

Nonlinear Editing Basics

After completing this lesson, you should be familiar with the following concepts:

- Editing is the process of altering recorded information to create the most perfect recording possible.
- Editing on DAWs is very easy, because everything is nondestructive and because hard disk recording is nonlinear, almost anything is possible.
- Cursors change appearance and function depending on what they are pointed to.
- DAWs allow the user to create multiple takes on a single track so that it is possible to keep multiple versions of the same audio.
- Using a DAW to edit audio allows you to treat audio like you treat text in a word processing program.

Glossary for this Lesson:

Analysis File - A file a DAW creates which contains a picture of a soundbite.

Audio File - A file a DAW creates which contains the actually sounds recorded.

Compositing - The process of taking the best parts of several performances of the same material and combining them to create one very good take.

Copy - An editing command which allows you to copy whatever is selected to the computer's memory for other uses.

Cut - An editing command which does the same thing that copy does, but also removes the selected data. Using cut is the equivalent of copying and then pressing delete.

Edit Decision List - This is the actual list of instructions which tells the DAW which parts of which audio files to play at what time.

Editing - The art of changing recorded tracks make them better (hopefully).

EDL - An edit decision list.

Leading Edge - The left edge of a region or soundbite.

Linear - Proceeding in a line or relating to a line. Things which must happen in a specific order, determined by a line (tape).

Nondestructive - A change which is not permanent. It can always be completely undone.

Nonlinear - The opposite of linear. Things can happen in an arbitrary order (whatever you decide).

Paste - An editing command which places data which has been copied or cut using the copy or cut editing commands.

Region - A part of a soundbite which has been separated into several pieces.

Reverse - An editing command which causes a region or soundbite to be played from end to beginning.

Soundbite - The block of audio data as it appears in DAW software.

Take - One record pass. A recording of a particular part of a piece.

Trailing Edge - The right edge of a region or soundbite.

Trimmer Tool - The trimmer tool allows the user to perform edge edits. The beginning and ending points of a region can be edited in this way.

Experiments:

1. Create a new project in DP DAW software. Look at the project file on the hard drive. What files and folders were automatically created?
2. Try recording several takes of the same musical or spoken phrase. Try renaming the takes, copying them, and deleting them.
3. Get into the edit window. Can you make the cursor into the three forms discussed in this lesson?
4. Try performing an edge edit in the edit window.
5. Try moving audio forward and backward in time by dragging and using the arrow keys. Change the grid value and try this experiment again.
6. Try selecting a small region of audio. Separate this region out using the Split command. Now copy and paste multiple copies of this region. Try to layer the copies using the layering commands.
7. Use the reverse command to reverse a region of audio.
8. Try creating a composite track out of several takes of the same audio. What makes this task very difficult, and why is this a powerful technique?
9. Listen to some recordings of popular music and identify edits in the piece. What edits are we supposed to hear? What edits aren't we supposed to hear?

Nonlinear Editing Basics

Nonlinear digital editing is an art. Learning to edit well is almost like learning a new instrument; it takes a lot of practice to get good at it. This lesson will introduce you to some of the concepts which get you started, but it is important that you spend some time practicing editing on your own.

WHAT IS “NONLINEAR” ANYWAY?

The word **linear** refers to things that move in a straight line. Tape, for instance, is linear. First you get part A, then part B, part C, and so on. You can't start with part C then get part B, then part A unless

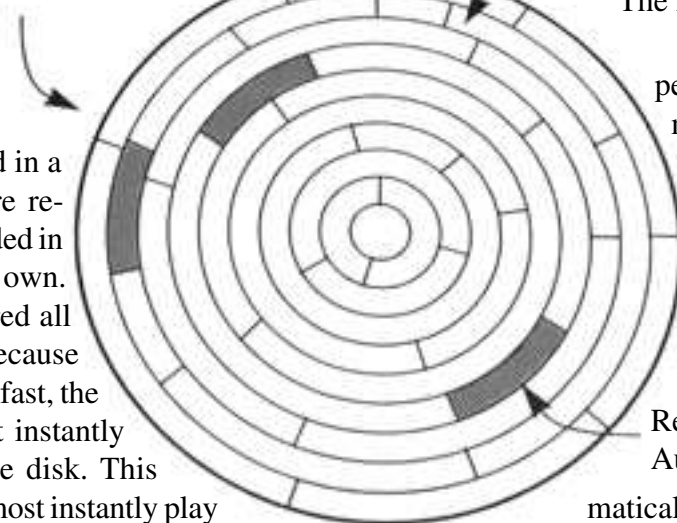
A	B	C
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you do some fancy rewind-

ing and fast-forwarding, but there will still be gaps in the sound. Thus, tape machines are linear recorders, because everything that was recorded must fall into a certain order along the tape which is our line.

Hard disk recorders (DAWs) are **nonlinear**. Information is not recorded in a line. When sounds are recorded, they are recorded in separate files all their own. These files are scattered all over the hard drive. Because the disk is spinning so fast, the hard drive can almost instantly access any part of the disk. This means that you can almost instantly play back any part or parts of anything you recorded

The Actual
Hard Disk



Sectors On
The Disk

Audio files are the thing that eats up a lot of space on your hard drive. Audio takes 5 MB per minute of mono audio. That means that if you record eight mono tracks for 3:30 (a standard length of a pop tune) You would have used 140 MB. We will soon see that this number is quite low, however.

