



MUSIC  
PRODUCTION  
HANDBOOK

VOLUME 1

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## 1 BACK AWAY FROM THE MOUSE

Mapping, both Key and MIDI, is the foundation of Live's performance capability. Key mapping, once configured, gives you single-key access to Live's most important functions like looping, draw mode toggle, click track, punch recording, etc. Once you configure your set of key mappings, go to the preferences, there is an option to save the current project as your default project, so those mappings will be waiting there for you in every new project.

## 2 QUICK A/B

When mixing you need to make sure that changes to effects like Compression and EQ are really helping the track. Some quick work with key mapping makes it easy to compare presets. Say you have an EQ in a track and you want to try out some new settings. First duplicate the effect (command D on mac ctrl D on PC) Turn the first one off using the effect's power button (now the first is off and the second one is on). Enter key mapping mode (command K on Mac Ctrl K on PC) and map both power buttons to a single key (the A key), then exit key map mode. Now if you hit the A key the effect that was

off turns on and vice versa, so you can hear which version you like better. This process becomes so fast and easy you might find yourself doing it all the time.

## 3 GO PARALLEL WITH RACKS

There are 4 types of Racks in Live: Effect, Instrument, MIDI, and Drum. Each is a way to split the incoming data into multiple "chains" which have unique processing, then the data is combined at the end. Racks are a way to process data (MIDI or audio) in parallel within a single track. Also, racks allow you to save a group of effects as a single preset to be used in other projects. Group effects together using a key command: Command G on Mac or Ctrl G on PC. With instrument racks you can layer multiple soft synths to create huge thick pads. With effect racks you can split the audio into separate frequency bands, allowing you to put a delay on just the highs and keep the low end mono perhaps. With Drum Racks each incoming MIDI note has its own instrument and chain of effects, your snare could be sampled and run through a compressor, and the kick be created with a third party synth. With MIDI effect racks you can create complex arpeggiated patterns by stacking multiple arpeggiators in parallel along with other MIDI effects.

## 4 BE MODULAR AND DOCUMENTED

Clips, Racks, Tracks, and Presets can be shared from project to project. Right click on the title bar of any of these objects and you can assign it a color, name, and even custom info text that shows up in the help view in the lower left corner of the Live window (“?” opens up the help view). In the Live Browser you can look inside other projects, grabbing individual tracks or clips and dropping them in your current project. The more you name, color, and add custom text, the more efficient you will be in the future. Also, look for custom info text in the live library presets, many of the patches give you hints at the best way to use them.

## 5 TRY OUT SOME SOUND DESIGN

One of the coolest live effects, Corpus, creates a “talking” synth. It is a pretty long process, but the end results are worth the time spent. Check out [this YouTube video](#) where we go over many important Analog, Corpus, and Effect Rack features.



**LOUDON STEARNS** teaches [Advanced Music Production with Ableton Live](#), and [Composing and Producing Electronic Music](#) at [Berkleemusic.com](#). As a bass player, producer, and laptop musician, Loudon’s music can be heard on numerous documentaries and short films. While continuing his studies of composition, engineering, and sound design, he is currently pursuing a degree in physics as part of ongoing search for the answer to the question of life the universe and everything.

After studying harmony at University of Lincoln, Loudon became actively involved with the National Guitar Workshop, where he was an instructor and the live sound engineer. At Berklee College of Music he graduated with honors with a dual major in bass performance and contemporary writing and production. Now an assistant professor in Berklee’s Contemporary Writing and Production Department, Loudon teaches classes in sequencing, arranging, and scoring to visuals.

## 1 L/R BALANCE

Are the vocals well centered? If not: In Ozone, unlink input level faders to make necessary adjustments. This will rarely be necessary, but should be done first. Subsequent stereo processing will track better to preserve imaging, i.e. the stereo sound stage.

## 2 TIGHT LOW END

If bass is lacking focus and clarity, try a high-pass filter on the side-channel ('elliptical EQ'), essentially making the low end mono. In Ozone, use the EQ in Mid-Side mode, listen and observe LF content in the side-channel. While listening to the regular stereo signal, adjust the cut-off frequency of the side-channel high-pass filter until it sounds right. Make sure this is not set too high, stereo imaging and width should not change noticeably.

