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Desktop Music Production for PC

Lesson 7:
An Overview of Mixing

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The Reason Mixer

The Reason mixer is laid out very similarly to many small desktop mixers. That is, it has a number of input channels that are essentially the same. There is a section where signals are routed to and from external devices, and a master section where the output signals are controlled.

The Reason Mixer: 14 Channels, a Master section, and four separate sends and returns.

Mixer Components in Reason

Channel Strip
Routes signals to and from external devices.

The Channel Strip.

Master Section
Controls the output of the entire mixer.

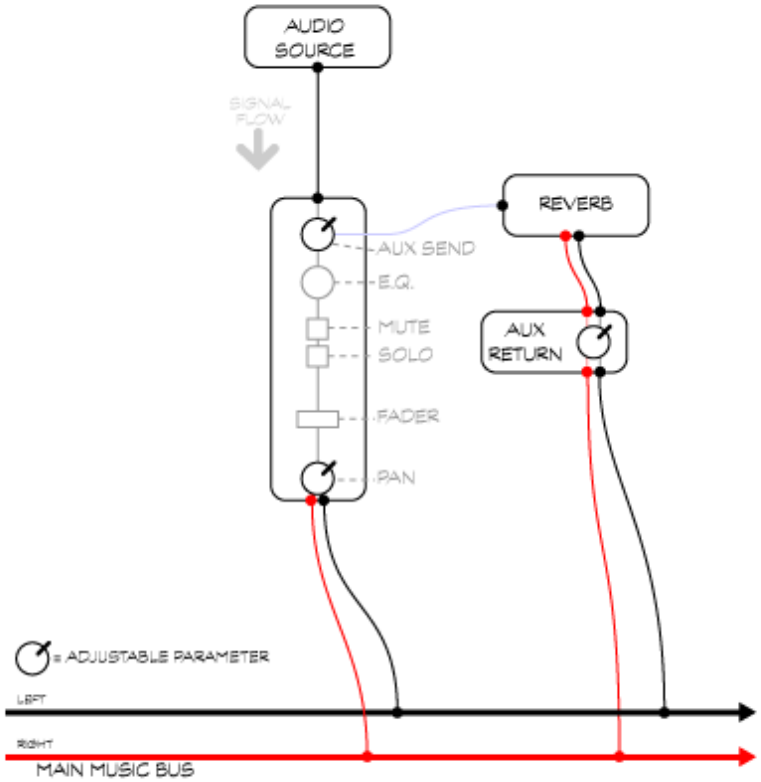
The Master Section.

Let's take a deeper look at how signals move through a mixer.

The Reason Mixer

Mixers and Signal Path

In general, audio signals enter a mixer at an **input,** and then travel through a **channel strip** where various parameters may be controlled, such as the volume level, placement in the stereo image, and tone quality.



Signal path in a mixer.

Using the Reason channel strip as an example, let's look at the available controls.

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Next Activity: Exercise: Available Mixer Controls

The SONAR Mixer

Now compare the Reason mixer with another software mixer, Cakewalk's SONAR.

The mixer in SONAR.

Notice the similarities of this layout with that of the Reason mixer. Some of the similarities you might notice are:

- multiple channel strips with dedicated controls for each channel
- auxiliary busses (sends and returns)
- master level faders

There are differences as to exactly where the various controls are, and how the controls look graphically, but the interfaces are very similar in layout and function. Take this short quiz to compare the SONAR mixer with the principles we have learned with Reason.

The SONAR mixer quiz.

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Next Topic: The Hardware Mixer

The Hardware Mixer

Let's look at a very common hardware mixer, the Mackie 1202.

The Mackie 1202 mixer.

Identify the various controls on the Mackie, and then note the similarities and the differences:

The Mackie quiz.

Technical Issues in Mixing

Levels

The importance of good signal levels in recording and mixing cannot be overstated when it comes to maximizing signal quality and minimizing distortion.

Watch this movie illustrating how to set levels. **Click the image to start the video.**

Setting levels.

When setting up a physical studio, you will need to set levels for all devices using the method given above. Once all your input gain levels are adjusted appropriately, you should leave them alone, and make all relative level changes with your channel faders. Use your mixer output level controls to make adjustments to your overall listening volume.

Be careful when mixing because as your ears tire there is a tendency to raise levels to better hear sonic detail. Professional studios have level meters installed to protect engineers from creeping volume levels.

Loud volumes can damage your ears, and you should protect them as best you can: They are your best tools for mixing!

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Aesthetic Issues in Mixing

In this section, we will examine general issues of mixing from an aesthetic standpoint. Besides the technical issues we have explored, we now look at the musical and artistic considerations in making a good mix.

Levels of Instrument Parts

The most commonly adjusted parameter of a mix will be the individual levels of instruments. The relative balance between instrument parts is key to the successful expression of a piece of music. For example, the balance between the bass and drum parts is essential to a groove mix. Vocals need to be heard over instrumental backing, and the louder each individual part, the louder the whole.

When setting the relative balance of instruments in a multitrack piece, channel faders adjust the levels of individual parts until you find a mix that suits your personal tastes. Level changes alter the mix and gives you one dimension of control over the clarity of the overall sound.

Automation of Instrument Parts

In actual performance, levels will vary throughout a piece. Therefore, engineers will often continuously adjust the levels of the track to compensate for uneven playing, environmental changes, or unintended dynamic changes. This is often called "riding the level." Often, in the process of mixing, the producer acts much like an orchestra conductor by bringing out key elements in a production.

Fortunately, many professional and semi-pro-level mixers have the ability to store movements of faders through a process called **mixer automation**. Most software-based mixers such as those in Cakewalk's SONAR and Propellerheads' Reason also feature this capability.

Automating a mix involves recording the fader movements as control data to a special memory location, and then playing back the movement control data. This data can often be edited as well, either by recording over the track, punching in and out as needed to replace only the changed information, or by using a graphic or list editor window.

Aesthetic Issues in Mixing

Spatial Location

Stereo sound represents space in two dimensions along a horizontal plane. A sound can be placed between two speakers with its relative location controlled by the pan control.

The third dimension, **depth,** is often simulated in stereo by balance between instruments and by adding reverb.

Surround sound adds the third dimension by adding speakers behind the listener and controlling the relative loudness of each sound in each speaker.

Since we cannot assume you have access to an accurately configured surround sound mixing system, we will work with the stereo field and add depth with reverb.

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Aesthetic Issues in Mixing

The Sound Spectrum

In the last section we explored how the spatial location of instruments can add clarity to a mix by precise placement in the stereo field. Now let's look at how equalization can also help add clarity by avoiding an effect called masking. Let's think of the sound space created by a mix as a room. The horizontal plane is governed by pan, the depth is controlled by reverb, and overall vertical plane is controlled by volume settings. Now think of the whole sound spectrum from lowest to highest frequencies as filling the whole room from floor to ceiling, with the highest frequencies at the ceiling.

Many instrumental sounds fill up a large portion of the volume of the room. Think of the piano. It has very low frequencies as well as high frequencies. Now think of the sound of a guitar. It doesn't go as low or high as the piano, but it does cover a large portion of the middle range. If you have a piece with both guitar and piano playing chords in the mid-register, some of the instrumental sound of one will mask parts of the other sound unless we are careful to separate the two instruments. We can do this somewhat with pan and reverb, but equalization can further help to clarify our mix.

Let's now do an assignment that examines levels, spatial location, and the sound spectrum in mixing.

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Next Activity: Assignment: Mixing in SONAR

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