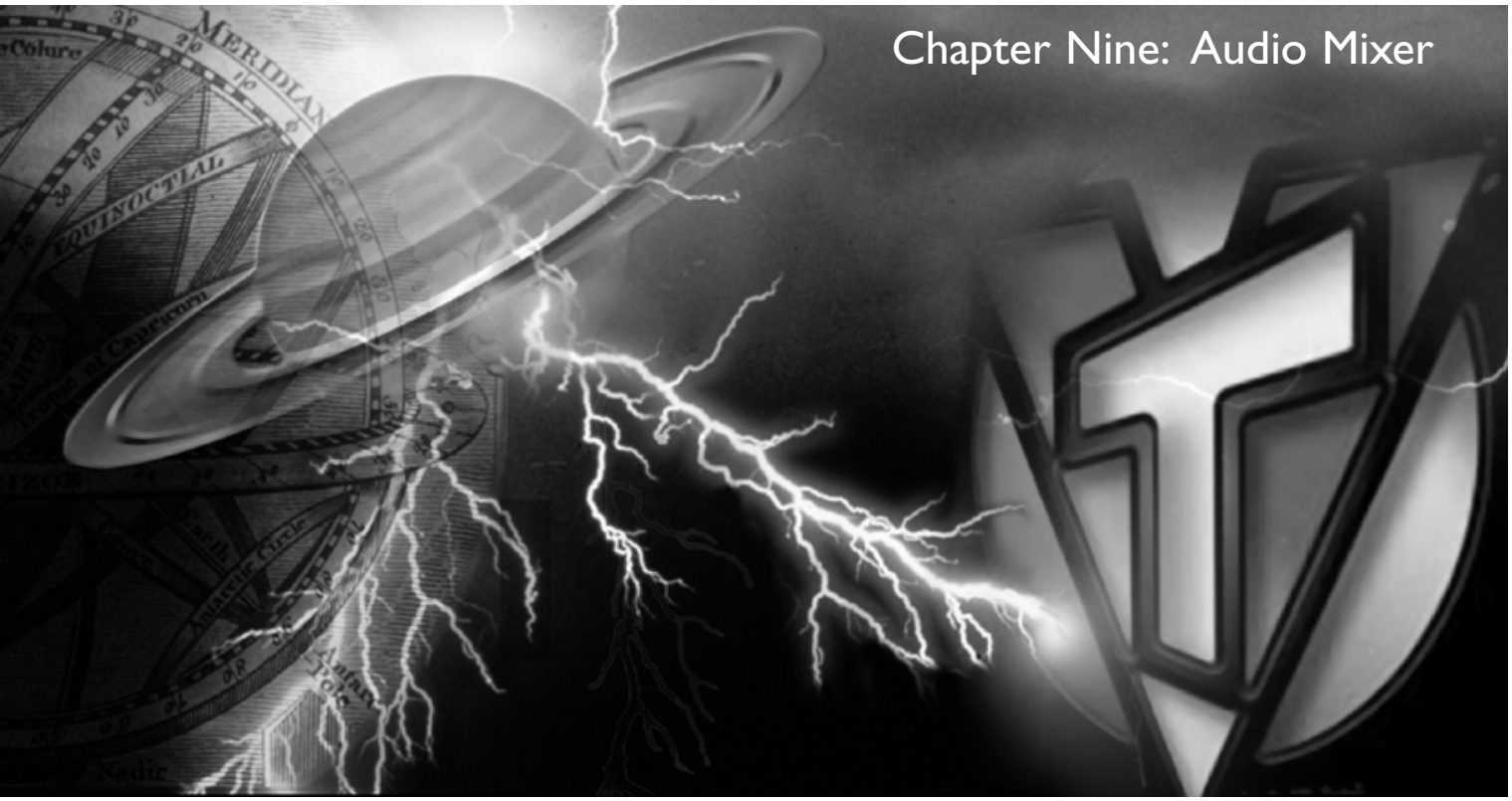

Chapter Nine: Audio Mixer

Chapter Nine: Audio Mixer

Sound can greatly impact the quality and effectiveness of your production, and it can change the entire mood of a scene. Through the Audio Mixer, you can combine music, sound effects, and narration from different inputs, and produce audio to accompany your video. Audio mixing is the process of blending several audio signals to create a combined signal.

