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HOME STUDIO HANDBOOK

PART ONE

THE EASY GUIDE TO RECORDING YOUR MUSIC AT HOME

Everything you need to write and record from scratch

SET UP YOUR HOME STUDIO / RECORD GUITARS, BASS, DRUMS & VOCALS / WRITE CATCHY SONGS / BUY AFFORDABLE GEAR
PLUS... LEARN TO MIX & MASTER / GET YOUR MUSIC HEARD

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WELCOME TO...

HOME STUDIO HANDBOOK

PART ONE

Never before has it been so easy and enjoyable to write, record and polish your own music at home. Music technology has come such a long way, meaning that what was once the sole domain of recording studios is now within the grasp of everyday musicians. In fact, home recordists are one of the fastest-growing groups in music; even professional bands are building their own home studios (or cool garden pods filled with studio gear and instruments), moving away from spending days, or even weeks or months, in traditional recording studios.

The reasons why beginners like you choose to record music at home varies – some of you may need to keep costs to a minimum, some of you may crave greater creative control over sounds, processes and the finished article, and some of you may simply want to record music in private without anyone else (namely a producer or engineer) hearing it. Whatever your reason for recording from home, the *Home Studio Handbook: Part One* can help you.

In this first edition, we have packed in a goldmine of information to help you create the music you have always dreamed of. Don't know what kind of gear you need in order to record from home, or what to do with that gear when you do buy it? Unsure how songs are structured, or stuck for inspiration on where to begin with songwriting? Confused as to what DAW means, or intimidated at the thought of miking up a drum kit? Don't be! We address all of those scenarios, situations and more with the *Home Studio Handbook*.

This first *Handbook* will walk you through the whole home recording shebang, from buying affordable hardware and instruments, through to setting up your recording space, writing songs, laying down tracks and honing them afterwards. And when you're ready for recording at a pro level, check out the upcoming *Home Studio Handbook: Part Two,* on sale 21st July 2016.

Life is too short to ignore your dreams and passions. If you have always wanted to create, record and release your own music, let us help you begin doing so right now.

CLAIRE DAVIES, EDITOR

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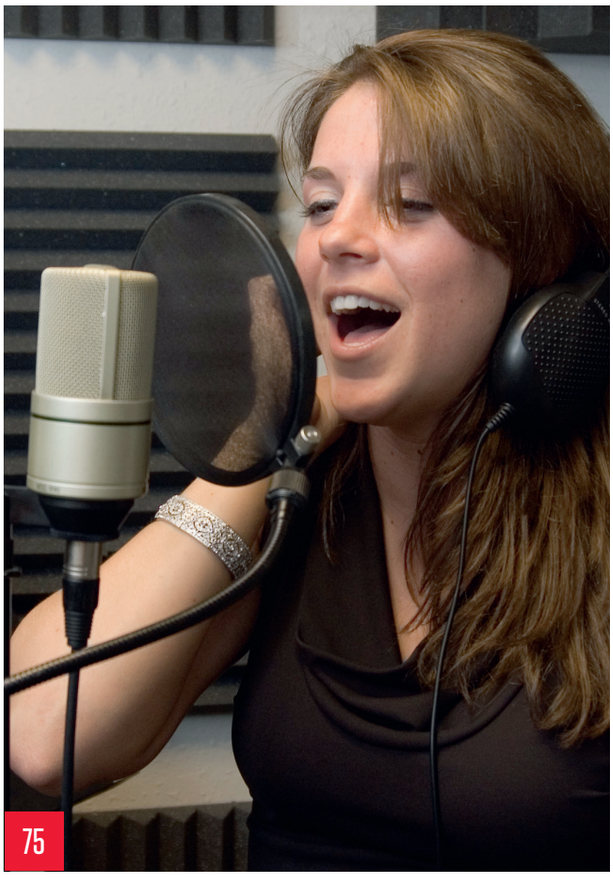


SETTING UP

RECORDING

BUSINESS OF MUSIC

YOUR FIRST HOME STUDIO

So, you're about to take your very first steps into the big world of home recording. If it all looks a little daunting, don't worry – we're here to help! Over the next few pages we'll take you through everything you'll need to start recording music at home. From the hardware and software you'll require, through to the physical space you'll be recording in, as well as the method of capture and monitoring, our expert advice will help you realise your dream and get the sounds in your head down on record. We'll explain everything you're likely to encounter as you set up your studio, such as choosing the right DAW, mics, and headphones, as well as talking you through the ins and outs of getting your music onto your computer. Let's go!

YOUR FIRST HOME STUDIO
THE BASICS

Whether you're in a band, or you're a singer-songwriter or budding producer, putting together a home recording set-up has never been easier or more affordable. Here we discuss what you'll need to get started

The rather romantic vision of a recording studio is one that's full of expensive gear: mixers, vintage keyboards, racks full of effects, beautiful microphones and much more besides.

While these places still exist – and some great records continue to be made in them – the wonderful reality is that, if you're a band or a solo musician who wants to record music, you can set up your own 'home facility' for hundreds, rather than thousands, of pounds.

As with so many things, this big change has been driven by the digital revolution. Whereas once all recording gear had to exist in physical form and each of your performances were captured on tape, the vast majority of it has now been 'virtualised' and can run as software on your computer. Yes, there are some things that will always remain 'real' – speakers, mics and instruments that you want to get your hands on and play, for example – but in many cases, a box that used to cost thousands can now be replicated with a tiny download from the internet.

One piece of hardware you're definitely going to need, however, is a computer. If you're used to old-school methods of recording, the idea of plugging your guitar into a Mac or PC and capturing your ideas in a piece of software might sound daunting, but the whole process is far simpler than it was even five years ago.

That said, we can't deny that, if you do want to record to computer, there are a few more bits and pieces to consider than if you go down the standalone recorder route. As well as the machine itself, you'll need a piece of DAW software (if it helps, you can start by thinking of this as a powerful multitrack recorder) and an interface that will give you the inputs and outputs you need to plug in your >

instruments, mics and other bits of gear. Once you've got the software installed (which is easy) and the interface hooked up, the world is your oyster.

With a computer and a DAW you can not only record, edit and arrange tracks, you can manipulate them in all manner of different ways, and all on a big interface (your monitor) using a mouse. Yes, music software does crash sometimes (though far less than it used to), and there might be bits of it that you don't understand, but as long as you can use the elements of it that do matter you'll be fine.

You will need microphones to record instruments that don't have an audio output

These are the basics of home recording in 2015, and over the next few pages we're going to focus on the finer details of what you'll need in your recording set-up, starting with gear...

PICK UP SOME GEAR

WHEN IT comes to buying gear we will always advise you to get the best you can afford, but as renowned heavy metal producer Andy Sneap points out, don't cash in your life's savings.

"You don't need to spend megabucks," he reveals. "I used to make great recordings on Mackies [mixing desks] and ADATs [digital recorders]. When you think of the quality of mic preamps now compared to what you had 20 years ago, you're gonna get results. As long as your micis in the right place and you've got good tone, this whole myth of 'Neve this' and 'preamp that'... Nah, you haven't got to do it."

MICS ON A BUDGET

IF YOU want to record any kind of sound that can't be produced by an instrument with an audio output on it, you're going to need a microphone. It might be tempting to walk into a consumer electronics store and just buy the cheapest one you can find, but this is an area in which it really does pay to make the right choice.

We discuss microphones in depth on page 14, but there are three main types that you need to be aware of: dynamic, condenser and ribbon. Dynamic mics are the most rugged and reliable, offering great value for money and being suitable for live and basic studio work. Condenser mics are the most widely used in the studio: they're more delicate than dynamic mics, but have a wide frequency

WHAT A BAND WILL NEED

It almost goes without saying that, once you've got your line-up sorted, the first things your band are going to need are the ability to play in time together, and some decent songs.

There's also the matter of gear to be considered, too, so let's run through each member's essential gear must-haves (you can find lots of buying advice starting on p. 23).

SINGER

Other than vocal ability and swagger, your frontman/woman doesn't necessarily have to bring a great deal of gear with them. A mic is one of the essentials, though, and possibly a vocalist-specific multi-effects unit for pitch correction or backing vocals.

GUITARISTS

At least one guitar, an amp/cab, leads (the best quality you can afford), spare strings and a selection of effects pedals or a multi-effects unit should be on every guitarist's shopping list. The type of guitar and amp you choose will depend on the music you make and – let's be frank – the image you want to present in the band. A mic that's suitable for sticking in front of your amp will come in handy as well.

DRUMMER

The endless boxes of stands, drums and cymbals are unavoidable if you're the sticksman in your band, though you might want to consider a decent electronic kit for recording if you have noise-averse neighbours. If you'll only be using a live kit when recording, a set of drum mics is needed.

BASSIST

A trusty four-string is going to be your first purchase, or investigate the extra flexibility a five-string allows if your music demands it. Bass amps and speakers can be costly, but once they're purchased you're ready to go. There's also an increasing number of bass-specific pedals if you like to experiment with different effects.

KEYBOARD PLAYER

Plenty of synths arranged on right-angled stands always look the part, but more soulful or introspective players will more likely remain seated at a stage piano or workstation-style keyboard. Alternatively, you could keep it more modern by generating sounds in software on a laptop and then playing them from a controller.

Many bands record their live sets as a way to monitor their progression

SOLO ARTIST

The term 'solo artist' might refer to an acoustic guitar strumming singer-songwriter type, such as Ed Sheeran (when he doesn't have a backing band with him, naturally), a Prince-style multi-instrumentalist, or a pop artist like Gotye who wants to make music at the cutting edge.

Either a computer with some recording software or a standalone hardware recorder is essential here. After that, you're looking at monitor speakers, an audio interface, mics, acoustic treatment for your recording room, and any instruments that you might want to play (such as guitar, keys or bass).

Remember, too, that one of the big advantages of software is that it can give you not only the sounds of a lot of instruments, but a way of generating virtual performances on them. As such, you can put together a complete song that sounds as though it was played by a real band, even if it was just you and a laptop.

HOW TO MAKE A DIY ABSORPTION PANEL

There are times in music production when you have to become a bit of a DIY enthusiast. Constructing your own basic absorption panel to alter the acoustics of your room is a pretty easy task, provided you have the right materials. Fancy making one for your recording space? Here's a list of what you'll need:

1. Planed timber or planks of MDF to make a frame.
2. **Medium density cavity wall insulation slabs (not loft insulation), plus appropriate dust mask and gloves.**
3. Acoustically transparent cloth to cover it with (something you can blow through should be fine).
4. **Some screws, nails and fittings for holding the frame together, and a staple gun to fix the fabric in place.**
5. Hardboard to hold the slabs in position at the back.

Start by making a frame with the timber and brackets. Lay the fabric out on the floor, placing the frame over the fabric. Next, pull the fabric back over the frame and staple it firmly in place, making sure that it's nice and tight. Once this is done, put on your dust mask and gloves before laying the insulation slabs in place. Finish off by nailing on the hardboard back.

Alternatively, there are some companies making DIY bags to which you can add your own acoustic insulation slabs. If you're simply looking for some absorbent slabs to place in corners of your space, you can bundle up a pack of medium density cavity wall insulation in some fabric, or even re-use an old bean bag.

A DIY absorption panel can help to alter the acoustics of your recording room or space

response that makes them great for capturing vocals and instruments in greater detail. A ribbon mic is typically the third type you'd add to your collection; again, these are designed for studio use, but offer an alternative to condensers.

When you buy a mic, make sure it's suitable for plugging into your recording gear. If you choose a condenser mic, for example, you'll need phantom power on your audio interface.

AUDIO INTERFACES

YOUR AUDIO interface serves as the technical bridge between the sounds that you make in the real world (for example, sounds from an instrument or your mouth) and your computer. Sound can flow the other way across this bridge, too – from the computer to your speakers or into your headphones. All of which is a roundabout way of saying that your audio interface will have both inputs and outputs on it.

An audio interface is the bridge between your sounds and the computer

The number of each of these will depend on the model you choose; musicians who produce the majority of their songs 'in the box' tend not to bother with too many inputs, but if you want to capture your five-piece rock band, a box with more 'ins' will be appropriate. Also, choose a model that has the right kind of inputs – ones that are designed to accept mics and guitars, for example.

The more you pay, the better the preamps you're likely to get, which will influence the quality of the recordings you can make, and the analogue-to-digital and digital-to-analogue conversion will improve. You're also likely to get more advanced built-in mixing and routing capabilities, and possibly even effects.

Most interfaces these days are connected over USB, though some use FireWire or other connectivity options.

MONITORS

WHILE A decent mic and audio interface will help you to make better recordings, there's no point in doing this if you compromise on quality by listening to them through a low-quality or inappropriate speaker setup.

This is where dedicated music monitoring speakers come in. These are designed not to 'flatter' your music, as many hi-fi speakers do, but to give you a true representation of how it all really sounds. If you can trust your speakers, you should be able to produce better mixes that will translate well to other systems.

You might think it would hold true that the more you pay for monitors the better they sound, but this isn't always the case. What's more, monitor choice is a personal thing so, if at all possible, make sure you actually get to listen to the models that you are considering buying.

SOFTWARE

AUDIO RECORDING and sequencing software, also known as a DAW (Digital Audio Workstation), resembles a studio setup >

GET ORGANISED

Whatever the size of your setup, keep your workspace tidy with these handy tips

GROUP YOUR CABLING

This will make fault-finding easier, allow gear to be moved and patched quicker, and help reduce cable-borne noise problems. Keep cables grouped together by type (audio, mains, MIDI, and so on) as this will make it quicker to find a particular line.

TIDY YOUR CABLING

Use Velcro cable ties, easy release plastic ties, or flexible trunking to keep your grouped cables together. This can allow the bunches to be arranged for maximum floor space and minimal cable treading.

LABEL EVERYTHING

Invest in an office labeller with a variety of label tape sizes to keep track of your cable connectors and mains plugs, etc. We use ours to label equipment when a repair is made so that we know what work's been carried out.

START A 'FAULTY' BOX

Every dodgy cable or faulty stompbox should be stored separately for repair or recycling of its components, instead of being put back in the collection only to disappoint you again.

STREAMLINE YOUR GEAR

Space is always at a premium in a home studio, so identify any items that you don't use and consider selling or swapping them. For example, are there items that you don't make use of because they're not wired up?

GEAR ACCESS AND ELBOW ROOM

Spend some time considering the layout of your equipment with regards to working practice. Make sure that the items you use regularly are within arm's reach of your seat and that the controls and displays do not require you to bend and stretch too much.

WRITE THINGS DOWN

There's always an office somewhere throwing out a perfectly good whiteboard, and these can prove useful in the studio – use them for writing 'to do' lists for your tracks, or for jotting down lyrics or gear repair lists.

To record at home you will need a computer with a DAW (Digital Audio Workstation)

on your screen. It records audio and MIDI, plus it often contains loops and samples and a host of common effects for use on your songs. Mac users will probably already own GarageBand (which is more than enough to get going with), but you might consider upgrading to its big brother, Apple's Logic Studio. Cubase and Pro Tools are the two other main DAWs that work on both PC or Mac, but there are loads of other options including Sonar, PreSonus Studio One and Ableton Live. There are plenty of free options available, too.

CHOOSE YOUR ROOM

WHEN RECORDING at home, lo-fi production king Steve Albini [Nirvana, The Stooges] says that experimentation is key. "With acoustic guitar, the acoustics of the room matter because the mic is not going to be hearing the guitar exclusively – it'll be hearing the sound bouncing around in the room," he says. "If you play and listen without being concerned about recording, you'll find that in some environments your guitar sounds better than in others.

"Wander around your house with the guitar and find the spot that sounds really good. Kitchens can be good for acoustic guitar because they have a lot of irregular hard surfaces. Not like bathrooms where the walls are typically close together with parallel hard surfaces."

If you've ever had noisy neighbours, you'll know that sound travels. But before you get sidetracked repaying the, erm, compliment, remember that it's the sound travelling inside the room that concerns us when recording. In the simplest terms, if you put up a couple of mics in a room they will pick up everything from their perspective. That includes the instrument they're closest to and, to a lesser degree, any other instrument playing at the same time, as well as other sounds that are occurring in the room.

The other main factor that influences the way we set up a recording space is

Each of your rooms will sound different, so wander around your house with a guitar to find the spot that sounds best. Kitchens have irregular hard surfaces, while bathrooms are more closed in

acoustics. How significant this is depends upon what you're recording. Generally, the louder the instrument the more it will reveal the room's acoustics. From a practical perspective, domestic spaces can be excellent for many recording tasks, and each room in your home will have its own unique character. Soft furnishings such as carpets, curtains and sofas do an excellent job of soaking up frequencies, particularly mid to high ones, and you can use this to your benefit. Similarly, a tiled bathroom will be at the other end of the spectrum – bright, brash, lively.

Finally, it's worth remembering that if sound can travel out, it can also travel in. Trains, planes (and noisy neighbours) can all add unwanted noise to your recordings, including low frequency rumble or vibration. Fans, monitor screens and ambient sounds that we're normally oblivious to can all add a layer of unwanted background noise. If you can't get these things out of your recording space, at least try to keep away from them. Ideally, you will use a directional mic that will reject sound emanating from behind it.

ARRANGING YOUR SPACE

A GOOD starting point for any recording set-up is to arrange things so that all the performers can see each other. If you're in a band, this may mean you will all be facing inwards. There may be times when you have to compromise, but if you're recording yourself it's not an issue.

Next up, consider the two factors of isolation and acoustics. In situations where there are multi-instruments, with players facing into the room, using directional mics (pointing away from the centre of the room) will give you good initial isolation of each instrument, but the sound of the instruments bouncing off the walls back into the mics will cause a problem. A good trick in this instance is to dampen the space behind each player with acoustic panels. Soft furnishings and duvets and so on can do a cracking job.

Quite often, acoustic panels will be all you'll need and this approach may give better results than artificially trying to give each performer a separate space – something that's often done in large studios using acoustic divider screens. See the boxout on p.9 that walks you through making your own panel.

You may be beginning to get a feeling of space envy, particularly if you're planning to squeeze a whole band into your living room. But remember, some of the greatest ever recordings have been made in tiny spaces (check out Motown's Hit Factory studio). You can always open the door and mic up the hallway for added distance.


Keep your cabling tidy to maximise floor space

One subject that ties in with room layout is volume. Although a well-rehearsed band might give their best performance if they're all playing in the same room, you can't rely on this for recording if some instruments are much louder than others – recording an acoustic guitar in the same room as a drum kit is asking for trouble! If you do need to record a group playing together to capture the performance, it's best to treat some of the instruments as 'guides' to be replaced later.

TO SOUNDPROOF OR NOT?

SO FAR our discussion has centred on treating the acoustics of your room, but now we'll look briefly at the subject of soundproofing. If you've ever lived next door to a musician, you'll know how important this is. For our purposes, it also demonstrates the two-way nature of the problem: if sound is capable of escaping your room or house, it can also penetrate someone else's. And that's not cool.

Probably the most annoying noise pollution is produced by bass frequencies, which are transferred structurally. Mid and high frequencies, on the other hand, use the available medium (air), so leaving a window or door open really can make a big difference to their transmission. At a professional level, dealing with these two types of acoustic isolation can be rather complex. What's more, the resultant spaces are often heavily upholstered and oppressive, with little or no natural light.

Assuming you haven't just won the lottery, things in your recording space will likely be more modest. So what are the options? Probably the easiest way to get a quick improvement is to seal your doors and windows. Although double glazing can improve isolation, it's often the sealed nature of replacement casement windows that improves their effectiveness. If you have older windows, consider DIY sealing strips, which can also help around door frames, and don't forget the gaps at the top and bottom of the door.

Once you've done this, you may find that typical 'studio odour' – stale and slightly whiffy – creeping in. If you can't afford proper air conditioning, regularly opening the doors and windows when you're not making any noise is effective. ■

FINAL FOOD FOR THOUGHT

Don't give up! Look, we've all been there. You get your hands on a bunch of shiny new gear, you set it up, sit back and then... you feel like a caveman gawping at a monolith – it's a big vertical learning curve. But don't feel bad, and don't get too bogged down in jargon and technology either. Throw a weekend and a truckload of coffee at it and you'll be amazed at how quickly the mist starts to clear.

As time goes on, you can dig as deep as you like into every aspect of this guide – be that audio interfaces, microphones or software – and that's all in addition to the advice you'll find on writing your own songs, creating huge guitar sounds or aping classic drums sounds, and more. There's always lots to learn, but remember that Rome wasn't built in a day. Every journey starts with the first step, so take yours slowly.

YOUR COMPUTER AND DAW

Combined with the right software, your computer can be a seriously powerful music making tool. Find out what you'll need right here...

Rather like Clark Kent, your computer has a dual identity. On the one hand, it can be used for everyday tasks such as sending email, browsing the internet and watching videos of skateboarding cats. On the other, it's a creative powerhouse that can help you to make pro-quality music. Providing it isn't a decade-old machine, your current PC or Mac should be fine to start making music on.

As a general rule, more powerful machines will be able to cope with more complex projects and run the latest software, but whether you've got a Mac or PC, releasing your existing computer's music-making potential doesn't have to be costly or difficult. You can start creating songs with a few free pieces of software and one or two bits of kit.

WHAT IS A DAW?

DAW STANDS for Digital Audio Workstation, which is a computer-based system for recording, editing, mixing and playing back audio. While it's true that Digital Audio Workstation could in fact refer to your whole system, including the hardware components, here we're focusing solely on software. A DAW reproduces all the components necessary for recording in software.

Breaking it down further, a DAW is for recording anything you want. It has a multitrack recorder capable of recording any audio through your audio interface (the number of tracks you can record simultaneously usually depends on the number of channels your interface has). What's more, some DAWs have virtual instruments that you can use to create additional backing.

These instruments can each have their own track alongside the audio tracks,

RECOMMENDED DAWS

It's important to note that, while all DAWs have their strengths and weaknesses and work in slightly different ways, there is no definitive 'best' product on the market and no software is going to magically turn a bad track into a good one. These are just tools that are there to do a job – it's up to you to use them well.

GARAGEBAND

Free with your Mac

Apple Logic's little brother, Garageband is an easy to use, yet surprisingly powerful, DAW that many bands record with. It doesn't pack the breadth of features that Logic boasts, but it's a great starting point for beginners. The best part? It comes free with your Mac, so you can spend your cash on gear instead.

www.apple.com

APPLE LOGIC PRO X

£149.99

If you're a Mac user and you feel as though you're starting to outgrow GarageBand, this is the natural next step for you. Its comprehensive features set and the huge roster of built-in instruments and effects make it a big favourite among recording pros, and it's now available at a ridiculously cheap, instantly downloadable price on the Mac App Store.

www.apple.com

STEINBERG CUBASE

From £73

If you've been aware of music technology for a while, you may remember Cubase from as long ago as 1989, when it made its debut on the venerable Atari ST. 26 years of development later and it's every bit as comprehensive as you might expect, sporting plenty of state-of-the-art features. On the downside, it is expensive, though as with many DAWs there are different versions available to suit the needs and budget of every type of musician.

www.steinberg.net

PROPELLERHEAD REASON

From £85

Reason used to be a complete no-no for bands because it wasn't capable of recording audio. That's all changed now and recording in Reason is actually reassuringly simple, plus its fabulous built-in mixer is 'inspired' by a classic studio console. The software can't host standard VST or AU plugins, but additional instruments and effects can now be purchased in the form of Rack Extensions.

www.propellerheads.se

AVID PRO TOOLS

£599

Still considered an industry standard, Pro Tools has been challenged from all quarters in recent years. Avid's response has been to make it more 'open', in that you no longer need special hardware in order to run the flagship version, and more file formats are now supported. When it comes to recording and mixing, Pro Tools takes some beating.

www.avid.com

PRESONUS STUDIO ONE 3

From £69

PreSonus' Studio One 3 is a relative newcomer to the fray and, despite its 'free with an audio interface' beginnings, it's a fantastically powerful tool. Studio One 3 is available in two versions: Artist (for singer-songwriters) and Professional. It's also easier to use than the likes of Logic and Cubase. Written from the ground up for quality, its built-in effects are world class. Worth a look if you're not getting along with the big boys.

www.presonus.com

but the sounds are played using MIDI data – you can either play the notes on a keyboard, or enter them graphically onto a grid. There's a wide range of virtual instruments, running from drums, violins, pianos, and other such conventional instruments, through to programmable synths. In addition, some DAWs come with a number of audio loops that you can use to build backing tracks.

When it comes to the computer you're using, the more powerful it is the better as there is a lot of processing to take care of. However, you need to check the DAW manufacturer's website for minimum computer requirements and recommendations: the type of computer you need, and maybe its speed in GHz, will be listed on there, along with the operating system information.

You will also need to know about RAM and hard disk space. Most DAWs typically need between 2GB and 4GB of RAM to operate efficiently, and you will need a certain amount of hard drive space for installation of the program and any supplied extras, such as audio loops. You'll also need to have enough capacity on your hard drive to store recorded audio, or invest in an extra drive that's dedicated to audio storage.

All DAWs give you a range of effects – naturally, some provide a more comprehensive range than others. These effects are generically known as plugins because they can be plugged in at various points in your software mixer's configuration – they can be used on individual audio tracks or applied to a range of tracks (if you set them up as send-and-return effects).

If you want a wider range of effects – perhaps some guitar amp sims if your DAW doesn't provide them – you may be able to buy more, usually from third-party developers like Native Instruments, the maker of Guitar Rig, or IK Multimedia, the company behind AmpliTube. Plugins come in a range of formats and each DAW will support one or more.

DAWs offer a full production environment: once you've recorded guitar, vocals, drums or the like, all of the tracks can be seen on screen in a software mixer, which is a virtual copy of a hardware one but can often be more flexible.

Releasing your computer's music-making potential doesn't have to be costly or difficult

As well as your effects, you'll have EQ and virtual faders, and in some DAWs you can put these under automation so that any fader moves made during a song can be recorded and reproduced each time it's played back. You can mix your song down to stereo and even add a final layer of polish and glitz with some pretty nifty mastering effects, leaving you free afterwards to do whatever you want with the resulting audio file. ■

UNDERSTANDING MICROPHONES

With so many different models available, choosing the right mics for your recording space can be a pretty daunting task. This handy guide will make it easier...

Microphones come in all shapes and sizes, and if you're a newcomer to recording you may well wonder if there's really much difference from one mic to the next.

Well, there is – not only in the way they work, but also in the way they sound. There's also a massive variation in how much different mics can cost.

If your budget limits you to just one or two mics, having a full understanding of how they actually work will put you in a much better position to choose the ones that suit your needs. In this guide we'll aim to give you a good understanding of all the different factors to consider when choosing mics. Then our comprehensive buying guide (p.32) will help you find the best mics for vocals, guitar and drums.

THE BASICS

SOME MICS, typically condensers, need to be powered to work. These require either 48-volt phantom power or a separate power supply. Dynamic mics come in two types: ribbon, which are very fragile, and moving coil, which are extremely rugged.

Mics also vary in what they actually 'hear', as determined by their pickup (aka polar) patterns. The main types are cardioid, which mainly pick up sounds arriving from the front; figure-8, which pick up equally from front and back; and omnidirectional, which pick up sounds arriving from all directions equally. There are variations on these basic types, such as super- and hyper-cardioid, and some mics offer a choice of multiple polar patterns that can be selected by the user.

A mic's frequency response also needs to be taken into consideration. Some mics are quite bright, others are ideal for low frequency sounds such as bass and kick drums, while others have a boost in the midrange that accentuates speech. Options such as low cut filters and level trims ('pads') feature on some models.

Factoring in the massive variation in price, it's easy to understand why picking 'the one' may seem like a headache. Keep in mind that budget mics can do a good job, and in many cases costs are saved in the peripherals and trimmings rather than in the fundamentals.

Gaining a basic understanding of how microphones function will make it clear why various types sound and behave the way they do. It will also give you an idea of how you'll need to handle them. Mics are precision (and often delicate) items, so if you don't want to spend cash getting them fixed regularly, it's time to listen up!

DYNAMIC

ONE OF the most familiar microphone types is the moving-coil dynamic. These work on the principle of electromagnetic induction. A small induction coil is attached to a movable diaphragm, and the whole mechanism sits in the magnetic field of a fixed magnet. Sound waves move the diaphragm and this induces a current in the coil that can be extracted as an audio signal. The concept is simple enough that manufacturing robust mics is easy. The downside is that the physical nature of the design can compromise the frequency response, and the sensitivity is less than a typical condenser. This makes them less useful for quiet or distant sources.

CONDENSER

TRADITIONALLY MORE intricate and expensive than dynamic mics, the increasing availability of good, affordable models has made the condenser (or capacitor) the most common mic. A flexible capsule diaphragm and rigid backplate make a parallel-plate capacitor. Changes in the distance between the two caused by sound vibrations produce changing capacitance and voltage, which can be extracted as an audio signal. This relies on the plates being consistently charged, requiring typically 48-volt phantom power sent down the mic cable from your mic preamp. If the mic includes a valve, a dedicated power supply will provide power for the valve and the plate charge.

With electret condenser mics, a permanently charged material is used in a capsule akin to a traditional condenser. Although the capsule itself doesn't need power, the output electronics do.

Condenser mics come in all shapes and sizes, from tiny lapel mics to the large capsule mics for vocals. They typically have good high frequency response but are susceptible to wind noise and vibration. Through careful capsule, body and grille design, the frequency response and pickup pattern can be tailored – particularly with the larger capsule designs (over 1-inch

MIC TYPES AT A GLANCE	 DYNAMIC	 SMALL CAPSULE CONDENSER	 LARGE CAPSULE CONDENSER	 RIBBON
COST	Cheap to make and therefore cheap to buy	Made with intricate compact components, so they can be expensive to buy	From cheap upwards; valve types and multi-pattern versions cost more	Intricate design, so mid-price upwards
BUILD	Robust mechanical design, low handling noise, can handle high SPLs	Susceptible to vibration and handling noise	Susceptible to vibration, diaphragm sensitive to humidity. Low self noise	Delicate ribbon, prone to wind and plosives. Some of them have heavy magnets
PICKUP PATTERN	Cardioid, hyper-cardioid	Omni, cardioid, hyper-cardioid, figure-8	Cardioid or multi-pattern	Figure-8, cardioid
SOUND	Upfront, can lack high frequency accuracy	Uncoloured and sensitive with good high frequency response	More coloured than small capsule designs	Smooth response with tail-off in the high frequencies
GOOD FOR	Live vocals, guitar and bass amps, most drums	Quiet sources, ambient and stereo miking, strings, piano	Vocals, guitar amps, drum overheads, feature instruments	Speech, guitar amps, taming complex high frequencies
NOT GOOD FOR	Quiet sources or where you want accuracy	Rather awkward for remote recording environments with no phantom power	Damp or windy conditions, cramped spaces	Challenging or particularly windy environments
EXAMPLES	Shure SM58 Sennheiser MD421 Beyerdynamic M201	AKG C451 SE Electronics SE4 DPA 4011	AKG C3000 Neumann TLM103 Rode NTK	SE Electronics Ribbon R1 Karma K6 Coles 4038

capsule diameter), the frequency response can vary massively.

RIBBON

LIKE MOVING-COIL dynamics, ribbon mics rely on electromagnetic induction, but here the soundwave vibrates a thin conductive metal ribbon. With this sitting inside a magnet, you have another form of dynamic mic. As the ribbon needs to be light, it's also delicate, so ribbon mics tend to be less rugged than moving-coil dynamics. However, modern compact neodymium magnets have made it possible to make these mics less bulky.

OTHER TYPES

RARER TYPES of mic include carbon, laser and liquid mics, and ceramic or crystal mics, but their performance isn't great. If you encounter these it's most likely to be in the form of instrument contact ('bug') mics or acoustic guitar bridge pickups.

VALVE VS SOLID-STATE

YOU'LL OFTEN hear music producers talk of how they got an amazing sound by using a valve mic, and an abundance of more affordable models has now made valve mics accessible to everyone, including the home recordist.

The valve-based amp circuit can impart some pleasant colouration to the sound, especially at higher levels. This is technically known as second harmonic distortion and gives both a 'warm' and 'smooth' sound in contrast to the harsher sound of third harmonic distortion, more typical of transistor designs. Valve mics need a dedicated power supply, which can make them cumbersome. Also, as the body contains a small valve, they're not indestructible, and the valve becomes an additional component that may break down.

PICKUP PATTERNS

THE OTHER fundamental aspect of a mic's design is its pickup or polar pattern. As mentioned earlier, the main types are cardioid, omnidirectional and figure-8. You may also come across options that fall somewhere in between these types, while some of the more advanced mics offer a selection of patterns, or even a continuously variable controller all the way from omni to figure-8.

Achieving the different polar patterns is an integral part of mic design, and both physical and electrical techniques are utilised. Ribbon mics produce a figure-8 pattern because sound hits the ribbon from both sides. For diaphragm-based mics, the physical design affects the pattern. If the mic capsule is sealed apart from the diaphragm side, you have a pressure-only design and hence an omnidirectional pickup pattern. Open up access to the back of the capsule and sound waves will hit both sides, resulting in a pressure-gradient design and a more cardioid pickup pattern. If two capsules are positioned back to back, their outputs can be electronically combined to produce a variety of pickup patterns.

One of the biggest issues with polar patterns is inconsistent frequency response. For example, a cardioid is designed to pick up sound mainly from the front, and although midrange frequencies will be rejected at the back, low frequencies will be picked up from all around and high frequencies may also get picked up at the back.

USB MICS

COMBINING MIC, converter and powering all in one, the new breed of USB mics offer a simple 'plug and play' solution that's attractive to computer-based musicians. On the downside, you may be limited by the quality of the onboard converters, and the selection currently is limited. ■

GETTING THE AUDIO INTO YOUR COMPUTER

Sort out the technology early on and your recording sessions will run much more smoothly

Ideally, when you're recording music you want the technology to fade into the background so that you can concentrate on creating and capturing the moment. Whether you're working on your own or with other musicians, the slightest gear-related hiccup can bring your session grinding to a halt and scupper the spark of performance or creativity.

The key is, of course, preparation, but good recording sessions also require a flexible approach and the ability to modify and make adjustments to your setup on the fly. To do that, whether you're recording a band or a solo voice, there are some fundamentals you will need to get to grips with.

In a recording studio setup, the so-called 'signal flow' simply refers to the various stages of the journey of a sound from the instrument or voice being recorded to an audio track in your DAW. If you're using a single mic, or recording direct into your interface via a preamp, this process should be a pretty simple one, even for the beginner. But as soon as you go multiplying the number of mics, preamps and tracks involved, things can easily get a whole lot more confusing.

What's more, if you're planning on arranging a complex recording session involving lots of musicians, all of their instruments and possibly even a hardware mixing desk, then you'll need to get to grips with the signal flow of the desk as a separate piece of equipment. Now, if that's all beginning to sound a bit daunting, try to remember that, in essence, it's the same process as before, but duplicated. So hang in there, keep reading and it will all become clear soon.

RECORD AND MONITOR

IN ANY recording setup, you have two types of signal: the record signal from the mic or audio interface input, and the monitor signal returning from your audio recorder (ie, your computer). You need to be able to listen to your record signal accurately so that you can be confident that what you're hearing is what's being captured. You also need to be able to monitor what you've already recorded (monitor signal) while adding or overdubbing more parts.

If you're planning on connecting one instrument or mic to your computer and recording that signal on one track, or even if you're using a few inputs in this way, things are pretty simple. But what if you have a guitar amp with two mics, plus a DI, that you want to combine into one signal? Or if you have 20 mics on a drum kit and want to record the drums on eight tracks? Grouping is the solution.

When it comes to mixing, software is excellent at this and you'll often find you have endless buses at your disposal. But at the input stage, software struggles. If you're recording many inputs and need to group or bus signals together, while monitoring the recording in real time, the simplest option may be a hardware desk. Look at the signal flow diagrams opposite and you'll see that as the setup becomes more complex, so does the signal path.

PLUG ME IN

LIKE COMPUTERS and hi-fi equipment, recording gear has its own set of connection protocols. Although these may at first seem like an arbitrary mish-mash, you'll quickly realise there are certain pointers to keep you in check when you're plugging things up.

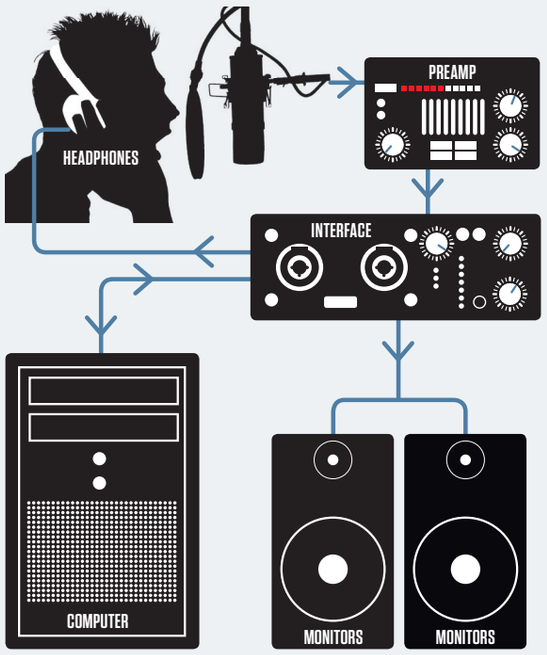
Mics typically use XLR connectors and usually you'll find the same type on preamps. XLRs contain three wires (two for the signal and one for the ground) that form a balanced connection, which eliminates noise interference. They use male and female plugs and these indicate the direction of the signal – male is an output and female an input.

When it comes to the line level signals that connect preamps, interfaces and monitoring, things are less clear, with jacks, phonos and XLRs all in common use. The important thing to be aware of is whether the connections are balanced or unbalanced. Phonos are unbalanced and XLRs balanced, while jacks can be either, sporting three rings for balanced, two for unbalanced. In most cases, connecting from one jack type to the other shouldn't cause problems, but bear in mind that operating levels may differ between the +4dB operating level of professional 'balanced' equipment and the -10dBu level of unbalanced 'consumer' gear. Plugging a +4dB level signal into a consumer -10dBu unit could overload it, causing undesirable distortion.

Finally, always check that the phantom power is switched off before you connect or disconnect anything. Apart from the loud noise that you will experience through your monitors, microphones and preamps can be damaged by accidental phantom powering. ■

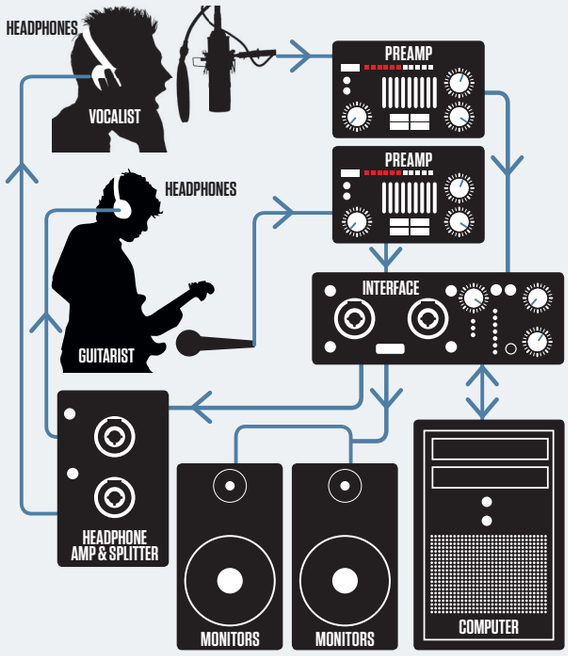
SIGNAL FLOW 1

In this simple arrangement we're using a single preamp. This could even be built into the interface. We're also using the interface's headphone feed, and relying on the interface and the software to provide a foldback mix.



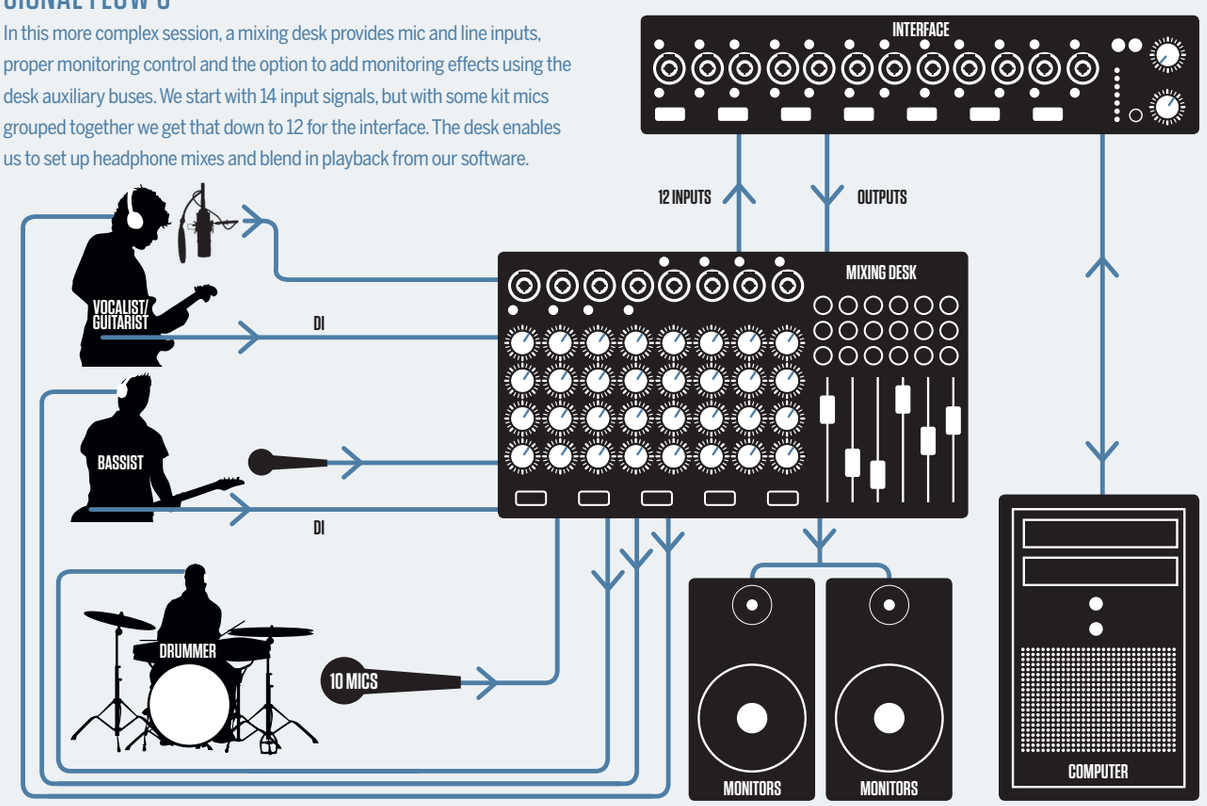
SIGNAL FLOW 2

In this second example we're using two preamps and still using the facilities of the interface for monitoring. Now we've introduced a headphone amp to provide two separate headphone feeds.



SIGNAL FLOW 3

In this more complex session, a mixing desk provides mic and line inputs, proper monitoring control and the option to add monitoring effects using the desk auxiliary buses. We start with 14 input signals, but with some kit mics grouped together we get that down to 12 for the interface. The desk enables us to set up headphone mixes and blend in playback from our software.

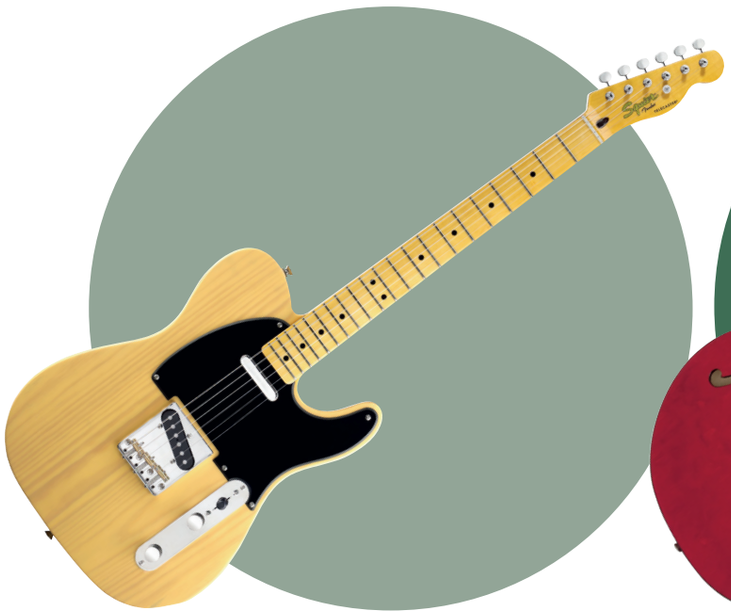


HOME STUDIO GEAR GUIDE

There are so many different types and brands of gear out there that it can be a minefield for the wannabe studio recordist to choose what's best for the task at hand. Especially as there are going to be a ton of factors that will decide what you're going to need, from the sound you're after to the method you'll be employing to get your music into your DAW, to suitability for the songs you're recording, and pure considerations of budget. Let us help you decide what's best with some expert guidance on everything from the best studio guitars, amps and drums to the interfaces you'll need, best mics for the job and more. Once you've made the right gear choices, you can get down to the business of capturing your music!

BUDGET ELECTRIC GUITARS

So, what is a studio guitar? Well, almost any serviceable guitar that stays in tune could make the cut when it comes to recording, but some guitars will help you reference classic tones a little more easily. Back in the 1950s, Fender, Gibson, Gretsch and other heritage brands established the sonic templates for electric tone that most of us still work to today, so it pays to at least consider guitars that command those tones for your studio. Here you'll find a selection of models that won't break the bank, but will get you close to those iconic sounds.



SQUIER CLASSIC VIBE TELECASTER '50S

£359

The Telecaster is one of the definitive electric outlines, and this Classic Vibe edition nails the '50s sound courtesy of a vintage-tilt maple neck and custom single coils that do the business for country, blues, rock and jazz.

www.fender.com

EPIPHONE DOT STUDIO

£229

If you're after an incredibly well-priced thinline semi-acoustic, you can't go wrong with Epiphone's version of Gibson's venerable ES-335. Resonant, airy humbucker tones and slick playability thanks to its SlimTaper neck.

www.epiphone.com

GRETSCH ELECTROMATIC DOUBLE JET WITH BIGSBY

£445

A classic Gretsch design at an affordable price-point. The Double Jet gives you twangsome Black Top Filter'Tron pickups, which, combined with the Bigsby Licensed B50 vibrato, offer country and rockabilly thrills aplenty.

www.gretschguitars.com

SCHECTER STEALTH C-1

£449

Part of Schecter's Diamond Series, the Stealth C-1 has a smooth satin-finished neck that puts speed to the fore, while coil-splittable SuperRock-II humbuckers wring every last drop of rock-ready tone from the formula.

www.schecterguitars.com

YAMAHA PACIFICA 611HFM

£475

Since the late '80s, the Pacifica has been one of the go-to budget guitars. The 611HFM brings a Seymour Duncan SP90-1N neck pickup for single coil-meets-humbucker sounds, while the bridge TB-14 delivers hot PAF-style tones.

uk.yamaha.com

IBANEZ IRON LABEL RGIR20E

£479

The Japanese company has always leant towards metal and shred, and the Iron Label series packs high-output EMG active humbuckers, the option of hardtail bridge or Edge-Zero II vibrato, plus lightning-quick Nitro Wizard necks.

www.ibanez.com

SQUIER CLASSIC VIBE STRATOCASTER '60S

£360

This isn't the cheapest Strat in the Squier catalogue, but it's one of the best. The Classic Vibe models aim to capture the intricacies of Leo Fender's golden-era instruments while maintaining a strict budget, and this '60s example does a fine job. Its C-shaped maple neck offers comfortable playability for the vast majority of players, while the Alnico V single coils – which are slightly hotter than regular singles – combined with the alder body offer good approximations of classic tones with which legends such as Hendrix, Knopfler and Gilmour made their names.

www.fender.com

PRS SE STANDARD 24

£399

Although it's Paul Reed Smith's most affordable offering yet, the Indonesian-made Standard 24 still delivers many of the features that made its Custom 24 forebear such a hit. The neck is most worthy of note, delivering 24 frets across a 25" scale length (halfway between a Les Paul's 24.75 and a Strat's 25.5), while the thoughtful cutaway around the top of the fingerboard makes tracking those tricky solos a breeze. Key to the 24's versatility are its coil-splits, which enable you to cover clean funk, jazz and blues just as capably as high-gain rock, metal and even shred.

