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Music Technology
for the Traditional Irish Musician

Gavin Ralston reviews aspects of music technology with the traditional musician in mind.

Music Technology

for the Traditional Irish Musician

A new series in which Gavin Ralston reviews aspects of music technology with the traditional musician in mind, brought to you in association with Waltons Music

In this new series of articles I will discuss aspects of music technology and how these apply to Irish traditional musicians and recorded music. The series will cover recording systems such as portable recorders, hardware multitrack recorders and DAW (digital audio workstations). I will then be discussing microphones, speakers and audio interfaces and also looking at editing, mixing and mastering audio. And of course I will be talking about value for money, best approaches when recording and what to expect from these recordings.

Towards the ideal portable recorder:

There are so many ways in which we can record music – mini disc, cassette tape, dictaphone, laptop recorders, even mobile phone recorders – that these choices can be confusing. I have been recording music for over 20 years and have bought far too much equipment and been in enough sticky situations that I hope to be in a position to give advice. I've had 3 mini disc recorders, I've lost my cassette recorder, my Dictaphone fell, my DAT player died and I've upgraded my mobile phone numerous times so it's hard to find one solid recording system as technology keeps changing.

That is until now: I recently got a new device called the Zoom H2, which is a portable digital recorder. It's a great recording device – handy and so simple to use that I was wondering what I was I doing before it came out. I've stacks of mini discs with rehearsals and live gigs of Beginish and Dave Munnelly and it would take me two or three days to go through all of them and that's nothing in comparison to the amount of home recorded cassettes I have from the late 80s and 90s. When I got the H2, I spent about 15 minutes looking at it and pushing buttons before I was up and running. Within 5 minutes I was listening to two different short tunes I had recorded which opened in iTunes as separate pieces. Voila!

One device to record them all:

The Zoom H2 seems to be the simplest and best equipped recording unit available. There are other portable hard drive units available, but for features and ease of use the Zoom is a hard act to follow For example, in the past I used a Sony stereo mic (£100, 6 years ago) plugged into my portable mini disc recorder (£200, 5 years ago), and then I had to bring along a few mini discs, either blank for new ideas or half used for ideas to be developed (€2 each). All that equipment is now is on eBay! The mic on the H2 is slightly livelier than the Sony stereo mic, but that's not a bad thing. The quality is as good if not better that the mini disc, and I don't need to carry a single disc with me. Again it just opens straight onto my computer and there's a choice of formats – either mp3 48-320 or wav 44.1/48/96 K – which covers most audio formats that are used today.

Applications:

The H2 is perfect for recording sessions, lessons, rehearsals, solo recordings , interviews or whatever you're having yourself. I've been working with a good friend of mine Geoff Woods recently and we've been transferring ideas and tunes via the internet (which is great for avoiding Dublin's M50 'car park'). It did take

half an hour to get a tune recorded on mini disc, then transferred into my DAW (Protools/Apple Mac) before I could email it to Geoff. Now with the H2 I can email it as quickly as it takes me to record a five-minute piece of music. It's easy to see why these units have become standard issue for a number of broadcasting and educational institutions.

Mic Configurations / Record Modes:

The front of the H2 has two cardioid microphones (named after the shape of the heart) in the XY configuration (2 mics pointing outwards at a 90º angle from each other). The rear of the H2 has another pair of cardioid mics pointing outwards at a greater angle of 120º, which they call the W XY – giving a greater amount of separation between left and right.

The first choice you'll need to make is which of the two recording modes you will use. 'Stereo Mode' uses the two mics on the front of the H2 to give you a conventional stereo recording which the unit then saves as a stereo Wav file. '4 Channel Mode' uses the front and rear mics to achieve a 360 degree sound field saved as two separate stereo Wav files which can later be adjusted to alter front rear balance as desired. This could make for an interesting recording when used during a pub session, as you'll be able to hear the music on one side and then the local gossip on the other! I haven't had a chance to use it in a session or rehearsal on the surround 360˚ setting yet, but it should enable you to hear all that's going on between all the musicians with a far greater depth of field than is possible with a standard stereo mic configuration. This is truly amazing when I think of all those noisy cassette tapes I have of rehearsals where I can't make out anything with all the tape hiss and no separation.

Putting down tracks:

To start recording you hit the red button in the centre once and then it's ready to record. Hit the button again when you're ready to play and that's it! When you're finished push the red button again and it stops, stores the tune and then it's ready for another recording. To play back the recording, push the button at the bottom with the play/pause sign and it'll play it back straight away. To adjust the microphone level, just push the button on the left- or right-hand side on the front, according to the desired change. There's a 'mic gain' switch, which adjusts the mic level in bigger steps – Low/Medium/High. There is also a 'headphones out' socket, an 'ext (external) mic in' and a 'line in' so you can record from an iPod, cd, mini disc or whatever you were using before. Phono to Mini-jack cables come with the unit as well as headphones, a USB cable, a windshield and a power adaptor, and the unit runs on AA batteries or the included AC Adaptor.

To go into more detail, push the menu button and a list of options come up. 'Lo cut' is a setting to cut off very low frequencies. This is especially useful for vocals and most traditional instruments and will also help eliminate foot tapping and other background noise. Here you'll find a choice of formats for recording. The higher the quality, the more space it takes up on the memory card. Everything from humble MP3 through CD standard 16bit 44.1 kHz right up to Mastering Quality 24bit 96kHz is available depending on your requirements.

The unit comes with a 512MB card as standard, which at the standard format in stereo mode will give you 48 minutes. You can buy extra cards up to 4GB each, which will give you a total of 377 minutes.

Also provided is an 'Auto Gain Control', a type of compressor limiter that adjusts the dynamic range of your recording giving your recordings a more 'professional' and radio friendly sound. Presets include setups for recording speech, vocal, drums and percussion and Live Events. This function depends on your personal taste, so experiment and see which one you prefer.

'Monitor' is for listening back while recording so you'd need to plug in the headphones. Pre record allows you to constantly store audio in standby mode until you hit record and then it will only keep a few seconds before you actually hit 'record' which is great if you pushed the button too late to get the very start of a tune (or gossip). 'Auto record' will only record audio of a certain level and will ignore the rest, i.e. when you're in the middle of a session and you only want the tunes and not the gossip!

ZOOM H2 – the simplest and best equipped recording unit available

Organising your files:

'File' is where the recordings are stored with names like STE-000.mp3. If you click 'enter' (centre red button) you can rename the track. It also displays some technical information such as time, date, format and size. Here you can also mp3 encode, normalize (boost levels if too low), divide, mark and delete. In this regard it is much the same as a mini disc but to be honest I didn't really feel the need to do any of that here as all I wanted to do was push record and play and keep all the editing for a later date.

'Folders' is a very handy option for organising and classifying your files so you don't loose track of them, especially when your card starts to fill up.

It also has a tuner and a metronome, but I'm not sure we'd need that for sessions or lessons, although for home recordings it could be very useful.

Sum of its parts:

Sometimes with a unit as clever and versatile as the Zoom H2 it can be difficult to figure out exactly what it's meant to be. Is it a recorder? Is it a USB mic or is it an audio interface for your computer? In truth, it's all of these things but much more besides. Put another way, try pricing 4 decent microphones, a portable recorder, a USB interface, a chromatic tuner and a metronome and I think you'll see that the Zoom H2 really is a true bargain.

In the short time I've had my H2 I've found lots of unexpected applications for it and I believe the more I use it the more new applications I'll find – kind of like a Swiss army knife for musicians. I don't believe there are very many musicians, professional or amateur, out there who couldn't find a use for the Zoom H2.

More technical information is available on: www.zoom.jp

Music Technology

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Last month I discussed the inner workings of the Zoom H2. In this article I'm going to talk about its practical use. I've leant from the hands-on approach as reading manuals was never my strong point. Actually there was a great catch phrase when I first started recording and things were going wrong: my brother would say that it was a classic case of RTFM (read the feckin manual!)

