



The A-Z Of Pro Tools

Interactive e-book

Pro Tools Expert

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A Is For AAX



The AAX plug-in format was announced on 20th October 2011, AAX being the acronym for Avid Audio eXtension. AAX was developed to replace the RTAS and TDM plug-in formats which were 32 bit and made it impossible for Avid to create a 64bit DAW.

AAX is a 64 bit plug-in format made exclusively for Pro Tools 10 and 11. 32 bit versions of AAX plug-ins worked in Pro Tools 10. It took a little longer to implement it into Avid's video editor - Media Compser but as of v8.1 Meda Composer now supports AAX Native plug-ins too.

AAX Native And AAX DSP

There are 2 types of AAX plug-in:

- AAX Native for use in Pro Tools, Pro Tools HD Native and Pro Tools HDX systems
- AAX DSP for use in Pro Tools HDX systems.

With AAX, you can share sessions between DSP-accelerated Pro Tools systems and native-based Pro Tools systems and continue using the same plug-ins. Your sessions will sound exactly the same, regardless of the rig you're using.

How Many Developers Have Ported To AAX?

AAX has been a huge success for Avid with many vendors porting to AAX Native, there are now several hundred AAX plug-ins and instruments for use in Pro Tools 11.

AAX DSP porting has been less popular with around 50% of developers who made TDM versions of Pro Tools plug-in only porting their TDM plug-ins to AAX native formats. However some other developers have created AAX DSP plug-ins for the first time. In reality there are far more AAX Native plug-ins than there are AAX DSP, this is partly due to the efficiency of the new Avid 64bit audio engine making DSP less of a requirement for many Pro Tools users.

Where I Can Find AAX Plug-ins?

Pro Tools Expert started the first AAX database on the web and we continue to maintain it to make sure Pro Tools users can find out what AAX plug-ins are available, [check the AAX plug-in database here](#)

B Is For Bounce To Disk & Bounce To Track



Bounce To Disk is the way in which either entire mixes or parts of a mix can be mixed down to a file using the internal mix engine in Pro Tools.

A Little History

In the 'good old days' of audio production whenever a track needed to be mixed then it would be sent as an analogue audio signal to another machine, or to another track on the same machine. In the very early days before multitrack recorders this would be playing off one machine, adding a live performance, and mixing them together onto another machine and then doing it over and over until it was finished.

Then as multitrack machines came along, once you had used 3 of the 4 tracks, to add more tracks, you had to mix those first 3 tracks down and record it onto the 4th track so that you could free up the first 3 tracks to record more material and so on. As multitracks expanded the need for more tracks always out stripped the tracks available so that the practice continued through into the digital world with machines like the Tascam DA88 and Alesis ADAT.

Then there was the final bounce to a separate stereo machine to make the final master, first in analog and then digital. As technology developed DAWs began to offer the option to do all of these options within the box including creating a final master file for either manufacture or more recently for digital distribution on the internet.

Bounce To Disk

There are various names for this process, in Pro Tools it is called Bounce To Disk, in other DAWs it is sometimes called render to disk.

Bounce to disk reduces the need for any external equipment to be needed when creating a final master audio file or to create additional stems.

Online And Offline Bounce

In Pro Tools versions 10 and below Bounce to Disk is an online (real-time) process meaning that any bouncing of the audio takes the time of the entire length of the song or audio marked on the timeline. Offline Bounce was introduced in Pro Tools 11 offering faster than real-time bouncing of the audio, this is normally a faster than real-time process but the time taken is determined by the complexity of the session and the plug-ins used.

Uses For Bouncing Audio

The first use for bouncing audio is as already outlined, to complete a final stereo or surround mix of the audio.

Bouncing can also be used for creating separate audio stems, for example when delivering a set of different mix components for film and TV.

The final use for bouncing audio to create audio versions of complex tracks and to free up system resources, this is often referred to as track freezing. However track freezing in Pro Tools is achieved by using offline bounce as a work around.

Bounce To Track

This is where instead of using the Bounce To Disk option, you configure the mixer so that you record your mix to a set of tracks within the session, mirroring the way the early multitrack machines were used. You could do it with the final mix or use it to create all your stems in one pass, but even with Pro Tools 11 bouncing to track is a real time process, however it does give you the option to audition the mix one more time and making changes can be achieved quickly by dropping in on the bounce track having tweaked the mix for just the section that needs fixing. You don't need to rebounce the whole project.

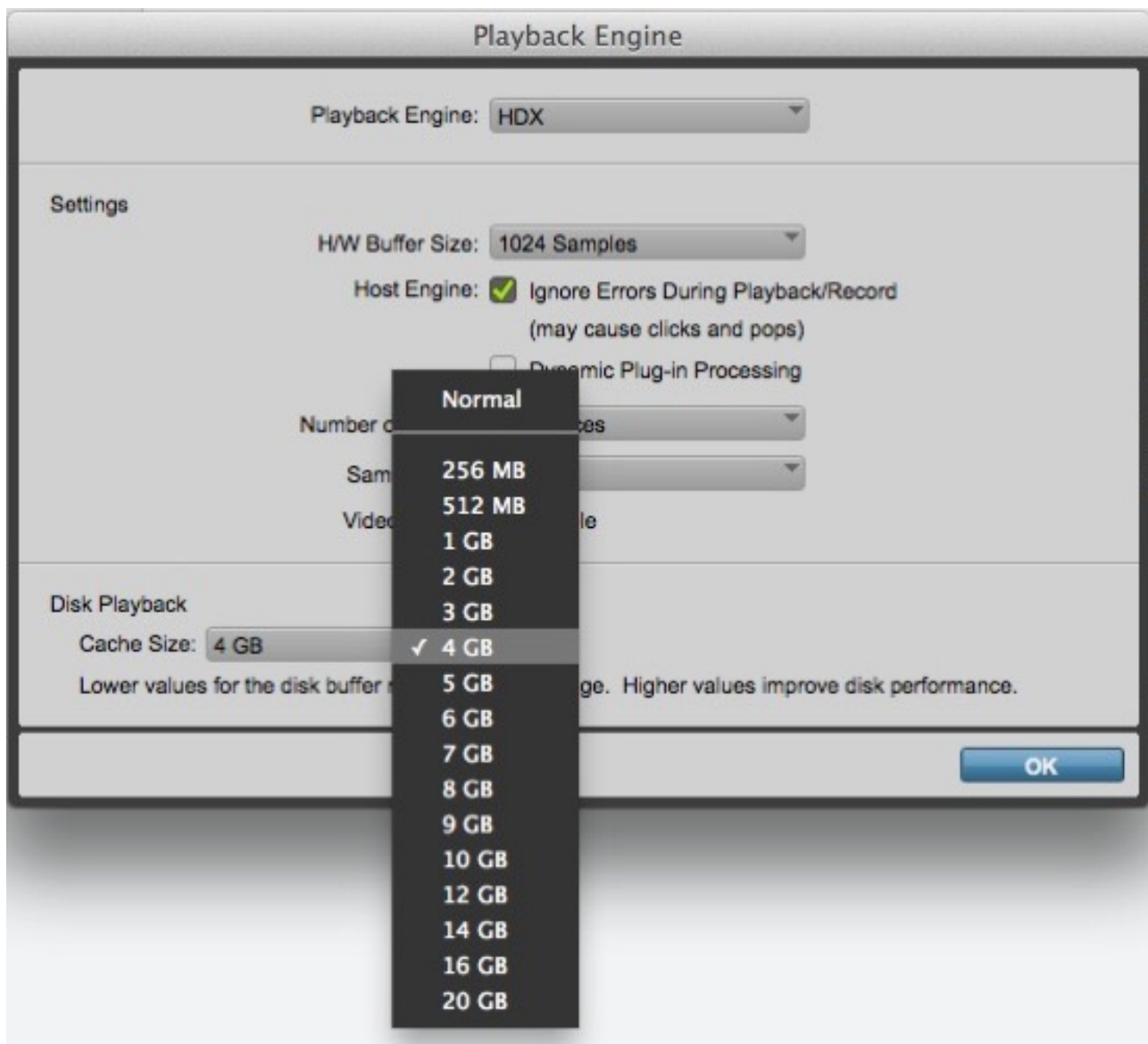
Complexity Of Offline Bounce

In Pro Tools HD software Pro Tools can create multiple files from different sources allowing the creation of stems, or multi track freezes in a single pass. Offline bounce is limited to a single stereo track in native Pro Tools software.

The Pros And Cons Of Online And Offline Bounce

Offline bounce can be a huge time saver on large projects and was one of the most requested features for Pro Tools. Whilst offline bounce can save the user time most professionals would check an audio file before sending it out as the final master, of course this can only be done in real time which defeats the object of rendering it in faster than real-time. However on balance the addition of offline bounce is a feature that brings great benefits to Pro Tools users.

C Is For Cache And Clip



Caches are a key part of any computer system and effectively are temporary stores designed to retrieve data quickly. For example, browsers use them so you don't have to keep downloading the same images again and again and caching appears in two places in Pro Tools disk caching in Pro Tools HD and Wave Caches for the waveforms in the clips.

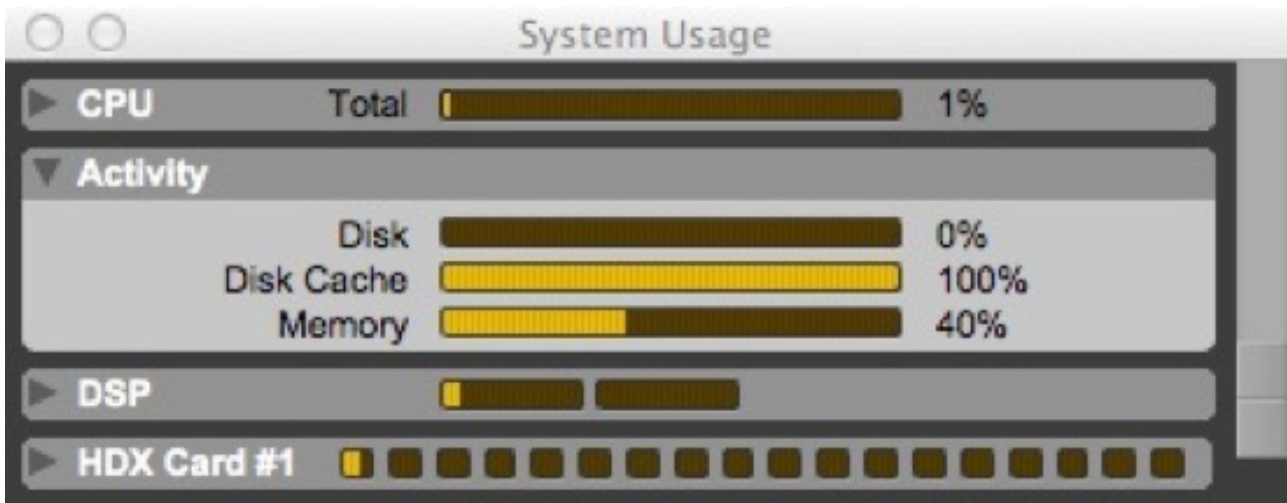
Disk Cache (Pro Tools HD Only)

In the Playback Engine the Cache Size setting how much Memory (RAM) the Avid Audio Engine (AAE) allocates to pre-buffer audio for playback and recording. In most cases, the default setting of Normal is the best Cache Size for most sessions.

With Disk Cache in operation, Pro Tools HD loads some of the audio files used in Pro Tools sessions into RAM for cached playback so speeding up playback as Pro Tools doesn't have to pull the files off the hard drive. Pro Tools will load the audio files nearest to the cursor or playhead location. This is especially useful when working with shared media storage whether it is from an Avid Unity ISIS shared storage system or a small network attached storage drive on your home

network. The primary advantage of the Disk Cache feature is that it will take the load off your storage media, because Pro Tools has pre-loaded the media into RAM.

To determine the maximum amount of RAM available for the Disk Cache, Pro Tools checks how much RAM you have in your computer and subtracts 4 GB so in the screen shot above the computer has 24GB of RAM.



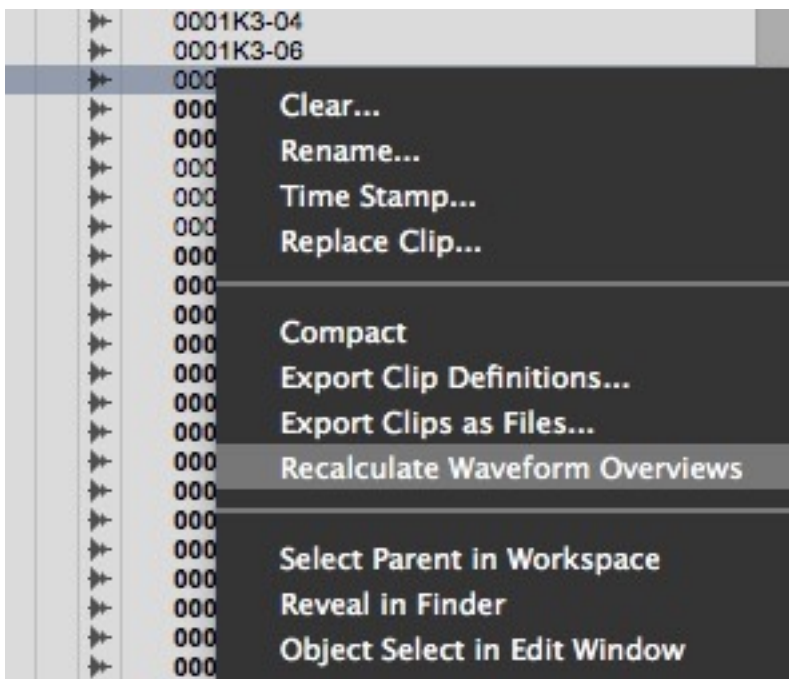
You can use the Disk Cache and Memory meters in the System Usage window to determine whether to assign more or less RAM to the Disk Cache for the current session. In this example the Disk Cache is full up but it is not clear if the whole session has been loaded. If you hover over it with the display tips option on it will tell you if you need to allocate more RAM to the disk cache to get the full session into RAM.

WaveCache File

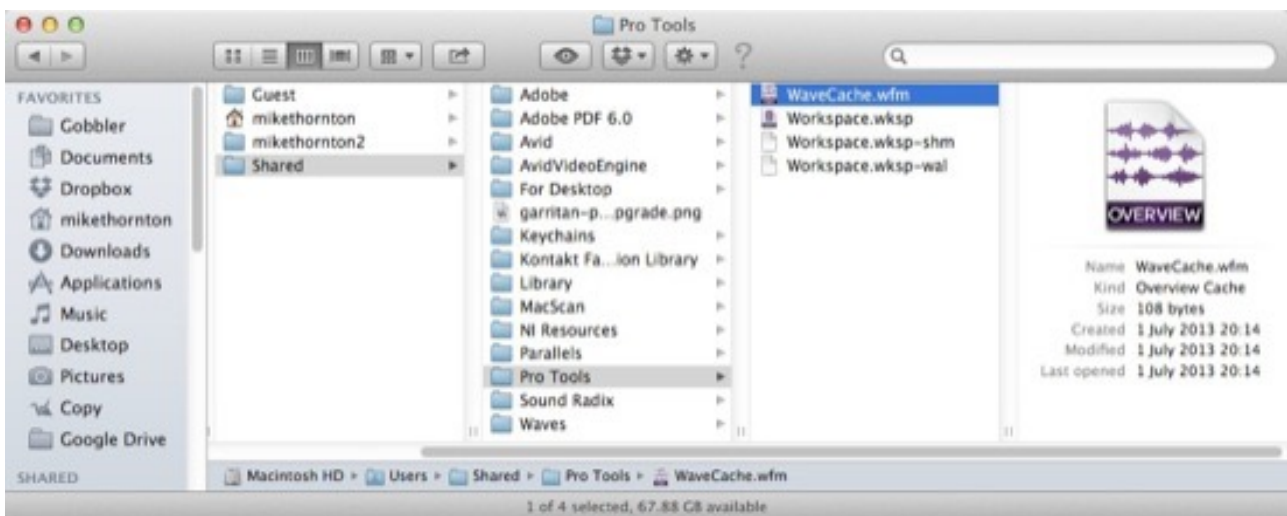
The other place Pro Tools uses caches is for the storage of the waveform data which it stores in the WaveCache.wfm file.

By storing waveform data in the WaveCache file, sessions open more quickly. The session WaveCache file can be included whenever a session is transferred to another Pro Tools system (7.x and higher).

Deleting or trashing a WaveCache file will not mess up your session or your system. However, be aware that when you next open the session it will take longer because Pro Tools has to recalculate waveform data for any associated audio files and create a new WaveCache file.



But before you delete this to deal with a waveform display issue it is always worth using the Recalculate Waveform option in the Clip List by right clicking on the problem clip in the clip list and selecting Recalculate Waveform Overviews. If that doesn't fix it then it is worth considering deleting the WaveCache file.



You may not find a WaveCache file in the Session folder but Pro Tools maintains another WaveCache file inside the Databases folder. This global WaveCache file stores waveforms that cannot be written back to the sound file, such as read-only files, files on network and other read only volumes, and interleaved files.

- On Mac, the WaveCache file is stored in /Users/Shared/Pro Tools.
- On Windows, the WaveCache file is stored in <Systemdrive>/Users/Public/Pro Tools.

Clip

Recently we went through a renaming process in Pro Tools to align the names with Media Composer and at that point what had been called regions ever since Pro Tools started became clips.

What is a clip?

A clip is a segment of audio, MIDI, or video data. A clip could be a drum loop, a guitar riff, a verse of a song, a sound effect, some dialog, or an entire sound file. Because a clip can be a segment of a file or the whole file it can be confusing to know which is which. But there are several tips to help you to identify them.



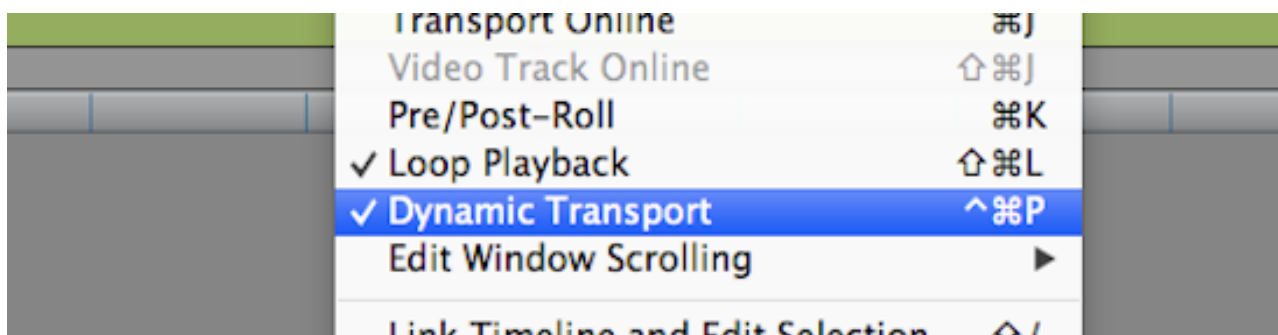
In the clip list, what we used to call the region list, some items are in bold type and some are in light type. The bold type ones are the whole files, the original media. The light type items are edits from those original files. You can see in the screenshots above that on the right, there is an original file "Anna 2 rt1" in bold type, and then below there are a number of items in light type which are edited clips based on the original file. Because Pro Tools is non destructive in the way it edits, you won't find a file called "Anna rt1-04" in the Audio Files folder. As you see on the left the only files in the Audio Files folder for the session are the original files which are displayed in bold type in the clip list.