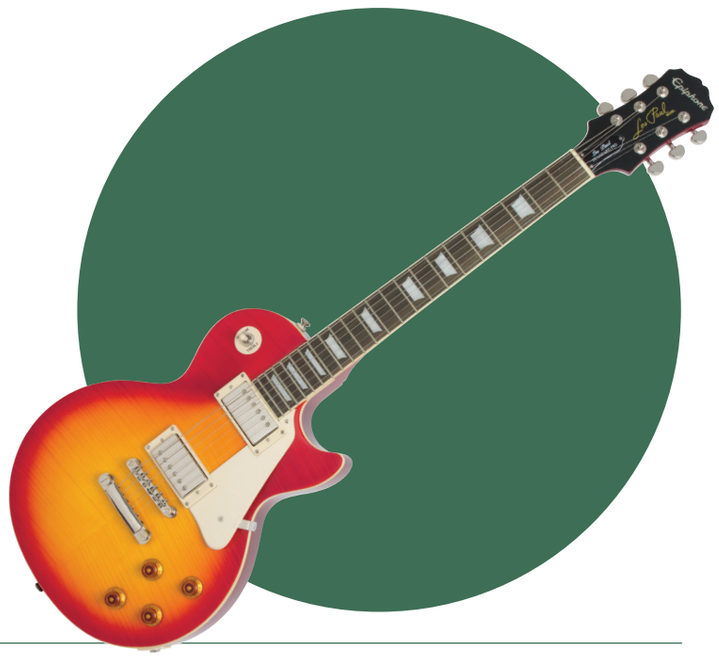
www.prsguitars.com

EPIPHONE LES PAUL STANDARD PLUSTOP PRO

£379

Where would the likes of Jimmy Page, Joe Perry and Slash be without the Les Paul? The PlusTop Pro is one of Epiphone's top-end LPs, delivering Gibson-like specs for an affordable price. You get a AAA-grade flame maple top on a mahogany body, Grover tuners for rock-solid tuning stability, plus rock-orientated ProBucker humbuckers, based on the original Les Paul's PAF Patent Applied For pickups. Add in coil-splits for single-coil-like sounds, and the PlusTop Pro delivers all the Les Paul tones you could want and a whole lot more.

www.epiphone.com



BUDGET ACOUSTIC GUITARS

Choosing an acoustic guitar at the lower end of the market can be a bit of a minefield; the quality of wood can vary greatly, which can affect the recorded tone of the instrument. Thankfully, there are no such problems with the options we've listed here, all of which feature solid tops for livelier resonance and sustain. Some of the guitars also feature built-in electro preamps, and while for most purposes we'd recommend recording with a condenser mic, it's worth experimenting with these sound sources in order to add different timbres to your mixes.

FAITH NAKED MERCURY PARLOUR

£399

Faith's affordable acoustic line doesn't compromise on quality. This compact, parlour-sized guitar has a deeper body than most, lending its solid Engelmann spruce top and mahogany back and sides a balanced tone that sits well in a mix.

www.faithguitars.com

EPIPHONE DR-500MCE VS MASTERBILT

£449

Vintage-style visual appointments, and the solid Sitka spruce top and solid mahogany back and sides deliver a pronounced lower midrange and rich projection for strumming, amplified by the flexible eSonic 2 preamp.

www.epiphone.com

VINTAGE V400N

£179

A solid spruce top is paired with Eastern mahogany back and sides for a classic big dread tone which, while not as rich as more expensive models, is ideal for your first mic'd recordings.

www.jhs.co.uk

MARTIN LX1E LITTLE MARTIN

£409

Features a solid Sitka spruce top with High Pressure Laminate sides, which put out a powerful output when strummed and a nuanced sweetness when fingerpicked, plus the impressive Fishman Isys T preamp.

www.martinguitar.com

FENDER SONORAN SCE

£310

This 'tight' dreadnought screams fun with its colourful finishes, but delivers serious tone, with a rich bass courtesy of a solid spruce top and scalloped X bracing, plus Fishman's Isys III preamp and under-saddle Sonicore pickup.

www.fender.com

ARIA 511

£499

Made of pure solid woods, the 511 delivers serious VFM, and its classic pairing of a Sitka spruce top with Indonesian mahogany back and sides makes for a punchy output and impressive sustain when strumming big open chords.

www.ariaguitars.com

YAMAHA LJ6 ARE

£513

Part of a redesign of the company's ever-popular L Series, the LJ6 features a medium jumbo body with bass-enhancing X-bracing, which offers a tone well suited to strumming, with a sweet top-end. While the guitar has laminated back and sides, its solid Engelmann spruce top boasts Yamaha's Acoustic Resonance Enhancement, designed to emulate a well-played-in acoustic, as well as a passive pickup system that – despite offering no onboard control – delivers a convincing plugged-in sound. Everything about the LJ6 points towards a much more expensive guitar, from the stunning sunburst finish to the record-ready tone.

uk.yamaha.com

TAYLOR GS MINI

£399

This travel version of legendary builder Taylor's Grand Symphony-sized acoustic has proved incredibly popular, largely thanks to its surprisingly full sound. The guitar's compact body features a solid Sitka spruce top and laminate sapele back and sides, projecting a tight low-end and musical voice, which ensures it sits well in a mix with bass and drums, honing in on the guitar's essential mid frequencies while still delivering some high-end sparkle. The GS Mini is also compatible with Taylor's ES-Go pickup, which can be more electric-sounding but produces a modern, alternative voicing for recording.

www.taylorguitars.com

SIGMA S000M-15

£499

Formerly Martin's affordable sub-brand in the '70s, Sigma now offers a wealth of value-for-money acoustics among its ranks, including this 000-shaped all-mahogany beauty. Mahogany produces a darker, mellower tone than spruce, making it popular for fingerpicking styles such as folk, country and blues. In addition, the 000 size lends the S000M-15 a trimmer waist and tighter low-end than dreadnoughts, with more of a focus on upper-mid frequencies, making the acoustic sound pop out of a mix. A Fishman Sonitone under-saddle transducer is also included, producing an honest representation of the guitar while avoiding much of the typical piezo high-end 'ping'.

www.sigma-guitars.com

XOTIC CALIFORNIA'S XSC SERIES

SHAPING VINTAGE TONE.

SELECT FROM:

Swamp Ash or Premium Alder Body

Hand Wound Raw Vintage USA Pickups

S/S/S or H/S/S Pickup Configuration

Roasted Flame Maple OR Indian Rosewood Fingerboard Option

5AAA Roasted Flame Maple Neck Option

Light, Medium, Heavy OR Super Heavy Aging Option

XOTIC CALIFORNIA CLASSIC® XSC-2 SURF GREEN HEAVY AGED

Xotic Guitars
CALIFORNIA

xotic.us • facebook.com/XoticUSA

BUDGET STUDIO AMPS

The key to a good home studio amp is output power – lower-wattage amps allow you to get the kind of cranked valve amp tones you hear on classic rock records without blowing your eardrums. Some modern heads and combos offer cabinet emulation and silent recording outputs, perfect for late-night sessions and which might negate the need to mic up entirely. These low-wattage amps, along with a few modern options, deliver serious tone at recording-friendly volume levels.

FENDER BLUES JUNIOR III

£490

The Blues Junior is one of the best-selling amps in the world, thanks to a great clean tone, reverb, and a sizeable palette of medium-drive tones for blues, rock, '60s pop and loads more besides.

www.fender.co.uk

VOX AC10

£359

This newly released lower-wattage version of the classic AC design is a killer do-it-all option for anything short of metal. From The Beatles to Brian May and U2, it's all in here and at a great price.

www.voxamps.com

HUGHES & KETTNER TUBEMEISTER 18 HEAD

£549

With an integrated Power Soak for silent recording, plus the near-legendary Red Box speaker emulation, the TM upholds H&K's well-deserved reputation for high standards. It has an exceptionally versatile set of onboard sounds, too.

www.hughes-and-kettner.com

BLACKSTAR HT-5R

£349

Infinite Shape Feature enables you to get British and American-style valve tones, while the onboard digital stereo reverb comes into its own in conjunction with the speaker-emulated output – switchable between 1 x 12 and 4 x 12 cabinet voicings.

www.blackstaramps.com

ORANGE MICRO TERROR

£99

Packs 20 watts into an unbelievably tiny chassis thanks to a solid-state Class D power stage. Sounds best when wound up to levels that are loud enough to compete with a drummer, but there's no denying the quality of its tonal palette.

www.orangeamps.com

LANEY IRONHEART IRT-STUDIO

£399

15 watts of valve power, plus USB connectivity for re-amping and silent recording make the IRT-Studio an incredibly useful rock and metal amp to have kicking around for your sessions at home.

www.laney.co.uk

BUDGET BASS GUITARS

Like the guitar market, the quality of budget basses has vastly improved over the past couple of decades. If you're just recording bass at home, your focus should be the sound, and all of the options here have tones that will punch through a mix; something that's especially important when DI'ing or using amp sims. The tonal variety isn't quite as wide as it is with guitars, but there's still plenty of choice. As always, decide what kind of tone you're after before you invest your cash.

SQUIER VINTAGE MODIFIED PRECISION BASS PJ

£280

The P-Bass is perhaps *the* bass guitar, and the PJ gives you extra versatility with a Jazz Bass bridge pickup plus the P-Bass split-neck pickup, ensuring it covers most genres with ease. The modern C profile neck makes it an easy player.

www.fender.com

EPIPHONE THUNDERBIRD-IV BASS

£229

Possibly the coolest looking bass on the planet with that 'reversed' zig-zag body, but it also delivers the tonal goods thanks to a pair of punchy Epiphone TB Plus bass humbuckers, a maple neck and mahogany body 'wings'.

www.epiphone.com

YAMAHA TRBX174

£183

With modern styling and a low price tag, the TRBX174's alder body, paired with split-coil and single-coil pickups, offers serious versatility, while Yamaha's ever-reliable build quality ensures it will withstand countless sessions.

uk.yamaha.com

LTD F-104

£308

Purpose-built for heavier styles, the F-104's extended 35" scale length makes down-tuning a cinch, while two ESP-designed pickups and a two-band active EQ means you'll have no problems retaining definition in lower registers.

www.espguitars.com

SQUIER VINTAGE MODIFIED JAZZ BASS '70S

£280

If you seek old-school tones, this '70s-style Jazz Bass will get you there. Its pair of single-coil pickups offers a defined bass tone with plenty of cut, further emphasised by the maple neck and fingerboard.

www.fender.com

STERLING BY MUSIC MAN S.U.B. RAY 4

£334

A cut-price version of Music Man's ever-popular StingRay 4 bass, the S.U.B. Ray features an onboard two-band preamp, low-noise humbucking pickups and a smooth satin neck finish for modern playability and hi-fi sounds.

www.sterlingbymusicman.com

DRUM KITS

The more you spend the better the quality of wood, shell construction, shell hardware etc, which will make them easier to keep in tune. Most shells will be based around maple or birch. Maple delivers a warmer, deeper sound, and birch is brighter with more attack. If you play prog you may need a seven-piece kit, but for rock a four-piece should suffice, so only buy what you need. Sub-£1,000 kits often come with generic factory heads so you may want to invest in new skins.

TAMA CUSTOM SUPERSTAR HYPERDRIVE

£1,219

It may stretch your budget, but this kit has it all – a thumping sound and excellent build quality. The 2015 model is all-maple and features die-cast hoops and an undrilled bass drum, plus two toms, two floors and a matching snare.

www.tama.com

PDP MAINSTAGE

£525

At just over £500 the Mainstage kit is at the upper end of entry-level, but still represents good value for money if budget is tight. As we've come to expect from PDP, DW's little brother, the build quality and sound is faultless.

www.pacificdrums.com

YAMAHA STAGE CUSTOM BIRCH

£599

Yamaha's credentials run through this kit like the words in a stick of rock. It's beautifully made; solidly engineered to take the knocks of real life and produces a quality of sound that defies its attractive price tag.

uk.yamaha.com

PEARL EXPORT

£429

A rehearsal room classic that shook up the scene once again on its rebirth in 2013, with new cutting-edge shells, tom mounts, lugs and hardware package, and at less than £500 it's an astonishingly well-appointed set-up.

www.pearldrum.com

MAPEX ARMORY

£849

A six-piece Mapex kit for comfortably under £1,000, including an impressive snare. Hybrid shells, rounded bearing edges, isolation-promoting tom mounts and superb finishes make the Armory a great choice for the studio.

www.mapex.co.uk

SONOR ESSENTIAL FORCE S-DRIVE KIT

From £1,089

Well-built, beautifully finished and great sounding drums, with a TuneSafe system that will help keep your drums singing through multiple takes. Top it with some new heads and you'll have yourself a studio workhorse.

www.sonor.com

CYMBALS

Aside from your drums, cymbals represent a large portion of the percussion 'voice' on your tracks, particularly the hi-hats and ride cymbal. Prioritise these when buying, before moving onto crashes and further effects-style sounds such as splashes and chinas - if you really need them. If you're adding to an existing collection we'd recommend trying new cymbals alongside your own metals to ensure they are complementary. Often a pre-packed set, usually containing at least hi-hats, a crash and a ride, is the most cost-effective route to great sounds, but if you can't afford new cymbals then consider second-hand, rental or a loan from a local drummer, because quality increases dramatically the more you spend.

SABIAN B8X

From £53

A boosted version of the cymbal brand's best-selling B8 range, boasting more hammering, adjusted profiles and smoother bell lathing. Suited for rock and metal players, with plenty of size and model options.

www.sabian.com

ZILDJIAN ZHT

From £67

Zildjian's most musical sheet bronze series yet boasting some fantastic, rich and pro-sounding crashes and rides. With single options and box sets available you're guaranteed to find something that works on your recordings.

www.zildjian.com

PAISTE PST8

From £57

Using the same alloy as Paiste's classic 2002 line, these are superbly made and quality sounding cymbals with enough variety across the range to offer warm and dark sounds, right up to lively and bright.

www.paiste.com

MEINL MB8 CYMBALS

From £76

Contemporary-sounding cymbals that sit happily within touching distance of Meinl's pro ranges. The high level of automation built into the manufacturing process guarantees consistent quality and sound across the range.

www.meinlcymbals.com

STAGG SENSA CYMBALS

From £29

Stagg is fast becoming known for its quality instruments, and its first complete new series since 2005 offers versatility at a moderate price. Tonally positioned halfway between dark and bright, Sensa will perfectly complement your set-up.

www.staggmusic.com

DREAM IGNITION

£365

There's not much of a range on offer, but the 14" hats, 16" crash and 20" ride of this cymbal set offer classic sounds at a reasonable price, especially considering they are cast B20 bronze that's been hand hammered and lathed.

www.dreamcymbals.com

Forget what you've heard about red light fever, recording your own music can be one of the most fun and rewarding experiences you'll have with your guitar, and guess what? It doesn't have to be difficult or expensive! This feature is all you need to get started. We'll explain recording gear, how to get it working and how to get a great sound from a simple set-up with both an electric and acoustic guitar

HOME STUDIO STARTER

>>>

What You Need To Record

Before you really get stuck into recording at home, here's the gear you'll need to get the job done...

GUITAR

This goes without saying, but before you record, it's worth checking out all of your guitar for buzzes, noises and intonation. A quick setup doesn't cost much – or if you're handy you can do it yourself – but the benefits of having your gear in order now will pay off later. Get a set of fresh strings on your guitar, give them plenty of time to stabilise, and you'll be sure that you're capturing the best sound possible from your instrument

MICROPHONES

You don't need a cupboard full of expensive and rare microphones to get a great sound, but if you're recording electric and acoustic, we'd suggest getting your hands on at least one dynamic microphone, and one condenser microphone (see Mic Check p43). If you don't want to buy them, you can always look into borrowing (ask around) or hiring some mics (check with your local music shops or practice spaces). With some careful preparation and placement, these will have you covered for most situations

MULTI-TRACK RECORDER

Of course, not everyone owns or wants to use a computer for making music on, and while they aren't as common as they used to be, there are still plenty of hardware multi-track recorders out there that mean you don't have to touch the spreadsheet machine. Hardware recorders have a limited track count, offering four, six, eight, 12 or 16 tracks per-song, but they have their benefits, too. They're simple to use, they're self-contained portable units so you can take them to a practice room or gig easily, plus they often have effects and CD burners built in!

AUDIO INTERFACE

Sounds nerdy doesn't it? Don't worry, this little box is simply the bit that allows you to get decent quality audio running in and out of your computer. All computers have rudimentary onboard audio interfaces (how else do you think your Skype calls work?), but this box will override the on-board hardware in your computer and give you better quality audio

DAW RECORDING SOFTWARE

A DAW (or digital audio workstation) is the software you'll be using to actually record with. There are many different options out there that you've probably already heard of, but most essentially offer the same thing

COMPUTER

A decade ago, computers needed to be hot-rodded to handle recording audio to a decent level, but these days, pretty much any off the shelf computer will do a good job of capturing enough tracks simultaneously to get your ideas down. Don't get hung up on whether you're using a PC, Mac, desktop or laptop; it doesn't matter. If you're going to be doing lots of recording, you might want to invest in some extra storage, however, as full-fat audio files can mount up after a while

>>>

Understand Your Audio Interface

Get to grips with the gadget that makes computer recording happen...

IF YOU'RE recording on a computer, the interface is one the most essential ingredients in your set-up. As we mentioned over the page, the interface is the bit that connects your guitar, microphones, headphones and speakers to your computer. Think of it as the main hub for all of your audio inputs and outputs. Audio interfaces can range from ultra-simple and affordable to very complex and expensive, but the market is awash of feature-packed boxes with price tags that are easily in reach.

Inputs

The first decision you have to make when you're looking for an interface to record with is how many inputs – and what type of input (instrument or microphone) – you'll need.

Make sure your audio interface has all the inputs and outputs you need!

This will govern how many tracks you can simultaneously record to their own tracks in your recording software. For example, if you're a singer-songwriter recording guitars and vocals and using software instruments, a simple two-input interface that includes at least one microphone preamp will most likely be fine. You can record two audio sources at a time on different tracks, then overdub extra parts such as solos or backing vocals later.

If you're working in a band set-up with drums, and want to record the entire rhythm section playing together while keeping all of the instruments on their own tracks for mixing later, then of course you're going to need a lot more inputs. There are plenty of

Some smaller amps can be used as audio interfaces, such as this Yamaha THR

"The interface is one the most essential ingredients in your set-up"

interfaces available with eight or more microphone inputs, and they have really come down in price over the last few years.

Connectivity

The next thing you need to think about is how the interface will connect to your computer. It used to be that interfaces were circuit boards that you had to mount within the computer, but these days they're pretty much exclusively external boxes that run off USB, Firewire or Thunderbolt (for Apple people). Check the connections on your computer to make sure it's compatible, and also think about power. If you're likely to be recording in an environment where electrical sockets are sparse (acoustic guitar in a church, vocals in a bathroom, etc) having an interface that can power itself from your laptop's battery will be a handy feature.

Finally, it's worth noting that some interfaces can connect to portable devices such as a phone or tablet as well as your computer, giving you the ultimate in portability.

Having an interface that can power itself over USB or the like is handy

Recommended kit

Take the stress out of shopping for an interface with our top picks!

VIDEO
www.bit.ly/tg280video

THE MOBILE RIG

Recording on a phone or tablet gives you a set-up you can take anywhere

IK Multimedia iRig Pro
For just over £100, you get a simple box for plugging in your guitar or a microphone (although not at the same time) to an iPhone or iPad, plus it also works on Mac computers. Pair it with IK's bundled amp modelling an recording apps and you have a straightforward setup to take anywhere.

Shure Motiv MVi
There aren't many Android compatible interfaces on the market that do it all, but this little box from Shure does. It looks a bit like an alarm clock, but gives you a combi socket for a mic or guitar, it will also work with PC or Mac.

Presonus AudioBox iTwo
Just because you're going mobile, doesn't mean you have to be limited to one input at a time. The AudioBox iTwo is compatible with either iPad or Mac, and offers two inputs – one for mic and one for instrument, as well as MIDI, balanced 1/4-inch outputs, and an internal analogue mixer for under a £100. The Studio version bundles a condenser mic and 'phones for just £50 more.

THE SINGER-SONGWRITER SETUP

Recording your songs alone in your bedroom? Here's the gear for you

M-Audio M-Track Mk II
£69. That's all it'll take for you to bag one of these rock-solid, easy-to-use interfaces. It's got everything you need on it, and comes bundled with some great plugins from studio effects legends, Waves.

Focusrite Scarlett Studio
This is a complete out-of-the-box solution to get you recording immediately. For around £179 you'll get a decent interface, a condenser microphone and a pair of studio monitoring headphones. If you want to take the fuss out of getting geared-up, start here.

UAD Apollo Twin
Okay, so it's not the most affordable (around £689), but as well as being loaded with two premium inputs, the Apollo Twin runs UAD plugins. This gives you access to world-class recreations of studio gear, effects and amp modelling, and it'll take the strain off your computer. It's an investment, but well worth it.

THE FULL-BAND STUDIO

Ready to commit your band's magnum opus to wax? These interfaces won't let you down

Tascam US-4X4
If you want to record a small band, this affordable interface from Tascam will give you four simultaneous inputs; that's more than enough to try all of the techniques we'll cover in our tutorials, plus you could record your drummer with a simple four-mic set-up.

M-Audio M-Track Eight
The M-Track Eight offers excellent value for money for around £260, you'll get eight mic inputs, metering for each channel and two headphone outputs. It also comes bundled with Cubase 7 LE and some Waves plugins to help with your mixing. Bargain.

Focusrite Saffire Pro 40
With eight analogue mic preamps on board, the Focusrite Saffire Pro gives you enough inputs to record your whole band at once, or mic up an entire drum kit in detail so you can overdub everything after. You can expand the number of inputs, too!

Understanding Microphones

Chances are your songs have vocals on them, or even acoustic guitar – that means you'll need something to capture that sound...

ALL MICS are basically the same, right? Wrong. Put down the Singstar mic and think about investing in something more suitable. That being said, you still don't need to spend a fortune to get a microphone that'll have you covered for recording your guitar. The most important thing is to choose the right kind of mic for the job. For this tutorial, we'll be sticking with the two main types of microphone used for recording guitars, these fall into 'dynamic' or 'condenser' categories.

Dynamic mics

Dynamic mics are the type of mic you'll see most commonly, and are great all-rounders for recording guitar cabinets, drums and even vocals. Their passive design means that they don't require any power to work, and they're also less sensitive than condenser microphones. This lower sensitivity means that a dynamic microphone can usually handle very high Sound Pressure Levels (SPLs) without getting damaged, making them a great choice if you need to close-mic a loud source like your guitar amp. They're affordable, rugged and will work on any interface with a mic preamp.

TG recommends

Shure SM57

No list of microphones would be complete without mentioning the SM57. It's the Swiss Army knife of any studio, from bedroom set-ups to multi-million pound facilities. Stick it in front of your amp, on a snare drum, or use it to record vocals. It's about the best £85 you can spend on recording gear.

JZ Microphones GTR-1

You may not know the name, but the GTR-1 from JZ Microphones is a serious contender. It's designed specifically for mic'ing guitar cabs, and its flat design means it'll sit as close as you want to the grille on your speaker. Plus you'll pick one up for a similar price to an SM57.

Audix i5

No prizes for guessing that Audix has positioned the i5 as an alternative to the 57. It's got a rugged build quality, can handle SPLs of up to 140dB (that's louder than a jet taking

Condenser mics

A condenser (sometimes called 'capacitor') microphone is another classic studio choice. Its applications range from acoustic guitar, to vocals, to the ambient mic'ing of a guitar cab. Condenser mics have a few extended features when compared to their dynamic brothers. First off, most condensers will require power from an external source, which is sent down the XLR cable, so you'll need to make sure your interface has phantom power. If not, you can buy external preamps or phantom power units to take care of this for you.

Because of this circuitry, condenser mics can pick up a wider range of frequencies, plus greater sonic detail than a dynamic mic. This isn't always an advantage, though, as with increased sensitivity comes a lower resistance to very high SPLs. If you place them too close to a sound source, you could risk damaging the mic. On top of this, the condenser will 'hear' a lot more background noise – fridges, computers, traffic, air conditioning etc – so you need to make sure you choose your mic and environment carefully.

TG recommends

Rode NT-1A

The Rode NT-1A has been a household name since it launched, with about 1.5 zillion of them sold to-date. For good reason too. A street price between £130 and £150 will bag you this low-noise condenser, a proper elastic cradle mount and a pop shield to tame those Bs and Ps on your vocals.

SE X1

SE Electronics have a habit of packing a lot of bang for not much buck, and the X1 continues this with features such as a -10dB pad (for using it on louder sources) and a bass roll-off (to cut down on low-end rumble). Bag it on its own for about £90, or push the budget to £150 to get it bundled with a cradle, pop shield and wicked-looking Reflection Filter for recording your vocals!

AKG C1000S

This small-diaphragm condenser has got you covered for multiple applications, with a -10dB pad switch, bass roll-off, and switchable cardioid or hyper-cardioid patterns. It can also be powered with a battery, so you can plug it in even if you don't have phantom power! Handy.

"Condenser mics pick up a wider range of frequencies and greater sonic detail"

Mic check

Use a dynamic mic if...

- You're placing the mic very close to a loud source
- You don't need as much high frequency detail
- You want to minimise spill from other sources

Use a condenser mic if...

- You want to capture a wide frequency response (acoustic guitar, vocals etc)
- You are recording an instrument with a lot of dynamic range
- You want to record from a greater distance (ie ambient room mics)

PICK-UP PATTERNS

Nope, we're not talking about the ones in your guitar. Every microphone has what's known as a polar pick-up pattern, which determines the shape of space around the mic's capsule that it can 'hear'. It can sound technical, but it's actually quite simple. Here are some of the most common.

Omni-directional

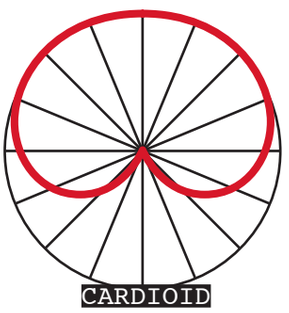
An omni-directional mic picks up sound from all (omni) directions. They work really well for capturing 'group' sounds, for example, more than one acoustic guitar or vocal chants, but are a big no-no if you want to eliminate spill between instruments.

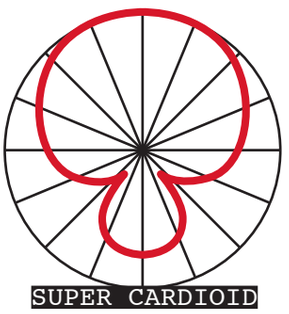
Cardioid

This is the most common pattern. If your mic doesn't have switchable patterns, chances are it'll be a cardioid design. The name comes from the fact that it picks up sound in a heart-shaped pattern around the front of the mic's capsule, so it's great at picking up the sound in front and to the sides of the mic, while rejecting sound from behind.

Super cardioid

These types of mic give an even tighter – or more directional – pick-up pattern to the front of the mic than a standard cardioid, but the trade-off is that they don't reject sound from behind as well. This is great if you want to increase isolation between instruments in a live recording, you'll just need to consider the placement of the sources so that they aren't bleeding into each other.

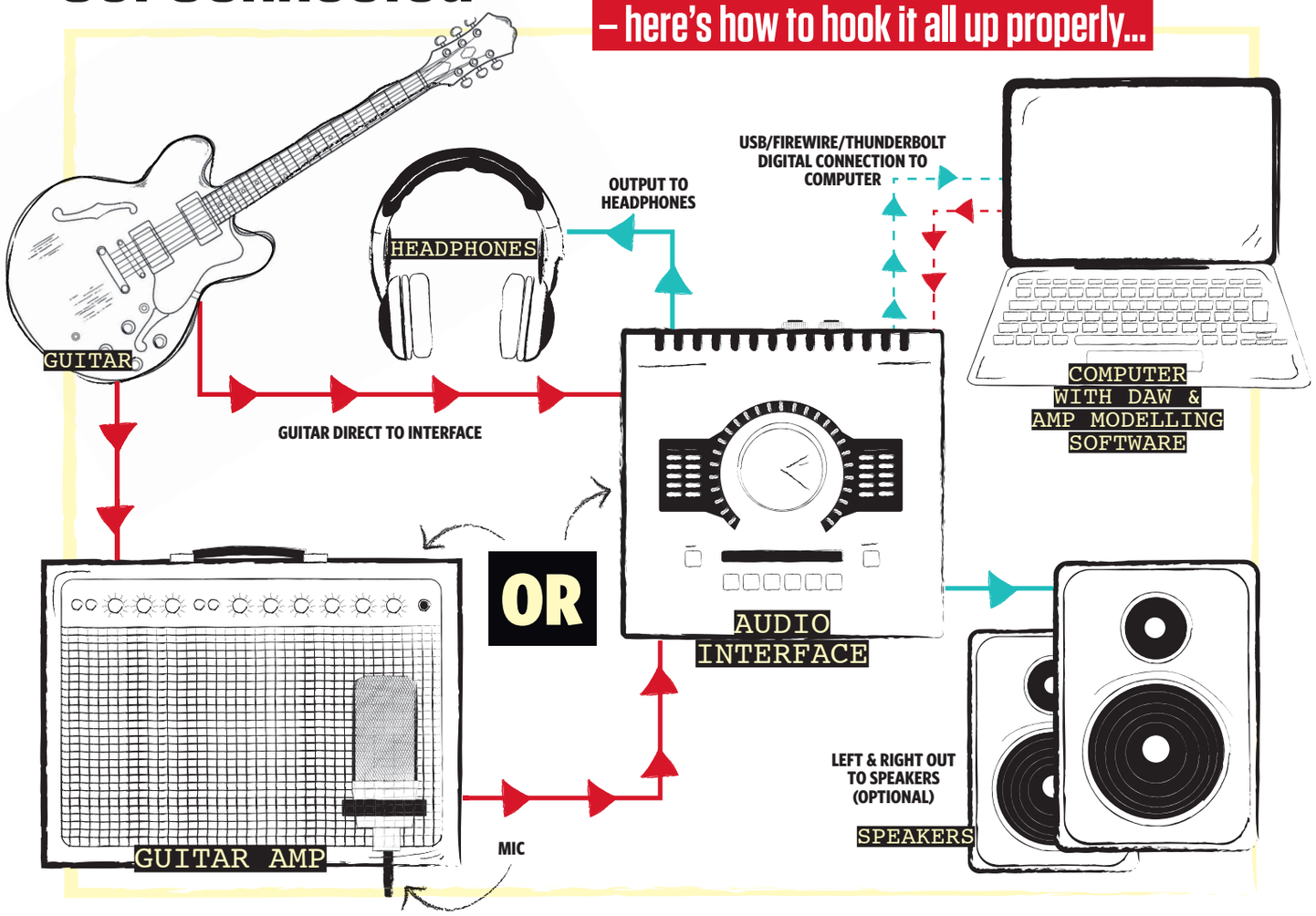




Dynamic mics are great all-rounders

Get Connected

When the time comes to put all the gear together that last thing you want to hear is nothing at all – here's how to hook it all up properly...



THE SOUND OF SILENCE

There's nothing more frustrating than getting all of your connections together, then hearing nothing. If you've done it as per the manual and you're still stuck, here's how to find and solve problems before your inspiration dies...

Check your connections

Yes, we know you've already done this, but a loose jack here, or a forgotten USB cable there can bring everything to its knees. While you're doing a complete 'idiot' check, don't forget to make sure your guitar's volume control is turned up – we've done this plenty of times!

Got power?

When you're using a condenser mic, make sure you've turned on your interface's phantom power switch, otherwise you'll hear nothing. So easily forgotten, but so easily fixed, too!

Check your settings

We can't walk you through the settings for every piece of recording software, but here's roughly how they all work. First make sure your computer is talking to the interface as the main audio input and output device. On a Mac, you'll find this in the 'Sound' menu. For PC check your device manager.

Check your DAW software

Think of the DAW as another signal in the chain; the audio goes from your instrument to the interface, into the computer and into the software. To make this possible, check your software is set to use the interface as its input and output device. Otherwise, it might try to record from your built-in hardware. You can usually find this in one of the menus at the top of the screen: it will be called 'Audio Setup', 'Audio Preferences', 'Audio Devices' or similar.

Assign the correct input to your track

This is common when using an interface with lots of inputs, and recording multiple tracks. Sometimes, you'll find that if you are recording on 'Track 4' your software will automatically look to input four of your interface for the signal. Fine. But if your guitar is plugged into a different input you record nothing. You can usually change which input you want to use on each track's 'inspector' (most often found on the left-hand side of the main screen of your DAW).

Switch on your track's monitoring

Many DAWs are set up to replicate the signal routing of old tape machines, so for reasons we don't have space to go into here, you'll need to press the 'monitor' button to hear yourself. This is also found in the track inspector on the left of the screen, and usually resembles a speaker or headphone icon. It's worth noting at this point that the fader in your recording software controls the monitoring volume for each track, so you can turn it up or down to suit. It won't increase or decrease the recorded level of your signal.

Don't forget about the hardware

Some interfaces have mute buttons or monitor volume controls, or even switchable dual master volumes that control your speaker or monitors. Make sure you haven't knocked one of these by mistake, and are adjusting the correct control for the output you're trying to listen to.

Stay calm

It's frustrating when things don't work, but when they do, try to methodically go through your signal chain in a logical order before giving up and you'll soon find the problem. It'll usually make you kick yourself!

meris

More than Logic.
Uniting Art & Engineering.

www.soundnetwork.co.uk/meris

Sound NETWORK

Make The Most Of Amp Modelling

No room to record? Neighbours on your back about noise? Amp modelling is your silent partner...

DON'T LET space or noise restrictions stop you from recording your guitar at home. There are loads of great software amp modellers available such as Native Instruments' Guitar Rig and IK Multimedia's AmpliTube. In fact, many DAWs come loaded with great amp modelling on board for free. Whichever one you're using, the concept is the same. Here's how to get the most out of modelling.

Start it up!

First, make sure you're connected up as per the diagram on p44. Once you've loaded your DAW, create a new audio track. Amp modelling is then applied as a 'plugin'. Think of a plugin as program within a program, your DAW acts as a 'host' to the amp modelling software, and all of your settings and signal chains are saved into the song, so it'll remain exactly as you leave it when you next open your song. You'll need to use it as an 'insert' effect, rather than a send, otherwise you'll hear a blend of your guitar's dry, clean signal along with the effected sound when playing.

A DAW such as Logic will act as a host to your amp modelling software plugin

"Flick through some different amp and speaker types, you might find the perfect match where you least expect it"

Amp modellers give you the freedom to swap and tweak 'til you're happy

Tweak practice

One benefit of amp modelling is that it is inserted on the output of your DAW's signal chain. This means that what is actually being recorded is your dry guitar sound, so if you decide to change the EQ, gain settings or even the type of amp after you've recorded, you're free to do so!

Make decisions

The last point is indeed one of the greatest virtues of amp modelling software, but at some point you will have to make a decision on your tone in order to finish your song. Learn how to recognise when your finished, then move on to the next part.

Try everything

It's easy to fall into preconceptions when using an amp modeller – big rock tune? Use a stack! But it's also a great idea to try out some unexpected models, too. Flick through some different amp and speaker types and see how they fit in your mix and you might just find the perfect match where you least expect it.

Build cool sounds

In the real world, every time we want to add a pedal, amp or speaker to our rig, we're plagued by switching boxes, cables, and noise. As well as this, you'll need the space, and resources to get your hands on such gear. But this is virtual, baby! Rigging up two amps at once is easy, and you won't find a ground hum in earshot. This is also true of creating crazy effects patches. Want three fuzzes, a wah, and four delays? The only limitation is your imagination and processing power, so get stuck in!

Mic mechanics

Many amp modellers give you control over the type of virtual microphone that's used on your virtual cab, and you can usually change its position, too. Play around with blending different virtual mic types and placements together, and you can often scratch the tonal itch that EQ and gain settings can't reach.

Get hard

Okay, we know this bit is predominantly about software amp modellers, but many multi-effects units and amps can act as an audio interface too, with on-screen control over your amp. This will take some of the effects strain off your computer, and allow you to silently record the settings you know and love without any noise from microphones.

Modern modelling will let you tweak every bit of an amp's recorded sound

ROCKING IN THE FREE WORLD

Three software amp modellers that won't cost you a penny!

IK Multimedia AmpliTube Custom Shop
www.ikmultimedia.com
This expandable version of IK Multimedia's AmpliTube is totally free, and comes with four amps, five cabs, nine stompboxes and more! If you like it, you can download more models, but you will have to pay for them...

Native Instruments Guitar Rig Player
www.native-instruments.com
Guitar Rig Player gives you one amp (based on a Marshall Plexi), plus a host of effects including delay, modulation and filters.

Kuassa Amplifikation Lite
www.kuassa.com
Kuassa's Amplifikation Lite is 100 per cent free, and provides you with a three-channel amp equipped with EQ and cabinet modelling. It's not the flashiest, but it is solid, and won't cost you a bean.

Recording your acoustic guitar

Recording your acoustic needn't be difficult. All you need is a good mic and the right surroundings

THE ACOUSTIC guitar is a pure instrument. The sound it produces is self-contained, and relies on you as the player to influence it. This can be done with different string types, picks, but most of all, the room. There are loads of tricks for getting different acoustic guitar sounds on your recording, and in this tutorial we'll show you just a few of them. The good news is that you can get brilliant-sounding acoustic tracks with just one microphone, some careful room selection and mic placement. Here's how

ONE MIC

Acoustic guitars are dynamic instruments, capable of outputting a range of levels and frequency responses. For this reason, the most common way of capturing an acoustic guitar with a single mic is to use a condenser. But before you position the mic, have a listen to the guitar in the room. Your environment can have a great effect on the sound; empty spaces with lots of hard reflective surfaces (a bathroom, for instance) will give you a bright, lively sound, whereas a room with carpet, sofas and curtains will soak up a lot of the reflections, giving you a dryer, punchier acoustic tone. An acoustic can be played anywhere, so experiment with different rooms to see which gets you the sound you prefer.

Position the mic about 30cm in front of your acoustic, aimed at the join between the body and the neck. Positioning the mic here will keep it out of the way of your picking hand, and will avoid too much muddy low-end from the soundhole.

Difficulty **EASY!** *You will need:* ✓ Condenser microphone ✓ One microphone input ✓ One track

Stereo Set-up 1 X/Y CONFIGURATION

Capturing your guitar in stereo can give you a huge, wide-sounding acoustic part for your tune, and it's really quite easy to do! When you record in stereo, it's best if you can use a pair of identical microphones, so that the signal picked up by each will be equal. For this method, we're going to use an X/Y placement. This is where the capsules are crossed over, so that they're an equal distance from the source to minimise phase. Once again, position them around the 14th fret of your acoustic. Pan them left and right,

Difficulty **EASY!** *You will need:* ✓Two condenser microphones ✓Two microphone inputs ✓Two tracks

Stereo Set-up 2 SPACED PAIR

The second way of recording in stereo is using a spaced pair. It's similar to the X/Y idea, except for this time we'll physically move the microphones apart to achieve an even wider sound than before. Place one microphone between the bridge and the soundhole, and aim the other at the fretboard. Once again, you'll want to pan these tracks left and right respectively when mixing to achieve a spacey, stereo effect.

Difficulty **MODERATE** *You will need:* ✓Two condenser microphones ✓Two microphone inputs ✓Two tracks

Stereo Set-up 3 OVERHEADS

The acoustic guitar is an organic sound, and there's an argument that it should be captured more ambiently. After all, you don't stick your head down by the body of the guitar when listening to someone play! A good method for achieving a very natural acoustic sound is to try positioning a pair of microphones at the player's head height as shown. This way, you'll be recording 'what they hear' rather than an artificially close sound.

Difficulty **MODERATE** *You will need:* ✓Two condenser microphones ✓Two microphone inputs ✓Two tracks

THE DOS & DONTS OF RECORDING ACOUSTIC

Do Experiment with different rooms, this can make a huge difference to the sound of an acoustic guitar

Don't Tap your foot too loudly. If you must, take your shoe off and place a cushion underneath your foot

Do Try different picks and strings. These are some of the biggest tone-shaping devices you have at your disposal, so it's definitely worth it!

Don't Move too much while recording. You should be aiming to keep the guitar a consistent distance from the microphone

Do Remember to switch off phones, boilers/air conditioning and anything else that could make noise during your take. If you're a heavy breather, try and keep it quiet!

Don't Stress too much about string noise. It's part of a natural acoustic sound. Coated strings can help minimise string noise and consider using some string lubricant such as Fast Fret or similar

"You can get brilliant sounding acoustic tracks with just one mic"

PICKUP/MIC BLEND

If your acoustic has a pickup on it, you can get two contrasting tones from one take by blending the sound of your pickup with the ambience of a microphone. It's easy to do to – simply plug your guitar into your interface's instrument input (we'd suggest keeping your preamp's EQ 'flat' so you can tweak the tonality later), then record the mic signal on a separate track using the one mic method above. You might want to play with the distance of the microphone, just to get the sounds to compliment each other as well as possible. Once you're done, try panning the tracks, or running the pickup track through amp/speaker modelling to create some extra texture.

Difficulty **EASY!** *You will need:* ✓Electro-acoustic ✓Condenser microphone ✓Mic/instrument inputs ✓Two tracks

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Recording your guitar amp

Recording your amp isn't rocket science, and once you understand a few basic principles, you'll be getting a great sound in no time

WHILE MANY of us will record our electric guitars straight into a DAW and use amp and effects modelling to create the sounds we want, there's just something about recording a proper guitar amp in a live room, particularly a full-fat valve amp. As with recording an acoustic, however, mic'ing up an amp is a process that requires a bit of knowledge, and a fair bit of trail and error to get the ideal sound. Here's how to set your amp up for recording, and get your mics set up to capture that sound in the best possible way.

Start with your guitar

We mentioned this earlier, but we really mean it. A great guitar sound starts at the business end of your signal path. With your guitar set-up with fresh strings that are played in, you've got the first link in the chain sorted.

Get your sound

Before you get started with microphones, fine-tune your pedal and amp settings to get them the best they can be to your ears in the room. Try moving your amp to different positions in the room – or even a different room if possible– and see where it sounds best. Set your drive, EQ and overall level to a place where you feel comfortable, then move on to the mic.

Speaker easy

As we just mentioned, if you're getting a great sound in the room, the only job the mic has to do is capture it. But the position of your mic in relation to your speaker can radically change the sound. Put simply, depending on where you position the mic, you can change the sound it's capturing from bright to dark. The brightest tone is found dead-centre of the speaker – right on the dust cap. As you move the microphone to the edge of the speaker, you'll find the sound gets progressively darker. Distance will also play a key role in your resulting tone – placing the mic very close to the speaker will capture the amp's sound in detail, with a lot of attack and definition. With this type of set-up you're recording the sound of the speaker, with hardly any room sound.

The further you move the microphone away from the speaker, the more you'll capture the room reflections, adding ambience and depth to your sound.

The examples on the next page also illustrate how multiple mics can affect tone.

Three ways to mic your speaker

1 CLOSE-MIC'ING

The easy way...

Positioning your mic close to the speaker is the easiest, cleanest and most convenient way of recording your guitar. A dynamic mic will handle the high SPL of your cab, so you can place it as close as you can physically get it. Start in the centre of the speaker cone, and move it towards the edge of the speaker. It's worth enlisting the help of a bandmate at this point to monitor the sound the mic is picking up through headphones against the sound in the room. If you're recording alone, do this yourself, it'll just take a bit longer.

Once you've found the right position for tonality, try moving the mic back/towards the speaker and listen to how it changes the timbre of the sound. When you're ready, hit record!

Difficulty **EASY!** *You will need:* ✓ Guitar amp ✓ Dynamic microphone ✓ One microphone input ✓ One track

2 AMBIENT MIC'ING

Add some space to your sound

For some styles of music – or just personal taste – you may prefer to capture the sound of your amp in a more natural, ambient way. Ambient mic'ing will capture more of the sound reflections in the room, as well as the amp, and can really help your guitar to sit in the mix well later. Because you'll be placing the mic further from the source, we'd recommend using a condenser mic; the extra sensitivity and frequency response will keep your sound full, even at a longer distance. Start with your microphone about a foot (30cm) away from the grille. As with close mic'ing, the tonality of your captured sound will change, depending on which part of the speaker you aim the mic at – however bear in mind that this effect will be lessened the further you get from the speaker. The rule here is simple: move it further from the amp to record a more distant, roomier sound, and closer to the amp to capture less ambience.

Difficulty **EASY!** *You will need:* ✓ Guitar amp ✓ Condenser microphone ✓ One microphone input ✓ One track

3 CLOSE/AMBIENT BLEND

Strike a balance – use both!

The final way we'll look at is a mix of the two previous methods. Using a blend of close and ambient mic positions gives you two things: the best of both worlds in terms of maximum attack, and spacial effect from each position, plus the ability to balance these sounds in your final mix. Get started by replicating both set-ups we've already looked at. At this point we should mention phase. Much like your phaser pedal, phase between two mics will carve out a hole in your sound. With two mics in fixed positions, the phase will be at a set frequency. It can be used to make your sound fuller or thinner, depending on which frequencies are affected. Phase is pretty much unavoidable, but it can be minimised using the 3:1 rule. The idea is that your second mic should be positioned three times the distance from the source (your amp) as the first (close) mic. Ultimately though, you shouldn't let this worry you too much. You're not going to break anything. Use your ears, listen to the two mics together, and if it sounds good, it is good!

Difficulty **MODERATE** *You will need:* ✓ Dynamic microphone ✓ Condenser microphone ✓ Two microphone inputs on your interface ✓ Two separate tracks to record

TRACK-TRICKS

TG's top tips to make recording amps easier

Mark your spot
Once you've found your ideal mic placement, mark the amp with tape or chalk so you can find it again if the mic gets knocked or moved.

Cone home
Not sure where the speaker starts or finishes? Take a look around the back if your cabinet is open-back or shine a torch through the grille to see its outline.