## 3 FREQUENCY BALANCE

Using the spectrum analyzer and your ears, are there any portions that need to be cut? Subtracting unnecessary frequencies may unmask the important portions in audio better as well as regaining headroom, rather than trying to boost the important parts and running the risk of clipping. In Ozone, if large amounts of cut are needed, it is usually best to use the EQ in Digital mode.

## 4 DYNAMIC PROBLEMS

Are the various instruments of a track cohesive? For example: it may be easier to reduce sibilance early by de-essing. In Ozone, use the Multi-Band Dynamics tool. To affect only lead vocal sibilance, which is predominantly in the stereo center, use Mid-Side mode and use frequency dependent compression on the mid channel only to minimize unwanted side effects, such as loss of clarity and silk. Use the mid-frequency band in a 3-band processor to adjust for sibilant frequencies.

## LEVELING

An essential part in mastering is to ensure all tracks play at the same perceived loudness. This task is best done using your ears and relying less on level-meters, as they do not accurately respond to the frequency response of our ears. To leave the entire load of leveling all your tracks to individual limiters is not recommended, as they tend to alter the sound if driven too hard. 2dB of limiting may already have an adverse effect, especially on the transient and bass content of a track. Use previous gain stages in your processing to get all of your tracks within 3 dB of perceived loudness from one another.

For example: In Ozone, before you use the Loudness Maximizer as a last step in leveling, capture/bounce your tracks

at the highest resolution (24-bit, 32-bit float, or higher) used. Next, line up all these bounced tracks in the right order as they should appear on a CD. Use one instance of Ozone on the master insert using the Loudness Maximizer only. For a CD, set a healthy -0.3dBfs safety Margin and leave the Threshold at 0dBfs. Set Mode and Dithering to taste/need. Now you can use gain (e.g. automation) on individual tracks or parts of a track to achieve coherent leveling without having to change the Loudness Maximizer settings. In vocal music, use the vocal level as a 'loudness-anchor' or reference when dealing with mixed musical styles and arrangements. Listen to the transitions from one track to the next for coherent leveling. After all, we as mastering engineers are responsible for making sure there aren't any sudden changes that would spoil the flow of a record.



## MARC-DIETER EINSTMANN teaches *Audio*

*Mastering Techniques* at [Berkleemusic.com](http://Berkleemusic.com). Marc is the senior mastering engineer at MasterLab Mastering Studios, based in Berlin and Hamburg, and owner of Sonic Silver Mastering, based in New York City. Since 1987 has worked with artists and producers, such as Dave Stewart, Annie Lennox, Chrissie Hynde, Mick Jagger, Mary J. Blige, the late Notorious B.I.G., Depeche Mode, Yo-Yo

Ma, Elvis Costello, The Neptunes, Frankie Knuckles, Flood (U2), David Kahne (Paul McCartney), Rodney Jerkins (Michael Jackson), Alan Moulder (Nine Inch Nails), Chris Evans-Ironside (Drafi Deutscher), Dru Hill, and D'Angelo, among others.

## 1 SAVE YOUR FAVORITE SCREEN LAYOUTS

Unless you have a couple of large monitors, your on-screen interface will easily get cluttered. Using view presets (via Memory Locations) and Window Configurations (accessed in the Window menu), you can store and recall your favorite screen arrangements for tracking, editing, and mixing sessions. Create a set of presets for various tasks with customized layouts, control settings, and track displays; then switch between them with a single click.

## 2 WATCH YOUR RECORDING LEVELS

While analog systems generate rich harmonic distortion when overdriven, clipping the input to digital audio devices almost always degrades sound quality. Keep in mind that the waveform displays in the Edit window is not a good indicator of acceptable levels—tracks recorded too hot can appear to be fine. Use your track meters when setting input levels, and make sure they never display inputs in the amber range. To be safe, back off a bit when your levels approach the extremes of the yellow range.

## 3 CREATE A PRESET LIBRARY

Pro Tools provides session templates for quickly creating new projects with standard track layouts, but sometimes you'll want to begin a new session with customized track configurations. Rather than building these from scratch, save your favorite setups in dummy sessions and use the Import Session Data command to pick and choose whatever you want. For example, you could import from a drum track session that contains ten of your favorite kick configurations, another ten for snare drums, and so forth. If an à la carte approach works best, start with a rich menu!

