT]** → Goes to the Report screen.
3. **{EXIT}** (softkey # 8)
4. Press **{SHUT DOWN} twice** (softkey # 8)
5. Wait for the board to shut down (takes about 30 seconds)
6. When the monitor says it has shut down successfully, you can hold the power button down until the board turns off.
7. Turn the monitor off after the board has turned off.

## 4 The Lighting Rig

### 4.1 What is the Lighting Rig?

The Lighting Rig refers to the entire lighting system, including the light fixtures, the rails they are mounted on, the dimmer outlets, dimmer electrical system, etc.

### 4.2 Types of Lights

There are multiple types of lights, such as Fresnels, Lekos, Followspots, etc.

The Lighting Rig rig contains mostly Source Four lights, with some Fresnels.

The lights on dimmers 23, 28, 37, 39, 41, 45, 46, and 48 are what's known as "Source Four Fresnels", which are a sort of in-between of the two types. Instead of movable shutters like a Source-Four, it has 4 "doors"—called "barndoors"—, one on each side to prevent over-flooding of light.

Below is a list of how many types of lights the Lighting Rig currently has, along with the type of bulb that each one requires.



Figure 12: Quantity of the Types of Lights

Ref	Qty	Bulb	Light Type
1	17	HPL <sup>1</sup>	ETC Source Four Jr Zoom 25° /50°
2	1	HPL	ETC Source Four
3	6	T4	Colortran Mini Ellipse <sup>2</sup>
4	12	HPL	6" Fresnel
5	1	G9	Strand LEKO Zoom Ellipsoidal 25° /50°

<sup>1</sup> HPL bulbs are labelled as “Halogen Lamp” on the box

<sup>2</sup> Catalog number 213-155 in the Colortran catalog.

This figure is a list of types of lights by dimmer number, so you can check what type a light is if a certain dimmer goes out.<sup>10</sup> For which light each dimmer has, see ?? and look for the corresponding reference number.

Figure 13: Which Dimmer Has Which Type of Light

Dim.	Type	Dim.	Type	Dim.	Type	Dim.	Type
1	1	12	1	23	4	40	1
3	1	13	1	26	3	41 (1)	4
6	1	14	2	28	4	41 (2)	4
7 (1)	1	15	5	30	1	43	3
7 (2)	1	17	1	33	3	45 (1)	4
8 (1)	1	18	3	37	4	45 (2)	4
8 (2)	1	19	1	38	3	46	4
9	1	21	1	39 (1)	4	48 (1)	4
10	1	22	3	39 (2)	4	48 (2)	4
11	1						

### 4.3 Light Fixture Safety

**Only trained Producers or Work-Studies should be physically handling the Lighting Rig, and never alone!**

If you need to physically change something on the lighting rig, such as changing a gel, looking at what dimmer a light is connected to, or repositioning a light, you need to do so safely.

That includes:

1. Having at least 2 people present, where one person is on the ladder while the other is holding it down securely
2. Making sure the space is well-lit using the fluorescent lights

<sup>10</sup>See Figure 7 for the Dimmer locations.

3. Wearing gloves while handling lights or any equipment related to it (outlets, light bulbs, etc.)

## 5 Gels

### 5.1 What is a Gel?

A gel is a coloured piece of plastic sheet that changes the light that is shone through it. It is mounted directly in front of the light you want to put it on to have a colour effect.

### 5.2 Picking the Right Gel and Colour Theory

Picking what gels to use is not in my area of expertise, though there are a lot of resources online (mainly in print) that can help you understand Colour Theory in theatre lighting.

For example, if the red level in a gel (of RGB) is high (even if it doesn't look red), it might not be beneficial if one of the actors' costumes is very red, because they will stand out the most compared to other actors and their costumes. In this case, the Lighting Designer might want to coordinate with the Costume Designer when deciding on what gels to use.