Use small amps
Getting a great amp sound from a valve amp means cranking it up. Do this with a 100-watt stack and you'll end up with sirens on your recording! Instead, try a low-wattage amp to minimise the volume, and give a more usable result.

Gain killer
Careful with that gain knob. When you're recording, it's easy to go overboard with the drive, but when you stack up layers of distorted guitars, it gets messy. Get the gain to your usual level, then back it off a notch.

Double up!
A classic guitar recording trick is to double your track with an identical part. Play as tightly as you can, pan them left and right, and bang... instant huge tone. For an added twist, try changing your gain, EQ, pickup settings or even guitar on one of the parts.

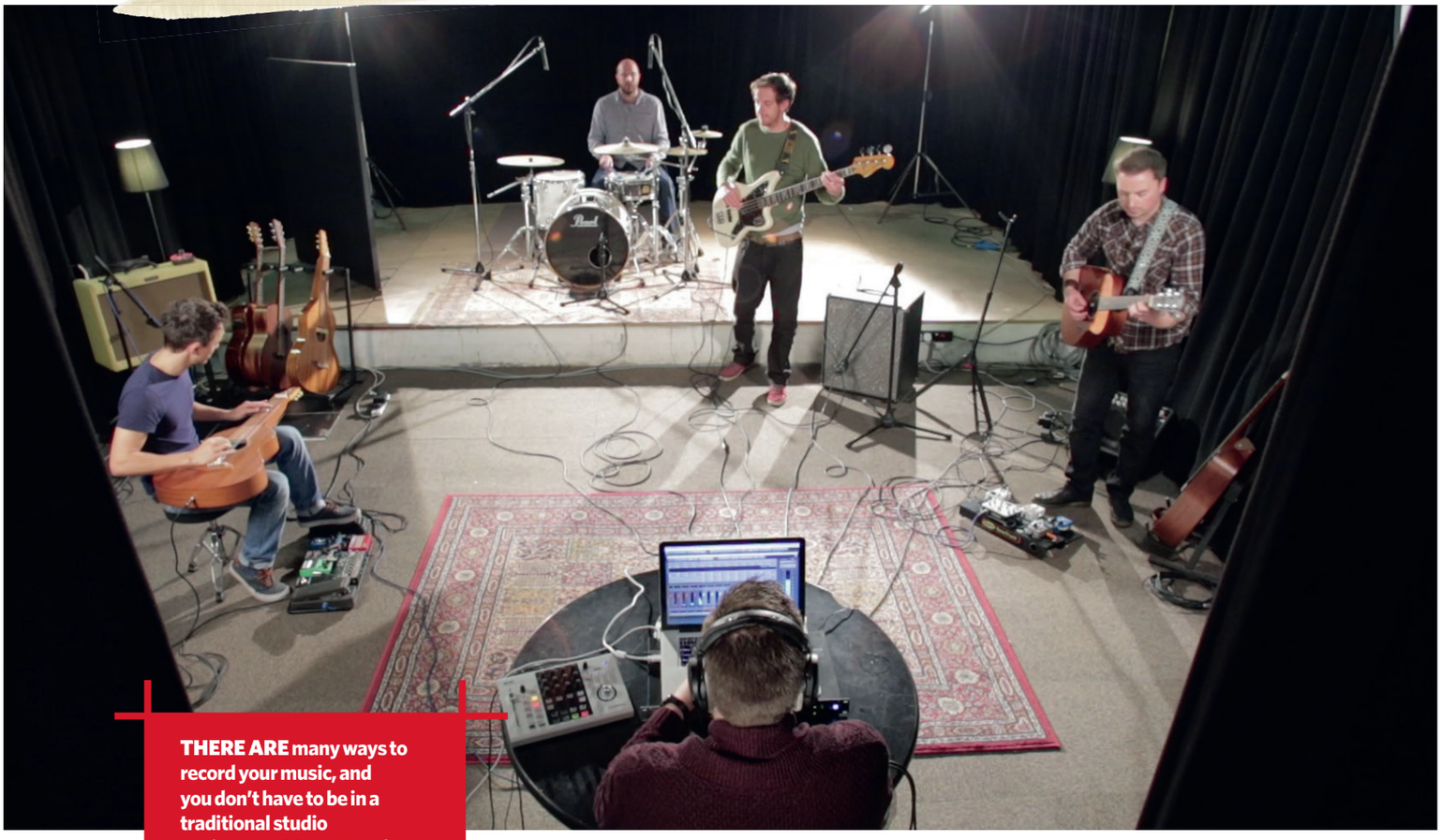
The voicing
One of the best ways of adding thickness to double-tracked guitar parts is to use different voicings of the same chord. Try playing one part as open chords, and then switch to barres for the next track. It will instantly sound richer!

Dare to DI
Recording a DI'd clean version of your part straight from your guitar is the ultimate safety net. You'll be able to re-amp your part later either live or with a modeller, or simply have a backup if anything goes wrong with your amp track.

>>>

Record Your Band

Essentials for tracking a band playing live together



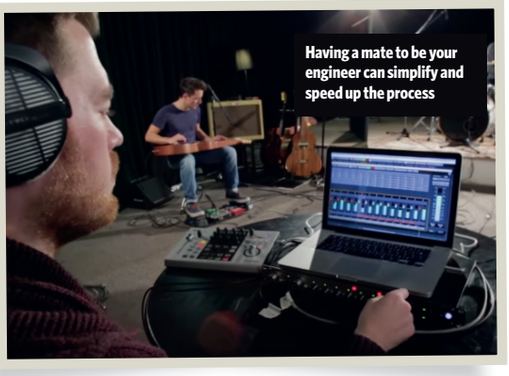
THERE ARE many ways to record your music, and you don't have to be in a traditional studio environment to get good results. Capturing musicians playing together can reap great rewards in terms of dynamics and practicality, and showcase your band's chemistry together. Here's out 10-step guide to getting started with it...

1 Get the right gear first

As well as your instruments and amps, you'll need a laptop capable of running DAW software such as Cubase and Logic, or if you're old-school, a multi-track portastudio. You'll also need an interface that can take multiple XLR inputs; eight would be ideal to cover amps, drums and room mics, too. With that in mind, you'll also need plenty of XLR cables, and it's worth labelling them with each source (eg Guitar Amp 1) so the signal paths don't get confusing. Dynamic mics for amps are a must, as is a set of condenser and dynamic mics for the drums. If possible, an extra condenser or two to use as ambient mics is useful for capturing more of the overall sound of the band in the room. You might decide to DI some sources too; bass and acoustic amps are prime candidates as they often feature XLR outputs. Also, bring spare strings, patch leads and guitar cables, because you never know!

2 Prepare

Before setting up to track your band, make sure you choose a song, or songs, to record that you can play consistently well live. You're going to be capturing the instruments live and while you may leave solos and vocals (see Overdub Session) for a separate session, you need to nail your live parts and make sure the band dynamic and tone is as good as can be. Having a friend who can engineer is so useful, as it allows you to focus on your performance and speeds up the process of checking levels, and starting/stopping recording. Next, you need to choose your location. It could be your usual practice room or even a village hall, but you'll need enough space to position your band and not have excessive unwanted reverb…



Having a mate to be your engineer can simplify and speed up the process

3 Positioning the band

Because you'll be using mics to record the instruments, 'spill' or 'bleed' is inevitable between them. This is when the instrument on one mic is picking up the sound of another. It tends to happen less with the close mics you'll have on amps, but the drums are a loud instrument and spill from them is likely. Because of this it's advisable to record your

vocals in a separate session rather than have a sensitive condenser mic picking up the other instruments as well. You can minimise bleed between the other instruments by positioning musicians in a semi-circle or horseshoe shape so they're spaced out from each other but still close enough to communicate but amps aren't facing each other where they could cause feedback.

4 Drum mic'ing basics

Using a four-mic setup for the drums to capture clean sound, start with the overhead mics first. These capture the sound of the kit being played in the room and help produce a clearer cymbal sound. Start by positioning them six feet above ground level and aimed down at the kit. It's vital that they are equal distances from the kit to avoid mic phasing (which happens when the sound is hitting each mic at different times). For the kick drum, the closer you position the mic to the batter head (the side that is hit) the more attack you'll get from the sound. You may also choose to place a pillow inside the kick drum as a muffler to reduce unwanted overtones and help give a punchier, less boomy sound. For the snare, position the dynamic mic a couple of inches above and an inch from the edge of it. The further you move it away, the more room ambience you'll get. And to reduce the amount of hi-hat cymbal sound hitting the snare mic, make sure it's facing directly away from the hi-hat.

5 Recording guitars

Dynamic mics are rugged enough to cope with the high frequency sound pressure levels coming from amplifier speakers. A single-mic setup with the mic directed at the speaker cone and almost touching the grille cloth can get you a good sound, especially if you tweak the positioning (see p42 for more) and it's important to monitor the effects on tone when you change the positioning; dead centre will be punchier, positioning to the edge adds a darker tonality. When you've found your sweet spot, mark it with a cross of tape on your grille. If you have enough XLR inputs on your interface, you may want to add a condenser several inches away for more of an ambient element but make sure you engage the -10 decibel pad setting if it has one to help prevent clipping.

6 Recording acoustics

Though the ideal way to record your acoustic is with a condenser mic (see p43) the potential for mic bleed would compromise the recording too much. But fear not, if you're an acoustic player you can still track live with the band by mic'ing an acoustic combo amp or using its DI. Your choice of pickup and preamp comes into play here. If you want to give magnetic soundhole or piezo pickups more of the 'acoustic' sound of a mic'd guitar, carefully dialling in your tone with an onboard EQ or preamp pedal can reap rewards. An acoustic in the mix with a band needs mids to stand out though, and less of the bass you might dial in when playing solo. Inevitably, there's compromise involved.

7 Troubleshooting

When the live session is underway make sure all guitarists and bassist have a tuner pedal and constantly re-tune between takes. Why risk sabotaging your song before you've even played a note? And once you start, if someone makes a significant mistake, be prepared to stop. You've got to give your best chance at a performance you can live with. This is where the extra pair of ears of the laptop engineer are especially useful; they might hear a problem with the performance or signals that you don't.

8 Overdub session

You'll get the instrumental core of your song tracked in the live stage, but to take the pressure off, you may want to save solos for an overdub stage, using amp and effects modelling plugins to nail a take and tone that you're comfortable with. But you may also choose to overdub parts to really add impact to your song's parts, such as adding ringing overdriven chords in the chorus. Think about how you can enhance it without losing that live energy you've captured.

9 Vocals

When recording the live instrumental, remember to keep vocals in mind with your playing dynamics so when you add them, the musicians are already reacting to the parts where vocals will be, such as taking things down a notch with their playing when the first verse comes in. For the singer, it's important that they try to keep that live dynamic in mind for their own recording takes, again using the interface and laptop setup. Get comfortable with the band recording and try some run-throughs before even touching that record button; this will serve as a warm up for vocal chords that should make tracking easier in the long run. It's very important that the vocalist is comfortable in the recording space so make sure they're singing up to the condenser mic to open their vocal chords and ensure they have a monitor mix of both their vocal level and the song that they're happy to sing with. Add the kind of effects that you would use post-recording for this monitor headphone mix; reverb can really help a singer's performance as opposed to a dry uninspiring signal, in the same way as it does for a guitarist.

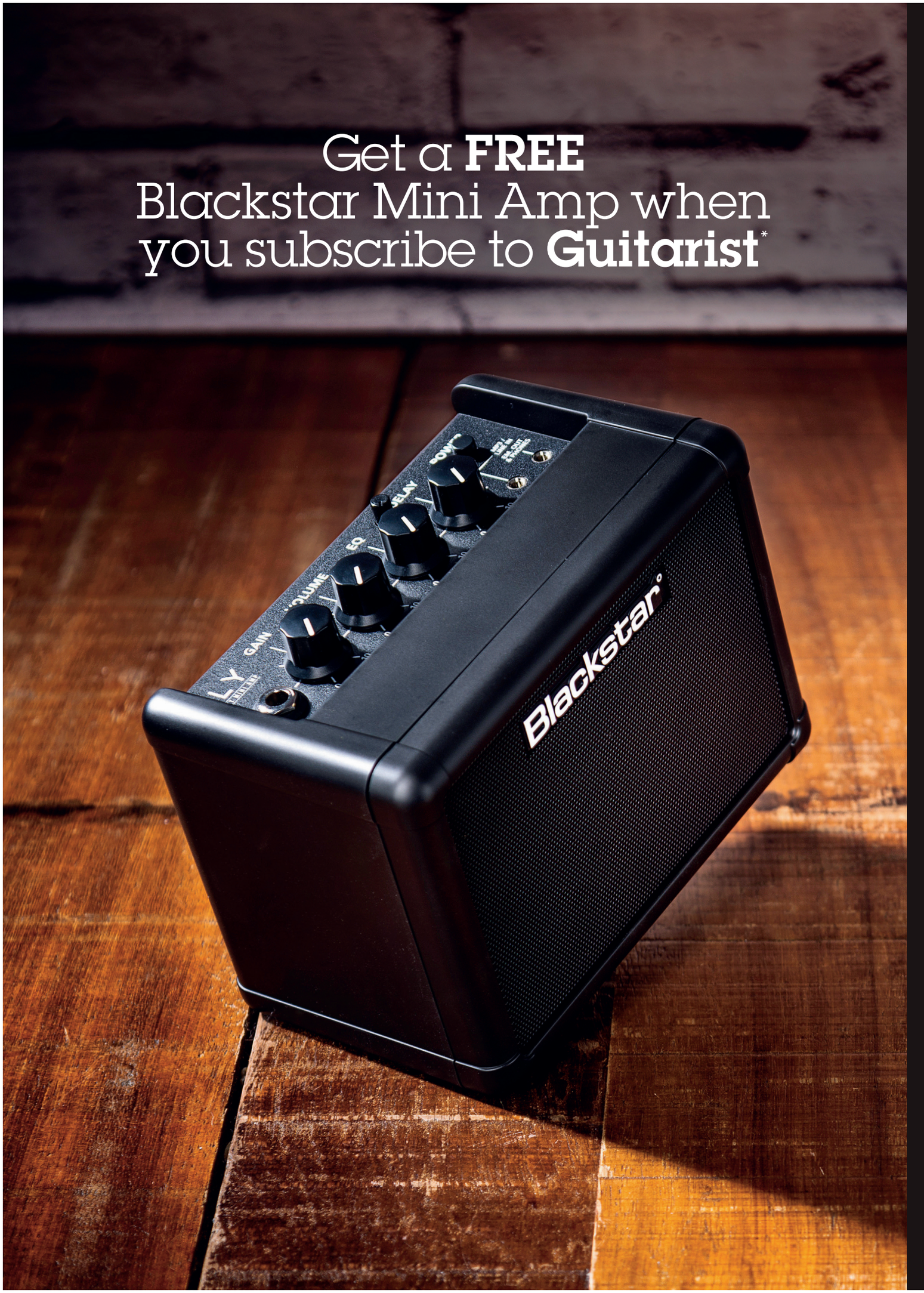
Remember to re-tune between takes – even being a little out can ruin a take


Make sure your overhead drum mics are equidistant to avoid mic phasing

"Recording live helps capture the energy of musicians playing"

10 Good foundations

Listen back and critically evaluate all the takes you have as a band before moving forward to the mixing stage. If you get good takes at the live and overdub stages that reflect the dynamics of your song well, it makes mixing your song a much more straightforward process as you'll be reflecting what's already there. And that's one of the great things about tracking the bulk of a recording live; it helps capture the energy of musicians playing a song in a more organic way that can be harder to replicate by tracking all the instruments individually.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GET STARTED WITH SONGWRITING

You can have all the production know-how in the world – and a studio to rival the biggest rock producer – but it won't mean much if you're lacking great songs to record. Crafting a song that will stick in people's minds, make them want to buy your music and come to your gigs is hugely important. In this section we'll be giving you pointers on how to write stand-out tracks. We'll be looking at the anatomy of the song – breaking it down into key components – and suggesting 10 simple songwriting chords to get you started. Lower Than Atlantis' Mike Duce is also on hand to share his experience of writing for LTA, 5 Seconds of Summer and *The X Factor*'s Luke Friend. So grab a pen and a notebook, and let's dive in...

LTA's Mike Duce has also written for chart toppers 5 Seconds Of Summer

THE BASICS OF SONGWRITING

Lower Than Atlantis' Mike Duce is fast becoming hot property on the UK songwriting scene. We recently spoke with him to find out more, and to get some tips for you to use when writing

With four successful albums under his belt, Lower Than Atlantis frontman and guitarist Mike Duce is racking up a wealth of songwriting experience and nouse.

In fact, Mike has recently been linked to songwriting circles that have worked with both indie and major label recording acts, including some high profile pop bands such as 5 Seconds Of Summer.

But in the beginning Mike wasn't so different to you. He started off writing songs at home, gradually building up the confidence and knowledge to walk into a 'proper' recording studio and work on the same level with award-wining producers. Sure, he'll sometimes write something that's not up to scratch, but he doesn't waste anything. And that's one of the take-home messages you'll get from Mike here: keep everything you work on when writing, because one day that riff you consider too technical for your current project might actually be the hook to your biggest-selling single. >

WHAT INSTRUMENT DO YOU PREFER WRITING SONGS ON AND WHY?

"It's mainly acoustic guitar, a Martin DRS1. There's just more romance to writing on acoustic. I like the way it sounds, too, like it almost sounds distorted if you're strumming it hard enough. Plus, I can walk around and play – I normally walk around when I'm writing. When I'm on tour, I like to write outside. Songwriting is the main part of music for me. Second to that is recording and making something I've created sound as good as it can."

IS IT IMPORTANT TO HAVE A WORKING KNOWLEDGE OF OTHER INSTRUMENTS TO HELP WITH SONGWRITING?

"Well, I also play bass. I normally work with a producer when I'm writing and he'll program the drums for me, but I'll talk to him about what I want. If you sat me behind the kit I'd be awful, but I know what drums should be doing; not just beats but fills as well. So yeah, you've got to understand the workings of a song in its basic form. Even when I was a kid, writing silly little songs, I'd nod my head and know where the kick and snare were going to fall. I recently wrote a song called *Weirdo* that stemmed from a little slap bass thing. This is one of the ways I write. If it sounds like a Mariachi band, I'll go with that vibe lyrically.

"Other times I'll write something that's a cool starting point. It could be a word, a one-liner perhaps, that becomes a tagline in a song. Normally I'll come up with a chorus first, some epic chords or a nice sounding chord progression, then I'll hum over it. Then I'll do about three toplines [melodies], pick the best bits and sew them together. Once I've got the chorus, the verses seem to write themselves. I think a lot of people rush the middle-eights, but I like an interesting mid-eight so I spend as much time on them as possible. I work in 'pop structure' most of the time. Whether there's an intro or not, I'll usually go for verse, pre and chorus, maybe a little post-chorus, verse chorus, mid-eight, chorus, end."

HOW DO YOU GET YOUR IDEAS DOWN?

"I use Voice Memos on my iPhone. For a while I tried getting my head around

While Mike plays electric guitar live, he mostly writes on a Martin DRS1

© Will Ireland

Logic, but if I'm not great at something straight away it p**ses me off. Ben [Sansom, lead guitarist for Lower Than Atlantis] knows how to record music, and most of the people I work with have a decent level of production skill, so I just leave them to it.

"With lyrics, I always write them by hand. I can't stand it when I'm in a session and someone hands me an iPad or something to write on. I like seeing the words on the paper – it helps me channel better. I love it when I've got the lyrics down and they're just scribbled out everywhere, with the good

> "Lyric writing is like therapy: it helps me get closure on something"

lines squished in wherever there's space, and I then get a fresh sheet of paper later to write them out properly."

AT WHAT STAGE DO YOU TAKE YOUR NEW SONG IDEAS TO THE BAND?

"Normally when the structure is sorted and the topline is there. I'll write the lyrics later on. It's different when I'm

"Once I've got the chorus, the verses seem to write themselves. I like an interesting mid-eight so I spend as much time on them as possible"

writing for other people, though. A lot of the time I'll be writing for a pop act and I'll have about two days in a [writing] session with them, with the song needing to be finished by the end of that session. I don't like that as much.

"You can get the structure of a song to roughly where it needs to be, but the lyrics have to be on point. There are even a couple of songs on our new album that I don't think are very good because I was rushed. It's like a painting: when is it *really* finished? The longer you leave it to breathe, especially lyrics, the better it's going to be."

DO YOU THINK THAT SONGWRITING IS AN INNATE ABILITY, OR CAN IT BE LEARNED?

"All music is subjective. Who's to say something is s**t or not? It's all down to who's listening to it. Who's to say that someone is a great songwriter or not? Is it based on how many copies of an album they've sold? I think anyone is capable of writing, but certain people might not enjoy doing it."

WHAT'S YOUR BIGGEST MOTIVATOR IN TERMS OF LYRICS?

"I only noticed this a few weeks ago, but I've got quite a lot of love songs. I don't often get romantically involved – I'm a bit of a loner – so I guess when I do [get involved] it's a big deal for me. Lyric writing is like therapy: it helps me get closure on a subject once I've written about it. I'm running out of things to write about now because we've got a fair few songs. I need some new experiences."

HOW DO YOU KNOW WHEN YOU'VE WRITTEN A GREAT SONG?

"*Here We Go*, our biggest single to date, was originally meant to be a B-side. When it was finished we thought it was better than that. We never thought it would be a single or anything, but that maybe we'd put it on the album. I sent it over to my manager, who loved it, and our radio plugger said, 'This is the single; we have to go to radio with it t*omorrow*.' So that song was written, recorded and out to radio in three days. Music for us is a passionate process. For others, like our manager and radio plugger, it comes more from an industry perspective."

HOW MANY IDEAS DO YOU SCRAP WHEN WRITING?

"If I think something is s**t I'll sack it off straight away without working further on it, but I never scrap stuff that I've spent time on. I've got so many things on the back burner – riffs from four years ago. I have this one riff that's real intricate and technical. I want to try building a song around this riff, it's that good."

HOW DID YOU WRITING FOR 5 SECONDS OF SUMMER COME ABOUT?

"I wrote a song called *Emily* with The Invisible Men [Grammy-nominated music and production trio], and it was looking like Lower Than Atlantis were going to break up. The Invisible Men were like, 'We love this song. Is it ok if we put it to this boy band we know?' At the time I thought, 'Why not? I've got nothing to lose', so they put it out to One Direction.

"Then The Invisible Men got a session with 5 Seconds Of Summer. I went to the session and we recorded over the two days they were in with us. We finished a track [*Heartache On the Big Screen*] that became the B-side to a single that went to number one in about 40 countries.

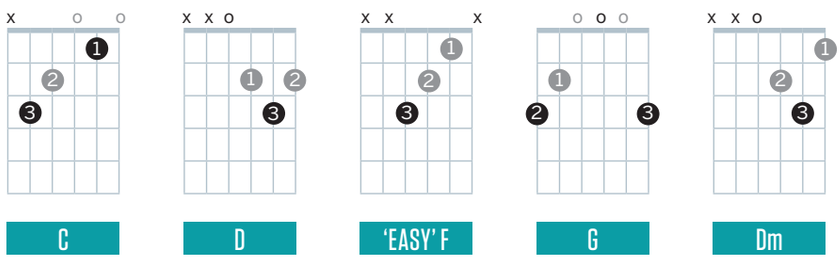
"After that I worked with McBusted, and me and my friend Dan Lancaster worked on Luke Friend from *X Factor*'s album [*Hole In My Heart*] – we've got five or six songs on there. I've also been working with Nick Hodgson [ex-Kaiser Chiefs drummer] and Sam Preston from The Ordinary Boys, who had a couple of number ones with Olly Murs."

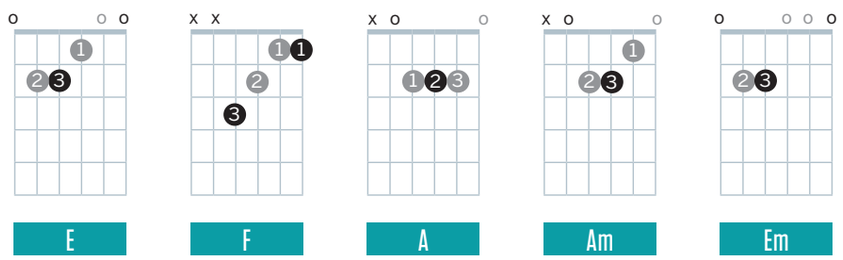
WHO ARE YOUR SONGWRITING INSPIRATIONS?

"I have a really eclectic music taste, which is a cliché to say but I really do listen to all kinds of music. I think that subconsciously I take little things in and then do my own thing. And I pay attention to what's going on around me. I take it all in." ■

10 SIMPLE SONGWRITING CHORDS

You only need a few basic chords for your songs, and these 10 are ideal!





ANATOMY OF A SONG

Here we break the song down into its individual sections to see what makes each one tick

Song arrangements are often commonly referred to as ABABCBB, for example, or some variation thereof. A, B and C sections are verses, choruses, and bridges or middle-eights, or sometimes intros, outros or solos. The right kind of structure will keep people listening and ensure your hooks get under their skin.

Here we'll be looking in detail at each of the different components of a song – the intro, the outro, the verse, the chorus, the bridge and the middle-eight.

By the end of this you'll hopefully be able to create a song structure that has a journey, gives the listener what they want, and doesn't ramble on. So, what do we know? Well, we know that a classic pop song should be over by around three minutes and 30 seconds, and that the chorus should always happen within the first minute, but really the listener needs to be hooked within the first 10 seconds of the song. For new artists and writers especially, there can be no compromise – if the song is going to be a hit, it has to hit the mark instantly. Here's how...

THE INTRO

THE START of the song presents some of the big components of the track and establishes the groove and the feel. This can be conveyed by a full band or by the strumming of an acoustic guitar, for example. The pace of playing here sets

the energy level of the song. Use the intro to show the listener what their experience of the whole song is going to be. If you're stuck, use an instrumental version of the chorus as a springboard for ideas.

A killer bassline can be established along with the groove. This gives you a great kick-off point into the first verse, and it's a hook in itself. If the song is based around a chord sequence then use this, but if it takes longer than 15 seconds double the pace of it – this will still establish the harmonic landscape ready for the verse.

Of course, there's always room for more hooks, whether vocal or instrumental, and an energetic, hook-laden intro means you can relax a bit when making the transition to the verse. For true 'power songwriting', craft the intro so that it also works immediately after the chorus – this gives you a chance to repeat intro hooks in the body of the song and it also helps everyone prepare for the drop to the second verse, because it's the same as the first time.

THE VERSE

YOUR JOB here is to settle into the main groove and musical environment of the song, whether it's bassline-led, a chord sequence or a riff of some kind. After what was hopefully a catchy intro, there's often a step down into the first verse, enabling listeners to begin climbing back up to the energy of the chorus. Musically, the key elements should continue so that the groove stays intact and keeps the momentum going, but instrumentation can be stripped back to allow space for the verse vocal to be heard. The vocal in the chorus is probably going to be loud, high and multiplied, so the verse vocal will usually start off lower in pitch and with lower energy levels so that it can gradually climb up again.

If the music of the verse and chorus is essentially the same, the verse melody needs to be different to the chorus melody. A good way to achieve this is to simply play opposites: if the chorus is busy, make the verse sparse, and if the chorus is legato or smooth, make the verse staccato or stabby. These opposites will help balance the song out and create contrast between verse and chorus.

Try to make the verse as hooky as the chorus, even though the energy is lower. Internal rhythms and rhymes, and the use of short, memorable phrases, will help with this. Lyrically, you have a chance to draw the listener in with some killer first lines. Good examples are "Roll away your stone," [Mumford & Sons], where the title of the song is the first line; and the first verse of Bob Dylan's *Make You Feel My Love*, where the entire concept of the song is delivered in the first four lines.

THE CHORUS

THIS IS what your song is all about. The chorus is the part that crystallises the message of the song, and it's the only bit those in the business care about. A great chorus can make up for a rubbish verse, but the best verse in the world will not make up for a flatlining chorus.

> The chorus is the bit people carry around in their heads as they go about their day. This means hooks, hooks, hooks!

The chorus is the bit people carry around in their heads as they go about their day. This means one thing: hooks, hooks, hooks! The chorus is the place to break out the biggest hooks you can come up with. Musically, the chorus is usually the most powerful section. If you're at a gig, this is the part everybody sings along to. Melodically, the chorus should be 'up' in terms of pitch and energy, whilst also being easy to sing along with and easy to remember. Great choruses stick in your brain after one hearing. Again, short phrases are the key to making them memorable, and repetition is the hammer that drives the hooks into the listeners' heads – just listen to Bon Jovi's *Livin' On A Prayer*.

When you're working on your chorus, try and imagine a crazed mob singing it back at you. Lyrically you should be thinking simply – the fewer lyrics the better. 'Ooohs', 'Wooohs' and 'Yeeeaaaahs' are also great crowd pleasers, and they can be combined with sparse statements to great effect. Always deal with basic human emotion, try not to be negative, and think about who you're writing for.

THE MIDDLE-EIGHT

IF OCCURRING at all, the middle-eight is traditionally placed after the second chorus. The idea is that it introduces something new into the verse/chorus / verse/chorus situation, and not only keeps things interesting but also allows you to go on a little journey that leads the listener neatly back to the last chorus.

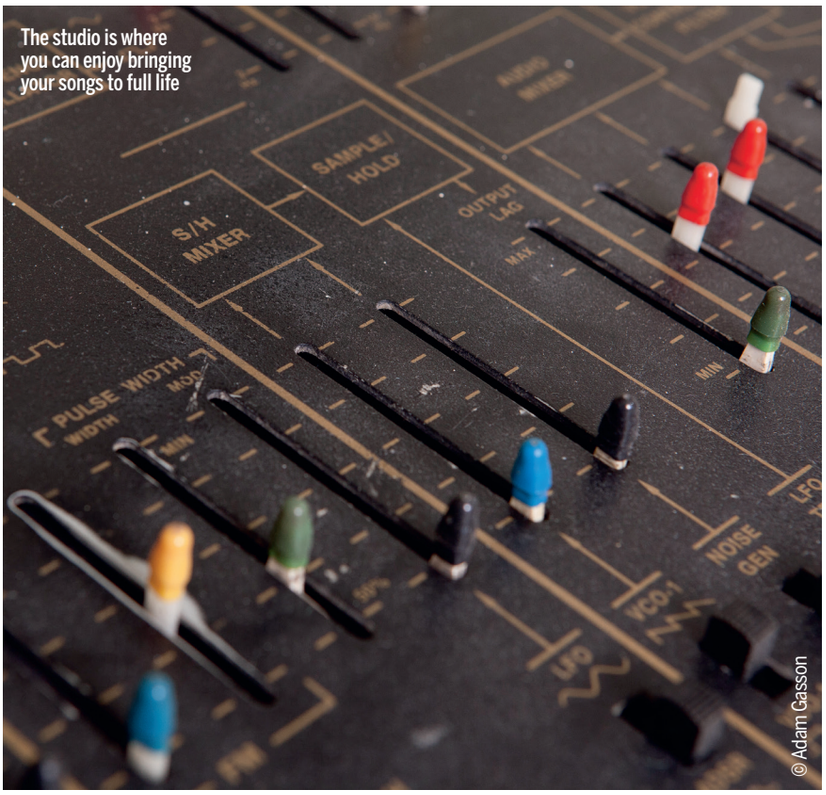
The middle-eight can include a new chord sequence, a new topline melody, a rhythmic shift such as going half-time, or a sonic change brought about by the introduction of new sounds. It doesn't have to feature a complete vocal; it could have some abstract vocal improvisation, some spoken word or no vocal at all. It doesn't even have to be eight bars in length, but it does need to allow you to bring in your last chorus at about two minutes 40 seconds, otherwise you'll be pushed to round off the last choruses in under three minutes 30 seconds.

A good middle-eight will begin its journey straight away, so it's best to change key from the off. Don't just go back to the root chord and start a new progression, try a related key such as the relative minor (eg, if you're in C major, the relative minor will be A minor – it's always three semitones below the root major.) This key change sets up a different atmosphere, which in turn will make the chorus sound extra-juicy when it returns.

Sometimes what's required to change the landscape is an instrumental or solo section. This can vary from the virtuoso performer playing over a verse or chorus part, through to a simple but interesting instrumental. If you need some space in the song but a solo or new middle-eight part isn't working, try a simple breakdown – usually the beats are left in and a bare minimum of the instrumental elements are kept going, then vocal elements, usually the chorus, are re-introduced.

THE BRIDGE

THE BRIDGE (sometimes referred to as the pre-chorus, lift or climb) isn't an essential part of the song, but it can help to build >



The studio is where you can enjoy bringing your songs to full life

energy and set the scene for the chorus to have more impact than it would have coming straight from the verse.

The bridge generally works in three different ways. Firstly, it begins raising the pitch and energy of the melody from the lower reaches of the verse to the high energy of the chorus. Secondly, it begins increasing the dynamic levels of the track (making it louder). Thirdly, it can be an opportunity to use the lyrics to enhance or contextualise what has been said in the verses, and to make the chorus more poignant when it finally hits.

When writing the instrumentation for a bridge, there are a few rules to follow. The melody of the bridge should be different from that of the verse and chorus. If the verses have been flowing, the bridge melody should be more percussive and build up energy. In a fast-moving track the bridge should provide some respite. Lyrically, the bridge can help twist the emotional knife, softening the listener up for the killer blow of the chorus.

THE OUTRO

THE OUTRO can be a chance to add a few more barbs to that big chorus hook, and can allow you to re-introduce some elements from earlier in the song. More often than not the last chorus gets repeated twice and just carries on for a while, perhaps even losing the vocal and introducing a solo.

The simple repeated chorus makes a perfectly good outro, and sometimes the chorus can get bigger, in terms of adding voices and instruments, or develop in other ways. For example, the vocal can simplify into a single repeated final hook that continues over the chorus chords – check out Nirvana's grunge classic *Smells Like Teen Spirit*, for example.

Developing the outro chorus can allow melodies from earlier in the song to make a dramatic re-entry. Sometimes, whether by accident or design, the verse, bridge or middle-eight melody will sound great over the chorus chords and provide a whole new twist for the end of the song. In the Red Hot Chili Peppers' *Under The Bridge*, for example, the chorus develops chordally and melodically and veers off in a new direction.

The outro can also be a 'bookend' and simply mirror the intro of the song, as in James Bay's *Hold Back The River*. This has the added advantage of setting up a subconscious 'rewind' factor in the listener, who then wants the intro to continue into the entire song all over again. Another outro option is to break down to a stripped-back, slower, quieter version of the chorus or first couple of lines of the song, often with just a vocal and piano/strings. This device makes for a rather calm ending where the lyric has one final chance to plant its big emotional hook. ■

HAVE YOU WRITTEN A CLASSIC?

Our handy checklist will help you find out:

- THE SONG MOVES YOU, THE WRITER
- IT HAS A GOOD TITLE
- THERE'S A CATCHY INTRO NO LONGER THAN 15 SECONDS
- THERE ARE HOOKS ALL THE WAY THROUGH, RIGHT FROM THE START
- THE LYRICS ARE SIMPLE WITH MEMORABLE PHRASES
- THE SUPER CATCHY CHORUS IS IN BY THE ONE MINUTE MARK
- THERE'S IMMEDIATE MEANING
- PEOPLE CAN RELATE TO IT
- THE SONG HAS NO MORE THAN THREE MAIN SECTIONS
- THE LAST CHORUS IS IN BY TWO MINUTES AND 40 SECONDS
- THE OUTRO MAKES YOU WANT TO REWIND AND PLAY IT AGAIN
- IS THERE BALANCE (LOUD/QUIET, RAP/VOCAL, SMOOTH/SHARP)?
- IS THERE LYRICAL CONTRAST? (MAKE SURE THE LYRICS AREN'T ONE-DIMENSIONAL)

FLATTLEY

Guitar Pedals

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CONSIDER YOUR GUITAR SOUND BEFORE HITTING THE STUDIO

As part of your songwriting process, it's important to have an idea of how you want your parts to sound to get the best out of your recordings

When writing songs on guitar, having a killer riff or chord progression is only half the battle. And while capturing your playing in the studio can be simple enough for the most part, it can often lack the big, wide and distinctive sound found on pro recordings, so think about your sound before you start recording.

There are many ways to make your electric or acoustic guitar recordings sound much thicker, wider and altogether bigger, as well as a whole world of effects and amp settings that mean you can dial-in the most appropriate, impactful sound for your songs. So, grab your acoustic or electric guitar and spend some time experimenting. First up, let's look at some essential guitar effects...

OVERDRIVE

WHAT IT SOUNDS LIKE Fuzz, distortion and overdrive are three types of gain effects that all 'distort' a clean guitar signal in different ways. Overdrive is the mildest of the three, and attempts to recreate the effect of a valve amplifier being 'overdriven', creating those warm, slightly crunchy rhythm sounds (think AC/DC) and the singing, sustaining lead tones (think Stevie Ray Vaughan) that our ears have become accustomed to for over half a century of blues and rock guitar.

USAGE TIP For a heavy overdrive sound, set the 'gain' or 'drive' control high and the 'level' or 'output' lower. For more of a clean boost effect, do the opposite.

DISTORTION

WHAT IT SOUNDS LIKE Evil, loud and edgy. Distortion – in all its menacing, jagged glory – is the sound of a guitar signal possessed. The first distortion boxes were the 1960s fuzzes; they were uncomplicated and unforgiving beasts. Since then we've come to think of distortion in a more modern sense with the development of more refined sounds and circuits. Distortion underpins everything from The Rolling Stones to Jimi Hendrix to Nirvana, to the heaviest of modern metal.

USAGE TIP Try using your guitar's volume control to regulate the amount of distortion and volume – effective for moving between rhythm and solo sounds.

DELAY

WHAT IT SOUNDS LIKE The pedal records a note, then repeats it either once or multiple times at a predetermined time spacing. Delay is used in everything from early rock'n'roll to modern rock and pop. Some modern stompboxes attempt to provide the warmth and majesty of analogue and tape delays alongside the crisp and pristine clarity of versatile digital delays, with a range of lo-fi emulations, modulated sounds, and special effects like ping-pong and reverse.

USAGE TIP Set up two amps and experiment with the stereo settings on delay units such as the DL-4, the Flashback or Vox DelayLab. Limitless fun awaits!

REVERB

WHAT IT SOUNDS LIKE Reverb simulates the reverberations and reflections of sounds as they bounce off surfaces, and decay as they're then absorbed. This 'sense of space' is what we perceive reverb contributes to a guitar sound, and types of reverb are often named after the spaces they emulate (cathedral, room etc). Used on practically every recorded sound you hear, its heyday was the '60s surf guitar craze when the likes of Dick Dale used it to conjure up images of crashing waves.

USAGE TIP Think of ways to drop it in and out and vary it. Use it as an effect rather than a component part of your sound.

PITCH SHIFTER

WHAT IT SOUNDS LIKE Pitch shifting can be using a device to create note harmonies as you play, or transposing your guitar to another key entirely, or the otherworldly noise of bending and squealing demonstrated no better than by Rage Against The Machine's Tom Morello on *Killing In The Name*. Names such as Eventide and DigiTech (Whammy) dominate the genre. Octave pedals are pitch shifters, as are the kind of complex harmoniser units used by Steve Vai.

USAGE TIP Combine pitch-shifting pedals with delay and tremolo for eerie guitar sounds, or pitch shift chords to add unexpected glissando to rhythm parts.

OCTAVE

WHAT IT SOUNDS LIKE Jimi Hendrix's solo in *Purple Haze*, played with a driver in front of Roger Mayer's early Octavia effect, is still one of the most arresting effects moments in music. The addition of notes generated an octave above the lead line creates a rich, warm, otherworldly and psychedelic tone. Though used sparingly today, Jack White's riffs on *Blue Orchid* and *Seven Nation Army* prove that the octave effect can still take simple riffs to a much higher plane.

USAGE TIP If your octave pedal is not polyphonic you'll only be able to play single notes. If you try chords, it'll turn into a great big horrible mush.

TREMOLO

WHAT IT SOUNDS LIKE Tremolo is the classic, oft-heard effect of a guitar sound's volume cutting in and out at a variety of speeds. It's exemplified by the surf guitar sounds of the '60s when it was used alongside reverb to conjure up those crashing waves, and it was wonderfully revived by The Smiths' 1980s classic *How Soon Is Now?*, Radiohead's *Planet Telex* from *The Bends*, REM's *What's The Frequency, Kenneth?* from *Monster* and countless others. Volume up and down, in time: it's as simple as that.

USAGE TIP Try setting your tremolo pulses in time with the music. This can be particularly effective with on/off staccato sounds.

VIBRATO

WHAT IT SOUNDS LIKE Vibrato was first introduced in early guitar amps from Magnatone, Gibson, Fender and Vox. It is not the same as tremolo. Vibrato is modulation in pitch, tremolo is modulation in volume. Any confusion could be down to historical mislabelling: Fender's Synchronized Tremolo fitted to the Stratocaster, for example, is in fact a vibrato unit. Think of the vocalist's vibrato, or what you do with your fretting hand when you use vibrato on notes. Famous users are as diverse as Blur's Graham Coxon through to blues legend Robert Cray.

USAGE TIP Slow vibrato can produce ethereal sounds when used over sustaining arpeggio notes or ringing chords. Faster speeds have an obvious wobbling effect.

FLANGER

WHAT IT SOUNDS LIKE Anything from a jet taking off at one extreme, to a slower, 'wobblier' version of the phaser that's thicker and more machine-like at the other. Though it's often associated with rock and metal players from Van Halen to Metallica, one of the best examples of the flanger effect ever committed to record is The Cure's *A Forest*, which, according to its producer Mike Hedges, features up to seven units at once!

USAGE TIP Try setting the speed of flanger so that the complete modulation starts and finishes either every two or four beats of your song.

PHASER

WHAT IT SOUNDS LIKE The earliest phaser effect, the Uni-Vibe, was developed to create a sound akin to the Doppler-esque movement of a rotary speaker. Phasing sounds like a swirling, psychedelic sweep, with a detectable cycle between different frequencies (eg: warm and bassy, trebly and hollow). It was a popular '70s pedalboard addition, bringing texture and movement to rhythm and lead parts. Brian May's playing on *Sheer Heart Attack* typifies the effect.

USAGE TIP The faster you set the rate control, the more the effect will change from cycling swirl to flutter. Try extremes of both for some classic '70s sounds.

CHORUS

WHAT IT SOUNDS LIKE Chorus is related in sound to flanger and phaser, in that it relies on phase cancellation to create a characteristic swirling sound. However, rather than create a sweeping frequency change over time it simulates the narrower variations in pitch and timbre that typically happen when a group of similar instruments perform the same part in unison. This shimmering, warbling fluctuation can be heard on songs such as Nirvana's *Come As You Are*.

USAGE TIP For subtle effects, set the depth medium/high and the speed (rate) to minimum. For more sea sickness, increase both rate and depth. Woah…

COMPRESSION

WHAT IT SOUNDS LIKE Guitarists use compression pedals ingeniously and creatively. Whether it's to provide the long sustain for soaring, expressive lead notes, to increase the percussive punch and attack that's come to characterise funky rhythm, or to even out the dynamics of fingerpicked chord-melody styles, these unassuming and deceptively simple boxes have been used in the true spirit of 'effects' pedals; to add character to a guitar part, and create an impact.

USAGE TIP For the most compressed sound, set the sensitivity (compression) knob high and the output low. For a clean boost, do the opposite. ■

10 CLASSIC AMP SETTINGS

Stuck for guitar tone ideas? We've worked out the amp settings for 10 legendary tones that have made an impact on modern guitar players and appeared on undeniably classic recordings

KURT COBAIN SMELLS LIKES TEEN SPIRIT (NIRVANA)

EFFECTS: DISTORTION PEDAL We recommend using the middle pickup of a Strat type guitar, and a good distortion pedal is essential if you really want to nail his grungy sound. Kurt used a Pro Co Rat and a Boss DS-1.

NOEL GALLAGHER DON'T LOOK BACK IN ANGER (OASIS)

EFFECTS: DELAY SET TO 400MS WITH THREE REPEATS On this track Noel probably used his trusty Epiphone Riviera on the bridge pickup. On the second half of the solo he adds a touch of delay.

SLASH SWEET CHILD O' MINE (GUNS N' ROSES)

EFFECTS: NONE Use the neck pickup of a Gibson Les Paul plugged into a Marshall JCM800 stack for the full effect. Pull back on the drive control if it sounds fizzy at higher settings.

JOHN FRUSCIANTE UNDER THE BRIDGE (RHCP)

EFFECTS: COMPRESSION SET TO FAST ATTACK, MEDIUM RELEASE AND SUSTAIN Frusciante uses the neck pickup on a Strat or Jaguar. Have the drive up higher and turn the guitar volume down to get the subtle, slightly distorted sound.

JIMI HENDRIX PURPLE HAZE (JIMI HENDRIX EXPERIENCE)

EFFECTS: FUZZ PEDAL The intro to *Purple Haze* was played on a Fender Strat plugged into a Marshall 100-watt amp and 4x12 speaker cabinet. The fuzz pedal really pushes the mid frequencies and, combined with the middle pickup, it produces a thick tone.

DIMEBAG DARRELL COWBOYS FROM HELL (PANTERA)

EFFECTS: NONE Dimebag preferred to use solid-state (as opposed to valve) amps, and put his guitar signal through a parametric EQ before his amp. Try it centred on 90Hz, 180Hz and 360Hz with maximum bandwidth and cut.

BRIAN MAY TIE YOUR MOTHER DOWN (QUEEN)

EFFECTS: EQ BOOST BEFORE AMP A home-made mid boost emphasised the mid frequencies of Brian's guitar. Try boosting the mids with an EQ pedal (rather than using your amp's EQ). A large room reverb completes the sound.

ED O'BRIEN MY IRON LUNG (RADIOHEAD)

EFFECTS: PITCHSHIFTER, COMPRESSION, CHORUS Set the pedals up in this order (guitar to amp): compression (medium attack and release, lower sustain), chorus (speed: 4; depth: 2) and pitchshifter set an octave up.

JIMMY PAGE WHOLE LOTTA LOVE (LED ZEPPELIN)

EFFECTS: NONE The pushed mids here give the famous *Whole Lotta Love* riff a thick quality and ensure the reverb washes into spaces left in the rhythm. If you use a separate reverb pedal, try to EQ the tone of the reverb so it's not too bright.

MATT BELLAMY PLUG IN BABY (MUSE)

EFFECTS: FUZZBOX-TYPE DISTORTION, DIGITECH WHAMMY Matt Bellamy's intro to Muse's *Origins Of Symmetry* classic *Plug In Baby* was played using a DigiTech Whammy pedal. Be careful when adding reverb, though – the idea is to just lift the sound, so don't overdo it.

There are many tricks guitarists can use to power up their sound on a song

GET A HUGE SOUND

How are you going to give your tracks the impact they require when it comes to recording them? Here are some ideas to think about when you're writing...

GET IT RIGHT AT THE SOURCE

BEFORE YOU start fiddling with settings, make sure you have the right sound as a foundation. If it doesn't sound great to begin with, it's probably not the right tone. The meat of everything is in the tone and the player; once those two are in harmony, all you're doing is trying to get that extra five per cent in your sound.

