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Making Modern Metal: Part 1

Pre-production

• [Recording](#)

By Mark Mynett

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In this three-part series, we follow the painstaking production of a metal album, all the way from rehearsals to release.

This is the first in a series of three articles which deconstruct and explain the processes involved in a modern metal production. Providing this style of music with maximum sonic impact — the desired balance between ‘heaviness’ and ‘clarity’ — requires that numerous challenges be overcome. I discussed this in general terms in my SOS November and December 2009 articles (free to view at www.soundonsound.com/techniques/extreme-metal and www.soundonsound.com/techniques/mixing-metal). This time, I hope to reveal even more about this demanding genre by discussing my production of the Damnation’s Hammer album *Unseen Planets, Deadly Spheres*.

I’ll start this month by covering the planning and pre-production, before moving on to the studio recording sessions in part two. In the final installment, I’ll explore all things post-production, focusing on the mixing and mastering. Hopefully, by following this project from inception to completion, you’ll get a good feel for how you might best approach a modern metal project — or, in fact, any other guitar-based production, because while metal has its own unique sound and demands, most of the techniques and decisions involved are relevant to other genres.

In this article...

- [The Best-laid Plans...](#)
- [Hammer Time](#)
- [Towards A Tonal Blueprint](#)
- [Performance Notes](#)
- [Clicks & Guides](#)
- [Choosing The Right Sounds](#)
- [Next Time](#)
- [Down-tuned Bass & Guitar: Pitch Instability](#)
- [Clicks & Tempo Maps](#)
- [Masking](#)
- [Fresh Heads!](#)
- [About The Author](#)
- [Cymbals](#)

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The Best-laid Plans...

The world's best-produced metal albums feature the most emotionally charged sounds and performances, and they involve meticulous planning during pre-production. In rare instances, bands take care of pre-production themselves, and your involvement as producer at this stage may be minimal. But it's far more usual — and effective — for a producer to play a significant role in a band's pre-production, as in this project.

If I had to choose three qualities that best sum up the sound and performance approach of Damnation's Hammer, they'd be 'heaviness', 'heaviness' and 'heaviness', in that order. This involves doom through to thrash influences, entwined with avant-garde '80s metal, less-than-conventional time signatures, and sections featuring dark effects-based atmospherics. When founding member Tim Preston initially contacted me, it became clear that the band were seeking to convey this sound via a powerful, loud and clear production — which was fortunate, since I tend to loathe lo-fi metal productions! It was apparent, through their references to other productions with a very natural/organic vibe, that they also desired a comparatively unprocessed, warm-sounding album. As we were reading off the same battle-hymn sheet, my thoughts turned quickly to pre-production: a critical yet vastly undervalued stage of a successful metal project.

Representing metal's sounds and performances in recorded form is rather like putting together a complex jigsaw: each element needs a space within which to sit, but it must also combine with all the others to form a coherent picture. Due to the density of the sounds involved, especially the harmonically rich distorted electric guitars, and the often-detailed nature of the performances, this tends to be a challenge. Even a well-recorded multitrack doesn't automatically mean the sounds are appropriate for the relevant band's style; they might not 'get along' with each other in the context of the mix, regardless of how well they're processed. So, well before tracking commences, you should establish a clear vision of how a project's songs, sounds, and performances should best be represented in recorded form. Your 'blueprint' must also factor in the opinions of the band and, if relevant, the record label, and it will inform the vast majority of your production decisions and your communication with the band. The failure to establish such a vision at the outset — even if it's to be adapted and refined along the way — usually ends in disappointment!

Hammer Time

This notion of a design blueprint may sound rather abstract, so let's look at how I approached things with Damnation's Hammer. Their rehearsal room, in one of Lancashire's 'dark, satanic mills', was an easy drive from my studio, which meant I could easily pack my mobile Pro Tools rig, attend a rehearsal, and capture a live recording of the planned album. On arrival, after some brief banter with the band, I quickly set up a basic recording array: kick and snare spot mics, stereo drum overheads, a bass DI, and a Shure SM57 each for the two rhythm guitars were joined by a mono vocal-mic feed from the PA. As I set the levels, conversation quickly turned to the band's sounds and their instruments/equipment. The guitarists explained the distinction between their rhythm tones: one had a (very) strong low-end emphasis, and the other, though still with fairly prominent lows, a generally brighter, more cutting tone, with more going on in the upper mids. I had reservations about how tight and controlled the low end of both rigs would be when translated via close miking, but it was clear that the fundamental tonal identity of both rhythm guitars was 'scooped'.