What is mentioned above is important if you have a scene with only that colour gel (even on multiple lights), and if you are using LED lights where you program the colours instead of using gels<sup>11</sup>. In short, keep these ideas in mind but there's still a lot of room to experiment and explore different types of gels without worrying about Colour Theory.

### 5.3 Gel Sizes Per Light

When you are picking a gel from VCP's inventory, check that it's the right size to fit on the light you want to put it on.

Here is a table of the sizes a gel needs to be to fit in each type of light.

Figure 14: Gel Size Requirements per Light Type

(in)	(cm)	Light Type
6.25	15.875	ETC Source Four Jr Zoom
6.75	17.145	ETC Source Four
7.50	19.050	Strand Leko Ellipsoidal
2.00	5.080	Colortran Mini Ellipse

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<sup>11</sup>Which VCP does not have.

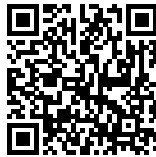
## 5.4 Gel Inventory

In the Green Room (Room 274), there is a filing cabinet to the right side when you enter the room. The top drawer contains all the “Warm Gels”, and the bottom drawer contains all the “Cold Gels”.

Note that there is also a bin labelled “Gel Dropbox” that contains gels that have to be put back into their folders.

For a complete inventory of VCP’s gels, please see the “VCP Gel Inventory” list that is in the Green room, or at this URL: <https://husseinesmail.xyz/guides/all/VCP-Gel-Inventory.pdf>

Figure 15: VCP Gel Inventory URL



## Part III

# Lighting Roles

## 6 The Lighting Designer Role

### 6.1 Why is it Important?

Lighting has a big effect on the mood of a show. It can also show changes in a show, like day/evening/night, reality/flashback/dreamworld/etc, happy/sad/calm/etc. The Lighting Designer is also the main reason the entire show doesn’t just have regular fluorescent lights on during the entire show run.

In short, **the Lighting Designer can add as much mood as any actor onstage can.**

### 6.2 Ways of Documenting Your Work

There are computer softwares out there that can help you document how you position your lights, like the “Lightwright<sup>12</sup>” software, or pencil and paper might be the way you decide to go. This section is nothing but a suggestion of what you can do. If you have your own way of documenting your lighting notes, by all means do that.

Like most things in the world, your process can always be changing if you find a better way to document your work, or to make it easier for others to read.

<sup>12</sup><https://lightwright.com>, requires a paid subscription

There are standards out there for how to make “Lighting Plots” (what I refer to as the Visual Diagrams<sup>13</sup>), and cue lists, but I haven’t been formally taught all that. If you prefer to look into official methods, there are more published books than internet articles that can help you at local libraries.

Keep in mind that your notes may need to be referenced if something goes wrong during or between performances, so it’s good to keep them neat and comprehensive. Normally, if the Lighting Designer isn’t the Lighting Operator as well, they are not present during performances<sup>14</sup>.

### 6.3 How I Make Lighting Charts

This section is mainly to show that even the way I document lights has changed over the years I have been doing lighting for theatre. This section can also serve as a template if you don’t already have your own format of documenting your work.

If at any point you are curious about what my previous notes looked like, please feel free to reach out<sup>15</sup> even if it’s years later and I’m not at VCP anymore.

**2015-2019** : During these years, I was in high school at the time and had done little research on how other documented lighting notes. I might help to know that these notes were a bit inefficient to read<sup>16</sup>, and worked with about 15 lights in total.

My notes during this time was mainly a Word document where each cue had 5 parameters. They were grouped as a list, which also wasted a bit of paper and meant I had less cues per page.

1. “LX”: The cue number
2. “PAGE”: What page in the script the cue was on
3. “SUB”: What submaster to turn on and at what percentage (because on the lighting board there I had to use submasters because there was no alternative)
4. “LIGHTS”: What lights were on and at what percentages. This didn’t matter as much since I was using submasters and not cues.
5. “NOTES”: Self-explanatory

**2019-2020** : At this time, it was very similar to what I did in high school, considering I was just a Lighting Designer at this time.

