

Copying Lighting Cues to QLab With eos2qlab

by Wendy Roome 1/5/2023

Summit normally uses QLab as the master controller for sound, video & lighting cues. QLab runs the sound & video cues itself. The EOS controller – Element2 or Nomad – actually runs the lighting cues, but QLab uses Network cues to tell the controller when to execute them. Thus the operator sees a single, integrated cuelist. Furthermore, when lighting & sound cues happen at the same time, QLab can link them so the operator sees them as one cue.

A QLab Network cue sends a command to the lighting console via the local ethernet.

Commands are simple strings. The following command tells an EOS controller to execute a cue:

```
/eos/cue/cueList#/cue#/fire
```

For example, **/eos/cue/1/14.5/fire** executes cue 14.5 in cuelist 1.¹

Note that QLab just tells the controller *when* to start the cue. The lighting controller determines the timing and the lighting levels. Think of QLab as the stage manager for the lighting controller.

While that's simple, if the show has 300 lighting cues, typing those commands can be tedious and error prone. The Summit MacBook Pro has a program, called **eos2qlab**, to automate the drudgery and to check for errors.

Eos2qlab works with QLab versions 4 and 5, and it supports the network patch extensions on QLab 5.

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¹ While the Element2 is limited to a single cuelist – cuelist 1 -- other EOS controllers can have multiple cuelists.

Preparation

Before running eos2qlab you should

- Connect the Element2 to the ethernet (usually with ethernet port 1).
- Save the Element2 show (not absolutely necessary, but it's safer).
- Enable OSC commands in QLab, and configure QLab's OSC password, if any (see "Enabling OSC in QLab" on page 7).
- Make sure the QLab file defines "Network Patch 1" with the ethernet address & port for the Element2.² In QLab 5, the network patch type must be either "OSC Message" or "ETC Eos Family".
- Save the QLab file (so you can revert if you screw it up!).
- By default, QLab 5 requires a passcode for OSC access. "Enabling OSC in QLab" explains how to deal with passcodes.

Starting eos2qlab

Eos2qlab is a command line program,³ so you will need to start the Terminal app to run it. Terminal opens a window into which you type commands. Terminal prints a "\$" prompt to tell you it's ready for you to type a command, and you hit ENTER or RETURN to run the command. Eos2qlab is also interactive, but it uses a "*" prompt to tell you it's ready for a command.

When you start eos2qlab, it reads the cues from the EOS controller and from QLab, and displays a summary of both lists. If you have a lot of cues, this could take a few minutes. Here's an example from a previous show. You type the commands in **red**, followed by ENTER or RETURN. The cue counts, addresses & version numbers may differ:

```
$ eos2qlab
Connecting to EOS & QLab ...
Connected to EOS at 127.0.0.1:8192 and QLab at 127.0.0.1:53000.
Getting cue list(s) ...
EOS Show:
  Address: 127.0.0.1:8192
  "SenseSensible" version: 3.1.3.8
  101 cues in 1 cuelist(s).
QLab Workspaces:
  Address: 127.0.0.1:53000
  "Sense-Sensibility-10-08-test.qlab5" version: 5.0.12 *** selected ***
  57 cues in 2 cuelist(s) in "Sense-Sensibility-10-08-test.qlab5".
EOS Cuelist 1: 90 non-auto cues, 101 total cues "Lamp Test"
QLab cuelist "Main Cue List": 2 non-auto cues, 50 total cues, 25 broken cues.
  25 AUDIO, 24 FADE, 1 MEMO
```

² If you started with our stock QLab file, Network Patch 1 is already defined. If not, assuming the ethernet cable is in port 1, set "Destination" to "192.168.42.101" and port (the box after Destination) to 8192. Set "Type" to "address", "Network" to "Automatic", and leave "Passcode" blank.