Because you can rename clips it isn't always clear what the original file name is. A recent feature has added clip info to the Name window which enables you to see what the original file was called.



Double click with the Grabber tool on a clip on the timeline and the Name window will open. If it looks like the one on the left, then click on the little triangle to the left of Clip Info and it will extend and display the info on that clip including the parent file's name.

D Is For Dynamic Transport



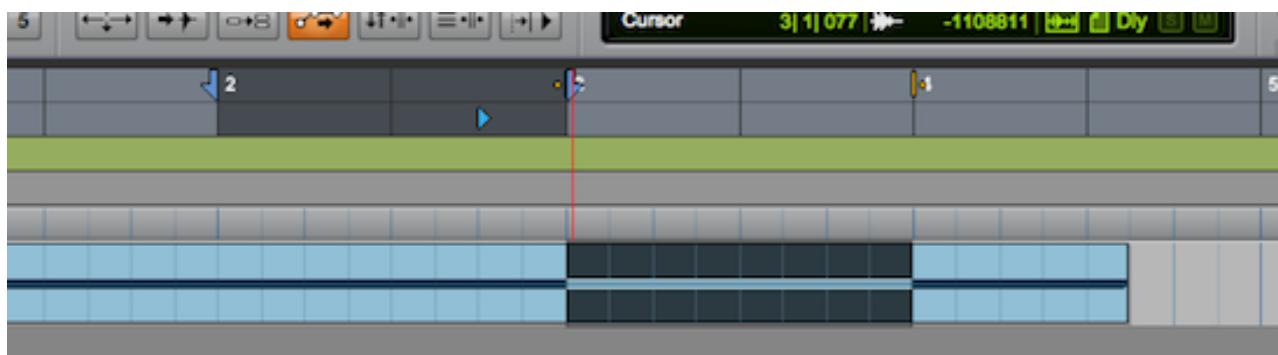
Dynamic transport is the perfect way for me to link this A-Z of Pro Tools post with last week's Pro Tools Fundamentals post on playback modes. Dynamic transport is the fifth playback mode, the others being normal, loop, prime for playback and half speed playback. Much misunderstood (especially by me, for a long time), dynamic transport is very useful once you understand what it is and what it does which can't be achieved using the other pro tools playback modes. To enable dynamic transport hit CMD+Ctrl+P (Cntrl+Start+P on the PC), select it from the options menu or right-click on the play button.

Three things happen automatically when dynamic transport is instantiated:

1. loop playback is switched on
2. Timeline and edit selections are unlinked
3. The primary timeline ruler doubles in depth revealing the playback start marker

What Is It For?

The first use I became aware of for dynamic transport was logic style dragging of a looping timeline selection. if you are looping bars 1-4 and you want to loop bars 5-8 you can simply grab the grey timeline selection between the blue timeline selection arrows. This is a method of working familiar to users of many other DAWs. For me it is particularly reminiscent of Logic but similar features are available in Cubase etc. However this is secondary to the real point of dynamic transport. Dynamic transport allows you to start playback from anywhere on the timeline, breaking the link between the timeline selection and playback. Really useful for auditioning loop points - rather than having to start playback from the beginning of the timeline selection, the playback start marker allows you to start playback from just before the end of the timeline selection saving you having to sit through the entire loop just to check the loop point.



Anything Else?

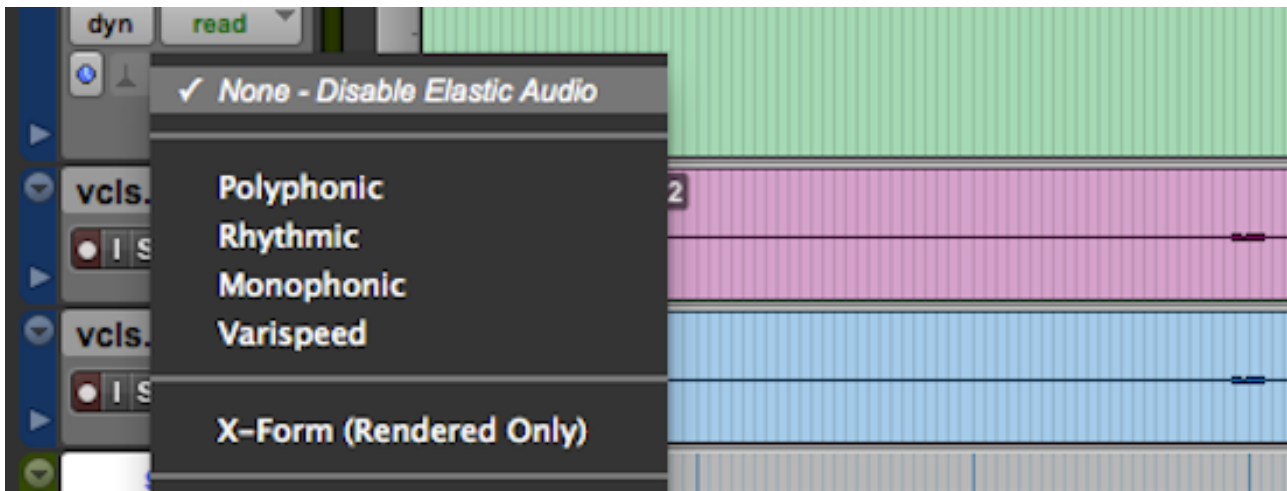
Option/Alt-clicking the timeline selection snaps the edit selection to the timeline selection - Useful to know as switching to dynamic transport unlinks edit and timeline selections.

They can be re-linked when in dynamic transport but using this option-click trick is all I ever need.

There are a couple of preferences for dynamic transport in the options tab which are worth investigating. "Play start marker follows timeline selection" is switched on by default. This makes the play start marker update to the in point of the timeline selection when the timeline selection is moved. "Timeline insertion/play start marker follows playback" does the same thing as the insertion follows playback button on the edit window toolbar. In fact newer users of pro tools might not be aware that this used to be the only place you could toggle insertion follows playback apart from pressing the N key. Is it any surprise I got so confused about why the playback behaviour of my system seemed to change randomly from time to time?

It's worth saying that use of pre-roll isn't compatible with dynamic transport and trying to use both at the same time gets pro tools in a bit of a dither - Hmmm, "Dither" begins with D.

E Is For Elastic Audio, Edit Mode And Export



Elastic Audio

Elastic Audio is Pro Tools' real time timestretch, very like Logic's flextime, Cubase's audio warp and the similar features found in Ableton and Studio One. In Pro Tools elastic audio has to be enabled on a per track basis. Five algorithms are available suitable for different types of material:

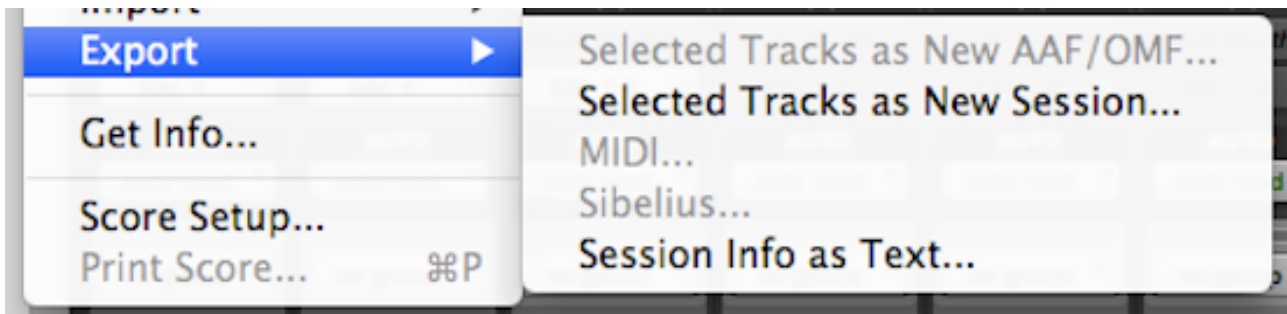
- Polyphonic - suitable for general use and the only algorithm which offers independent pitch manipulation known as elastic pitch
- Rhythmic - preserves timing and transients and as such is suitable for rhythmic material
- Monophonic - analyses frequency content as well as amplitude making it particularly suitable for vocals and other monophonic material
- Varispeed - links playback speed to pitch in the same way as varispeeding a tape machine or vinyl would
- X-Form - high quality processing available offline only, often used instead of one of the real time modes after all the tweaks are complete for the best possible quality.

Its worth knowing that the analysis elastic audio has to complete before any manipulation is possible is performed on a per file basis, not per clip, so if you are trying to timestretch a 10 second subclip from a 2 hour file the analysis will take a long time as the whole parent file will be analysed. In this situation a good workaround would be to consolidate the clip to a new file first. For more on using elastic audio [check Russ' video here.](#)



Edit Modes

Pro Tools Edit modes have been covered before in a Pro Tools Fundamentals post earlier this year. For musicians slip and grid mode are the Pro Tools equivalent of switching snapping on and off and for post, spot mode and shuffle are invaluable. If you are a musician check out spot and shuffle, they are useful to us too and if you are working in post you probably already use grid but set to frames instead of bars and beats. [Find out more here.](#)



Export

Sometimes its necessary to bring something out of Pro Tools in a form other than a bounce of your track. For these occasions Pro Tools has a few exporting options, some of which I can't say I use often but like so many things they are invaluable on those occasions when you need them.

Pro Tools can export the following:

- Selected Tracks as New AAF/OMF
- Selected Tracks as New Session
- MIDI
- Sibelius
- Session Info as Text
- Export Clip Definitions
- Export Clips as Files
- Export Clip Groups

Selected Tracks as New AAF/OMF

AAF and OMF are well known to the post community but less so in music. The idea of both is to provide a platform independent file format for moving projects between different platforms. AAF is a more recent version building on the basic OMF format. Both offer a way of exporting media from a project maintaining their track and timeline information.

Selected Tracks as New Session

This feature offers the option of saving a copy of a session using only the tracks you have selected. This option, found under export in the file menu is identical to saving a session copy and checking the “selected tracks only” box.

MIDI

Exporting MIDI files is strangely nostalgic for me, Its something I haven't done much in a long time but if you need to export MIDI from your session as either a type 1 or type 0 file the option is right there under the export options.

Sibelius

For the readers amongst us (sounds like a line from a Bill Hicks routine), the option to export MIDI to Sibelius is here.

P L U G - I N S L I S T I N G				
MANUFACTURER	PLUG-IN NAME	VERSION	FORMAT	STEMS
Avid	Pro Limiter	11.0.0d528	AAx Native	Stereo / Stereo
	Pro Compressor	11.0.0d528	AAx Native	Mono / Mono
	Pro Compressor	11.0.0d528	AAx Native	Stereo / Stereo
	Mod Delay III	11.0.2d626	AAx Native	Mono / Mono
	SonsAop PSA-1	11.0.2d626	AAx Native	Mono / Mono
	EQ3 1-Band	11.0.2d626	AAx Native	Mono / Mono
	EQ3 7-Band	11.0.2d626	AAx Native	Mono / Mono
	EQ3 7-Band	11.0.2d626	AAx Native	Stereo / Stereo
	Click II	11.0.2d626	AAx Native	Mono / Mono
	Dyn3 Compressor/Limiter	11.0.2d626	AAx Native	Mono / Mono
	Impact	11.0.0d528	AAx Native	Stereo / Stereo
	ReVibe II	11.0.1d544	AAx Native	Mono / Mono

Session Info as Text

From a comprehensive list of files used, to a list of plug-ins used in the session through to a full EDL, this feature can provide it. Far more useful in post than it is in music but to quickly check compatibility between systems when sharing a session this is a useful feature for musicians too.

Export Clip Definitions

This is slightly obscure and I can't say I've ever used it but as Pro Tools stores subclips as in and out points in a referenced audio file, if you want to export the subclip rather than the whole file then exporting clip definitions allows this. When exported rather than just whole audio files being available in the import audio dialogue, any exported subclips are available for import too. It is useful if you want to export an audio file to another application that supports subclip data or clip definitions.

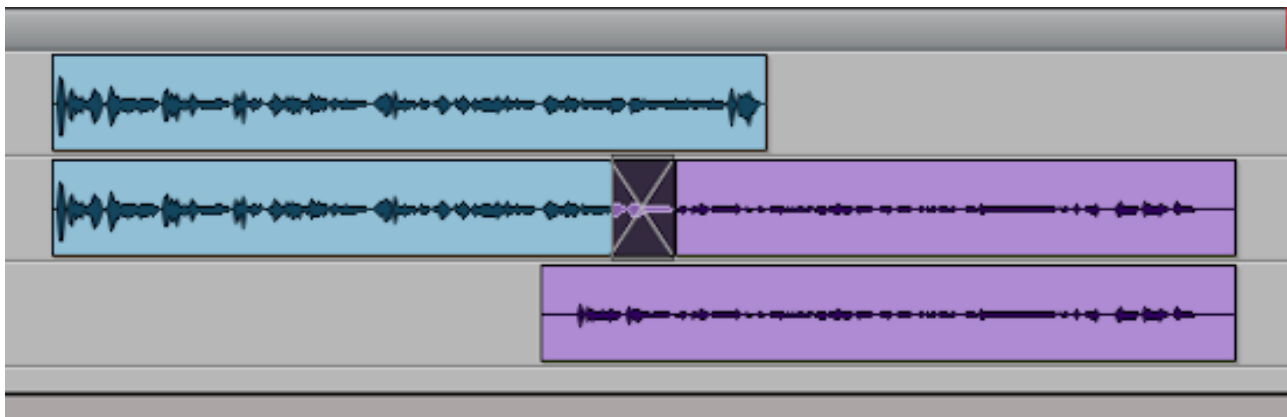
Export Clips As Files

Exporting clips as files creates whole files from subclips, this is similar to exporting clip definitions but creates copies of subclips which can be used by any platform, the downside is the potential to needlessly duplicate audio, unlike importing clip definitions which reference the parent file.

Export Clip Groups

As an extension of exporting clip definitions, it is possible to import clip groups, making it straightforward to prepare material across several tracks for re-use and to import the grouped clips maintaining the possibility to ungroup and edit the content unlike an bounce.

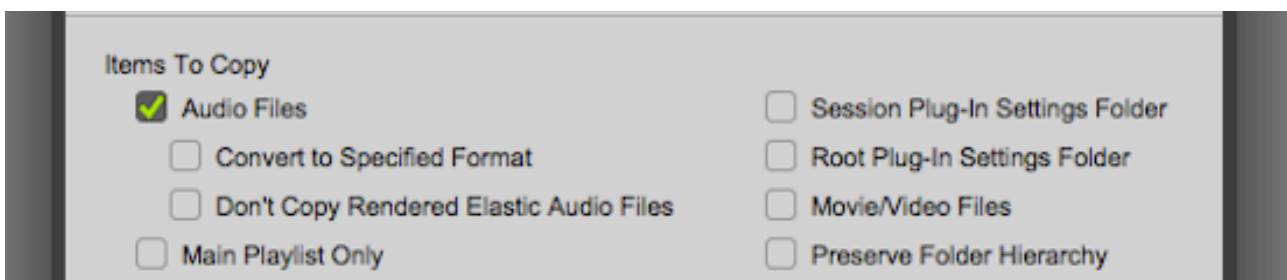
F Is For Fade And File



Continuing our journey through the A-Z of Pro Tools, the first letter of 2015 is F. There are a few candidates here. Fades are worth a mention as are files.

Files

Unfortunately in my experience when introducing students to Pro Tools, file management is the biggest single barrier to overcome. For many, Pro Tools is their first experience of dealing with software which references assets. Given the direction of current operating systems, and with iOS locking the user out of the file structure altogether, it seems that a division between pro users and consumers is going to emerge, with many not having to engage with file management at all in the future. I'm far from convinced this is a good thing but given the amount of people I meet who seem to rely on spotlight to manage their files (!) I can see a time when it will no longer be safe to assume that someone who is using professional tools on a computer knows how to look after their files. At the end of the day file management is about being organised and few of us are as organised as we should be but to make sure your sessions are properly archived, begin with the save copy command. If you need a refresher on this try this [article on Pro Tools session structure](#).

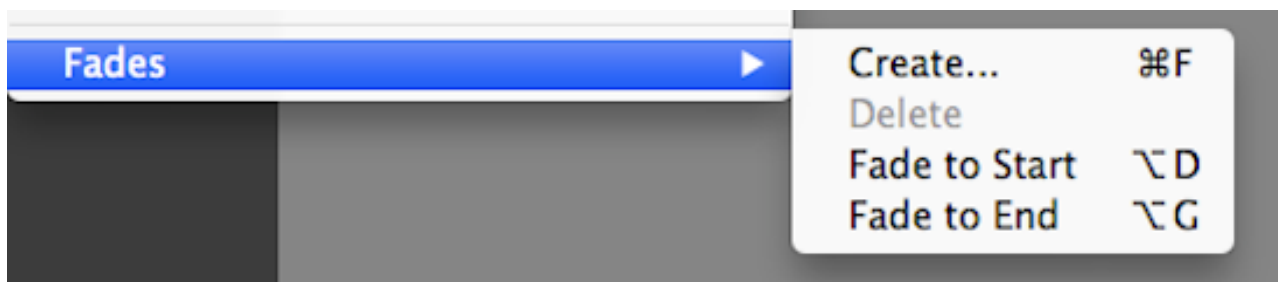


Fades

Fades are bread and butter in audio editing. When working with people who are new to Pro Tools, it regularly surprises me how many try to create fades using volume automation, which would be achieved much more easily using conventional clip-based fades. Fades are very important but the basics are reasonably self-explanatory. If you have never created any fades then members can watch this tutorial by Russ on creating fades using the smart tool and fades dialogue.

Preview

Until very recently Pro Tools printed fades as separate audio files in a dedicated Fades folder (the contents of which seemed to get lost or corrupted regularly and had to be rebuilt). This was a legacy behaviour dating right back to the early days of Sound Tools where crossfading between regions would push the system above its maximum voice count. Crossfading between two stereo regions on a stereo track used four voices for the duration of the crossfade: Two for the fade out and two for the (simultaneous) fade in. Rendering fades neatly bypassed this increase in simultaneous voices. Thankfully fades are now rendered in real time in Pro Tools today.