Simplicity:

The wonderful thing about this unit is how simple it is to use. I have mentioned before how many different systems there are out there and that at one stage or another I had them all but that's only one of the benefits. On the technical side it's unobtrusive so it doesn't create the red light syndrome (panic attacks while recording) and you don't have to watch the unit when you should just be playing or concentrating on someone else play. When using other systems you would often have to check that everything is ok, that it's still recording in case the computer has an on screen dialog saying 'dae error 132' or that you've run out of space or you've forgotten to turn the mic on as well as push record. You can just push record and go. Speaking of space for recording, on the cover of the H2 box there is a simple chart laying out the time available on the SD card depending on what format you have the card in. The default setting on the card is wav 16bit/44.1 kHz which is good enough quality to edit and use for most things so I just left it at that. It's possible to reduce the quality to get more space if it's only for lessons and you're running out of space but if you want to send someone some music to listen to use the default higher quality setting. Enough guff.

Sound checking:

The longer I have the Zoom H2 the more uses I can find for it. The first example of how useful it can be was on Friday night when I was doing a sound check. As performers know, the musicians are the last to hear what they sound like through the PA speakers as we're normally sitting behind the PA on stage and often we're the first to hear how bad it was after the show! That can be really annoying as there's nothing we can do about it afterwards. Anyway, it was one of those sound checks where everything sounded muffeled and rough so I had a brain wave, left the stage, positioned the H2 on its stand at the back of the hall and played away through a few more songs. Afterwards I was able to review the overall sound and have a chat with the sound man to adjust a few things. It was actually the empty room and a loud PA that caused the problems during sound check so I got him to turn it all down and it sounded fine. It was an old trick I used before with the mini disc recorder when we were touring America, where the sound engineers are more accustom to rock music than Irish trad, but again, the H2 made it much easier being one self-contained unit.

Songwriting:

Example 2: I was rehearsing with a friend at home recently and during the rehearsal she mentioned that she had written a new song so, with the guitars to hand, we decided to throw around a few new chords and arrangements. Now at this point I had my pen and paper ready to write down the few chords an to make note of the developing song when I thought of the H2. Ideal. I propped it up in front of us and pushed record. At this stage we were still trying out different ideas so we recorded all the versions and when we were happy with an arrangement we recorded that final version without any complications or change of mood from jamming to professional recording session with mics and headphones etc. I went into 'menu', then 'file', then 'rename' as I renamed the full version of the song from ste-005 to 'the take'. It's a bit fiddly pushing the right button, then record button, then right button for the next character but it's no different than renaming a track on a mini disc and it's worth doing it to keep note of what you've recorded until you can get to your computer to upload all the info. So while the kettle was on for the celebratory cup of tea I uploaded the final version to my computer and emailed it to my friend Luan, thus saving the paper, ink, a CD and my head-grief transferring from mini disc to Protools to iTunes to email outbox.

Quick recording:

From a quality point of view there's no noise at all and everything is very clear. I placed the unit between the two of us at the same distance apart and if I was to be critical, my guitar was a bit too loud in comparison to the vocals but all I wanted to do was to get the idea down asap. If I had plugged in my head phones and turned on the monitor within the menu options on the H2 I could have heard that the guitar was too loud before I started to record and I would have placed the H2 closer to the singer but again it was done very quickly and only for an idea. To correct the imbalance I would have to use my DAW (Digital Audio Workstation) and rebalance the recording there. It's possible to rebalance as the mic is a stereo mic meaning 2 channels (left and right) are recorded at the same time. So in the interest of this article, I imported the song into Protools then turned down the left side which brought down the guitar and then the balance was perfect. This comes back to a point that I mentioned in the first article: It's very important to know what the recordings should sound like and what to expect when recording. I wanted a quick recording and that's what I got. In the next example I needed something better.

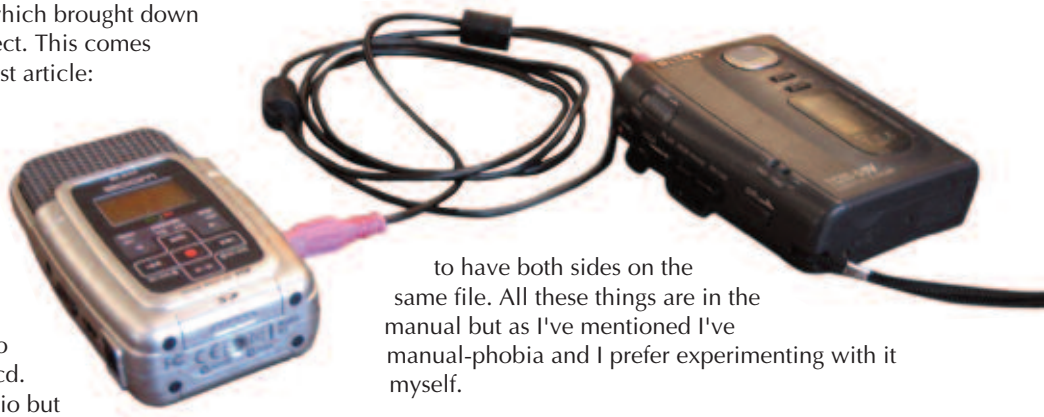
Transferring from other media:

Example 3: Brendan Begley wanted me to transfer an old live cassette recording to cd. Now I have a professional recording studio but being the nephew whom he taught in school, where I made his life hell, there's not a hope I'd get a penny out of him for hiring my big Protools system so I thought I'd use the H2 as a test. Here's another great feature of this unit: you can record directly through the mic jack input without having to use the microphones. That means you can record from a mini disc, CD or even vinyl as long as it has a small ipod size headphone output. Transferring from vinyl is a tricky thing and if I personally wanted to transfer a full record to CD I would use the bigs guns again in my studio but if I was only interested in getting to hear the music, it's perfect. The transfer: I plugged in a mini jack to mini jack lead from the cassette player to the input of the H2. The recording goes through the cassette headphone amplifier, which can boost the noise level, so I turned the headphone output to about 5 and monitored the input level on headphones plugged into the H2 and adjusted the input gain switch on the left hand side to medium. I also watched the input level meters on the H2 screen which gave me an average level of 70%, which is the best balance between distortion peeks and signal/noise levels (I will go into detail at a later date). Once the 14 minutes song was recording I transfered it to the computer in 35 seconds and then opened Toast Titanium, which I use for burning CDs, and pulled across the audio file in question and burnt the CD in 20 seconds. The quality is fine and Brendan's delighted.

Click track:

The Zoom H2 also features a metronome which is handy for practicing or when recording to keep you in time. I'm not a huge fan of recording with a metronome or a click as it's also called as sometimes it interferes with the musician and music by putting emphasis on tempo and less on performance and feel but it's really up to the individual as to what suits them. It's also got a tuner on the screen using the built in mic so it can tell you how out of tune everybody else is within the session and you can also record them to prove it! It works on chromatic, bass and guitar including DADGAD which I thought was nice touch from a Japanese company.

Two extra features which are really useful are the AGC/Comp section and converting 4 ch. mode to 2 ch. wav. The AGC/Comp section is the third option within the menu and it's a function that automatically adjusts the recording input level so low level signals are turned up and high levels are turned down which limits the recording from any distortions or noises which is great as often in sessions you can never tell what's going to happen next. Converting from 4 ch. to 2 ch. is necessary when using the H2's 4 ch. option which uses both microphones on either side of the H2. If you don't you'll be left with 2 separate tracks of the same recording but on different files so one file will be the front mic and then another file will be the back which isn't really of any use. It makes more sense to have both sides on the same file. All these things are in the manual but as I've mentioned I've manual-phobia and I prefer experimenting with it myself.