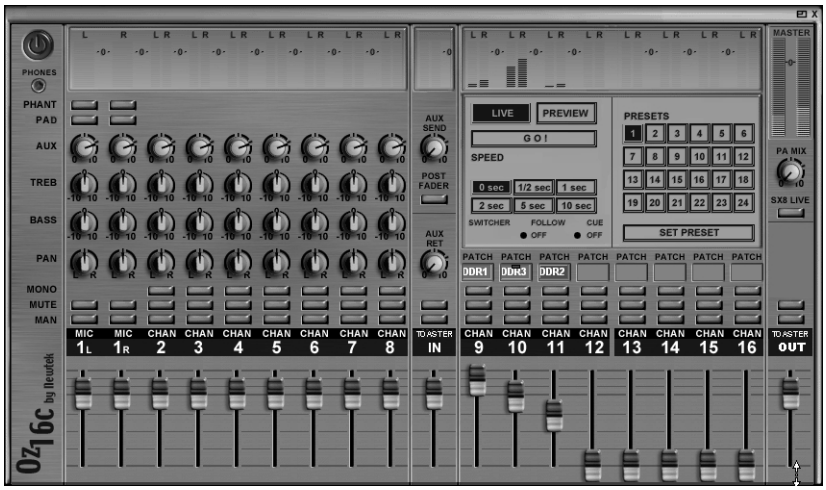


Figure 9.1. The Audio Mixer.

The Video Toaster [2] card supports both audio and video, allowing them to be played or recorded at the same rates. This eliminates sync problems typical to systems that need a separate audio card. You can capture audio that is better than CD-quality audio (48 KHz) with the card's on-board (unbalanced) mini-stereo inputs. If you add the optional SX-8 breakout box to your system, you get microphone, balanced XLR, and unbalanced RCA inputs and outputs.

Audio captured by the Video Toaster [2] is stored in the industry standard WAV format; this is the default, but you can choose other formats from the Capture panel. When you record audio and video together, the audio is captured with your chosen format: RTV or AVI.

INPUT AND OUTPUT

MICROPHONE/XLR BALANCED INPUT

On the Audio Mixer, the first channels, 1L, 1R and 2 are microphone/XLR channels. These are the only channels that can accept microphone input or XLR balanced input. The Audio Mixer lets you switch between microphone and line input.

Microphone-level inputs use low impendance, or very low voltage, while line-level inputs use high impedance, or much higher voltage, to transmit a signal. Remember, if you place line-level devices into the inputs when they are active as microphone-level inputs, you will get distorted sound.

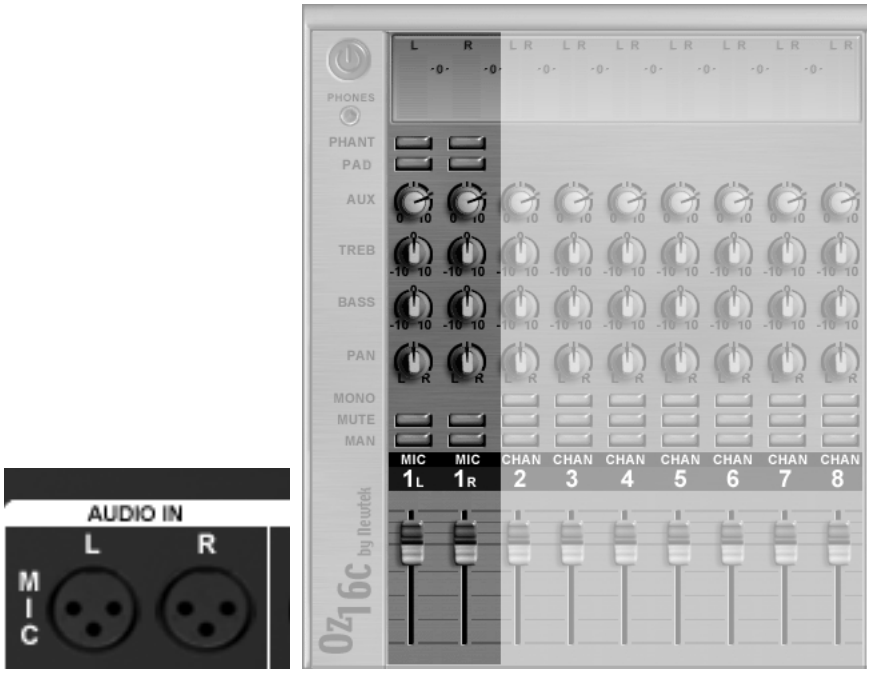


Figure 9.2. Left: Microphone inputs Right: Microphone channels.

In the **Microphone** channel on the Audio Mixer, a few options are slightly different from the other channels. For microphones that accept it, **PHANT** stands for phantom power, which lets the mixer send low-current DC voltage to the microphone's electronics through the same wires that carry audio. This extra voltage is about 48V, and boosts power to the microphones slightly.

The **Pad** control lets you add or reduce the sensitivity of the input. The XLR inputs are equipped with preamplifiers, which are affected by this current. You send a pad to the the preamp on the SX-8 breakout box. Think of this as adjusting the strength the input.

- Deactivate **Pad** when you want a stronger signal from the input**,** such as when a microphone sits far from the source, and you need to boost the input.
- Activate **Pad** to reduce the signal from the microphone, such as on a microphone that is close to a loud sound. In this case, you soften the sound.