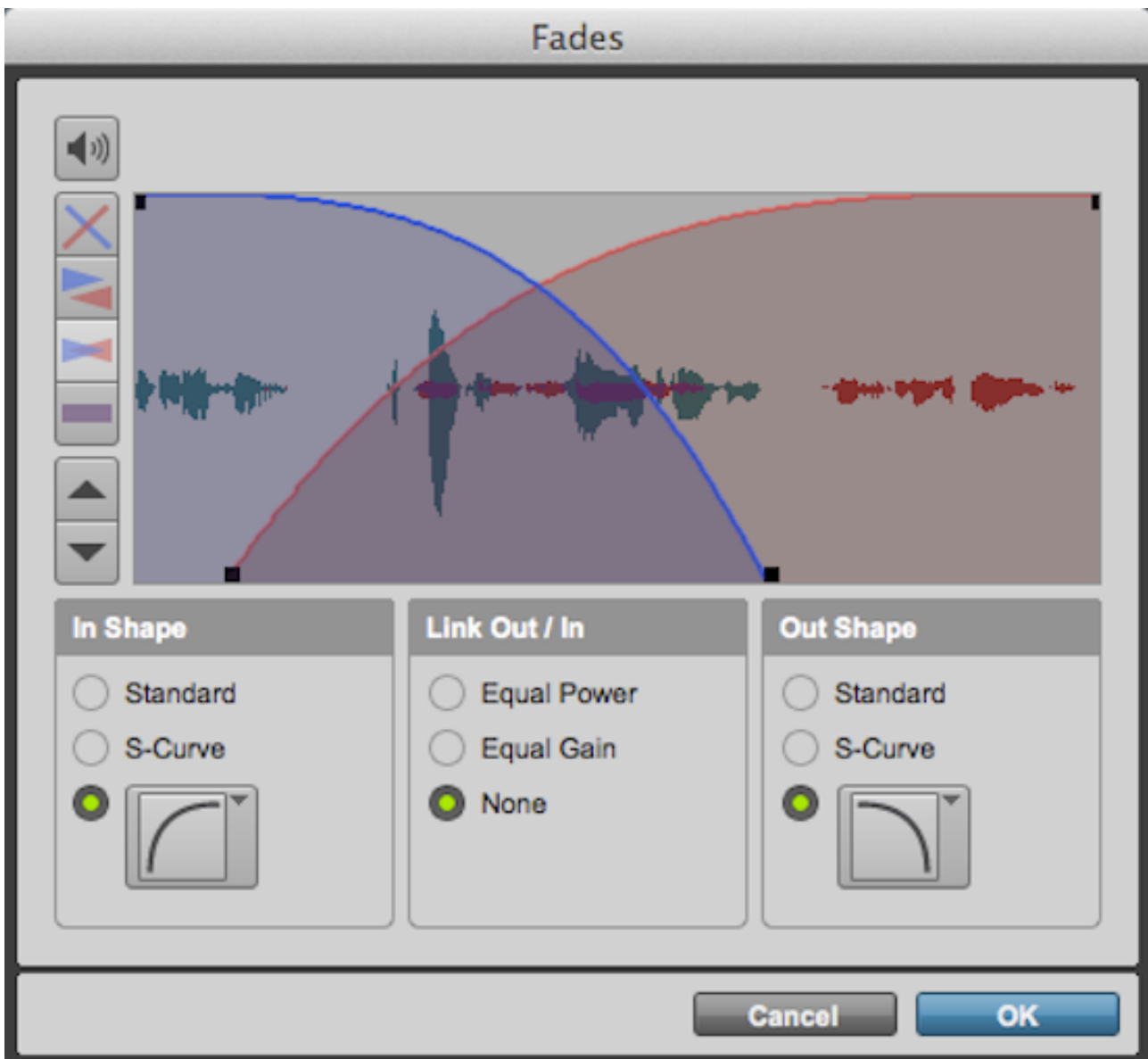


Fade Shortcuts

While many people edit very effectively using just the Smart Tool, I have never been particularly fond of it. I prefer to use keyboard shortcuts. Command F (Control F on PC) is well known but if you don't use Command Focus when creating fades it is definitely worth trying. With Command Focus active in the Edit window (Command+Option+1 on a Mac, Control+Alt+1 on PC) pressing D will create a fade in from the clip in point to the insertion point (assuming the insertion point is in the clip), G will create a fade out from the insertion point to the clip out point and, if an edit selection exists crossing a clip boundary, F will create a fade (in, out or crossfade) depending on whether the edit selection is over the head, tail or between two adjacent clips.

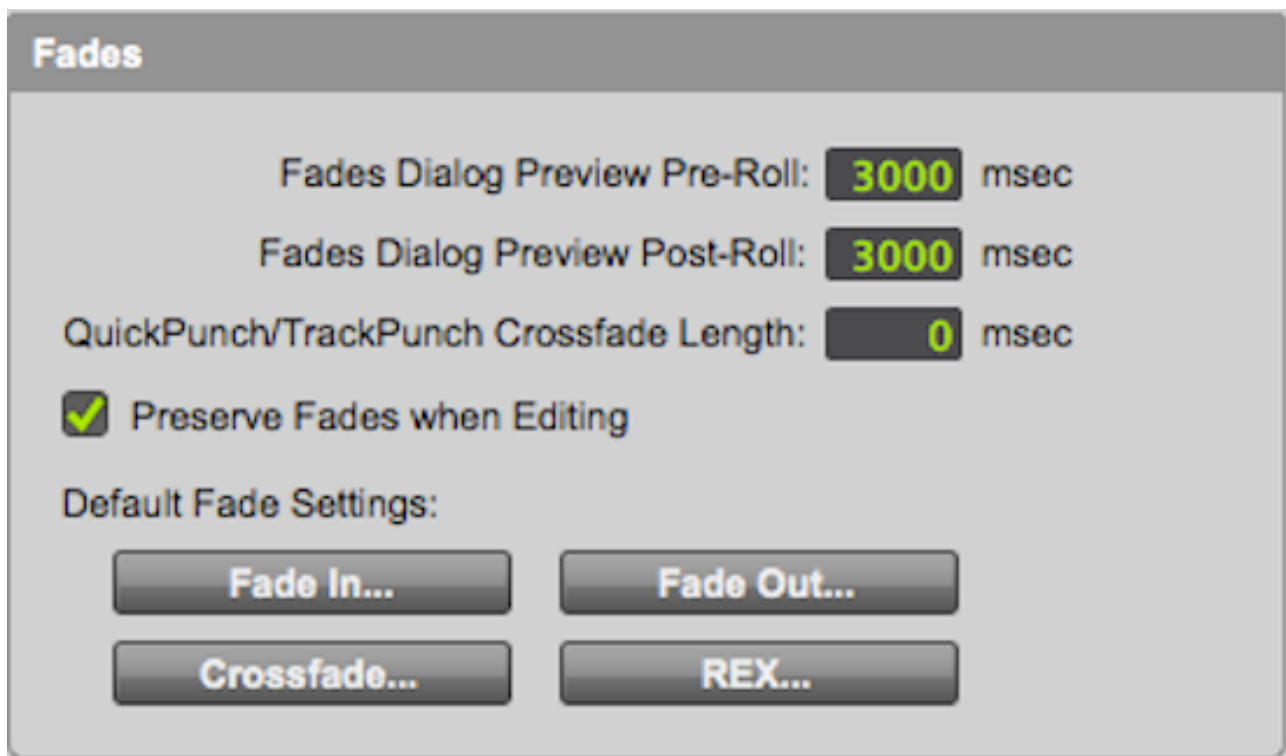
Trimming Fades

Usefully it has always been possible to trim fades using the Trim tool. This allows the fade length or the in and out points to be tweaked freely but if you want to tweak the shape of the fade itself it is necessary to use the fades editor.



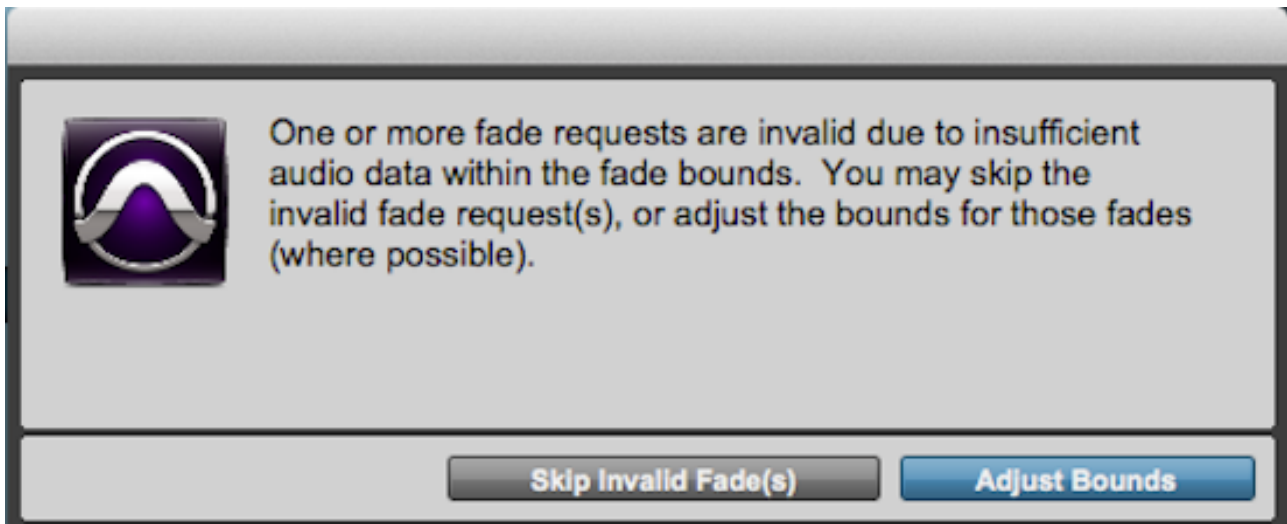
Fade Editor

The fades editor window was, as far as I'm aware, the last piece of the Pro Tools GUI to receive a facelift and I found it rather amusing to see a window which was still so stubbornly blocky and refusing to believe it wasn't still part of Pro Tools 5! Since Pro Tools 11 it has finally joined the rest of the interface but the contents of the window are still unchanged, giving fine control of both the incoming and outgoing fades with useful, standard fades. The interface doesn't allow for the direct dragging of the crossfade point like many would expect but by setting Link Out/In to none it is possible to manipulate the fades by handles at each end. To be honest this isn't somewhere I spend much time other than choosing between equal power and equal gain fades.



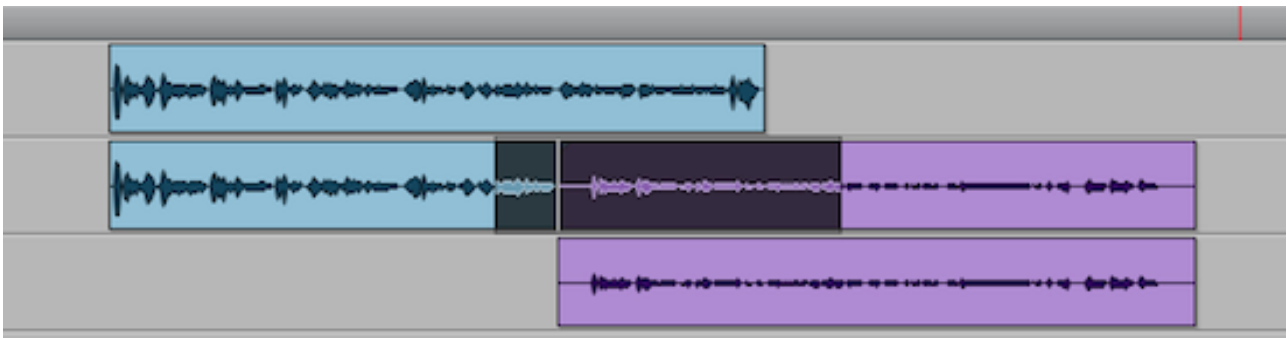
Default Fade Preferences

The choice of whether you should choose an equal power or equal gain fade only really affects crossfades. The correct choice depends on exactly what is being crossfaded with what. If the incoming and outgoing clips are "correlated" then equal gain is the right choice. If the material isn't strongly correlated then equal power is the correct choice. This business about correlation is a bit technical but simply put it is about how similar the two sounds are to each other, its a bit more complicated than that but it is important because if you sum two uncorrelated sounds together then the overall level will rise by 3dB, if you sum two correlated sounds together the overall level will rise by 6dB. Because of this the two choices exist. If you use equal power to crossfade strongly correlated sounds then there will be a noticeable rise and fall in level (3dB) during the crossfade. Similarly if equal gain is selected for use on uncorrelated material there will be a corresponding dip in level during the crossfade. The default fade shape can be set for fade in, out and cross in the editing tab of the preferences. If you need the other shape select it from the fades dialogue.



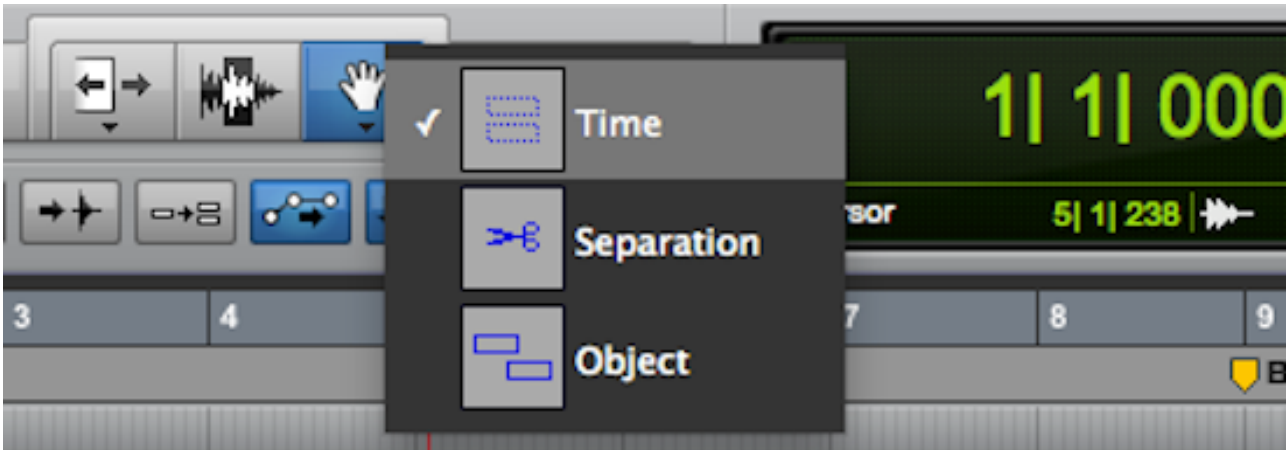
Invalid Bounds

An area which causes much confusion is the subject of a crossfade having “invalid bounds”. I remember discussing this with a BBC editor who told me about a feature of her system, which displayed the “handles” of a clip to avoid this. I’d love to see this as a view option in Pro Tools, toggled with a modifier? The handles refers to the audio available beyond the in and out points of the clip. In a crossfade there has to be audio available before the in point of the incoming clip and after the out point of the outgoing clip for the crossfade to be possible. In the image below the whole file clips are displayed above and below the crossfade track. In this example a crossfade of the duration of the edit selection wouldn’t be possible as there isn’t enough audio in the parent files to allow a crossfade of that length.



Stay tuned for the next instalment which predictably enough will be brought to you by the letter G (cue Sesame Street music....)

G Is For Grabber



It's unlikely that anyone who has used Pro Tools at all hasn't come across the Grabber tool. Used for moving clips on the timeline and creating and manipulating automation breakpoints and MIDI, the Grabber tool comes in three variants, accessed by clicking the disclosure triangle underneath the Grabber in the toolbar or by repeatedly pressing F8. They are the Time Grabber, the Separation Grabber and the Object Grabber.

Time Grabber



The "normal" one, actually the one which gets used 99% of the time. The Time Grabber selects entire clips and allows you to move them. Selecting a second clip deselects the first clip unless shift is held, in which case a contiguous selection is made, extending the edit selection to the end of the second clip.

Separation Grabber



The Separation Grabber behaves like the Time Grabber unless a clip is partially selected, in this case using the Time Grabber would change the edit selection to the length of the entire clip. The Separation Grabber separates a new clip at the edit selection in the same way as Command+E (Control+E on PC) would. This edit selection can cover multiple clips and multiple tracks though both must be contiguous, for non-contiguous grabbed selections you need the Object Grabber.

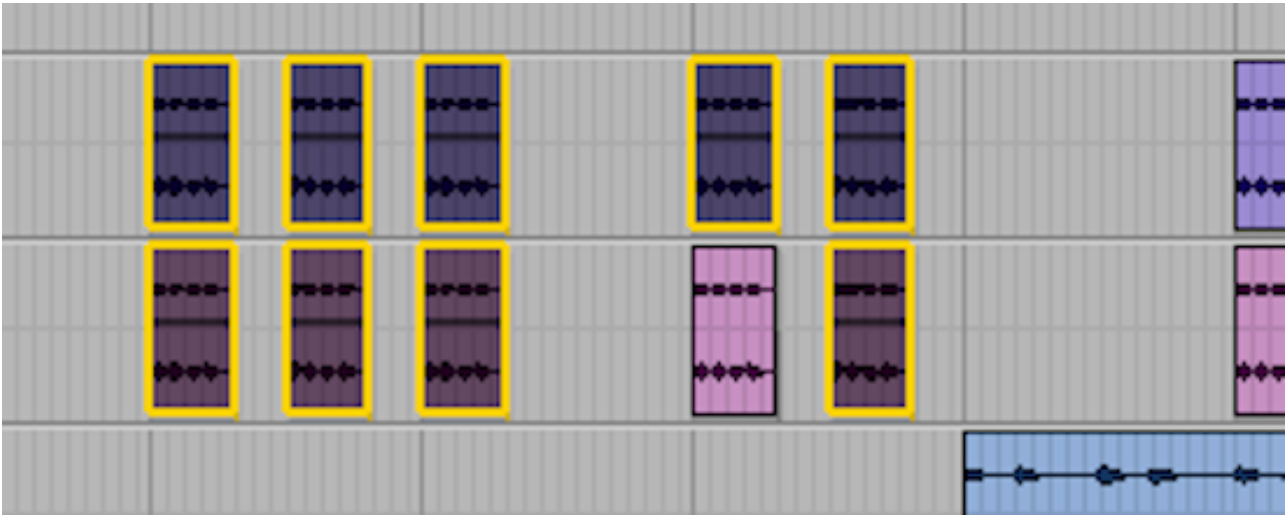
Object Grabber



Only available in Slip or Grid mode, the Object Grabber allows non-contiguous, whole-clip selections to be made. Clicking on a first clip selects the clip in the same way as the Time Grabber but holding shift allows multiple, non-contiguous clips to be made across multiple, non-contiguous tracks independently of any active edit groups. Object selections are indicated by a yellow outline around the selected clips and significantly the empty spaces on the timeline, between the clips in the object selection are not selected (i.e. dark grey, to indicate they are part of an edit selection). Possibly more useful than the Object Grabber tool itself is the possibility to create object selections from edit selections and vice-versa.