Given the riff-driven nature of the material, the guitar tones would be the foundation of my blueprint, informing what I needed from the other elements. For instance, a bass sound with

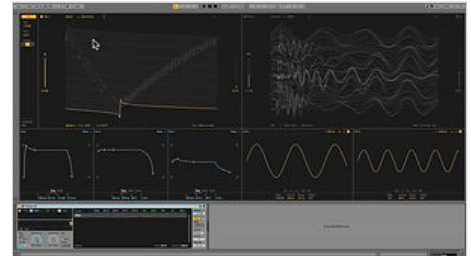


Damnation's Hammer, rehearsing in one of Lancashire's 'dark satanic mills', and their album Unseen Planets, Deadly Spheres, which is the focus of this series on metal production.



Making Modern Metal

1 week 2 days ago.



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a similar frequency emphasis to the guitars would result in the instruments masking each other (see the **'Masking'** box), whereas one with emphasis in the low-mids left vacant by the guitars would occupy its own place in the spectrum, reducing the risk of masking.

I couldn't consider the bass tone solely in relation to the guitars, though. The bass/kick relationship is similarly critical, and drummer Gary had made it clear that while he was fairly open about snare/tom tunings and tones, he wasn't a fan of 'clicky' kicks. So, to prevent the bass sounding 'disconnected' from the kick, I'd need to be careful about the level of high-frequency 'clank' in the bass. This was significant, since bassist Jamie is a fingers (rather than pick) player, with a powerful percussive style. I'd also need to be careful that the note attack from the bass didn't overshadow that of the rhythm guitars. The desired kick sound (warm and full, with no overt clickiness) also had implications for the rest of the kit, particularly the toms. Capturing toms with similar tonal qualities to those of the kick would result in a more cohesive drum sound overall. And then there was the snare...



Although both guitarists had slightly different sounds, their sounds were both quite low in pitch and, generally, 'scooped'. So it made sense to start with the guitar sound and design the other instruments' sounds to work with them.

Unlike kicks, snares can be effective across a broad range of tunings, so where should you start? Initially, at least, I like to consider the speed of the drum performance: the slower the performance, the more time between hits in which to let the snare's decay be heard; and the greater the focus on fast subdivisions, the greater the need for the snare's decay to be constrained, to avoid obscuring the next transient. Although this album features a fair amount of fast double-kick work, there are no especially fast snare parts (such as 'blast beats'), so I reasoned that a thick, weighty snare with comparatively long sustain would work.



The drummer explained his aversion to clicky kick sounds, and Mark assessed the different kit pieces—eventually deciding to raise the cymbals and use a different kit.

Towards A Tonal Blueprint

All these considerations led me towards my tonal blueprint for the project, the key points of which were as follows:

- Given the very riff-based style, the low-end-focussed, scooped identity of the rhythm guitars should lay the sonic foundation. Keeping the lows tight and controlled, so the guitars could be reproduced effectively by small speakers/headphones, would be a significant consideration, especially as we'd made the decision to quad-track the rhythm guitars.
- To maximise the impact of the rhythm guitars, the bass should occupy a different spectral space; emphasis in the low-mids would exploit the gap left by the scooped guitars.

- For the bass not to appear detached from a 'warm' kick, with less click than in most modern metal, and to avoid the bass obscuring the note onset of the rhythm guitars, its high end and the 'clank' of the percussive fingered style would need containing.
- A deep, fairly low-tuned snare with relatively long, undamped sustain would yield the desired thick, weighty sound, and full/warm tom tones would work with the kick.