The other options on the microphone channel are also available on the stereo channels, which are discussed next.

RCA STEREO INPUT ON THE SX-8

These six lines can be driven by stereo, mono, or unbalanced inputs from CDs, tape recorders, video decks, and so on. Channels 3 through 8 on the Audio Mixer directly correspond with the audio inputs numbered 3 through 8 on the SX-8 breakout box.

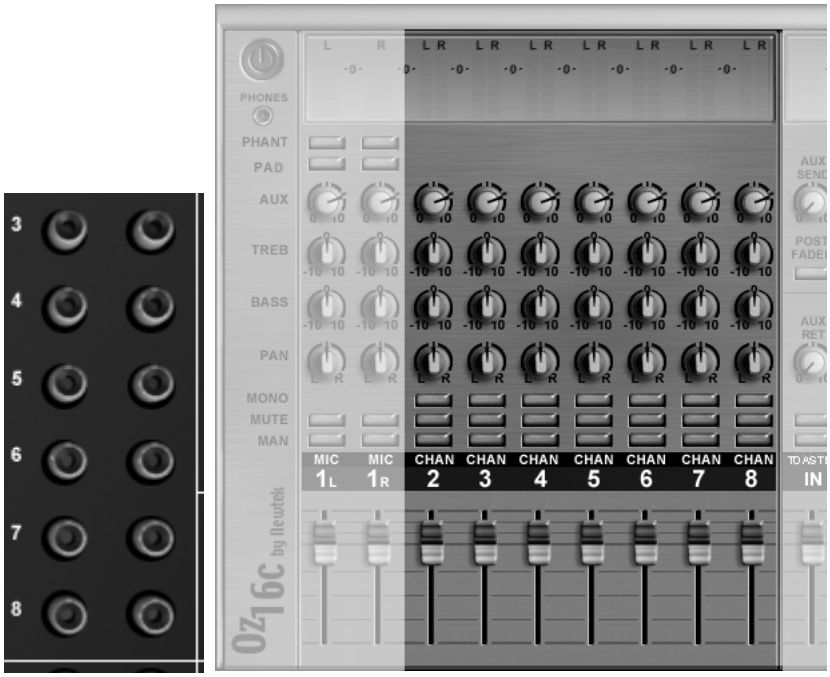


Figure 9.3. Left: RCA unbalanced inputs. Right: Audio Channels.

VIDEO 101: BALANCED AND UNBALANCED INPUT

Audio signals need two wires. An unbalanced line uses the shield as one of those wires, and a balanced line uses two wires plus the shield. A balanced system needs balanced electronics and usually uses XLR connectors. Balanced lines are less likely to pick up external noise, which is a substantial concern in professional audio where you may use several hundred feet of cabling. Unbalanced lines may pick up more noise, usually hum, as cables get longer.

Stereo devices use both the left and right channels on the SX-8 breakout box. Mono devices use only the left channel, so the right channel becomes unavailable. When you add audio devices to the SX-8, they are automatically patched to their respective channels on the Audio Mixer. Therefore, if you add audio to audio input 5, that input is patched to Channel 5 of the Audio Mixer. The signals for the left and right channels are represented in the volume unit meter, discussed next.

PATCH POINTS FOR AUDIO FILES

Patch points are the areas where you can patch a computer-generated audio source. For example if you add an audio file to the DDR, you can drop the DDR tag onto the Audio Mixer patch bay. On this Audio Mixer, you cannot adjust controls like **Treble** and **Bass** for computer-generated audio. You can adjust volume and control the channel through **Mute** and **Man**.

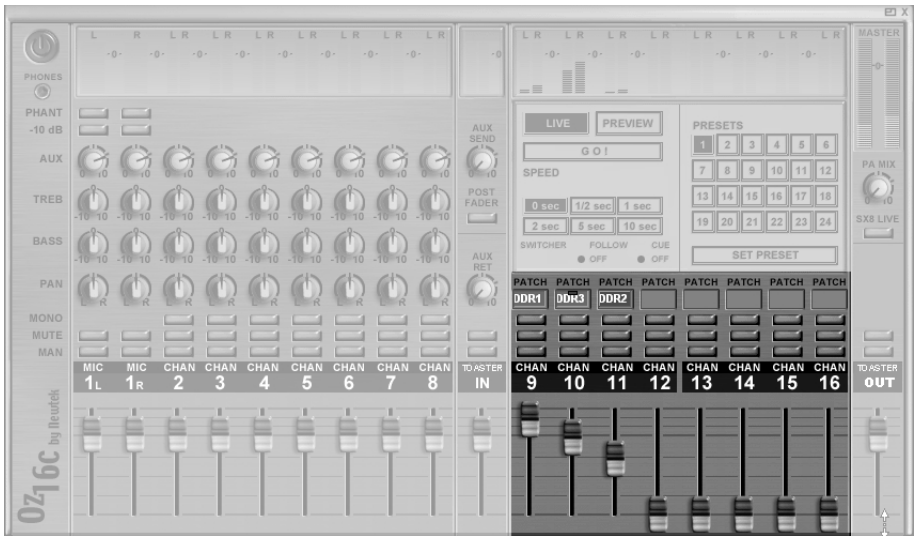


Figure 9.5. Patch bays for adding computer-generated audio.