Edit selection

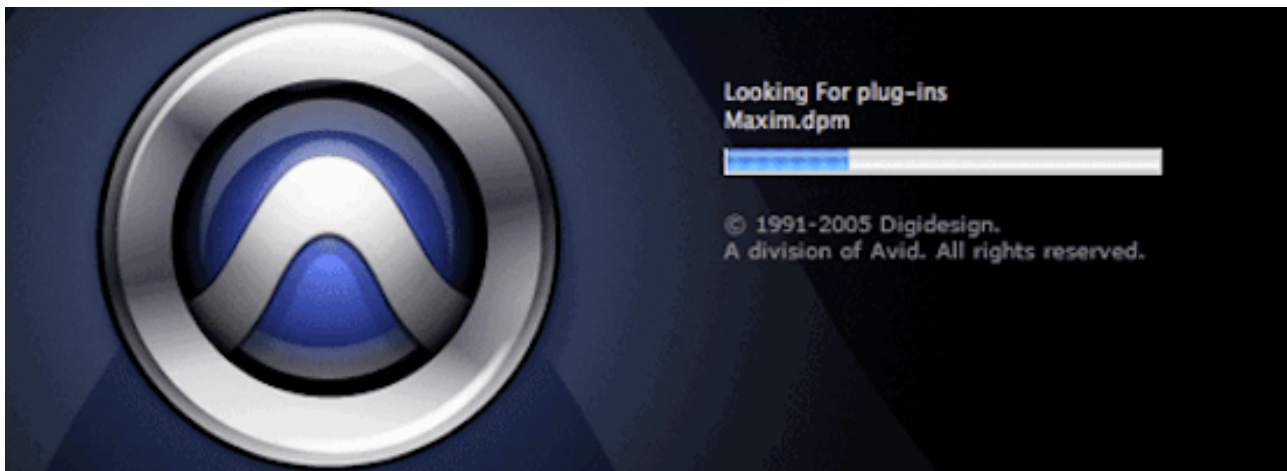


Object Selection (with one clip deselected using shift-click)

Edit and Object Selections

To change an edit selection to an object selection simply double-click the Grabber tool in the toolbar, any clips falling entirely within the edit selection will become selected as objects. Any partially selected clips will be deselected. In itself this isn't particularly useful but because the selection is now object rather than time based, it is possible to deselect individual clips from the object selection, far quicker than selecting around the clips you wish to exclude from a large selection. It is straightforward to turn an object selection to an edit selection by double-clicking the selector tool in the toolbar.

H Is For HD



We think of HD as software today but it is principally a hardware solution. Pro Tools HD was introduced in 2002 and was discontinued in 2011. Although its fair to say that the pain involved in abandoning the interdependent hardware and software of HD to move on to new hardware extended the life of HD, for a computer system 9 years is an awfully long time. I wasn't using HD systems prior to 2002 but the leap in performance represented by HD systems at the time was huge. For all of the debate around the relevance of hardware based DSP systems today, it is undeniable that Pro Tools HD was (and still is) a great product with an exceptionally long life. I use HD systems every day and in spite of a few idiosyncrasies, for music, tracking and mixing live bands, they still work brilliantly.

What is HD about Pro Tools HD?

The HD part of Pro Tools HD was ostensibly the increased sample rate. 24 bit recording was introduced in 1997 in Pro Tools III, by 2002 the current high end Pro Tools system was the Mix and Mix plus systems which offered respectable IO and track counts but were restricted to a 48kHz sample rate. HD offered new hardware and clocking specifically designed to support sample rates up to 192kHz. Even all these years later opinion on the importance of recording at high sample rates is divided but its easy to forget the enthusiastic rush towards high sample rates which was prevalent at the time and with consumer soundcards proudly displaying their 96kHz credentials, its understandable that a a professional system like pro tools had to get on board.

Timeslots in TDM 2

A major limiting factor in older Pro Tools systems was the TDM buss, the original TDM buss offered 256 timeslots in total. HD increased this to 512 timeslots per DSP, removing a major limitation. Of course all of this change necessitated expensive hardware upgrades similar to the change from HD to HDX and the hardware change didn't coincide with an major version change of the Pro Tools software - Pro Tools 11 is incompatible with HD hardware. The transition between Mix 24 and HD happened between 5.2 and 5.3 - hardly as big a change as v10 to v11.



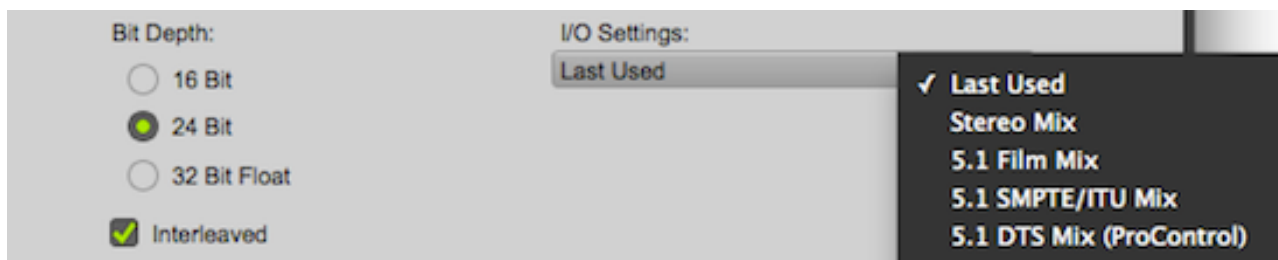
No Latency, No Problem

Today the processing power of an HD system often isn't the main reason to buy one, leaving differences between software aside, marketing restrictions (IO, voice count, track limitations) apply but the principal advantage offered by Pro Tools HD hardware (i.e. things you can't do running HD software without HD hardware) is the extremely low latency monitoring and the possibility of monitoring through DSP plug-ins. There is of course the halfway house solution of managing latency using interface-specific, dedicated mixer apps like those offered by Focusrite or UAD (and with UAD the possibility of monitoring through plug-ins) but working entirely within Pro Tools, HD or HDX hardware is the only truly low latency solution.

HD System, HD Software

The most visible distinction between HD and non-HD systems today is of course the software and so much has been said about the frustration felt by non-HD users at the arbitrary withholding of software features to drive sales of hardware that I won't add to it here. We all know that HD software offers features which non-HD software does not and many people feel strongly that these features should be available to all without the compulsory purchasing of any hardware. For all its occasionally clunky charm - for example having to insert a TDM plug-in before it if you want to monitor through an RTAS plug-in or constructing cunning workarounds involving printing to a track in destructive record and consolidating the clips on that track to avoid a real time bounce, depending on what kind of work you do, Pro Tools HD has facilitated so much work for such a long time that I think it deserves the entry for H all to itself.

I is for I/O, Insertion Follows Playback, Identify Beat, Instrument Track, Import Audio, Import Session Data



This week we are spoilt for choice, so many significant parts of Pro Tools relate to the letter I that its a good opportunity to revisit some of the great content already on the site.

I/O Setup

Pro Tools offers flexible, customisable routing and with the addition of mapped output busses in Pro Tools 9, sessions travel better between systems than they used to. People who work entirely in the box and on their own system can get by without visiting this page often but in my world, constantly moving sessions between systems, I'm in and out of here daily. If you could do with a primer, [Mike Thornton offers some resources](#).

Insertion Follows Playback

Put simply this controls where playback will start from after you press stop. Insertion follows playback and link edit and timeline selections are so important to understanding how playback works in Pro Tools that the first thing which came to mind when I started the Pro Tools Fundamentals series was [a tutorial on precisely this](#).

Identify Beat

Everyone knows how to move audio on the timeline but not everyone knows how to move the timeline to match audio. You don't have to use Beat Detective to build a tempo map. It all starts with Identify Beat. [Here is a video tutorial from Russ](#).

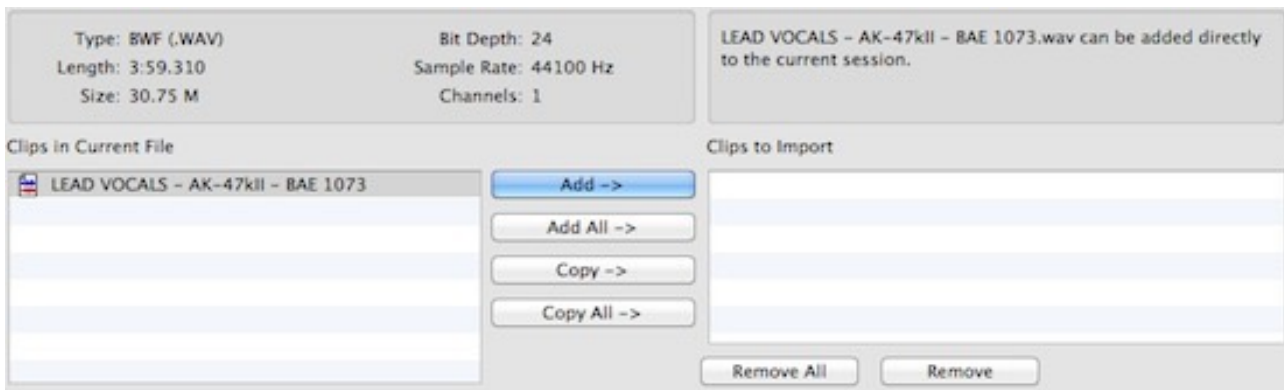
Instrument Tracks

In the old days (pre Pro Tools 7), to use a software instrument you had to create a midi track for the midi and route that to an instrument inserted on an aux input. Instrument tracks neatly combined both midi and audio into one, far easier format (as long as you know you have to show the instrument section in the mixer to find the midi controls - not at all beginner-friendly). [Russ explains all](#).



Import Audio

Although you can drag and drop audio in to Pro Tools or use the workspace browser, I encourage beginners to use the import audio window as it helps avoid some of the problems waiting to trap the unsuspecting newbie. [I wrote a piece on it last year.](#)



Import Session Data

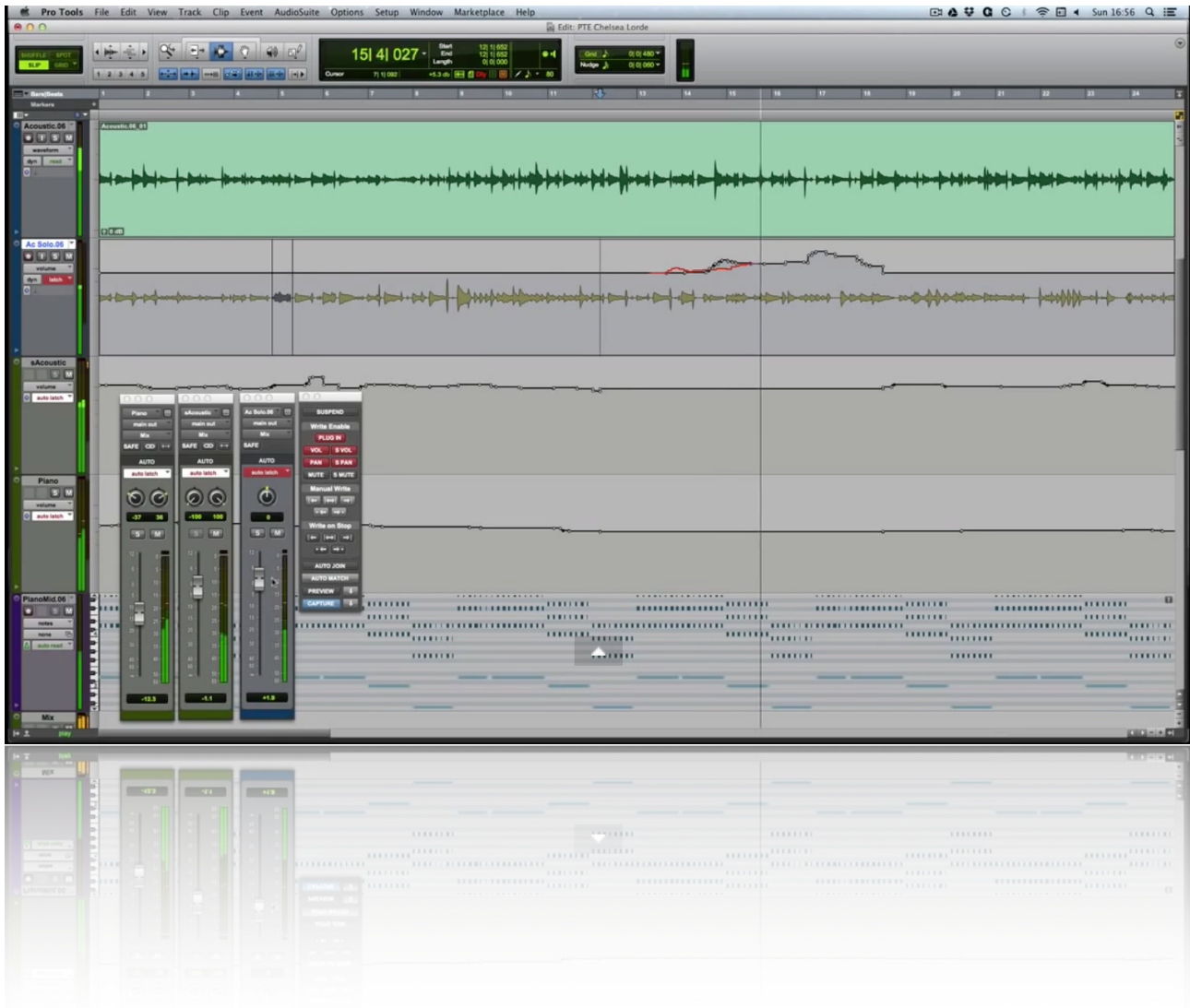
Pro Tools doesn't allow you to have more than one session open at the same time, neither does it officially support track presets. This might appear restrictive but if you know how to use Import Session Data then most of these restrictions fall away. Its a busy window, it looks complicated but its actually very simple. We have a video tutorial that covers this.

J Is For Auto Join

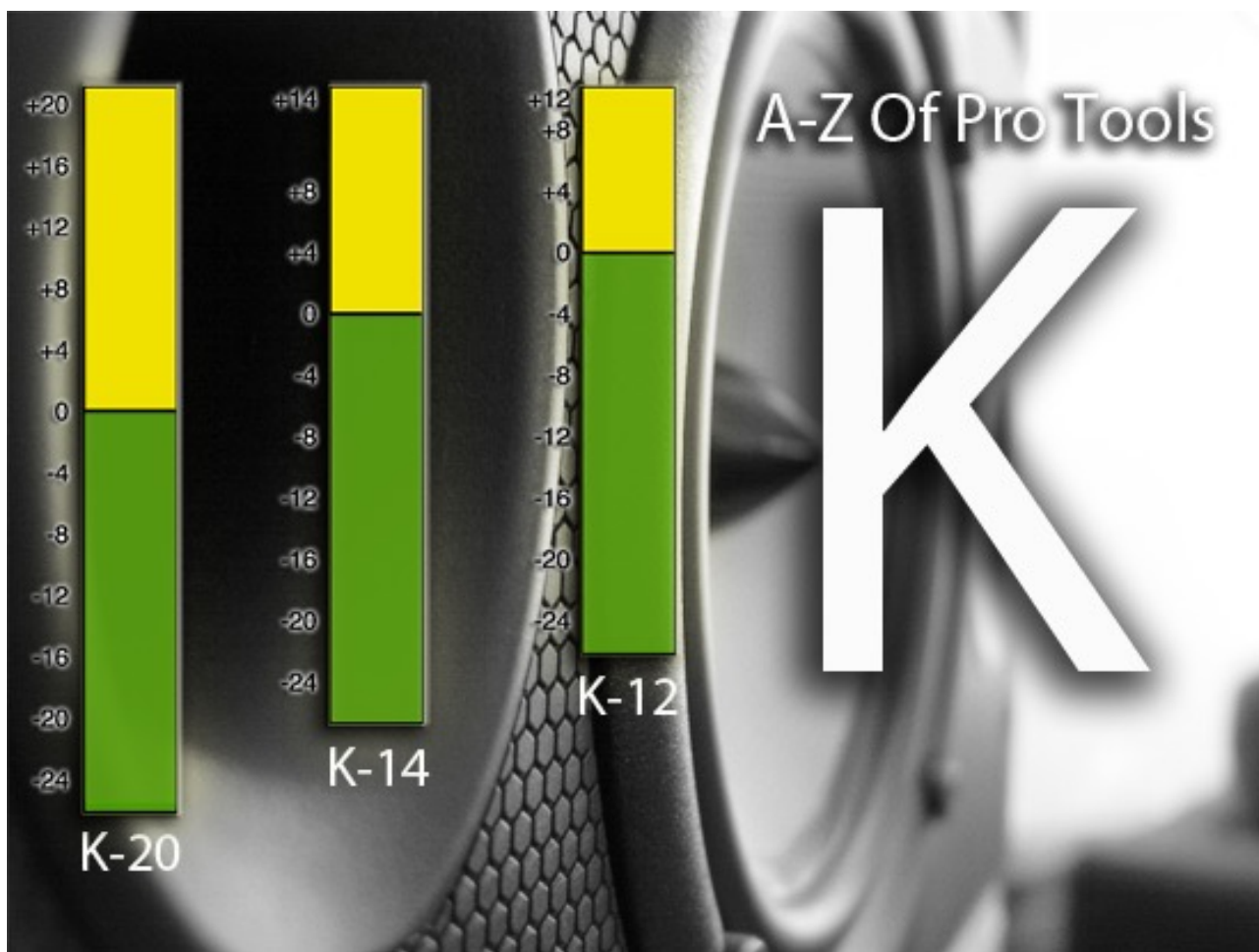
While last week the letter I offered a wealth of options, the choices are rather thin for J. One of the few candidates is Auto Join.

Much overlooked, especially by the music community, its both simple and useful but only available to HD users.

[Here is a video showing it in action](#)

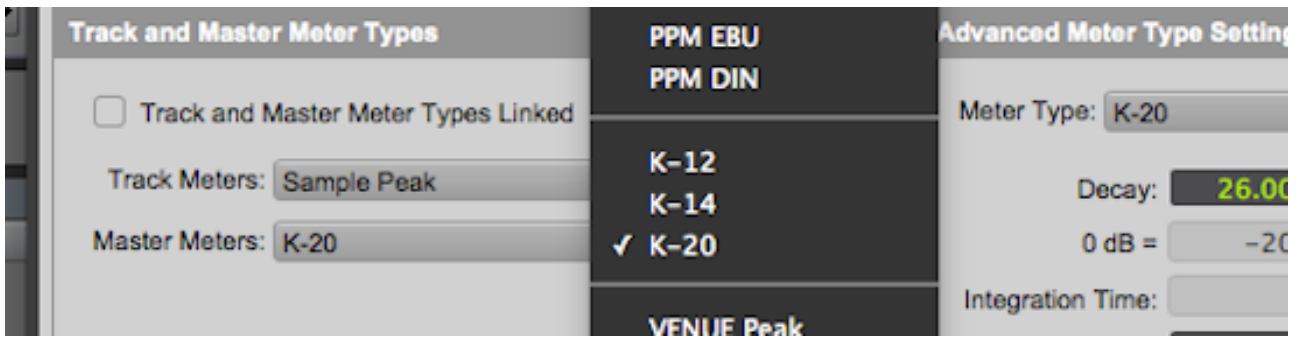


K Is For K-System



One area of Pro Tools 11 HD which received welcome improvements was the metering. It is a pity that there were no metering options based on the new loudness standards of EBU R128 and ATSC A/85 even though Avid told us when Pro Tools 11 was launched they would be added at some point, but the available options are still a vast improvement over the sample peak metering previously available. Most of this was aimed at the post community with options such as PPM meters, the offering for music mixing was the K System.