INVERSIONS

PLAYING THE same notes but at different points on the guitar is a sure-fire way to fatten up your overall sound. Try playing the same chord progression in two different ways: one as you've written it, and again using different inversions (open chords instead of barre chords, for example).

KEEP IT INTERESTING

PERCEPTION IS powerful, and in the same way that the jumpy parts in a horror film are normally preceded by silence, you can add the perception of loudness and power by creating dynamics. Look at your song like a movie or a story. You've got to have things happen – you can't just have everything full blast from start to finish. If you've got piles of guitars going on in the verse, when you get to the chorus the guitars may not seem so wide. Have a look at the arrangement and see where you want the guitars to be wide, and this will help you to have a better chance of creating the impact in the places you want it to happen.

TRY RETUNING

PLAYING IN lower tunings makes your tone fatter. Even if your song is in standard tuning, you can still add some extra girth by recording one of your tracks in a dropped tuning. For example, try playing in drop D and transposing your part so that the pitch is correct.

LAYER AN ACOUSTIC

THIS IS a trick that's used to add extra depth to rhythm parts. Don't worry about the sonic qualities so much; you're after the percussive element of the acoustic's strings rather than a full-bodied sound.

EXPERIMENT WITH YOUR GEAR

YOU'RE NEVER going to gig with one, but many artists have utilised the raspy tone of a practice amp to add aggression to their tracks. It really makes an impact, even at lower levels, so give it a go.

USE AMP MODELLING!

WHAT USED to be a dirty word to tone purists has now become a staple of recording. The good news is that amp modelling is affordable and practical, and is no longer viewed as 'faking it'. This is a great and quick way of trying out many different amp sounds without needing to have loads of gear at your disposal. ■

GO MOBILE!

The digital revolution is well upon us, offering up an even easier route into the recording world

When Apple launched the App Store in 2008, the world duly reacted by making Facebook available everywhere, and creating games where you fire birds at pigs. For musicians, though, it was the birth of a new way of using devices. Suddenly, our phones and tablets were capable of everything from tuning our guitars to simulating amps; even giving us entire studios in our pockets via apps like Garageband.

As common as these apps have now become, there's still a little confusion about if – and precisely how – you can integrate your mobile device into your recording process. When it comes to songwriting and getting your ideas down before a proper session, going mobile is definitely the way forward. So sit back and allow us to tell you everything you need to know about playing and recording with your mobile device, and which apps and accessories you will need to do it.

A DIY REVOLUTION

WHEN IT was first announced back in 2004, GarageBand was hailed as a revolution in DIY music-making. Its inclusion with every new Mac meant that everyone buying one of these machines could write and record songs. GarageBand for iPad brings the DAW's best features to Apple's tablet and, at the mere price of £2.99, it has proved to be as important as the original in terms of introducing music software to a new generation of artists.

We've seen several DAW-style apps on the iPad, but GarageBand is still the best. Neatly designed and featuring software instruments and audio functions to suit most musicians, the app makes a great portable sketchpad for working on ideas. The touchscreen does a remarkably good job of controlling it all,while the audio capabilities of the iPad make it easy to record real instruments, too. One of the most attractive features for existing GarageBand users is the fact that songs can be transferred to the program's desktop version. Audio recordings can then be edited, tweaked and perfected using the features of the full GarageBand app, allowing rough sketches and demos to be worked into fully-finished songs.

It certainly doesn't replace the full Mac version of the program, so it's best to think of it as more of a complementary tool. For most of us, GarageBand for iPad will be called into action when we need to work on song ideas at those times when we're away from our computers.

With a good mic or audio interface, the app can be used like a modern version of the classic TASCAM Portastudio, enabling you to layer up to eight tracks of audio on top of each other. GarageBand's sound quality is superb and its editing features are superior to most portable multitrack recorders. ■

GETTING STARTED

BEFORE YOU can start recording, you will need to get your guitar or vocal into your device. That means it's time to choose an audio interface.

An audio interface is a bit of technology that enables you to perform into a PC or iOS device. Over the last couple of years, there have been many developments in i-device interfaces, and your decision on which one to buy will come down to the types of sources that you want to record, analogue or digital input to your device (better signal quality), and which apps you will be using (some apps require bespoke hardware to run). The interfaces below are some of our favourites.

GUITAR ONLY

There are plenty of guitar-only guitar interfaces out there from the likes of Peavey, Apogee, IK Multimedia and Line 6, and most of these companies produce analogue and digital versions. The analogue interfaces connect via your device's headphone socket, while the digital ones plug in to the 30-pin or Lightning port.

COMPUTER INTERFACES

It's possible to use your existing USB interface with the help of Apple's own 30-pin (old) or Lightning (current) to USB converters and a powered USB hub. Your interface needs to be class compliant (so it doesn't need specialist drivers to run) and powered by a hub running off the mains.

GUITAR AND MICROPHONE

If you're going to be recording from more than one source (guitar and microphones), you will need a microphone input on your interface. Focusrite's iTrack Studio and Roland's Duo-Capture will let you record from either of these sources, individually or together, and they will also work on PC or Mac.

DIGITAL MICROPHONES

If you're only in need of one mic and a portable set-up for recording acoustic guitars, vocals or miking your amp, it's worth considering one of the many great digital condenser microphones now available to buy. Products like the Blue Microphones Spark Digital (featured right) or the Apogee MiC include a built-in interface and connect directly to your iPad or iPhone digitally for sheer ease of use. Take your time to research the different options.

>

RECORDING IN GARAGEBAND

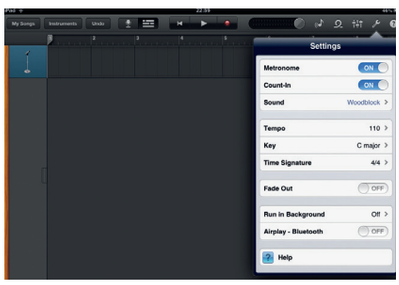
Regardless of which method you use, recording audio into GarageBand is essentially the same process

1 GarageBand saves your projects as Songs. When you load up, you will be presented with the demo tune. Press the My Songs button featured in the top left corner of the screen. On the next screen, you should then press the '+' button and select New Song to get going.

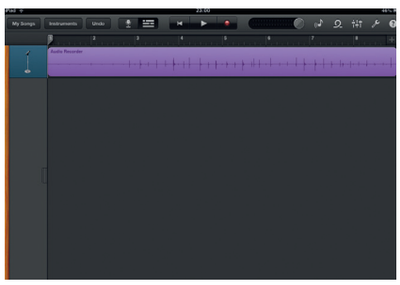
2 GarageBand will ask you what kind of track you want to create. You can program a drum track, select a synth/keyboard patch, or use its virtual Smart Guitar. If you want to record your acoustic guitar, amp or vocals from a mic, choose Audio Recorder for your first track.

3 If you'd rather record your guitar straight in using GarageBand's amps and effects, choose the Guitar Amp option. This will load up an audio track with an amp and up to three effects pedals. There are loads of presets to choose from, and you can also tweak them.

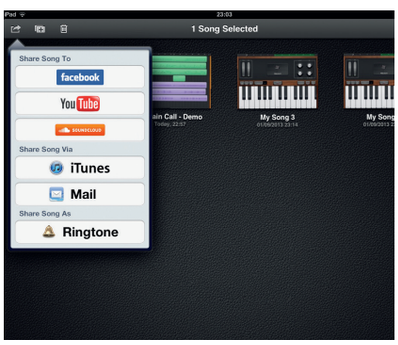
4 Set your recording levels by using your interface's input controls. You don't want the audio to clip because this will produce nasty digital distortion. Play the loudest part of your song and make sure that the audio levels are coming in at just under the red.



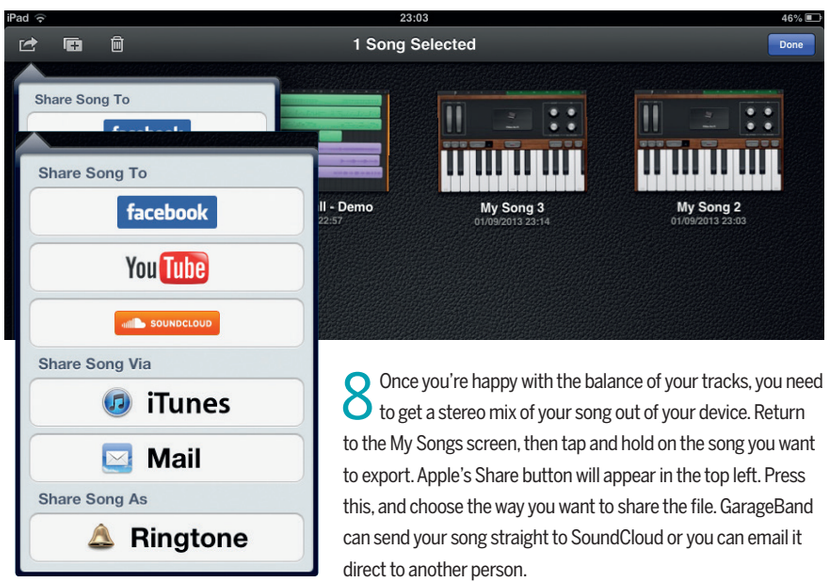
5 Before recording, you may want to make more tweaks. From the main arrangement screen, select the Wrench tool in order to access your song's settings. Ensure Metronome is switched on and then tap your song's tempo. Turn on the Count In option to get a four-click count-in.



6 Now that you're ready to go, hit record and lay down your first track. Once you're totally happy with your performance, move on to the next track. Repeat the second and third steps depending upon what sources you are recording until you have built up your tracks.



7 You'll want to mix your song before export. Expanding the instrument panel on the left gives you volume sliders for each channel. GarageBand also contains a master mixer with two effects that can be applied to every channel. Add or remove these to or from each track by clicking the mixer tab along the top right of the screen.



8 Once you're happy with the balance of your tracks, you need to get a stereo mix of your song out of your device. Return to the My Songs screen, then tap and hold on the song you want to export. Apple's Share button will appear in the top left. Press this, and choose the way you want to share the file. GarageBand can send your song straight to SoundCloud or you can email it direct to another person.

AMP MODELLERS

No amp? No problem! Perfect for recording in a hurry or on the move, grab an audio interface and turn your tablet into your favourite amp with these modellers

ABOUT ANDROID

While we'd love to have included Android apps and devices, developers are yet to make really usable apps for them because there are so many different devices capable of running Android (each one with different hardware specs), making compatibility across the board difficult.

IK MULTIMEDIA AMPLITUBE

£free/£14.99

Since it was released, the AmpliTube software has evolved from an amp modeller into a complete, all-singing, all-dancing app, offering recording and drum tracks. In addition to the included five amps, five speaker cabs, two mics and 11 effects, you can also add a whole load of gear through in-app purchases.

POSITIVE GRID JAMUP PRO

£3.99

The excellent JamUp by Positive Grid comes loaded with six amps and 16 effects, but as with other modelling apps you can add more by making purchases within the app. We love JamUp's sound quality, and the control layout is nice and large, so any tweaks you need to make are easy.

PEAVEY/AGILE PARTNERS AMPKIT

£free

Peavey's free amp modeller comes with one amp, two stompboxes and a couple of mic models. You can buy the AmpKit+ package for £14.99, which includes four amps, ten effects, plus access to over 100 pieces of gear to add later. You'll need to use Line 6's Sonic Port or Mobile In interface.

LINE 6 MOBILE POD

£free

Straight off the shelf of the App Store, it's hard not to be impressed with Line 6's Mobile POD app. It packs the power of the teeny red kidney bean into your phone with 32 amps, 16 speaker cabs and 16 effects – yep, that's the same as the POD 2. As before, you'll need to use Line 6's Sonic Port or Mobile In.

BEFORE YOU RECORD

You've set-up your recording space, assembled your band, and you're ready to hit 'record'. But unless you want to waste your time and that of the other musicians by making a sub-par recording of that perfect performance, there are a number of things to consider when setting up a recording session. Over the following pages, we'll show you how to capture the energy of a band performance when you're all recording in the same room. We'll also run you through optimal mic positioning, monitoring and foldback, show you how to get the best guitar sounds, record great vocals, prep drums for recording and much more. Just remember, the key to a successful recording session is preparation.

HOW TO RECORD IN THE SAME ROOM

Recording together is a brilliant way to capture the energy of a full band, but you must set up correctly. Here's how to do it...

Having already looked at your first recording space (p.7-11), here's how you and all of your bandmates should be setting up if you're intending to all play together in the same space. Remember, it's the sound travelling inside the room that concerns us when we're recording. In the simplest terms, if you put up some mics in a room they will pick up everything from their perspective. That includes the instrument they're closest to and, to a lesser degree, any other instrument playing at the same time, as well as any other sounds occurring in the room.

A key factor that influences the way we set up a recording space is acoustics. Generally, the louder the instrument the more it will reveal the room's acoustics. Domestic spaces can be excellent for many recording tasks, and each room in your home will have its own character.

If sound can travel out, it can also travel in. Trains, planes (and noisy neighbours) can all add unwanted noise to your recordings, including low frequency rumble or vibration. Fans, monitor screens and ambient sounds that we're normally oblivious to can add unwanted background noise. If you can't get these things out of your recording space, at least try to keep away from them. Ideally, use a directional mic that will reject sound coming from behind it.

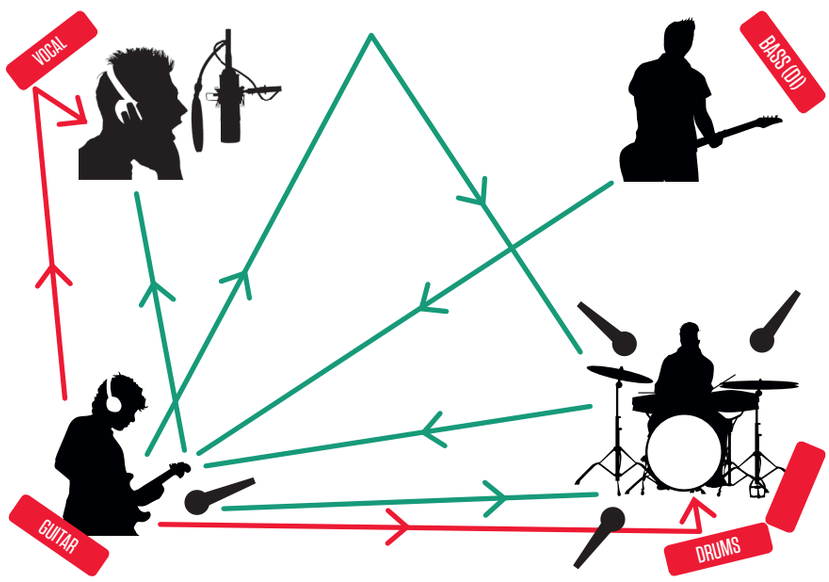
Arrange the performers so they can see each other. For a band, this may mean they'll all be facing inwards. But even if you're recording one vocalist in the same room as your computer, visual contact can be beneficial. There may be times you have to compromise, but if you're recording yourself it's not an issue.

First, consider isolation and acoustics. With players facing into the room, using directional mics (pointing away from the centre of the room) will give you good initial isolation of each instrument, but the sound of the instruments bouncing off the walls back into the mics will cause a problem. A good trick is to dampen the space behind each player with acoustic panels. Soft furnishings, duvets and the like can also do a great job. Often this will be all you need, and this approach may give better results than artificially trying to give each performer a separate space – something that's often done in large studios using acoustic divider screens.

Although a well-rehearsed band might give their best performance if they're all playing in the same room, you can't rely on this for recording if some of the instruments are much louder than others. For example, trying to record an acoustic guitar in the same room as a drum kit is asking for trouble. If you do need to record a group playing together to capture the basics of the performance, it's best to treat some of the instruments as 'guides' to be replaced later on. >

ONE-ROOM SETUP

In our full band setup, using cardioid mics will help reduce the spill you record as sounds arrive off-axis (green). Using acoustic panels behind each player reduces reflections coming back into the front of the mics (red).



MIKING UP: FINDING THE BEST POSITION

IT'S ALL well and good knowing which mics to buy and how to connect them up, but when it comes to recording the real skill lies in where you point them. And the optimum position very much depends on a combination of factors that varies with each recording scenario. The following process is one that will help you deal with any situation:

1. LOOK

FIRST UP, you need to consider how the instrument you're recording makes its sound and where that sound comes from. You may think this is obvious – an acoustic guitar, for example, has a sound hole, so the sound comes from there, right? Well, in part, but it also resonates through the body, the sound board and even the strings up the neck. Most instruments produce sound from a number of places, so pointing a mic directly at one part will capture just one aspect of the overall sound that you have become accustomed to hearing.

2. LISTEN

FOLLOWING ON from this, the next step in achieving the perfect mic position is to actually listen to the instrument from specific locations. Get your ear in as close as possible – without damaging your hearing in the process – and you will discover how coloured the sound is at specific points. More often than not you will find it bears little resemblance to the balanced sound image you'll hear when walking around the room.

3. SELECT A MIC TYPE

CHOOSING THE right microphone for the job in hand usually begins with you choosing between a dynamic and a condenser mic. As a general rule of thumb, condenser mics produce more accurate results with better high frequency response, and are certainly more sensitive, which is particularly great if you're going to be recording anything quiet or from a distance.

The downside is that they're also more sensitive to handling noise, vibration and wind noise, and don't respond to being dropped, kicked or spat at (no, really). So it's no surprise that you'll see drum kits, for example, miked mainly with dynamics, with condensers used to capture the added sparkle of cymbals and hi-hats.

What about ribbon mics, you ask? Well, it's certainly renaissance time for these old-school microphones. But, in contrast to condensers, they can be lacking in top-end response, they don't deal particularly well with close plosives and wind, and they are typically a figure-8 pattern. On the plus side they sound smooth, can be great for taming edgy or bright instruments, and sound good when EQ'd. All things you should consider before choosing one.

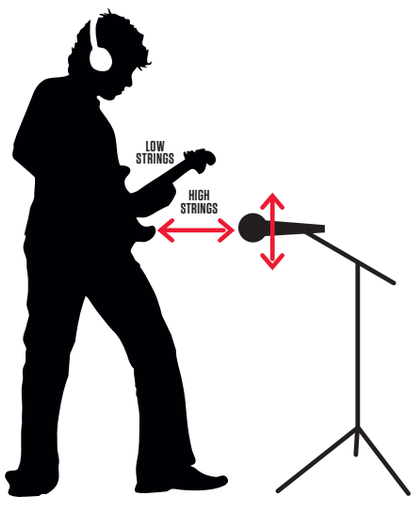
4. SELECT A PICKUP PATTERN

THE OTHER important consideration when choosing a microphone is its pickup (or polar) pattern. The main patterns are cardioid, omnidirectional and figure-8,

MICROPHONE POSITIONING

MIC POSITION 1: DISTANCE

Just putting a mic up in front of something will usually give you some kind of useable result, but the real skill comes from fine-tuning the position and that becomes more important the closer you get to the sound source. If you're after a tight, close sound, adjust the frequency balance of the instrument by pointing at the appropriate part.



MIC POSITION 2: ANGLE

Another consideration with mics is their off-axis response. You can use this to your advantage by subtly angling the capsule slightly away from the sound source. For a cardioid, this will typically reduce the high frequency response slightly and can be great for taming sibilance from singers.

MIC POSITION 3: PROTECTION

Microphones can be very prone to wind plosives. The best protection is offered by placing a pop shield halfway between the sound source and the mic. If that proves awkward, a foam windscreen is also an option, but you may notice this causes a change in the response.

Don't be afraid to experiment with miking techniques – here a DI'd guitar sound is livened up with some 'picking' noise

and these are augmented by variations like hypercardioid and supercardioid.

By far the most commonly used type is cardioid. Designed to pick up sounds arriving mainly from the front and sides (on-axis) while rejecting sounds from the rear (off-axis), cardioids enable you to better isolate instruments, which can be useful for small recording spaces. Keep in mind that the degree of isolation varies with different frequencies, and a typical cardioid actually picks up very low frequencies fairly evenly from every side. Overall, a cardioid mic delivers a sound incorporating a 'coloured' room sound element.

5. POSITION

NOW THAT you've done the groundwork, you're ready to actually point that mic at something. Recording multitrack music requires the close-miking of most elements (unless your recording space is extremely 'dead' acoustically), as multiple layers of ambience can easily become problematic when recording.

But what do we mean by 'close'? A good starting point is between 9 inches and 12 inches, but it's also perfectly acceptable to move right in to a couple of inches, or move further away. The point is that at this proximity you'll be mostly capturing the direct sound of the instrument and little of the ambience of the room. The downside to this method is that the closer you get to the source, the more accurate you need to be with the positioning.

For a vocal, this shouldn't be too problematic as long as the vocalist doesn't move around too much. With instruments such as hi-hats, snare drums, acoustic guitars and guitar amps, a few inches to the left or right can make a big difference. Ultimately, if things don't sound right or you don't think you're capturing the balanced sound you want, just back away a bit.

The other thing you might notice is what's called the 'proximity effect'. With a directional microphone, when you get right up close there's often a significant boost in the low frequencies. On the one hand this can be quite desirable for vocals, but on the other hand it can make acoustic guitars sound horribly boomy. If you want the closeness without the boom, an on-body or preamp low-cut switch should do the trick. Alternatively, you could try using an insert EQ, or simply back the mic away a little bit.

When it comes to microphone positioning, there's no substitute for experimentation and experience, so get plenty of both and you'll build up your own personal bag of techniques to suit your instruments and setup. ■

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TECHNICAL TIPS

PHANTOM POWER

Certain condenser mics require 48V phantom power, which can be supplied from your mic preamp or audio interface. You'll usually find some indication on the body of the mic that this is the case. If not, check the manual. Typically, valve mics (which have their own power supplies), dynamics and ribbons don't need phantom power. Avoid sending phantom power to mics that don't need it.

VIBRATION NOISE

Condenser mics can easily pick up vibration noise from the floor and some of them therefore include on-body low cut or roll-off switches. Failing that, a suspension cradle is your best bet.

VOLUME

Although most mics can handle high SPLs (sound pressure levels), close-miking a loud source can overload the mic electronics. Sometimes you'll find onboard cut switches or even, on small condensers, capsule insert collars. These 'pads' typically reduce the signal by 10-20dB.

MIC STANDS

When setting up a stand, try holding the mic itself in one hand while you slacken off the clamps with your other hand. Now position the mic, then tighten the clamps again. That will help you get the mic exactly where you want it to be.

WIND

The microphone popshield is a common sight when recording vocals. When it comes to positioning it, place the mic popshield halfway between the sound source and the mic for best effect. Slightly less effective is the foam windscreen that fits over the capsule grille.

MIC CABLES

Once you're happy with your mic positions, take the time to tidy up your mic cables – stick them down with some tape if necessary. This will help to prevent any horrible or expensive accidents, as well as any unwanted movement of the mics during recording sessions.

MONITORING AND FOLDBACK: HOW TO CLEARLY HEAR WHAT YOU'RE RECORDING

MONITORING AND foldback are vital aspects of the recording process. You need to be able to hear as accurately as possible what you're recording – if this is sorted, you can be confident that when you play it back it will sound the same. You will also need to provide a decent foldback so that you or whoever you're recording can hear both the pre-recorded tracks and also themselves playing at the same time.

In our signal flow section (p.17) we suggested that when it comes to complex multi-mic situations, a hardware mixing desk is often the simplest option. When it comes to providing effective headphone foldback, things can become even more complicated. The main reason is latency (processing delay), a consequence of the buffered route the signal has to take in and out of the computer. If you're playing an instrument that makes an audible sound in a room, the sound you hear will be a combination of the foldback through your headphones and the direct sound in the room. So if the foldback sound is delayed by even 20ms, it's confusing.

Through headphones (and with low buffer settings, for example, 32 or 64 samples), this can sound like a chorus effect. With higher buffer settings (for instance, 512 or 1024) it will sound like a slap-back delay. Remember that when monitoring a record signal it's going into the computer and back out again, so the buffer delay is doubled.

There's no standard solution to this, and you'll find both hardware and software options, which vary between manufacturers. We've grouped things together into two options: hardware based and computer based. Of course, you could use a combination of the two.

HARDWARE BASED METHOD

USING A mixing desk (and its onboard preamps), you can set up your foldback mix prior to the audio interface stage, adding effects if necessary. Then it's simply a case of routing the signals from the desk to the interface. As well as the bus systems we mentioned earlier, desks often have direct sends on each channel for this purpose.

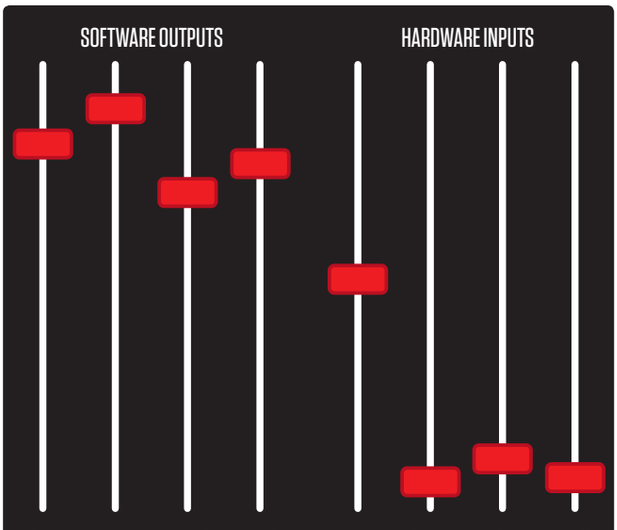
This method – similar to that used with hardware multitrack machines pre-computer recording – will work with any software platform. The downside is that you will need to come up with a solution for dropping in when overdubbing. You'll need a headphone mix that combines playback from the computer of both the part you're overdubbing and the rest of the track. When you drop in to record, you will want the overdub track to stop playing back.

One option is simply to mute the overdub track at the point where you drop in. Alternatively, set up an extra track on your sequencer and use it as a slave for the foldback, then you can choose when it will stop playing in advance. Both options work, but are fiddly. Many music producers who use

CUE MIX

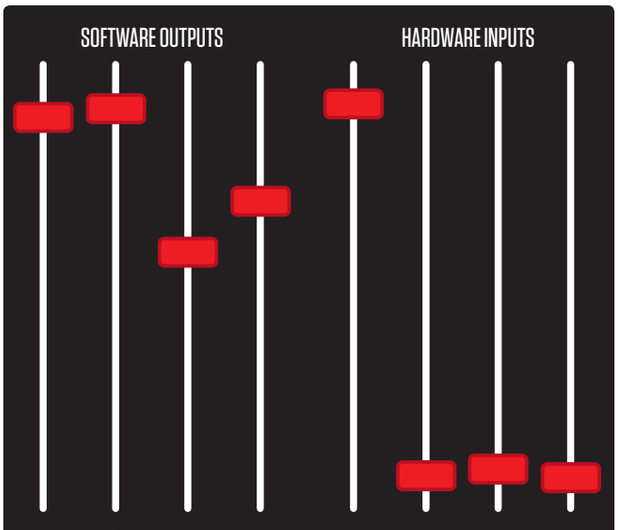
The idea with a cue or headphone mix is that you are able to set up a balance for a musician specifically for their set of headphones. On a mixing desk this can be easily done using auxiliaries, but many interfaces will now have monitoring software. This usually enables you to set up specific balances for each of the physical interface outputs, combining audio from both your software and also from inputs such as microphones or DIs.

OUTPUTS 1 & 2 (MAIN MONITORS)



In our main monitors, the recording engineer simply wants to hear a small amount of the input signal.

OUTPUTS 3 & 4 (HEPHONES)



Our headphone mix for the performer has a different balance from our software and much more of the input signal.

hardware mixing desks with a DAW have given up on the concept of dropping in, preferring instead to do lots of separate takes and comp them afterwards.

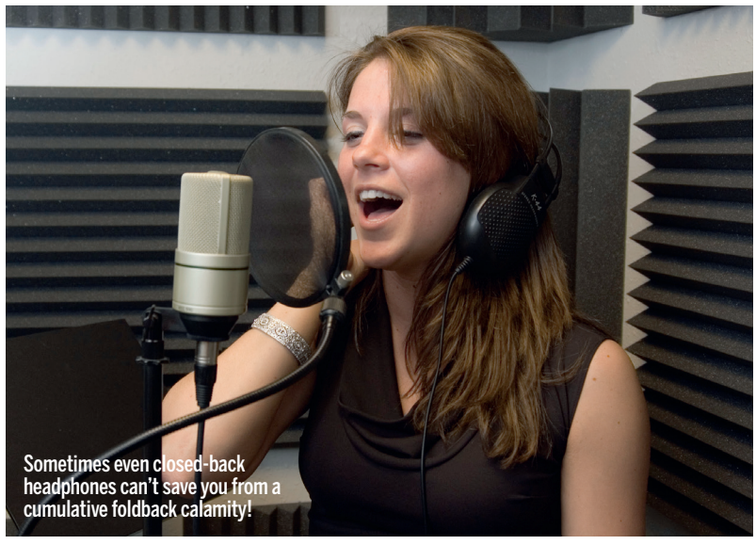
COMPUTER BASED METHOD

GIVEN THE potential for awkwardness with the hardware option, both software and interface manufacturers have tried to find alternative solutions. These vary both in functionality and success. However, they all rest on one method: routing the input signals to the outputs without going via the computer's CPU.

On interfaces from the likes of MOTU and RME, this is achieved via the incorporation of a processor-based routing system into the interface. This is controlled by proprietary software (MOTU's is suitably called the CueMix) that enables you to set up a full mix combining inputs to the interface and outputs from your software. On cheaper interfaces, you will often find more basic versions of the same idea.

PC users may have encountered ASIO Direct Monitoring (ADM). Assuming your software and hardware support this protocol, it enables the software to switch the hardware into a temporary routing configuration when recording, mirroring an input back to its corresponding output. So, for example, if your mic is coming in on input 3, when you go into record it gets routed back to output 3 without an extended trip around the CPU.

On the Pro Tools platform, meanwhile, things also vary. Some Pro Tools LE interfaces support a system called Low Latency Monitoring that's not unlike the ADM system above. Others (Mbox, for example) offer simpler onboard headphone mixers. But unsurprisingly, the most successful hard/soft system comes from Pro Tools TDM. This on-card DSP routing system allows you full zero-latency monitoring from within Pro Tools software – as well as when using an auxiliary bus. This enables you to work easily in the traditional way, overdubbing and dropping in with no problems. And your monitoring balance is saved within the session. When it comes to recording sessions, this is a major strength and attraction of this otherwise particularly pricey system. ■ >



Sometimes even closed-back headphones can't save you from a cumulative foldback calamity!

"I CAN'T HEAR MYSELF!"

Aside from getting things working on a purely technical level, good foldback can be a tricky thing to achieve. It's not unusual for a perfectly good track balance to elicit the complaint, "I can't hear myself!" Performers hear themselves as a combination of the sound in the room and their foldback. This is the case even if the headphones are of the closed-back, sealed variety. So to keep the studio atmosphere harmonious, here's a list of practical tips:

SOLID RHYTHM

To get a performance that's in time, a good solid tempo reference is needed. Often this will need to be louder than you initially think, and a simple headphone balance that avoids unnecessary effects will help.

RELIABLE PITCH

Any instrument that you pitch by ear (the voice, for example) needs something to pitch to. A good, solid pitch reference is essential. If your track is sparse with only bass and beats, it's always worth considering adding a guide keyboard track to help with this.

TWO'S COMPANY

Some performers struggle if they're sent off to another room to perform. If this is the case, bring them into the room with you and both wear headphones.

OUT OF PHASE TRICK

On rare occasions, some performers may ditch headphones altogether in favour of standing in front of the monitors. To avoid unacceptable spill into the microphone, an option is to wire one of your monitors out of phase with the other and angle them so that the sound meets where your performer is standing. Be careful, though, as this is something of an unpredictable technique.

BEWARE HEADPHONE SPILL

On quiet sections of a track it's very easy for a mic to pick up headphone spill, especially if you're using a solid click or rhythm in your headphone mix. Play back these sections to check they sound fine.

OFF-BEATS

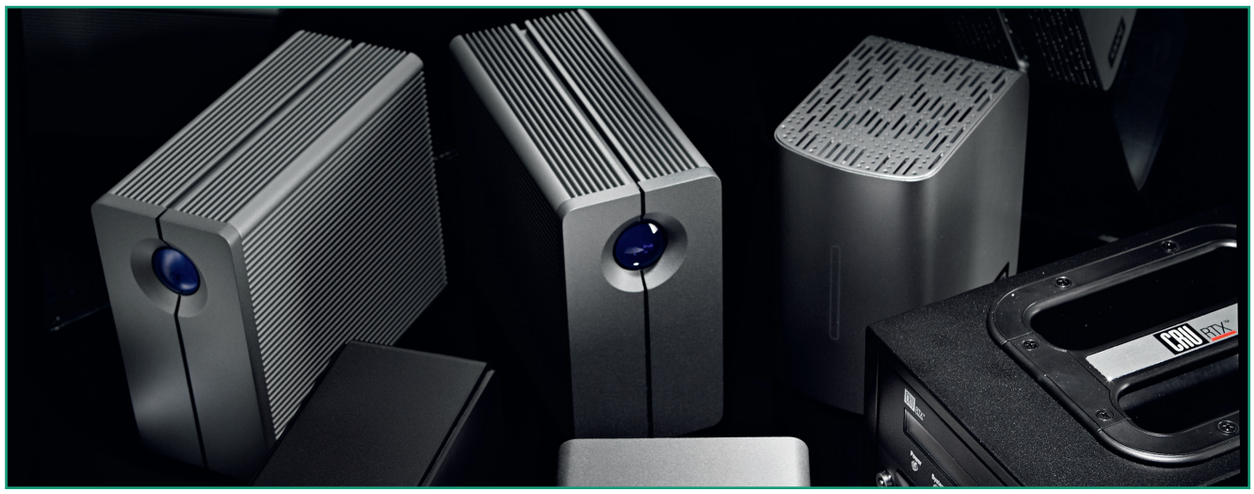
Although drummers tend to pull and push against a click track, it's sometimes difficult for them to hear an on-beat click unless it's very loud. Try programming something that perhaps emphasises the off-beat so that they can easily hear it in the gaps.

VERB FOR VIBE

Many people like to feel they're performing to a final mix, karaoke-style. This doesn't often produce the best recordings, but one thing that does help is reverb, especially for vocals. Even a touch will help yield much better results.

HEADPHONES ON YOURSELF

If you regularly struggle to get an acceptable headphone mix, try monitoring with headphones yourself. You may find it sounds a little strange when you subsequently listen on speakers, but it will put you in a similar place to the performer.



BACKING UP

Your gear is set up. You're almost ready to record. But how will you ensure the music you create is secure? Here's a word on data backup

Say you've been recording for a couple of days and you've created some of the best music of your career to date. What would happen if your computer's hard drive failed? Where would you stand? And what about all of your applications? Do you have all of your installation files stored offline? Serial numbers and authorisation codes? How hard would it be to replace all of that stuff if you had to start fresh with a new hard drive or even a whole new computer?

It's the nightmare scenario for the desktop artist, but it needn't be anywhere near as painful as all that. You see, in an ideal world you could simply pop in a new drive, fire it up and be ready to begin right where you left off. Well, that all depends on the strength of your backup.

Once upon a time, backing up one's computer was quick and easy, involving little more than slipping a floppy into a disk drive. However, modern productions on today's machines push around far more high-quality audio data to and from your drive. Copying gigabytes – maybe even terabytes – out to a backup medium takes a lot of time, and there's no denying that it can be a major pain. Still, it must be done, and in this feature you'll learn about storage mediums, offsite and online storage options, plus the potential pitfalls and solutions. Your work is very important, so make sure it's protected.

WHAT AND WHEN?

SO WHAT exactly should be included in a backup? Ideally, everything. You should be keeping at least one clone of your entire system drive for a start – ie, your operating system and any essential data such as drivers that you need alongside it. This type of backup needs to be done intermittently. It will allow you to restore your entire system or migrate to a new one if your old machine, system drive or the computer on which it resides is damaged or replaced.

FILE ORGANISATION

SOME USERS don't separate their system files out from their projects and other documents, but many do, and doing so can be quite convenient. You might keep the two on completely separate drives or merely separate partitions. You don't have to – that particular practice stems from a time when drives were smaller and slower – but it can still help to keep things organised.

Copying an entire drive is sometimes known as 'ghosting', and there are certain applications dedicated to making the task easier. If you have ever suffered a catastrophic system drive failure without a backup, you'll be aware of the complete hassle of re-downloading, reinstalling and re-authorising all of your applications.

TIMETABLING

SPECIALISED BACKUP software might allow you to schedule periodic backups, but some apps have their own ideas about when they ought to be snapping at your bits. Apple's Time Machine, for instance, is automatically configured to keep hourly backups for the previous 24 hours, daily backups for a month, and weekly backups for all previous months. This is not a fool-proof backup system, though – it's intended as a means by which your system can be restored to a previous state, though that does serve essentially the same purpose, up to a point.

You see, Time Machine will start deleting the oldest backups when your backup disc gets full. Nevertheless, Apple's schedule isn't unrealistic and

gives you a pretty good example of a reasonable timetable – though hourly backups might be overkill, especially if they're starting to munch away at your production power.

GET SERIOUS

THE GENERAL rule is that if you're working in the studio each day, you should make a backup copy of your work each day. You don't need to clone your whole system – just keep a backup of your daily work. If you're an intermittent studio dabbler, you might be better off making a backup once a week or even once a month. It depends on your production schedule.

We'd recommend making multiple backups, on multiple formats, if possible. We also very emphatically suggest that you keep one or two extra copies of your most precious files offsite – way offsite if possible. Mail them to an out-of-town friend or a relative for extra safe keeping. Disasters can and do strike. We hope they never happen to you, but they have to be considered. What if your home burns to the ground while you're at work? What if Mother Nature hits your area with some natural catastrophe? What if your production laptop gets lost/stolen? Your latest song will likely be the last thing on your mind, but when you do get back on your feet you'll still have a copy available.

BACKUP TOOLS

THERE ARE many ways to go about making a backup, and we polled a number of musicians to find out what methods they preferred. A distressing number of those polled have never made a system-wide backup but have instead copied their most important files piecemeal onto an external drive. It's reasonable to grab your most essential files *en masse*, but the number of people regularly taking more fundamental backups is small, which is strange when it's so easy to do. The aforementioned Time Machine is installed on every Apple computer sold, and Windows users have access to Windows Backup, at the very least. Third-party options include Macrium Reflect (for Windows) and Clonezilla.

The free version of Macrium (find it at macrium.com/reflectfree.aspx) is easy to use and will get the job done. The slightly fiddlier Clonezilla (check out clonezilla.org) is a free and open-source solution for Windows, Mac and Linux users.

XXClone (good for Windows users) is free for personal and private use and allows you to copy the volume ID to your target drive so that you can boot from it (visit www.xxclone.com/index.htm). Mac users who don't want to use OS X's Disk Utility can get Carbon Copy Cloner. It will make bootable clones, and you can even schedule it to wake or power up your Mac to make a clone (visit www.bombich.com/index.html).

BIT BY BIT

SO NOW that we know making occasional clones of your entire system drive is necessary and actually very simple, how about taking care of those smaller daily or weekly backups? Many of the software options we've listed can run scheduled backups, but often you'll be doing just as our polled musicians do: copying files and projects one at a time to an external storage disk. This is the method you'll want to use for files that get changed or updated a lot: think works-in-progress, sample collections, plugin folders and even presets.

Be aware that most DAWs' primary file formats don't save everything you do. For example, their primary file format will likely merely point to any audio files recorded or imported into the project. These are usually kept in a specific folder, often a sub-folder of the project itself. You could simply copy the project folder, but that will likely also copy bad takes and unused audio over, too, which will rapidly munch up space. Some DAWs allow you to purge unused audio, so take advantage of that before you back up: Live's 'Collect All and Save' and Cubase's 'Back up Project' commands, for example. Furthermore, many DAWs provide a packaged file format that will roll all audio and pertinent data into a single, self-contained file/package – Cakewalk's BUN files, for example, or Logic Pro X's Package files.

However you store your projects, you'll want to back these up every time you make a major change to one. Make copies and archive them safely when you've finished the project.

MAINSTREAM MEDIA

We've seen plenty of digital storage options come and go over the years. Nothing is future-proof. Currently, our hope lies not in the media itself, but in the way it connects to our computers. USB 3.0 is fast and reliable and there are tons of external storage options available, primarily in the forms of the thumb drive, external hard drives and solid state drives. Prices are plummeting on the latter two, with a couple of terabytes of hard disk storage available for well under £100. Apple very much want to provide you with another option in the form of Thunderbolt peripherals. This lightning-quick connection protocol hasn't yet become ubiquitous, but Apple users have the option of Thunderbolt-based drives and drive arrays. Many third-party drives offer compatibility with both USB and Thunderbolt ports.

These solutions are ideal for the massive storage needs of desktop music producers and are especially good for backing up your entire system, your apps, OS and all. USB thumb or stick drives are likely suitable only for less demanding tasks. You can indeed get one with a full terabyte of storage, but it could set you back nearly £1,000. Still, for intermittent and safety backups of your projects and documents, the thumb drive remains an inexpensive and convenient option.

WHAT ELSE?

SPEND SOME time examining your work drive in detail. Thoroughly go through your documents folder, go through your project and application folders, and make a big old checklist of everything you use frequently. Do you swap out lyrics? Do you maintain a growing collection of band photos? Do you make your own videos? Back 'em up!

The same goes for important industry contacts. If at any time you're unsure whether something is worth backing up, ask yourself this question: "What would I do if this specific data were to vanish today?" If you'll miss it, back it up. ■

HOW TO PREP YOUR DRUM KIT FOR RECORDING

Power up your drum takes with a little pre-session effort

Just like any other instrument, drum kits aren't always set-up for the perfect recording. A more experienced drummer will have evolved and enhanced their kit; they may have found a favourite snare or two, collected a few good cymbals, and will have set up their kit so that it feels right to play live.

A drum kit will sound different in any room, and any song will call for a distinct drum sound, so for every session you will need to fine-tune the kit and the room for that specific demand. Every aspect of the kit has to be addressed and this feature takes you through all the issues that should be ironed out prior to you hitting the record button.

There's no substitute for experience, but this guide will help to ground you in the basics of the drum session, speed up the learning process, and give you a feel for how to get the kit tuned so that its sound wins through in the final mix.

CHOICE OF KIT

AS WITH any instrument the quality of manufacture has a huge impact on the sound it makes. Any drummer worth their salt will have evolved a good fettled kit around them, but their playing ability might occasionally outstrip their ability to pay for a good kit. If your kit works for you then great, but if not you might want to consider borrowing one from a generous mate or even hiring one for your session. The same goes for drum mics – aim to get hold of the best quality you can. A poor sounding kit will sound exactly that on your recordings.

The better recording kits include Gretsch, Ludwig, DW and Yamaha, and

some makers are famous for individual drums. For example, Noble and Cooley snares, Ludwig kick drums and Zildjian cymbals. The Ludwig Black Beauty snare is a timeless classic recording snare. A good drummer will have a selection of snare drums and cymbals and the choice will be determined ultimately by the song you are going to record.

It's the job of the drummer and the producer to make gear choices based on how you want the end result to sound. Ask yourself questions such as, 'Does the song need a deep fat snare or a high snappy one?' Make changes to suit. If you're not sure what sound you're after, listen to some of your favourite albums to give you inspiration. Maybe you want your drums to sound big and boomy like John Bonham's, or tight and crisp like Travis Barker's, or even dry and punchy like Questlove's. The more you know and prepare in advance, the less chance there is of you and your band feeling disappointed with the end result.

DRUM HEADS

SKINS SHOULD always be brand new, or thereabouts, for a recording session. Drum heads soon lose life after repeated beatings, so make sure you have spare heads with you. Undoubtedly every drummer has their favourite heads but, as a general rule, coated heads record better – their tone is warmer and they still have a good 'skin' attack. And although its always a personal choice, two-ply heads tend to sound much better than single-ply.

Clear heads tend to be overly bright and without body on the top side, but they work well for the bottom resonant heads where thinner is better. Once new heads are installed, ensure they are properly bedded in with some playing and stretching so that they don't lose their tune during the session.

TUNING

WITH DECENT tuning and a good set of heads, most drum kits can sound and record brilliantly. Learn the basic principles of tuning, or get friendly with someone in the know. Our basic rule of thumb is to finger-tighten all tension bolts, working in opposites. Once finger-tight, use a key to tighten using a full turn on each opposite tension bolt until the head is fully stretched and cranked up and you can hear the glue cracking on the hoop, then leave it to stretch-in and settle. Repeat for each drum until complete.

Turn the drums over to begin with the resonant head. Tap the head at each lug and tighten the bolts until you get a consistent equal tone. Once done, turn the drum over to the batter head and begin de-tuning. De-tune each lug by half a turn until the batter head is half a turn below your desired pitch and then gradually increase the tension until you are at your desired pitch level. Remember that a higher-tuned resonant head means a shorter, shallower note; a higher batter head means a deep note with long sustain and a good stick response, and if they are both tuned the same you get a longer sustained and pure note.

You really should have a good idea of what you're going to play once the record button is pressed. There's nothing worse than waiting while the drummer tries to nail a new fill idea

STICKS

YOUR CHOICE of sticks is determined by the song and the weight of playing required. A drummer should carry a selection of weights and varieties of wooden sticks, and you should have a feel for which stick is required. You may find that a softer song requires brushes or mallets. A good in-between solution are 'hot-rods', a bunch of thin sticks lashed together which make a more diffused but clear hit. Or why not try nylon tips instead of wood tips for more attack, or play with the butt end of the stick?

You could even arrive at a combination solution with a stick in one hand and a brush or hot-rod in the other.

DAMPENING

MOON GELS and gaffer tape are essential items for the studio to help dampen unwanted overtones and excessive ring.

At this stage it's also worth keeping in mind that things like a towel over the floor tom, or your wallet placed on the snare drum will eliminate ring and produce a 'dead' drum sound, as popularised by drummers such as Ringo Starr.

HEADPHONES

HEADPHONES ARE a necessary evil unless you go all-out for a live-style recording with PA and wedges and embrace the spill. But considering how you will be recording at home (or perhaps in a garden shed or pod-style recording environment), that's an unlikely scenario!

Most drum sessions will be done using headphones and to avoid spill they should be of the closed-cup variety. The long-time classic studio headphone is the Beyer DT100. They're hardy and not too bright for high-volume listening. That said, there are better-sounding cheaper headphones to be had, particularly from the likes of Audio Technica.

KNOW YOUR PARTS

A LOT of time can be lost during a session because some band members aren't completely clued up on their individual parts. There will always be the opportunity to change something when you're recording if a part really isn't working for the song, but you really should have a solid idea of what you're going to play once the record button is pressed. After all, there's nothing worse for the rest of the band than waiting around while their drummer tries to nail a new fill idea.

PHYSICAL PREPARATION

IF YOU'VE never warmed up before playing, now's a good time to start. You want your takes to sound natural and flowing. If you're stiff and pent-up, your playing will be rigid and lack life. Remember, this isn't a gig so you won't have an hour to get warm. You want to be ready to go for take one, so hit the practice pad or do a couple of run-throughs before you record.