ZOOM H2 – the simplest and best equipped recording unit available

In next month's article I will be looking at the H4, the 4-track version of the H2 and this is where you can layer take upon take and that's where a click would come in handy. If you have any specific questions or seek advice please email me at gavin@silverwoodstudios.com. More technical information is available on: www.zoom.jp

Music Technology

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Now that I've talked about some basic recording options available with the portable Zoom H2 unit, I would like to move on to what can be done with these recordings and make some suggestions around the recording process. I also want to discuss other options like computer interfaces, mics, preamps, 8- and 16-track recorders. Each of these can produce good results with a little bit of care, knowledge and know how.

One of the most important points to remember about recording is that it can be broken down into these percentages: 50% of the recording is affected by the musician and the instrument, 25% by the environment or room and 25% by the recording equipment. If you have your music prepared, have warmed up and have your instrument in tip top shape, find a room that is sympathetic to your instrument without too much affect. I've heard of pipers rehearsing in a bathroom because of the natural reverberation but recording the pipes in such a room would give a loud undefined booming sound which lacks detail. On the other hand a small bedroom with a carpet floor and curtains will probably absorb all sustain from a quiet instrument like a solo guitar piece, making it harder to sing out. The key here is to find a room or space that naturally suits the instrument and will greatly enhance the recording. A suggestion I'd make is that if you do want to record a solo guitar piece, get into the bathroom before the piper as the reverberation may help to sustain the long notes. On similar lines, the small bedroom should sound good for the piper, as long as it's not too small, otherwise the recording will sound boxy and unnatural. The best way here is to experiment and listen to the results. Because you're not paying for a recording studio on an hourly basis, take the time and analyse the results, then make a decision on what sounds best.

I don't believe that someone has to be technically minded or have the right lingo or jargon to have an opinion on a recording. If the recording sounds too loud, reduce the microphone level or step back from the mic. If it sounds like the instrument is in a big room find a small room or move closer to the mic. If the fiddle sounds a bit squeaky, try moving the microphone from directly in front of the fiddle to the right-hand side, out-of-sight line, and double check the amount of rosin you have on the bow. If the accordion or concertina is making too much button noise, move the microphone away from the direct button area or, if it's still there, check your instrument for air loss.

These are only suggestions, but, as you can see, it is possible to listen to the recordings and make a judgement call without knowing a lot about the technical side. I reckon it's a bit like wine tasting: full-bodied, round, full of flavour sounds like a cracking bottle of wine to me whereas a light refreshing fruity wine isn't my thing and would suit my missus perfectly. I'm no wine connoisseur but I'll check the wine list, read the guff and the history, check the wallet and order away. If I get it wrong, I'll know not to get that one again, but generally it works out fine.

The red light zone:

I have often seen people play the most amazing music in sessions and rehearsals, or even warming up before a recording session, but as soon as I push the record button, they clam up, lose all their fluency and don't produce their natural sound. There is something about that little red light that affects every single one of us but I reckon the major difference between a professional and an amateur player is, apart from experience, a pro knows how to put aside that 'red-lightitis' and concentrate on the music. It takes time to relax into a performance and often it's the second or third take that will be the best. It's not important which is the best but that you have a take that you're happy with.

Here are some suggestions to take the edge off the nerves: Take a deep breath and exhale, concentrate on your instrument, know what you are going to play and enjoy what you're doing, which is, above all else, why we all picked up a musical instrument in the first place. When you push the record button, count yourself into the start of the tune in the tempo of the tune which should help to settle the pace of the tune. A little trick is count 1, 2, 3, leave 4 silent, and then start. This will enable you to cut or edit out the count at a later stage and provide a quiet start to the tune. This may sound slightly strange but, trust me, it will matter if you're going to use these recordings for a CD or for public listening and there's noise and speaking or other such sounds before the music starts. A further trick is to let the last note hang at the end and then leave a few seconds silence again for a quiet end to the tune. Another trick, which I learnt while recording with Producer/Engineer Dave McCuin, is to push 'record', then play a bit of the tune to get the tempo and to settle the hands, stop-count yourself in and then start the tune for real. These are all simple but useful tips for recording and are great to get the best from a recording session.

LOGIC: A PROGRAMME FOR RECORDING, EDITING AND MIXING MUSIC

Different approaches to recording:

Here's an example of a solo recording session that was developed into a great CD. Paul McGrattan contacted me a few years ago before starting his second solo album, 'Keelwest'. We had previously recorded the second Beginish album with all of us playing live in Bill Shanley's fine studio, The Cauldron, Dublin. Even though this was a great and rewarding recording process, Paul felt that for his new solo album he wanted to go back to a solo setting. He decided to go to Achill island, brought a simple recording set-up and did it all himself. He had an AKG C3000 mic, a DAT player and a set of headphones, got inspired, positioned the mic in front of his flute, as he had done many times before in the studio, and proceeded to record 3 or 4 different versions of 12 or 13 selections of tunes. Then he brought the recordings out to my studio where we selected the best versions, edited out any slight blemishes and, at this point, it was ready for the extra musicians to do their thing. This is where the count-in was invaluable, as the guys knew when to start playing.

This process of recording after someone else has already played might sound a little strange but it is more often the case within professional recording circles. I had recorded with Ronan Browne on Seosaimhin Begley's '91 solo album, 'Taobh na Gréine', a full 3 years before I met him and I also recorded with Luka Bloom and Sinéad O'Connor in 2001 on a song called 'Love is a Place I Dream of', yet I've never actually met Sinéad! Anyway, Arty McGlynn, Colm Murphy, Noel O'Grady, Paddy Glackin and I all contributed to Paul's album with him beside us but not actually playing and the recording process worked a treat. Paul was able to concentrate on his own playing while on his own and then, while in the studio, he was able to focus on other people playing to his music. Once you realise what is possible with recordings, a wealth of possibilities opens up.

Alternative recording set-ups:

I now want to cover the alternative recording set-ups that are available as they all have their strengths. Most semi-professional musicians have a computer-based recording set-up of some kind. Protools seems to be the most popular but there are many other options like Cubase or Digital Performer or, recently, Logic and GarageBand. These systems depend on what type of computer you use and how much space you have allocated to recordings. I have two computers: one for Protools and music only and the second is for everything else. This may sound extravagant but there are fewer things that can go wrong this way and, in my experience, everything has gone wrong at one stage or another. I only got into computers in '95 starting off with an Atari ST because of their influence on music and, at this stage, after using 4 different software systems and at least 8 different PC and Mac computers I'm an expert on when things go wrong with computers. It's funny, but the more I work with them the less I trust them. They are great, are constantly getting better and are the future, but I have spent a lot of time looking at a screen rather than playing music which can be frustrating.

The second recording set-up is the stand-alone 8-track or 16-track units from Roland, Yamaha, Zoom and Akai and the like. I've used most systems on my quest to have a working recording studio – I had the Roland VS880 in 1998 and the Roland VS1680 in 1999. I loved them, and they certainly do not cause as many operational problems as regular computers, but they can be limiting with a whole new system to learn and it's not possible to upgrade and improve in the future plus the quality is not as good as most protool systems. I have heard some great results from these units including 'O' from Damien Rice which was recorded on a VS880, so none of those down sides bothered him or the millions who bought it.

The third category includes portable units like the Zoom H2 and H4 as well as M Audio, Korg, Sony, Tascam and Roland. These units will replace mini disc and cassette recorders as well as simplify the whole recording process, which has to be a good thing for all of us. What is useful is that once a recording has been done on these units it can be edited on a computer or DAW (Digital audio workstations), as Paul did.

In next month's article, I will describe a recording session in detail and also discuss the stand-alone digital multi-track units.

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Having covered the broad strokes of recording sessions and the related gear and some techniques, I'd now like to get more specific and look at each of the instruments in the trad arsenal in detail.

