

Q&A FOCUS

Recording

YOUR QUESTIONS ANSWERED



Get your recording nightmares sorted once and for all with this month's Q&A Focus session...



Sonar echoes

Q Here I am, messing about with my newly bought copy of Sonar, thinking I could actually make some music with the thing. Man, was I wrong! I play the guitar, and one of my mates suggested that I look into recording the output on my computer. I've set everything up properly, but when I try to play into the computer, the sound is sort of echoey, like it has a delay line on it. How am I supposed to work in this way? If I can't figure out what's going on, that friend of mine is going to get an

unpleasant surprise! Thanks in advance for your help.

Adam Smith

A What you're hearing is that old computer music headache, latency. It's not possible for the computer to play back that signal at the exact same time you're playing, since it takes time for the soundcard to do an analogue-to-digital conversion during recording, and then a digital-to-analogue conversion in order for you to hear what's been recorded. In addition, the signal is buffered for a given period of time.

Many soundcards offer some sort of hardware monitoring of the

input signal so that you can hear what's going on before it's sent to the A/D converters. In addition, most decent soundcards offer low-latency ASIO or WDM drivers. If yours does, you should be using them for best results, and you need to find a happy medium between low latencies and error-free buffer settings. See the walkthrough below for a quick guide to how to do this in Sonar.

Right dynamics

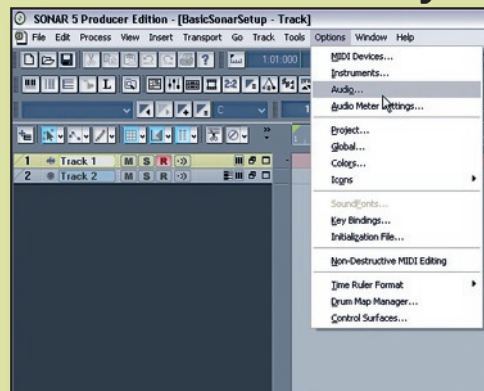
Q I want to begin recording my vocals, guitars and suchlike, so I need to look into getting a microphone.

I've been advised to look for a large diaphragm microphone, but I'm confused by the terminology surrounding these things. For instance, what is meant by the term 'cardioid'? Most of them seem to be cardioid, so I assume that it's a popular design? What's the difference between a large diaphragm microphone and a small diaphragm model? Can they be used for the same sort of things?

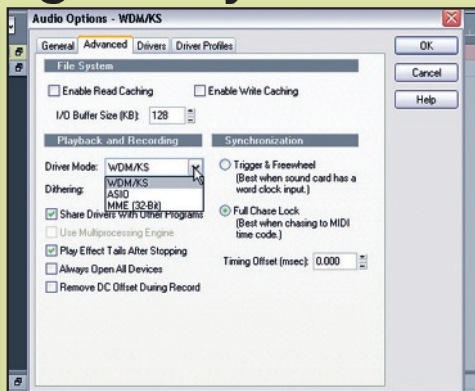
Ed Carney

A Microphones come in a bewildering array of styles, but these are really based

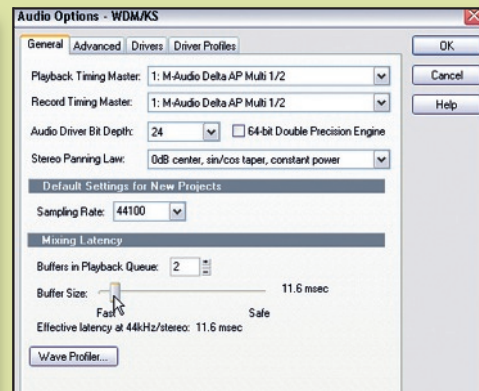
STEP BY STEP Adjusting latency in Sonar



1 If you're getting an unreasonable amount of delay between what you play and what you hear, it's the result of your soundcard's latency. Adjusting this in Sonar 5 is easy. First, click on the **Options** menu and select **Audio** from the list of available options. This will give you access to all of the parameters necessary to fine-tune your audio interface's performance. >>