Get a decent sleep and eat well the night before, too, as you'll be more alert and less likely to tire out when the ninth take of track 11 comes around. ■

PREPARING YOUR VOCALS

Vocal coach and singer Elena Kay offers her top 10 do's and don'ts before heading into a vocals recording session

So, you've set up your home studio and you've chosen which songs to record. You've got your DAW and microphone ready, but you aren't quite sure where to begin. Have you ever wondered what professional singers do before they go into the studio? Well, Elena Kay has been there and done it. A professionally trained singer who taught vocals at BIMM, with some of her former students going on to perform with music legends including Led Zep's Robert Plant, Elena is the perfect teacher to help you on your way.

So, if you're new to singing and recording vocals, make sure you follow her essential 10 do's and don'ts before you even think about hitting the record button. >

DO LEARN YOUR MATERIAL THOROUGHLY

"OKAY, WE'RE guessing that you already know your songs, but do try singing them by heart if you haven't yet – a lot of singers find that they can focus more on the meaning behind the lyrics when they don't have the sheet in front of them. Stay true to the story you are singing. Which words would you like to emphasise? You will also need to think about where to take your breaths so that you have the stamina to sing until the end of each phrase. After all, you don't want to have to breathe in the middle of a word!"

DON'T SING WITHOUT WARMING UP FIRST

"A LOT of vocalists underestimate the strain they put their vocal cords under when singing without a good warm-up. Ideally you want the warm-up to last for about 20 minutes and cover your entire vocal range. Sing a few scales (do-re-mi-fa-so-la-ti-do) and arpeggios, starting from a comfortable pitch and repeating it up a semitone each time. Do take it easy when you reach the high notes, as you don't want to be belting straight away, and don't forget to warm up your lower range too."

DO PRACTISE MICROPHONE TECHNIQUE

"SING THE songs using your studio microphone to make sure you're happy with your sound. Start by standing about six inches away from the microphone and record a few takes to hear how you sound – you might have to experiment with your position to hear how it changes the volume of your vocals. Standing too close, for example, could make your vocals sound quite loud and even distorted. A solution? You could move away from the mic during the parts of the song where you have to belt. And remember not to point your mic towards a speaker otherwise it could cause nasty feedback,"

DON'T DRINK TEA, COFFEE OR ALCOHOL

"CAFFEINATED AND alcoholic drinks can make you dehydrated, which can have an effect on your vocal cords. You might notice that your larynx feels dry and irritated after you have had too much caffeine, for instance. Make sure you stay well hydrated before and during your recording. Have a bottle of water with you and drink regularly, but avoid ice-cold water because this will tighten your vocal cords."

DO KEEP YOUR ENERGY LEVELS HIGH

"RECORDING A song on your own without the buzz of an audience can be a different experience from singing on stage. This can have an effect on your tone and you might not project enough. Thinking of how you would perform your songs in front of an audience can lift your energy levels during a recording session and this will be reflected in your sound. You could even practise some small movements in front of the microphone, although try not to move too far away from the microphone, as this will interfere with your volume."

DON'T EAT CHOCOLATE

"SADLY, CHOCOLATE – and dairy foods in general – can irritate your throat. This is because your body tends to produce excess mucus (phlegm) when you eat dairy, which can result in coughing. Some professional singers eliminate dairy from their diets completely, although you can just avoid having them when you practise and record your songs to see if you notice any difference. Mint flavoured chewing gum can also dry out your throat, so it's best to replace it with a fruity alternative. And, of course, avoid smoking."

DO CHECK YOUR POSTURE

"PRACTISING IN front of a mirror can feel a bit awkward, but it will help you to see how your body works and to see if you are carrying any tension. Make sure your shoulders aren't too tight and that you stand straight, with your legs slightly apart. Balance on both legs, push your shoulders and head back, and imagine your body standing and feeling taller. Check for any tension in your neck, jaw and shoulders. If tension is present, use some gentle massage to release it."

A deep diaphragmatic breath can help you produce a strong, well-projected sound and support a high note without damaging your voice. It can also help you relax

DON'T STAY UP TOO LATE THE NIGHT BEFORE

"AVOID GOING out to places with loud music before a recording session; you must avoid shouting and wearing your voice out. A tired throat can lead to an unpleasant, croaking sound or even hoarseness. Get a good night's sleep, as you don't want to be drinking too many teas and coffees the next day to prop up your energy levels when recording."

DO PRACTISE DIAPHRAGMATIC BREATHING

"A DEEP diaphragmatic breath can help you produce a strong, well-projected sound and can help you support a high note without damaging your voice. It can also help you to relax if you feel nervous before recording. Sit on a comfy chair to start with. Take a few long breaths, making sure the air fills up your lungs and tummy. Putting one hand on your stomach will enable you to feel if it's filling up with air. Ensure your shoulders are relaxed. If they lift up when you inhale, your vocal cords will tense. Exhale with a long hissing sound ('sss') till all the air finishes. Repeat a few times. You can then experiment using other consonants and vowels ('vvv', 'mmm', etc)."

DON'T OVERDO IT

"FINALLY, TAKE regular breaks if you feel your voice is getting tired while you practise. Singing too much before a recording can tire out your vocal cords. You really want to be able to hit those high notes, so make sure you don't always sing on top of your voice when you rehearse. Just take it easy!" ■

BEFORE YOU RECORD

Putting in the work on your music before hitting the studio will pay dividends on finished tracks. Here's some important questions to ask yourself before you start...

You've chosen the room you will be recording in, you've thought about acoustics and soundproofing, and you've rigged up all your gear. You're tantalisingly close to pushing 'record' but, the fact that you now have to lay down heroic takes, and with all the pressures studio work brings with it, you find yourself ill-prepared.

Just getting the actual job done in the recording studio often gets in the way of getting the *right* job done. The role of a producer is to keep everyone on track. Whether you're producing yourself or you're working with a producer or other musicians, you need to get to grips with this criteria for helping to decide what material will make it onto a record, and what will be consigned to the bin.

WHAT'S THIS RECORDING FOR?

THIS QUESTION will affect every single thing you do on the day. Although you should be aiming for the best work you can possibly muster, inevitably there will be some compromises, often down to the amount of time available. If you're making recordings for commercial release, for example,no corners can be cut. If, on the other hand, these are simply demos to help you get gigs, you could argue that it's all about vibe over quality.

IS THIS TAKE IN TIME?

TIMING AFFECTS the sense of excitement and power in your recording. Be well rehearsed and avoid relying on retiming your work via the computer. Audiences are sensitive to scrappy playing, so do your best to ensure that everything's tight without losing feel.

IS THIS TAKE IN TUNE?

CHECK GUITAR tunings between every take. Insist that your drummer tunes his toms, snare and kick. Be particularly careful with bass instruments and analogue synthesisers that can drift without notice – they will suffer particularly hard if you have to retune them later.

IS THIS TAKE EXCITING?

YOU COULD argue that if production was just about tuning and timing, you could get a computer to do it. You'd be right, but ultimately one of the key skills lies is in knowing the difference between an exciting take and a merely adequate one. It should go without saying that only the exciting takes should make your record.

IS THE SONG INCOMPLETE?

YOU ROLL up with writing left to be done to the song. This aspect of the creative process takes lots of time to get right, so don't do it with a studio clock ticking – it will freak you out so much that you won't be able to write! Instead, get all of your parts structured and fully worked out before you start the actual recording.

LAST MINUTE CHANGES TO A SONG

YOUR BASS player suddenly throws out the bassline he's played for years and doesn't tell you until you're in the studio and all set to record. This changes the whole feel of the tune, but your bassist is adamant it's an improvement. That's a big mistake! Get all of your parts agreed in advance.

BAND NOT REHEARSED

YOU CAN correct pitch and timing in the DAW, but the end result will sound like pitched and timed recordings with any sense of feel removed. Spend at least the same amount of time in rehearsal

DON'T FORGET TO EAT!

Recording sessions can stretch for hours, so ensure you have the fundamentals covered

Basic needs can be sorely overlooked in the passion for recording an album. Too many sessions are spoiled where everyone is hyped on coffee but struggling to cope with not eating for 12 hours. When recording at home, you can stock up the fridge and cupboards in advance so that you're not relying on takeaways.

Factor in at a least a 30-minute lunch break where you do actually eat, and have meals at the time you would normally eat – not five hours later or past midnight – otherwise you may not have sufficient energy to record, let alone make it to the edit stage.

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as you have set ahead for recording your songs. Trust us, you'll need it.

BAND NOT PRESENT

IF YOU'RE recording your band, all of you should be in your home studio or nearby so that any artistic decisions can be agreed upon. One exception to this can be when the engineer or producer – that may well be you – is attending to technical issues such as editing, EQing, and programming. This is tedious work to witness, so perhaps ask your band to leave you to it and return with a fresh set of ears the next day.

STUDIO NOT EQUIPPED

YOUR HOME studio should have all of the equipment you require to bring your music to life. Again, if you're recording with others you may want a place to play live together for a raw, live feel. Is there space in your home studio to accommodate that? On that note, do you have enough mics for the process? Can you isolate the bass guitar and drums, for example, so that there isn't any problematic 'bleed' from them that will be a nightmare come mixing time?

EQUIPMENT NOT WORKING

CHECK ALL of your equipment to ensure it actually does what you require it to do before you start recording. Stock up on strings, leads, drumheads, sticks and batteries and keep them to hand.

LOST MUSIC FILES

DO YOU know exactly where your prelim work is, and are you confident that it will load up correctly come recording time? Preparing your reference files in advance will save you valuable studio time.

NOT ENOUGH TIME

THINK THROUGH the tasks you need to achieve carefully and plan to spend the requisite amount of time on each task. Then factor in a contingency of a couple of hours on top of that just in case.

ILL HEALTH

MUSICIANS HAVE a habit of pushing on through the most hideous of viruses in order to record, but sometimes you just have to cancel the session. Luckily your home studio won't charge a cancellation feel, so be honest about how you (and any others) are feeling. This way, you won't be wasting your time recording vocals when you have a head cold – you will sound terrible and you will only need to reschedule later anyway.

THE STRENGTH OF STRINGS

UNSURPRISINGLY, OLD strings sound old. They dull over time, quickly drift out of tune when played and they lose the vibrancy that's essential for a great take. This is especially true for bass strings. Take the time to restring all of your guitars a day or two before the session. New strings need to stretch and settle before use, so rehearse your parts for an hour to ensure they are 'played in'.

LYRICS

THE VOCAL is the most important component of a song. The quality of the singing is crucial to the success of the session; it's what your listeners will be zoning in on no matter how great your bassline. Despite this, it's tempting to leave lyric writing to the very last minute, with some songwriters even rushing them out in the studio. Lyrics are the actual content of the song, the meaning behind the music and the aspect of the composition that fans will most likely focus on. Therefore, your lyrics need to have the highest priority. Complete your lyrics in advance of the recording and rehearse them properly.

Think through the tasks you need to achieve and plan to spend the requisite time on each task. Then factor in a contingency...

BACKUP

NO PERSON ever regrets making a backup. On Macs you can use the Time Machine facility to make incremental backups through the day, although hard drive activity can interfere with the actual recording process, slowing down your Mac. Another common approach is to set your recording path to a folder that's regularly updating to the cloud via a service such as Drop Box, but bear in mind that this isn't a true backup. If you change a file and later need to revert it back to an earlier stage, DropBox will only store the most current version of the file.

Ultimately, it would be wise of you to invest in a rugged external hard drive. And remember, it's not the backup that's important but the 'restore'. ■

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LAY OFF THE BOOZE

At least until after the session!

Alcohol affects your hearing significantly: medical research has demonstrated that it raises the threshold of perception for lower frequencies all the way up to the higher midrange spectra (around 1KHz). This 'numbness' means you're likely to add more bass and boom to your mixes even though this is already present in the mix – you simply don't hear it. The end result can be a peculiarly dull mix.

Some players swear that they play better with Jack Daniels, but this is an illusion. Coordination and judgement, essential for skilful playing, are both compromised by a remarkably small amount of alcohol. Leave the drinking until after you're done recording.

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ADVANCED RECORDING

Hopefully by now you're well-prepared and well kitted-out, and you know your way around your home recording set-up and DAW. But now, as they say, it's business time. Over the next few pages we'll take you through the actual recording process itself, pulling together what we've shown you so far. We'll show you how to add real professional polish to a recording, with an explanation of effects processors and when and how to employ compression, delay and more to sweeten, tame or bend your recorded sounds to your will. Then we'll show you some best practices for mixing, and take you through the basics of mastering that finished recording.

SETTING UP YOUR DAW

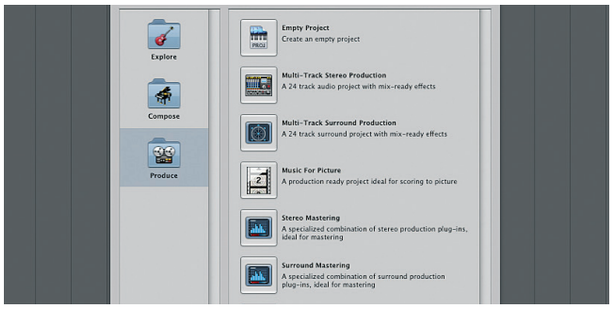
For recording, your main goal is to record and play back your required track count cleanly, without glitches. This can be influenced by a number of things including your audio interface drivers and operating system, so ensure they're up to date.

Keep an eye on audio buffer size. A small buffer size will reduce the round-trip latency (the time it takes the signal to travel from inputs to output) via the CPU, but it will also tax your system more, which can result in instability or glitches. Run a multi-track test session, recording and overdubbing multiple tracks and observing how everything behaves. If things get a bit sticky, try bouncing down a few stems for overdubbing and then reuniting everything for mixing.

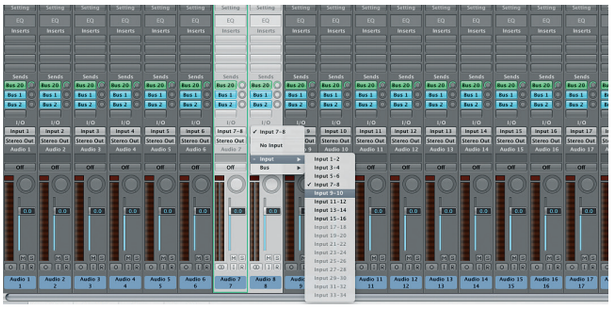
Plan your track layout. Keep your physical track inputs and track layout roughly the same. For a drum kit, use sequential interface inputs assigned to sequential arrangement tracks, working logically through the kit from kick to room mics so that you know where all of your connections are, whether you're looking at your screen or audio interface. Label the tracks and colour-code them for ease of navigation, and decide whether you want to record any stereo mics to stereo tracks or keep them on mono ones.

When using multiple mics on the same instrument, grouping the tracks can be useful when creating new tracks for recording (eg, playlists in Pro Tools) and can retain phase coherence when editing (eg, phase-locked editing in Logic Pro). When preparing for overdubbing, consider setting up extra tracks for multiple takes. Some DAWs have bespoke overdubbing and editing systems for stacking or for handling multiple takes on the same track. ■

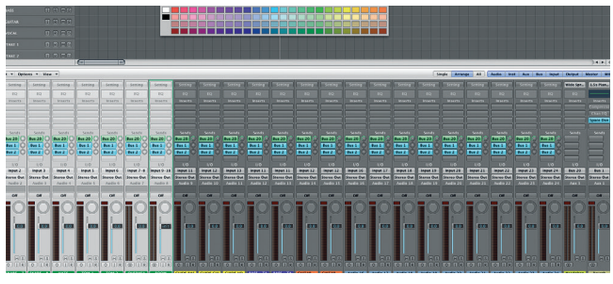
STEP BY STEP PREPARING A DAW RECORDING SESSION



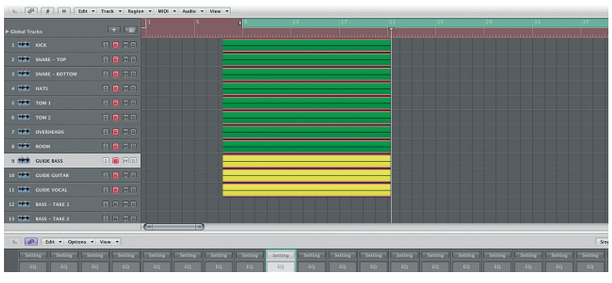
1 Many DAWs include stock templates to get you started. Here we're using the Multitrack Stereo Production template in Logic Pro 9 (it looks different in Logic Pro X, but the process is the same). This gets us up and running quickly, and we can then modify it to suit our exact requirements.



2 The template features a set of sequential inputs and tracks, including a ready-made, pre-fader headphone send on bus 20. We still need to tweak things to match our layout, however. First we switch our drum room and overhead tracks to stereo and reassign the inputs.



3 Now we need to label everything up, working through our drum kit first and then moving on to the other instruments. We're using guides for bass, guitar and vocals while tracking our drums, but we can also set up tracks for the 'keeper' takes, taking care to assign the correct inputs. We'll also colour-code our tracks.



4 Now let's get our buffer size set up. Rather helpfully, Logic tells us the round-trip latency for each setting. A good solid setting for our system is 256 samples, which quotes a round-trip delay of 11.6ms. Finally, we record a set of tracks and check that our system can handle them without any glitches.

CUE MONITORING

When recording and overdubbing, it's of paramount importance to make sure that everyone can hear the track or click reference and, if necessary, each other. Most DAWs include extensive internal bussing, so in theory the necessary flexibility is there.

In practice, however, things can still get pretty complicated, particularly when you're recording multiple instruments at the same time in separate spaces. In cases like these, everyone will need their own headphone feed with its own level and possibly its own blend control (for example, drummers usually want their headphones louder than everyone else's, which is understandable).

As already noted, DAWs all have plenty of routing options, enabling you to create individually bussed cue mixes for your players and the control room. However, during recording, all DAWs route signals via their CPU, so when you monitor an input signal via the DAW, you'll find it introduces a delay (latency). The length of this delay is dependent on the audio driver buffer size and any delay introduced by plugins in the signal path, and while you'll generally need this to be as small as possible, under stress a really small buffer size could introduce instability and audio glitches.

Mackie's Onyx range of mixers – of which this is an extreme example! – combine tactile mixing with audio interface functionality, but they don't give you the multiple mix set-ups of a well-designed software mixer

DEALING WITH LATENCY

IF YOU'RE doing electric guitar overdubs using a DI and the guitarist is listening via the studio monitors, a buffer size of 128 samples may be workable. However, with sound-producing instruments rather than DIs, any significant difference in timing between the headphones and what the musician can hear from the room will usually manifest itself as a delay or chorus effect. This will be most pronounced for vocalists as they can hear their own voice internally, via the headphones and via the room – this is offputting. The only way around the problem is to have some kind of zero- or near-zero-latency monitoring set-up.

While we're here to promote the advantages of computer based recording, the simplest option is probably a hardware mixing desk. Certainly, if you're recording only a few mics and one or two players at a time, a small desk can be a cheap, quick and flexible alternative.

Alternatively, you can go for a DAW that incorporates some form of hardware-based routing (see Direct Monitoring, left). The gold standard in this case is Pro Tools HD, but there are plenty of other solutions including software-controlled cue mix systems from the likes of MOTU, RME, Focusrite and others.

Finally, you might want to look at a hardware desk that incorporates an audio interface – the Mackie Onyx, for example. The main benefit with these is that setting up levels and headphone feeds becomes a far more tactile process, but you also get the convenient integration of an audio interface. Even so, this won't provide the multiple mix set-up flexibility that you can get from a good software mixer like MOTU's CueMix. ■

DIRECT MONITORING

Most DAWs feature direct monitoring, whereby the input audio is re-routed at the (direct monitoring-compatible) audio interface. This is to avoid the round-trip latency through the computer, giving effectively zero-latency monitoring.

By augmenting this capability with software control, some interface manufacturers have worked in additional functionality, allowing multiple recallable cue mixes that combine interface inputs and DAW outputs. Good examples are MOTU's CueMix, Focusrite's MixControl and also RME's Total Mix. The only downside with this approach is that you can't apply plugin processing to input signals.

For PC users, the ASIO 2.0 protocol also includes its own direct monitoring capability. When implemented properly, this controls the interface from within your DAW.

Cubase implements this functionality pretty well, with three behavioural variations, including one that works like the auto input monitor option of a tape machine. Remember, though, that you'll still need to set up a cue mix incorporating the input signal.

Unsurprisingly, the most elegant monitoring solutions are those found in cases where both the hardware and software come from the same manufacturers. Probably the best example is of this is Pro Tools HD or HDX, but you will also find great Cubase integration with Steinberg's new MR Series interface, as well as some rather excellent cue mix options presented in PreSonus Studio One 3 when used with certain PreSonus interfaces.

BLUFFER'S GUIDE TO EFFECTS

Effects processors play a significant role in professionally engineered recordings. Here's our rundown of the most common examples...

Exactly what is it that makes a professionally recorded track sound so, well, pro? Surely it can't simply be a matter of sticking a microphone in front of a singer, or plugging in a guitar before hitting record? Actually it can, given the right material, circumstances and environment.

A stripped-back folk guitar track, for example, might be recorded live with no embellishments. That said, the great majority of recordings employ a vast number of available gadgets that are used to tame or sweeten the sound coming in and going out. These devices are called effects processors and come in both hardware and software incarnations.

There are a number of different types of effects. Some are utilitarian and are meant to control a signal being recorded, while others are designed to artificially add a sense of space. Still other effects can be thought of as 'wow' effects that are brought in to add layers of interest and excitement to a recording.

Since most popular hardware effects had already long been based on digital technology, effects processors were among the first to get the software emulation treatment and accounted for the bulk of the first wave of plugins to hit. The industry was soon rife with both emulations of classic effects and entirely new processing tools.

Most software sequencer packages come bundled with the essential effects, and there are plenty more available online and through your local retailer.

However, you don't have to lay out cash to build an effects arsenal – there are hundreds out there for free, thanks to talented software developers who are kind enough to create them.

REVERB

WHAT DOES IT DO? Reverberation is a ubiquitous effect – you hear it all around you every day. You can't have failed to notice, for instance, that your voice sounds different in a stairwell than it does in a tiled bathroom. That's because sound bounces off the smooth surfaces and moves around each space in a specific way. In essence, reverb gives a sense of space or distance to a sound.

A nicely placed reverb can be the glue that holds your mix together. Overdone, though, and it can make it sound muddy and confusing. If you're trying to create the sound of a band playing in the same room, use one or two master reverb effects. This way, you will be applying the same environment to your whole mix.

USE IT ON Reverb can be used on everything you want to put in a 'space'. Use it sparingly on lead vocals and instruments, though, since it will cause them to sound further away. If you have guitar in a band, it will work great on drums to give a sense of cohesion.

DELAY

WHAT DOES IT DO? Delay is perhaps one of the simplest effects and, in fact, delay serves as the basis for many other more complex effects. A delay processor does exactly as the name suggests: it delays the incoming signal, sending it out later than it came in. Sometimes it's used as a corrective tool. More often, however, it serves as a sound-enhancing effect.

When combined with the un-delayed signal it creates a cool echo effect. Sometimes many copies of the echo will be present, and (usually) each will be successively lower in volume than the preceding one. You might hear this effect on, say, the last line of a vocal or on a guitar line. U2 guitarist The Edge is famous for his use of delay.

USE IT ON Short delays sound awesome on vocals – they were often used to treat the vocals on John Lennon and Buddy Holly records, for example. They also sound great on rhythm and lead guitars.

COMPRESSION

WHAT DOES IT DO? A compressor is a dynamics processor – it helps to maintain a steady volume even when the incoming signal is fluctuating wildly. As a tool, compression will reduce the large peaks in your performance and leave you with an even dynamic. This is great for smoothing out an erratically-strummed acoustic part. Gentle compression will also help two parts sit together more naturally, or you can also use it to add more snap or sustain to your notes. However, an overdriven guitar part is already compressed when it leaves your amp, and you might be left with a squashed sound if you heavily compress driven/saturated guitars. The answer is, quite simply, to use your ears.

Compression will leave you with an even dynamic. Gentle compression will help two parts sit together more naturally, or you can use it to add more snap to your notes

USE IT ON Use compression on everything that requires taming. Vocals are a given, unless you or your singer has great microphone skills. Entire mixes are often (over-) compressed to make them sound louder. Go easy here because too much compression or limiting can suck the life out of your tracks.

EQ AND FILTERS

WHAT DO THEY DO? An EQ allows you to control the amount of low-, high- and mid-range frequencies in your tracks. Some are simple bass and treble controls, while others are splayed across eight, 16 or even 32 frequency bands, each with a slider to cut or boost a specific frequency or set of frequencies.

EQs and filters are essentially the same thing, except that a filter is designed to attenuate (or reduce) rather than boost levels of specified frequencies. These handy tools allow you to then shape the tone of your tracks.

USE IT ON You can apply equalisation to make room in your mix, or to correct missing frequencies in recordings. For instance, does your vocal and guitar fight for dominance? If so, try cutting the upper mids in the guitar to make room for the voice.

MODULATION EFFECTS

WHAT DO THEY DO? Chorus, flanger and phaser effects are all considered to be modulation effects. Flanging sounds as if the frequency spectrum is sweeping up and down. The Small Faces' *Itchycoo Park* contains the classic example of this sound. Chorus effects do just what you think – they simulate multiple copies of the input signal playing simultaneously, though each with a slightly different pitch and time. Nirvana's *Come As You Are* is rife with chorused guitars.

Phasers sound similar to flangers, but there's a sweeping 'notched' sound in play, giving them their characteristically metallic, piercing tone.

USE THEM ON These effects are ideal for sweeping guitars, electric pianos and even the occasional bass track.

DISTORTION

WHAT DOES IT DO? The studio is a funny place. Engineers spend thousands of hours ensuring the truest, purest recording of the source material, while the material itself might be an unholy wail of screeching guitars or distorted vocals. Let's face it, we all like distortion. We like raw, crunchy sounds that spit and growl. And we can achieve these gritty sounds through various types of distortion, such as overdrive, fuzz and clipping.

USE IT ON Distortion is primarily used for guitars, but it can also be very effective when used on vocals – just ask Nine Inch Nails frontman Trent Reznor. Used subtly, it can spice up digital drum tracks or loops, too, and some folks even love the sound of fuzz bass. ■

ADVANCED RECORDING: ACOUSTIC GUITAR

For such a simple instrument, the acoustic guitar can be a tricky beast to record. Have no fear, though – our easy step-by-step tutorial will show you how it's done...

Acoustic guitar is one of the mainstays of modern music and, alongside piano, it's one of the most popular instruments for budding musicians to learn to play – and yet recording it can be a fiddly business. Often, putting a guitarist's playing under the microscope reveals limitations in the instrument itself – such as tuning and intonation – alongside inadequacies in their playing, such as timing, string noise and tuning again.

Whether any of this is a problem or not depends on how important the guitar is to your track, and you may be able to mask some or all of these issues quite easily – your DAW includes plenty of audio editing tools, so through careful comping and editing, it is possible to fix iffy acoustic guitar parts to a certain extent. Even so, getting things as good as possible at the source should always be your initial goal, since a well-recorded guitar part will always sound better than one that's been edited into shape.

STRING THEORY

ACOUSTIC GUITARS come in a range of shapes and sizes, including steel- and nylon-strung and electro-acoustic with pickups. In this in-depth feature we'll demonstrate how to approach all of these, playing to each guitar's own strengths.

The size of the guitar itself influences not only the sound, but also how easy it is to record. Dreadnoughts and jumbos, for example, are loud and can be boomy if miked too closely near the sound hole. By contrast, smaller 'parlour' sizes, or the Little Martin types favoured by Ed Sheeran, produce a more focused sound.

Strings come in various gauges, and this will influence the sound as well as how easy the guitar is to play. A mid gauge has better projection for finger-picking but can be tough for barre chords, while the thinnest gauge can sound fizzy with less body.

Finally, we should mention playing styles. Strummed guitar can be pretty loud, while finger-picking can be surprisingly quiet. Either way, the goal when recording guitar is to capture a balanced sound, so super-close miking may not always work. In essence, miking a guitar is a trade-off between achieving a balanced direct sound and picking up some of the room ambience.

THE RIGHT SOUND

THERE'S NO doubt acoustic guitars are among the most tonally rich and beautiful of instruments. It's a stern heart that can't be melted by Salma Hayek's ode to Antonio in *Desperado*. This being the case, it follows that the first step to getting great acoustic guitar recordings is getting a great acoustic guitar sound. To the trained ear, different guitars, strings and even plectrums can make a massive difference to the sound. So before you go any further, make sure things sound good to your ears. If they don't, there's absolutely no chance that you'll be happy with the recording, no matter how skilled you are. Even if you have to sell your stamp collection, get your hands on a suitable guitar for recording.

THE RIGHT SPOT

ACOUSTIC GUITARS are generally heard in real spaces and have long release times that blend brilliantly with natural reverb. Consequently, overly dry signals will sound dull and lifeless in a way that few conventional algorithms can repair, and it's this failing that most commonly singles out bedroom recordings. The solution, as with most recording techniques, is simple: pick a brighter spot. You want a large room, preferably with wooden floors and hard surfaces.

If your floors are carpeted, try putting some MDF under the player, or change the room. And be sure to place your player near some reflective surfaces.

RATTLE AND HUM

FINALLY, THE only right place for guitar recordings is as far away as possible from shirt buttons, jean studs, belt buckles, zips, belly button piercings, watches and just about anything else that might bash against the guitar body and ruin an otherwise perfect take. ■ >

ACOUSTIC TECHNIQUES

OUR BASIC acoustic guitar recording technique is a combination of solid advice and trial and error. However, we'll keep the latter within pretty tight limits, so you should get the right result pretty quickly. What we're describing certainly isn't the only way of doing things, but it is a reliable one, and although we'll cover various multi-mic options later, this simple, effective technique uses just one mic.

In terms of microphone type, the best option is a cardioid condenser, which, being directional, keeps most of the room ambience at bay. Also, being quite sensitive, it will serve for both strumming and picking duties. Whether you use large-diaphragm or small-diaphragm mics is a matter of taste, although the large-diaphragm will more likely have a nice 'curve' to its frequency response, emphasising upper mids and high frequencies, while the small-diaphragm will be flatter. As an aside, if you want a more earthy sound you can use a dynamic mic, but these can be a bit too crunchy in the mid frequencies and are less sensitive, resulting in more gain and noise at the mic preamp stage.

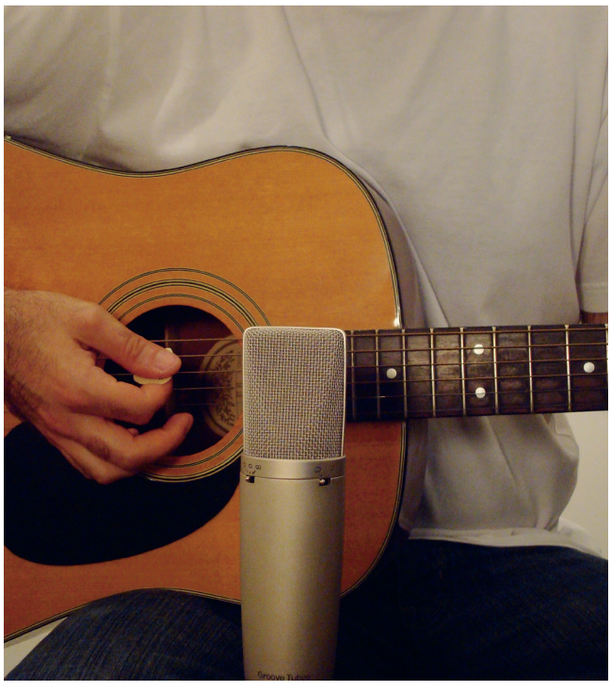
The basic miking process, then, is as follows. Get the guitarist sat down and playing, preferably on a chair or stool that doesn't move or make any noise. Look at the guitar between the point where the neck joins the body and about halfway across the sound hole. The width of the fretboard, and a few centimetres above and below it, is your golden area for miking. Moving towards the sound hole will give you a bigger sound, while moving towards the neck will deliver a smaller sound. Upwards, towards the low strings, will be bassier; lower, towards the high strings, will result in a brighter tone.

This just leaves distance as a consideration, and that will depend on the style of playing and how much room ambience you want to capture. For quiet finger-picking you can go right in to 20cm. For strumming, start at about 30-40cm.

Finally, be aware that hard floors in smaller rooms can produce quite dominant early reflections. If these get too unpleasant, position the guitarist and microphone on a rug or mat. ■

STEP BY STEP ACOUSTIC GUITAR RECORDING FUNDAMENTALS

1 First, select a suitable microphone. Here we're using a quality large-capsule tube cardioid condenser, which we know has a slightly enhanced top end. For a flatter response, a small-capsule cardioid can be better. Remember, this mic includes its own power supply, but regular condensers use phantom power, so make sure your mic preamp is suitably equipped.

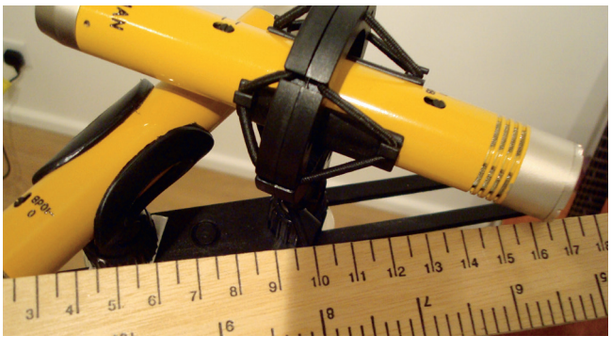


2 Our basic technique requires miking up the sweet spot, which is roughly from where the neck joins the body to about halfway across the sound hole. Right in the middle of this spot will usually suffice, but with a boomy guitar you may find that moving further towards the neck reduces the low frequencies. Don't be afraid to experiment by moving the mic aroud within these areas.

3 With the main position established, it's time to decide how close to get. For a really intimate sound you can go right in to 20cm, but for most situations keeping the mic about 30-40cm away will be absolutely fine. How ambient this sounds will depend on the room, but in a small room early reflections can be quite obvious, even at 40cm.

4 Finally, when close miking, tiny positional changes can be significant, so angle the mic either towards the bass or treble strings to change the overall guitar sound at source. By the same token, encourage your guitarist not to shift position – or capture all your takes in one sitting. Keeping a reference photo of the playing position can be handy. >

STEP BY STEP RECORDING NYLON STRINGED GUITAR



1 This technique combines a single close mic with a stereo pair. For the stereo pair we're using two identical small-capsule cardioid condensers in an ORTF formation (named after the Office de Radiodiffusion Télévision Française, where it was invented). This places the capsules 17cm apart with a 110º angle between them. For the mono mic, we're using our large-capsule cardioid condenser.

2 For a balanced, airy sound, start with the stereo pair between a metre and two metres away from the guitarist, and – critically – rather than placing them at guitar level, come up to around shoulder level, directing the array down towards the guitarist. Start with this set up directly in front of the player, parallel to the guitar soundboard.

3 Our focus when setting up is the stereo pair, and the great benefit of the ORTF setup is that we can easily reposition the mic array and try different distances to get the best balance of room and direct sound. Feel free to move the whole set-up not only nearer and further, but also off axis. Here, we're trying a popular technique: pointing in from the neck side.

4 With our stereo pair sorted, the final piece of the jigsaw is to bring in the single close mic. Think of this as a spot mic – the only difference is that this time the focus is on capturing the close, intimate sound. With both the stereo pair and mono mic recorded, we have plenty of flexibility to control the ambience when mixing.

ROOM ACOUSTICS AND REVERB

Recording acoustic guitar is a matter of personal taste. If you're playing the guitar yourself, what you hear is a combination of the direct sound and the room sound – plus you can feel the instrument vibrating through you. Capturing something that complex with just one mic can be tough. A guitarist will often hear their recorded performance back through the speakers and feel it's been scaled down. That's not to say that close miking doesn't have its merits, it's just maybe not what a guitarist is used to hearing.

In essence, what we're really talking about here is ambience and the part it plays in the overall sound. This is particularly significant for classical and flamenco-style playing – that is, nylon-strung guitars. By instinct, players will dig into their instrument, making the most of the space they're playing in, and encourage the room acoustic to come alive. In a studio there may be less ambience to play with, and this, again, can result in a more clinical sound.

To combat this we can capture the ambience when we record, or add some artificial ambience afterwards. We'll look at the former option here. Even so, by using multiple mics and recording to separate tracks, it is perfectly possible to prepare yourself for the second option, should you decide later that the original room ambience isn't good enough.

So, how do we get this live ambience? Well, if you have a nice space to record in, your best bet is to try and capture the guitar with a single mic or a stereo pair. By positioning this a metre or two from the guitar you can get a good balance between direct sound and ambience. Obviously, the stereo option will give you ready-made width as well.

For stereo miking, options include a spaced pair of omnis, an AB crossed pair, an ORTF spaced pair, or, for maximum flexibility later on, a mid/side configuration. All are valid techniques, but the key is in positioning them to achieve the desired balance between guitar and ambience.

Alternatively, if your room sound is compromised but you have a nearby hallway or more lively space, you can try recording with a close mic and an ambient mic or pair of mics. This is something of a compromise, but if this is the reality of the space you have then at least it does give you the flexibility to re-balance the sound later.

RECORDING ELECTRO-ACOUSTIC GUITAR

ELECTRO-ACOUSTIC GUITARS are often viewed as having poorer sound quality, but we now see far more guitars factory-fitted with decent pickups from companies like Fishman and LR Baggs. Sometimes, the plug-and-play convenience is welcome, particularly if isolation is an issue.

Electro-acoustics can vary a great deal in their technical configuration, with options including both passive and active transducers, the latter often accompanied by a battery-powered preamp, complete with onboard EQ. Further options include retro-fitted sound hole pickups and transducers with accompanying internal mics. Electro-acoustic pickups are designed for stage playing, so you'd expect to plug them into guitar amps or PAs. However, output impedances vary, and you may need to step these down prior to plugging into your mic preamp. You can do this with a DI box or high-impedance instrument input on your mic pre. Output impedances vary from high for passive designs to more regular impedances for active designs, so for the latter, you can often plug straight in at line level. If you do have a bad impedance mismatch, it will usually manifest itself as distortion.

From a creative perspective, the DI signal can be quite useful, providing a tight, edgy and upfront sound that can blend pretty well with a miked sound. The only thing to bear in mind is that there will be slight timing differences between the mic and the DI, and it will be necessary to shift one slightly. The other thing to bear in mind is that the transducer signal can be worked at source on the active controls, or on your mic pre using EQ. If you're confident in your EQing abilities, why not sculpt the sound straight off?

In the tutorial below, we're going to assume you've got a handle on basic mic technique already and focus solely on the DI, with a view to blending the two signals for the final guitar sound. ■

STEP BY STEP RECORDING A DI GUITAR SIGNAL

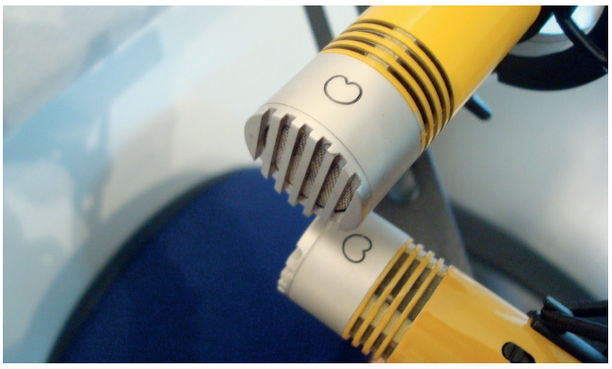
1 Let's assume we're aiming to record an electro-acoustic via both a single mic, as described earlier, and the direct feed from its pickup. Here we'll cover the pickup aspect only, since we've already covered the mic part. Stage one is to connect up to our preamp, either via a high-impedance input/DI or a line input if the impedance is suitable.

2 Our guitar includes its own battery-powered preamp circuitry. It's always wise to check that the battery is fresh – if it isn't, you'll probably notice some distortion in the signal. These active designs can usually handle different preamp inputs, but be prepared to adjust the volume output based on the type of input you're using.

3 You'll also find that the active preamp includes its own EQ settings. These are tailored for acoustic guitar, and are great for shaping low and high frequencies. Even so, if you're using a decent preamp, why not continue to shape the sound there?

4 Finally, when combining DI and mic signals, the mic signal can be delayed slightly, resulting in frequency cancellations when you combine the two. There are some hardware solutions for fixing this, or you can live with it while recording and use a track delay setting or phase rotation plugin when mixing.

STEP BY STEP MID/SIDE STEREO MIKING

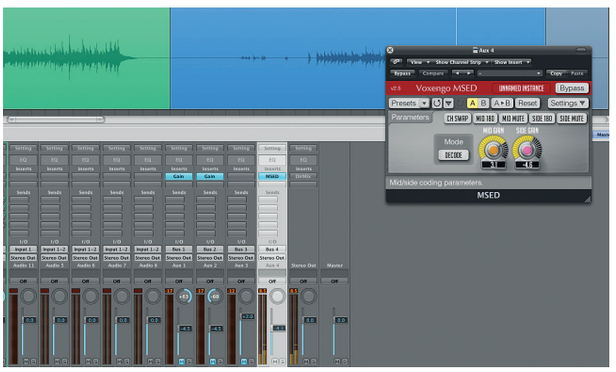


1 If your acoustic guitar is a featured instrument destined for its own space in the mix, it can be a good idea to record it in stereo. Stereo techniques are many and varied, including an X/Y pair (pictured) and the classic ORTF technique. For our steel-strung acoustic we're using mid/side, as it allows us to adjust the ambience balance when mixing.

2 To record in M/S you need two different types of mics: a figure-8 for the sides and a cardioid for the middle. The next stage is to set up the mic array in a coincident formation, ready to position. Although we're using a large-capsule mic for our figure-8, a ribbon mic can also be an excellent choice if you can get hold of one.

3 Our focus here is slightly different to that for the classical guitar, as we want our central mic to capture the direct sound much like a spot mic. So, we're back to setting the mic array up at the same level as the guitar rather than at shoulder height. Once again, for hard floors, a mat or rug can tame unwanted early reflections.

4 As an M/S setup combines the two separate mic capsules, it's important when setting up to get the capsules as close as possible. You should focus on where the actual capsules are within the headstock, and if you do M/S recording regularly, there are also a number of special M/S-only single-point mics that are worth considering.



5 One downside with M/S is that the two signals are effectively encoded when recording, and need decoding to be heard in stereo. This means that monitoring how it sounds requires decoding just for monitoring purposes. You can do this by splitting the figure-8 signal using two channels, phase-reversing one side and balancing with the mid signal.

6 More purpose-built options for this particular job include hardware decoders (you'll often find these on location mixers) and the many plugin decoders on the market. Here we're using the freebie MSED from Voxengo. By putting this on a stereo auxiliary and panning and routing both tracks, we get an instant L/R decode.

10 PRO TIPS

Give these ideas a shot to get the recorded tone you've always dreamed of...

1 FINGERS OR PICK?

Alternate between picking and fingering techniques when recording – does one sound better on the recording than the other? And if picking seems too obtrusive, does moving the microphone help?

2 TRY A DIFFERENT GUITAR

Whether you choose from your extensive collection, or you borrow a guitar from a mate, it's worth trying at least a couple of different guitars when recording: they can sound radically different.

3 PRACTICE MAKES BETTER

This is obvious. If you know what you're playing and you're playing it confidently, it will sound better by default. If you don't, it won't and all the tonal 'trouble' you're having will snowball.

4 BE AWARE OF REFLECTIONS

What's beneath you, to your sides and above you when recording? For example, you'll notice that recording on a hard floor sounds very different than when you're on a thick carpet, because of the reflected sound (or not) coming back to the microphone. Experiment, listen, learn – you don't have to kill the reflections, but you do have to be aware of what they're doing.

5 SOMETIMES, LO-FI WORKS

Jez Williams, Doves: "Sometimes, in the studio, I like the [acoustic] guitars to sound quite trashy, like an early Bowie sort of sound, and you can get that by using dictaphone microphones, and blending it with an expensive mic signal. It puts a load of middle crunch on it."

6 TRY A DIFFERENT PLECTRUM

If you're layering a strummed rhythm part, try using a thin plectrum. Different thickness picks can have a remarkable effect on tone, so before you stampede for the EQ knobs or buy that expensive mic, first try shelling out 79p on a thin pick.

7 EQ GENTLY

If you find you're needing to EQ things radically, you probably have a fundamental issue with microphone choice and placement. Get that right in the first place and you'll save yourself a great deal of work.

8 CUT BASS

You might like your acoustic all fat and bassy. It can be good when solo, but it's a problem in a band mix because the acoustic may clash with the bass. Try rolling off frequencies below 100Hz, creeping up to around 350Hz to taste. Notice how mixing just got easier?

9 FLOCK OF SEAGULLS?

If you've ever tried to mic up a guitar with brand-new strings, you'll know all about finger noises: we call them seagulls. To avoid them, get a good few hours on the strings before recording. Coated strings can reduce squawks too.

10 JUST FEEL IT

Dan Auerbach, The Black Keys: "I just put the mic in front of me, it really doesn't matter. Some of my favourite acoustic sounds are field recordings, a really cheap mic picking up the vocal and the acoustic. I don't like perfection; it really bores the s**t out of me."

ADVANCED RECORDING: ELECTRIC GUITAR

Recording killer guitar parts the right way doesn't have to be taxing, as this guide will show you

There's a difference between recording electric guitars and acoustics. How? You'll most likely be miking up an amp, for starters, though many of the same ideas can apply. Either way, the goal is to produce a great sounding, well played, well captured performance. There are many ways of achieving your desired sound, and of getting that sound into your computer or recording device. Over the next few pages we'll discuss how to find the right method for you, and how to get a first take underway.

Guitars are like many other instruments, in that getting them to sound right starts with the instrument itself – and if that instrument is amplified, the amp will also play an important role in the equation. So, even if you're not a guitarist, it still helps to know that a guitar with twin-coil pickups (say, a Gibson Les Paul) will produce a thicker tone than one with single-coil pickups (like a Fender Strat). At the same time, a rock-style amp, such as a Marshall, will have a crunchier tone than a Fender. For bass, a MusicMan will produce a smoother tone than a Fender Precision, with its more upfront sound.

A quality, in-tune instrument with decent pickups and fresh strings, played well and plugged into a decent amp, will sound excellent at source, but chip away too much at each of those variables and you will find that the results may begin to deteriorate rapidly, irrespective of how you record them.

Beyond that, there's a vast range of other things for you to consider when recording, including not just how to record (mic, DI or both) but also what to record (effects, overdrive, room and so on). There's an awful lot to learn, so let's get busy recording your electric!

RECORDING WITH AN AMP AND MICS

FIRST OF all, you'll want to decide whether recording with an amp and mics is right for you. The pros: great tone if you get it right; it's simple; great player feedback. The cons: the noise can be disruptive; you have to live with the sound forever; it requires lots of space; good amps and mics can be expensive.