To patch a computer-generated input to the audio mixer

1. Open the DDR and add an audio file.
2. Drag and drop the DDR tag onto an available channel.

NOTE

To patch an audio file to the Audio Mixer, you must add the audio to a panel, such as the DDR or ToasterEdit. You cannot drag and drop an independent audio file into a patch bay.

AUDIO MIXER CHANNELS

VOLUME UNIT METERS

The volume unit (VU) meters that sit at the top of the panel mimic an LED-type display. The VU meter measures the audio signal in volume units. Your goal when mixing audio is to keep the audio level strong enough to produce a good signal, but not so strong that the audio is distorted (known as overmodulation). On a digital VU meter, that level is typically about 70 percent of zero, where zero represents your threshold. If your signal passes zero, then it may be clipped and will sound distorted.

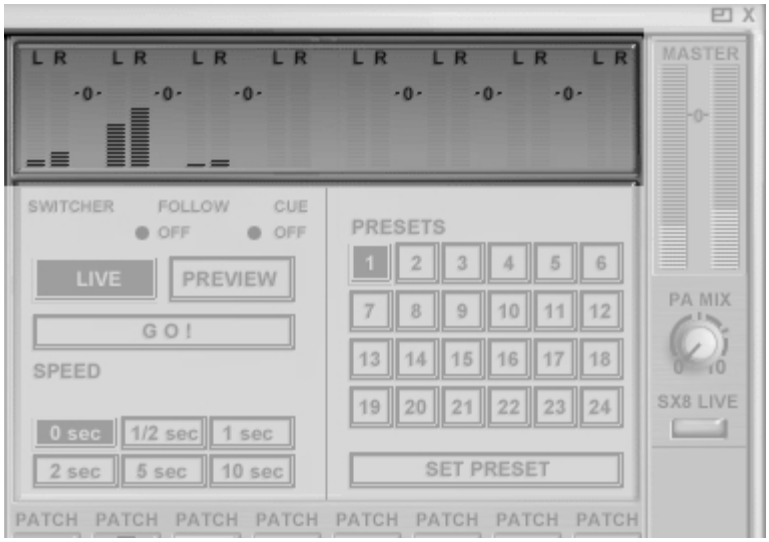


Figure 9.4. LED-style volume unit meters

The VU meter sets the standard for your sound volume. Any audio that exceeds the peak when it comes into Video Toaster will be distorted when you send it to output. When you set a volume level, you leave a little bit of head room for unexpected sounds, so that sounds that come in louder than expected will not distort. If your audio level is too low, the signal-to-noise ratio deteriorates.

CHANNEL CONTROLS

Aux

Aux gives you independent volume control over channels that you send to external components like monitor speakers, or special effects units such as reverb or echo. The auxiliary component must be patched to Video Toaster through Aux Send and Aux Return on the SX-8 breakout box.

The volume you set for Aux affects only the signal sent to Aux Send. You do not affect the signal sent to **Toaster Out**. **Aux** gives you a special mix. For example, if a choir director with headphones attached to Aux Send wants to hear only the lectern, you lower the **Aux** for all other channels. Aux Send and Return are discussed in more detail later in the chapter.

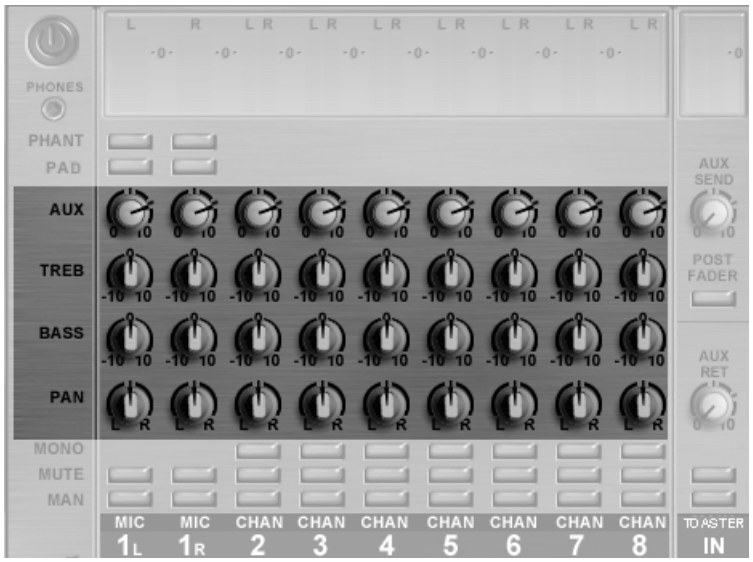


Figure 9.6. Controls for audio channels include Aux, Treble, Bass, and Balance.