Preparation:

Firstly, let's look at the guitar and how it's set up. New strings are a must at this stage as older strings lose top end and it's harder to get in tune. I find that a new set of strings put on the night before a recording session is the best. This way the strings still have the brightness but less of the squeak associated with new strings, plus they have settled in and are less likely to slip when tuning. Some people like to replace them an hour before hand and that also can work well, but I have heard of a recording session that involved putting butter on too recently installed strings to stop the excessive squeaking. The strings will slip before they settle down, so allow 20 minutes for this. Also make sure that there's no rattling or buzzing coming from the guitar as this will be amplified by the microphone and will not add to the session. An example of this is the excess strings at the end of the machine head, so be sure to cut them off. Another suggestion is to remove your watch, as this may rattle while you move your hands and the microphone may pick up the ticking.

I have a number of different acoustic guitars, much as a tradesman will have tools, and I will chose a particular guitar for the session. I've been using a Gibson jumbo for many years and it has a great big sound which is perfect for backing, but if I'm finger-picking or playing tunes I will use my Gibson dreadnaught - a regular shaped guitar but brighter sounding which helps while playing melodies. Another guitar I use often is a high strung which can be a regular guitar but using the higher octave strings normally put on a 12-string guitar.

Which Microphone:

I would usually start off with a small condenser microphone as this would generally capture all the detail and brightness of a guitar that is needed to fit into the final mix. I like the Neumann KM 184 mics as they seem to have the best detail, but I've used a variety of other mics depending on the session. I have used the Studio Projects C4 mics which are very similar to the Neumann's but at a fraction of the price. I've also recorded using a dynamic Shure SM58 and it gives an interesting sound but it is not as pure as the condenser. When I first met the great guitarist Chris Newman many years ago, he suggested that I get an AKG 451 mic with the CK3 capsule, as that is what he used both in the studio and live with his vintage 1930's Martin guitar. I did get one and it sounds slightly darker than the 184s

which I often use depending on the guitar and session. I've a collection of mics and pick a microphone to suit the instrument – it's important to understand the characteristics of the mics. While doing a solo piece, I would try a larger diaphragm microphone like the Neumann TLM 127 or U87 as this can capture all the bottom end of the guitar, normally lost in a mix of other instruments. I also have a Studio Projects T3 Valve mic which I like as it gives the guitar a big fat sound and is great with voice and solo guitar.

Microphone set up and positioning:

I generally start off with a single mic pointed at the front of the guitar, between the neck and body at the 12th fret. Moving the mic up the neck will give more brightness and moving it towards the body will produce a darker sound, so experiment to see which works best for your instrument. On occasion, I have used two microphones on a guitar, one pointed at the neck of the guitar and the other pointing at the sound hole or bridge and then panned to the left and right of the speakers. This can sound great but is only effective when there are a small amount of instruments on the tune. If there are a lot of instruments involved in the recording, it is much more effective to use a single small condenser mic as that will make the guitar fit straight into the overall sound. It's also critical to stay reasonably still while recording as any movement will effect the tone and level of the microphones.

Common problems and how to solve them:

A common issue with the acoustic guitar in the studio is excessive booming if the microphone is too close to the guitar. This is called the proximity effect, where frequencies are over-pronounced. If, like me, you are recording yourself, you won't have anyone else listening to the speakers to tell you that the guitar is booming before you go for a take, so this is where maintaining the mic position is critical. You have to get an even balance between the sound of the guitar and the sound of the room to get the best results. Record the guitar in a reasonably live room to prevent it from sounding dead and dull. Wooden floors are good, but don't record in a room that is too large as the guitar sound will be lost in the natural reflection. If you have recorded a guitar and you're getting excessive booming, use some EQ to reduce it. I would start at 100 Htz, which is always a problem frequency, and reduce it until the boom has gone. Try a very slim width or Q to limit the overall bottom-end loss. Also, try a little reduction at 200 Htz as this may also help. If your guitar sounds dead it's possible to add some short plate or spring reverb to give it some life. If your guitar sounds boxy try reducing the lower mid frequencies like 250 Hz or 500 Hz which should help. 'Boxiness' is harder to resolve so try changing the room or mic position before reaching for the EQ.

Equalization, compression and effects:

Once the guitar is recorded I use some compression to even out the over-all sound and also add some punch. I have a few different types of compression on my computer as well as some real compressor boxes and I'm familiar with their characteristics so I'll use one to suit the guitar. I often use the bomb factory LA2A compressor in my protools system which softens the overall sound as well as adding some lower mid range. I sometimes use the Fairchild compressor which gives a brighter sound than the LA2A. On occasion, I use some reverb to add some life if needed, but I would always err on the side of caution rather than going mad with the amount, as it can sound great by itself but won't necessarily work in a mix. You should always judge the reverb amount in the overall mix. EQ can be really useful for the guitar to fit into a mix and I often use it to give a bit of brightness, depending on the initial recording of the guitar. I remember having to edit a guitar I recorded which was a great take but sounded really dull, so I dug out the EQ and cut everything below 100 Hz, reduced 250 Hz, added some 4 K Hz and it worked fine. I reckoned it was easier to do than re-record it as the performance had a certain extra flair that just seemed to work.

Guitar in the mix:

As mentioned earlier, compression is a great tool to keep the volume level even and punchy, as well as a bit of reverberation to add some life and brightness. All of this is very subjective, but if you consider that what I've suggested here are the available tools for you to use in the overall mix of things, you'll gradually become familiar with your own best use of them as the recording requires. I did a song recently which required some volume changes within the mix as the verse had a finger-picking section and the chorus had a strumming part which was obviously louder. I was able to automate the changes using the computer by selecting the section that needed to be louder and then reducing the other section to give the guitar an overall level and balance.

All the above can also be applied to bouzouki, cittern and mandola to very good effect.

Next month we'll look at recording fiddle and all the attendant issues and techniques.

If you have any specific questions or seek advice please email me at gavin@silverwoodstudios.com.

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RECORDING THE FIDDLE

The fiddle is a unique and enormously flexible instrument. In traditional music every fiddle player has his or her own idiosyncratic sound and touch, which can be distinguished even after hearing the first few notes. There are so many wonderful players and regional styles that it takes a versatile instrument like the fiddle to give the depth and space to capture that richness. It can be a wonderfully smooth and expressive instrument in the right hands but a weapon of mass destruction in the wrong ones. The Donegal power, the Clare touch or the West Cork/Kerry bounce are a few examples of the diverse colours and styles of fiddle playing that have developed within the tradition. I remember being in a session at the 1997 Shetland Islands folk festival with Paul O'Shaughnessy and Tim O'Brien, both on fiddles, when Tim turned to me and said, frustrated, "I wish Paul would slow down so I can see what he's doing with his fingers." I have been very lucky to have worked with many wonderful players in trad, classical, jazz, folk and cross-over styles. Each of these players has his/her own sound, which makes the recording sessions a pure joy because all I have to do is put up a microphone and let them at it!

Preparations for Recording the Fiddle:

I have heard of players changing the strings the evening or a few days before a session and also those who never change their strings unless one breaks – it's obviously a personal preference. Of course, the biggest factor in the music produced is the type of fiddle and bow. Traditional fiddles generally have a bit of bite to their sound, whereas a classical violin has a more rounded sound. What also makes a difference is the hair tension of the bow, the amount of rosin, the brand and age of the strings and closeness of the bow to the bridge. The choice of recording

room will also have an effect, as will microphone choice, but the basics of instrument choice and setup will be the largest factors in the recorded sound. If the fiddle is too squeaky or sharp sounding in the room, it's going to sound like that through the speakers after the recording, so sort these issues out before you start. Try and get the sound as you want it before approaching the microphone, as this will make the whole session a lot easier.