LISTEN CLOSELY

GET YOUR amp sounding right in the room first. Spend a bit of time thinking about the kind of sound you want to achieve and listen objectively. This is the time to experiment – getting it right at the first stage will make miking a lot easier. Try your amp in different areas of your room at the volume you're going to record at. Sweep your amp's tone controls through their range while playing and stop each one when it sounds right. Once you have set up your sound, it's time to position the microphone.

GET CLOSE

MANY ENGINEERS like to close-mic amps and cabs with a dynamic mic. Believe it or not, placing the mic at different points in front of your speaker has a huge effect on the sound you capture. Start with the mic placed one-three centimetres away from the grille, pointing halfway between the centre and edge of the speaker. Moving the mic by just a couple of centimetres will change the sound. As a general rule, miking the centre gives you a bright sound, while moving the mic towards the edge of the cone makes things sound darker. Moving the mic away from the amp introduces ambience to the sound.

MAKE YOUR MARK

ONCE YOU'VE found the position in which you're going to place the mic, use some tape (any kind is fine as long as you can easily see it) to mark the exact spot on the speaker grille. This will save you much time if your mic gets moved during the recording and you need to reposition it. Obviously, if you're using a cab without a grille, it's advisable to skip this step.

SHED SOME LIGHT

IF YOU can't see through your amp's speaker grille, carefully feel around the edge of the grille to work out where it's positioned inside the cab. Another option involves shining a torch through the grille cloth. When doing this, you should be able to make out the outline and centre of the speakers.

DUAL MICS

BOTH DYNAMIC and condenser mics are suitable, and a cardioid pattern is advisable. With very close miking you may also be able to gain some proximity effect to bolster those low frequencies. For more flexibility, it's also possible to use a pair of coincident mics, blending them to achieve various different sounds. And for ambience, you can add in a room mic, too. Be prepared to use additional room damping or set up a dead isolation space for the amp, though. And just bear in mind that loud overdriven guitar, of which feedback is part of the sound, requires physical proximity of the guitar player to the amp, so you'll need to put the player in the room with the amp and then have them wearing a pair of loud headphones for monitoring.

DON'T SOLO

WHEN YOU'RE trying to carefully balance the instruments in your mix, you will need to listen to each of them in isolation from time to time. However, when you make tonal adjustments to a specific part, always check to see how it sounds in context with the other tracks in your song. Sometimes, what sounds right on its own won't fit in a busy mix.

LOSE THE BASS

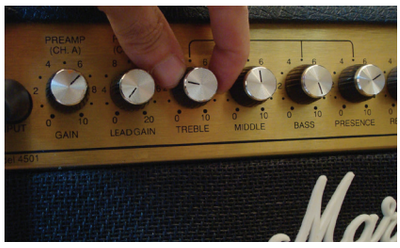
DON'T TRY and cram a load of low-end in on the guitar. It's got to have some low-end, obviously, but the bass guitar needs to have its space as well. ■ >

STEP BY STEP BASIC SINGLE MIC TECHNIQUE

1 Grab a good quality dynamic mic and seek out the speaker cone. Here we're using a torch to pinpoint where the cone is. As you can see, the centre of the cone is quite small. With this found, we can now set our mic up pointing right at the centre.

2 Imagine a horizontal line through the centre of the cone and try different mic positions, moving towards the outer edge. You'll get an increasingly mellow tone, with the cone centre becoming slightly off-axis. To make it more so, angle the mic away.

3 The speaker tends to be set back from the cloth, so even if you're up against it you'll still be about ten centimetres from the cone centre. Even at this distance the sound can be harsh, so try starting up to 20 centimeters from the cloth. Here you'll find small changes in mic position have less impact.



4 Finally, if things aren't working, don't be afraid to try a different type of mic – such as a ribbon mic, which will give you a nice smooth tail-off in the high frequencies – or you can adjust the amp sound. Here we're modifying our amp tone controls to deliver a warmer tone.

STEP BY STEP TWO MICS ARE BETTER THAN ONE... SOMETIMES

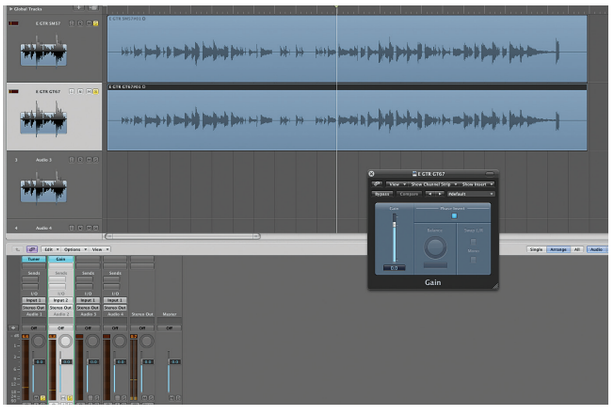
1 There are various ways you can approach using two mics on an amp, including spaced stereo pairs. However, our technique actually uses a coincident pair of different mics with the goal of blending them into a mono signal at the mixdown stage. By balancing the two mic characteristics, you can achieve many sounds.

2 The first step is to choose your mics and get them set up. We're using our trusty Shure SM57 for upper-mid articulation, and a valve condenser for low-frequency proximity and a more 'hi-fi' top end. Both mics should occupy the close-in position that we used for our single-mic technique.

3 This is a coincident technique, so the capsules must be as close to each other as possible and pointing in the same direction. The idea is to minimise phase cancellation when they're balanced evenly. If necessary, set up a cue mix, put on some cans and move the mics while the guitarist plays to help find the sweet spot.

4 Much like our single-mic technique, you'll still need to position the pair of mics in relation to the speaker cone. It can be tough making this uniform if the mics are side by side, so we're actually putting one above the other. Now, when we move the whole array towards the cone edge, there's more consistency.

5 Next, route each mic to its own track and get their levels closely balanced. This requires a bit of trial and error, but essentially you adjust the mic pre gain for each with your faders at unity or equal gain. Then you can rebalance the monitor faders to hear how different blends affect the tonality.



6 Finally, with our two tracks recorded, we can further explore the multitude of sounds available. It may be that we opt for just one of the mics on its own, or we might just blend in a tiny amount of the second. We can even phase-reverse one track to create further interesting combinations.

BEST OF BOTH WORLDS

So far we've recorded one or two mics, possibly blended prior to recording, but essentially we've been capturing the guitarist's live sound. However, there is another option, which involves recording a DI (direct injection or direct input) signal either in isolation or in conjunction with the miked sound.

So what are the advantages of this approach? Well, first of all, if you split the DI immediately after the guitar or bass output you have a completely clean signal that you can blend in with the amped sound, reprocess or even use on its own. You may think that this last option sounds absurd, but with bass guitar, a clean DI'ed sound can often be worked effectively with some EQ and compression into the punchy, tight low-end glue a track needs. And if you're after funky, clean picked guitar, a DI can be just the ticket for that as well.

As noted, you can blend the DI with an amped sound for more clarity, or even use it as a re-amping source. Re-amping gives you the flexibility to compile a number of takes and then send the clean DI source back out to an amp. Of course, you're then free to try out all sorts of different amps, mic positions and so on. This is a tried and tested technique that predates software amp simulations. And speaking of amp sims, those, too, are of course an attractive reason for recording a clean DI (see Software Amp Modelling, later in this feature).

It's worth noting that DIs can be taken at other points in the signal chain – after the guitarist's pedal board, for example. You'll also find amps (particularly bass amps) with DI outputs onboard, and these can be useful if you want to capture the drive of the input section. Be careful, as the DI can be tapped from various different places in the preamp, including before and after any EQ or onboard processing, or be artificially enhanced to sound like it's been through a speaker. Either way the amp sound, particularly for guitars, is heavily influenced by the speakers, so tapping the signal just before that can sound odd.

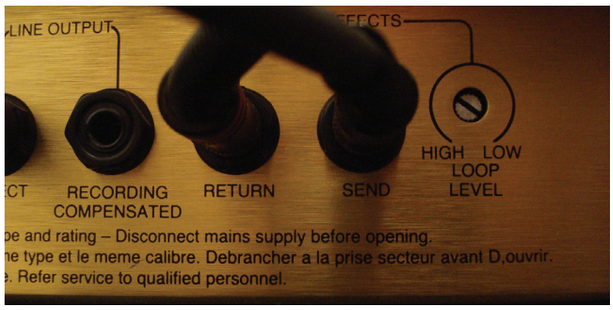
Finally, you might find that blending DI and miked signals may highlight a slight delay between one and the other. If this occurs, you'll need to delay or phase rotate one of the signals to get things working, as switching the polarity of one signal is usually too big a change to be effective. There are some hardware units that can do this, but this part of the process is best left until you're mixing.

DIs can be taken at any point in the signal chain, after the guitarist's pedal board for example

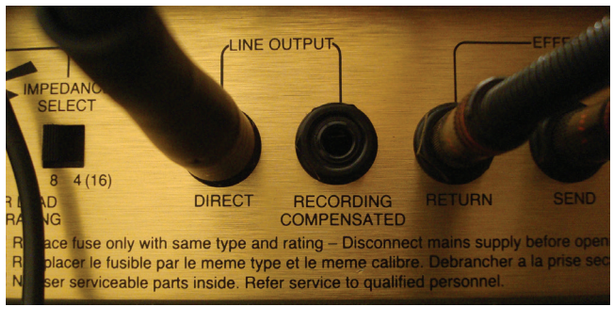
STEP BY STEP DI SPLIT RECORDING

1 The most obvious point at which to DI your signal is immediately after the guitar output, using the DIs balanced out to feed the mic input of your mic pre via an XLR lead, and the pass-through connector to continue the signal to pedals and amp. (Note: our DI is active and powered by phantom power or battery.)

2 Some pedals work well at source – wah-wah is the perfect example of this as the playing and pedal interaction are vital to the overall effect. Here we're taking our DI split straight after the wah and prior to the guitar amp, so that the DI will include the wah-wah effect but nothing else later in the chain.



3 We also have a guitar multi-effects unit and preamp modeller in our chain. Here we're using it solely for its effects (chorus, delay, and so on), and it's connected to the effects loop of the amp. So, with our DI split prior to the amp and effects loop, we get a clean DI but still hear the effects via the amp.



4 It's worth checking out the options offered by your amp. Ours gives us a post-preamp DI feed and a post-preamp 'recording compensated' output. The latter is lower-level but also has a thinner sound than the DI, so each can have its uses, as long as we're aware of how they sound and take that into account. >

PRE-PROCESSING ELECTRIC GUITAR

MOST GUITARISTS and bass players sculpt their sound at source using pedals and their amp's onboard EQ, reverb, drive and so on. But when recording, you have to ask yourself which of these elements could be problematic when mixing and which you might be able to improve on using better plugin effects. So, which bits should you record, and which parts would it be better to bypass?

As a general rule, though, try to avoid too much reverb. You could be recording some spring reverb-drenched surf guitar à la Dick Dale, but being tied to a fixed reverb balance can be pretty tough when mixing. So, the first step is to make sure the reverb is turned down or off.

Next, it's delays and modulation. Delay can have a huge influence on the way a guitarist plays (think of U2's The Edge, for example), particularly when tempo-synced. The best advice here is to simply not record these sorts of delays with the signal. By tapping the DI off prior to the delay, the player will still hear the effect via the amp.

Modulation effects such as chorus are less time-critical. If you have a great-sounding chorus or phaser pedal that's integral to the sound, consider recording it with the signal. Tone-shaping effects like wah-wah tend to be inextricably linked to playing, so we would advise recording these as part of the signal unless you're confident that you have the tools and skills to replicate them later.

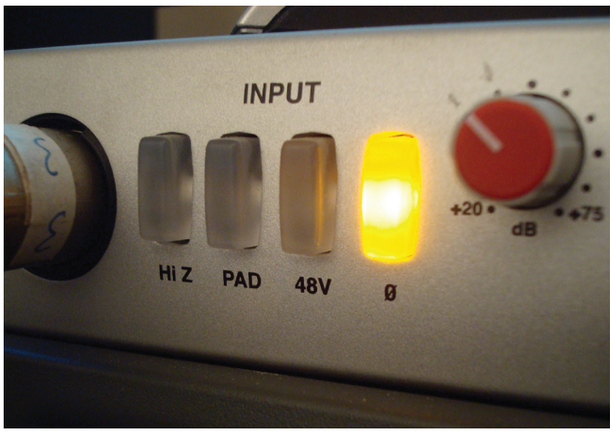
DRIVE TIME

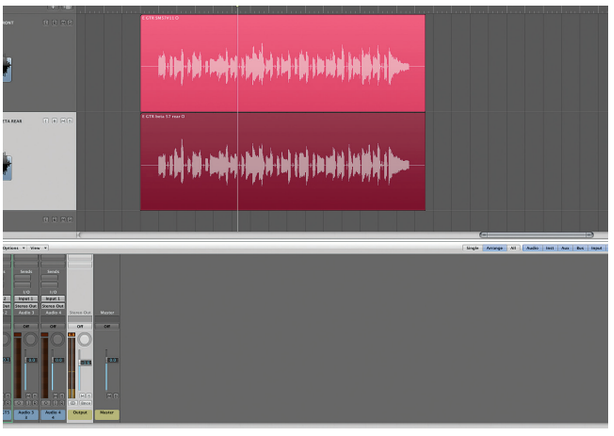
TYPICALLY, DRIVE is added by both distortion pedals and preamps. Many amps allow you to tap a DI off after the preamp stage, but these can sound edgy. If you do want drive in your recorded signal, use a pedal for it and tap the DI off straight after. Compression and EQ can both play an important role in the source sound, and bass players often squash their tone to deliver a more consistent feel. This can be a bit extreme, but don't discard it outright. Often, it's best to go for a more conservative version of their sound, and pre-process with better-quality outboard EQ and compression if available. ■

STEP BY STEP MIKING THE BACK AND FRONT OF THE AMP

1 It may seem counter-intuitive, but miking the back of a guitar cabinet as well as the front is a great way to get a slightly different sound. For this technique you will need an open-backed amp such as a typical combo, and two microphones. You should move the cabinet away from the wall to minimise unnecessary early reflections.

2 The positioning for the front mic should be the same as in our standard single-mic technique. The rear mic can be harder to position, though – you'll typically find the amp's valves in the corresponding space at the rear of the amp, and in an all-valve amp they'll be large and hot. Even so, try and access the rear of the cone at the same position and distance as your front mic.





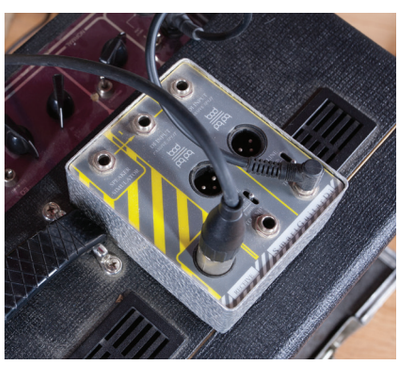
3 In this position, your rear mic is picking up a phase-inverted version of the front mic to some degree, as the cone will be moving away from the rear mic when it's moving towards the front mic. It's good practice to phase-invert the rear mic at source. If you can't do this, make a note that it needs inverting on its track.

4 If you have the option to monitor the two mics with one phase-inverted, you will appreciate the range of sounds you can achieve by balancing them in different ways. At times, the scooped hollow nature of just the rear mic itself can also be pretty usable. >

RE-AMPING

While we're on the subject of DIs, another great technique is re-amping. By sending the same DI from your DAW back to an amp or pedal chain, you can mic up the results and tweak settings while judging the results in context. Probably the most indulgent option is to set up the pedals and amp head in the control room, with the cabinet isolated elsewhere. However, to achieve this successfully with correct impedance matching and minimal noise, you will need a suitably equipped DI box (check out units from Radial and Little Labs).

Finally, another slightly odd-sounding technique that can be particularly good for rhythm guitar is to actually mic up the electric guitar strings, as if the guitar were an acoustic. This adds extra poke and attack to the sound that you can blend with the amp into mono, or even pan against the amp sound. The only thing to remember here is that you'll need to isolate the amp in another room in order to avoid spill.



SOFTWARE AMP MODELLING

UP UNTIL now we've focused on capturing your guitar sounds through your amp with a mic or via DI. Of course, these methods aren't going to be practical for everyone. If you're planning on recording at unsociable hours, or you can't crank an amp at home, amp modelling could be your new best friend.

One of the benefits of software amp modellers is that they keep everything inside your computer, meaning that you can run multiple instances of them (computer power permitting). And the best thing? You can tweak your settings after you've recorded your guitar sounds.

Most software will be set up to record the sound coming in from the interface as a dry track. So even though you are hearing the sound of your guitar being fed through a virtual amp, it's actually being added when you play back, rather than to the recorded file. This means your sound remains totally flexible throughout – a bit like re-amping. But tread carefully here, because it's easy to get caught up in endless tweaking!

On the plus side, there are hundreds of available sounds, recording is silent, it's space efficient, and you can change sounds after you have recorded. And the cons? It requires a powerful computer; there's less player feedback than you'd get from a 'real' amp; it can sound processed and artificial. ■

HOW TO STEAL THAT SOUND

Ever heard a gorgeous guitar tone and then spent ages tweaking your EQ controls to try and match it? By using an EQ with an analyser it's possible to quickly get into the right tonal ballpark you're aiming for.

Firstly, import the audio track of the guitar sound you like into your DAW. Next, select an EQ with an analyser, or you could choose a spectrum analyser plug-in (most DAWs have one included these days). Play the track and take a good look at the EQ curve. Then, try to match it with an EQ plug-in on your own guitar track. It won't tell you things such as pickup type, tuning or gain settings, but you should be able to get pretty close.

LEVELLING UP

Getting a good signal from guitar to computer is absolutely essential, so here's how to do it right

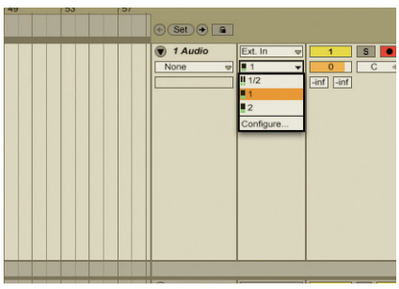
TRADITIONALLY, ENGINEERS miked up acoustic guitars or amplified electrics. Since the advent of amp simulators, we can bypass this process and concentrate on getting a healthy guitar signal straight into the computer without having to resort to a multitude of outboard processors and effects pedals.

These, of course, used to be recorded onto the track itself and couldn't be changed afterwards, which meant your sound had to be perfected before recording. Nowadays there's no need to spend hours setting up your gear – you can focus on getting your moments of inspiration down and have all the time in the world to reconfigure the sound once it's inside the computer.

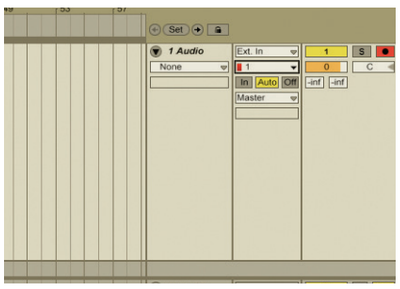
Needless to say, your guitar still needs to be set up properly and tuned before each and every take. Quality cabling is also vital, to carry your signal from the guitar straight to the computer without degradation or interference. Lastly, your soundcard – which works to convert the analogue signal of the guitar into a digital one – should be the best you can afford, although it needn't be extortionate if you're recording one instrument (or vocal) at a time.

But if you're not getting the best signal into your sequencer, then a brilliant performance can be ruined, no matter what sonic trickery is employed at a later stage. Our goal, then, is to record a strong signal to mask any background hum, yet one that never reaches 0dB or suffers from digital clipping. Below, we explain how to do it... ■

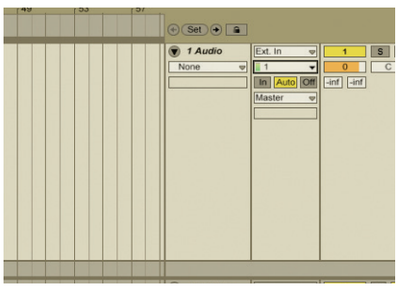
STEP BY STEP GETTING YOUR GUITAR INTO THE COMPUTER



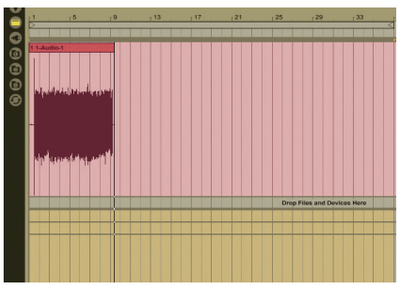
1 The electric guitar has a relatively low output volume so, in order to provide some boost, you will need to connect it to the hi-Z (hi-impedance) or instrument input on your soundcard. Now, select and arm the corresponding input in your sequencer for recording. The guitar is mono, so we've set our audio track to record only the left channel.



2 The input meter should register your playing. You'll need to adjust the gain control on your soundcard to accommodate the type of material you want to record, whether that's a rather heavily strummed chorus or a softer, picked intro. Play the section a little harder than you normally would and increase the gain until it peaks constantly.



3 Once your signal is clipping, gradually reduce the input gain until only one or two peaks register. Now, play the section normally and be sure to check that the input level never goes into the red – if it does, reduce the input gain by a small amount only, play your sequence again and then check to make sure that no peaks occur.



4 Now that you've got a healthy signal, record all of your takes without adjusting the input gain settings. If you want to record a louder or quieter section, follow the previous steps again to ensure your signal remains at the optimum level. If you want to record an entire song in one pass, set the input gain for the loudest section.

5 After each take, listen back to the recording to make sure no digital clipping has occurred, and also check that the signal was strong enough to mask any background hum that may have been present. Finally, zoom in on the waveform for a visual reference. Note that the signal is healthy throughout our take, yet it isn't slammed up to 0dB.

6 Now you can employ your favourite amp simulator and add effects. We didn't put any additional strain on our computer's CPU during recording by applying effects. With the recording finally done, you're free to use compression, reverb and anything else your heart desires to sweeten your epic guitar take! >

HARDWARE AMP MODELLING

USING A dedicated amp modeller has its benefits over using software. For starters, tweaking is (usually) easier and it won't put any additional strain on your computer. There are loads to choose from – think Line 6, Boss, Vox and Fractal – and many hardware units also have a USB connection that will act like an audio interface.

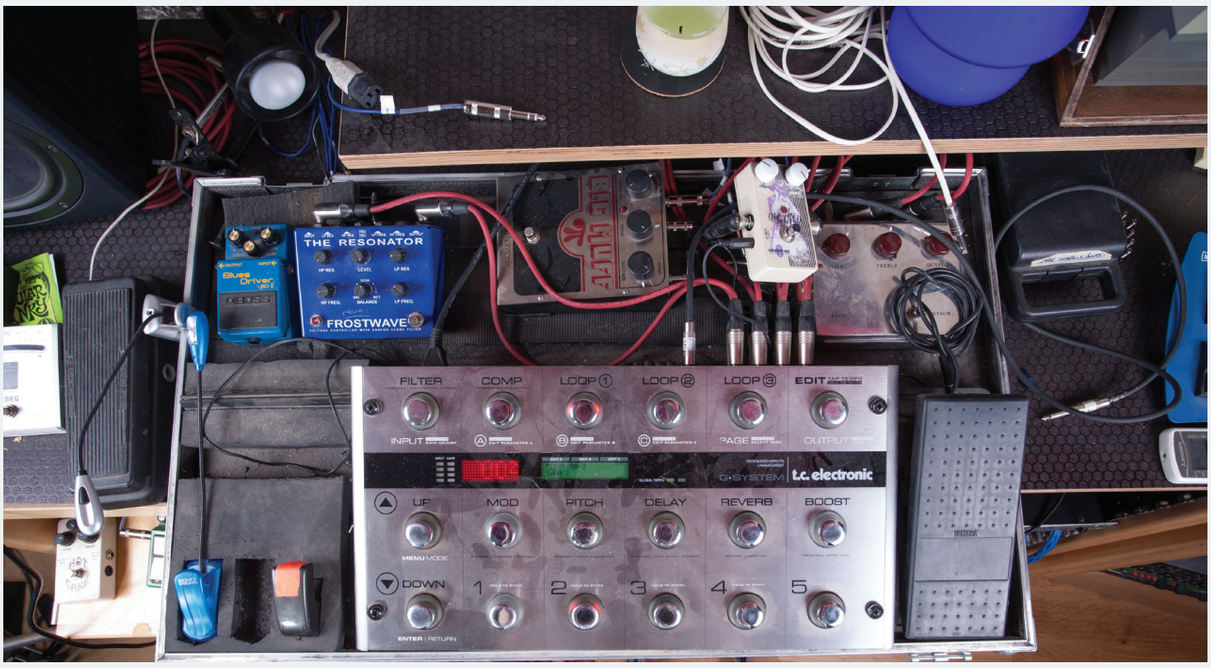
The advantages of using a dedicated amp modeller include: when it comes to sounds, there are hundreds available; recording is silent; an amp modeller is also space efficient; they're relatively inexpensive to buy.

The cons include: it can sound a bit processed and, in some cases, artificial; less player feedback than a 'real' amp. ■

ESSENTIAL GUITAR TOOLKIT

You're not a real guitarist until you've got this lot and you know how to use it all

Tuner
Strings
Picks
E-bow (magnetic device for infinite sustain)
Straps
Strap locks
Capo
Bottleneck (for playing slide guitar)
Guitar stand
Cables
Fuses
9v batteries
Chord book
Well stocked iPod for reference; there are some great phone apps, too – check out Guitar Toolkit



TECHNIQUES FOR YOU TO TRY

By now you should have an idea of how you're going to record your guitar. Here are some other ideas to boost your recordings...

LAYERING

Very few recordings these days are created using only one guitar track for rhythm and one track for lead. If you want your guitars to sound bigger, you will need to start building up layers.

JAM WITH YOURSELF

Unless you're a robot, you will never play the same part in the exact same way, and just as multiple violins in an orchestra sound huge, the tiny fluctuations in timing and tuning that occur when double-tracking combine to create a sense of fullness. Of course, you will want to play the part as tightly as possible, and also tune up between takes.

DOUBLE TRACKING

Double-tracking is one of the most common and simplest ways of beefing up your guitar recordings, and if you're not already doing it, prepare to be enlightened. The principle is simple: record your guitar part, then record it again. With two very similar guitar tracks on separate channels, set them to equal levels on your mixer. Pan one track hard to the left, and pan one track to the right so they're not taking up the same sonic space, and you should find that your whole sound becomes clearer.

VARY YOUR SETUP

Remember what we said about small changes having the biggest impact? By changing elements of your setup in between takes, you can easily add a subtle sense of variation to your tracks. Try a different guitar, pickup position, pedal, mic (or mic placement) to add further interest to your tracks.

DON'T CUT AND PASTE

Resist the temptation to simply cut and paste the same audio take into multiple layers: it won't gain you anything. In fact, you could even end up taking away from your sound's fullness. This is because your parts will be perfectly in sync with each other, and they will contain the same harmonic information, causing phasing. As the two parts coincide with each other, you'll notice certain frequencies start to disappear, leaving you with a thin, swirly mess.

LOWER YOUR WATTAGE

To get that cranked-amp sound at home volume levels, it's often better to drive a smaller amp harder. Use cool-sounding smaller amps so that the actual volume is not killing and destroying. What happens to your ears when you hear something really loud? They close down.

BASS GUITAR: THE LOWDOWN

Whether recording or programming your parts, become an ace of bass with our guide to low-end production

When it comes to guitars, it's usually those of the six-stringed variety that tend to steal all of the limelight. But without someone solid holding down the bottom end and keeping things moving, guitarists wouldn't have the freedom to go off and do their thing, making the bass guitar a vital part of any band.

These days software enables us to record, edit, tune, shape and manipulate guitar sounds quickly and effectively, and that includes bass guitar as well. Today's amplifier-modeling software emulates such classic amp rigs as Ampeg's SVT (IK Multimedia Ampeg SVX) and more boutique-style offerings like Mark Bass (Overloud's Mark Studio 2). These often include bass-specific effects pedals as well as cabinets, both contributing to the overall sound achieved.

Great though these tools may be, they aren't going to be much use if your raw bass sound isn't up to scratch. Playing style, instrument and strings, as well as the amp and mic choice, pickup choice and the quality of your preamp/DI front-end, will all have an effect on the final bass sound quality.

In this feature we'll start with what makes a good bass sound, and then we'll move on to consider how you can refine and even combine things to get the exact sound you're after. We'll take a look at bass-specific software, including the likes of virtual amps and pedals, as well as more esoteric plugins like phase shifters.

As well as processing recorded parts, software can also provide you with the raw bass tones themselves via sample-based ROMplers – these are a godsend if you don't have a bass guitar or a bassist yet still want to get a 'played' sound on your final track.

Finally, with all that sorted, we'll finish up with a little info on mixing, focusing on both the essential processes such as EQ and compression, as well as additive effects like reverb.

BACK TO BASS-ICS

DIFFERENT TYPES of bass each have their own unique sound, character and genre suitability. At the rockier end you've got the thick, rounded Fender Precision (aka 'P Bass') and the edgy Rickenbacker 4000 Series; while for funk and pop sounds there's the refined upper mids of the Fender Jazz and the punchy Music Man StingRay. Beyond those you'll find a bewildering array of bespoke, modded and visually stylish instruments by Wal, Status, Warwick, Alembic and so on. Many of them have five or even six strings, extending the playing range, tonality and technical complexity of the instrument even further.

Pickup configurations also vary, and this, along with the onboard tone controls and choice of active or passive internal electronics, further influences the sounds that individual instruments can make.

A bass guitar generally comes from the factory equipped with 'round wound' strings. These are much like the low strings on a guitar, made of a solid core with a thin wire wound around it, and they produce the brightest sound. There are also flat wound strings which elicit less finger noise but aren't as bright as round wound, and thus are best suited to fretless and double bass. Ground wound offer a smoother alternative to round wound, but tend to be pricier. Strings also come in a range of thicknesses (gauge), further influencing tone and sustain.

PLUGGING, PLAYING AND RECORDING

FOR AMPLIFICATION, you can use anything from a cabinet with a separate head to a single-speaker combo. The amp stage can be super clean, overdriven, tube or solid-state and invariably includes tone-shaping. The sound you hear in a room will depend on the way the room interacts with the amp, and this will be influenced by the volume you dial in. Low frequencies also tend to cancel out in untreated rooms, so you may find the sound you get varies depending on the amp's position.

Your bass sound will also be affected by the style in which it's played. Finger playing gives a solid legato sound; picked playing, more percussive articulation. The most percussive technique is slap, which generates not only a mid-range percussive sound but serious low-end thump. There are 'ancillary' techniques like slides, bends, hammer-ons and pull-offs, the proficient delivery of which can turn a simple bass part into a fluid, pro performance. Playing near the bridge can produce a brighter, pokier sound.

Recording highlights issues such as tuning (check your tuning regularly) and intonation, which concerns the tuning consistency at different points along the neck, and from string to string. Ensure your bass has been set up properly.

Be aware that pickups can capture buzz, hum and interference from phones, monitors, lights and ground loops. You might find that moving around reduces this, while some amps include a 'ground lift' option to fix ground loop problems. Finally, playing inconsistencies such as string scrapes can become very annoying further down the line. ■

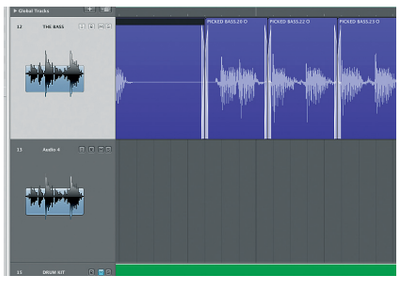
STEP BY STEP BASS PLAYING STYLES

1 For a full, rounded sound, fingered playing is the best option and you will hear it in all forms of music from pop to fusion. It's a playing style that requires focus to develop speed at, however, and fast notes can get a bit lost unless you have really good playing technique.

2 Picked bass has more attack and thus cuts through the mix much better. It's a technique often used by rock players and it sounds particularly good with a P Bass or Rickenbacker. Pick precision also makes it great for fast, aggressive playing. This approach can work well with groove parts, too.

3 Playing position also has an effect on the sound that you make with your bass. One technique you could try is playing near the bridge (as shown above) for a poky, more cutting sound, or playing where the guitar neck joins the body in order to achieve a warmer tone.

STEP BY STEP CREATING A GREAT BASS SOUND



1 Let's kick things off here with a DI bass sound. We have done some editing on the performance because the timing is slightly out in places. We've also gone for the picked sound as our starting point because we like the brighter attack – it's more suited to the sound and style we're after.

2 Next, we load up an amp sim plugin (here its Mark Studio 2). This patch includes a tube preamp and a 6"x10" cabinet with a 1" tweeter. The sound instantly becomes bigger, rounder and closer to what we're after. Much of the sound comes from the miked cabinet, so we'll try to improve that next.

3 Although we like the sound, it's just too big. We can adjust the cabinet in a few ways, starting with mic position Far and cone Border settings. For extra attack we could also switch to a dynamic microphone. We like the sound of the ribbon, though, so we stick with it.

4 Now we set about adjusting the sound with our pedal board. The first stop is the compressor. With a fast (lower) Attack and Release, we can add sustain to the sound and emphasise the pick sound. Some Chorus can also fill the sound out, adding subtle richness – a little goes a long way, though, so be careful here.

5 Our amp model is pretty clean, so to dirty up the sound and add some edge the distortion pedal is our next port of call. Care is required with this one so we only add the tiniest amount of Gain and keep the Tone setting clear of excessive high frequencies. It's easy to go overboard, so step back every now and then to listen to what you're doing.

6 Our plugin lets us blend in the original DI signal nicely and without any fuss, and here we want to try phase shifting it as well. In a relatively simple process we copy the audio onto a new track and then load up our phase alignment plugin. Once this is done, it's clear to hear how the sound changes as we rotate the phase. >

RECORDING OPTIONS

WHEN RECORDING guitars, you'll often take a clean DI (direct input) signal as well as the amplified one, giving you the option to reprocess the sound later. With bass, the DI is often the more useful signal, and when a solid, clean sound is your goal it may be the only sound you use.

Many bass amps incorporate DI outputs, making splitting the signal at the source much simpler. However, these DIs sometimes follow the initial preamp stage, so the sound could be influenced by it. For a totally clean signal, a simple DI box enables you to split the signal into two before it gets to the amp. If you're only recording the DI sound, many audio interfaces include high impedance (Hi-Z) inputs to facilitate this.

MIC OR DI?

WHETHER YOU'RE recording a bass amp in a room or using a software emulation to amplify a recorded DI signal, you will probably end up wondering which one you should use: the amp or DI version. For the most part it comes down to genre, but bear in mind the character of the other instruments in your music. If you have overdriven guitars in your mix, for example, your bass should probably be kept pretty clean.

However, you don't have to choose between amp and DI – you can use both. By combining the solid, clean sound of the DI and the driven, edgy sound of the amp/cab, you can get both flavour and precision. Unless you have supreme confidence in your ears, it's advisable for you to keep the two signals separate, rather than blending them at the recording stage, so that you can adjust their balance throughout the mixing process if necessary, and process each one differently in turn. If you're using an amp sim rather than a real one, you may also be able to simply blend the DI and amplified sounds within the plugin.

PHASE CONSIDERATIONS

THE PARALLEL DI/amp approach is great, but it can raise phase issues. If you're recording the amp cabinet live, mic position can influence the phase relationship between the cabinet signal and the DI, and you may notice certain notes sound louder or quieter than they should. You can address this later by marginally shifting one of the audio parts or using a corrective plugin (see below).

There are hardware solutions, including mic preamps with continuous phase adjustment or DI boxes with flexible phase adjustment options. Whichever solution you choose, be aware of phase issues if you're planning to blend DI and miked sounds. ■

BASS PLUGINS

IF YOU only have a DI signal to work with, it needn't be a problem thanks to the many software amp and pedal emulations available. If you don't have the means to record a real bass at all, there are some truly excellent bass ROMplers that can sound every bit as good as a real bass.

AMPS AND PEDALS

BASS AMP plugins are less commonplace than their guitar amp counterparts, but you may find that your guitar amp sim includes some bass amp options. It's a similar story with virtual stompboxes, most of which are bundled with amp plugins and not available separately.

Waves GTR3 covers all bases, with seven bass amps and six bass cabs, as well as 25 amps and 26 pedals for guitar. It can also run in standalone mode. Native Instruments' Guitar Rig 5 includes a bass amp and cab, along with a ton of general-purpose effects.

Overloud's Mark Studio 2 is a full-on emulation of the Mark Bass amplification system, boasting six amps, nine cabinets and five pedals. Cabinet options include various mic positions and a rear bass port level control. Studio Devil's Virtual Bass Amp Pro takes a slightly different approach and features two discreet amp channels, each with its own compressor, preamp and power amp. These can be mixed, or you can use the adjustable crossover to bi-amp them. Finish that off with chorus, reverb, a 12-band graphic EQ and one of three cabinet emulations or DI emulation. Softube's Bass Amp Room only includes one bass amp and three cabinets, but the click-and-drag mic positioning is pretty flexible. It includes three tone controls and a DI mix fader.

Ampeg SVX is a well-established bass plugin boasting four amps, six cabinets (including six mic types) and eight pedals (including Ampeg-certified Octaver and Overdrive). It's now augmented with IK's awesome Custom Shop, with add-on options including amps and cabs based on classics from Trace Elliot, Orange, Fender Bassman and Gallien-Krueger.

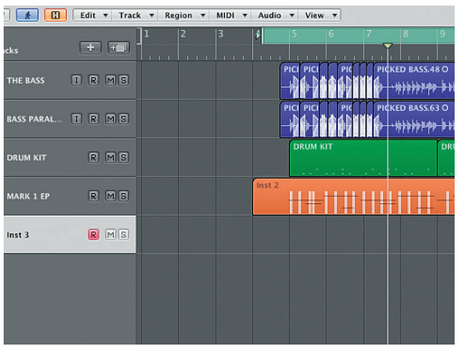
OTHER PLUGINS

AS TOUCHED on earlier, phase differences between miked and DI signals can often create problems with your low end. You can resolve this by either delaying one signal to better align it or by 'rotating' its phase using an all-pass filter. Applying the latter process essentially means that different frequencies are delayed by different amounts, and Universal Audio's plugin emulation of the Little Labs IBP (InBetween Phase) is a good option, with a time delay control so you can use either technique on its own, or both together.

Voxengo's PHA-979 takes a similar approach (delay and phase rotation), but also offers individual left/right phase control. Waves' InPhase is a bit more complex, being capable of handling two-channel audio – either a stereo pair or two mono channels using the sidechain input. With zoomable waveform displays for each signal and both delay and adjustable filter-based phase shifting, it's a powerful plugin.

Finally, we have the Sound Radix Auto-Align and Pi plugins. Auto-Align automatically adjusts timing to correct phase relationships, while the Pi plugin dynamically rotates phase for the very same purpose, working to enhance punch and coherence. ■

STEP BY STEP MIXING BASS



1 At the mix stage, bass comes either as a single mono track or as two or more layers that make up the whole part. Here we have two tracks of bass; the first stage is to buss them together so that we can process them both individually and as a blend, so we route both tracks to the same bus (aka group channel).

2 We zone in on the EQ of each individual track. It's clear that the amp sound is providing the mid-range edge and the DI is supplying the low-end. To tidy up the amp sound, we use low- and high-cut filters. The low-cut will help avoid very low frequency cancellation when blended with the DI, while the high-cut gets rid of extraneous noise.

3 The DI track is providing more of the true low end, and we can enhance this slightly with EQ. Here we are using a low shelf to boost at 110Hz and below. We can also curtail some of the higher frequencies with a high shelf cut. This is a gentler, more musical solution than a high-cut filter.

4 By compressing the two tracks together as a sub-group we can make them gel as a unit. Our first compressor, Cytomic's The Glue, is a punchy VCA design, and with a quickish Attack (0.3ms) and fast Release (200ms), it adds punch to our sound and slams the pokiness a little, making the sound fatter overall.

5 For additional finessing we follow the VCA compressor with a gentler compressor. We go for a valve model, just tickling the gain reduction circuit by no more than 2dB. This gels the sound further, particularly at the release stage, and imparts a touch of valve-style warmth.

6 At this stage it's not unusual for the sound to feel too narrow in terms of stereo field. An excellent way to add subtle width enhancement is with a small ambience reverb. We keep the Decay time short (about 100ms) and set a high-cut at 1.7kHz to contain the higher frequencies.

ADVANCED BASS EQ

If you need to EQ the bass heavily at the mix stage, you need to address very low sub-bass frequencies, which are the lower mids that fill out the sound, and the frequencies near or on top of the kick drum. Without big monitors or a subwoofer you won't be able to hear the sub frequencies in the bass. Once you start adding some low-frequency EQ or combining two bass sounds, you can end up with peaks and troughs competing with other sounds. It's preferable to be able to hear these (a subwoofer helps) and/or view them using a spectrum analyser. Focus on 75Hz downwards and combine suspect parts gradually to detect any cancellations or peaks. Try notching the problem frequencies out.

If your bass lacks fullness, focus on 500Hz down to 150Hz. Sweep a bell-shaped EQ boost through this range to zone in on the problem. Often a broad boost of a few dB will add the low-mid glue you need. If your mix sounds too full in the low frequencies, it's often this same area that's to blame. It could be down to other instruments, so you'll need to modify each one to provide space for the bass.

Bass guitar and kick drums can clash, so you might need to notch out some of the kick frequencies from the bass part. A frequency analyser can assist in finding the kick frequency (90Hz is a good place to start). Try pulling out just a few dB from the bass with a narrow Q at the kick frequency to begin with.

ADVANCED RECORDING: DRUMS

Everything you need to know to get the best from both drums and drummer for that all important kit recording session. From sticks and skins to mics and miking, it's all here in this definitive guide

Although at first it might not seem like the case, recording drums is actually surprisingly easy. Admittedly, it's often the sound of a badly recorded kit that makes an otherwise great track sound like a 'demo', but if you follow some simple rules, you can avoid the pitfalls.

Of course, a posh recording studio would make things easier, but we are going to be recording at home and turning our DAW into a drum studio with nothing more than a basic set of microphones, an audio interface and a set of headphones!

Apart from the recording gear, the drum kit and the room, there is, of course, one more vital component: the drummer! If your drummer's not up to scratch, all your efforts will be wasted. There's no point listening to a great recording of something that's badly played. So make sure your drummer knows how to tune his kit, hits well, and can play with a click. Ready to go? Then let's get some mics on your kit...


Different mics can suit different kick drums, so it's worth experimenting


A spot mic placed 1-3" above the head is the usual way to mic a tom

MIKING THE KIT

THERE'S NO 'right' or 'wrong' way to place mics on your drum kit but if you stick to the following guidelines you'll be well on the way to getting a pro sound in no time.

BASS DRUM

THE ORTHODOX position is on the non-pedal side of the bass drum about level with the rim and slightly off-centre. Some drummers cut a small hole out of this head for the mic to get a look-in, while others don't use a head on this side at all.

Bass drum mics have an exaggerated low frequency peak for the boom and a high frequency peak for the click, and because these peaks are at slightly different frequencies, different mics can suit different bass drums – so it's worth trying different options if you can.

HI-HAT

THE BRIGHT crispness of the hi-hat is best captured by a condenser microphone. Great choices include the AKG C451 and C414 and the Rode NT5. Neumann pencil mics in the KM range are also great if you can get your hands on one.

Place it 4-6 inches above, half way between the bell and edge and away from the snare drum as much as possible to restrict the snare spill. In the '80s when isolation was everything you'd often find rugs hung on a mic stand arm between hat and snare mic as further anti-spill measures.

TOMS

A SPOT mic on each tom is the orthodox way to go. Position in a similar manner to the snare drum, a couple of inches above the skin and just inside the rim, directed at the centre. The rack tom always suffers from snare spill and all toms suffer from cymbal spill but

>


Keep the hi-hat mic as much away from the snare drum as possible to avoid snare spill

Overhead condenser mics capture the overall kit sound and cymbals


Room mics will pick up the room's natural ambience and add colour and character to your kit sound


Overheads won't always pick up the ride, so place a spot mic over the cymbal

generally toms aren't used much so can be gated out after the event.

OVERHEADS

TO CAPTURE the top of the kit in general and more specifically the cymbal work, a pair of condenser mics are used over the top of the kit. They're useful for providing a coherent picture to the whole kit into which you can place the spot mics. Without them the kit is a disparate bunch of unconnected sounds. Use a matched pair of the best condenser mics you can lay your hands on.

Depending on the height of the ceiling, place them 6-8ft above the floor either side of the kit angled down to the centre of the playing area.


Snare mics should be positioned 1-3" above the head pointing to the centre of the skin

ROOM MICS

A MICROPHONE or two to pick up the general room ambience is vital to add colour and character to the overall sound of your kit. A pair of room mics can be processed heavily and just added in slightly to the mix to give it the required energy levels as well as reinforcing the sense of space. A single mic works okay but for best results try a pair.

Ribbon mics are popular here, and have a mid-range character that brings the best out in a room. Good condensers and valve mics are also up to the job.

Start in the middle of the room with the pair equidistant from the kick drum. The brighter condensers and valve mics fare better nearer the ground to lessen the impact of bright cymbals. Ribbon mics work well around head height or lower.

SNARE

PLACING THE snare drum microphones can be tricky for a couple of reasons: firstly, you want to avoid as much spill as possible from the hi-hat mic and secondly, it's hard to weave the mic stand in between rack tom and hi-hat. A good starting position is one-to-three inches above the head just inside the rim pointing into the centre of the skin. Angle it away from the hi-hat if you can and below the level of the rack tom rim.

A mic underneath the snare (phase inverted) is a great way to capture the brightness from the buzz of the snare wires. Place it close to the skin and directly at the wires. Spill from the bass drum is a problem despite the fact that you can safely roll-off the low frequencies so try and angle away from it.

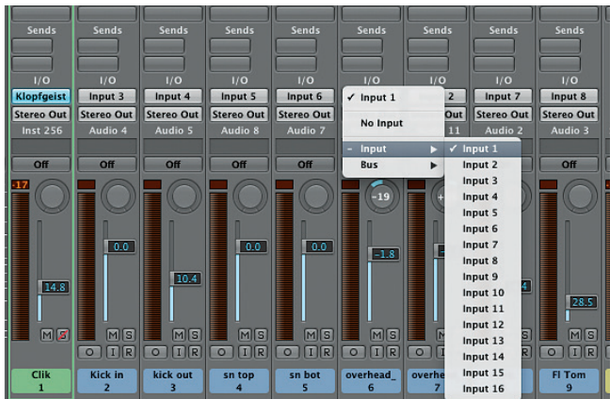
RIDE CYMBAL

DEPENDING ON the drum part, be prepared to put a spot mic on the ride cymbal because their detailing tends to be out of the overhead's earshot. The choice of mic is similar to the hi-hat and is placed between the bell and edge and as far away from tom spill as possible.