2 Once you've opened the **Audio Options** dialog, click on the **Advanced** tab. This is where you can tell Sonar which of your installed drivers ought to be used. You'll see a drop-down menu for selecting the **Driver Mode**. You should be using **WDM** or **ASIO** drivers, if you have them, since these offer the lowest possible latency figures. >>



3 While still in the **Audio Options** dialog, click on the **General** tab. This is where you tell Sonar important stuff like what bit-depth and sampling rate to use. It's also where you can adjust the buffer size via the horizontal slider. Slide it as far to the left as you can get away with without introducing audio dropouts in your signal. If that happens, you'll need to re-adjust it.

on a handful of different designs. The type of microphone you're likely to see used on stage is a dynamic microphone. Such a mic is often designed specifically for live performance and has been designed to accentuate certain frequencies in order to cut through a mix. Dynamic mics use a movable inductor that's vibrated by sound waves. This vibration is converted into an electrical signal that can then be recorded. If that sounds familiar, it might be because it's the same principle used in a loudspeaker, but in reverse. Some dynamic

"THE TYPE OF MICROPHONE YOU'RE LIKELY TO SEE USED ON STAGE IS A DYNAMIC MIC"

microphones have found favour as studio mics. For instance, the Shure SM57 is used the world over for miking up guitar cabinets or snare drums. Most pro studios have at least one of these.

As you want to record vocals, you might indeed find it helpful to look into the various large

▼ Impass your mates: get a diaphragm



diaphragm condenser models. These mics are far more sensitive than dynamic microphones, and require some sort of power to be fed to them. They contain a delicate capsule holding a diaphragm that acts as a plate in a capacitor. This plate vibrates when sound waves come flying at it and results in a variable current that can be recorded as an audio signal. As you might guess, the size of this diaphragm determines if a mic is categorised as a large or small model. The large variety is suitable for tracking a great number of sources, including, more often

than not, vocals. Those big side address mics you see famous vocalists singing into in studio pictures are large diaphragm condenser models.

A small diaphragm microphone *could* be used for vocals, but they're more suited to recording things like acoustic guitars and hi-hats. They tend to have an enhanced high frequency response.

When a microphone is said to have a 'cardioid' response, this simply means that it's engineered to pick up the signal directly in front of the capsule, while rejecting sounds from behind or on either side of the mic. When drawn as a graphic representation, this pattern looks something like a heart, hence the name. Cardioid patterns are suitable for a wide variety of sources, and many budget-minded microphones will have only this sort of response.

Other response patterns are 'figure-eight', which picks up the signal in front of and behind the mic. There are also 'omnidirectional' microphones, which are engineered to pick up the entire surrounding area. Many costlier, top-of-the-range microphones will have all of these response patterns available.

Money talks

Q There seem to be a lot of very inexpensive microphones on the market these days. Are these any good, or should I save up a bit more money and get a 'name' brand? I can't understand how the big companies would be able to charge so much if these cheaper mics can do just the same job.

Tony Maximer

A The marketplace is overrun with various types of microphones at so many price points that it's easy to understand your confusion. This is largely due to increased demand for decent microphones to supply the burgeoning home recording market. In the days of four-track cassette recorders, the deficiencies in the recording chain may not have been so apparent, but our modern high-resolution desktop recordings reveal every single pimple. When the quality of our recording medium increased, we suddenly found out that we needed to upgrade that cheap Tandy dynamic mic.

To say that this has benefited

"NOWADAYS, YOU CAN PICK UP A GOOD, PROFESSIONAL SOUNDING MIC FOR UNDER £100"

the home recordist would be an incredible understatement. It used to be that access to a decent large-diaphragm microphone was restricted to those who could afford to shell out a couple of grand on a Neumann U-87, or had the resources to spend some time at a pro studio. Nowadays, you can pick up a good, professional sounding mic for under a hundred quid.