Microphone Types and Specific Models:

To start with, I set up a number of microphones in a bunch around the fiddle and then listen carefully to which one sounds the best. I have often used two or more mics on the same fiddle, with each mic giving a slightly different quality and depth to the sound. I start off with my condensers – an Audio Technica AT 4033 mic and a Neumann KM 184 – and then I use either my valve Studio Projects T3 or a Neumann TLM 127. The AT 4033 is a large diaphragm mic which sounds great on a fiddle, capturing the low- and mid-range frequencies, and then the smaller pencil-like KM 184 mic gives the detail and top end, which can produce a lovely balanced fiddle sound. The Valve T3 mic can sometimes bring a nice lower mid-range into the equation, and the TLM 127 can give some extra body, but these are really optional extras and I don't use them as a rule, as I can generally get a decent sound using the first two mics. A good quality ribbon mic can also give some great results, but because you have to be very careful with its handling and use a good quality pre amp to power it, it's not as popular as the condenser type. Dynamics can be rather hard sounding on the fiddle in the studio as they're designed to boost the upper mid ranges so they are not a great choice for this type of recording.

Microphone Position:

When I'm using a multi-mic setup I'll position the two or three main mics right beside each other at about 18 inches above the fiddle, facing down, pointing between the bridge and the fingerboard where the bow meets the strings. This captures most of the sound and is a great starting point. Adjust the height of the mic to suit the sound, i.e. closer to get more detail and further away to get more body. I have placed the microphone a lot higher than 18 inches to capture more of the room sound, but this does depend on the context of the whole recording and is not always suitable. For solo playing, more of the room sound will give depth to the sound but, in a band context, too much "room" will make the fiddle indistinct. I have recorded classical quartets (two violins, viola, cello) with two mics positioned between the four players, at three feet above their heads, which gives a great room sound, and four mics positioned close to each of the players, which I can use if I need more of any particular instrument.

If I want to try another mic position, I place a mic 12 inches away, facing down at the point where the body meets the neck of the fiddle on the highest side. This gives a slightly darker sound and more of the ambience and room sound, which works really well in conjunction with the first mic position.

When using multi-mic setups be careful about phasing – the sound waves can cancel other sound waves when out of phase, which results in lost frequencies and sounds weird and nasally. There is the 3:1 rule: place the second mic three times the distance from the first mic that the first mic is from the source. Another position is at the head height of the player, 12 inches away from the chin rest point or close to the player's ear. This position reflects what the player actually hears and can be an alternative for people who dislike the direct mic in front of the fiddle approach. The most important thing to remember is that each fiddle and player has a different sound, so experiment, as no one mic position or microphone works every time.

Common Problems Encountered and How to Solve them:

Tuning is something that can cause problems, so I always advise to do multiple takes and then, with a DAW, to cut and paste any mistakes (more on this in a future issue). Another common issue is level jumping, so I often use a compressor to level out a performance. There are two main types of compression use: a) balance the overall sound and b) alter the sound using the compressor. In the first case, I use a transparent compressor which works without affecting the sound, thus maintaining the tone of the fiddle. In the second case, I use something like my Avalon 737sp to smooth out the tone and make the fiddle sound expensive and posh. This is always a requirement as it all has to be taken in the context of the whole sound. For example if I had accordion, fiddle and flute, I would use my transparent compressor to let the natural sound of the fiddle shine through with the other instruments. When recently recording with Caoimhín Ó Rathallaigh on fiddle and Conor Byrne on flute, I was able to use the Avalon to great affect on the fiddle as there was plenty of space within the whole sound.

For solo playing, more of the room sound will give depth to the sound but, in a band context, too much "room" will make the fiddle indistinct

Regarding EQ, I rely on the one or two different mics to do most of that work, but if you only have one mic then you'll have to start pushing and pulling certain frequencies. This basically translates into only taking out the trouble frequencies as much as possible and boosting the lacking frequencies gently. I will go into more detail about EQ use as well as compressors next month. A touch of short reverb like a plate reverb is always nice to give it a bit of extra depth and a longer reverb at the same time can give a sense of space. Always err on the side of caution before committing to reverb amounts, as too much is a sure way to ruin a good recording.

Next month I'll look at recording the accordion and concertina as well as EQ and compression tips and uses. If you have any specific questions or seek advice please email me at gavin@silverwoodstudios.com.

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RECORDING THE ACCORDION AND THE CONCERTINA

Of the same family yet with their distinctly different sounds, the accordion and concertina are the back bone of traditional music. In sessions, you'll always hear an accordion, while the concertina has the bite of any fiddle and is probably the last instrument you'll hear as you walk off in the distance. I remember well my first hearing of Tony McMahon and Noel Hill performing live at the Cork folk festival many years ago. The instruments create a huge sound together with the accordion generally being the eldest brother, by which I mean the loudest, while the little guy or concertina still gets his speak in and isn't shy.

Physically and acoustically they are very different. Both are free reed instruments, but the accordion produces the majority of its sound from one side while the other is reserved for drones. The concertina on the other hand produces notes from both sides and in no particular order, at least that is how it seems to us non-players. The great young concertina player Aogan Lynch did show me a scale or two during our Dingle pub-circuit days but the instrument really wasn't for me. There is a lot of figuring out where certain notes are and it didn't seem to follow any particular pattern. This might have something to do with it being invented by British scientist Sir Charles Wheatstone in 1829. A scale will start on one side for the first four notes and then finish off on the other side for the final four notes, all the while pushing and pulling. Each scale is completely different. The accordion, invented by musical instrument maker Christian Buschmann in 1822, is a lot less complicated. The notes are right in front of you on one side and you just push or pull. The other side as mentioned before has big deep low notes which work as an accompaniment to the melody. The concertina has a higher pitched but very sweet sound so you can see how they would work well together.

Preparations for Recording:

Making sure that the instrument is in tune is a rather obvious statement, but this is important on a number of fronts. The instrument may be in tune with itself but, because it's not straightforward to tune, everybody else has to tune to it if it isn't in concert pitch (A=440 Hz). This isn't so easy when you're involving other instruments like a piano or other fixed-tuned instruments. Before a big recording session, send the instrument off to a specialist to get it properly tuned as this will save a huge

amount of time in the studio. Also get the specialist to check for and fix any air leaks, clicks or squeaks, as those types of noises become very obvious when in front of a microphone and are really hard to get rid of afterwards. Also, get the action set to minimise finger noise and button clicking. There is not a lot we can do about finger noises as they are a natural side effect that happens while playing the instrument - all we can do here is to limit it the best we can. It's important not to get hung up on the noise but it's also important to try and keep it to a minimum.

Microphone Types and Specific Models:

Similar to the fiddle mics, I like using the Neumann KLM 184 and the Audio Technica AT 4033 on both the accordion and concertina. An AKG 414 also works well, but I find that it makes the accordion sound slightly harsh – it can depend on individual engineer, musician and, of course, the instrument. When recording the concertina you should have a pair of similar mics otherwise you'll get a different sound for each side of the instrument which can be rather off-putting. The accordion doesn't necessarily follow the same rule, producing different sounds from either side, so I use an AKG D112 on the drone end as well as a KLM 184, and for the melody side I use either the KLM 184 or AT 4033.

Microphone Position:

For the concertina I place the mics a foot apart from each side pointing slightly down. On the right-hand side of the accordion is the air button, so avoid placing the microphone in direct line with it as you'll get a periodically loud whoosh into the mic and a big thump from your speakers. Place the mic a foot away from the melody side of the accordion and from the drone side. There is a microphone with a long goose neck available that is clipped onto the strap, enabling the mic to be pointed directly at the drone side and it stays in position when being moved to draw air, but I find that I get a better sound from the stationary mic. If the accordionist is jumping around, like Daire Bracken, then I have to reconsider, but in the studio most players sit still so the mic levels are even. On this point, when setting the mic level, get the musician to play a passage of the tune and so you can figure out the volume balance and judge the input level from this.