Treble and Bass

Treb and **Bass** help you control the tone of the audio channel. You can enhance tones or reduce inappropriate frequencies. These controls offer a +/- 6dB range that give a boost or cut to the controls.

The **Treb** control helps you brighten sounds, or get rid of high frequency noise.

- Rotate the control to the right to increase treble; this adds presence by making sounds seem clearer.
- Rotate to the left to reduce treble; use this method to remove hiss or unwanted high frequencies.

The **Bass** control lets you boost bass, or get rid of rumble from low frequency noise.

- Rotate to the right to boost bass on desired channels and add depth.
- Rotate to the left to remove bass and decrease low sounds like hum; bass sounds on other channels will come through more cleanly.

Pan

Pan's function depends on whether you work with a mono or a stereo input. With mono, **Pan** lets you send the entire audio signal to the left or right of the stereo output. With a stereo input, when you move **Pan** toward one side, you reduce the signal on the other side. So if you rotate **Pan** all the way to the right, you hear only information from the right input.

Mono

When you activate **Mono**, you accept only the signal from the left input of a stereo input. You can, however, sweep the **Mono** signal to the left or right by rotating **Pan**.

Hint

To pan both sides of a stereo signal independently, plug each input into a left audio input on the SX-8 breakout box. Switch Mono on for each of those channels. Then each side of the signal is patched to its own channel in the Audio Mixer.

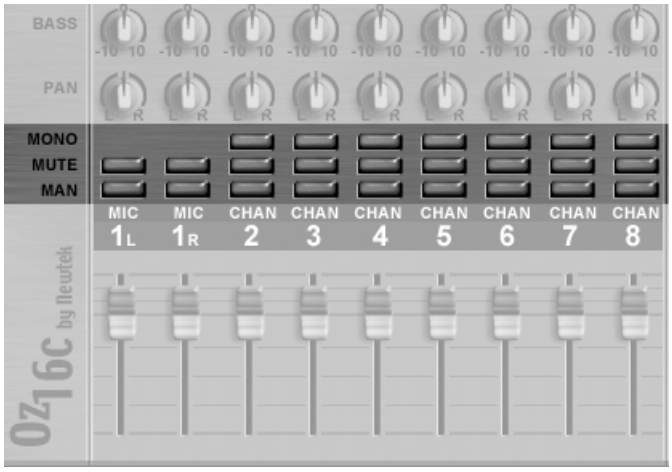


Figure 9.6. Mono, Mute, and Manual let you control output from channels.

Mute Channels

Mute lets you mute a selected channel or channels so that you do not hear their signals. For example, if you wanted to get rid of a particular signal for a while and not move its volume control, you can hit the **Mute** button. The signal is still active; you just can't hear it. You also will not record a signal that is **Mute**d.

Manual Control

Man is short for Manual, and it gives you manual control over a channel even if that channel is assigned to a preset (discussed later). This option comes in handy when you realize that you need to adjust a channel, and you want to override, but not change, the preset. Some channels, such as **Aux Send** and **PA** are manual by default, and cannot be assigned to presets.

VOLUME

At the bottom of every channel is the volume control. As explained earlier in the chapter, you want the volume of the channel to be strong enough to produce a good signal, but not so strong that the audio is distorted.

- Push the control up to increase volume.
- Push the control down to lower volume.

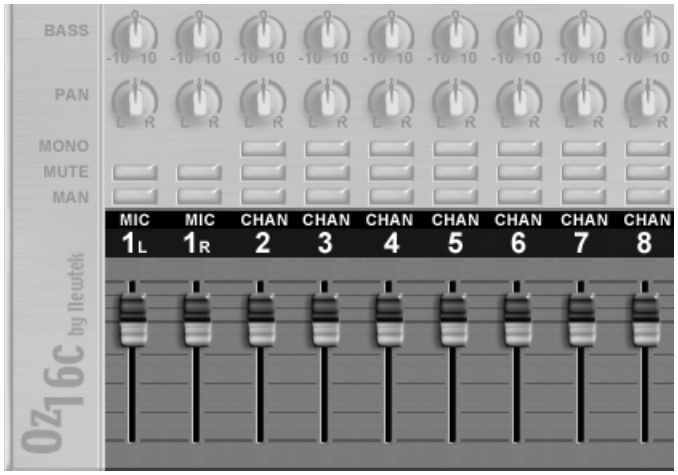


Figure 9.7. Controls for Volume

AUX SEND AND RETURN

The **Aux Send** and **Aux Ret** knobs are master controls where you adjust the volume of the signal that you send to or return from an auxiliary device. Auxiliary devices can be audio effects processors, amplifiers, monitor speakers, and so on.