Performance Notes

Having developed a tonal blueprint, my attention turned to the songs and performances. Well before recording commences, a producer should identify potential problems with the individual performances, particularly those of the drummer, whose parts inevitably provide the production's foundation — because once this foundation is in place, your options for the remaining structure are drastically reduced. A musician who's unable to perform their parts accurately and comfortably in the comparatively relaxed setting of a rehearsal room is even less likely to play well in the studio. So during rehearsals, you need to rein in band members who are attempting to play parts outside their comfort zone, and ensure each of them knows precisely what they intend to play during each song section: the drummer should know exactly what fills will be played; the guitarist(s) and vocalist should know exactly what, if any, overdubs will be recorded; and the lyrics should be 100 percent complete. If new ideas emerge in the studio, it's fine to explore them (and indulging them a little can help a band feel more relaxed) but to allow studio time to be used most effectively, these ideas should really concern peripheral elements only, rather than the music's core focus.



Damnation's Hammer bassist Jamie monitoring the click via headphones during rehearsals focussed on tempo mapping.

Having listened to the band run through the album (recording all the while), I was enthused by the strength of the material. Superb riffs, grooves, textures and dynamics, all contributed to an engaging musical journey. Yet, some of the main compositional approaches would present challenges in achieving the 'tight' production the band and I craved. Specifically, there was an emphasis on ensemble rhythmic synchronisation (the metric structures of the guitar and bass riffs being largely or entirely coordinated by the kick patterns), combined with less-common time signatures and radical tempo shifts (eg. a section of fast double-kick patterns featuring bar lengths of five and seven, synchronised by the bass and guitars, dropping to a slower tempo in 6/8). Although the level of complexity was nowhere near that of, say, Meshuggah, such sections would need to be performed very tightly for the listener to be able to make sense of the music.

Clicks & Guides

This brings me neatly to a decision that should be near the top of the pre-production priority list: to click or not to click. My initial opinion was that the production needed tempo mapping and a click. By rehearsing and tracking to a click, the drummer's grooves and beats could be 'tightened' and made more consistent, whilst any required performance edits would be easier. Just as importantly, it was clear that there was a small tempo range within which the album's riffs and grooves would be most effective. A drift upwards in tempo would result in the riff subdivisions being too fast to play accurately, resulting in a loss of rhythmic impact. A slower tempo would result in the riffs, and other performances, lacking drive, urgency, and energy. Click use would obviously enable the band to lock to the optimum tempo.

The band, though, were initially intent on tracking the album click-free, hoping this would deliver a more natural feel. So I invited them to carry out a test recording of both tactics for one song, and see which results they preferred. This involved the band tempo-mapping the selected track in the DAW and rehearsing to the resulting clicks, then recording two whole-band rehearsal versions: one with the drummer performing to the click; one without. On listening to the results a few weeks later, it was clear to us all that the click version exhibited a tighter, more professional-sounding performance, and that its riffs and grooves were performed far closer to their optimum tempo.

Having decided to use a click, the band felt they needed my help with the tempo mapping; they'd spent several hours on just one song but were not entirely happy with the outcome. I started by tempo-mapping the rehearsal recording I'd already captured. Then, during a few more days with the band, we fine-tuned everything, focusing on the remaining problematic sections. (Rather than the fatiguing 'war-volume' setting of a regular rehearsal, we did this in my studio with an electronic drum kit and Line 6 Helix amp-modelling units at lower levels!)

The band practiced to the resulting clicks for three rehearsals and, following a few minor tweaks, the album was tempo-mapped to perfection. We then discussed the option of using live, rather than recorded, guide tracks when tracking the drums in the studio. The familiar sense of live-ness and eye contact has the potential to benefit the energy and feel of a drum performance, but a lack of precision from the other musician(s) can compromise it — and the relative complexity of this music increased the chances of arrangement errors in the live guide, resulting in an arrangement mistake with the drums. Conversely, with precisely performed recorded guide tracks, a consistently tight reference is provided throughout, whilst supplying a 'guide-performance-guarantee' for drop-ins/tracking in sections. For these reasons we made the decision to use recorded guide guitars.

When guide tracks created during pre-production are adequately performed, they should be fit for use in the studio. Drummers monitor the guide tracks for quite some time in the studio, so their sonic quality is important, even if they're not destined to end up on the record. By personally engineering/recording these guide tracks, I could also ensure high-quality rhythm guitar tones, which would provide a useful context within which to judge the miked drum sounds.