## 4 USE GROUPS FOR REDUCING SCREEN CLUTTER

Most people use groups to simultaneously change levels or other parameters on multiple tracks, but it's also easy to simultaneously show and hide all group members. You can use this function to switch between a set of simplified screen views rather than scrolling around to locate tracks. Create a set of groups that account for all of the tracks in your session, making sure that each group is small enough so all of its members can fit on screen. Using the Mac OS, simply Control-click on

any group name to show only those tracks. With Windows, this is a little less convenient—right-click on the group name, then select Show Only Tracks in Group.

## 5 PUNCH IN MIXES TO UPDATE BOUNCES FASTER

Even though there's no way to bounce a Pro Tools mix without playing it in real time, you can speed up the process

by recording the mix on a track in the session. Route your mix tracks to a bus that feeds a new Audio track, then record on that track while playing through the mix. After the first pass, you can punch in subsequent updates only in sections where changes have been made rather than re-recording the entire song. When finished, consolidate the mixed regions (or clips, as of Pro Tools 10) and use the Export Regions (or Clips) As Files command to almost instantaneously generate a bounce with the desired format, bit depth, and sample rate.



**ANDY EDELSTEIN** teaches [Pro Tools 101](#) and [Pro Tools 110](#) at [Berkleemusic.com](#).

Andy is an active educator, record producer, engineer, and multimedia developer. He is currently Associate Professor of Music Production and Engineering at Berklee, and has also served as Assistant Chair of the Music Production and Engineering Department during his twenty-five-year tenure at the College. Andy has produced, recorded, and/or mixed numerous records from jazz and rock to bluegrass, Celtic,

and blues, including the genre-bending Wayfaring Strangers critically acclaimed Rounder releases, the SpinART debut by independent rockers Apollo Sunshine, and the latest Dry Branch Fire Squad live album, all using his Pro Tools HD system. Andy is Principal of Rapid Eye Media, specializing in multimedia production services. His design and production work is featured in a series of award-winning interactive exhibits at the American Jazz Museum in Kansas City, MO and the Longyear Museum in Brookline, MA. Consulting clientele has included the GRAMMY Foundation in Santa Monica, CA. Andy holds a B.S. in Electrical Engineering from the Massachusetts Institute of Technology.



## 1 WORK FAST WITH TEMPLATES

Having a project template set up with all of your favorite devices, patches, most commonly used parallel effects, and audio tracks really helps to streamline your songwriting and production process. After creating a project containing these elements, make the file read-only so you don't accidentally overwrite it. Then, make it the Default Song Template in Reason's General Preferences. This way, as soon as you open Reason you'll be making music without any time wasted setting up devices and tracks.

## 2 INDIVIDUAL OUTS FOR MAX CONTROL

Many of the devices feature individual outputs, including Redrum, Kong, NN-XT, and Dr. Octo Rex. Learn how to assign sounds to these individual outs for maximum control over each signal in your mix. For example, when you can assign the drums in Kong to its individual outs you can add EQ and compression on the Main Mixer to the snare drum but not to the bass drum, or parallel reverb to the low tom but not the hi-hat. That's the level of control you want in order to produce truly pro sounding mixes.

## 3 COMBINATORS FOR SOUND DESIGN

Constructing your own sounds is key to creating a unique identity in your productions. Combinators offer a quick and easy way build your own sounds without needing to know how every synth parameter works. By starting with a mixer in the combinator you can easily mix and layer instrument patches and effects for a monstrous sound without programming a single synth. After you cook up something you like, you can then save the combinator patch for quick recall in any of your Reason projects.

## 4 MASTER BUS EFFECTS ARE COOL

DJs often run an entire stereo mix through an effect, such as tempo synchronized filters and delays, to add extra drama to their mixes. You can recreate this effect in Reason by inserting an effect device, such as the PH-90 Phaser and the Alligator Filter Gate, in the Main Mixer's Master Section, at its main output. Then, automate the effect's Bypass button and some of its parameters to turn up the drama at specific points in your song.

## REWIRE FOR THIRD PARTY PLUG-INS

A common complaint about Reason is that it does not work with third party plug-ins, such as those made by Waves or iZotope. This is not entirely true. When you rewire Reason into a rewire compatible DAW program, such as Pro Tools or Logic, you can process Reason's

output through third party plug-ins. In fact, up to 64 stereo outputs can come from Reason's Hardware Interface device and be plugged directly into the DAW program's mixer. In other words, the output of every device in Reason's Rack can be sent to its own mixer channel in the DAW for up to 128 channels of third party plug-in processing! Rewire opens up a world of possibilities.



