Setup

Obviously, the lighting board has a computer built into it. However, the computer is much more than a tool used by the board at certain times. The lighting board is completely digital. Everything that happens in the board is processed by the computer, even if you run it manually.

The board decides what the level of each light should be and sends this information to the 8-packs. The 8-packs process the levels as inputs, and send the according amount of electricity to each circuit. There are three different modes of output that the board can send: AMX, DMX, and MCX. Each is a different type of way to communicate to 8-packs. The 8-packs we use must receive an MCX input. Thus, the mode that board is in should always be set to MCX.

Changing the Output Mode

To change the output mode, press the “Main Menu” button, then “Setup” (the F4 button). Then, press “More” (F4). The first position in the display should show the output (“Out”) mode that you are in. To change it, press the “Out” (F1) button until the desired mode is displayed. In order for the lights to do what you want them to do, the correct setting is MCX.

Although electricity is continuously being sent to the lights by the 8-packs, the lighting board only sends changes in levels to the packs. The 8-packs keep each light on its level until the board tells it to change. Thus, if you turn the board off while the packs are still sending electricity to the lights, the lights will stay on. So, if you wish to use the board without changing the light that is on stage (say you want to program it), you can
change the output mode of the board to DMX. The packs then do not receive anything they can understand, and therefore do not change the levels of the lights. You can then freely use the board without affecting the lighting on stage. To be able to affect the lights on stage again, just set the output mode back to MCX. *Remember that the board will send the current lighting to the packs when you change modes, so you must change the board’s settings back to what they were before switching back to MCX.*

All other settings are set automatically by the board when you reset it. *Do not change any of the settings in the “Main Menu” → “Setup” menu other than the output mode and bottom board mode* (discussed in the next section). If you do, you can turn everything to the correct settings by resetting the board. However, everything that was programmed into the board will be erased.

I recommend that the board is reset for each show before the techs start. That way, there is nothing left over from previous shows, and you will not accidentally use those cues.

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**Resetting the Board**

To reset the board, turn the power off. Simultaneously hold down the F1, F2, “Help”, and “Change” buttons. While continuing to hold them, turn the board back on. Continue to hold the four buttons until a message is displayed saying that the board has been reset.
**Manual Operation**

The left portion of the lighting board consists of two boards, each of which have 32 dimmers. Each dimmer controls a light or set of lights that are wired together. It can be set to a level from 0 (off) to 10 (full). The top set of dimmers is the A-board. The bottom set of dimmers can be set to three different modes: **Subs**, **B**, and **33-64**. The subs mode will be covered later. When the bottom board is set to 33-64, it becomes a continuation of the A-board. This setting is never used (there are not enough 8-packs to use it, and it is impractical for our purposes, anyway). When the bottom board is set to B, it is the B-board.

### Changing the Mode of the Bottom Board

To change the mode of the bottom board, press the “Main Menu” button, then “Setup” (F4). Then, press the F1 button until the desired setting (Subs, B, or 33-64) is shown on the screen. Press the “Main Menu” button to exit the on-screen menu when you are finished.

Each dimmer on the B-board is hooked up to the same lights as those on the A-board. For example, dimmer 5 on the B-board is hooked up to the same lights that dimmer 5 on the A-board is. However, the level of the entire A-board is controlled by a different crossfader than that of the B-board. The crossfader for the A-board is located toward the middle of the lighting board. It is labeled “A” and is marked with levels numbered 0 through 10, with 0 on the bottom and 10 on the top. The B crossfader is located directly to the right of the A crossfader, and is labeled “B.” It is marked with levels numbered 0 through 10, with 0 on the top and 10 on the bottom. (Note that the
right side of the B crossfader is labeled “subs/33-64” and is marked with levels 0 through 10, with 0 on the bottom and 10 on the top. This is used with the other two modes of the bottom board, subs and 33-64.)