Even so, this isn't to be taken lightly – you don't want to get ripped off. There are a lot of microphones of dubious quality on the shelves these days. Some manufacturers go to great lengths

to disguise cheaply made imported capsules by wrapping them up in a housing that looks suspiciously like the above mentioned Neumann. Nickel-plated enclosures do not equate to professional build or sound quality, so it benefits the customer to do some research. Some of these microphones use the same imported capsule, even though they come from different companies.

That isn't to say that there aren't some bargains to be had. For instance, Audio-Technica recently released their AT-2020 model to rave reviews. It sells for about £100, and sounds fantastic. We know quite a few engineers who've bought these and have had no trouble using them alongside their costly vintage microphones.

Rode mics are coming down in price and are pretty good too, as are the AKG and Shure line. Mind you, we suggest that you get



▲ If money's tight, try the sleek-looking AT-2020

Give me input

Q I'm new to this music-making business, but I've been following along with your tutorials and articles for some time. I started with Computer Muzys, and learned how to make my beats and sequences, but I eventually

found that I wanted to record my own voice or a guitar. I bought a copy of Cubase SX as well as a new audio interface (MOTU), and I'm utterly lost! I have no idea how to set up the inputs and outputs of my soundcard. I spent a lot of money on a FireWire box just so I could record different things all at once, but it does me no good whatsoever if I can't access the inputs! Please help! Also, while you're at it, can you explain how I should use my external effects processors?
Chris Cromleigh

A Cubase has a lot of options for setting up multiple inputs and outputs, and this can be a little confusing – even more so if you have any external processors you want to bring into play. This sort of thing is accomplished in the VST Connections editor. See the walkthrough below for a guide to getting your I/O in order...

instruments should be recorded with a compressor. Yet I've also read that it's best to leave any processing until after the recordings are made. Do I need to buy a compressor then, do you think? All of the hardware compressors I've ever heard recommended are way out of my price range, and I'm told I should stay away from the budget ones. What should I do?
Russell Mason

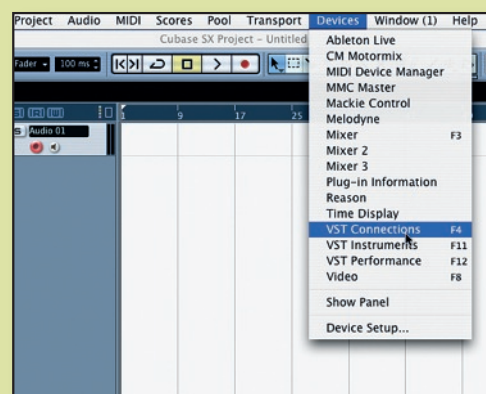
compression or limiting in order to prevent overloading the inputs. Compressors 'squash' the dynamics of the signal, increasing the level of the quiet sections and reducing the louder signals. Limiters do only the latter job. Since a recording can be ruined if the inputs of the recording equipment are overloaded, these devices were employed as preventative tools. However, dynamics processors like these are also used to enhance a signal once it's been tracked. Compression can smooth out any wayward dynamics in a performance, as well as imparting

Getting vocal

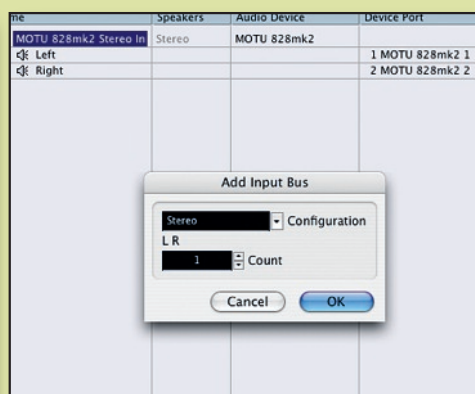
Q Every recording book I've read suggests that vocals and other