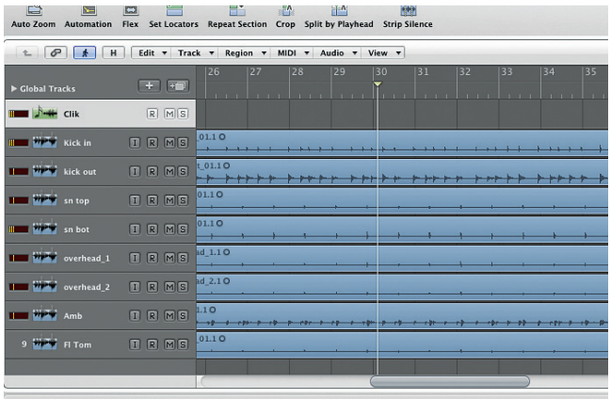
BEFORE YOUR FIRST TAKE

TO START with get the drummer to hit each drum individually for a while. This will also start the drummer warming up. Consider whether you're hearing the drum at its best. Does it sound the same as it does in the room? Could the mic position be better? Dial up a rough record level, bearing in mind the drummer will hit it a lot harder during a live take. Use EQ to improve the tone once you're convinced the mic's in the right place. This can be done on the way to 'tape' if you're blessed with good EQs but otherwise it's generally better on the playback side. The same goes for compression – you can't undo bad compression, so leave it to the playback side. >

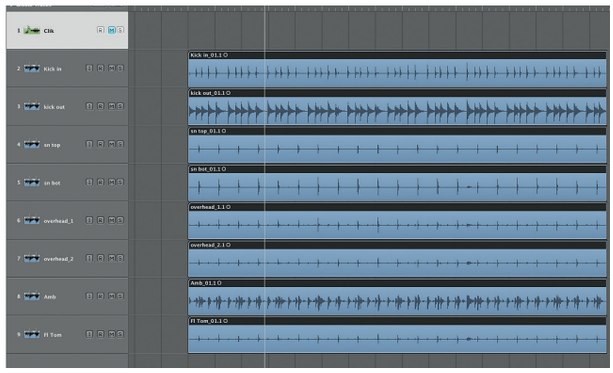
STEP BY STEP GETTING A GREAT RECORDING



1 Plug the mics into your audio interface. The overheads go to inputs 1 and 2 and will need 48-volt phantom power (unless you're using ribbon mics – in which case, don't touch that switch!). Bass drum in and out go to inputs 3 and 4, while snare top and bottom go to 5 and 6. The ambient (hopefully a condenser, so requiring phantom power) goes into 7, and the floor tom mic into 8.



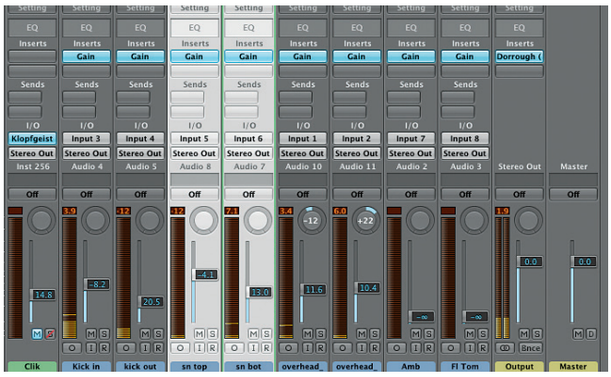
2 Get the drummer to beat the hell out of the drum kit. They always play louder on the actual takes, so don't worry about getting too hot a signal – having the highest peaks spike at around -5dB is a good target. There is something to be gained from clipping, but not on the way into the interface – keep it clean.



3 Once your levels are sorted, it's a good idea to run a test take to check for silly mistakes and any uninvited hum, hiss, clicks or crackles. You can also use the test recording to check the phase of the mics and ensure a fully-fat sound on playback. Even though the theory of phase is complex, the practice is easy…

4 Insert a trim or gain plug-in into each of your eight drum channels. Bring up the first kick mic, followed by the second. When the two are balanced, try inverting the phase on the second kick channel (the button labelled with a circle with a diagonal line through it). Leave the button set where the sound is best.

5 Now turn down the kicks and bring up the overheads, panned centre. Try inverting the phase of one of them. If the overheads sound fatter with just one channel phase inverted, leave it like that. Bring the kicks back in and blend them with the overheads. Change the phase on both the overheads now, and leave them set at wherever the kick sounds fattest.



6 Balance in the top snare mic and switch the phase to whichever setting sounds fattest with the kick and overheads. Bring up the bottom snare mic and set the phase to the opposite of whatever the top is set to. Repeat this process with the floor tom and ambient mics. This is quick 'n' dirty, but now you're set to record.

Moongel can be placed on toms and snares to dampen ringing and unwanted overtones

Once you're happy with the individual drum sounds, get the drummer to play the whole kit. Check levels and balance the kit for monitoring purposes. Make sure there aren't any odd noises and the whole thing feels consonant. Record a bit of their playing and let them hear it so you can discuss the sound and its merits for the track you're about to record. Be prepared to make changes to any of the above factors. Now is the time to experiment and evolve the sound. It's unlikely to come good just like that.

DAMPING

ONCE THE kit's in tune listen to the drummer playing the whole thing. You're listening out for how the drums interact with each other and in particular the ring of the toms, the liveliness and ring of the snare drum and the boom and tightness of the kick drum. Invariably some drums will ring unpleasantly despite not being hit and will require dampening. How much is partly down to the liveliness of the kit and room and partly down to the sound required.

A product called Moongel is a useful tool. These little squares of blue jelly can be placed on toms and snares to dampen the ring. By lightly touching around the outer edge of the top skin and at the same time hitting the drum you'll hear a sweet spot where the decay is just right and that's where to put the gel. There are of course other similar alternatives to Moongel available. You can also use gaffer tape and rolled up toilet paper on the same sweet spot but it takes more time to put on and take off when you want to try another spot. Gaffer tape is necessary to dampen the bottom head if you want to do that, either over wads of toilet paper or concertina'd into three or four fins that hang down and absorb the resonance. Damping the bottom skin is good for that thuddy 'duf' sound that goes in and out of favour. Bear in mind for an ambient live kit sound you may not need to dampen the drums at all.

For snare drums, O-rings are great. Take an old snare head and cut around the edge at the point where it starts to curve up to the rim. Then cut a concentric circle about an inch inside the first leaving a circular ring which you simply place directly on top of the drum head without adhesive. It works well to cut down the ring if that's what you want.

In the old days of pudgy dead snare drums you'd even find dusters and tea towels taped across a section of the snare head.

Kick drum damping again depends on the kick sound you're after. For the more common tight punchy kick drum a pillow or cushion placed inside the drum lightly against the front head will suffice.

Lessening the damping will increase the after-boom. If you want a very boomy kick drum, as in jazz for example, you can use the tom approach with gaffer tape and toilet tissue to shape the tail. Drummers with double-headed kicks often mount a strip of felt on the inside against the back head which works well.

FINAL DRUM TWEAKS

WHILE THE drummer plays the kit, listen for buzzes and rattles. If for example they're not using a rear skin on the kick drum the loose lugs can rattle and these might need to be taped up. Listen for squeaky kick drum and hi-hat pedals and be ready with WD40.

Check with the drummer that they're using all the drums and any not being used should be taken away or damped with a cushion or something so they don't add to the general resonant hum of the kit.

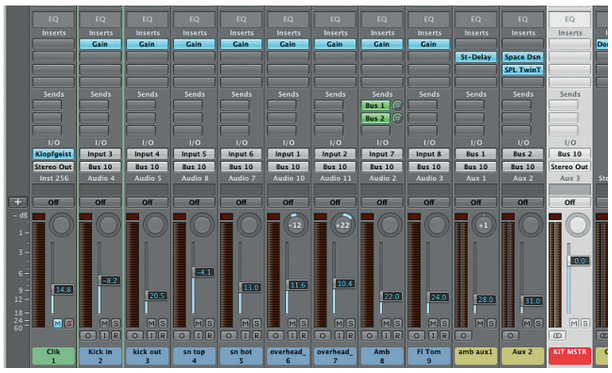
Although you'll prepare everything thoroughly before you set up mics and start recording, all the previous factors (drum choice, heads, sticks, tuning, damping etc) are all flexible and open to change right up to the last recording take. The ultimate consideration is to the song being recorded so although one set-up perfectly suits one song, you might have to re-approach the kit set-up for another to get the sound you want at source. Don't fall into the trap of thinking that one sound covers all and you can

Check the kit for buzzes, rattles and squeaks that the microphones could pick up

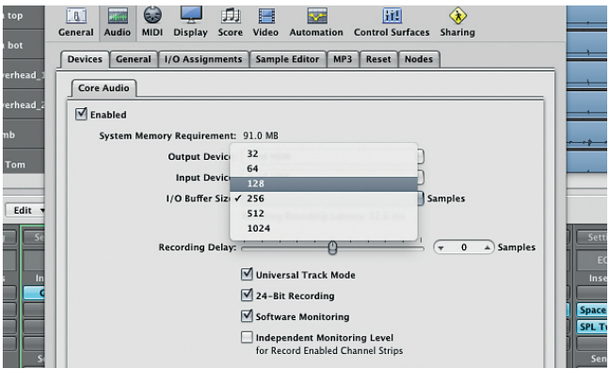
STEP BY STEP SETTING UP A ROUGH LIVE MIX

1 Although you won't create your final drum sound until the mixdown, you'll need to get your mix half-decent for recording. Here's some CPU-friendly advice to help you get it right. Create two auxiliary sends and returns from the ambience track. Insert a delay plug-in over the first return and set the L and R Delay times to 30ms and 60ms.

2 Next, insert a room reverb over the second aux return, set to around 0.6s Decay time. Compress this and then add a harmonic distortion effect like SPL TwinTube. This artificial space will help the kit sound more 'finished' while you're tracking – and a more exciting sound will make your drummer play better.



3 Take your individual drum channels and the two new aux returns and set their outputs to a new bus. Create a new aux return for this bus and call it 'Kit master'. This is your main drum channel. Now create two or three more busses and returns for the rest of your recorded track stems (guitars, bass, vocals, etc).



4 You should now have five or six 'master' faders, making it easy to create a good working balance and hear the drums properly in context. You can also create a separate sub-mix for the drummer by adding aux sends to the master faders and routing them discreetly to the headphones output. To minimise latency, you want your audio interface buffer size to be as small as possible.

fine-tune it in post-production. The source sound is king.

CLICK TRACK

CLICK OR no click is always a big point of debate. The decision should take into account the needs of the song, the drummer's ability and the feelings of the producer and the band. The results are always very different so the decision shouldn't be taken lightly. Using a click track always makes editing so much easier but that shouldn't have a bearing in the debate. If you decide on a click, establish with the drummer the best sound for them to latch onto, the interval (quarter-note, 16th note etc) and level of accents for downbeats. You don't want to be hearing the click in the control room so route it out of a discreet output. You also don't want to hear strains of click spill on the drum overheads as the cymbals decay at the end so always try to map the click with automation, turning it down in quiet sections and off on the last beat. That means making sure the drummer always starts at the same point on the click. For example, tell them to hear one bar of click, stick hit the next and come in on bar three.

GUIDE TRACKS

THE DRUMMER'S going to need something to drum along to if you're not doing a full band live session. For getting the best performance you can't beat playing along with other people, ideally with a visual connection. With other players in the drum room you have to think about spill. If you can screen them off, great. If they're playing electric instruments you can DI them. A guide instrument on the room >

TRY THIS!

BOTTOM HEADS ON TOMS

Wherever there are two heads, there are three possibilities. If you tune the bottom (resonant) head of a tom to the same pitch as the top (batter) head, you'll get a purer tone with more sustain – perfect for jazz and its derivatives. If you tune the resonant lower, you get a slight pitch drop-off and less decay – great for rock. Tuning the resonant higher shortens the decay further, which can be great for close miking. A good starting interval for the difference in pitch between heads is a minor third – ie: three semitones either way.

FRONT HEAD ON THE KICK OR NOT?

The front (resonant) skin on the kick drum is important for creating a good, meaty tone. Jazzers love it, and most rock/poppers have a hole cut in it to allow microphones and dampening material (a small blanket, say) to be placed inside. For metal styles, where you're mainly looking for click and thud, you may as well just remove the front head so that you can get a mic right in on the beater point.

TIGHTEN THE KICK DRUM

It's possible to create a little kick drum chamber using, blankets, duvets or a coat. These are draped over the kick drum, and any microphones are placed in and in front of it. Use a couple of small mic stands to hold the blankets up. The chamber prevents spill from the cymbals and snare getting into the kick drum mics, making it easier to boost the high frequencies at the mix stage and thus enhance the 'clickiness' without adding harshness from the cymbals.

GET A CRAPPY MIC

Tape recorders used to come with built-in condenser or electret microphones. Put one of these old machines into record/pause mode and take the output into your DAW for an exciting, super-crunchy sound. Sometimes, rubbishy old battery-powered mics can sound good too. Put these types of mic in a place where they can hear the whole kit. The corners of the room can offer interesting results – experiment!

RECORD WITHOUT CYMBALS

Recording a kit in a difficult space without ideal equipment can be a fruitful and rewarding experience, but you might still feel that your results sound amateurish. One of the classic drum sound problems is too much cymbal spill. This happens in the best of studios, and when it does, the pros just record the crashes afterwards. That way you can bring up all the exciting roominess of the drums themselves in the mix, then blend in perfectly recorded cymbals afterwards. As long as they share the same buss compressor no one will ever know (although your drummer will hate playing without cymbals).

ESSENTIAL GUBBINS FOR A TROUBLE-FREE DRUM SESSION

Moon Gel, for damping; 3-in-One oil, for squeaky pedals; a drum key (because the drummer will forget theirs); an adjustable spanner, for rattly stands; gaffer tape, for holding stuff; masking tape, for attaching damping materials and the like; empty cigarette packets and J-Cloths, for that '70s sound; blankets; stage weight or sandbag; and Japanese cooking chopsticks – great for tom parts!

3-In-One oil is handy for getting rid of unwanted squeaks

and overhead mics is a no-no. Fine up to a point if you're doing live takes but not for something that isn't going to be in the final mix.

You can always resort to just an aural connection and have other players in another room and everyone on headphones. If you're using a click track you can always record the guide parts initially in the room with the drummer and then re-record the drummer overdubbing to those guides. Not ideal for performance but it works well.

ESTABLISHING TEMPO

THE BEST way to do this is to get the band to play free until you have the right feel and capture the tempo from that performance. You can usually do this on the tempo counter of your DAW but if not there are plenty of phone apps that do it.

If the natural playing speeds up and slows down through sections you'll have to carefully program the click to do the same. This is the sort of thing that would be best worked out in rehearsal because it can take time. Above all rehearse and settle into your performance before you begin recording. Good luck!

MAKE SOME ROOM

BEFORE YOU hit the record button, you need to prepare your session. Working with a sprawling production featuring 20 tracks of backing vocals and tons of plugins is going to mean complications down the line. By bouncing down the key elements of your track as new audio files, you can unload all plugins from the session. This will prevent latency problems, so that the drummer will hear everything right in his headphones and there won't be any complicated latency compensation processes happening in the background.

You should aim to end up with a few bounced 'stems' – guide drums, bass, guitars, keys, vocals. Make sure they all start on bar 3 or later, so that you have at least a couple of bars of count-in. The click or guide drum loop can be MIDI-triggered or printed as audio. These few tracks then need to be turned down to around -15dB – this will leave plenty of headroom for the click to be clearly heard by the drummer over the backing track and the drums.

Do a test take to make sure every part of your kit is recording as it should

LET'S RECORD!

YOU SHOULD now be ready to press the record button, safe in the knowledge that you have the sound of the drums completely nailed. Of course, there's a whole bunch of stuff to do post recording to turn the raw drum takes into a mixed kit. First, though, we have to make sure we record everything we need.

There's nothing worse than putting up your drum recordings, long after the drummer has packed up and left, only to find that the bottom snare mic hasn't recorded or that your middle section has click track from the headphones spilling all over it. That's why a test take is important; here are a few tips on how to get the most out of the session...

Kick drum damping, and how you achieve it, will depend on the kick sound you're after

GET LOTS OF TAKES

WITHOUT GOING overboard, the more you can get the better. If possible, use folders or playlists to keep your takes sorted, and make notes as you go as to what each take was and why you did it: 'Take 4, felt beater instead of wood', 'Take 9, keep hats closed', etc. Ultimately you may find it best to edit a selection of different parts together to build the perfect take.

RECORD SINGLE HITS

AT THE end of your drum session, record individual hits of each drum and cymbal at different volumes. Allow plenty of time for toms to ring and cymbals to decay. These backup components can then be used to help you repair almost anything after the event – invaluable for moments when the drum stool creaked or a motorbike went by and ruined an otherwise perfect take.

PREPARE TO BUILD A MIX

ONCE YOU'VE got your recordings, you need to get the drums sounding killer in the mix, so get the session well organised. Work with your stem session to start with, then bring the rest of your multitrack back in. Organise the key elements of the mix into auxiliary busses, and bring them all down to -10dB. As a rough guide, your kick drum should be metering between -12 and -7dB. This will leave you with loads of headroom to build a punchy drum sound without clipping your master outputs. ■

GET ORGANISED

10 top tips for recording a drum kit

1 Once you've got all your drum tracks, recording levels and playback processing, save the session as a template so you can import it as a start point for other songs in the drum session.

2 Group the drum tracks together so you can duplicate them all or create a fresh playlist with one click and keep the session flowing.

3 If you're using a click try to ensure the drummer always starts at the same bar.

4 Do one or two takes then have a playback to discuss sound, parts, performance etc. It will also give the drummer an objective view and a breather.

5 Continue with a couple of takes at a time followed by a playback until you're happy you have all the parts available for a compilation edit.

6 Always offer encouragement, feedback and advice and keep the drummer as fresh as possible.

7 Listen for energy, tightness, groove/feel, fills.

8 Don't be afraid to try big brush-stroke changes if things aren't working.

9 Always remember you can overdub additional drum parts – tom fills, cymbal crashes, hi-hats.

10 Keep an ear on the foldback mix and suggest any changes you think could help their performance.

ADVANCED RECORDING: VOCALS

Recording the human voice isn't just a matter of kit and technique – it's also about getting a great performance out of your singer

Truthfully, if there's one single element of your song that should demand the majority of your focus, it's the vocal. The vocal, over and above anything else, is the first thing anyone listens to. An underwhelming vocal gives a poor first impression of the whole track, and once that happens there's usually no coming back.

The first and most important aspect of a vocal is the performance. If a singer delivers a passionate and believable performance, you can get away with imperfections in tuning or sound quality. If they're timid in their performance, on the other hand, poor tuning, tone and timing are made all the more apparent.

Getting the best performance out of a singer involves many considerations – psychological, aesthetic, technical and physical, to name but a few – and a good producer will cover all of these areas, building confidence, setting the right ambience, offering advice and generally guiding the performer through what can be a nerve-wracking task.

Then there's the technical side of the vocal to think about. Picking a mic and preamp to suit the singer, getting a headphone balance they can comfortably sing with, and getting a good quality signal in the can are all vital.

Once you have captured a good performance, you then have a lot of post-production processing to get through. This means compiling a definitive vocal from all of your source takes and editing that into a smooth performance, making any tuning and timing tweaks that might also be needed to improve the result, plus a whole host of other more minor considerations.

Once you have your perfect lead vocal, the next thing to think about is backing vocals. A double-track vocal to the lead can add strength and size when needed; harmonies are superb for adding a sense of depth and musicality that works in certain situations, and counter-melodies can really imprint a song. As Brian Eno likes to point out, 90 per cent of hit records have backing vocals, while 90 per cent of non-hit records don't. ■

PREPARING THE SINGER TO PERFORM

As producer, it's your job to give the singer the ideal physical, technical and emotional environment to work in

AS THE producer or engineer, recording the vocal is just one small step in a number of tasks that you have to carry out in order to achieve your goal of a finished record. For the singer, it's their moment, and it's huge. Rarely do you come across a singer who's keen to get in the recording room and start singing. On the whole singers are nervous, insecure and fraught with self-doubt, and those are the more confident ones!

At any time there can be a complex group of psychological issues involved, so always approach a vocal recording sensitively, placing a calm focus on the vocalist but being careful not to put too much importance on the situation at hand. There's nothing worse for a session than an anxious producer: you're the one who should be radiating calm vibes and serenity for the singer to feed off.

In fact, your job is to create the best environment for the singer to perform in. One important consideration, especially in a band situation, is who should and shouldn't be present at the session. Some singers like the banter of a whole group because it can help to dissipate the intensity, but a more nervous singer will feel much too pressured with everyone watching. It's down to you to read the situation and, if necessary, ask everyone else to leave the room while vocals are being recorded. You can get the others back in the control room once a few passes have been recorded to discuss the merits and way forward, if you feel democratically inclined. Otherwise, get them back in once you've comped the vocal to present the finished article.

GOING FOR A SONG

SIT DOWN with the singer and talk through the objectives. If there are a number of vocals to do, decide upon the first one to work on – ideally one that's not too demanding. Discuss all of your practical intentions: a lead vocal, a double-tracked vocal in parts, possible harmonies and how you'll go about recording them, whether it be with full takes or dropping in line by line. Discuss the approach and attitude you'd like to hear from the singer – it can be useful to reference tracks by other artists. Play them songs that are close to what you have in mind in terms of production and overall sound, so they get a sense of their required contribution. Play artists with the sort of attitude and delivery you think would work for the track. This kind of guidance should give them an idea of what they need to do, and it can make the task seem easier. Inspire them into a creative moment.

Singing is a muscular activity, which means singers are minor athletes. An experienced or trained singer will have a warm-up routine to prepare their vocal chords for the work ahead, but you'll be surprised at how many go into the studio without any warm-up and expect to belt out an amazing vocal. Give them five or 10 minutes alone in the recording room to acclimatise their voice. ■ >

STEP BY STEP PREPARING THE ROOM

1 The physical environment is vastly important. First of all, decide where the vocal mic is going to go, ideally giving yourself a visual connection to your recording position. The prime consideration is the sound, so don't place the mic up against a window in an effort to see the singer.

2 A music stand is necessary for lyric sheets and making notes. A comfortable chair and side table (not to mention a rug underfoot) will not only create a homely feel, but they will also give the singer somewhere to sit during playback over headphones. Don't forget a jug or bottle of water and a glass.

3 If your room isn't ideal acoustically, or you're hearing too much of the room when you record, you might need to buy or borrow a Reflexion Filter. SE make the original, but there are alternatives. These shelter the mic from room reflections and enable you to record vocals in adverse conditions.

MONITORING

Many singers go to pieces when isolated and listening on headphones. It's worth exploring monitoring options. Like speakers, headphones all sound different: the classic Beyer DT100s are dull and lifeless, and a brighter, livelier set can do the trick. The Audio-Technica ATH M-series are great low-budget options.

Try getting your vocalist to sing along to a loudspeaker playback. Bono famously did a lot of his vocals in front of the monitors in the control room with a handheld SM58. Try it in the recording room, feeding the foldback mix to a monitor at a volume the singer is comfortable with. You can phase-cancel the spill afterwards: with the mic and speaker in the same position, play back the foldback mix exactly as it was, including the vocal and any reverb. Record it, flip the phase 180° and mix it in with the main vocal track. It won't kill the spill completely, but it will get rid of a lot of it.

STEP BY STEP GETTING A GREAT RECORDING

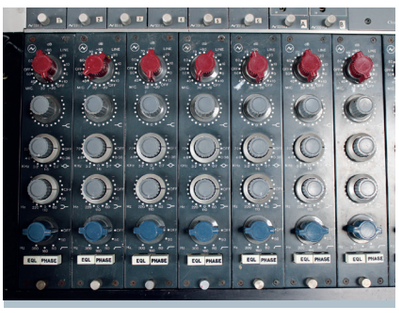
1 The human voice is one of the most harmonically complex sounds you're ever likely to record, and the human ear has naturally evolved a great sensitivity to all of its nuances, so in most situations you'll use your best microphone – but not always. It's worth trying out as many as you have because different singers suit different mics.

2 If a singer is ridiculously loud, or if they like to hand-hold the mic, and if the song's on the heavier side of rock, a dynamic mic such as the Shure SM58 can be a very usable vocal mic. It's predominantly built for live use, but it records well, stands up to abuse and loud levels, and sounds pretty good.

3 Normally you'll use a large-diaphragm condenser mic for vocal recording because of its sensitivity and the harmonic detailing it picks up. The Neumann U87 and AKG C414 are at the top of the list here, although there are much cheaper ones that do a good job from SE, Rode and others. Use them set to a cardioid pattern.

4 If you have the option, vintage valve mics such as the Neumann U47 or U67 are renowned for their warmth, clarity and definition. There are other valve mics to choose from, but none are better. Whichever you choose, put a pop shield in front of it. This can be shop-bought or made from a wire coat-hanger and tights.

STEP BY STEP VOCAL PREAMPS



1 Your mic needs coupling with a good preamp if you're to capture the best sound. Many audio interfaces come with mic pre's built in, but their quality varies. Don't assume it's OK because you can plug a mic into it – check the specs and compare with those of other preamps you can get access to.

2 Although it certainly isn't these days, the mixing console was once the main supply of mic preamps: you'd plug into a desk channel, add EQ and route it to the multitrack. Some desks, such as the Mackie Onyx, have good-quality pre's, but most cheaper ones should be avoided if at all possible.

3 A standalone dedicated preamp is by far the best option. If you have a choice, test them each on your singer with the mic of choice, as different combinations can give different results. Neves are well-known because they're excellent, but there are many others of a similar standard available.

CAPTURING THE VOCAL PERFORMANCE

SINGERS CAN'T carry on 'playing' for hours like their instrumental colleagues. There's an optimum window for capturing the best performance between the singer warming up their voice and tiring themselves out, and sadly it's all too narrow. Once the singer is warmed up and ready to go, you will need to quickly get them comfortable with their specific headphone mix. While they're doing their warm-up routine in the recording room, you should be anticipating a rough foldback mix for them, ideally using the same model of headphones they are using, creating a few vocal tracks in your DAW so that you can quickly go from one take to another, and setting up any in-line hardware processing that you might be using, as well as any monitor processing – reverb and delay, usually. You should also guess a rough recording level so that when they finally hit the mic you're recording everything.

Go into the recording room and check that the singer is feeling good and ready. Make sure the pop shield isn't touching the mic and that it's in position, and that there aren't any other headphones still plugged in from previous overdubs that will spill onto the vocal track. Before you begin the actual recording, get the singer's headphone volume right and check they're hearing everything they need to hear, making initial adjustments to the mix based on that feedback. Ask them if they want any reverb or delay for monitoring and set that up.

WARMING UP

RECORD AN initial warm-up pass; this serves many purposes. First, it allows you to get a good record level, although bear in mind that the vocalist will probably sing a lot louder in later takes, so err on the side of caution by about 3-6dB. Urge the singer to tell you about any changes they want during the pass, particularly to their own voice and effects levels. Listen to the sound quality of the vocal: is it clear? Check it's not distorting on peaks.

Your singer should move in close to the mic for quiet sections, and back away from it for louder parts

Listen to the tuning – if it's consistently sharp, try turning the vocal up relative to the backing track; in contrast, if the vocalist is singing consistently flat try nudging them down a bit. If the vocal is both flat and sharp, they're clearly struggling to fit in with the mix while hearing themselves. Get them to take one headphone off an ear so that they can hear themselves in the room – ask them to place it against the back of their head to prevent spill.

Also during the warm-up phase, listen to the dynamics of the singing and the mic technique of the singer. If they're not already doing so, ask them to move into the mic for quiet sections so that they're two to three inches from it, and back off 18-24 inches for louder sections.

If you're using a cardioid mic, get the vocalist to notice how their tone warms up as they move in, and urge them to use that creatively, without moving in so close that it becomes boomy. When they move out for loud moments, listen to how much of the room sound you get in the mic. If it's too roomy, tell them not to move back so much. ■

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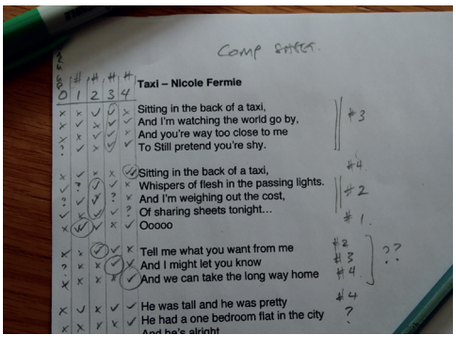
Though they may be among the more, ahem, unsung contributors to a project, backing vocalists can add real depth and interest

BACKING VOCALS

It's always worth trying out backing vocal ideas, even if you don't end up using them. The first consideration is any double-tracked lead vocal parts. You can always create a double track from unused lead takes and some deft aligning, but if you have the time, record a few takes sung to the phrasing of the lead vocal comp. It may only work in the chorus to add strength, but you might as well get a couple of full takes. The double track will eventually be quieter and duller than the lead; some mild distortion can work to blur the edges and glue it in. The aim is to give the lead vocal strength without it being noticeable.

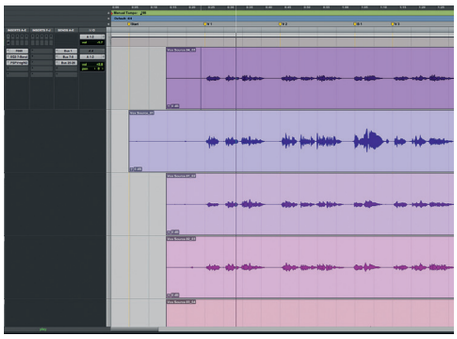
Next, it's harmony time. A good blend of different voices tends to work best, but that's a rare commodity. For serious harmony work, do another session after some proper rehearsals, when you know what you want. Counter-vocal arrangements, which can add a great deal to a song, also need to be well considered and rehearsed. Don't forget the possibility of layered 'ooh's and 'aah's', which, as long as they're not too corny, can add a touch of production class.

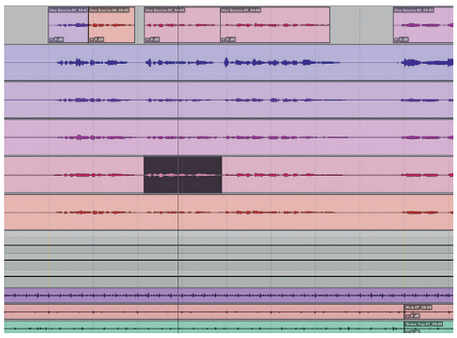
STEP BY STEP THE RECORDING PROCESS



1 The singer's warmed up, you've got a good sound and level, and it's time to switch on the metaphorical red light. Ideally you should have a copy of the lyrics with you and make notes as the take proceeds. These can be general observations about style and technique, as well as specific notes on phrasing and lyrical issues.

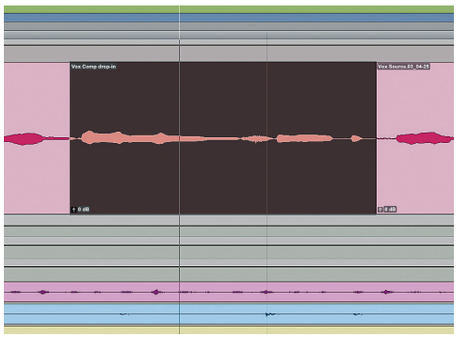
2 After that take, or maybe one more, it's worth getting the singer in to listen back to what they're doing. This can be settling mentally and give you both a much clearer objective view of the session. It also allows you to discuss your observations and to give the singer subtle guidance, both generally and specifically.

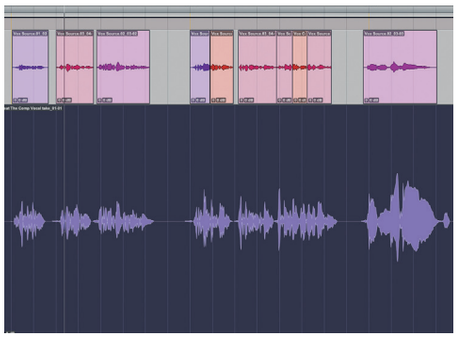




3 Do two or three more takes on the trot from beginning to end and, hopefully, if the singer's on the case, they will nail it. After working with a singer for a while, you'll get to know which take is likely to be best – often it's the third one – and after which take they will tire. Don't push your vocalist into one more take if they need to stop for a while.

4 Using the notes you took during the recordings, or listening to each take line by line, you can piece together a comp track from the best bits. This can be as microscopic as you like – some producers take whole lines, others individual syllables – but you should end up with a definitive performance (there's more on comping on p.127).

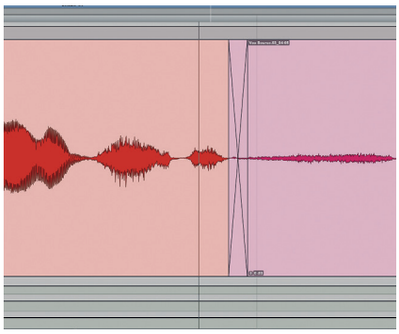




5 Playing the comp down from the top will inevitably show up the best and worst parts of the vocal. Again, make a note of the bits that you want to improve and then, rather than doing whole takes again, you can send the singer back into the box and just drop in for those lines. Repeat the drops until you're happy.

6 If you think the singer can make an improvement to the overall vocal, gently suggest they play 'beat the comp'. This often works when your singer is uptight, because the sense of achievement from completing the first comp can bring relaxation. Do a couple more takes and, if it works, comp those takes in with the first comp.

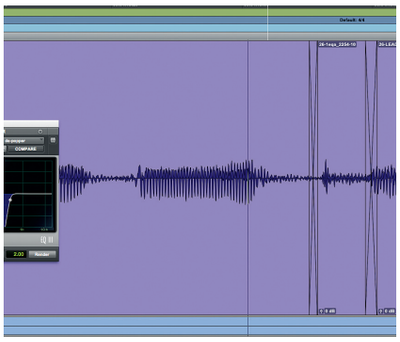
STEP BY STEP VOCAL POST-PRODUCTION



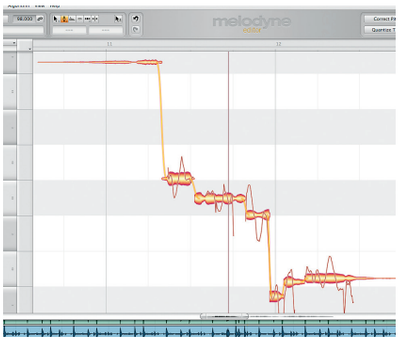
1 The main vocal comp has to be seamless and sound as though it was a continuous take. Listen through it in solo, making sure there are no double breaths and that all the breaths are intact. Put mini-crossfades over every edit and listen for natural phrasing and timing between edits.

2 Even with pop shields, inevitably there will be some plosives in the vocal, which can be an ugly distraction. A high-pass filter set to around 80Hz can take the very low, windy ones off, but for the big ones you'll need to do some momentary EQing to the offending pop.

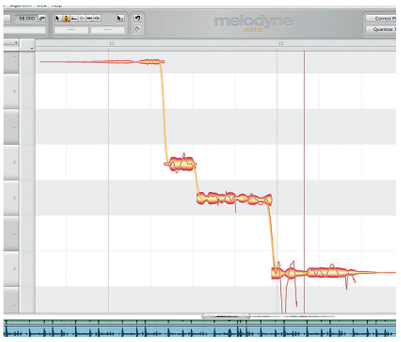
3 If your DAW can do offline processing, the job of 'de-popping' is made so much easier. Zoom in and highlight a selection wider than the area of the pop. Use a steep high-pass filter set to about 300Hz to render the piece and you should see the waveform diminish spectacularly.



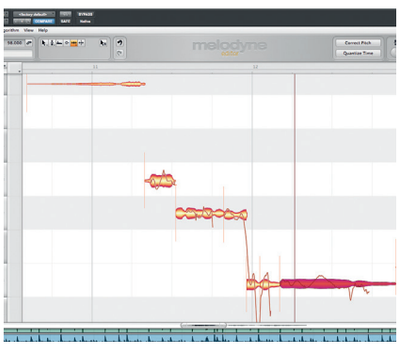
4 If you don't have offline processing, route your vocal to another track with the same high-pass filter inserted and record the offending section. Drag that back on to the main vocal track and draw the processed audio back to just encompass the pop. Apply a smooth crossfade on either side – job done.



5 For a vocal that's at all 'tuney', now's the time to dig out a pitch correction device. Don't use an auto-tuning function unless you're pushed for time. Instead, use manual tuning, which enables you to manipulate the vocal in very precise ways. Celemony Melodyne is the best tool for this job.

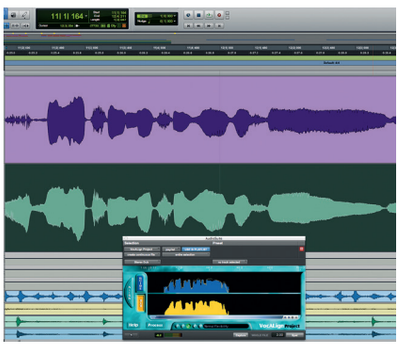


6 Transfer the passage you want to retune into Melodyne. Using the Pitch Drag tool in non-grid mode you can pull the pitchy bit into a tuning that sounds right, though it won't necessarily be perfectly pitched. Melodyne will also retain vibrato and any pitch slide in and out of the note, or flatten them.



7 Melodyne is also useful for minor phrasing and timing adjustments. For example, if you want a word to carry on longer and have the following word come in slightly later, drag the first out and shift the second further down the track. For timing, it's a case of selecting the words and moving them in time.

8 Double-track vocals generally work better when their phrasing is tight to the lead vocal. The same applies to harmonies. It's hard to achieve and can take a lot of time to get right, so for convenience you can just get the backing vocals close enough and let Synchro Arts' VocAlign plugin do the rest.



9 Again, this is much easier if you have offline processing. Highlight the area of the lead vocal that you want to tighten up and hit the Guide capture button. Move the highlighted area onto the backing vocal track and capture the Dub. Hit the Align button to magically tighten it up. Neaten with crossfades. >

RECORDING VOCALS PLUS ACOUSTIC GUITAR

WHEN IT comes to recording, everyone develops their own go-to techniques for specific situations. To keep things simple here, though, we're offering you two overall approaches – 'as live' or 'overdub'. Which one you go for depends upon the sort of music you want to make and the proficiency of your performers. It may also affect precisely what bits of equipment you will need.

Along the way, you'll also need to consider whether you want to keep things rigid by using a click or rhythm track, and whether or not to process your signals at source using channel strip options such as EQ and compression.

'OVERDUB' OR 'AS LIVE'?

IF YOU'RE trying to replicate a warts 'n' all live performance, recording the guitar and voice together is definitely the way to go. From a technical perspective, this will require you to capture the guitar and the singer using two mics via two separate preamps. It also enables you to record without any headphone cue set up, making things a bit more straightforward. The main downside is that each sound source (guitar and voice) will, to some extent, be picked up by both mics. In itself this isn't a disaster, but if you want to repair anything by overdubbing one or other element on its own, you'll struggle to edit this in without it being obvious.

One solution is to record a number of takes and edit them 'as one', so that voice and guitar always stay together – just make sure that each take is at the same tempo and that the tuning is consistent. If wandering tempo is a problem, you will benefit from listening to a click track through headphones. Overall, the better and more consistent the performer the more successful this technique will be.

Overdubbing is the more widely-used recording technique, enabling you to compile 'perfect' takes for voice and guitar. Overdubbing simply means recording one track on top of another. From a technical perspective, you can use the same mic for both guitar and vocals, so you'll only need one preamp. However, headphones will be needed for a cue mix while overdubbing. As you may have gathered, the best way to go about this is to record and edit the guitar first and then add the vocal. It will benefit you to use a click track in this case.

Do you want to record your guitar and vocals together or in separate takes? The choice is yours

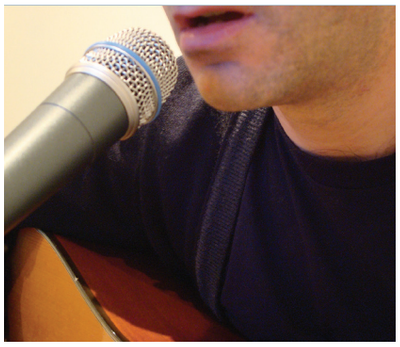
CLICK CONSIDERATIONS

EVEN MUSICIANS with a good sense of rhythm struggle to replicate the same tempo each and every time over multiple takes. So if you're planning to record things in free time, it's still a good idea to use a metronome reference prior to the performance. However, to really lock things down, a click or rhythm track is well worth considering. This doesn't have to be completely rigid, and can include tempo changes for different sections of the song, but it'll keep each take closer to the 'clock', making editing much simpler. It's often easier to play over a percussion pattern rather than a click. You'll probably find a basic drum machine that's capable of producing a shaker or clave in your DAW, so use it to play a basic groove that fits with your song.

Finally, if you're using a separate preamp strip or mixer channel, you'll have the option to apply EQ and possibly compression as you record. The best advice we can give you here is to keep things simple, employing the former to remove unwanted low frequencies or add high-frequency sparkle, and the latter to contain any sudden peaks. But if you're not entirely comfortable with either of these techniques, just record everything completely 'flat'. You can always process later with plugins. ■

STEP BY STEP MIKING UP VOICE AND GUITAR

1 The first step is to position your guitar mic. To assist with separation, it's best to get in as close as you can, but you still need a balanced instrument sound. A good spot is about nine inches out from where the guitar neck joins the body.



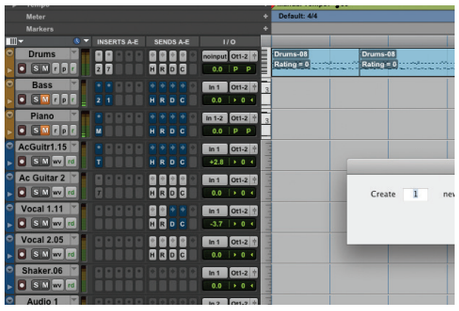
2 For the vocals we're using a dynamic mic with a supercardioid pickup. Its tight pattern helps keep out some of the guitar, but because it's a dynamic mic we can get right in close with no pop shield. This on its own helps with isolation.

3 If you're recording yourself and monitoring on headphones, move the guitar to get the desired mic sound. If you're recording someone else, make sure they're comfortable and not going to move, then angle or move the mic to change the tonal balance.

STEP BY STEP GETTING SIGNALS INTO A DAW

1 With your mics set up, the next stage is to get their signals into your computer. Make sure your mic preamp is turned right down and the phantom power is off before plugging in the cables. Check which mics need phantom power and then switch it on for those mics only.

2 One advantage of using the mic preamps in your audio interface is the signals get routed straight to your DAW and should be numbered sequentially to match the interface. If you've opted for the standalone mic preamp option, you'll need to connect it to your interface with a separate cable.



3 Set up some tracks in your DAW and assign the inputs to match those of your interface, making sure that you know which track is fed by which mic. You'll find with most applications that putting a track into record mode will automatically activate the input meters.

4 Finally, start playing and singing so that you can set the mic gain. Start off low, increasing gradually until you reach the level you need, but don't let the meters peak. If you're recording near your monitors, keep them low to avoid spill and feedback. You're now ready for take one!

HOW TO MONITOR – THE LATENCY ISSUE

With an 'as live' recording, you can set up a couple of mics and record in one go without any headphone cue feeds. But as soon as the performer wants or needs to hear themselves (eg, when overdubbing), you'll hit audio interface latency. For a headphone cue feed, you need to be able to hear the mic you're recording and possibly an already-recorded track at the same time.

If you try and monitor the mic signal via your DAW software, a delay (latency) will be introduced. Even with small audio buffer settings you'll hear an echo. Many of the cheaper audio interfaces include a headphone mix control, so you can create an instant blend between mic input and DAW output. The more complex interfaces now include their own latency-free mixing software and effects. You could use a small analogue mixing desk with mic preamps and headphone facilities. >

MIXING GUITAR AND VOCALS

ONCE YOU'VE got your performance in the bag, or at least compiled it from a number of takes, you're ready to get mixing. You may be wondering what this involves and why you need to bother, particularly given that we're only dealing with a small group of tracks. Essentially, mixing enables you to rebalance the elements of your track. Beyond this, there are plenty of other techniques and tools at your disposal.

From simply panning elements within the stereo field, through to applying EQ, compression, reverb, delay and various other effects, your DAW is packed full of powerful tools. The basic deal is to use these wisely and your track will end up sounding way better. It's possible to go too far and ruin things, but remember that every plugin has a bypass switch, so always use it to check the 'before' and 'after', and make sure your changes are positive for the song as a whole.

BASIC TOOLS

EQ IS the most frequently used mixing processor, and it's likely you will need to EQ every track in your mix at least a little. You'll probably need to process the whole, combined mix as well. EQ is essentially a glorified tone control with which you can shape the frequency content of a sound in subtle or extreme ways. This could involve brightening something up (by adding higher frequencies) or removing low-frequency rumble (which might well be caused by a mic stand), but you can be much more extreme with EQ if you like. Most plugins of this type include a visual display to help you see your changes.

A compressor can be thought of as an automatic level control. With the slider or threshold knob, you can set it to affect only the parts that exceed a certain volume. The other controls (primarily ratio, attack and release) influence how it does this. With the kind of music we're dealing with here you should be using compressors to reduce the extreme dynamics that live instruments and the human voice produce, so that all aspects of each sound can be clearly heard.

EQ and compressor plugins are designed to completely replace the original sound with the processed one, so you typically use them as 'insert' effects on a channel. The other main category of effects – reverb and delay – are added to sounds, which is typically done by using an auxiliary 'send' control on a mixer channel to send a portion of the signal to a separate return channel into which the effect is inserted. The outputs of these two channels can then be adjusted until the correct balance between the unprocessed (dry) and processed (wet) sound is found.

At a basic level, reverb replicates the complex reflections of a sound in a physical space, while delay tackles the related concept of echo. Your DAW will contain numerous reverb and delay plugins that will each work hard to give you an incredible amount of control over the 'virtual' context of your recordings, from small rooms through to wide-open concert arenas.

FANCY TOOLS

BEYOND THE basics, there are also a whole host of effects plug-ins available that are capable of seriously changing the way your tracks sound. From phasing to flanging, and bit crushing to distortion, these effects can be used both brutally or subtly. If you're aiming for a natural, live feel, go carefully.

Even so, light use of chorus can be great for thickening up sounds, such as voice and guitar. And if you're feeling creative, phaser and flanger effects typically evoke the styles of the 1960s. Needless to say, you will find all of these and more present in most DAWs, so if you want to know how they sound, load them up and have a play.

GET PREPARED

WITH ALL of this to think about, it can be tempting to dive straight in, but a little preparation now will save you heaps of time later on. So make sure that you're happy with your edits, using crossfades to smooth any clicking out where parts meet. Then load and bypass an EQ and compressor on each channel, including the master. Finally, set up two reverbs and one delay on auxiliary return (aka FX return) channels. ■

20 PROFESSIONAL VOCAL TIPS

However you choose to approach your recording session, here are a few more things to consider for getting the best out of your vocals:

1 Many vocalists sing better when they tilt their head back a little, as it opens up their vocal chords. The easiest way to take advantage of this is to place the mic slightly higher than the singer's mouth, angled down towards them – this will encourage them to tilt their head back as they sing.

2 Make sure you keep track of your singer's position (even if your singer is you). You will often find yourself taking breaks, or coming back to re-record a line, and it's important to make sure the vocals are coming from the exact same position each time – if not, they might not sound the same. It goes without saying that you should also keep track of where the mic was on the previous take.