With the guide rhythm recordings complete, the drummer was given the final templates to practise to. These took the form of a 'stereo' file comprising two mono tracks: the click in one channel, the guide track in the other. For whole-band rehearsals, just the click was used, monitored in the drummer's headphones and by the rest of the band via the PA. When the drummer was rehearsing alone, the guide track could also be monitored.

I asked for recordings to be made of these rehearsals, so that beats not performed precisely enough could be highlighted, and any less-effective patterns amended. This individual practice time is a vital pre-production aspect for the whole band; to allow them sufficient time, the mapping and guide tracks were completed well in advance of the studio recording sessions. Throughout this process, the various rehearsal and guide track recordings allowed me to comment on the parts, arrangements, and resulting amendments. So by this point I was happy that, from a performance perspective, both band and album were studio-ready.

Choosing The Right Sounds

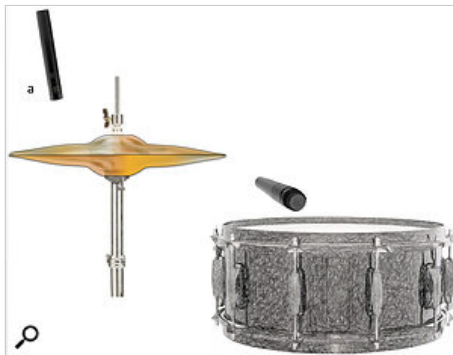
Another benefit of attending rehearsals was that I could assess the positioning and number of cymbals and toms, so I could plan ahead for the number of mics required, with a clear scheme of the access points (a frequent problem with large drum kits, particularly with the snare top mic). Although I could see there wouldn't be any snare- or tom-miking issues, the cymbals were too low/close to the shells for studio recording. The sooner a drummer can start practicing with their metalwork raised up (obviously without hits becoming uncomfortable), the better — it reduces the amount of metalwork bleed in the snare and tom mics, and the level of shell hits in the metalwork mics. For metal drum recordings, it's generally favourable to gain as much separate control as possible over each and every kit piece, as this allows them to be processed with fewer unwanted side effects. Gary, then, lifted his hats, ride and cymbals as high as comfort allowed, and rehearsed like this for the remaining time.

I'd also observed that, despite his heavy-hitting approach generally delivering the power required of a metal production, his performance style involved the cymbals being hit way too hard for a studio setting. Despite my concerns about the level of spill I'd have to contend with when mixing, though, I felt a lighter approach to cymbal hits was a performance alteration that would take him several months to adapt to properly; so I opted to work around this, rather than to raise the matter!

A more governable consideration was Gary's drum shells and metalwork. Despite spending time on tuning and damping, I wasn't sufficiently convinced by the punch and tonal attributes



Drumming with cymbals placed low, near the rest of the kit, can cause difficulties in metal music. It's generally desirable to have them placed rather higher, to allow greater separation for mix processing.



of his snare or toms, and felt his range of metalwork too dark-sounding. Fortunately I was able to borrow a Yamaha Oak Custom kit, which is warm and full sounding but brighter than maple, as well as a Yamaha 9000 snare and a suitable range of top-end metalwork.

To avoid wasting studio time, we re-headed and tuned the kit (lubricating the tension rods after they were removed using WD-40) just prior to the last band rehearsal. This gave the Remo Powerstroke 3 heads a chance to bed-in. The kick was tuned really low, with both batter and resonant heads tightened just enough to take the wrinkles out. This involved roughly half a lug turn from the point where they were starting to grip. With a Falam Slam Pad used to enhance attack as well as head durability, and a damping pillow in contact with both heads simultaneously, the kick sounded warm yet punchy. The toms were tuned very much on the low side, with the resonant heads three semi-tones lower than the batter heads. Similar to the kick, the largest of the two floor toms (to be used only for the occasional accent) was tuned pretty much as low as possible, with toms one, two and three tuned in fourths, so they sat within an octave.