Audio files are stored in a folder called “Audio Files” which is automatically created in the project folder.

in any order you want. Because there is no “line” to follow, no preset order of playback, we say that hard disk recorders are nonlinear.

HOW ARE FILES ORGANIZED?

When you type a document in a word processor, and then save, you generate one file on your computer. In a DAW program, however, what you see on screen becomes one file, but the program may generate several other files as well. When you open a new file in Digital Performer, it creates a project folder. The project folder has the name of your file plus the word “project” after it. If you open this folder, you will see your file as well as a couple of folders.

When you begin to record sounds, a new **audio file** is created each time you start recording. Audio files contain the actual sound data that you recorded.

Each time audio is recorded, the DAW has to analyze it. It needs a moment to create a picture of the sound on screen so that you can work with it. This **analysis file** is stored as a separate file in the “Analysis Files” folder inside the project folder. One analysis file is stored for each audio file in the project. Analysis files are smaller than audio files, but they can take up a lot of space in a big project.



ARE YOU NONDESTRUCTIVE?

If we want to edit a recording on tape, we must get out the trusty old razor blade and actually slice the tape apart. This is considered a destructive edit because there is no way to ever put the tape back together like it was. We can't make the tape whole again. When we edit recordings on a DAW, these edits are (for the most part) **nondestructive** edits. This means that there is always some way to completely undo our edit if we want to.

When you work with the main project file on a DAW, it looks like you are cutting holes in your audio, deleting parts and moving things around. However, the audio files on the hard disk remain unchanged. When you are working with a DAW you are actually creating an **EDL** or **edit decision list**. An EDL is simply a list which tells the DAW when to play what part of which audio file. For instance, we might want to play the audio file "Vocal 1" from 3:45 to 3:51 three times in a row, starting at measure 18 beat 2 in the song.

TAKE IT AGAIN

One of the biggest advantages of hard disk recording is the ability to create multiple takes. A **take** is typically one pass through a song or a part of a song. Typically, in a big studio where the tape machine has many many tracks available, the engineer will record a performer performing the same part several times. Each take is recorded to a different track on the tape so that the engineer, producer, and artist can listen to all of the takes later and choose the one that is best.

On a DAW, each track can hold multiple takes. Only one take can play at a time, but all of the takes only take up one track. So, we can create a track and name it "lead vocal". We can then record 5 or 6 different takes of the vocalist singing the first verse of a song. We can then listen to all of the different takes and decide which is best.

In Digital Performer, the takes column shows the number (or name)

	TAKE	MVE	DEL
stor	1		
-1	1		
-2	1		
-3	1		
-4	1		
-1	1		
-2	1		

of the current take. You can rename takes anything you like from "Stinks" to "Perfect Take!" By clicking and holding, we can create a new take, switch between different takes, delete a take, or even make a copy of a take. (This is very helpful if you want to try a punch in/punch out.) You can see a picture of the takes column in the lower left hand corner of this page.

THE EDIT WINDOW

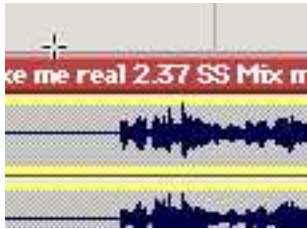
Most DAWs offer a special window dedicated to editing audio you have created by recording. In Digital Performer, you access the edit window by double-clicking on the audio you wish to edit. When the edit window opens, you will see a greatly enlarged version of your audio. Each individual recording you made will be treated like a separate block on the screen. This block is called a **soundbite**. Each soundbite has two edges. The left edge is called the **leading edge** and the right edge is called the **trailing edge**. Soundbites can be quite long, so you may have to scroll to one side using the scroll bars to see both edges.

THE CHANGING CURSOR

The mouse's cursor actually changes appearance and function depending on where you move it on the screen. It is very important that you memorize each of these cursor functions so that you will be able to



make edits on audio you record. When you point at the middle of a soundbite, the cursor looks like a finger pointing. When you have the pointing finger,



you can select the entire soundbite with one click.

If you move to the top of bottom of a soundbite, you will notice that the cursor changes into a cross hair. The cross

hair is used when we only want to select part of the soundbite. At the bottom of this page, you can see a soundbite which has been partially selected. When you move the cursor to one of the edges of the soundbite, it turns into two tiny arrows pointing at each other.

EDITING YOUR AUDIO

Unless you are blessed to record only perfect musicians who are able to perfectly execute every musical part on the first take every time (yeah, right) you will need to master the skill called editing. **Editing** is the art of moving, changing, and rearranging parts of takes to create a track that really shines out of audio that doesn't.