³ Eos2qlab uses a wordy command-line interface, rather than a graphical interface, for the same reason that books for grownups use words, while books for children use pictures.

```
QLab cuelist "Manual Cues": 4 non-auto cues, 5 total cues, 0 broken cues.
  4 NETWORK, 1 GROUP
```

*

“*” means eos2qlab is waiting for you to enter a command. The “check” command compares the two cuelists and summarizes the differences:

```
* check
All QLab network cues are in EOS.
EOS cuelist 1: 90 cue(s) not in QLab
  1-2320 [90]
```

*

This example started with a blank QLab workspace, so all 90 EOS cues are missing from QLab.

Adding EOS Cues to QLab

The “add” command adds Network commands to QLab for the missing EOS commands. It adds them before the next EOS cue that’s already in QLab, or otherwise at the end of the QLab list. Thus if EOS has cues 1, 2 and 3, but QLab only has cue 2, “add” will put cue 1 before cue 2, and cue 3 at the end of the list.⁴

If the insert point is in a QLab group, eos2qlab adds the new cue at the top level, before the group. And if the insert point is in the middle of a linked sequence of QLab cues, eos2qlab adds the cue before the head of the sequence. So if lighting cue 2 is in a QLab group, and a sound cue continues into that group, eos2qlab will insert cue 1 before the sound cue.

The “add” command lists the options for the new cues, and lets you change them as needed. Here’s a simple example which accepts the default options, and adds 90 cues (you type the commands in red, followed by ENTER or RETURN):

```
* add
Summary of add operation:
  1. Target QLab cuelist: Main Cue List
  2. Network patch number: 1
  3. Cue Color: red
  4. Flag cues: false
  5. EOS Cues: 90 cues in list 1
Enter y to add the cues, n to cancel, or 1-5 to change an option: y
.....
.....
Added 90 cues to QLab.
QLab Workspaces:
  Address: 127.0.0.1:53000
  "Sense-Sensibility-10-08-test.qlab5" version: 5.0.12 *** selected ***
  147 cues in 2 cuelist(s) in "Sense-Sensibility-10-08-test.qlab5".
*
```

⁴ Eos2qlab recognizes linked EOS cues, and only adds the lead cue. For example, if EOS cue 3 follows into cue 3.2, and 3.2 follows into 3.4, eos2qlab will add EOS cue 3, but not cues 3.2 and 3.4.

NOTE: Check the options carefully before you type “y”. **There is no “undo” for this operation!** That’s why you should save your QLab file **before** you run eos2qlab.

It can take a few minutes to add the cues. The QLab window will flash as they’re added.

Option #1 lets you add the new cues to a different cuelist.⁵ This can be useful the first time you use eos2qlab (see “Tip: Simplifying the Initial Cue Load” on page 6). To change the cuelist, enter “1” instead of “y”, and then enter the cuelist’s number:

```
Enter y to add the cues, n to cancel, or 1-5 to change an option: 1
Select target QLab cue list:
  1: "Main Cue List" (default)
  2: "Manual Cues"
Enter cuelist number, quit, or return for default: 2
```

Summary of add operation:

1. Target QLab cuelist: Manual Cues
2. Network patch number: 1
3. Cue Color: red
4. Flag cues: false
5. EOS Cues: 90 cues in list 1

```
Enter y to add the cues, n to cancel, or 1-5 to change an option:
```

You can then change another option, or type “y” to add the cues.

The other options are similar: eos2qlab lists the choices, and you enter the value.

Changing Cues in Element2 or QLab

WARNING:
eos2qlab cannot detect changes you make to
Element2 or QLab after you start the eos2qlab!.

Eos2qlab downloads the EOS and QLab cuelists when it starts. If you make changes after that, eos2qlab will **NOT** see those changes. For example, after running the “add” command, often you will move the added light cues to fit in with the sound cues. Eos2qlab will not see those changes.

There are several ways to avoid this problem:

- Quit eos2qlab after doing an “add”, and restart it when needed.
- Use eos2qlab’s “refresh” command to get the latest cue information.⁶
- If you haven’t used eos2qlab for a while, the “add” command asks if you want to refresh the cuelists from EOS and QLab.