**ERIK HAWKINS** teaches [Producing Music with Reason](#), [Programming and Producing Drum Beats](#), and [Remixing with Pro Tools and Reason](#)

at [Berkleemusic.com](#). Erik has written and produced beats for songs on ABC, CBS, FOX, MTV, Nickelodeon, and New Line Cinema, on films and TV shows such as *Ugly Betty*, *CSI: Miami*, *Burn Notice*, *Lie to Me*, *Big Brother*, and *The Last Day of Summer*. He has worked with and remixed artists such as Irene Cara, Digital Underground,

DJ Sasha, Conscious Daughters, Brenda Russell, and Stryper. He is the author of *The Complete Guide to Remixing* (Berklee Press), and numerous articles for publications including *Remix*, *Mix*, *Electronic Musician*, and *Keyboard*. His album, *Erik Hawk & The 12-Bit Justice League* (MuziCali/Synchronized Music), is packed full of killer beats and is available through iTunes and CD Baby.

## 1 BE READY IN A FLASH WITH TEMPLATES

Creating your own templates allows you to set up the most commonly used elements in your productions so the moment inspiration strikes, you can be ready to record quickly. Start by opening a new empty project and then add the elements that you most often use. For example ; two audio tracks, 4 MIDI tracks, Groove Agent One and HALionSonic as virtual instrument channels, and a REVerence reverb FX channel. Once the setup is complete, go to the file menu and select SAVE as template. Your templates are available in the “More” category of the project assistant when you start a new project.

## 2 CUSTOMIZE YOUR WORK ENVIRONMENT: PREFERENCES AND WORKSPACES

Customize how Cubase looks and responds by editing your preferences and saving your workspaces layout. Open the preferences settings from the Cubase menu to set your knobs to move linear or circular, choose text input on left click for entering data, adjust the color and line intensity, etc. All of these parameters and many more can be

setup, named, and stored for all of the engineers who use your studio.

You can also create workspace setups that call up the size, position, and content of your Cubase windows. From the Window menu, open the Workspaces submenu, select “New Workspace” and enter an appropriate name. Setup the windows as needed and your new setup can be activated from the workspaces menu or through a key command as needed. Create workspaces that are ideal for tracking, editing, and mixing.

## 3 WORK MORE EFFICIENTLY USING KEY COMMANDS

You can save hours of time by learning and customizing key commands in Cubase. The default key commands are listed in the various menus as well as in the manual, and they will expedite everything you do with your project. Select the tool you need by hitting 0 through 9, open the mixer with F3, toggle the transport out of the way with F2, you’ll spend more time making music and less time scrolling through menus.

## 4 USE VST INSTRUMENT CHANNELS TO GET THE MOST OUT HALION SONIC AND OTHER MULTI TIMBRAL PLUG-INS

Cubase uses instrument tracks to conveniently combine the audio and midi routing of virtual instruments, but in order to get the most out of a virtual instrument, open the virtual instrument window from the devices menu (F11) and assign your virtual instruments to the rack. Any MIDI track can now be assigned to play the virtual instrument, and you can activate multiple channels of audio routing to the mixer right from the window.

For example, Groove Agent ONE can have 16 stereo outputs, each assigned to it's own fader in the mixer. Individually process each drums pan, level, EQ, compression settings, and effects for a pro sounding mix.

## 5 CREATE MULTIPLE ARRANGEMENTS OF YOUR SONG FAST USING THE ARRANGER TRACK

Songwriters, want to work on getting the perfect arrangement of your new song? Create an arranger track and put together as many versions of the tune as you can imagine. Record your basic parts (such as the verse, chorus, bridge) and add the arranger track from the project menu. On the arranger track, outline each section with the pencil tool (you can create and name as many sections of any length as you need) and create an arranger chain by adding the created events in the order you want them to occur.

Create multiple arranger chains to compare different forms of your song. You can even use the arranger for triggering sections in a live performance.



**ROSS RAMSAY** teaches [Producing Music with Cubase](#) at [Berkleemusic.com](#). Ross as a faculty in the Piano department at Berklee College of Music, has been teaching piano for twenty-five years, and has been included in the Who's Who List of American Teachers several times. He composes and produces music for local and nationally broadcast television, radio, cable, and video programs, and has been a featured soloist on piano and keyboards with various artists touring throughout the United States and Europe. Ramsay is a product specialist and clinician for Yamaha Corporation of America, Digital Musical Instruments, and Pro Audio Division. He received a Bachelor of Music from Berklee College of Music in 1986.