**2020-2022** : The main show I’ve designed lighting for during this period was *All Together Now* in November 2021. The majority of these notes were in the form of a table, with 3 columns:

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<sup>13</sup>See Figures 6 and 7

<sup>14</sup>Unless you want to watch the show :)

<sup>15</sup>[HusseinEsmailContact@gmail.com](mailto:HusseinEsmailContact@gmail.com)

<sup>16</sup>though I didn’t know it at the time

1. Cue number: Same as “LX” from previous notes
2. Song name: Because in this show, there was only one cue per song
3. Lights: All the lights that were in this cue needed to recreate it immediately

The notes for this show also included

- A table of contents since this had more tables than notes for previous shows
- a list of lights sorted by what colour gel it has while also listing where onstage it points, so that if the director wants all blue lights on so you know which to turn on,
- A list of descriptions about where each light points and what colour it has, sorted by channel number
- A list of channels that make up the “**GW**”, or “General White Wash”.

#### 6.4 The Lighting Designer’s Notes for the Lighting Operator

When you are making notes for the Lighting Operator, they don’t need to know each note you have, just what could help them in case a cue goes wrong. Here’s what I recommend putting in your notes for the Lighting Operator to reference (preferably in a single document and stapled together if it is multiple pages):

- A description of what the document is in case someone else comes by it. Indicate that it’s for the Lighting Operator of whatever show you’re doing so it doesn’t get discarded during Tech Week if someone tries to clean up the booth in preparation for the show.
- A list of lights grouped by the gel colour they all share. If you have 12 lights that all have gels, group them together in a table sorted by what colour gel they have along with their stage location (USR, DSC, etc.). This is a variation of what’s known as a “Circuit Table”, where you have a table of each light sorted by the channel number which also has what gel it has, focus notes, and the type of light (Reid [3]). You can have this as well if you prefer.
- A Visual Channel Diagram of the lighting rig, similar to Figure 6 so that if a light is on when it shouldn’t be or vice versa, they can quickly look up the channel number.
- A list of lights (and percentages if they are not all 100%) that are part of your “General Wash”. A general wash is when lights without gels light up the entire stage. This could also be mapped to a submaster, but still include the set of lights on your document if you do set it to a submaster.
- A table of all the cues in your show file, these columns:
  - The cue number as they appear on the lighting board show file, so that they can go to that cue directly by typing **[Goto] [Cue] [#] [\*]**

- The page and line number in the script each cue refers to, so that the Operator knows if they should be ready to do 2 cues in a row quickly.
  - Short description of the cue, so that the Operator can follow along with the show by also looking at this table
  - Lights in this cue. This includes all lights and all percentages. This is so that the Operator can verify while the cue is on that all lights that should be on are on and that no extra lights are on.
  - Fade Time in seconds. This is so that the Operator knows how early or late to press the cue button.
- Finally, a copy of the script with lines pointing to specific points for when to run a certain cue. When I mean specific, ideally it would be the Operator waiting for an actor to say a sentence, and the Operator would press the “GO” button between 2 specific words of that sentence.

## 7 The Lighting Operator Role

### 7.1 Why is it Important?

The Lighting Operator is as important as any stagehand, possibly more. The Lighting Operator executes the Lighting Designer’s designs for the performance in question. You have the designs in one hand and the actors’ work and the set in the other, and it’s your job to put them together to make something amazing, each performance.

### 7.2 What You Need to Know About the Lighting Board

The Lighting Operator doesn’t need to know as much about the lighting board as a Work-Study or Lighting Designer, since you are only operating a few buttons during a show’s run. When turning on/off the board for you to operate, a Work-Study is expected to do this for you and set everything up for you.