3 Chorus effects are great, but one of the best ways to achieve chorusing is to actually record multiple takes of the vocal. You can then take a few of these and layer them – try panning a couple slightly and leaving one centred, or thinning out the underlying pair with EQ and more heavily compressing the central one for added impact.

4 One of the great ways to keep a vocal punchy but still interesting is to use some of your additional takes to layer key words. These could be words that are significant in a lyrical sense, or that work well with the groove, or that enhance the arrangement. Just be sure not to overdo it – use them sparingly enough that they keep their impact when they appear.

5 Breath noise can be problematic, but it's also vital on some vocals – completely removing it can make a vocal sound artificial and over-processed. Sometimes the words and breaths will slide between each other, so make sure you set any gain reduction carefully to leave some of the vocal in the track.

6 It's always worth trying a vocal in a different key, just to see how it sounds. It can be easy to get stuck in your ways, but it only takes a minute to sing a line in a different key. You might decide it sounds horrible, but you could also be pleasantly surprised. You might even decide to put a key change in the track.

7 Remember, your vocal is not just another part of your track - it *is* your track. There will be musical elements that people like, and riffs that people love, but it's best to treat your vocal as the hook in almost every instance, as that is quite simply how most other people will view it.

8 Processing is great for adding emphasis to a vocal, but you can also add interest by using some real gear. For example, try recording a version of your vocal into an iPhone (you can set this up to run at the same time as you're capturing the vocal with a proper mic), or you might want to consider recording through a megaphone or guitar amp.

9 Try capturing vocals in different places. Generally dry is good, but if you have a great echoing hallway, or even a roof or a field… Why not? When recording outside, however, your nemesis will be the wind so you'll need to either invest in wind baffles or a foam cover. If you want a completely dry vocal that's free from reverb and reflection, it's hard to beat the middle of a field on a misty morning!

10 Giving your vocalist a little reverb in their headphones will help them tell whether they are singing in key. It will also keep their confidence high by giving them a good impression of their own voice. Your vocalist can't listen and sing at the same time – at least, not like the engineer can listen - but with reverb they can hear the pitch.

Your vocal is usually not just another part of your track – it *is* your track. It's best to treat your vocals like the hook, as that is how most other people will view it

11 No matter how carefully you've set your initial input level, singers will sometimes stray into louder territory than you planned, so even if you've tested their loudest note and left ample headroom, keep a stern eye on the incoming level to watch for clipping.

12 Generally speaking, the place for a vocal is in the centre of a mix. It may sound obvious to say it, but listen to almost any great rock or pop recording and you will hear that, while the instruments might be dotted all over the place, the vocals are usually centred. The vocal is normally the main element of any song, so centring it keeps it, well, central. We're also used to people speaking to us from the front, so it feels much more personal.

13 Be wary of anything that makes noise when recording. Even quiet noise will be amplified, including the slightest rustle of paper – this is why it's handy for the vocalist to have all of their lyrics memorised, as opposed to reading them off of a sheet of rustling paper. Other culprits include rattling bracelets and necklaces, as well as change or keys in pockets. Tell your singer to ditch them before recording starts.

14 It's great to take chances and experiment, but if you're going for a specific type of track, chances are there will be a specific type of processing that goes best with it. Spend a bit of time listening to the types of effects that are used in comparable tracks – don't just use the same old effects on every vocal.

15 We've said it before, but compression is key with vocals. If you want your vocal to cut through a mix, you'll need some level of compression to get consistent weight – how much depends on the track. A soft vocal needs some dynamic range, but if your singer is belting it over a shredding backing track, don't be afraid to push the compression up to limiting.

16 Reverb is a great tool for giving extra space and width to vocals, but it can also be a dominating effect. As an alternative option, try some subtle delay. The key to not overpowering your vocal is to ensure that the delays are EQ'd – if your delay doesn't have any EQ, put it on a bus and apply some EQ from there. A little bit of top- and bottom-end cut will thin it out and sound like reverb, but without the muddying tail.

17 Timing is everything. If your vocal lacks energy, try applying a little pre-delay. Or better yet, chop up your vocal and add delay or pre-delay to certain parts to create a tailored groove. Use a bigger amount than with percussion. Generally 1 to 3ms will be noticeable with drums, but with vocals you'll need to hit about 3 to 5ms or more to notice the difference.

18 Many vocalists find it easier to hit the right notes if they sing powerfully. If your singer is regularly missing notes, try asking them to sing with more force. Just remember that this will tire out their voice much faster, and none of the subsequent takes are likely to match the early ones, so it is generally best saved until towards the end of a session.

19 Sometimes a live vocal performance can sound amazing, but once you record it you're stuck with it. To get a similar effect on a studio recorded vocal, play it back through some speakers, then record that playback and layer it underneath your original. Since this is almost exactly what happens with live feedback, the result will be strikingly similar.

20 For some real bite on your vocals you can't beat a bit of distortion, and almost every DAW now comes with some kind of guitar pedal and amp simulator, so make use of them. The trick, as ever, is to strike the right balance between bite and intelligibility – unless you just want a mangled vocal, in which case, go for your life!

MIXING: THE BASICS

This brief overview of the mixing process will help you maintain perspective, set up a conducive environment, and foster good practices from the start

It's all well and good saying you're about to "do a mix", but what does that actually mean, and what's the best way to go about it? At its simplest level, mixing involves balancing the elements of the music so that they're both individually present, and making the best contribution to the overall track.

At its most complex stage, mixing can involve replacing elements and sounds, restructuring or editing the entire track, and sculpting both individual and overall sounds using automation and a multitude of effects. A mix is a sonic landscape, and your aim is to create a coherent yet distinctive one.

Time to learn more about the essence of a good mix, how to achieve one, and how to keep perspective.

WHAT MAKES A MIX GOOD?

MIXING IS subjective in terms of preference but objective in terms of quality. There are a number of common failings in a bad mix. For example, one key element, such as a bassline, might be overpowering the vocals to the point where it obscures them; or perhaps the levels of individual elements might fluctuate so that they're inconsistently audible.

So, if that's bad, then clear-sounding musical parts that can be distinguished from one another (when required) and that allow you to hear what's going on are good. But if good isn't good enough and you aspire to greatness, you need to go even further...

Each sound must not only be clear, it must sound incredible and stand up in its own right. The mix should encompass sounds taken from right across the frequency range. Bass should feel weighty and punchy, highs exciting and smooth, and the mid-range should be warm and musical. There should be interesting variation throughout, whether in energy or arrangement.

HOW TO ACHIEVE A GOOD MIX

THERE'S NO reason why mixing a track on a computer should be any different really to mixing on a mixing desk. That said, computers are so flexible now that it's akin to being in a technology sweet shop at times. So don't be afraid to push the envelope, but beware of being gimmicky. If you want your track to stand the test of time, concentrate on the fundamentals and use the latest technology to enhance your music only.

It's said that you can fix things in the mix, but if something sounds rubbish at the recording stage it will most likely still sound rubbish when you try to mix it. A mix is the sum of its parts, and while some mediocre sonic cracks can be papered over, the more cracks there are the more people will perceive them.

So when should you mix? Some people mix as they go, while others leave it until last. Whenever you tackle it, have fun and remember that mixing is a process aimed at arriving at a specific outcome. Within certain boundaries, that outcome is for the most part in your hands.

Getting a good mix involves many techniques, but maintaining an overall perspective is hard. Yet, in many respects, it's the key to getting it right. The following tips will help keep you on the straight and narrow, and maintain focus.

SET UP YOUR MIXING ENVIRONMENT

IF YOU'RE going to achieve consistent mixes you need a predictable space. Position your monitors properly (at ear level and not too far apart) and try to reduce the room ambience (having lots of furniture in the room can help with this).

VARY YOUR MONITORING LEVELS

ONCE YOU get into the minutiae of your mix, it's easy to work for ages without even thinking about the monitoring levels. Try working for short spells at different levels (say, quiet, medium and loud). Each will offer you a different idea of the balance.

TAKE A BREAK

MIXING CAN be an all-consuming activity if you're not careful, and time will tick by without you noticing. Force yourself to take a break and rest your ears, as the more tired your hearing gets the less productive you'll become.

COMPARE AND CONTRAST

ARE YOU aiming for the sound of an existing artist or band? Line up some examples in your arrange window. This way you can switch between your mix and theirs to play a fun game of 'spot the difference'. With regular practice you will be able to recognise how the various frequencies of their production slot together.

BEWARE OF EXTREMES

MUSIC SOFTWARE offers such a powerful array of tools, it's easy to go way too far. As a rule of thumb, if you find yourself applying large amounts of the same kind of EQ to everything it's quite possible you're not hearing things properly.

PHONE A FRIEND

IF YOU think your mix sounds rubbish, be brave and play it to someone else whose opinion you trust. It's surprising how levelling other people's opinions can be, and their objectivity may bring something glaringly obvious to your attention. ■ >

Getting a good mix involves many techniques, but maintaining an overall perspective is hard. Yet, in many respects, it's the key to getting it right

10 TELL-TALE SIGNS OF AN AMATEUR MIX

How to identify and avoid some of the common pitfalls of mixing and end those production nightmares

You've spent hours mixing your brand new tune, but no matter how much you fiddle it still doesn't stand up against your favourite releases. You've tried everything – bolstered the bass, drenched the whole thing in effects, added more parts (and then removed them again), and even made it louder – but it just doesn't sound right.

So, what can you do about it? Well, the chances are good that somewhere along the way you have committed one of a handful of the common production sins that all budding producers have fallen prey to at some point (don't worry – we've all been there!). Making music is often a quite long, lonely and personal experience – you're composing in your bedroom, quietly (or noisily) having fun and getting on with your dream. But this also means that you're too close to the project. Part of coming up with a great finished track is being able to step back and listen with objective ears.

It's also important to get feedback from others, but getting valuable feedback is difficult. Just as making music is personal, so are individual listeners' particular likes and dislikes, and the last thing you want is to be shot down in flames by someone who doesn't know what they're talking about or just isn't into your style of music.

The solution is to get feedback from a bunch of people who know what they're talking about! Drawing upon many years' experience of mixing and producing music, and importantly, listening to demos, newly-signed artists and commercial releases, we polled a selection of mixing experts to identify the top ten most common mixing mistakes made by budding producers.

Our ten-point list (starting below) contains everything from the obvious to the not-so-glaring, from throwing too much into an arrangement to making things too loud, and even – yes, we really do mean this – making it too perfect! So, be sure to keep these points in mind the next time you're working on a mix and your production nightmares could soon be behind you.

1 TOO NARROW

One of the most common problems with mixes occurs when too much is happening in any one part of the musical plane (or to look at it another way, not enough is happening). Try to think of music in three dimensions, and first, check the width. Great mixes spread themselves like a warm audio blanket across the entire stereo spectrum. Poor mixes, on the other hand, throw everything down a narrow beam of audio straight into your eardrums.

With this in mind, be sure to make good use of your 'humble' panning tools. Pan certain parts to extremes: unusual effects, percussive noises and pads go hard left and right; backing vocals can come further in; and main vocals and bass usually sit best in the middle. And while there are rules here, don't feel as though you can't break them. Just make sure that the finished mix sits across the whole width of the spectrum rather than in one part. Pan everything to one area and your listeners will simply think that one of their speakers or headphones is playing up!

2 KEEP THIS FREQUENCY CLEAR

So, that was width – now it's time for you to think about depth. There's nothing worse than a track that's been mixed so the whole thing takes your head off with all of the parts sounding like they're playing through a tin can. This is usually a sign of terrible monitors being used at the mixing stage – great monitors let you hear the whole frequency range of your mix. A simple rule of thumb is to keep instruments of the same frequency apart, like naughty children, so you don't get them clashing and fighting with one another for attention.

A good place to hit first is the bottom end, or bass. Most genres of music are driven by some form of bass (with rock it's bass guitar, for example, and with dance it's synth bass) so make sure your mix has some kind of low-end element upon which to hang. From there, spread everything upwards and across the frequency range and don't have too much happening in any one area of the spectrum.

3 TOO MUCH CLUTTER

Computers have put untold musical power at our fingertips, but this doesn't mean we need to fill 256 tracks every time we compose a new tune. In

fact, many great pieces of music use very sparse arrangements with a few well-recorded sounds and instruments. Take the famous Phil Spector 'wall of sound' production method of the 1960s – the name might imply that everything and the kitchen sink was thrown in there, but actually Spector's wall of sound was just well-recorded, distinct, big sounds.

We've already pointed out how important it is to have a good spread across both the frequency range and the stereo image, but decluttering can be done elsewhere in your mix as well, simply by removing parts from the arrangement. Some of the best pop songs feature a vocal, a guitar and nothing else, while some classic dance tracks primarily feature a drum machine, bassline and vocal. So go ahead and be ruthless here – you can increase your impact by decreasing your sounds.

4 THE WRONG SOUNDS

Sometimes tracks don't sound right because the constituent parts do not make a whole. This can be often caused by using sounds that simply don't fit – synth brass being used in place of a real part, for example, or a sample with slightly incorrect timing or pitch, for example. It can also be down to the use of some boring-sounding presets, too many or, indeed, incorrectly applied effects, or roughly recorded samples. Don't misunderstand this last point, though, because rough, lo-fi audio can sound fantastic in the right context. It's all about getting the right sounds for the track.

The mix is also extremely important here. Of course you'll want some sounds to stand out – the hooks, lead vocals and so on – but it can be jarring when other sounds that make up the arrangement are so poorly mixed that they end up taking over.

5 WHERE'S THE HOOK?

At the risk of stating the obvious here, one of the main problems with your average demo is that it's just that – average. In other words it lacks that certain something that will grab the listener's ear and make the track really stand out from the crowd. And as that crowd is getting increasingly, well, crowded – as more and more people discover the joys of at-home music-making – nowadays any tune worth its salt needs some kind of hook to make it instantly noticeable and enduringly memorable so that people take notice quickly.

A great hook can potentially be pretty much anything – it can consist of a cool bass sound or part, a melody, an effect or a vocal trick. Indeed, you will find that the best pop songs (think Kylie Minogue's *Can't Get You Out Of My Head*, for example) have all of these. Quite often, though, just one will do – that one amazing effect or riff that makes the listener want to listen again as soon as the track is finished, and has them humming it for the rest of the day. Get this right and you have won half the battle.

6 THE WRONG FEEL

Getting the right 'feel' on a track is probably the single most important consideration when composing and mixing. Getting the groove wrong will destroy the heart and soul of a rock track, and even an ambient, grooveless piece of music needs to have feel. Part of producing great tracks is capturing the feel and enhancing the groove.

Some of this is really obvious: if you're going for a classic rock track, a 100-120bpm tempo and a solid backbeat will be a good starting point. If you want something a bit more laid-back, slow things down and add a bit of swing. Beyond that, there are myriad subtle techniques you can use to define your beats and make them match the overall feel of your track. Learn them and apply them.

Beats define your groove, but you should be aware that they can also destroy it. Ram a rigid 4/4 beat onto a soul track, for example, and you could end up with a real mess.

7 LAZINESS

While time-tested sounds and tricks have their place and can sometimes be exactly what a track needs, many producers unthinkingly borrow the obvious bits of a genre and just throw them in willy-nilly. Clichés can make a track sound average, and sometimes dated, so think on your feet.

This advice extends to how you use your Digital Audio Workstation, too. Beware of just throwing something into an arrangement simply because it fits, or of automatically letting your software stretch a part to the right tempo just because you can. And then, of course, we have synth presets – yes, they can sound great, but if you're using a preset because it sounds out of this world, you can bet that it will be instantly recognisable to everyone else who owns that same synth, and you can also bet that they will shake their heads disapprovingly.

This kind of preset snobbery is so wrong in many ways – presets are created to be used, after all – but the more 'out there' and available a sound is, the more obvious its source will be, so at least tweak it a little to make it your own.

8 THE REAL OBVIOUS STUFF

There's really no excuse for dodgy tuning, but things like out-of-key vocals, clashing melodies and unintentionally obvious pitch correction are still common demo demons that simply make us angry. To all of the culprits responsible for this, we say: there are two flaps of gristle on the sides of your head called 'ears' – use 'em!

Coming a close second on our list of obvious bugbears is hiss. This was an all-too-common problem back in the early days when analogue met digital, but if you're working solely inside the box with nowt coming in, you really shouldn't experience it, so nor should your listeners. If you're recording vocals, guitars or other live instruments, take steps – both of the preventative and the corrective type – to eradicate extraneous noise.

And finally, the stereo master mix that clips never fails to astound and enrage us in equal measure, with many an otherwise astonishing track being ruined because the producer thinks that louder equals better. On that note…

9 TOO LOUD

We've already mentioned width and depth as two of the three musical dimensions that you need to consider when mixing, so let's move on to look at the third: height, or, to use the correct term, dynamic range. This is the ratio between the quietest and loudest sounds in the mix.

The general trend in music production over the past decade or more has been to make master mixes louder and louder by using compressors and limiters to 'squash' the dynamic range, both of individual parts and the entire mix. As a result, we've all experienced over-compression. You know what it feels like: you'll be happily listening to a classic track on your iPod in shuffle mode and then suddenly something comes in from a couple of decades later that blows your ears off.

While these techniques once worked to make tracks stand out, they've now become so extreme that they're having the opposite effect. Today there's an ever-growing movement to reverse this trend, and it's one we support.

10 TOO PERFECT

Many producers feel that computers have made music too perfect, and we think they may have a point. While we don't want to sound like our dads here, the slick production sheen that's imparted by today's music technology can often make tracks sound samey and uninspiring.

If pristine production is totally your thing, then by all means that's fine. But consider the fact that your music might benefit if you make things a bit more organic, a little bit earthier and a bit more raw. We know you don't want to sound amateurish – and our aim is to help you sound anything but amateurish – but sometimes it's fine to allow or even flaunt some slight imperfection in your mixes. ■

MASTERING: THE BASICS

You've written a killer tune and mixed it to the best of your abilities. Now discover how to give it a high gloss finish

Mastering is the final stage of the long production process, and your last chance to make your tracks as good as they can be. Done well and mastering will polish your mixes to perfection. Done badly and the process can undo much of the good work that came before it.

If you simply want to add a dash of life to a demo, there are plenty of things you can do with the tools you already have to transform your song into a track worthy of shouting about. In this feature we look at some of the common tools you're likely to run into when mastering.

MONITORING

THE POINT of mastering is to create a mix that sounds great anywhere you hear it, and such a feat requires decent monitors. Assuming that you've got those (and a suitable room) sorted, listen to as much different material as possible until you learn the limitations and idiosyncrasies of your environment.

When mastering, listen to tracks on many different systems. If your master sounds awesome in your bedroom but unbearable on earbuds, go back to the drawing board. If you're really stuck there are plugins that claim to compensate for flawed monitoring and poor acoustics, such as IK Multimedia's ARC.

EQ

THIS IS one of the most critical processes in mastering. Two main factors affect how we hear a finished mix and one of these is the frequency spectrum, so a good EQ is essential. It's also important for setting the tone of the finished master.

When mastering, you will want a fully parametric EQ with shelving filters for both the top and bottom end, as well as a high-pass filter. This allows precise work on specific frequency ranges as well as on broader top and bottom-end adjustments. When boosting, an EQ that imparts some character is best; perhaps one modelled on an analogue unit with a touch of valve warmth. For troubleshooting problem frequencies, giving a bit more presence to a vocal or carrying out similar frequency-specific jobs, a mix of analogue emulations and 'digital' EQs works well.

MULTIBAND DYNAMICS

THESE ALLOW you to compress and limit (and sometimes expand) different parts

Two main factors affect how we hear a finished mix, and one of these is the frequency spectrum, so a good EQ is essential

of the frequency spectrum individually. When troubleshooting bad mixes, this is a boon as it enables a large amount of control over each part of the mix – these tools can be used to tame bass, bring out vocals, reduce harsh top-end and fix a multitude of other issues. It can also be used more subtly to pull together parts of a mix and add some sonic glue.

LIMITING

LIMITERS HAVE become synonymous with the often overly loud style of modern mastering. This processor prevents peaks in the signal exceeding a certain threshold, so the signal can be turned up louder without those peaks causing any nasty digital clipping to occur.

STEREO TOOLS

STEREO PROCESSORS have varied uses in mastering. They are often employed to create a sense of space in the stereo mix, but this can have a knock-on effect on the clarity and focus of certain parts.

The most important things to be aware of when using stereo tools are that bass should usually be mono, and that vocals should normally take centre stage. It's also important to realise that stereo widening often increases the perceived level of high frequencies, so consider that when EQing your mix.

SIGNAL ANALYSERS

THERE'S A reason why pro mastering engineers have a visual meter on-hand to guide and confirm their impression. When mastering your own music, using a meter is important because your monitors may encounter problems reproducing certain frequencies.

So where should you place your metering? Stereo analysers should be placed after any stereo field processors in the signal chain (any decent stereo mastering plugin should include one). Frequency analysers should be applied at least after your EQ, though ideally you'll want to be able to check what's going on before and after the equaliser to see the effects, so we recommend that you place two into the chain. Many modern EQ plugins have built-in frequency analysis.

Dynamics processing can have an impact on the frequency content, too, so

If you aren't sure what a good mix sounds like, playing professionally mastered material in the same genre helps – compare them to your own

place an analyser at the end of your chain to check the final product.

If you aren't sure what a good mix sounds like, playing professionally-mastered material in the same genre often helps. A top tip is to play mastered tracks through the analyser and have a look at how the meters behave, then compare it to your own stuff. If there are obvious differences between your tracks and theirs, this will give you some pointers on what to fix.

STEREO PROCESSORS

STEREO TOOLS are one of the newest weapons in the mastering armoury, and there are quite a few ways in which these can affect the stereo field. One of the simplest is to delay one side of the stereo signal to create a perception of space. Beware: because the effect is not very natural-sounding, it should be used with lots of caution.

Another way to create artificial stereo is to use a type of comb filtering that spreads the frequencies of a signal alternately left and then right. This technique is much more suitable for mastering and is offered by plugins such as Vengeance Sound's Stereo Bundle.

As we've pointed out, artificial stereo isn't the most natural-sounding thing in the world, and a number of dedicated wideners such as Waves' S1 and Sonalksis' Stereo Tools are available for when you need less obvious stereo processing – such as when mastering acoustic guitar, for example. These utilities essentially act just like a mid/side processor, allowing you to adjust the balance between the mono and the stereo signals. This means that they can make the track seem wider without adding anything that wasn't already present in the signal.

The last stereo tool in the mastering engineer's toolbox is mid/side processing, as found in EQs and compressors. These tools allow the mastering engineer to either equalise or compress the stereo, or work on the mono signals separately.

Whichever process you use, the key to stereo processing is to not get carried away. Turn the effect off from time to time to evaluate the difference it makes, and take regular breaks because it's easy to get seduced by width. After a few minutes away from the studio your refreshed ears will be able to tell if you've overdone it. ■

10 COMMON PROBLEMS SOLVED

Connection confusion? Lamentable latency? We troubleshoot your most common woes to help you get back on track

1 MY DAW/COMPUTER DOESN'T SEE MY AUDIO OR MIDI INTERFACE

FIRST, CHECK if there's an update for the driver and any software for your interface. This will likely be unnecessary if you're using a Mac, since its OS has built-in support for class-compliant MIDI and audio hardware. If there's no driver available, any Windows users can use ASIO4ALL (asio4all.com), a low-latency driver that works with many interfaces.

Another thing to consider is driver conflicts. Sometimes one device doesn't want to work with another. For example, if you try to stick too many 1-in/1-out MIDI interfaces from the same manufacturer on your machine, your software may not be able to tell them apart. What about the possibility of an IRQ conflict or a bad PCI slot? PCI soundcards can conflict with other PCI devices in your machine. Try plugging your interface into a different PCI slot if possible. If you're using an external interface, have you tried connecting it with another cable?

2 MY GUITAR SOUNDS AWFUL WHEN I PLUG IT DIRECTLY INTO MY PC/MAC

GUITARS HAVE certain special requirements in the studio. The impedance of the signal produced by your guitar is likely not matched to that of your computer's line input. You'd be best served by using an audio interface with dedicated guitar inputs, or a DI box to convert the guitar's signal to line level.

3 MY RECORDINGS ARE DISTORTED

THE MOST obvious culprit is lousy gain staging. How many options for increasing the signal level do you have? Are you using an external mic pre, guitar amp, or mixer? Each of these devices provides an opportunity to overload either itself or a step further down the chain. Learning to master the gain stages means knowing the gear you use. Read the manuals and experiment to figure out at which points distortion is likely to occur, and set the levels to optimise your gain staging.

Some equipment allows you to choose between operating at +4dBu or -10dBV analogue signal levels, so make sure your levels are properly matched. Some mixers and interfaces offer a 20dB 'pad' that can be switched in to lower the incoming signal. Finally, most musical sounds are dynamic, meaning that they can be at turns very loud or whisper-quiet, and it's the loudest peaks that can cause distortion.

Many audio interfaces can record at a resolution of 24-bits, allowing enough headroom to back off the signal without the quiet sections being swallowed up by the noise floor. If this isn't practical, use a hardware compressor or limiter on the incoming signal to prevent the peaks from clipping.

4 THERE ARE WEIRD DIGITAL GLITCHES IN MY RECORDINGS

TO BEGIN with, make sure there are no unnecessary stresses being placed on your system during the recording. Also, if you're using any external gear with digital outputs, you might need to set either the external hardware or your interface as the digital clock master. It is imperative that all of your digital gear be clocked to a master clock. FireWire buss problems can cause glitches and dropouts, too. For instance, you may find that you need to put your external drive and interface on discreet FireWire busses.

5 I CAN'T HEAR MY MICROPHONE THROUGH MY INTERFACE

THIS IS usually down to one of three issues. First, some mics – such as large diaphragm condenser models – require power, most often delivered via the XLR cable connecting the mic. This is called 'phantom power' and is there for the purpose of powering your condenser mics, usually activated with a 48V switch

on an interface, preamp or mixer. Some condensers (such as AKG's C1000) use standard batteries instead.

The second place to look will be your interface. It may have a switch for toggling between mic and line level. Make sure it's set to mic level if plugging the mic straight into the interface. This is the perfect time to discuss input monitoring – applicable to any live input, not just microphones. Many interfaces allow you to mix between the incoming ('direct') signals and those played back by your computer. If not, you'll need to enable input monitoring in your DAW. Your DAW and interface user manuals will explain monitoring features.

6 WHY IS THERE AN ECHO ON MY GUITAR/VOICE WHEN MONITORING?

DO YOU have a delay plugin strapped across an insert? Some DAWs have preset template tracks and many of these tracks are pre-routed to auxiliary busses or have effects on the inserts. Shut 'em off! More likely, though, the echo can be due to the inherent latency in the system/DAW when monitoring through your music software.

First, try lowering the buffer size of your audio interface (check your manuals); if it's still not acceptable, consider using your audio interface's direct monitoring (if it has this feature), which monitors audio directly through the interface for near-zero latency.

7 I KNOW I'M PLAYING IN TIME BUT WHEN I PLAY BACK, IT SOUNDS OUT

SOME DAWS record 'what you play', while others record 'what you hear'. Taking the latter as an example, let's say there's some audible latency when monitoring but you decide to ignore the fact that when you hit your MIDI drum pads, the resulting drum hits come back out of the speakers a bit late – so long as the impact of skin against rubber is precisely on the beat. When you play it back it will sound late, as that is indeed how it sounded through the speakers during recording. The DAW recorded what you hear.

Conversely, you might instinctively adapt your playing to account for the added monitoring latency by playing a little early so that during recording, what you hear through the speakers sounds exactly right. However, if your DAW records what you play, upon playback the software will compensate for the latency (which you already compensated for yourself by playing ahead of the beat), resulting in the recording sounding early. This can affect audio and MIDI recording.

Get to know which mode of operation your DAW uses and adapt your playing and workflow practices to work with it. Some DAWs offer both modes – for example, Cubase with its optional (and on by default) Adjust for Record Latency, which records 'what you hear'.

8 WHEN I PLAY MY PROJECT, IT STUTTERS AND BREAKS UP

IT MIGHT be that your audio buffer size is too low for the tasks at hand. While this will minimise latency, it will also tax your CPU a lot more and you can wind up with stuttering and drop-outs. With that in mind, it makes sense to keep buffer size low when recording in order to avoid latency, but to increase it once all of your tracking is complete and you need to maximise CPU power for mixing duties.

Another option is to choose less CPU intensive plugins for basic processing needs. You don't need a bells-and-whistles super-delay to provide a simple echo. Find effects plugins that are equal to the tasks at hand; ditto for synths and samplers. There's no need to open a multigigabyte sample set just to play back a cowbell. Look very closely at all of the instruments and different effects in play and determine where you can cut back.

With a modern multicore CPU, you will experience break-ups as soon as one core is maxed out. As such, experiment with disabling plugins on different tracks in your DAW so that you can discover where the bottleneck is – you may find that you only need to disable/replace a plugin or two in order to alleviate the situation.

If you need every instrument and effect, consider freezing or rendering tracks to conserve CPU. This will allow you to bypass piggish effects and instruments and cut back the amount of processing and RAM needed to play your project.

Also, check to see if you are overtaxing your hard drive – lots of audio tracks and disk-streaming samplers can make heavy demands on your drive. If this is the case, you might consider creating sub-mixes of your tracks, ie, you might mix all of your backup vocals down to a single track. You can always keep the original multitracked vocals saved safely in a separate project, in case you do need to revisit them.

9 MY PLUGINS DON'T SHOW UP!

YOU COULD be attempting to use 32-bit plugins in a 64-bit DAW, or vice versa. Logic Pro X, for instance, is a 64-bit application that only runs 64-bit plugins. Some DAWs come in both 32- and 64-bit versions (for example, Ableton Live), so you can choose which you want to be able to run. Some include their own 'bit bridge' that will allow a 64-bit DAW to run 32-bit plugins. If your DAW doesn't have a bit bridge, there are third-party 'wrappers' that offer the same functionality. 32 Lives (soundradix.com) is such a program for AU, while jBridge (jstuff.wordpress.com) is what you need for VST.

Before getting sidetracked, though, make sure your plugins are compatible with your DAW (ie, an AU-only plugin isn't going to show up in a VST-only DAW) and installed in the correct folders. Check your DAW's plugin management system to see if any problems were detected on startup. There will be a way to force the DAW to scan again for plugins, too.

10 WHEN I LOAD A PROJECT, THE DAW CAN'T FIND THE AUDIO/SAMPLES THAT GO WITH IT

WERE THE audio or sample files moved or renamed? You'll find that most DAWs don't store samples or audio in their project's default file format, but rather pointers that tell the software where to look for the data on your drives. If you've moved the samples or audio, the software won't be able to find it. Some DAWs offer a 'find' feature, but others will need you to manually direct the software to the new path. Some software can store all of the files associated with a project in a single, monolithic file format. This can take up a lot of space, but it's a good way to ensure your data is stored with the project.

When it comes to samples and audio, it's a good idea early on to develop good organisational habits. It's all too easy (and rather unhelpful) to wind up with tons of files scattered all over your drives. ■

THE BUSINESS OF MUSIC

By now you'll have set up a home studio, chosen the right gear, and recorded your music to be the best that it can be. So, what do you do with it now? Not everyone's goals are the same – some of you will have been recording as a hobby, others for close friends and family. But for those of you who are recording music to share it with the world and get noticed, this section is for you. We've called in a raft of industry experts to give you advice on building your local fanbase and getting your music heard. We have tips on how to grow an organic buzz around your band, how to supercharge your YouTube presence, and how to get reviews. It's competitive out there, but with the right attitude and brilliant songs, there's no reason why you can't make an impact.

GET YOUR MUSIC HEARD

How to build a fanbase, connect with your local and national music scene, and get your music out there to grow a buzz around your band

You've recorded your music and now you're getting ready to share it with others. Whether you're looking for reviews, gigs at your local rock night, or you're using your new recording to connect with fans and other bands on and offline, this expert-led feature will help you.

Over the next few pages we'll be dishing out advice from trusted industry experts, advising you on how to find your tribe and build an online platform. From writing your own press release and making your songs available digitally, through to building a YouTube following and growing your fanbase, this feature will help you get your music heard.

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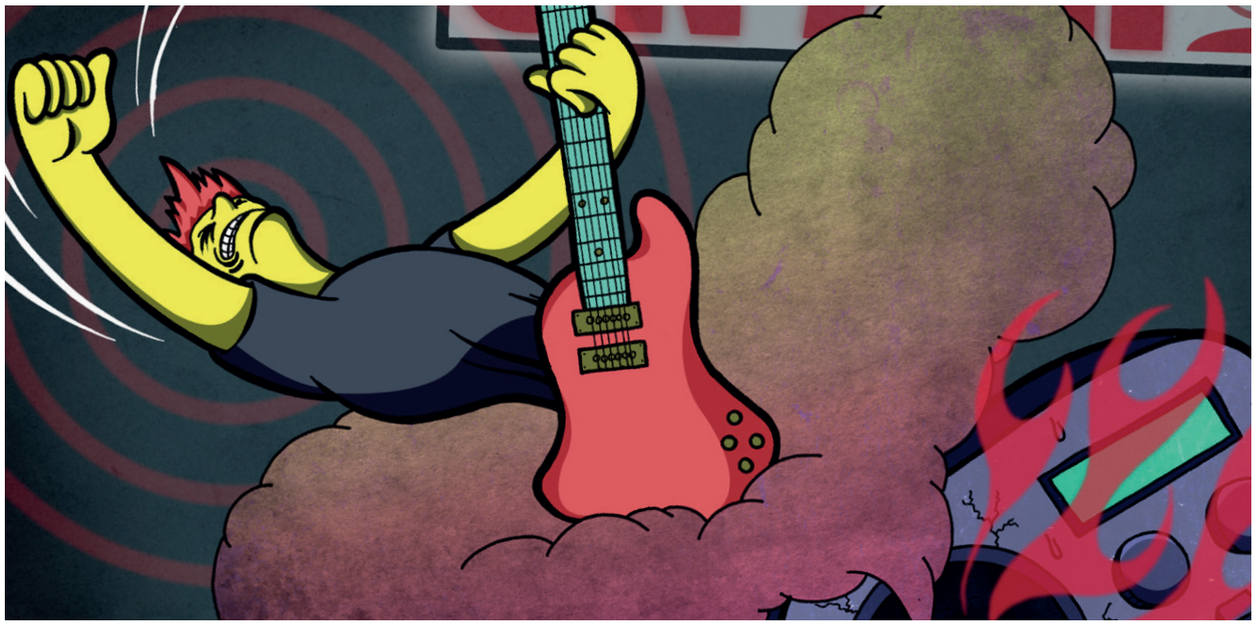

BUILD YOUR LOCAL FANBASE

Skip Curtis is a well-respected face on the UK music scene. He teaches students at BIMM Bristol about working in the industry, and he's a producer and songwriter, as well as consulting on A&R and artist development. Skip says that establishing a local fan base is an essential part of any artist's career: "Some artists are lucky enough to grow up in, or close to, a dynamic city with a strong musical heritage, while others find themselves plying their fledgling trade in areas with little musical infrastructure or culture.

"As the industry has moved online, geographical constraints have been reduced and online communication plays an important role in establishing a local fanbase," says Skip. "The most successful artists are those who build organically and establish a true connection with their fans and their community." Here, Skip gives you advice on building a fanbase – both online and in your home town.

SOCIAL MEDIA ESSENTIALS

"THERE ARE certain social media sites that it's expected for you to be using as a new artist – sites like Facebook, Twitter and SoundCloud are pretty much essential. Get in the habit of using these regularly by posting relevant content. Proper use will steadily increase your page's likes and followers, and you can guarantee that any promoters looking to book you will be looking at these numbers."

FOLLOW AND INTERACT

"POTENTIAL FANS and useful people are easy to find – a quick Twitter search will give you hundreds of useful and interesting local social media accounts to connect with. These like-minded people are the ones you should be interacting with early on and throughout your career. Don't spam and mass-follow thousands of accounts; do your research and connect with the ones you think would be most interested in your music."

ACT THE PART

"THE WAY you communicate online and in person should reflect what a dedicated artist you are. Lots of new artists act as though they don't take the industry or themselves seriously. While the novelty of funny pictures and in-jokes might win over a handful of people, in reality it's probably going to mean that local radio, press and promoters won't take you seriously. Keep your communication dynamic, but keep it on point."

RESEARCH

"UNDERSTAND YOUR local music community. Spend time investigating the different venues, promoters, bloggers, DJs, sites, magazines and tastemakers operating in your area. These will be the people to target once you're ready to release what you've just recorded and start building your hometown following."

ASK FOR HELP

"IT'S NOT cool so many artists don't do it, but you'll be amazed at the response you get when you simply (and politely) ask for something. Research the best and most relevant local new music site or magazine and send them an email asking if they'd be interesting in writing about you. More often than not you'll get a response; even if they're not interested, your name is out there. When you post links and content online, ask fans to share them. This isn't a desperate plea for exposure, just a simple 'If you like this, please share it.'"

LOOK THE PART

"THE WAY you market yourself online is a massive part of the modern music

industry. Press photos and good graphic design help build the 'cult' of personality artists are striving to create and these give audiences something to connect with. Getting this sorted might cost a bit of cash, but it's a necessary expenditure. The more professional you look, the more seriously you will be taken and the more fans will buy into you."

INTERACT WITH OTHER LOCAL ARTISTS

"THERE WILL always be healthy competition between similar artists from the same area, but that doesn't mean they shouldn't get along and support one another. Befriending and supporting other local artists online and in person is in everyone's interest. Not only does it help with gig sharing and fan crossover, but it also helps create a musical community and buzz in your area. Be visible, go to other artists' gigs, get your face known and support them online. Very often, certain places become hotbeds of talent and lots of industry eyes and ears will turn towards particular cities or areas."

DON'T OVERPLAY

"MANY ARTISTS fail to spot this pitfall, but overplaying in your local area can be detrimental to your career. Although you may want to hone your craft and keep playing as many shows as possible to build a fan base, in reality people will get bored of you. Music is readily available to consumers now, so you need to offer them something worth seeing. If you're too available your performances lose their excitement and appeal. Once that goes you lose the punters, and once they go you lose the promoters. Space your local gigs out and keep your set fresh."

VIDEOS

"YOUTUBE IS the king in terms of actual users and subscribers, so get a video presence online early. The approach you take depends on the kind of artist you are. Live sessions and acoustic videos suit certain artists with music that sounds good stripped back, while off-the-wall music videos will suit bands with more abstract sounds. No one's expecting big budget HD video shoots early on, but these days getting decent footage with clear audio is definitely achievable on a shoestring. Behind-the-scenes footage, studio clips and gig videos are great for drawing fans in."

BECOME THICK SKINNED

"YOUR MUSIC is never going to appeal to everyone. Prepare to be turned down plenty by promoters and press for purely subjective reasons. On a similar note, get ready for the occasional negative online comment. Arguing with trolls online will show you in a bad light. Don't waste your time on people who don't like your music, instead concentrate on interacting with the ones who do like your songs." ■

SUPERCHARGE YOUR YOUTUBE PRESENCE

Session musician Jon Harper has more than a decade of experience with major and independent record labels. He knows that building your video channel and attracting followers will help get your music heard worldwide. "YouTube has put artists in control of their image, allowing them to create their own video identity and broadcast their talents," he says.

"A few minutes spent establishing an account could allow you access to the industry and a vast audience across the world. You don't need a huge budget to promote your project, it's more about embracing a few simple ideas, being passionate about what you do and showcasing your talent.

"Setting up is simply a case of registering: choose a name and add some design to your page. Select a name that can run across your other online profiles." Here's more of Jon's advice for supercharging your YouTube presence...

BUILD YOUR BRAND

"MAKE SURE your YouTube page shares a similar design with your other sites to present a professional brand image. Use your own website or blog as a hub to tie everything together."

GEAR UP

"TO MAKE videos you'll need a basic way of recording and editing video and sound. You don't need pro equipment – many smartphones let you create HD video and upload to YouTube. There's also plenty of free video editing [software]."

BE CREATIVE

"WITH MILLIONS of videos on YouTube you need to stand out. You can hook viewers with creative covers. Look at the Trending section of YouTube. Note the content, length and hits of these videos – you can always 'piggy back' off others by creating a similar (or better) video as a 'video response' to drive traffic to your channel."

GIVE IT A NAME

"TITLES SHOULD be specific and improve your visibility by using keywords/phrases that people will be searching for (SEO). Add a detailed description and choose keywords from this for tags. Allow mobile sharing so people can watch on their devices and share on social media."

KEEP IT REGULAR

"REGULAR CONTENT keeps people coming back. Make a couple of videos at a time so you have reserves. Encourage subscribers by using YouTube's annotation feature, and by referencing related videos." ■

DIY PR

For those of you with no band budget for a professional press campaign, how about some tips on writing a knockout press release that will help get you reviewed? Luckily we have insider info from Jay Taylor, Director at Prescription PR. Jay's clients include Polyvinyl Records, Navigator Records and Sony Music, plus artists such as The Beach Boys, The Kinks, Tears For Fears, Richard Thompson and Lenny Kravitz. Rest assured, he knows what he's talking about!

"Jenny Bulley [Reviews Editor, *Mojo*] once told *The Musician* that, 'The value of a good press release can't be underestimated'. I couldn't agree more," says Jay. "This extends beyond just how well a press release is written, and takes into account its form and functionality."

Here are Jay's tips for writing a great press release and improving your chances of getting reviewed...

BE OUTSTANDING FROM THE START

"GET TO the point early on, and if you have already had some decent early coverage, include the best of the media quotes you've garnered at the top of your press release. It'll be eye-catching and instantly make you stand out from the 500 other releases that writer will receive that day."

KEEP IT BRIEF

"IF YOU'RE sending a physical version of your press release, don't exceed two sides of A4. If you're emailing it, ensure you format it correctly and send as plain text rather than as an attachment."

REMEMBER THE BASICS

"DOUBLE-, THEN triple-check the spelling and grammar. Include all relevant contact information and links to further information. For example, a bio, images, or links to more of your music."

WRITE FOR ONLINE AS WELL AS PRINT

"IF YOUR press release is more news related, keep it short and sharp. In all likelihood your press release may end up on social media with the title [and often the contents] replicated word for word. Make sure the title fits a site like Twitter's character restrictions for maximum impact and ease of sharing."

WHAT NOT TO INCLUDE

"AVOID HACKNEYED clichés about how you're the saviours of rock'n'roll. You never know, you might turn out to be just that, but at this early stage it's not your call to make. It'll be more of a turn off than anything else. Similarly, don't mention 'pounding drums', 'pumping bass' or 'driving guitars'. To the first-timer they might well indeed represent a valid analysis of your sound, but these phrases have been doing the rounds forever and are somewhat of an industry in-joke. Avoid at all costs."

MANNERS MATTER

"BEYOND THIS, when you approach journalists with your press release, be polite, patient. If they don't get back to you particularly fast, try to understand that they are busy people. You will soon discover that different editors have their preferred way of working but, generally speaking, a follow-up email is usually expected. Just try to resist the urge to bombard anyone too often." ■

GET THE NEW ISSUE FROM MYFAVOURITEMAGAZINES.CO.UK

JARGON BUSTER

Here we explain some essential words and terms that you might encounter in this *Handbook*, or elsewhere on your forays into the world of home recording

AUDIO INTERFACE

HARDWARE DEVICE with audio inputs/outputs for sending and receiving audio from your computer. Connects via FireWire or USB.

BUSS

ANOTHER NAME for a group channel or send effect. See Group Channel, Send Effect.

CHANNEL

GENERALLY REFERS to a mixer channel in a sequencer. Usually features a fader to control the overall volume level, EQ controls, and the ability to add insert effects. See EQ, Insert Effect.

CLICK TRACK

AN AUDIO cue programmed to a specific tempo and time signature to keep musicians in time when playing.

CLIPPING

DISTORTION THAT occurs when an audio input is overloaded.

COMPRESSOR

AN EFFECT that raises the overall volume of a channel by making the loud parts quieter, then boosting the entire signal. See Effect, Dynamics.

CONDENSER MIC

MORE SENSITIVE than a dynamic mic and requiring external power. Excellent for recording detailed sounds and capturing high frequency detail.

CUTOFF

THE FREQUENCY at which a filter starts filtering. See Filter.

DAW

DIGITAL AUDIO Workstation. A computer with the hardware and software to facilitate music productions.

DE-ESSER

AN EFFECT used to reduce unwanted 'S' sounds (sibilance or hiss) in vocals. See Effect.

DELAY

AN EFFECT that simulates echoes by repeating the sound. See Effect, Plugin.

DI BOX

DEVICE USED to plug guitars and basses into mixers or audio interfaces, negating the need for a separate amp.

DYNAMICS

THE VARIATION between loud and quiet music. Limiters, compressors and gates can adjust dynamics. See Effects, Compressor, Limiter, Gate.

EFFECT

PLUGIN THAT alters the sound of an audio/instrument channel, eg, a reverb effect. See Reverb, Filter.

EQ

EQUALISATION AUDIO processing that affects the frequency content of a sound. EQ can be used to either boost or reduce the volume of a sound at various frequencies.

FILTER

AN EFFECT or part of an instrument that removes certain frequencies from the sound to change its tonal quality. See Effect, Plugin.

GATE

AN EFFECT that silences audio below a certain volume, used to remove noise from poor quality recordings.

GROUP CHANNEL

A CHANNEL that can receive input from multiple other channels so that they can be processed together.

HEADROOM

AMOUNT OF volume you can add without distortion occurring.

INSERT EFFECT

AN EFFECT added in series to an audio or instrument channel, can only be used by a single channel. See Send Effect.

LATENCY

THE TIME it takes your audio driver to process audio. The gap you hear between hitting a MIDI note or playing a real instrument and hearing it.

LIMITER

AN EFFECT that stops a track's volume exceeding a certain level. See Effects, Dynamics.

MIDI

MUSICAL INSTRUMENT Digital Interface – a method of sending information between music hardware and software.

MIDI CONTROLLER

ANY DEVICE that sends out MIDI data, eg, a controller keyboard.

MULTITRACK

A PROGRAM capable of recording multiple audio parts on separate tracks.

OVERDUBBING

RECORDING A new performance over the top of an existing one.

PLOSIVES

THE POPS you get when a vocalist records a take. Can be reduced using a pop shield.

PLUGINS

SOFTWARE INSTRUMENTS/ effects that can plugged into a host program, usually a sequencer.

PAN

THE POSITION of a sound between the speakers.

PREAMP

DEVICE FOR amplifying a mic, guitar or record player before it's plugged into a mixer or audio interface.

REVERB

AN EFFECT to simulate multiple echoes as heard in real spaces. See Effect, Plugin.

SAMPLE

ANY SNIPPET of recorded audio data.

SEND EFFECT

A CHANNEL-INDEPENDENT effect that can be used by multiple sources at the same time. See Insert Effect.

SOUNDCARD

AN INTERNAL audio interface. See Audio Interface.

TRACK

EITHER AN entire piece of music, or an individual 'lane' of audio or MIDI data. See Audio, MIDI.

TRANSPORT CONTROLS

PLAY, RECORD, Fast Forward, Rewind, etc – controls used for track playback in your audio editor or sequencer. ■

TAKE IT TO THE NEXT LEVEL!

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