MOVING SOUNDBITES IN TIME

One of the simplest edits you can make is to change a soundbite's location in time. To move a soundbite forward or backward, you have to first select it. To select a soundbite, you simply have to move to the middle of the sound bite and click once on it. At this point, you can either click again and hold the mouse button down and drag the soundbite left or right. You can also use the arrow keys to move the soundbites in the track. You can arbitrarily drop the soundbite anywhere you want to in the track, but you will usually want to place it on a specific beat.

To do this, you need to turn on a grid mode. You can set the grid to a certain number of beats or parts of beats. In Digital Performer, you can choose different note values using the grid selector shown above. This will cause the soundbite to jump from one eighth note to the next. Remember, that moving

audio is completely non-destructive. You can always select undo from the edit menu to undo your last edit. You can also duplicate your original take and just work on the copy of the take. That way, if things get really messed up, you can always go back to your original take.



CUTTING IT UP

Now that you know how to move soundbites forward and back in time, it is time to learn how to cut them into little pieces. In order to divide a soundbite up into **regions**, you must first tell the DAW where you want the divisions made. This is done by selecting a part of a soundbite. To select a part of a soundbite, you need the region select tool (the crosshairs) which appear when you move the cursor just above or just below a soundbite. By dragging over part of the soundbite, you can select just that part. If you just want to separate these parts into different regions, you can select "Split" from the Edit menu. Another easy way to separate parts of a soundbite is to select a part of the soundbite that you don't want to keep (silence between verses or breath noises are good candidates) and then press delete. The part of the soundbite you selected will disappear, and the two remaining regions are separated. Once a soundbite has been separated into regions, you can rearrange the regions any way you please. Again, any deleting you should happen to do is never permanent. You can always hit command-Z and it will all come back.



REGION LAYERING

It is possible to put one region on top of another region. Whichever one is on top will play, the one behind it won't play. You can determine which region is on top using the **layering** commands. By going to the audio menu and selecting "Layering", and "Move to Front," you can move the currently selected soundbite to the top. Using the other commands in this sub menu, you can also move it forward and backwards as you please.

JUST A TRIM, PLEASE

Another very useful tool is the **trimmer tool**. You can get to the trimmer tool by moving to an edge of a region. By dragging the edge forward and backward, you can change the edge of the region. Of course, this is completely nondestructive and it is actually a quick and easy way to get back audio that you deleted. Just drag the edge back over the spot you deleted, and presto! You have that audio back!

CUT, COPY, AND PASTE

Just as in a word processing program, you can use **copy**, **cut**, and **paste** commands on your soundbites. One simple application of copying and pasting is creating the choruses of songs. Since the chorus is usually the same each time it occurs in a song, you just have to record it once and then copy and paste it to all of the places you need it.

In Digital Performer, you can make a copy of a region by holding down the option key while dragging it. Using cut, paste, and copy you can actually change a musician's performance completely.

ESREVER

Want to really keep your listeners guessing? You can **reverse** any region, making it play backwards by selecting the region and then selecting Reverse from the "Plugins" submenu under the Audio menu. Reversed words and phrases can add a sense of mystery and polish to a highly produced track. You might even experiment with a reversed phrase running into the forward copy of the same phrase.

COMPOSITING

Compositing is a procedure in which parts of different takes are merged into one take to create a better take. By cutting and pasting between takes, it is possible to create a track syllable by syllable by taking the best version of each note a musician performed. This can be incredibly time-consuming, however, so it is important to be able to get enough good takes while tracking so that a track doesn't have to be assembled from a billion teeny tiny regions. (This sort of thing does not help your stress level.)



Words To know:

Analysis File
Audio File
Compositing
Copy
Cut
Edit Decision List

Editing
EDL
Layering
Leading Edge
Linear
Nondestructive
Nonlinear

Paste
Region
Reverse
Soundbite
Take
Trailing Edge
Trimmer Tool

Let's Review

1. What does nonlinear recording mean, and what are the advantages of nonlinear recording over linear recording?
2. What kind of files are created when you create a new project in a DAW? Where are these files stored, and which of them are large, and which are small?
3. What is editing? What does nondestructive recording mean? What are you actually doing with the audio files you have created when you edit? What is the big advantage to nondestructive techniques?
4. What is a take, and how are takes used? What else can you do if you can use multiple takes?
5. What are two ways you can move sound bites in time? How is this accomplished?
6. How can sound bites be 'cut up'?
7. What does the trimmer tool do, and how is this helpful to us?
8. How can you edit using the copy, cut, and paste commands?
9. What is compositing, and what does it allow you to do?

Super Student

Technology changes and grows at a blinding fast pace. It can be very difficult to keep up with it. To show you just how fast technology changes, search on the world wide web and look at different computer manufacturers. At the time this book was written, the largest hard drive you could order with a computer (direct from the company that made it) was 72 GB. A simple search of the web should show you that even in a few months since this book was written, things have already changed radically!

DID YOU KNOW?

Video editing programs work very much like audio editing programs. Recently, video editors have become nonlinear and nondestructive, just like audio editors. It is interesting to note that video editors often use some of the same exact editing techniques that audio editors use. Some of the most powerful video editors, like the Avid system, are manufactured by the same companies that make audio editors (Avid also makes Pro Tools). Using even a simple video editor program, it is possible to create very professional looking video!