Suppose you have some cue set up on the A-board, and want to cross-fade into another cue. You can set up the next cue on the B-board. Then, when you want to cross-fade, slide both the A crossfader and B crossfader at the same time toward the bottom. Because the crossfaders are oriented in different directions, this brings down the A-board and up the B-board. To cross-fade to the next cue, set up the cue on the A-board. You can then cross-fade by simultaneously fading the A and B crossfaders toward the top. Generally, whenever the current cue is on the A-board, both masters are at the top, making the A-board’s level 10 and the B-board’s level 0. Whenever the current cue is on the B-board, both masters are at the bottom, making the B-board’s level 10 and the A-board’s level 0.

The **grand master** controls the level of everything. It is the dimmer in the bottom-right hand corner of the lighting board, and is labeled “GM.” It can be set to a level from 0 (black) to 10 (full). If you want light to appear on stage, make sure the grand master is at 10.

The **blackout button** is located underneath the grand master. If you press the blackout button, the grand master’s level becomes 0, thus creating a blackout. By pressing the blackout button again, the level of the grand master is set back to the level on the grand master dimmer.
Bumping

The buttons underneath the 32 dimmers in the A-board and the 32 dimmers in the bottom board are called bump buttons. When you press a bump button, the level of the button’s corresponding dimmer is bumped up to the value set by the “Bump” dimmer, located in the bottom right-hand corner of the lighting board, next to the grand master. For example, suppose the bump dimmer is set to 7. By pressing the bump button underneath dimmer 18 on the A-board, 18 is instantly brought up to 7. If 18 was previously at a value higher than 7, there is no change.

The bump buttons in the A-board control dimmers 1 through 32. They can be set to one of three modes: normal, toggle, and solo. If they are set to normal, holding down a bump button bumps up the dimmer. Releasing the button returns the dimmer to the level set by the dimmer. As many buttons as you can hold down can be bumped at a time. If they are set to toggle, tapping a button bumps up its dimmer. The dimmer then stays bumped until you tap the bump button again. If they are set to solo, the levels of all the dimmers except the one you bump are set to 0. The bumped dimmer’s level is set to the level on the bump dimmer. You must hold down the button to keep the effect. Once the button is released, all dimmers are set back, and the bumped dimmer is unbumped.

Changing the Mode of the A-Board Bump Buttons

To change the mode of the bump buttons on the A-board, press the button located on the right side of the lighting board labeled “MODE.” By repeatedly pressing the “MODE” button, you cycle through the three bump modes. Each mode is indicated by one of the LED’s over the button. If no LED is lit, you are in the normal mode. If TOG is lit, you are in the toggle mode. If SOLO is lit, you are in the solo mode.
The bump buttons in the bottom board control submasters 1-32 on the current page. Bumping on the bottom board will be covered later with submasters.
Snapshots

A snapshot takes a picture of the A-board and sends it to the output. When you take a snapshot, whatever is on the A-board at that time is stored in memory and sent to the output. The memory stores the levels on the A-board only. It does not store the level on the A crossfader. Thus, the A crossfader can be set to 0 when a snapshot is taken, and the snapshot will output its levels as if the crossfader were at 10.

For example, suppose there is a cue set on the A-board. When you take a snapshot, this cue is stored in the snapshot’s memory and sent to the output. The A-board can then be changed in any way, and the snapshot levels will still be sent to the output. The grand master does control the snapshot’s level. If you take a snapshot of a subsequent cue, the previous cue is cleared from the snapshot’s memory, and this cue is stored.

When you take a snapshot, the cues do not have to change suddenly; they can be cross-faded. When you cross-fade a snapshot, first the A-board is stored into memory. Then, the previous snapshot cue fades out while the new one fades in. If you want, you can change the A-board while the fade is happening. Of course, if the A crossfader is above 0 (and therefore the A-board is being sent to the output), this change will be seen on stage.

Taking Snapshots

To take a snapshot, set up the cue you would like to take a snapshot of on the A-board. It does not matter what the level of the A crossfader is. Set the desired cross-fade speed of the snapshot by turning the input knob. When you want to take the snapshot,
press the Snapshot “GO” button, located on the top of the lighting board, just to the right of the A-board.