A Traditionally, vocals and other instrumentation have been tracked with

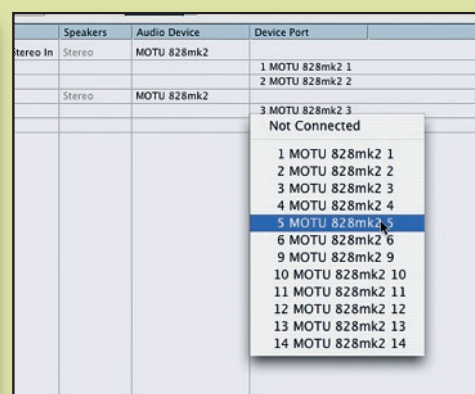
STEP BY STEP Connections in Cubase SX 3



1 Though there are a lot of options for setting up your audio interface in Cubase SX, it really isn't too difficult to do if you know where to look. You'll find everything you need in the VST Connections editor, which can be accessed via the **Devices** menu at the top of the main window. Alternatively, press **F4** to bring it up. >>

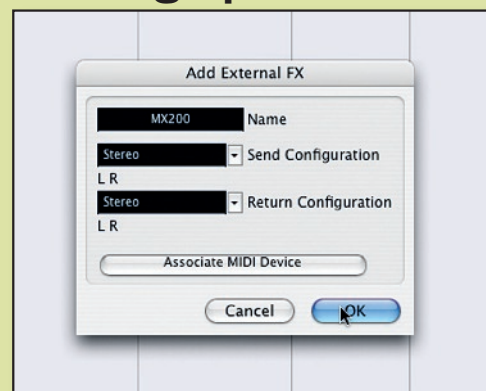


2 Once you've opened the VST Connections dialog, click on the **Inputs** tab to set up your hardware inputs. Next, select **Add Bus** to add a new input. When a dialog box appears, choose whether the new input should be stereo or mono. You can add as many inputs as your soundcard has to offer. >>

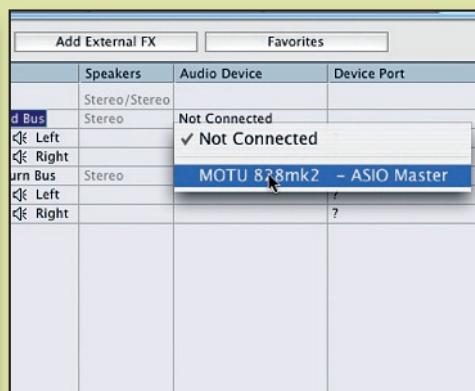


3 Now that you've created your inputs, you'll see them displayed vertically in the VST Connections window. Cubase will assign each of them in numerical order to the ports on your soundcard, but you can change them to any ports you like. You can then name them so that they're easily recognised from the Project window. Outputs are set up the same way. >>

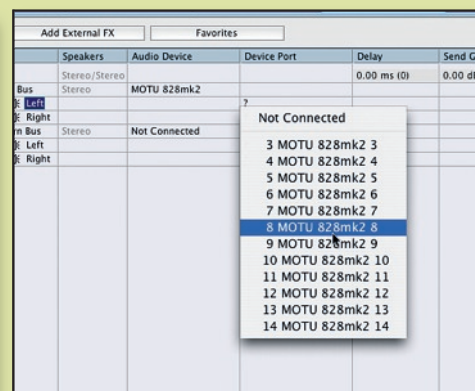
Setting up effects in Cubase



4 If you have external hardware effects processors, you can set these up in Cubase SX's VST Connections editor as well. Hit **F4** to bring it up, and click on the **External FX** tab. Now, simply click the **Add External FX** button, and tell SX whether the new effect is mono or stereo. Don't forget to name the processor. >>



5 Now that you've created your new effects bus, you'll see its name in the column on the left side of the **External FX** display. Both the **Send** and **Return** buses will be represented. Before you go on, assign these buses to your audio device by clicking in the appropriate column. We've chosen our ASIO Master, **MOTU 828mk2**. >>



6 Finally, you'll need to assign the specific port of the audio interface you want to associate with this effects device. Our MX200 is plugged into ports **8** and **9**. Now you'll find **External FX** among the plug-in options available in your various effects menus, and they'll be treated exactly as if they were software plug-ins.



a little bit of its own character to the signal.