Designed by renowned mastering engineer Bob Katz, the K system seeks to address the over-use of dynamic compression and the resulting loudness war in music mixing by standardising metering with known monitoring levels. For a thorough explanation of this subject, Bob himself explains the system thoroughly in his article "[An Integrated Approach to Metering, Monitoring, and Leveling Practices](#)". It's important to realise that the K system has nothing to do with K weighting, the EQ curve which is used in loudness measurement to mimic the response of human hearing.

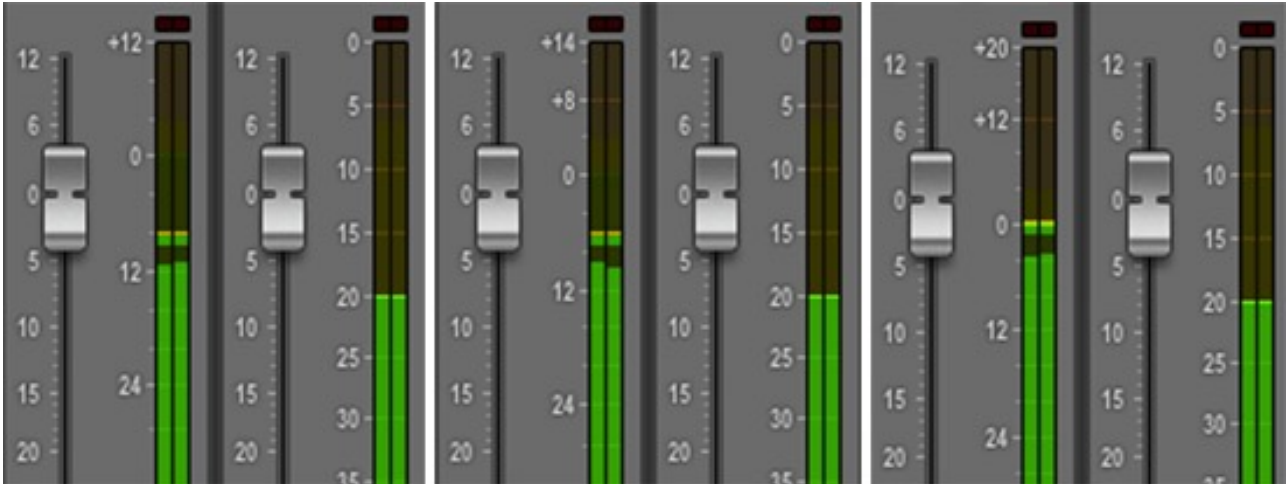


Peak Vs Averaged Meters

The principal meter used in DAW environments has historically been the sample peak meter. While this fulfils its role of monitoring headroom in a digital system it has never offered any meaningful information about the perceived loudness of the signal. In the days of analogue studios and tape machines, peak levels were less important and the VU meter was a commonly used device. While there are differences between perceived level and the indicated level as shown on a VU meter, it was still a useful device as it is essentially an averaging meter. In a similar way to Dorrough meters, the K system combines a peak and an averaged level meter but crucially it directly links programme dynamics with monitoring level.

Crest Factor And Perceived Loudness

Central to understanding the K system is understanding crest factor. This describes the difference in dB between the averaged level of the signal (the kind of level reported by a VU type meter) and the peak level (as reported by a sample peak meter). Even the most dynamic music typically has a crest factor of less than 20 dB, usually considerably less. In his excellent book *Mastering Audio, the art and the science*, Bob Katz observes an inherent link between monitor position (meaning the position of the volume knob, not the loudspeakers) and the use/over-use of dynamic compression. It seems that typically listeners respond most positively to average programme levels around 83dB SPL and if monitors are attenuated, a tendency exists for engineers to use dynamic compression to bring the average level of the music back up towards this 83dB "comfort zone". Conversely, if monitor levels are excessive, the tendency to bring up the average level using compression is reduced.



Examples of (L-R) K-12, K-14 and K-20 meters passing identical signals to a master fader with a sample peak meter.

There are three options in the K system: K-20, K-14 and K-12. The Pro Tools Reference Guide suggests K-20 at the mix stage to encourage a mastering-friendly mix, K-14 is suggested for mastering with K-12 being a possible option for broadcast. It should be noted that the K-system predates EBU R128 and ATSC A/85 and that it was always designed for music production rather than broadcast production.

Calibrated Monitors

It is because of the influence monitoring level has on the use of dynamics processing that the link between typical crest factor (i.e. dynamic range) and monitor calibration (i.e. precisely how loud your monitors are) is made. If your monitors are set to the appropriate level then most people will naturally mix towards this "comfort zone" of an average level of 83dB. The different K metering types are suggested metering/monitor levels which encourage mixing towards a target crest factor. Hopefully you can see that without the associated monitor calibration the metering with its variable 0db point is of little use. When mixing to K14 the 0dB point on the meter is 6dB louder but it should only be used with the accompanying -6dB attenuation of the calibrated monitor output. What you are trying to achieve is keeping the average level the same but encouraging use of different dynamic ranges through our perception of loudness. In fact, in a way the K System seeks to offer meters designed not to be looked at all but instead allowing your ears to be the judge of how loud something should be, which after all is what really matters to the listener.

L Is For Latency, Linking, Locations, Latch And Loop Recording

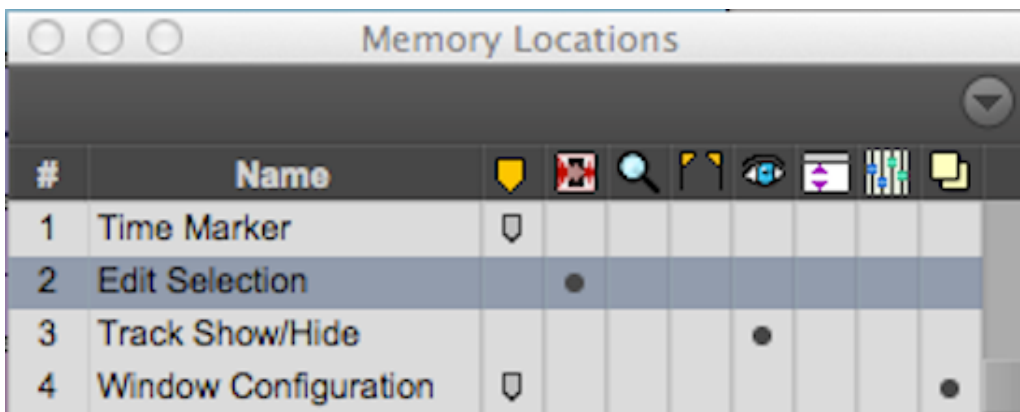


Latency

The first L which springs to mind is the bane of all computer recording systems - Latency. In audio systems latency is the distracting time lag between input and output in a recording system, usually encountered most obviously when recording audio or midi while monitoring the output. I covered this in some detail in the Pro Tools Fundamentals series last year so follow these links if you want to review this subject in more depth: [Managing latency part 1](#) and [part 2](#).

Linking

While it feels odd to be linking to posts about linking, its important to know how be able to fix missing files by relinking to them. In my experience the most common reason why Pro Tools can't find a referenced file is because a file has been added rather than copied to the audio files folder of the current project. There are lots of good reasons for adding rather than copying but I still advise people to leave the preference to automatically copy files in import checked. If you are unsure about this, most problems can be avoided by saving a copy and checking copy all audio files in the save copy dialogue. Some time ago Mike Thornton wrote a piece on [Linking Media](#). There are other examples of linking things in Pro Tools, for example linking panner controls: [Link Panners](#).

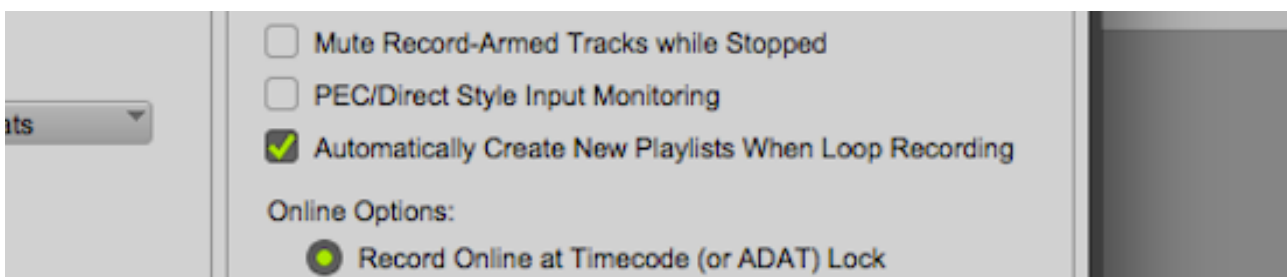


Locations

Although many of us refer to them as markers, there is more to memory locations than just marking locations on the timeline, read about some of the possibilities on using [Memory Locations](#), we have an excellent [Community Tip On Using Location 999](#) and another post offering ideas on [Other Uses For Memory Locations](#).

Latch

Latch mode is one of the four principal automation modes in Pro Tools: Write, Touch, Latch and Read. There are other modes besides these but users of any DAW will be familiar with these four common automation behaviours. In Latch mode an automated parameter writes automation when touched and continues to write after it is released overwriting any underlying automation until transport is stopped. Automation is a huge subject and when I'm asked by people who don't know much about Pro Tools just why so many professionals use it, I'll always mention the advanced automation features of Pro Tools HD as one of the areas which really sets Pro Tools apart from the best known other DAWs. Of these four modes latch is probably the most interesting as it useful for a first pass but also when fine tuning a mix, it offers the convenience of Write without the potential disasters Write mode can invite. An example of one of the more advanced automation features Latch mode offers was covered in this [Video On Auto Join](#) recently.



Loop Recording

Loop recording is a crowd-pleaser, Its not new but its still one of those features which gets a wow from those who haven't seen it before. Put simply it allows you to keep recording the same section over and over and keep all of the takes. This allows the player to get comfortable and experiment with different ideas over a repeating section but the real fun begins when you start comping your perfect take from all of the alternatives. If you've never tried it be aware that loop recording is not the same thing as recording in loop playback. There is a preference to create a new playlist from each pass which has to be ticked and most importantly of all, if you let a guitarist try this when tracking a solo remember to send the rest of the band home for the day, they won't be needed again til at least tomorrow!

M Is For Master Fader And Mute



Mute

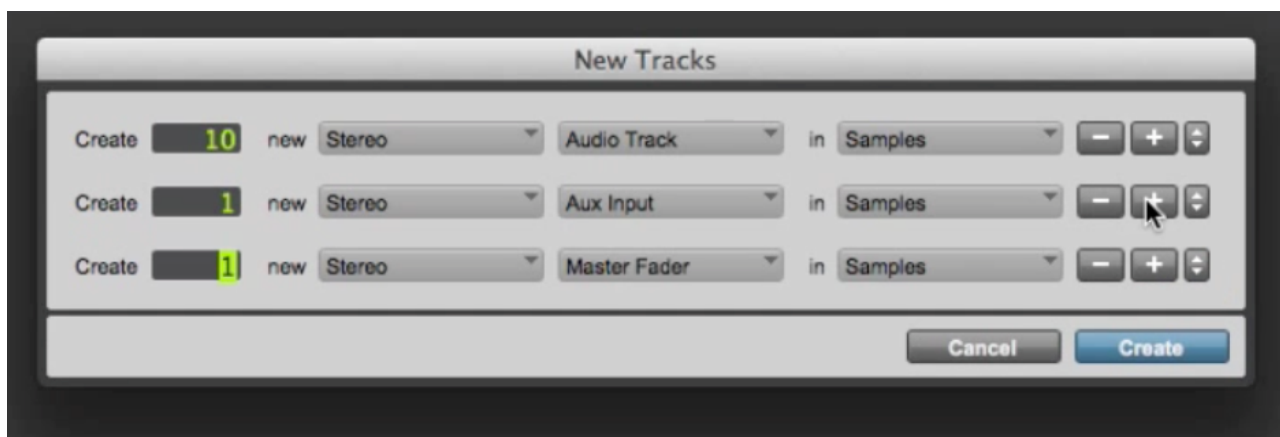
The first M this week is Mute. [In this free video](#) I demonstrate a useful trick for A/B-ing tracks using shift+S to toggle the mute buttons on selected tracks. This is really handy so be sure to check it out if you haven't come across it before.

Master Fader

I'm never shy of discussing what is going on under the hood of Pro Tools and the second M on the list this week is the master fader. These crucial features of any Pro Tools session are often misunderstood by novices and all too often are missing altogether from sessions. As we shall see, 64 bit floating point environments like Pro Tools 11 are more forgiving than TDM systems ever were but clipping is still a bad thing and if you understand master faders you will manage your gain structure more effectively and maybe start using them in more places than just your main output.

To review the whys and hows of master faders read the Pro Tools Fundamentals articles I wrote on this last year [Master Faders Part 1](#) [Master Faders Part 2](#).

N Is For New Tracks, Nudge, Numeric Keypad And "N"



When looking at what to include for the letter N I have noticed a common theme. All of these resources I have linked to have something in common. They are all highlighting common keyboard shortcuts. I think I have said before that my policy on keyboard shortcuts is that they are intended to be “shortcuts” i.e. they speed up the execution of things you do often. There is little point learning a shortcut for something you rarely do (and you’ll find it really hard to remember it as well). So with this in mind here are some N’s (and some shortcuts) I couldn’t get by without.

New Tracks

All sessions have tracks in them. Templates have their place, if you find you are building identical sessions time after time then save a template but if you are new to Pro Tools I strongly recommend you build your own sessions, avoid the stock templates in the quick start dialogue. You can use the newly introduced double-click with modifier to create new tracks but I’ve never really used them as the track creation shortcuts are second nature to me and more flexible. [Watch my video tutorial here](#)

Nudge

The number of people who drop out of grid into slip and move clips, notes or automation, effectively guessing where something needs to be amazes me. Nudging offers all the tools you need to place data whether you know exactly where it need to be or not. Learning a couple of shortcuts will take all of the guesswork out of finding exactly where something needs to be to tighten up your arrangement or mix. [Watch my video tutorial - Using Nudge here](#)

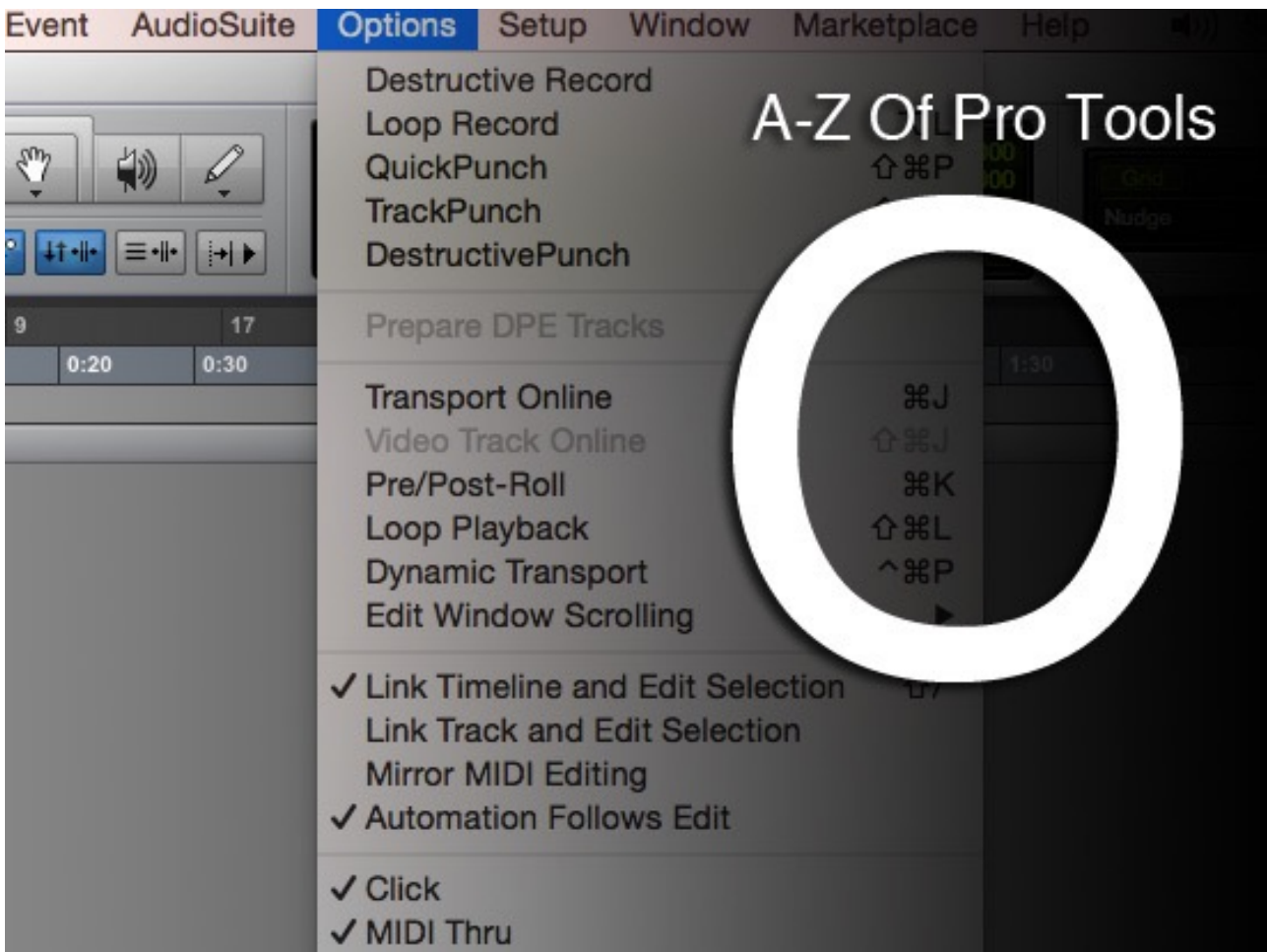
Numeric Keypad

All this nudging will have left the people without number pads on their keyboards feeling a bit left out. I can’t use Pro Tools properly without an extended keyboard. If you don’t have one then you should get one, read about why [here](#).

The N Key

Lastly there is the N key itself. With command focus active, pressing the N key toggles “insertion follows playback”. If you ever wonder why Pro Tools sometimes starts playback from the same place over and over again but at other times behaves like a tape machine, playing from where you last stopped it you need to read [this Pro Tools Fundamentals](#) article.

O Is For Object Grabber, Output, Open Most Recent And Options Menu



Output

In Pro Tools, Output refers to a path feeding physical outputs in your system. However since Pro Tools 9 there has been more to outputs than that with the introduction of mapped outputs. [Mapped outputs in Pro Tools](#) offer some level of flexibility when transferring projects between systems.

Even so, mapped outputs have never been perfect and often need some intervention from the user to get things right. Although I'm yet to try it, apparently Pro Tools 12 offers new features allowing you to define your monitor path to help with session interchange. I'm sure all will be revealed when we get our hands on a copy of 12.

Object Grabber

It feels like a cheat to reference another A-Z of Pro Tools article in an A-Z article but to review the difference between the Object grabber and the time and separation grabbers read this [Pro Tools Fundamentals](#) From last year.