Common Problems Encountered and How to Solve them:

I've mentioned a few already when talking about preparation, and it's nearly impossible to take clicks or squeaks out without a lot of grief and time. One issue that can be sorted out is foot tapping. I'll generally ask the player to remove one shoe and give them a cushion on which to stamp their foot which means the thump doesn't overwhelm the instrument. I can also take some very low frequencies off the instrument which won't affect the sound but will again reduce the thumping.

Another problem may arise if the instrument is too close to the mic. The sound can become boomy or boxy, so it's important to check the mic placement and pull the mic away from the instrument. If the instrument is starting to sound distant, pull the mic back in towards the instrument.

Post-track EQing, Compression and Reverb:

I use a little amount of compression to balance the tone and level of both the concertina and accordion, especially when recording with other instruments. I use stronger compressors to soften the sound when the music is being played at full force, as it can sound rather brittle and harsh, and this rounds off the hardest bits. The single row melodeon, for example, can blow the cobwebs off any microphone, so all you need to do here is to reduce the input gain on the mic. The B-flat concertina is a great deep, rich sounding instrument at two tones lower than a regular one, but is not be as loud as any accordion, so turn the mic level up.

EQ is the process of changing the tone or frequencies of a sound. The ultimate goal is to have an even balance of frequencies so there is no booming or screeching. It is generally broken down into three regions: bottom/lower range, mid range and top range. EQ will obviously depend on the instrument itself. The bodhran does produce a huge amount of low frequencies so when I've cut the low end off the accordion it gives more space for the bodhran to fit into the whole musical spectrum. This is the basic point and what we're trying to achieve with EQ, compression, reverb and recording: to create a space so that all the instruments can fit in and be heard clearly on a CD. As a guide, I have often taken out some very low and occasionally very high frequencies which helps the overall sound. Occasionally, I have added some lower frequencies to the concertina or reduced 2 or 4 kHz depending on the instrument or player. It's probably one of the easiest instruments to work with once it's recorded correctly. If the room or instrument is sounding good then your recording should sound good as well. Reverb wise, I like to keep it very simple: A short reverb to add depth and a medium reverb to add a sense of space, unless it's a slow air where I will push the medium reverb levels to give it even more space.

Digital Audio Workstations (DAWs):

A DAW can mean any digital recording unit like, for example, the Zoom, but it generally refers to computer-based recording setups. I have used a few different systems over the years, from Cubase to Digital Performer and, for the last six years, I've been using Protools. They all do the same thing, i.e. record and edit audio, so it's really a personal choice which one to use. Cubase comes free with the Zoom H4 but I use Protools as it's an industry standard system and I want to be free to bring my recordings to other studios. This has been helpful when I didn't have a piano, as I could head over to another studio with the files, record the piano and bring it home. I also did some recordings in the main studio in RTE with a 70-piece film orchestra and was able to bring it home and edit it in my studio which was pretty handy. The DAW converts the audio to digital and then you can cut and paste the music as you would in a word document. There are a lot of possibilities within the DAW like re-tuning instruments or totally changing the sound and tone (it can feel a bit like cheating but it's about result over sweat and tears) – this is an area that I will leave to another article.

Next month I'll look at recording vocals. If you have any specific questions or seek advice please email me at gavin@silverwoodstudios.com.

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RECORDING THE VOICE

In this month's article, I'm discussing the toughest instrument to record: the human voice. It is difficult to capture because every voice is different and the results will often have more to do with the mood and form of the vocalist than with the recording equipment. Consequently the recording process has to work around when the artist is ready to sing and this can occasionally create some challenges. Instrumentalists, at times, have mixed feelings regarding singers for a number of reasons: singers don't have to buy an instrument, or carry equipment through airports or figure out where they can get the best reeds, strings or instrument accessories. When they sing, they tend to stand out from the band or session. At the extreme end, it has even been suggested in some music circles that singers aren't really musicians – in certain musician unions in America, singers have to join the actors' union, Equity.

Feelings aside, the voice is a very complex and wonderful instrument. I have been working with singers longer than I've worked with any other instrument, and it still never ceases to amaze me how unique each voice is. When you hear such wonderful voices like Roy Orbison, Bobby McFerrin, Mairéad Ní Dhomhnaill or Declan O'Rourke, they are instantly recognisable. Both my aunt Cathleen and my mother Jos have a similar style of singing with their pure soft voices, however, there is something indescribable between them that I can hear and make a distinction.

Preparations for Recording:

Recording the voice and capturing each voice's distinctive qualities is certainly a challenge. The first thing you have to be aware of is that there is no textbook way of recording vocal. Each type of microphone works totally different with each singer and each singer has a different tone, way of singing and method of preparation. It requires patience to get the best take, planning – so you're not expecting the singer to give their best at 10 a.m., a good atmosphere and an open approach as to what each individual singer needs in order achieve their best performance and, lastly, the experience to know when to keep working or when to take a break.

I have tried many ways of recording vocals, some have worked, some have failed. There is no one way. Recording vocals is basically all about the psychology of getting the singer comfortable, focused and in the right frame of mind to perform with just the right amount of direction and help without affecting their confidence. It's about making sure the vocal chords are primed and ready, otherwise you're fighting a losing battle. Technology can help, but you'll get more results from an 'on form' singer rather than anything else.

Microphone Types and Specific Models:

Here is a list of mics that I have found work well with vocals: U 87, TLM 127, AKG 414, Rodes NT3, Studio Projects Valve T3, AT 4033, Shure 58, Braumer VMA. All of these mics work well and they range in price from €100 to €7000 (WMA). Obviously, it'll depend on your budget or what mics the recording studio has but the following are a few examples from my own experience. When working on Andrew Murray's solo album recently, we tried a U87 but found that it didn't really suit his big low voice as much as the AT4033, which costs at least a third of the price. When recording with Damien Dempsey, the Studio Projects Valve T3 worked better than the TLM 127 – again a cheaper mic.

Don't be afraid to try all the options available to you. If you only have one mic, don't worry, as not everyone will have a collection of mics from which to choose. The list only provides some suggestions. Aiming to get the best vocal performance is really worth much more than having a collection of mics.

A producer friend, Billy Farrell worked on the last three Corrs' albums and recorded all the backing vocals with an AT4033 in his front living-room home studio. I've even heard that Bono sings with a Shure 58, which costs only €100 and is regularly used in some of the world's best studios.

Recording Setup:

The standard way is to set up the mic in an isolated room and the singer uses headphones to listen back to the music. This option gives the cleanest recordings as there is no other sound influence going to the vocal mic apart from the vocal. It is recommended to use a pop shield to prevent popping sounds during singing, which also protects the microphone from overloading and produces a rather nasty loud sound. Adding some reverb to the voice in the headphones will take out some of the isolation for the singer and make the voice sit in better with the music.

One problem with using headphones is that if the vocalist is singing out of tune, it has more to do with the music balance within the headphones rather than the singer's pitch. If they're singing flat, it's probably because they can't hear themselves loud enough in relation to the backing music. On the other hand, if the singer is going sharp, it may be that they have too much of their own voice and they can't reference the key or note from which to pitch their own notes. If the singer is not happy with the headphones, even after adjusting the balance, one trick is to take one side of the headphones off, so they can hear themselves acoustically as well as listening to the music. Another, more extreme approach is to record the singer in the control room while they are directly in front of the speakers and reverse the phase of the speakers to help isolate the music from the vocal take.

Singers, like the rest of us, respond to interaction and energy. I have often recorded live, with everyone in the room and the singer either in the corner or within eye contact through a window in another room. This approach makes everyone more alert and involved as it's all happening in the 'now'. On occasion, I have seen singers perform as if their life depends on it during a concert, but totally withdraw when singing by themselves in the studio, which is why it's so important to get the right mood and approach. The vocal mic can pick up some of the music in the live setup but as long as there isn't too much 'spilt' it shouldn't be a problem.