#### 7.2.1 Required Knowledge

The Lighting Operator does need to know about these buttons/switches:

- **[GO]** → This button goes to the next cue. When following your prompt book/script and you see the next cue, you would press this button. Keep in mind what the transition times are of each cue so you can plan accordingly when to actually press the **[GO]** button. This button has a small green light coming from it in the center of the board so it’s easy to find.
- **[Back]** → This button is directly above the **[GO]** button, and is labelled “Stop Back”. If this is pressed while a cue is transitioning, it stops the transition right there without completing the cue. If it is pressed when nothing is happening, it goes back a cue. This button can be used if you pressed **[GO]** one too many times.

- Master Levels → These are the 2 switches in the top-right corner of the board near the power button. If you're unsure about changing their levels, they should always be at 100% so the lights can turn on. There is a use for turning them down if you need to change levels and doing it via cues isn't helpful<sup>17</sup>.
- Reading the Lighting Designer's notes → Please read sections 6.2 and 6.4 (section 6.3 is optional). With the notes from the Lighting Designer, you can verify that the cues' percentages of lights are what they should be compared to the notes. If they are different, you should follow what is written by the notes and try to change the cue discreetly during a show (if possible). If you find any mistakes in the show file, please note the cue and ask a Work-Study to fix it before the next performance.
- Changing percentages → Please read section 3.7. This is useful to know in case you do need to change a light during a performance as mentioned in the previous point.

### 7.2.2 Optional/Extra Knowledge

The following concepts are optional for the Lighting Operator to know:

- Turning on the board → Please read section 3.3.
- Loading and saving shows → Please read sections 3.4.1 and 3.12.
- The rest of this document<sup>18</sup>.

### 7.3 What You Need to Know During a Show

When a performance is running, there is a certain way you should be told how to run cues. What would be said out loud by the Stage Manager is something similar to "LX 25 [*pause*] Go", where you are pressing [**GO**] for Lx 25. The reason there is a pause is so that you are also ready after being told which cue is about to happen (Reid [3, Section 10]).

## Part IV

# Conclusion

## 8 Contributing Members

A big part of this guide was written from my own research online and my own inventory taking, though there are parts that have been put into this guide from those previously at Vanier College Productions.

<sup>17</sup>Though turning down all light values from the previous cue via cues are more streamlined for the Lighting Operator during a show.

<sup>18</sup>"Knowledge is power." –Albert Einstein

Shania Mendes - The Robert & Nancy Accinelli Production Manager

- Helped take inventory of all the gels VCP has as of November 2, 2021.

## 9 Indirect Contributing Members

This section is a list of previous VCP members that have written content about the lighting board or the system as a whole that I've put in this guide.

- Madison Madhu - Technical Director during the 2014-2015 season, author of the "Lighting Board Operator's Manual: A Condensed Guide to Using and Operating the Strand 500 Series Console".
- Adam Bromley - Lighting Assistant for "Jekyll & Hyde The Musical" in March 2015, author of "Working Dimmer Chart" written September 23, 2015.
- Davida Tkach, author of the "Fred Thury Theatre House LX Plot" documents using Lightwright<sup>19</sup>, written October 28, 2010.

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<sup>19</sup><https://lightwright.com>, requires a paid subscription.



## 10 References

- [1] *GeniusPro and Lightpalette Operator's Manual. 2.6.* Available at [https://www.theatre crafts.com/archive/documents/300and500console\\_manual.pdf](https://www.theatre crafts.com/archive/documents/300and500console_manual.pdf). Strand Lighting Ltd. 2430 Lucknow Drive No 15, Mississauga Ontario L5S 1V3 Canada.
- [2] Rob Halliday. *2.6 Software Programming Information.* Available at [https://www.theatre crafts.com/archive/documents/2\\_6\\_shape\\_control.pdf](https://www.theatre crafts.com/archive/documents/2_6_shape_control.pdf). Strand Lighting Ltd. 2430 Lucknow Drive No 15, Mississauga Ontario L5S 1V3 Canada.
- [3] Francis Reid. *The Stage Lighting Handbook.* New York: Routledge, 2001. ISBN: 9780878301478.