## 1 GET TO KNOW THE SELECTION TOOL

Use the Selection tool, which you can access quickly from anywhere by just hitting the ESC key. This gives generic editorial control over many types of notation elements. So, to move something, choose the Selection tool and just drag it. To edit it, use its contextual menus (Control-click in Mac; Right-click in Windows), or if you need deeper control, double-click it to activate the tool that created it.

## 2 UTILIZE SHORTCUTS

Memorize, customize, and use the keyboard shortcuts (metatools) for expressions, articulations, and other tools. In selection palettes, these shortcuts are generally in the top-right corner of their assigned shape. Customize what key serves as the shortcut by holding down Shift and the key you want to become the new shortcut.

## 3 OPTIMIZE YOUR NOTATION INPUT

Use a MIDI keyboard and QWERTY keyboard shortcuts for notation input. It's dramatically faster than using just the computer keyboard, particularly for entering chords. Even the smallest, cheapest MIDI keyboard will be fine for Finale work.

## 4 KNOW HOW TO CONTROL NOTATION ELEMENTS

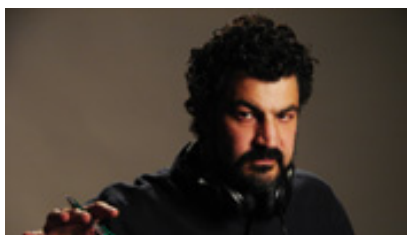
There are essentially just three places to check for figuring out how to control notation elements: the Main Tools palette, the Document Options window (Document menu), and the specialized menu that becomes visible when you select a tool. Nearly everything important can be found in one of those places. Then, the Utilities menu is a great source for some mind-boggling shortcuts that don't exactly map to specific tools.

## USE THE RIGHT TOOL FOR THE JOB

Don't fuss too much with getting performance quality playback. Finale is a notation program first and foremost. Other products, such as Digital Performer, Logic, and Pro Tools, are optimized for producing audio, and you'll be much happier using the right tool for the right job.

## BONUS: THE MOTHER OF ALL FINALE TIPS

The Help built into Finale is vast and indispensable. If you can't figure out something, go to Help > Index. From there, you can look up anything.



**JONATHAN FEIST** teaches [Music Notation Using Finale](#) at [Berkleemusic.com](#).

Jonathan has used Finale since it was introduced in the mid 1980s. Today, he teaches Finale to Berklee College of Music faculty, and uses it in his daily work as Managing Editor of Berklee Press. Jonathan is editor of *Finale: An Easy Guide to Music Notation* (2nd edition, Berklee Press 2005), and co-author of *Essential Songwriter* (Berklee Press 2004) and

*The Berklee Practice Method Teacher's Guide* (Berklee Press, 2004). He has edited over seventy books and courses about music, technology, culture, and business, including the Berklee Practice Method, Berklee Instant, and Songwriter's Workshop series. He has also taught several courses in software design and database development, and presents a writer's workshop called How to Write a Book. A composer and writer, Jonathan holds bachelor's and master's degrees in composition from New England Conservatory of Music.

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- [Composing and Producing Electronic Music](#)
- [Critical Listening 1](#)
- [Producing with Pro Tools](#)
- [Advanced Music Production with Ableton Live](#)
- [Remixing with Pro Tools and Reason](#)
- [Orchestration 1](#)
- [Producing Music with Reason](#)
- [Mixing and Mastering with Pro Tools](#)
- [Music Notation Using Finale](#)
- [Pro Tools 110](#)
- [Advanced Mixing and Mastering with Pro Tools](#)
- [Advanced Music Production with Pro Tools](#)
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- [Getting Your Guitar Sound](#)
- [Film Scoring 101](#)
- [Art of Mixing](#)
- [Audio Post Production for Film and TV](#)
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- [Music Production using Pro Tools](#)
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- [Acoustics and Live Sound](#)
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- [Music Creation using SONAR](#)
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- [Music Production using Ableton Live](#)
- [Music Production using Cubase](#)
- [Orchestrating and Producing Music for Film and Games](#)
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