Programming

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How to hack the mainframe *of lighting.*

What is programming (in lighting)?

- Programming is both organizing the lights and creating the cues for the show.
  - Cue: Basically, a look on stage. It's kind of a save file where it remembers what lights were on and how bright
- Organizing lights: Setting up channels and grouping them in a logical way.
  - Channel: The number that a light is assigned to.
- Cues for the show: A cue for every look onstage is made and then during the show, we go through them one by one.

Organizing lights

Channels and Patching:

A light is plugged into a numbered dimmer arbitrarily. To organize them we "patch" them into channel numbers. If our red lights are plugged into 6, 28, 302, it's easier to program if they're numbered 1-3. So we patch 6 into 1, 28 into 2, and 302 into 3. Now to turn on those lights, we can select 1 -3 to turn on rather than typing in those random numbers.

Chan	Address	Type
1	6	Dimmer
2	28	Dimmer
3	302	Dimmer
4		
5		

Channels (Cont)

How a show is channeled is 100% the designers choice.

Typically, lights are grouped together by systems and numbered by 10s.

so 1-8 are all the front blues, 11-18 are the front reds, 21-34 are the back ambers, 41-45 are pink tops and 51-57 are specials*.

*A special is a light that serves one purpose. For example, one that hits just one set piece.

Organizing lights

Groups and systems:

    System: Lights that have the same purpose. A system of red light, a system on front lights, a system of moving lights.

    Groups: A way to quickly select many lights, typically organized by systems.

Cues

When running a show, it's simply going from premade cue to premade cue. Before a show opens, a designer makes all the cues, deciding what a scene will look like.

List 1															
		Timing													
Cue	🔓	Int Up	Int Down	Focus	Color	Beam	Dur	M B A P A M F V	Fw/Hg	Link	Loop	Curve	Rate	Label	FX	Ext Links
1		5					5									
2		5					5									
3		5					5									

A breakdown

The Easy guide to programming lights:

1. Turn the lights you want on.
2. Record them into a cue.
3. Do for the whole show.
4. There is no step 4.

That's it actually all it is. However, knowing how to do it fast and organized is what makes a good programmer.

Some technical stuff

The Pudu is the world's smallest deer.

Syntax: This is how the board speaks and understands. It's the order of buttons you press to make things happen.

Different Syntax to turn Channel 1 to 60%:

1 at 60 enter.

60 at 1 enter.

Every board has different Syntax. Learning it is a key part of programming

Light Boards

A light board is basically a specialized computer that tells lights what to do. There's hundreds of kinds and they're all unique and for different purposes.

ETC Smartfade

ETC Ion

Leprecon 612

MA Lighting Grand MA 1

MA Lighting Grand MA 2

THE ION!

Our board and the industry standard.

Very easy syntax

Can do very simple to very complex shows

Great for theatre, not so great for live performance that are programmed on the fly.

Everything this presentation presents will be skewed towards an ION bias. It is what this author is most familiar with and feels works best with new lighting designers in the making. This means I'll generally be explaining things using ION syntax and will be teaching the basics of the ION board (though many skills can easily transfer).
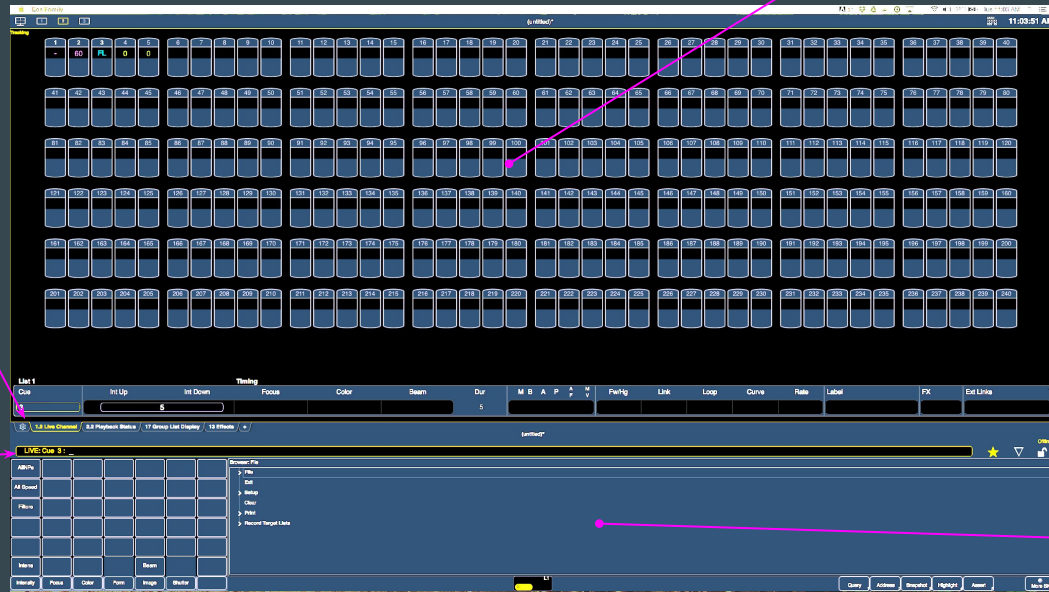
ION Specific stuff:

Current Tab: Shows whatever tab you're in. This one is showing the channels.

Tabs:
Different tabs do different things like show you a list of cues, the groups you've made, channels, etc.

Command line:
Where you can see the buttons you've pressed

CIA:
Menus and things pop up here. Can be minimized.

Look at the guides!

So You each have a guide to the ION with syntax and junk like that. Quietly Read through this now.

If you have any questions, please feel free to ask.

Let's talk about intelligent lights

Intelligent light: A light that does more than turn off and on.

Intelligent lights need both power AND data. Power to move the motors, turn on the LEDs or whatever. Data for where the light should be pointing or how bright the green LED should be.

Intelligent lighting (cont.)

Any one thing an intelligent light does needs an address. A normal light only get one address (or dimmer) which just tells it how bright to be on.

But if a light pans, tilts, turns on, has a strobe, has different colors, etc. Each of those is an address. Moving lights typically have 30-40 addresses.

Data

Data is generally transmitted through DMX cable.

DMX can carry 512 addresses of data also known as one "universe."
Big shows with many moving lights,LEDs, etc will have several
universes.

Light boards will have DMX outputs on the back of them.

So when you set up an intelligent light, typically, you plug in both
a power cable* and a DMX cable.

*Intelligent lights don't get plugged into a dimmer. They
get "live power" that's always on, like a normal outlet.
Plugging an intelligent light into a dimmer can seriously
damage them.

Lighting Network

Sometimes running huge runs of DMX cable is very inconvenient, or maybe a board can control many, many universes, but only has 2 outputs on the back.

In comes a lighting network. Boards will have an ethernet port on the back of them that can be run into routers, network switches and special things called gateways.

These have many DMX ports on them as well as an ethernet port. You can have many of these, so you can have many Universes all over the theatre with just one light board.