⁵ QLab allows multiple cuelists. View→Lists opens a sidebar with the cuelists. Use the “New List” button at the bottom to create a new list.

⁶ refresh can take several minutes, which is why eos2qlab doesn’t do it automatically.

Synchronizing QLab with Element2

Almost certainly you will change lighting cues during tech week. Level or timing changes are simple: just change them in Element2. They don't affect QLab.

But if you add or delete lighting cues in Element2, you will need to update QLab. You can do that manually, but it's easy to use eos2qlab. Just run it, as above. The "**check**" command will tell you if there are any differences. The "**add**" command will add the missing cue(s). It won't change the existing QLab network cues.

Although in this case you should tell "**add**" to flag the new cues, or mark them with a color, so you can spot them. Eos2qlab inserts a cue before the next higher cue. That's usually close to where you want it, but you may have to move it to fit in with the sound cues.

Element2 vs Nomad

The eos2qlab program works with either the Element2 or ETC Nomad on the theater's Mac Mini. As currently configured, eos2qlab first tries to connect to the Element2 at address 192.168.42.101:8192. If the Element2 doesn't respond, eos2qlab tries the Nomad at 192.168.42.104:8192.

So if you add cues to the Nomad during tech week, you can use eos2qlab to add those cues to QLab. Just be sure the Element2 isn't connected to the ethernet.⁷

QLab Cue Numbers & Descriptions

In QLab, cues have number & names. QLab prominently displays the name to the operator, and we usually set it to something describing when the cue happens and what it does.

When adding a cue, eos2qlab sets the QLab cue number to "q" followed by the EOS cue number. If you entered a label for the cue in EOS, eos2qlab sets the QLab name the name to the EOS cue number followed by the cue label in EOS. So if EOS cue 14.5 has the label "Xfade SL as Henry crosses," in QLab the number will be q14.5 and the name will be "Cue 14.5: Xfade SL as Henry crosses."

If the EOS label is blank, the QLab name is just "Light Cue ###".

If you've marked a cue as "scene start" or "scene end," eos2qlab adds that information to the QLab name.

Merging Lighting & Sound Cues

Eos2qlab will add all the QLab network lighting control cues, but if you will have to move them to fit in the with sound & video cues. You can use QLab sequencing tools – pre-wait, post-wait,

⁷ The Element2 should never be on & connected to the ethernet when Nomad is running. If both controllers are active, both of them will send DMX control signals to the lights. That won't break anything, per se, but if the controllers set different levels, the lights will flash like crazy.

auto-follow, etc – as desired to automate the sequencing between them. You can also move the network cues into groups, or even groups inside groups.

One gotcha: QLab does *not* know how long a lighting cue takes. QLab just starts the cue. As a result, for a network cue, “auto-continue” and “auto-follow” are identical: both start the next cue immediately after the lighting cue starts.

So if you want a sound cue to start after a lighting cue is complete, you must set the “post-wait” time in QLab to the cue time from Element2, and update it if you change the time.

Tip: Simplifying the Initial Cue Load

For a show with a lot of sound cues, such as a musical with tracks, typically the musical director starts using QLab early in the rehearsals. In parallel, the lighting designer creates the lighting cues on the Element2. Then in the tech rehearsal, we use eos2qlab to add those lighting cues to the MD’s QLab file.

Eos2qlab can do easily do that, but it will add all the lighting cues after the music cues. Then you have to move them up & put them in the proper sequence with the music cues.

If (say) the show has 100 music cues and 200 lighting cues, you will spend a lot of time scrolling the QLab window up & down.

Here’s a trick to make that easier. QLab can have multiple cuelist windows open at the same time.