Figure 9.8. Left: Aux on the SX-8. Right: The master controls for Aux in the Audio Mixer.

Aux Send is the master control for the **Aux** signals that you send from Video Toaster to an auxiliary component. As explained earlier, the **Aux** controls give you independent volume control over channels that you send to auxiliary components.

If the signal comes back from the device, it returns to Video Toaster through **Aux Return**. You control the master returning signal with **Aux Ret** to balance it with your mix.

The **Post Fader** button lets you control whether the master **Aux Send** signal is a pre-fader or post-fader signal. Activate **Post Fader** to use a post-fader signal, which recognizes each channel's volume settings. For example, if you sent audio from Video Toaster to an effects processor, you use **Post Fader** to use the same volume settings for **Aux Send** as you are sending to **Toaster Out**.

When you activate **Post Fader,** Aux Send accepts any **Mute** or **Man**ual controls you apply to the channels.

Deactivate **Post Fader** to use a pre-fader signal that disregards any channel volume settings. The pre-fader signal recognizes only the settings you make with the **Aux** control, which sets the volume only for the aux signal. For example, you want a pre-fader signal when you use monitor speakers and headphones.

Remember that your Aux and Aux Send settings do not affect the audio signal that goes to Toaster Out. Your volume settings on the channels affect the Aux Send signal *only* if you activate **Post Fader**.

TOASTER IN

Toaster In gives you master control over all incoming audio inputs. That is, you control the master volume for channels 1-8 and Aux Ret. If you do not have an SX-8 breakout box, then Toaster In controls all of your audio input.

LIVE AND PREVIEW

The **Live** and **Preview** buttons essentially give you two views of the Miser. When the **Live** button is active, changes you make happen right away. So, if you adjust the settings on a channel and **Live** is active, you hear your changes immediately.

The **Preview** button lets you preview your settings, so that you can make changes without affecting the Live signal. In Preview, you can move between the stored settings in the presets (discussed next) without actually running them: you double-click on the preset number and the Audio Mixer updates the settings for each channel.

When you are in **Preview**, you can choose a preset and click **Go!** to immediately go **Live** and launch the preset. When you do this, the Audio Mixer adjusts the channels based on the most recent preset, so if you want to jump immediately to your new preset, consider choosing **0 sec** for transition speed.

When you are **Live**, and you want to launch a preset, you can either double-click on the preset number or click the **Go!** button.

PRESETS

Presets let you assign settings to your channels that let you automate complex changes at the click of a button. Basically, presets are a snapshot of your settings. You store the snapshot so that you can quickly jump or crossfade between channel settings when you need them. You can also set up the Audio Mixer presets to work with the Switcher, so that when you switch between video inputs, you also switch audio.

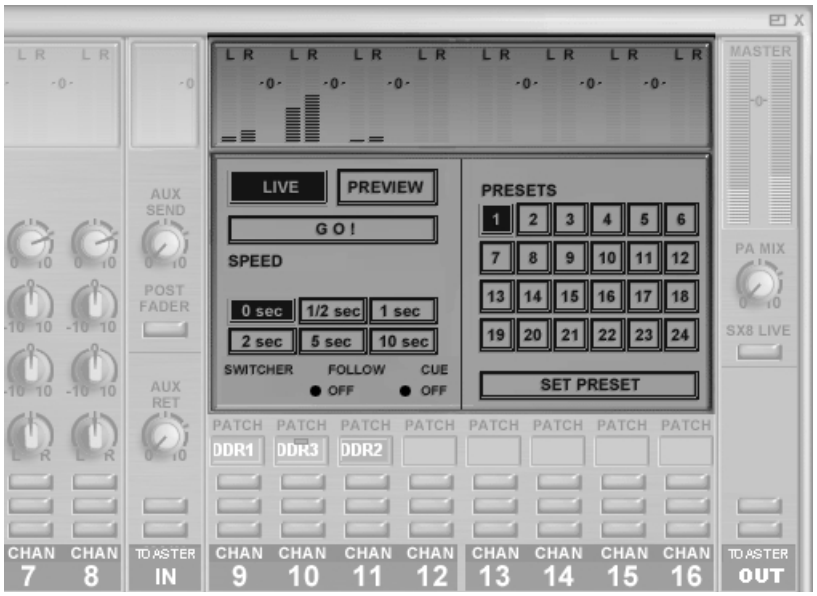


Figure 9.9. The Presets area

To create a Preset

1. Adjust each channel's controls, such as **Bass** and **Volume**.
2. Choose the numbered button that you want to assign as the preset.
3. Click on the **Set Preset** button to assign your settings.