Options Menu

The options menu contains so many useful things but every time I go there I notice something I've either forgotten about or was always a bit vague about. The Options and the Setup menu are both places where you find global settings for Pro Tools. The way to remember whether you should be looking under the Options or the Setup menu is to keep in mind the kind of things you find in each. Items under the Setup menu usually open a window offering adjustment of several parameters - for example the Playback Engine or Peripherals windows. The Options menu allows you to toggle parameters on and off (i.e. they are either/or choices) and doesn't involve a new window full of settings opening. For example I either want Pre/Post roll on, or I don't - no window, just a tick next to a menu item. If you keep this in mind its pretty straightforward remembering what lives in Setup and what lives in Options.

Open Most Recent

While opening a Pro Tools session might not be the most complicated operation, a shortcut I use every day is "open most recent" using CMD+Shift+O or Ctrl+Shift+O on PC. Simple but definitely one I use daily.

P Is For Pencil Tool, Pitch, Playlist, Plug-in And Pre/Post Roll



Pencil tool

In a round-up of legacy content relating to the letter P, the first on the list is the pencil tool. While not the most glamorous feature of Pro Tools, or the newest, its easy to overlook just how useful it is. I recall talking to a producer friend several years ago. He was a Cubase user trying out Pro Tools. He had a click in some audio and wanted to remove it. He asked where the sample editor was. I simply zoomed in, drew out the click with the pencil tool and zoomed out. He was impressed. For all our berating Avid for the things which are wrong with Pro Tools, its easy to overlook the things which are right. Find more on the pencil tool [here](#).

Pitch II

The Pitch II plug-in is a recent addition to the stock plug-ins in Pro Tools. The usefulness of detuning for thickening sounds can't be overstated. The swoosy-wooshy side effects of cyclic modulation effects limits their usefulness and the old TDM Pitch plug-in, apart from being TDM only, was also really nasty. For those who missed out on Soundtoys' free giveaway of Little Microshift, Pitch II offered a free plug-in for detuning effects and much, much more.

To see this plug-in in action and get some ideas on how best to use it watch these videos on using:

- [Pitch II on Keys](#)
- [Pitch II on Vocals](#)
- [Pitch II on Guitars](#)

Of course there are other ways to manipulate pitch in Pro Tools. Although Pro Tools doesn't ship with any pitch correction tools similar to Melodyne or Autotune, it does offer real time pitch manipulation in the form of elastic pitch. Check out how to use it [here](#).

Playlists

One of the most powerful features of Pro Tools, the significance of which is, in my experience, mostly lost on novice users is the playlist. Offering "fresh tape" for another take on a track-by-track basis, the usefulness of these is almost limitless, from loop recording to new playlists, to duplicating playlists before trying an experimental edit, playlists offer control of your sessions and the space to experiment. Learn more here: [First Steps](#), [Copy and Build Songs Fast](#), [Test Out Hardware Synth Sounds](#)

Plug-in

We couldn't visit the letter P without mentioning plug-ins. The Pro Tools world has undergone the biggest and most painful shake-up of its plug-in ecosystem imaginable and although there were lots of difficult moments along the way, Pro Tools has finally shaken off its TDM hardware legacy and while plenty of people have things to grumble about, there aren't that many things you can't do using AAX. Pro Tools Expert were the de facto resource during this transition. Although its not somewhere I go often, the [AAX Database](#) is one of those resources which really helped during the RTAS/TDM - AAX transition. Just nobody mention Waves AAX DSP - OK?

Pre/Post Roll

An indispensable feature when tracking. Toggling pre/post roll was the first shortcut I can remember really needing and actively seeking out. Using pre roll when dropping into record is an essential feature but maddening when playing back. Its CMD+K (Ctrl+K on PC). A really useful extra when setting pre/post roll is option-clicking in the waveform itself. This sets the position of the pre roll flag in the timebase ruler. Try it!

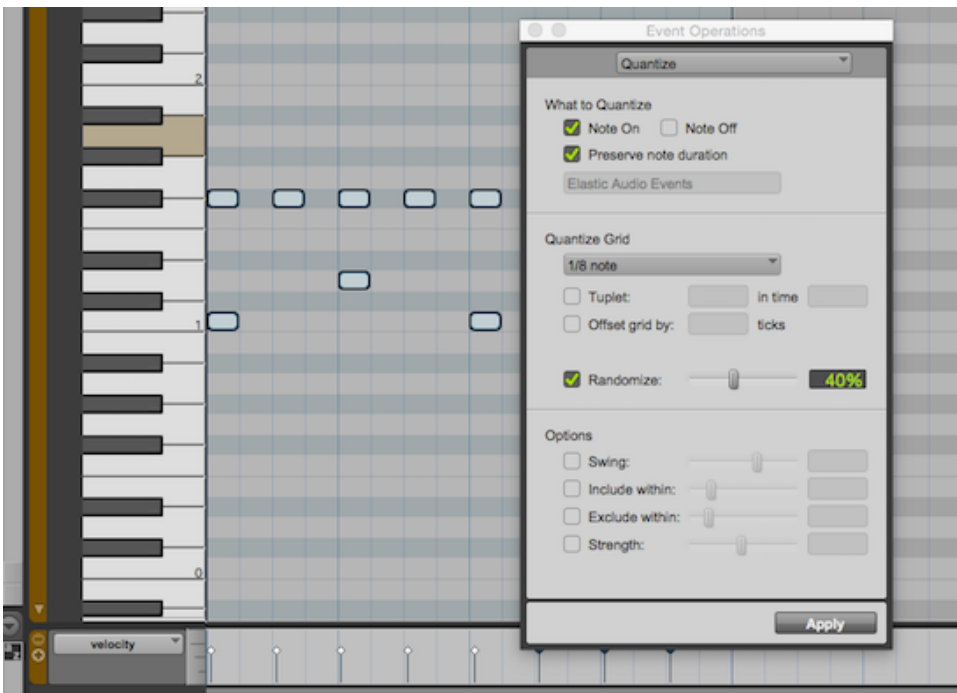
Q Is For Quantise



I couldn't cover the letter Q without looking at quantize. When quantizing people are usually talking about forcing musical events into strict time. Very, very useful but also very misused, how can you use quantize in Pro Tools and how can you avoid over-using it?

Quantize

In Pro Tools you can quantize MIDI notes, audio clips or the audio within clips using elastic audio. This can be rendered or "baked in" to the clip using the quantize window, found under event operations in the event menu and it is this window on which I'll concentrate here but there are other methods available. If you find you are quantizing everything to a 16th note grid after you have played it in you might as well enable input quantize, also found under event operations. For some styles this approach is appropriate but I'd think very carefully before leaving it switched on as a matter of course. A more recent addition to Pro Tools, and far more flexible than the previously mentioned approaches is using real time MIDI properties to quantize the unquantized performance in real time, on playback. Much like a real-time MIDI plug-in. Quantize can be applied using real time MIDI properties either on a per track or a per clip basis. For audio there is another option. Using beat detective offers a comprehensive toolkit for manipulating the timing of audio clips. Its been around a long time and the interface is showing its age but it gets the job done and crucially, it offers all the tools you need to fix timing in transient-rich audio all in one place.



The Quantize Window

The quantize window offers plenty of control for MIDI, with the option of quantizing note on, off or both, neatly changing the note duration to fit the quantize level. Tuplets are available so polyrhythmic tricks are easily experimented with, anything from triplets to five over four and beyond. Randomise offers a useful amount of “anti-quantize”. Under the options section are some really useful things. Variable swing is available. I’ve seen many people try to apply swing to events using too coarse a quantize value for the events being quantized, for example an eighth-note hat pattern won’t be changed if swung using a quantize value of 16, you would need a quantize value of eighth notes in this case. Obvious when stated like that but I’ve seen too many people think swing is broken because of this.

The last three parameters in the quantize window are potentially very powerful but I know I use them less than I’d like. Include within, exclude within and strength are all extremely useful when trying to avoid the damage which unrestrained use of hard quantizing can cause. Using exclude within you can set a margin of error within which the event will not be quantized, a “close enough” setting if you like. Exclude outside allows you to set a value beyond which timing won’t be corrected because if you were that far out, you probably intended to be and strength provides a global control which allows you to specify by how much you want to correct timing (perfect timing doesn’t necessarily make perfect music).

Approaches To Quantizing

This leads me to my best tips for using quantizing. The first thing I’ve found is that like everything in music, trust your ears. If it sounds in time, it is in time. Don’t go looking for timing errors you didn’t hear. You may well end up killing the performance. Secondly, when quantizing a part, I rarely find it necessary to quantize every note, for example try selecting only the downbeats and quantizing those. If the downbeats are in time then variations on the off-beats will add character or feel.

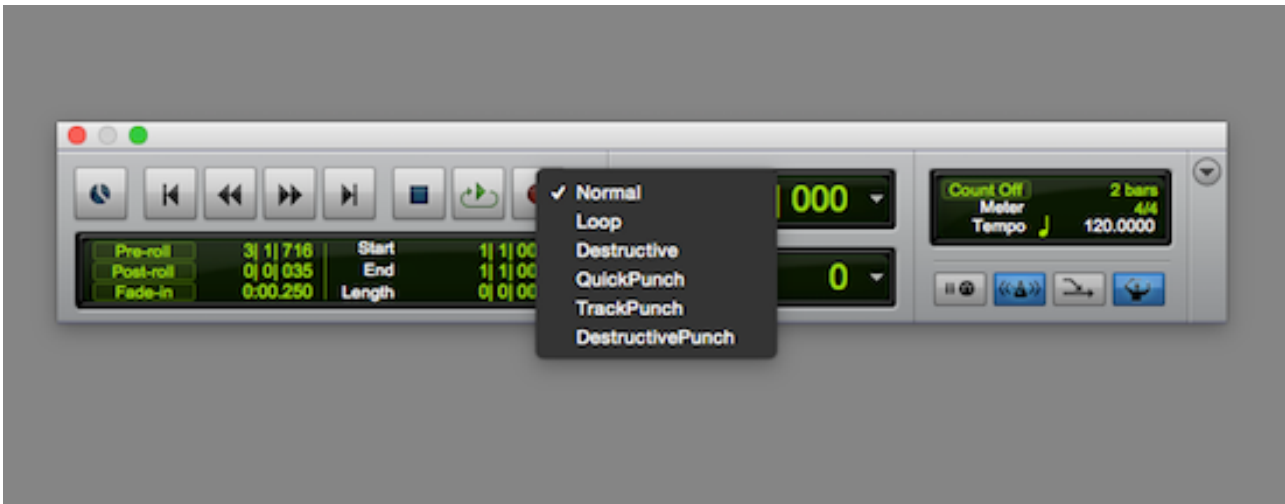
There is so much more to this subject. if you want to know more watch Russ’ video overview of MIDI quantize [here](#).

R Is For Record Modes



Recording something into Pro Tools should be easy and indeed it is, but that isn't quite the same thing as saying it doesn't sometimes get surprisingly complicated. Like most DAWs Pro Tools follows a similar system to that employed in multitrack tape machines and if you press record and play in the transport bar, any record-armed tracks will be recorded onto - easy!

Things can get a little more complicated when looking to replace a section on a previously recorded take. The significance of timeline and edit selections becomes important. It is the timeline selection which controls where a drop in will happen, not the edit selection if the two are unlinked. For more information see [this Pro Tools Fundamentals Article](#). An awareness of [how to use playlists and pre and post-roll](#) will definitely help as will understanding [how to manage latency](#). These are the basics and you can't really get by in Pro Tools without them but by using the other record modes in Pro Tools you can streamline and simplify your workflow. In my experience these are under-used and while you can get by without them, in the right application they are too useful not to know about.



Record Modes

The first potential source of confusion is that while they are related, record modes and [playback modes](#) are different things. For example, recording in loop playback is not the same thing as being in loop record, in fact loop playback in record only works with MIDI recording.

In Pro Tools there are six record modes:

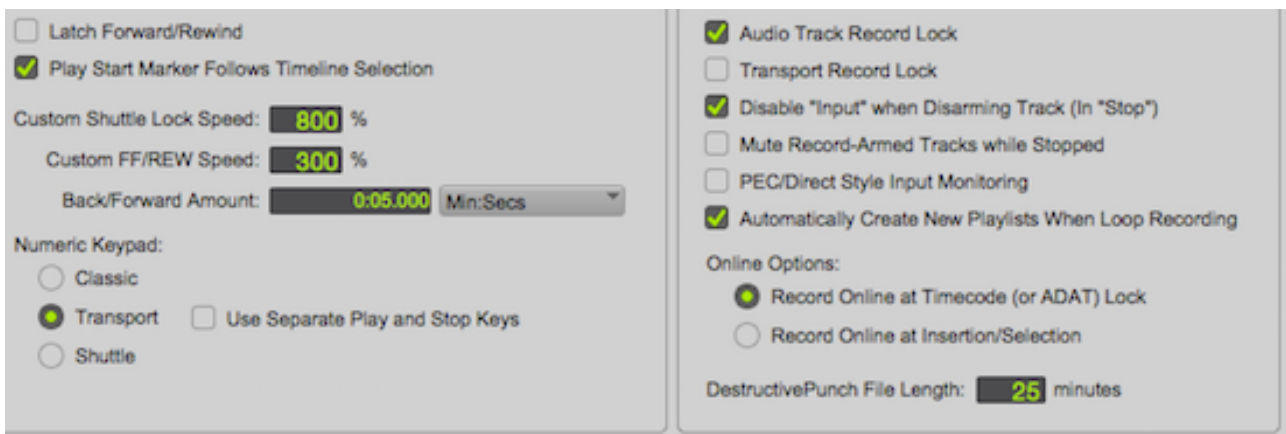
- Normal
- Loop
- Destructive
- Quick Punch
- Track Punch (HD only)
- Destructive Punch (HD only)

Normal

Is, err... normal. That is to say it is conventional record behaviour without any of the additional features of the other record modes. If you have used Pro Tools before you will have used this record mode.

Loop Record

For musicians I think this would be the other most commonly used mode. It's certainly the best known. The potential to loop record a section over and over again, in combination with the possibility of comping together all the best parts of the multiple takes is one of the most valued features Pro Tools offers the tracking stage of music production. Of course to get the most out of this feature you have to enable "automatically create new playlists when loop recording" in the operation tab of the Pro Tools prefs. For more on this see [here](#).



Destructive

The nuclear option! In destructive record Pro Tools permanently overwrites any underlying audio. While this might have been useful to conserve disc space once, those days are long gone. I have met someone who chose to record in destructive record to recreate the tape experience. While I like the idea of committing to ideas early in the production process I think this is a bit "hair shirt". Destructive record is more than just a historical oddity though, as it has provided post-production types with a way of avoiding long, real-time bounces by bouncing to a track in destructive record. Although offline bounce in Pro Tools 11 offers faster than real time bounce, the benefit of real-time bouncing is that encourages you to listen to your bounce - always a good thing.

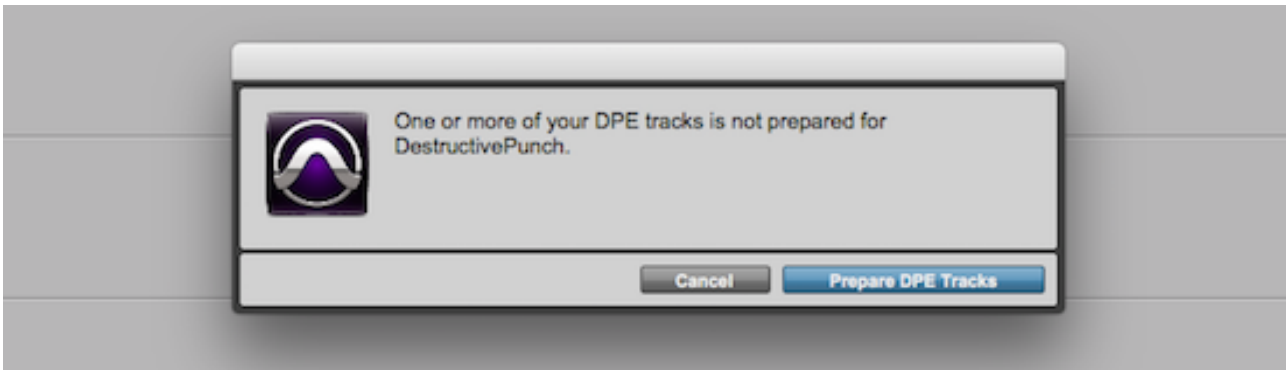
Quick Punch

Allows you to freely drop the Pro Tools transport in and out of record during playback causing clips to be recorded on any record-enabled tracks. This is a simple enough behaviour but to achieve it, Pro Tools has to be a bit sneaky. In quick punch Pro Tools is actually recording all the time while simultaneously playing back the visible track playlist. When you drop in to record all Pro Tools is doing is creating clips on the main playlist from the track being recorded rather than the track being played back. As a result quick punch uses twice as many voices. For a demo of using quick punch see Russ' video [here](#).



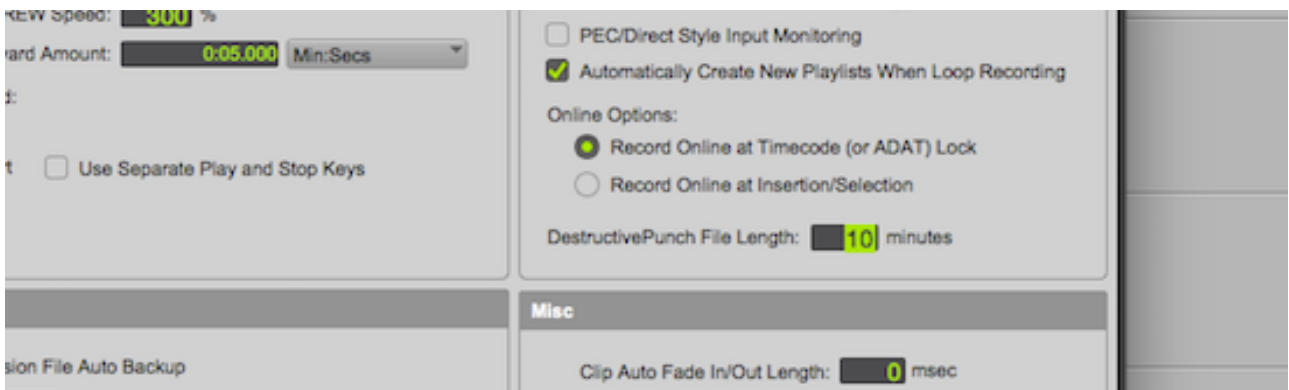
Track Punch

An HD only mode, track punch is very similar to quick punch but offers more flexibility in that rather than record-enabling tracks and dropping the transport in and out of record, track punch allows the punching in and out of individual tracks using their record enable buttons while transport remains in record. Lots of buttons which were previously red turn an exciting shade of blue but there's really not that much more to this mode. Tracks need to be track punch enabled (their record enable buttons will turn blue) when track punch and record enabled they will flash red and blue, and when record enabled but not track punch enabled they will be the familiar solid red.