Planning the Recording:

You have to be careful not to get too many different takes from the vocalist, as this will make the voice sound tired and strained. If you want the voice to remain fresh, limit the amount of times the vocalist has to sing to 'proper performances', and not just 6 or 7 warm-up takes. If it's working: great. If not, stop and wait until it is working. The studio is an amazing place for recording detail, so be conscious that every little nuance, like a tired voice for example, will be picked up even if it's within a band sound. If the singer has a cold, you're not going to get a great vocal take. Asking a singer to sing straight after dinner or drinking fizzy drinks isn't going to produce the best results either. If the vocalist is after travelling a long distance or has just finished work, this is not the time to record. Give them some time to relax, rest and get ready. This will save you a lot of time at the editing stage because you'll have the right take within three to five performances. This is where experience comes into play. If you're familiar with the singer's voice or it's a band member doing a vocal take, you'll know the character of the voice and you'll also know if it's on form or not. An off-form singer isn't going to produce anything you can use properly. Allocate enough time over a few days to allow for mood and form and pace the vocal recordings over that period. It's also important to know about each singer's marginal propensity to produce: If they keep singing the voice will become tired and strained and will pass its best.

Recording and Editing:

Within Protools or most DAWs there is a facility to record different takes on the same track which makes editing the vocals a lot easier. This means that instead of using 6 different tracks for one vocal performance, you can use one track with alternative takes to choose from. This is great when you need to fix one word or a phrase in a good vocal take, as all the takes are in the same position. If the first word in the second chorus is wrong, you can go to an alternative performance and cut and paste it onto the new track, thus creating the compiled master vocal take. Also, if some notes are out of tune in one take, it's possible to take them from other takes and again cut and paste them into the correct place. Additionally, Protools has an auto tuner program, which is a very clever device that automatically tunes a voice. You program in the key of the song, the strength of the correction and away it works. I know this is a form of cheating, but it can save a lot of time and energy. I use it on rare occasions but it is obviously preferable to get it right at the source rather than 'fixing' it with the computer. On the other hand, as a tool, the computer is great for fixing bad timing, by moving any particular bits that are incorrect, or by stopping the recording and breaking down difficult songs into more manageable sections.

Next month I will deal with percussion instruments as well as editing audio within Protools and using effects. If you have any specific questions or seek advice please email me at gavin@silverwoodstudios.com.

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RECORDING PERCUSSION INSTRUMENTS

Percussion instruments play a subtle but very significant role in traditional music but players are often overlooked and treated as non-musicians in the same way that other backing musicians are sometimes viewed. Whatever about giving your average spoons player two bowls of soup, a good percussionist or bodhrán player can add depth and life to any music session and can reach out across musical divides to entice the listener to take note. Rhythm is one of the first things that people pick up, indicated by the nodding of their heads, foot tapping or banging of tables, and the bodhrán is probably the first instrument bought by a novice who is looking to enter the world of the session and wants to take part in the 'craic'. This gives rise to a bit of slagging of bodhrán players, but, as with any instrument, when you get a good player, the teasing evaporates.

On the other hand, I remember a tourist entering a session in Dingle '93, removing the plastic wrapper from a new bodhrán and then proceeding to beat it within an inch of its life. One of the musicians present, Aogán Lynch, to his credit, very calmly put down his concertina and demonstrated a few subtle rhythms before telling the tourist to beat it back to his hotel. Plastic egg shakers are great percussion instruments but they don't always lend themselves to trad sessions and, with their new sound, they can impose a type of rhythm which isn't to everyone's taste. But, in the context of a group or musical ensemble or in the recording studio, they can add a lift and energy which encourages and drives the other players much like the bouzouki or guitar.

Recording the Bodhrán:

Recording the bodhrán can be tricky so, as with all the instruments I've covered so far, preparation is the key. The type of room is my starting point: a big room is going to add a lot of echo, so find a reasonably dead spot that doesn't have much reverberation without being totally dull. I have a room that has carpet on three sides of the wall and then a glass patio door on the fourth, so I adjust the player away from the glass where there

is little reflection but enough so that the sound isn't totally muffled. Make sure the skin on the bodhrán is loose enough, without being floppy, and that the room is heated, as that will play a major factor on the tone of the recording, especially with the bodhrán.

Mic-wise, I use a SM57 or my AT4033 together with an AKG D112, which was specifically designed for percussion like a drum kit's bass drum. This combination helps to capture the low frequencies on one mic and the mid- to high-range frequencies on the other mic. I have already talked about mic positioning in previous articles, and never is it more critical than with a bodhrán. Position the mic too close and you'll get a distorted booming sound; place it too far away and you'll lose definition and it'll sound distant and unclear. A suggested position is to have the AKG pointing towards the inside of the bodhrán, near the bottom, to get the low frequencies, and far enough away from the centre so as not to pick up too much of the hand movement, especially if there is a lot of up and down movement. Position the other mic at the front to pick up the impact of the beater, but again not too close so you avoid the distortion and clicks.

A good distance to start with is about 10 to 12 inches away, and then adjust to suit. As we're using 2 mics on the same source, 'phasing' can occur. Phasing is best described as sound waves clashing when two mics pick up the same sound source and consequently produce acoustic dead spots. On the mic preamp there is normally an option to change the phase, known as 'phase inverting'. Check which option sounds better, as if the mics are out of phase you'll notice the weaker dead spots, so adjust accordingly.

The bodhrán can also sound boxy sometimes, so spend time moving the microphones around to find the 'sweet' spot. Try one at a time and then combine the two mics. There is no real short cut here, so take your time as it can be painfully difficult to adjust afterwards. I also use a compressor to control the dynamic range, which is an old-school technique that I like. This means that I control the peaks and dips to get an even output from the mics. I use mic preamps with built-in compressors and separate compressors connected to the mic preamp.

It's critical to be conservative on the amount of compression applied to the audio as it's not possible to undo this. I suggest a fast attack with a medium release on the compressor and a threshold of -10db and a ratio of 3:1 and then you can adjust according to the result. You'll hear very quickly whether it's working or choking the sound, as all compressors work differently so without getting into specific brands, use your own judgement here. If you don't have an external compressor, don't worry, as the dynamic range of most modern recording units is very high. It's unlikely that distortion will occur and compression is a very commonly used tool so you can select one from your DAW or Workstation or Zoom.

When the bodhrán is recorded, I often add some EQ to balance the sound. As a rough guide I'll reduce some 100 Hz (which is the boom area), 500 Hz (which is the lower mid-range honk), 2 Khz (which is the nasty mid range) and then 10 Khz (which is the scratchy high end). Start from these points and then use your own judgement to sweeten the sound. I generally would do the lower frequency adjustments on the AKG and then the higher frequency adjustments on the second mic. I was lucky enough to hear engineer Tim Martin working on Donal Lunny's bodhrán and the beautiful, round, full-range sound was incredible. He used a subtle amount of compression and then some EQ to take out the boom and honk, which are legitimate studio terms.

Recording Shakers & Spoons:

Recording the shaker is a lot less difficult, as most condenser microphones will capture the sound well. I have often used a SM58 but, within the context of trad music, a condenser mic would be more suitable. As the shaker can be rather bright I tend to use a duller sound mic in compensation. Also, position the mic 2 inches away from the shaker and get the player to play across the path of the mic and not towards it as this will help keep an even mic level. This same approach can be applied to recording the spoons. If you have a compressor, use it and see if it's helping the sound. Compare the two results and then make a judgement call, as each situation is different.

Use of Metronome or Click Track:

One issue that I have not mentioned is a metronome or a click track. This is a beat or rhythm track recorded on one of the channels which is designed so that everyone can play in time with a central reference point. It comes from the rock music recording scenario when each musician would record separately: the drummer comes into the studio and plays the song with a click track and no music, then the bass player plays along with the recorded drums and so on, until each member of the band has added their individual parts. The principle is that the studio and producer can concentrate their attention on each individual instrument, thus building up the song brick by brick.