So when adding a lot of light cues to a QLab file with a lot of sound cues, try this:

- Save the QLab workspace, just in case!
- Create a new, empty, QLab cuelist (View→List, then click “New List”).
- Run eos2qlab, as above, and use “add” to add the lighting cues to the new cuelist.
- Right-click the new cuelist and select “Open in new window.”
- Quit out of eos2qlab (type “quit” or just “q”).
- You now have two QLab cuelist windows: one for sound cues and the other for lighting.
- Arrange them side-by-side.
- Drag & drop the lighting cues from the lighting cuelist into the sound cuelist.
- When done, close the now empty lighting cuelist.

To verify that you didn’t lose any lighting cues in the process, start eos2qlab again and do “**check.**” If you missed any cues, run “**add.**”

Other Checks

Eos2qlab has two additional commands to verify that QLab is synchronized with Element2:

select missing

This selects any QLab network cues that do NOT correspond to a lighting cue in the Element2. You can then delete them if you want. This isn’t a big problem – the Element2 will just ignore a request to run an undefined cue. But it could be a sign of some other

error. Note that eos2qlab does *not* delete the cues from QLab; you have to make that executive decision yourself.

select order

This selects any QLab network cues whose Element2 cue numbers are out-of-order. This isn't necessarily an error, but it might be.

Configuration Parameters

Eos2qlab reads configuration parameters from a JSON file. These include:

- The IP addresses and ports for QLab and EOS. This is actually a list; eos2qlab tries them all and uses the first one that responds.
- For added cues, the default QLab network patch, cuelist & color.
- Also for added cues, patterns to generate the QLab cue number & name from the EOS cue number & label.

The default configuration file is

jars/resources/apps.eos2qlab/default-config.json

under the directory with the eos2qlab shell.⁸ To change the defaults, copy & edit that file, and pass the file name as the first argument to eos2qlab.

You can also change individual parameters by adding

parameter-name=value

arguments to the eos2qlab shell. For example, this overrides the EOS controller address and port, and sets the default color for added cues to "none":

eos2qlab EOSAddrPort=192.168.0.115:9000 CueColor=none

Enabling OSC in QLab

Eos2qlab uses OSC to communicate with QLab. You must ensure OSC is enabled in QLab, and if QLab has an OSC passcode, you must provide it to eos2qlab. Both QLab 4 and 5 enable OSC by default. QLab 5 requires a passcode by default, but QLab 4 doesn't.

Here's how you enable OSC and set the passcode, if desired.

Telling eos2qlab about QLab's passcode

If QLab has a passcode, you append it to the QLab IP address and port with a slash, as in

eos2qlab QLabAddrPort=127.0.0.1:53000/1234

You can add that on the command line, as above, or modify the configuration file.

⁸ For the final word, check the eos2qlab shell.

Setting the passcode in QLab 4

In QLab 4, click on the “gear” icon to open the “Settings” window. Then select “OSC Controls.” Be sure the “Enable OSC Controls” box in the top left is checked. If you want a passcode, enter it in the “Use Passcode” box in the upper right, and click the (very faint!!) checkbox that’s to the left.

Setting the passcode in QLab 5

In QLab 5, click on the “gear” icon to open the “Settings” window. Then select “Network” and click on the “OSC Access” tab. First, be sure the “Allow OSC Connections” box is checked.

QLab 5 allows several passcodes with different permissions. If you don’t want to require a passcode, check the “view”, “edit” and “control” permissions on the “No Passcode” line. If you do want a passcode, add a passcode with those permissions.

Advanced Control

QLab can tell the EOS controller to do a lot more than just run a cue. Here’s a sampling of the other commands that you can use in a Network cue:

```
/eos/sub/1 0.50          -- Set submaster 1 to 50% immediately
/eos/sub/1/fire         -- Push submaster 1’s “bump” button
/eos/macro/2/fire      -- Fire macro 2
/eos/newcmd "sub 1 @ 75 sneak 5 enter"
                        -- Set submaster 1 to 75% in 5 seconds
/eos/newcmd "60 @ 100 sneak 1.5 enter"
                        -- Set channel 60 to 100% in 1.5 seconds
/eos/newcmd "60 sneak 1.5 enter"
                        -- Restore channel 60 in 1.5 seconds.
```