**Clearing Snapshots**

To remove the current snapshot from memory, set the speed at which you want the current snapshot to fade out by turning the input knob. When you want to clear the snapshot, press the Snapshot “CLEAR” button, located just under the Snapshot “GO” button at the top of the lighting board, just to the right of the A-board.
Submasters

Submasters store cues, or combinations of lights. Each submaster holds one cue. Submasters are stored into pages. There are 16 pages, each of which can contain 32 submasters.

Changing the Current Page

To change the current page, first make sure that you are out in the main menu (if you aren’t, press the “Main Menu” button). The display should read “Stack   Step   Fade Page   Setup.” While holding down the F3 button, rotate the input knob until the desired page number is shown. Then release the F3 button. Also, you can go consecutively forward through pages by repeatedly pressing the F3 button. This is useful if the page you want is close to the current page.

To make a submaster store a cue, you must record the cue into the submaster. When you record a submaster, it will store the cue being shown on stage exactly how it appears at the time you record it. The levels of the A crossfader, B crossfader, and Grand Master will be recorded into the cue on the submaster. Thus, when the submaster is brought to 10, its cue will be brought up to whatever level it was at at the time of the recording.

Recording a Submaster

To record a submaster, first make sure that the current page is the one that the submaster you want to record is in. Set up the cue you want to record. Make sure that the crossfaders and Grand Master are set appropriately (to record a cue on the A-board, the A crossfader and Grand Master should be at 10, and the B crossfader should be at 0). Press
the record button. Then, press the bottom board bump button whose number is the number of the submaster you want to record the cue in.

It is possible to view what a submaster stores by using **preview**. When you preview a submaster, the LCD display shows the levels of each dimmer. You can scroll through the list by using the input knob. In addition, each of the white lights over the 32 dimmers light up to a brightness corresponding to the level of each dimmer.

**Previewing a Submaster**

To preview a submaster, tap the “Preview” button. Then, tap the bottom board bump button whose number is the number of the submaster you want to preview.

Because the Edit mode of the board is buggy, *never edit a submaster*. If you have to change something, re-record the cue.

**Manual Control of Submasters**

Submasters can be used manually or in stacks. When used in stacks, the computer automatically crossfades between submasters. When used manually, you can manually fade submasters using the bottom board.

To manually control submasters, make sure the bottom board is in “Subs” mode (see page 3 for changing the mode). You can change the levels of the submasters on the current page by fading the dimmers on the bottom board. If you change the current page while submasters are still on, there will be a flashing amber light under those submasters to indicate that those submasters are no longer on the current page. To use the submaster
of one of those dimmers from the current page, bring the dimmer to 0, and then to the
desired level.

When crossfading between submasters by simultaneously bringing the old cue’s
submaster down and the new cue’s submaster up, there is normally a dip in the output
level during the fade. To hide this, keep the brighter cue on more than the dimmer cue
during the crossfade.

The bottom board crossfader controls the level of all dimmers in the bottom
board, just like it always does. Note, however, that while in Subs mode the levels on the
bottom board crossfader are in the same direction as those on the A crossfader. (Under B
mode, the bottom board crossfader’s levels would be in the opposite direction as the A
crossfader’s.)

**Chases**

A **chase** is a sequence of arrangements of dimmers. Each arrangement in the
chase is lit on stage sequentially. The arrangements of lights and the order they are shown
in depends on what you record into the chase. You can record up to 32 different chases.

**Recording a Chase**

To record a chase, tap the “Record” button, and then the “Chase Select” button.
Tap the bottom board bump button whose number is the number of the chase you want to
record. If the chase is not empty, a message will be displayed asking you if you really
want to clear that chase and record over it. If you do, press “Yes.”

On the A board, set up the cue you want in the first step of the chase. Then, press
F3 to record that step. Repeat the process described *in this paragraph* with each step in
the chase.
When you are finished recording, press the “Record” button.