Destructive Punch

I can't say I've ever used this mode in anger. Offering HD users a destructive record version of track punch it requires that all tracks contain a contiguous audio file which starts at the beginning of the session and is at least the length of the destructive punch file length setting found in the operation tab of the preferences. If these conditions are not met then the prepare DPE tracks window will offer to render some audio clips to your tracks to meet this criterion. Once set up operation is much like the name suggests, with track punch behaviour while maintaining a contiguous file on the main playlist.



Keep in mind that the behaviour of MIDI recording is fundamentally different to audio in Pro Tools and considerably more flexible. For example recording in loop play is possible and track punch is possible without needing a dedicated record mode. This A-Z is about recording audio.

S Is For Smart Tool



Its an old joke that the best thing about digital is that there are so many different ways to do a given task but the worst thing about digital is that there are so many different ways to do a given task! This is true all the way from importing files through to the final touches to your automation. Even the tools which I have always assumed gave Pro Tools its name can be approached differently and very early on in my Pro Tools career I got very comfortable switching tools using the function keys. The Smart tool offers automatic switching of tools and its hardly a new feature. It makes me wonder why I've never really used it that much. I think I just didn't know it was there to begin with and now its hard wired as a second choice for me.

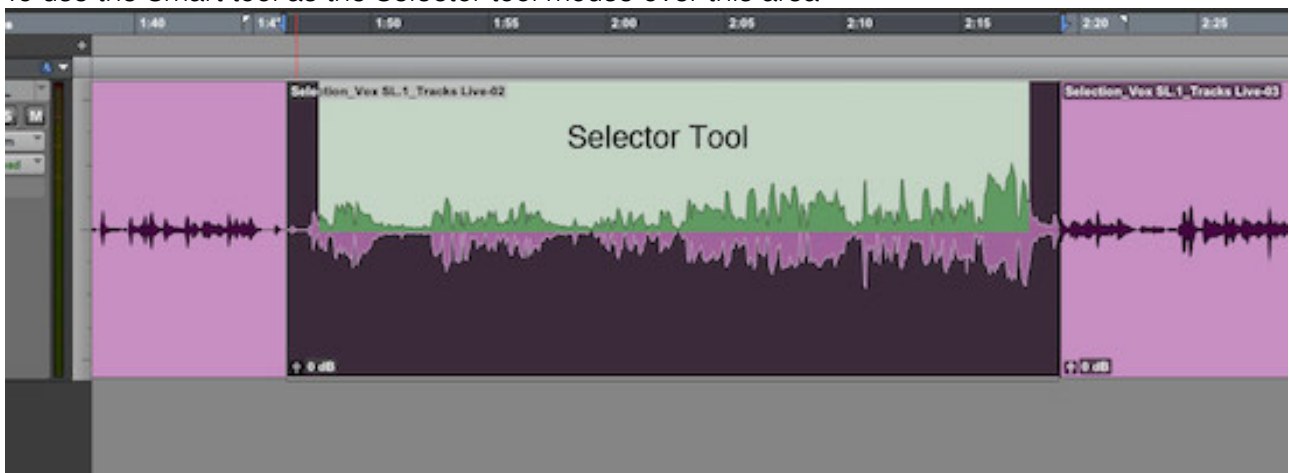


Smart Tool

So, what is the Smart tool and what am I missing? The Smart tool combines the Selector, Grab and Trim tools into one, the tool available changes depending on where your mouse is in the clip. It also provides Fade and Crossfade tools. Its very simple to use. To enable the Smart tool either click on the border above the Trim, Selector and Grab tools or press two of the function keys for any of these tools (F6, F7, F8)

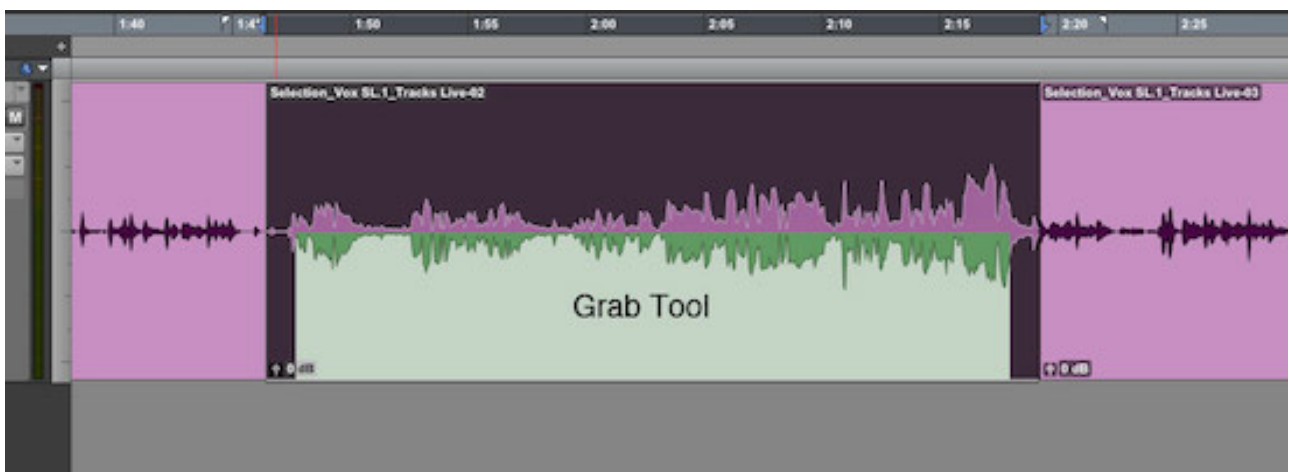
Selector

To use the Smart tool as the Selector tool mouse over this area



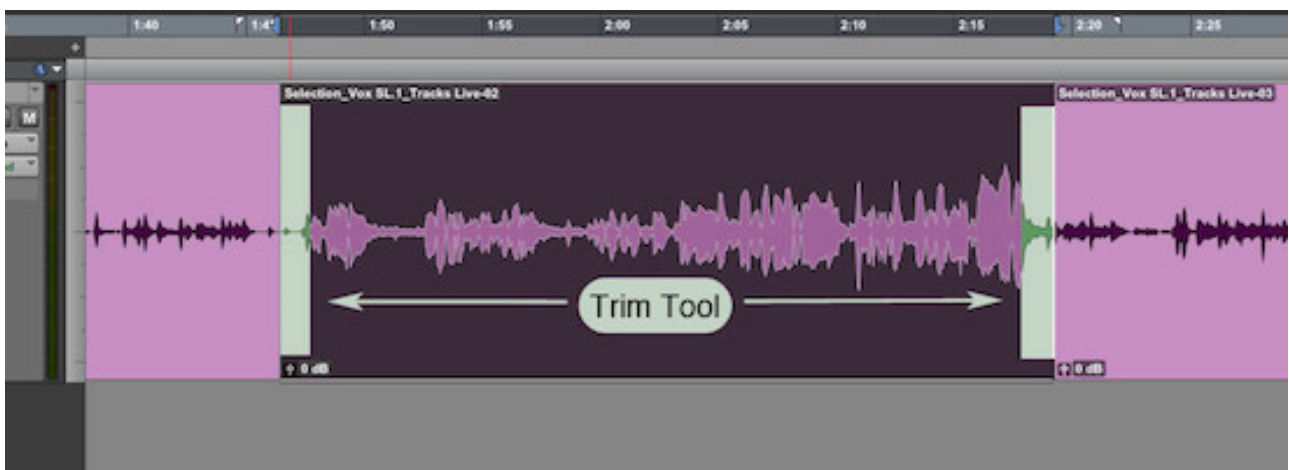
Grab

To use the Smart tool as the Grab tool mouse over this area



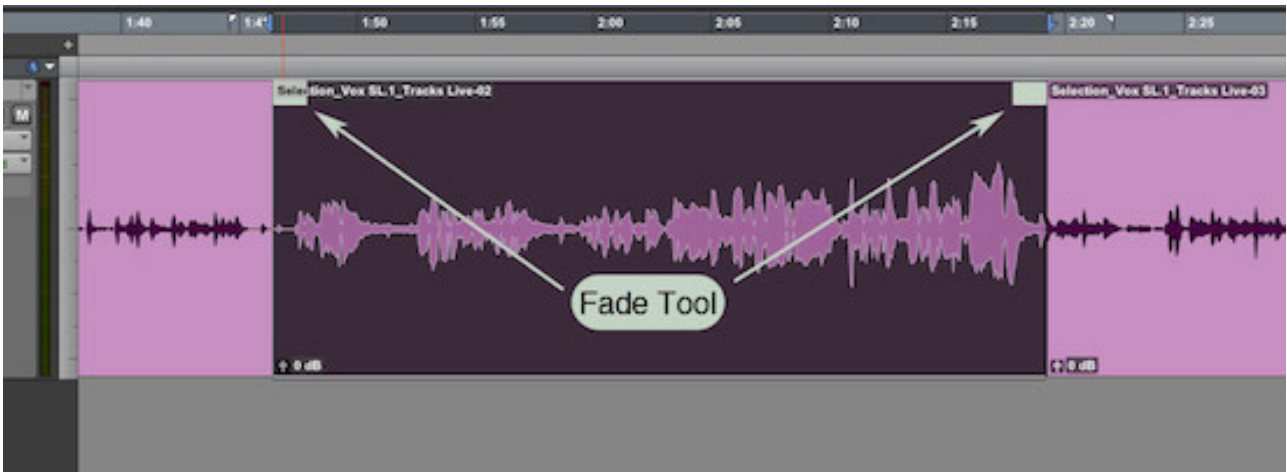
Trim

To use the Smart tool as the Trim tools mouse over this area. To reverse the direction of trim press Option/Alt.



Fade

To use the Smart tools to fade clips in and out, mouse over this area



X-Fade

To use the Smart tools to crossfade clips in and out mouse over this area. Keep in mind that there has to be material beyond the in or out point of the clip to perform a crossfade, otherwise Pro Tools will warn you about 'Invalid Bounds' - i.e. you are trying to crossfade beyond the beginning or end of the parent file.



For more on using the Selector, Trim and Grab tools see this [Pro Tools Fundamentals article](#)

T Is For Tab, Target, Tempo, Tick And Timing



After last week's single topic post on the Smart tool, this week we're looking at legacy content on the site relating to the letter T.

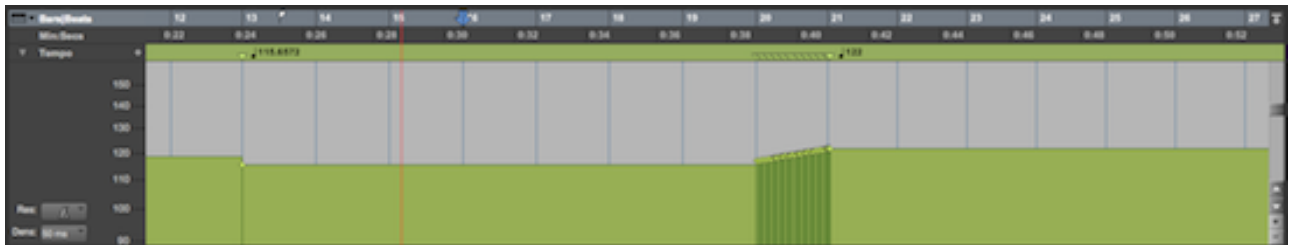
Tab

One of the first things a new user of Pro Tools needs to know is how to use the Tab key. One key can make you feel like a power user. [Find out how here.](#)

Target

You can get by in Pro Tools without this button but when I asked around a few regular users of Pro Tools hardly any of them could explain what it was for. [If you don't know what it is read this article and find out.](#)

Tempo

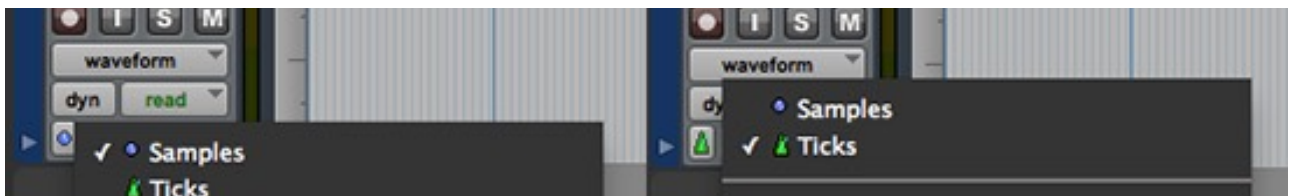


So much music is made in the default tempo of 120bpm. Its a great tempo but I've found myself changing the tempo to 121bpm just so its clear, if anyone were to look, that my tempo was a conscious choice. If you can't type a new tempo into the transport bar or you would like to tap your tempo straight into Pro tools but don't know how find the answers in this article.

Tools

What put the T into PT. These did! One for the beginners but its always good to cover the basics. [Part 1](#), [Part 2](#)

Tick-Based Tracks



If you are playing with Tempo you need to know the difference between ticks and samples. Brush up here.

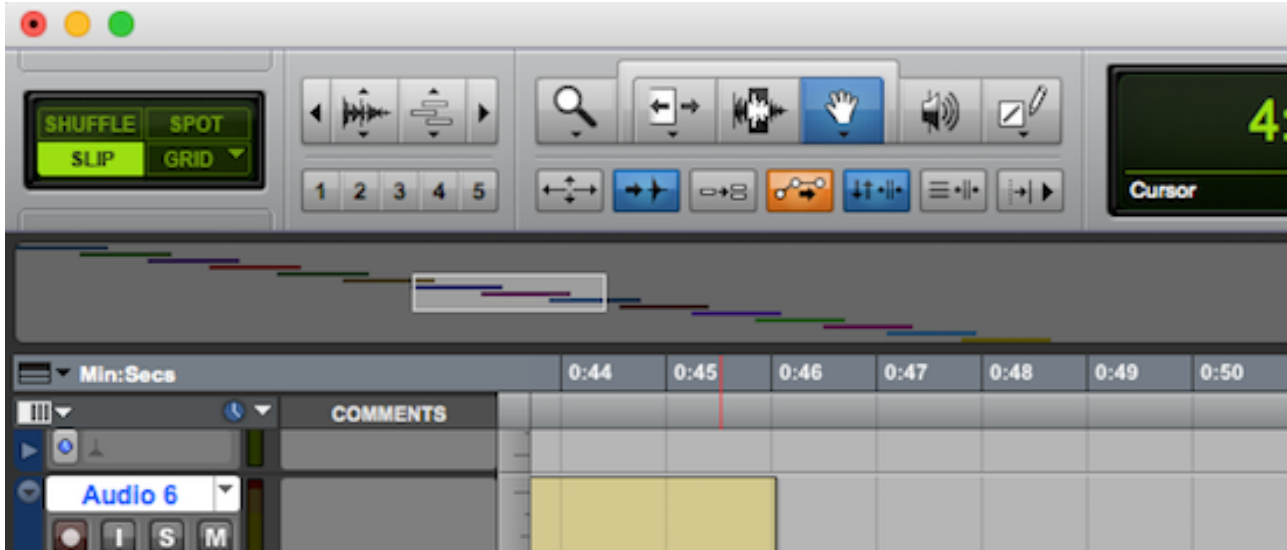
Timing

All but one of the topics covered this week have one thing in common. In one way or another they are all about timing. Here Russ offers a great tip on how you can manipulate the timing between your tracks to change the feel or try these [5 ways to get great timing](#).

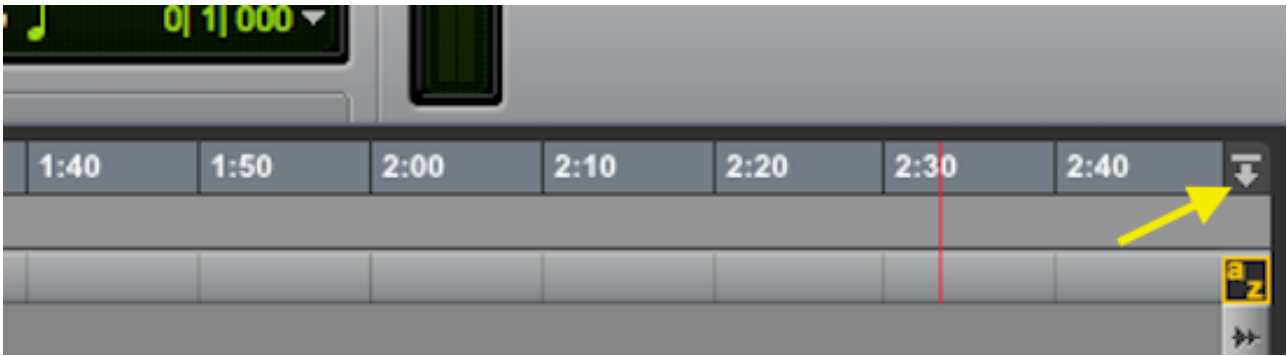
U Is For Universe And Undo



Universe Window



Although there aren't a huge number of things in the Pro Tools World which begin with U, the Universe window is definitely worth a mention. First introduced in version 8 it provides an overview of your entire timeline in a compact bar at the top of the edit window. I've yet to come across many people working in music who use this window very much (if you're out there please comment) but this is a feature much valued by the post community. In post, sessions are often much longer than in music and also much larger in terms of track count so I suppose its unsurprising that a feature like this is more use to someone navigating a couple of hundred tracks in session of over an hour that it is to me navigating a four minute pop song.



To toggle the universe window in and out of view, use the button at the top right at the end of the top timeline ruler. The Universe window always shows the whole session horizontally and the white box within it shows the current area displayed in the edit window. The box can be grabbed and moved from the universe window and its size updates in real time to reflect the current levels of horizontal and vertical zoom in the edit window.

Although I don't have an old version of Pro Tools available on which to check this, I'm fairly sure that when creating a session it always opened with the universe open. This is no longer the case in PT 11 and the Edit window opens with the universe either open or closed depending on its state when Pro Tools was last used. If you don't want to use it, you don't have to see it. I'm not aware of a shortcut to toggle the universe window but it can be opened or closed either by using the button or by placing the cursor over the divide between the Universe and the top of the tracks display and double clicking. The universe can be re-sized in the same way as the side columns.

Undo



What was life like without the undo button? Those of use who remember punching tracks in and out of record on a tape machine really appreciate this one. I'm sure I'm not alone in thinking many people rely on undo too much. If I'm going to make radical changes to a session I'll save it first. If I'm going to try an experimental edit I'll duplicate the playlist first. Many people just go for it and then hit CMD+Z over and over... In Pro Tools 10 and earlier there were up to 32 levels of undo. Since Pro Tools 11 this has been increased to 64. Why would anyone ever turn this down? Undo is such a lifesaver but its important to realise that not everything you can do in Pro Tools can be undone using CMD+Z (Ctrl+Z for PC users). Two really important things which spring to mind are deleting a track (can't be undone. My recommendation is always to hide and make inactive unless you are really, really sure), and edit selections. If you lose an edit selection hitting undo won't restore it but hitting CMD+Option+Z (Ctrl+Alt+Z) will.