Within traditional music this method can be rather alien as we play interactive music, and recording separately can kill it dead. I suggest that you record live with the percussionists before using click tracks and recording separately. As an example, when Beginish were recording their second album in '99, we went to a small studio in Tallaght which could only record one or two musicians at a time. We had to record separately, and the result was less than ideal. The tempos were inconsistent and it was totally lifeless. After spending two weeks in the studio and a lot of money, the decision was made to go to another studio where we could play live together and the difference was incredible. It sounded like real music. As a result, I'm very reluctant to use click tracks within trad music. Sometimes, they need to be used when dealing with a large number of musicians, but be careful when choosing a tempo to reflect the flow of the tune or song. Like most elements within the studio, planning is the key. Experiment with different tempos and see which one suits.

Over the next few articles, I'll address recording flute, whistle, banjo, mandolin and uileann pipes. I'll also go into detail about editing audio within DAWs, as well as talking to some people in the studio industry and getting their opinions about music technology and recording approaches.

If you have any specific questions or seek advice please email me at gavin@silverwoodstudios.com.

Music Technology

for the Traditional Irish Musician

A series in which Gavin Ralston reviews aspects of music technology with the traditional musician in mind, brought to you in association with Waltons Music

Over the past number of articles in this series on recording, we can see a pattern emerging regarding recording techniques and how music technology can be and is used within Irish music. When recording traditional music, it's important to remember that each instrument has its own specific tone and characteristics and requires varying approaches and techniques. At the same time, there are shared characteristics and requirements, especially as traditional instruments are all acoustic and require microphones.

Recording Approaches:

Before we talk about technology, we have to look at the elements that are within our control prior to and during recording. For example, if an instrument is out of tune, don't expect technology to tune it; if your instrument sounds slightly noisy (button noise from your accordion or scratchy fiddle tones), don't expect technology to totally fix it; if you started a selection of tunes at one speed and then finished at another, don't expect technology to adjust it. Protools and other such DAW have massive editing abilities but there has to be a level of quality and talent going into the recording system first.

Sometimes the expectations of what is possible with these computers can be unreasonable. Some of you may have heard the story of a well known musician who went into the studio on the first day of his album, took out the fiddle, played a selection of tunes once and then proceeded to start on another selection. When he was asked by the engineer to play the first set again to correct a few mistakes, he replied, "Can't you just Protool it?"

The second element in recording acoustic instruments is recognising how these instruments produce sounds. The concertina and the accordion, as mentioned before, are similar in theory, yet distinct in tone, so I start off with similar mics and positioning, before adjusting to suit specific needs. The guitar, mandolin and bouzouki all work similarly, so, again, I approach them with the same type of mics and mic positions. The fact that producers often use these few instruments together on

recordings shows how well they work together and how similar they are. The Tom Petty acoustic folk rock strumming sound is the result of combining an acoustic guitar, a 12-string acoustic guitar and a bouzouki all playing exactly the same chords throughout the song.

Tin Whistle, Low Whistle and Flute:

The tin whistle, low whistle and flute are again similar yet have distinctive characteristics: I generally approach them as I would singers. For example, their respective tones are within the middle to upper end of the music spectrum, yet breathy overtones and occasional intakes of breath are hazards to be aware of while recording. I addressed recording vocals in the seventh article of the series, but I'll recap on points that apply to recording the whistle and flute. To start with, I position the mic above the instrument, pointed down at a 30º to 45º angle to limit the amount of wind or breath noise. I then use a pop shield or wind screen if breath or wind is still a problem. When recording, I generally add some reverb to the instrument in the headphones, as this provides atmosphere and depth which help the musician feel comfortable during the recording. As with vocalists, if the whistle player or flautist can't hear themselves clearly, or are not comfortable with the headphone balance, the first thing to suffer is the tuning as they tend to compensate by over-blowing which results in the notes going sharp. Alternatively, record these instruments in a dry room (like the vocals) which will reproduce all the detail of the instrument and you can then add reverb at a later stage to give the atmosphere. This is the most common way to record for total flexibility. It is also possible to record in large rooms that produce natural reverberation but then it's not possible to reverse the process and remove the reverb at a later stage. As I've said before, experiment and review the results before committing to the final recording. Recording in a big room does produce a great sound but be careful that the instrument sound is still distinct.

Regarding mic choice for flutes and whistles, try different mics pointed at the same position and see which one works best. On Paul McGrattan's last solo recording, he used an AKG c300 which sounded lovely and he particularly liked, whereas Conor Byrne's flute sounded wonderful using the T3 Valve mic. An interesting technology point occurred recently when working on Aidan O'Donnell and Kieran Munnelly's recently released album. Kieran recorded the album in limerick and asked me to mix it and add a few additional instruments in my studio. When I listened to the flute recording, it sounded very hard, bright and breathy. It was recorded with a Neumann U87, which is a great industry standard mic costing €2000, but the issue here was that Kieran's flute didn't sound good on it. I've toured and worked with Kieran for many years so I know his tone intimately and I knew it wasn't his fault. The option to re-record was not available as it was a live recording and everybody would have had to record again. I found a solution with a piece of software called Mic Modeler from Antares (http://www.antarestech.com/products/amm.shtml) which enables me to change the type of microphone used on a recording session after it has been recorded. I was at first sceptical of the claims made of the tool in reviews, but it worked wonderfully and saved the whole recording session. I selected the source mic: U87 and then changed it to a Valve mic: TELE U47, and with a little EQ most the hardness and breath went away. However, what is important to remember is to take your time when recording and try all available options before going for a performance. Don't imagine that you can always Protool it!

Banjo and Uilleann Pipes:

The banjo and uilleann pipes are unique instruments and require special treatment. While the banjo is of the same family as the guitar, mandolin and bouzouki, it produces a much louder and brittle sound. Therefore, you need to choose a softer mic if possible, and position the mic differently. If the mic is too close to the skin of the banjo, you'll get all the resonance of the skin and the resonator. I would start by placing the mic closer to the neck, pointing to the body at about 6 inches away, and then adjust according to the player and instrument. A little compression at a quick attack level would help with the occasional spike or plectrum noise, but don't overuse it as that is part of the charm of the instrument.

I recently recorded with Clive Barnes who has a banjguitar which has the charm of a banjo but with more acoustic similarities to and tuning of the guitar. I started off with a Neumann KLM 184 mic and then gradually moved the mic closer to the body as if I were recording a guitar. Because it was a new instrument that I hadn't recorded before, I started out using techniques from similar instruments and then fine-tuned the approach to fit the specific situation. If you're ever in doubt regarding the sound talk to the player in question. It's always important to refer to the musician regarding their sound as they will know their tone better than anyone else.

The uilleann pipes have a wonderful sound so capturing them is always a joy, especially when the player and instrument are both really on form. With the pipes, getting the tuning and tone is not a case of 'point and shoot', as the instrument takes time to settle. Be prepared by allowing plenty of time to get all the elements in order before going for a take. Presuming that the instrument is in tune, the reed is behaving itself, and that the room temperature is constant and not cold, I would start off using Neumann KLM184s: one on the chanter and the other on the regulators in conjunction with the Valve T3, placed from three to four feet away at head height and pointed down at a 30º/45º angle. I can then select from the room sound on the valve mic and introduce the close mics for the chanter and regulators. As mentioned last week, always check the phasing when using multiple mics on one source of sound as 'out of phase' can sound rather nasty. The BBC engineers have 3:1 rule of thumb: the mics should be 3 times the distance apart from each other as from the source, i.e. 8 inches away from the chanter and regulator and then 24 inches (or two foot) away from each other. Once the three mics have been recorded, you can then decide which mics sound best and balance them accordingly. I would start off with the chanter and regulator mic and then gradually bring up the level of the room mic to add some depth and distance.

Next month I'll be talking about how to balance a few different instruments that have been recorded, and I will be talking to Daire Bracken about recording with his band Slide.

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