While you are recording a chase, you can set the default **direction** and **attack** of the chase using the F1 and F2 buttons. There are three settings for each. The settings for direction are >, <, and <=. If the direction is set to >, the chase will run in ascending numerical order. If the direction is set to <, the chase will run in descending numerical order. If the direction is set to <=, the chase will switch directions when it gets to either the beginning or the end. For example, if you have an 8 step chase, when the direction is > the chase will run from step 1 to step 8, and then start over at step 1. When the direction is < the chase will run from step 8 to step 1, and then start over at step 8. When the direction is <=, the chase will run from step 1 to step 8, then run back from step 8 to step 1, and then repeat the process.

The three settings for attack are [ ], ◇, and ◯. When the attack is set to [ ], the step is changed instantly, as if it were bumped. When the attack is set to ◇, each step is slowly crossfaded into the next step. When the attack is set to ◯, each step is instantly bumped up and then slowly faded down.

To show a chase on stage, you must **run** a chase that you have recorded. While you are running a chase, you can control which chase you are running, the **rate**—or speed—of the chase, the **level**—or brightness of each step—, and the direction and attack.

**Running Chases**

In order to run the chase you want, the chase must be selected. It can be selected either by being part of the current step in a stack (stacks are covered later in the “Stacks” section), or by manually selecting it.
Selecting a Chase

To select a chase, tap the “Chase Select” button. Then, tap the bottom board bump button whose number is the number of the chase you want to run.

Once the chase is selected, you can manually control the level, direction, attack, and rate of the chase. To control the level, use the “Level” dimmer located just above the “Chase Select” button. To choose the direction, tap the “Direction” button until the desired mode is lit. If not LED is lit above the button, then the direction is forward (>). To chose the attack, tap the “Attack” button until the desired mode is lit. If no LED is lit over the button, then the attack mode is \( \square \).

There are three ways to control the rate of a chase. One way is to use the “Rate” dimmer, located just to the left of the chase level dimmer. When the rate is 0, the chase does not progress. When the rate is 10, it progresses very quickly. Another way to set the rate of the chase is to use the “Tap Sync” button, located just underneath the “Rate” dimmer. Tap the “Tap Sync” button a few times at the rate you want the chase to run at, and it will run at that rate.

The third way to control the rate of the chase is to use the audio synchronization feature. When audio synchronizing is on, the rate of the chase is automatically synchronized to the audio being fed into the board through the audio input on the back of the board. To turn on audio synchronization, tap the “Audio” button. Tap the button again to turn it off. While using audio synchronization, always make sure that the audio “Level” dimmer located above the “Audio” button, just to the left of the “Bump” dimmer, is at 10. This dimmer controls the level that the music is “listened to” by the board. However, for most music, any level below 8 or 9 will turn off the rate of the chase.
completely, and anything above 8 or 9 will turn it on to full. I suppose this level dimmer could be useful if the music has a loud primary beat and a softer secondary beat. It could then be used to make the chase synchronize with only the louder beat.

While audio synchronizing is on, the “Rate” dimmer still has an effect. If it is at 0, then the step of the chase will change only when the audio synchronizing makes it change. If it is at anything greater than 0, then the step will change at the rate that the “Rate” dimmer is at, but will also change according to the audio. Generally, you should keep the “Rate” dimmer at 0 when using audio synchronizing.
Stacks

Stacks hold a sequence of cues. Using stacks, you can automatically set up the cues in a show, and crossfade between them automatically. To store cues into a stack, you must record a stack. The maximum number of stacks you can record is 16.

Recording a Stack

To record a stack, press the “Record” button. Then, press the stack “Go” button, followed by the bottom board bump button whose number is the number of the stack you wish to record.

You must record a submaster into each cue in the stack. To store a submaster in the cue, press the bottom board bump button of that submaster. If the submaster is in a different page from the one that the display shows after this, you can select the correct page by either repeatedly tapping F1 or holding down F1 and turning the input knob. If you do not want to record a submaster into the cue or you wish to have a blackout as the cue, record a submaster that contains a blackout.