V Is For Voice



I'm not aware of any other DAW which has a voice based system like Pro Tools does. I would imagine its a result of the DSP heritage of Pro Tools that all versions of Pro Tools have a system of voices which is distinct from the maximum number of inputs and tracks available. This is a similar situation to that found in polyphonic synthesizers where my synth might have 61 notes on the keyboard but I can only play 6 notes at any one time. In the same way Pro Tools can have far more tracks in session than can be played back simultaneously but as long as they aren't all playing at the same time there is no problem.

How Many Voices Does My System Have?

For Pro Tools and Pro Tools HD the maximum voices available decreases with increased sample rate. The following examples are all for 64bit Pro Tools systems (i.e. Pro Tools 11 and later).

- If you have Pro Tools HD you have 256 simultaneous voices available per card at 48KHz. Running HD software only without HDX hardware counts as running one HDX card.
- If you have non-HD Pro Tools software you get 96 voices at 48KHz, considerably more than the 32 maximum simultaneous inputs available to non-HD hardware users.
- If you are running Pro Tools First or Pro Tools Express you get 16 voices regardless of sample rate.

How Do I Manage Voices?

The simplest way to manage your voice allocation is to understand how Pro Tools manages them. When set to “dyn” (dynamically allocated voicing) Pro Tools assigns voices from left to right across the mix window (or top to bottom down the edit window). If the total number of simultaneous tracks playing back exceeds the maximum it is the first track beyond the voice limit counted from the left which will be the first track not to play back. The simplest way to give priority to an important track is to move it to the left.



Track 257 is the first to exceed the 256 voice limit on this system.

Of course there are many ways to mitigate voice stealing when sessions get large. The most straightforward is to bounce a stem of submixed tracks and to “hide and make inactive” the source tracks to free up some resources. On TDM systems it is possible to allocate fixed voices to specific tracks but in situations where I have run out of voices I have usually bounced a submix to eliminate the problem rather than try to stretch too few voices further than they want to go.

Native Plug-Ins In DSP Environments

DSP Pro Tools systems are designed to use DSP plug-ins whether they are HDX or TDM. As a result we encounter a couple of idiosyncracies. While DSP systems can use native plug-ins, native plug-ins exist outside the DSP environment and crossing this imaginary divide between the native and DSP worlds uses voices. Inserting a native plug-in under most conditions will use two voices, one for input and one for output and will add latency. The specifics of this are quite long-winded, see p953 of the Pro Tools Reference Manual for the details. A much more significant side-effect of this is that you can't monitor through a native plug-in while recording on a DSP system. A simple workaround exists, simply insert a DSP plug-in before the native plug-in and all is well. The solution is far simpler than understanding why it is necessary in the first place but keep it in mind next time you're trying to track electric guitars through a native amp sim on a DSP system.

W Is For Workspace Browser



The Workspace Browser is a file browser with enhanced search capabilities. It offers in app asset management with extra features making it more useful to musicians. A tool which allows quick, meaningful searches of a sample library is of course essential in post production and the best of the third party alternatives are very capable. A well organised sample library represents a significant investment in terms of time so choosing which management tool to use is an important decision. If you haven't checked out the Workspace Browser here are some things to be aware of:

Its An Exercise In Filing

If you are one of those rare people who actually enjoys filing then you're going to love this. If you are like the rest of us then what you are doing is organising and managing files and while the tools we have to help us get more powerful all the time, there still isn't any substitute for spending some time organising your files, the catalogs they belong to and the metadata they contain. You are unlikely to find your first experience of using the Workspace Browser much fun but you are investing time and effort now to save yourself time and effort later. Like so many things, you get out of it what you put into it and the best sample collection in the world is no use to you if you can't find anything.

Catalogs And Presets

To get the most out of the Workspace Browser you should build catalogs of related samples. Catalogs are collections of files which belong together in some way (you choose how) and crucially, unlike sorting files into folders, in catalogs the files themselves don't need to be moved.

The advantage of using catalogs as opposed to traditional, folder-based file management is that a single copy of a file can be in more than one catalog but it can ever only be in one folder. When I started using the Workspace Browser I quickly realised that I needed a way to quickly navigate to my samples folder (I don't have a huge collection of samples and they all reside in a single folder). Navigating from the root of the drive every time is a waste of time and I had spotted the five preset buttons at the top left. Assuming that I could navigate to my samples folder and store the preset to be able to go straight there I thought the presets feature didn't work for a long time until I realised that presets store the window layout, things like window size and which columns are visible but not the contents of the folders being viewed. For that you need a catalog.

Conform to Session Tempo

My favourite feature of the Workspace Browser for music production is the ability to preview loops at the session tempo. Rather than importing loops to audition them, if the conform to tempo button is enabled then a loop can be previewed with elastic audio timestretching it to the session tempo. The system is smart enough to begin playback on the downbeat and with Loop Preview or Auto Preview switched in it is possible to audition many loops in context very quickly. The big limitation of this feature is that while rhythmic content can be auditioned very effectively, the lack of any conform to pitch features makes the auditioning of pitched content in key with the session less viable. A pity as this would be a very powerful feature.

Separate Transport Controls

When auditioning loops in the Workspace Browser it makes sense to use the options available in the drop down menu in the browser. I would tend to leave loop preview and auto preview switched on. Loop preview is of course only relevant if you work mostly with loops. Auto preview starts playback automatically if a new sample is selected. This behaviour also happens when a new sample is selected when in loop preview even when auto preview isn't selected. The default setting is for both of these to be off but spacebar toggles preview is on by default. Spacebar toggles preview is a very useful setting which allows the spacebar to control playback in the Workspace Browser but 0 on the numeric keypad stays available to control playback of the session itself when a browser window is active - really useful.

Relinking

Since the new Workspace Browser there is no longer a Project Browser. The Project browser was a browser specifically for the current project. It always struck me as unnecessary. The only thing I ever used it for was relinking to offline media. Relinking is now done in the Workspace Browser too. To relink Offline media simply right-click on the offline file (italicised) and select relink offline, select the volumes and locations you wish to search, search by name, unique ID or both and relink to the correct candidate in the search results (although in my experience, if its offline it's because it isn't there at all)!

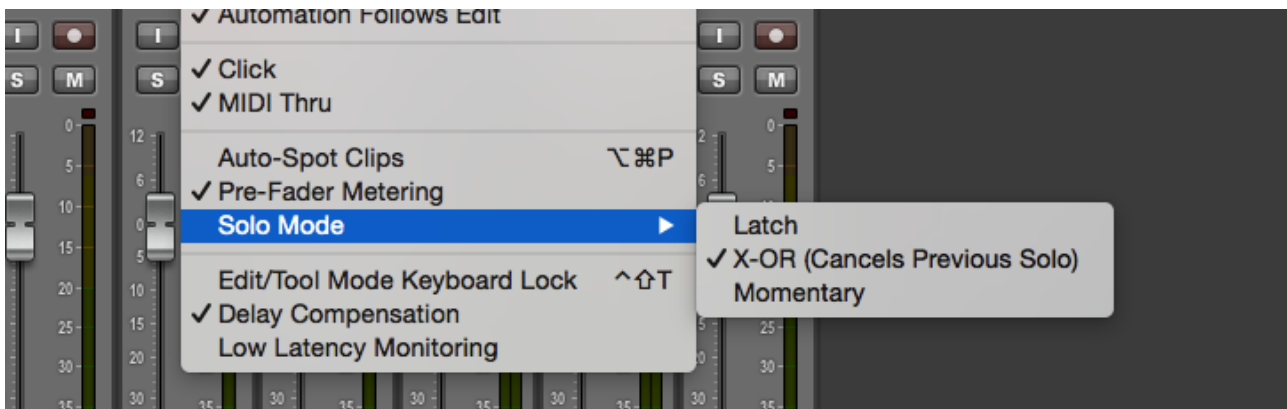
The Workspace: Its a pain to set up and a few things make it a pain to use even after you have set it up but the fact remains its better than relying exclusively on Finder or Windows Explorer to manage your files. For music I think the lack of a conform to pitch function limits its usefulness. The post community are displeased at the changes which have been made to the search function as since a change to the algorithm it now returns too many results. This has been discussed on the DUC. Apparently the default search has been changed from an "and" to an "or", widening the search results from any given terms. The Workspace Browser frustrates me as it could be so good but isn't quite there yet. That being said, although third party alternatives exist, if you have Pro Tools you already have the Workspace Browser and if you haven't put some time into trying it you really should as I meet so many Pro Tools users who do all of their asset management using Finder. Workspace isn't perfect but its better than Spotlight and Finder.

X Is For X-OR, X-form and Xpand2



X-OR

This solo mode is one of my favourite features. I use it all the time as unless you use a control surface it can be awkward to make comparisons between two tracks. Comparison is essential when mixing and I'm very wary of anyone who believes they don't need to do it. Our ability to compare subtle differences between alternatives is fragile and I really value the ability to swap between tracks with no interruption in the time it takes me to cancel one solo and engage the next. If you are using a control surface then hitting both solos at the same time is easy but if you are using a mouse then X-OR solo mode cancels previous solos when engaging a new one making comparison instantaneous. When in X-OR mode this behaviour can be suspended by control-clicking (Start click on a PC). To switch solo modes go to the options menu (if you're lucky enough to have an ICON I'm sure you've already found the dedicated buttons).

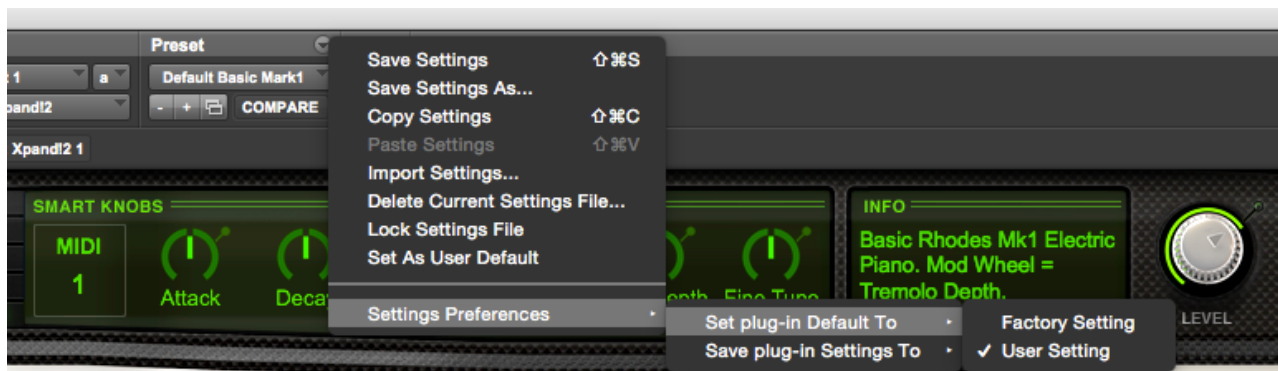


X-form

X-form offers the highest quality pitch and time shifting available in Pro Tools. It is available as an elastic audio algorithm, with the TC/E trimmer and as an Audiosuite process. It differs from the other available algorithms for elastic audio in that it is not available as a real-time process and has to be rendered. Apparently the algorithm used is based in the Radius algorithm from iZotope. It is common practice to use the most appropriate real-time elastic audio algorithm and swap it for X-form for the final pass. X-form is available to everyone as an elastic audio algorithm but the Audiosuite version is a paid-for option. Unlike the real-time elastic audio algorithms X-form offers no controls beyond switching in a preserve formants button and the ability to turn down the quality (it's faster that way but why would anyone want to turn down the quality of an offline process?).

When using X-form as an Audiosuite plug-in detailed controls are available. If you compare the X-form window with the Time Shift window you will see the the controls on offer differ only slightly. Time Shift is very capable but in my experience X-form does have the edge. While X-form offers 800% timestretch as opposed to the 400% offered by Time Shift the results will get weird long before that. Both offer the ability to timestretch/compress and pitch shift independently of each other with the added hilarity of formant shifting - turning male voices female (formant up) or making everybody sound terribly sad (formant down) - instant crowdpleaser! If you are reducing the duration or raising the pitch of the audio being processed it may be necessary to attenuate slightly to avoid clipping. Use for post production pull up and pull down tasks is straightforward and a full set of presets exist though these are also supplied for Time Shift.

When using the TC/E trimmer you can specify which timestretch algorithm gets used during trimming. Time Shift is the default in this application but X Form can be specified as can the Digidesign TC/E algorithm which was sorely missed by dialogue editors when it was [removed in v11.0](#).



So that's X covered and I've only just realised I could have done Xpand2 instead. This has been covered in detail many times by Russ, just type Xpand into the search bar on the front page of the Pro Tools Expert web site and you'll find loads of content reminding us just how good Xpand is.

Top tip for Xpand2 users

I love Xpand2 but I've always disliked the "Beneath the Waves" pad being the default. To change this just select a patch you'd prefer to use instead (I use "Basic Mark 1"), save it as a user preset and set that user preset as your user default. Then just select Settings Preferences - Set Plug-in Default to - User Setting and you'll never have to hear that swooshy-wooshy pad ever again.

Y Is For You



To choose You as the candidate for the letter Y could be seen as admitting defeat (look in the Reference Guide index - it goes from X straight to Z!) but I'd prefer to think of it as an acknowledgement of what is really important. I meet so many aspiring engineers and producers and although few of them put it so crudely, what they all want is for me to tell them "the secret". They pore over opinions on the web (yes I'm aware of the irony of me saying that here...) and rather than practice, look for an individual piece of knowledge which will transform their mixes. Sorry, it doesn't exist. However, here are some things you (and I) could bear in mind. Although this is written with studio-based audio recording in mind, they have something to offer no matter what you do.

Listen, Make A Decision, Move On

It really is that simple. I wish I always did it. The best mixes I see always show that the engineer has listened to what has actually been recorded (as opposed to what they think was recorded), identified a problem (if one exists) and fixed it. It sounds simple but its can be really difficult. When I look at someone else's mix I want to be able to understand why they did what they did. The best mixes always show a clarity of purpose that leave you in no doubt that the mixer's decision making skills is what makes it sound good, not the gear they used.

Do Less

Always difficult when we have so many tools and so much power at our disposal but if what has been recorded is well played and was properly captured, why should it need anything more? If I see more than three plug-ins on a track I start to wonder why, more than four and I'm definitely

looking closely to see what is going on. That's not to say that there is a maximum number of plug-ins you are "allowed" to use - of course there isn't. It's just that I've noticed a strong correlation between the number of plug-ins used and the effectiveness of the decision making being made by the mixer - Discuss...

Track Slow, Mix Quick

If there is one thing which I consistently recognise in my own recording it's that most of the time I spend on a difficult mix is trying to address issues with the tracking which could have been avoided if more time had been spent getting sounds right before tracking began. I track very quickly. This is usually a good thing as musicians bore easily and if the energy is good in a session then the performance usually reflects this. The part of the process which needs time spending over it, and is increasingly under pressure as more and more recording is done using mobile rigs in rented spaces, is the setting up of drums and, to a lesser extent, guitars. If you are experienced it is easy to get a good drum sound in under an hour.

The difference between a good drum sound and a great drum sound (unless you fluke it - it happens) is spending often a whole day working on the drums. This used to be common practice but because of the spaces so much recording happens in these days it's a bit of a luxury today.

Guitars are easier. Stick a dynamic in front of the amp and it will sound fine. With more work careful placement and a combination of mics can give better results but I always DI as well. Re-amping is such a useful technique. Why wouldn't you?

It's The Decisions You Make Not The Tools You Use

I spend most of my time looking at mixes made by students and if there are issues with a mix they are usually problems with the "big picture". Detailed work has often been carried out on something which isn't especially important while a fundamental issue remains with the balance of the instruments. While we all enjoy esoteric plug-ins and hardware, if the basics aren't right none of this will ever help. Perspective while mixing is easily lost and it's far and away the most important thing so put the spectrum analyser away, it won't tell you that the vocals are too quiet, only your ears can do that! Trust your decisions, be honest about your mistakes and your mixes will be all the better for it.

Z Is For Zoom



And so we arrive at the last letter of the alphabet. There was only ever one contender for this letter. Zooming, and session navigation in general represents the difference between slick and effortless operation of familiar tools and that feeling of struggling through software as if you are knee-deep in treacle. New users often use the zoom buttons and the zoom tool, I would recommend everyone finds an alternative to these as quickly as possible. Personally I favour using keystrokes but there are useful scroll wheel alternatives to these (Option/Alt with either the scroll wheel or a 2 finger trackpad drag zooms horizontally). Here is a round up of Zoom related tips for use in Pro Tools:

Zoom Presets

This is a feature I teach to new users as their very first introduction to zooming in Pro Tools. Using the zoom preset buttons zooms in horizontally by preset amounts. By default they zoom in progressively further from 1-5. The defaults are sensibly chosen but if you want to set custom zoom values then CMD+clicking (control on a PC) on a zoom preset button until it flashes will set a custom value. I don't use zoom presets myself but for a new user they are very simple and they are a very friendly introduction to using keyboard shortcuts as they are the only buttons in Pro Tools with their shortcut written on the button!

Cmd+[, Cmd+] And R+T

Incremental horizontal zooming using CMD+[or] (control on a PC) is still something I use every day. Although I use lots of command focus shortcuts, R and T for zoom in /out have never been ones I've used much. I still teach using command and square brackets as it always works regardless of whether command focus is active, which is more appropriate for beginners in my opinion.

Option/Alt A, Option/Alt F

These two shortcuts were the first quantum leap in session navigation for me. Option A zooms the edit page out horizontally to show the entire session. Option/Alt F zooms horizontally to fill the screen with the current edit selection. This is something I use constantly. I almost never scroll through sessions horizontally. I've never seen the point as I lose my bearings so quickly. Instead I zoom in (Option+F), edit and zoom out again (Option+A). Much better in a typical music session. Try it.

Zoom Toggle

While Option+F zooms horizontally to fill the screen with the edit selection, it won't fill the screen both horizontally and vertically. If you want to do that you can do it using Zoom Toggle. Find out how in [this Pro Tools Fundamentals article](#).

Waveform Zoom

Zooming the waveform often confuses people as, especially since the introduction of clip gain, there can be confusion as both result in bigger waveforms but for very different reasons. All of the zoom controls above the zoom preset buttons in the edit window can be clicked and dragged for continuously variable zoom but the question I get asked most often about waveform zoom is how to return the zoom level to its default. It can be done in two ways: Double-click the zoom tool or CMD+Opt+Ctrl+[. If you want to zoom an individual track's waveform check out [this community tip](#).

5 Shortcuts To Know

I've used just 5 shortcuts as a "survival kit" for Pro Tools which, if you know no other shortcuts at all will save you time every time you use Pro Tools. Of the 5 shortcuts, 4 of them are zoom-related and 3 of them are already mentioned in this article. [See the full post here](#).

In Closing

That's it for the A-Z Series. You never know, it might be back but for now, thank you to everyone who has supported it. I hope you've enjoyed reading it as much as I've enjoyed writing it.

About The Author



A Pro Tools user since 2001 Julian has a background in live sound.

He has been working in education since 2006, during which time he has introduced many new users to Pro Tools. He is a Certified Pro Tools Instructor and is very familiar with the mistakes and misconceptions common to new users.

He plays piano, bass and guitar equally badly and is an avid collector of microphones and keyboard shortcuts.

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