All channels that you adjust before you click **Set Preset** are assigned to the preset.

To recall a Preset

- In **Live** mode, select the preset number, set the speed and click **Go**. Or, double-click the preset number to automatically launch the preset.
- In **Preview** mode, double-click to load the preset, then set the speed and click **Go**.

NOTE

Some channels and controls are not stored in the presets: the Man control and channels without the Man control (Aux Send and Return, PA Mix) cannot be stored in the presets. Speed settings for preset transitions also cannot be stored as part of the preset.

PRESET SPEED

Speed lets you set the amount, in seconds, to use as a transition between your presets. If you choose **0 sec**, the mixer jumps straight from one setting to another—which makes an abrubt change. If you choose **10 sec**, the mixer slowly transitions between the preset settings over ten seconds, which involves fading out the current settings and fading in the new settings. You can also use the speed guage above the speed buttons to manually set any speed up to 60 seconds.

To apply Speed to Presets

1. Add audio for channels 2 and 3.
2. Set channel 2 to medium volume and channel 3 to no volume.
3. Choose preset button **1**, then click **Set Preset**.
4. Set Channel 2 with no volume and set channel 3 with medium volume.
5. Choose preset button **2**, then click **Set Preset**.
6. Choose **10 sec** for **Speed**, then click **Go!**.

NOTE

Speed cannot be stored with presets.You choose your speed ***before*** you click on **Go**, and the Audio Mixer applies the speed each time that you change presets. So, if you want a transition to be quicker, you select the new speed before you choose the next preset.

SWITCHER OPTIONS

The **Switcher** options let you use the **Auto**, **Take** and the Tbar action in the Switcher to transition between presets.

Cue

The **Cue** button lets the Audio Mixer listen for cues from other panels to activate the **Go** button.

To Cue a Preset

1. Create your presets and select the first one that you want to use.

2 Click on **Cue**.

3 In the Switcher, when you hit **Auto**, **Take**, or the Tbar, you activate **Cue** on the Audio Mixer and run your selected preset.

Follow

Unlike **Cue**, **Follow** uses the Switcher's speed and T-bar position for the Mixer's transition speed. Activate **Follow** and the Audio Mixer applies your presets when you make transitions in the Switcher. **Follow** associates the Audio Mixer preset with the same numbered channel in the Switcher: preset **1** works with Switcher channel 1, preset **2** with Switcher channel 2, and so on. **Follow** also behaves like an automatic Cue that moves to the associated preset when you change switcher channels.

TOASTER OUT AND THE MASTER SIGNAL

The master control at the far right of the Audio Mixer lets you control the volume of the master signal sent to audio output. You read the master VU meter the same way that you read the channel VU meters: you want to send a strong signal, but the signal should stay below zero. Ideally, if your output is too strong you should lower your individual input channels and leave the **Toaster In** and **Out** levels up.

PA MIX AND SX-8 LIVE

PA Mix provides yet another control over an output signal. The **PA Mix** accepts the same master signal as **Toaster Out**, but sends it straight to the PA Mix output on the SX-B breakout box. So, you can control the volume specific to the **PA Mix** without affecting the volume of **Toaster Out**. This option is also good as a feed for studio speakers, where you want to adjust the volume of speakers in the room (attached to the PA Mix output) without affecting the output to tape.

The **SX-8 Live** button sends a signal from the Audio Mixer panel to the SX-8 breakout box that instructs it to send the input audio from the SX-8 directly to the PA Mix output, and bypass the Video Toaster card. You still get audio into the Video Toaster card, but when you activate this button you essentially ask for two signals: one into Video Toaster and one to the PA Mix. When you pass audio through the Video Toaster, the digitizing process causes a slight delay. And, if you use the Video Toaster with a PA system while you switch, you want to avoid that delay. For example, if someone speaks into a microphone, you want the audio on the PA to coincide with the speaker's mouth, so you choose **SX-8 Live**.

WORKING WITH EQUIPMENT

If you want to add more microphones to Video Toaster [2], you can use an outboard audio mixer. Add that mixer to one of the stereo feeds, which is automatically patched to an Audio Mixer channel. You can control the microphones as a group in this way.

You can add a CD player, the stereo feed from a camera, a tape recorder, and so on to the audio inputs of the SX-8 Breakout Box; these feeds are automatically added to Audio Mixer channels.

XLR balanced lines use stronger casing for connectors that blocks out line noise, unlike RCA unbalanced stereo lines. Therefore, when you record audio, you try to use the XLR inputs unless you are reasonably close to the audio, then you can use RCA inputs instead.

You can feed some instruments, like keyboards, directly into the stereo inputs on the SX-8 breakout box, but for others, like guitars, you need to use a preamplifier (such as a direct box) to increase the signal before you feed it to the SX-8.