To set how long it will take to fade into the cue, hold down the “Change” button and turn the input knob. If you would like to store a chase in the cue, press “More” (F4). Then, repeatedly press “Chs” (F4) or hold down F4 and turn the input knob to select the chase. Notice that although you can choose a chase to be selected when the cue is up, the level and rate of the chase must still be controlled manually.

When you are done recording the cue, press “Rec [#]” (F3) to record the step. When you are finished recording all steps, press the “Record” button.
Because the edit mode is buggy, you should never edit a stack. Thus, whenever you need to change a cue, you must re-record the stack that the cue is in. For this reason, you should first write down on paper all the cues in the show, and divide them into several small stacks. Each stack should contain around five cues. For example, if the show has 50 cues, you should make 10 stacks, each containing 5 cues. Then, whenever you need to change, add, or remove a cue, just re-record the stack the cue is in. The down-side to this is that when you are running a show, it is possible to use the wrong stack. Therefore, always remember to write down when to change stacks in the prompt book and your cue sheets. Also, never delay changing stacks because the next cue is not for a while. You might forget by that time, and accidentally fade into the wrong cue.

If you re-record a submaster or chase, then all cues using that submaster or chase will use the new, re-recorded version, and not the old deleted version. Thus, if you change a submaster or chase, there is no need to re-record the stacks using that submaster or chase in order for them to use those changes.

You can view what is stored in a stack using the preview feature.

**Previewing a Stack**

To preview a stack, tap the “Preview” button. Then, press the stack “Go” button, followed by the bottom board bump button whose number is the number of the stack you wish to preview. Then, press “Do Prev” (F4).

**Running Stacks**
When you run stacks, you can automatically crossfade between cues. What cues you crossfade between and how long the crossfade lasts depend on what you recorded into the stacks and how you run the stacks.

The current cue is the one that is currently being shown on stage. The next cue is the one that will be shown after a crossfade is complete. The LCD display shows you what the current and next cues are in the left half of the main screen. The display should read, “[# of current stack]:[# of current cue] > [# of next stack]:[# of next cue].” [# of current stack] is the number of the stack the current cue is on; [# of current cue] is the number of the current cue. [# of next stack] is the number of the stack of the next cue; [# of next cue] is the number of the next cue. If a * is in place of the left side of the >, such as “* > 1:1,” then there is no current stack or cue. If a * is in place of the right side of the >, such as “2:3 > *,” then the next stack and cue is nothing (that is, nothing will be sent on stage after the crossfade). If a * is in place of a cue number, such as “1:3 > 5:*,” then either the stack of the * (in this case, 5) is empty or there is no cue in the cue number you selected. You can select the next stack and cue at any time.

### Selecting the Stack and Cue of the Next Cue

To change the stack of the next cue, first tap “Clear” (F1). Then, tap “Stack” (F1) repeatedly until the desired stack is shown on the right side of the >. You can also hold down F1 and turn the input knob to select the stack.

To change the cue of the next cue, repeatedly tap F2 to go through all cues in numerical order. You can also turn the input knob while holding down “Step” (F2).
To bring up the next cue, you must crossfade between the current cue and the next cue. There are two ways of doing this: pressing the stack “Go” button, and using the “Stack Fade” dimmer.

**Crossfading Between the Current Cue and the Next Cue**

To crossfade between the current cue and the next cue automatically, tap the stack “Go” button. The crossfade will last for the amount of time that was recorded into the next cue. If you wish to control the timing of the crossfade manually, you can crossfade using the “Stack Fade” dimmer, located just above the stack “Go” button. To use it, first make sure that the dimmer is in the same position as the LED indicator at the side of the dimmer: if the bottom LED is lit, make sure the dimmer is at the bottom; if the top LED is lit, make sure the dimmer is at the top. Then, slide the dimmer to crossfade.