If and how you'll need to use compression will depend on your recording techniques, as well as personal tastes. Most soundcards are capable of recording at 24-bit resolution, which improves dynamic range and reduces the need for compression when tracking. If you're recording at 24-bit, you can probably dispense with an outboard compressor, and use a software compressor plug-in once the recording is made.

If, however, you're recording at 16-bit resolution, you may very well need to use a compressor to wrangle those levels into shape. Obviously, it'd be best if the performers were skilled enough to alleviate the need for intervention, but that's not always possible.

You don't need to invest in anything terribly expensive. Sure, it'd be nice to have a classic vintage compressor, but you can always use something like PSP's Vintage Warmer to impart some retro colouration. If you're on a budget, you might want to look at models from Aphex or FMR. These will keep your levels in line while recording and won't break the bank.

▲ Though it's nice to have an expensive vintage compressor in your rack, you can always add some retro compression using a plug-in

▼ Nope, that phantom power switch on your Mackie mixer has nothing to do with Star Wars. Or Michael Ball for that matter



Phantom menace

Q What exactly is phantom power? I see that my Mackie mixer has a phantom power switch, and I assume it's to do with the microphone inputs? How does this work? Do all microphones make use of this?

Greg Nichols

A Condenser microphones need to be provided with electricity. In most cases, this current is supplied by your mixer or preamp and sent down one of the three conductors in the microphone cable. It's traditionally 48 volts. You should under no circumstance send phantom power down the line to any gear that does not require it. Some microphones (such as the CAD Equitek series) can be switched from battery

"IT DOESN'T MATTER HOW GOOD YOUR MIC IS IF YOU HAVE A MEDIOCRE PREAMP"

power to phantom power, and can use it to recharge the onboard battery. Phantom power is also used to supply current to lamps and other accessories.

Amplifying the problem

Q Do I need to invest in a good preamp? Does the preamp really make a big difference to the quality of my recordings? I keep seeing a lot of hype surrounding valve pres. Are they really better?

Tom Roberts

A Once home producers discovered that their digital recordings demanded decent microphones, it wasn't too long before they realised that they needed quality preamps as well. In fact, it might even be suggested that a good amount of your studio budget be spent on the preamp first, taking precedence even over the microphone itself. A good pre can make all the difference. You can get a great vocal recording with an inexpensive dynamic mic such as the Shure SM58 if your pre is up to scratch. Conversely, it doesn't matter one bit how good your mic is if you have mediocre preamplification.

As you suggest, valve or tube pres are all the rage lately. This is likely to be due to a psychological reaction on the part of engineers and listeners who are comfortable with the distorted sound of analogue recordings. Still, a tube pre can impart a certain character onto a track that you may like.

Yet tube devices are not inherently 'better' than other types of preamps. You should not overlook the fact that many classic recordings were made using solid-state preamps, such as the classic Neve 1073 (probably the

► Get a good pre and even basic mics like this one will give you great recordings

most emulated pre in recording history). A good solid-state pre will be a versatile studio companion.

As always, we suggest you get the best you can afford. Your own needs and style will determine which pre you might like. If you make gritty rock, you may want something with some colouration. If you're tracking a classical guitarist, you might prefer something pristine.



Bass instincts

Q I'm a bass player who's been distracted by the wonders of computer music. I've spent a good amount of time learning about software synthesizers and sequencers, but it's time to get back to my roots and incorporate the bass into my tracks. What's the best way to record a bass? Should I mic my cabinet up, or go direct?

Martin Fields

A We're always quick to suggest miking up amplifiers in order to capture the sound of the air being moved about. However, an amplified bass is notoriously hard to record. Even the most experienced engineer might prefer to record the bass through a direct box. Still, there may be times when you want to capture the sound of the bass rig. We've had good results using a mic designed to record low frequencies. The AKG D-112 is a good example. If you choose to record the cabinet, we'd recommend splitting the signal and recording a direct signal simultaneously, just in case. **cm**