TASK: AUDIO MIXER

For this exercise, you need two microphones, a host and a guest for the talent (for example, to discuss a topic for a talk show—use a script so you know when the program is over). You also need two CG title pages: one with the name of the show and one with credits for the end, and a music file. Also, use two cameras, one for each person.

SET UP THE AUDIO MIXER AND SWITCHER

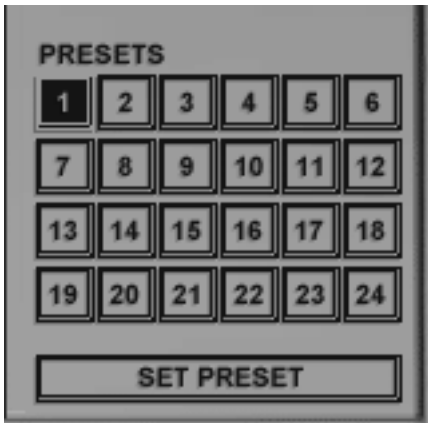
1. Add the microphones to the first two audio inputs on the SX-8 breakout box (see Chapter Two for more info). Add the cameras to the first two video inputs on the SX-8.
2. In Video Toaster [2], open the Audio Mixer. The microphone inputs appear in the microphone channels 1L and 1R. (Make sure that you've set up microphone one for the host and microphone two for the guest.)
3. Add a music file: open the DDR and add a WAV file. Drag the DDR tag onto Channel 9 of the Audio Mixer.
4. On the Switcher, place the host video in Channel 1 and the guest video in Channel 2. Place the CG title page on Channel 3 and the CG credits page on Channel 4. Place a Black background on Channel 5.

AUDIO MIXER PRESETS

1. Continue from the task above.
2. Set the Audio Mixer on **Preview**. In the Preset area, choose **Switcher Follow.** This control tells the presets to follow the Switcher channel with the same number.

3. Increase the volume and adjust bass and treble for Channel 1L, which is the audio for the host. Lower the volume somewhat for Channel 1R. Completely lower the volume for Channel 9. Set your **Toaster In** and **Out** levels as well.

4 Click on the **1** button on the Preset panel and click the **Set Preset** button.



5 Increase the volume and adjust bass and treble for Channel 1R, which is the audio for the guest. Lower the volume somewhat for Channel 1L. Click on the preset **2** button and click **Set Preset**.

6 Lower the volume for Channels 1L and 1R; increase the volume for Channel 9. Click on preset **3** and click **Set Preset**. Also click on preset **4** and click **Set Preset** to have two identical presets.

7 Lower the volume completely for all channels by lowering the master volume, Toaster Out. Click on preset **5** and click **Set Preset**.

8 Click on **1 sec** for **Speed**.

AUDIO MIXER AND THE SWITCHER

1 Continue from the task above.

2 On the Switcher, place the Black background on the Main bus, and place the CG title page on the Preview bus.

3 In the Audio Mixer, click on **Live**. Preset **5** should be the active preset, because the Black background is on Channel 5.

4 Open the Capture panel and set up your record settings (or you can record to a VTR—if so you must add the VTR to video and audio out). When you and the talent are ready, click the **Rec**ord button.

5 On the DDR, press **Play** to play the music file. In the Switcher, click **Auto** to fade from Black to the CG title page. As you do this, the Audio Mixer changes from preset **5** to preset **3**. The music fades in.

6 In the Switcher, place the host camera (channel 1) on the Preview bus. Click **Auto** to fade from the CG title page to the host. As you do this, the Audio Mixer changes from preset **3** to preset **1**, and the music fades down. (You may also want to hit **Pause** or **Stop** on the DDR)

7 When the switch completes, signal the host to begin.

8 When the guest speaks, switch to the guest camera (channel 2), and the Audio Mixer switches to preset **2**. Continue to switch between the host and guest as they speak.

9 On the Audio Mixer, you can click **Man** for Channels 1L and 1R, so you can adjust the controls for the microphones for the host and guest, if necessary. This will not affect the presets.

FINISH THE PROGRAM

1 Continue from the task above.

2 While the host and guest talk, set up the DDR again to play the music for the end. Click **Stop** to force the file to jump to the beginning.

3 As the host begins the closing statement, place the CG credits page (channel 4) on the Preview bus. In the Audio Mixer, **Follow** should still be activated.

4 When the host is done talking, hit **Play** on the DDR and click **Auto** to fade from the host camera to the CG credits page. At the same time, the Audio Mixer activates preset **4**, and the music fades in.

5 Place the Black background (channel 5) on the Preview bus and hit the **Auto** key to fade from the CG credits page to black. The Audio Mixer switches to preset **5** and the music fades away.

6 Click the **Stop** button to stop recording on the Capture panel.