To ensure consistent intervals between the batter and resonant heads, as well as between the toms themselves, I used a 'Tune-Bot', which uses frequency detection rather than drumhead tension to determine the tuning. Whilst providing enough tension to provide the right stick response, the snare batter head was tuned relatively tight, but with the resonant head significantly lower. Then, making sure they didn't rattle excessively during lighter hits, the snare wires were kept sufficiently loose to provide the necessary spit and attitude, but not so much that they sustained longer than the drum decay. I was able to tune out any unwanted ringing in the snare and toms, and they thus didn't need damping. The kit was dropped off at the studio the day before the session start, giving the shells and heads time to acclimatise to the room's humidity and temperature.



While it's perfectly possible to tune drums by ear, the Tune-Bot was useful for ensuring consistent intervals between the tom-toms.

Accurate tuning can make the difference between an OK demo and a good, professional metal production, and from a bass and guitar perspective, one of the most important considerations was ensuring these instruments were suitably adapted for down-tuning (in this instance to dropped C). Although performance technique is significant in allowing a down-tuned instrument to stay in tune, I confirmed that appropriately heavy string gauges (54/36/26/18/14/10 and 125/95/75/55) would be in plentiful supply for the sessions. I also stressed how essential it was that any bass or guitar potentially used for tracking be accurately intonated (see the down-tuning box for more on this thorny subject).

Next Time

After confirming with Tim that the lyrics were complete and committed to memory (referencing a lyric sheet can compromise emotional delivery and phrasing), and print outs were available to use in the control room, we were studio-ready. I'll take you through my approach to the recording sessions themselves in detail next month, but hopefully you can see just how much legwork goes in to setting up such sessions for the best chances of success on the day!

Making Modern Metal: Part 1 Pre-production

Making Modern Metal: Part 2 Recording

Making Modern Metal: Part 3 (of 3) Mixing & Mastering

Down-tuned Bass & Guitar: Pitch Instability

Pitch is vital to the sonic impact of metal music, and 'down-tuning' four-string basses and six-string guitars (whereby an instrument is deliberately tuned with a lowered system of pitches) is common, because it affords a deeper, darker and heavier timbre. But it also presents some challenges that should be evaluated and addressed during pre-production.

The essential problem is that the more you down-tune an instrument, the greater the loss of string tension and thus greater string excursion — which means an increased

'bow' in pitch when the string is struck. Unless this is counterbalanced with thicker-gauge strings than normally used for standard tuning (with A=440Hz at the fifth fret on the first string) this can result in: a thinner sound with softened note attack; instability of pitch, especially with lower notes; and difficulty in retaining tuning when two notes or more are played simultaneously. For example, if too light a gauge is used for the sixth guitar string when down-tuning it to 'B', that note can quite easily become a 'C' with aggressive picking. But it gets worse, because the degree of pitch variation will be different for the other guitar strings and those of the bass. What's more, these tuning/pitch variations become even more problematic when rhythm guitars are quad-tracked, where pitch consistency is required across four separate takes. Of course, tuning stability also hinges on a musician's ability to compensate for the loss of string tension during their performance. So how do we overcome these challenges when down-tuning?



Down-tuned Guitars

As a general rule, thicker strings mean greater tension and greater stability of pitch. The table presents a thickening of light, medium and heavier gauge string sets which can be used to compensate for the loss of tension when down-tuning a guitar. The three columns represent what's generally considered as light (38/30/22/14/11/8), medium (42/32/24/16/12/9), and heavier gauge (46/36/26/17/13/10) string sets.

As the standard-tuning pitch is progressively lowered through down-tuning, the given string gauges are increased to provide the closest gauge match for retaining string tension. All relevant pitches, and tension compensating gauges, are provided for the following commonly used dropped tunings.

- Dropped D: D/A/D/G/B/E
- Straight D: D/G/C/F/A/D
- Dropped C: C/G/C/F/A/D
- Straight C: C/F/A#/D#/G/C
- Dropped B: B/F#/B/E/G#/C#
- Straight B: B/E/A/D/F#/B
- Dropped A: A/E/A/D/F#/B
- Straight A: A/D/G/C/E/A

Light Gauge 38/30/22/14/11/8	Medium Gauge 42/32/24/16/12/9	Heavier Gauge 46/36/26/17/13/10
Drop and Retain Tension		
A=44	D=42	E=40
G=42	D=40	D=38
C=40	C=38	C=36
B=38	B=36	B=34
A=36	A=34	A=32
Drop and Retain Tension		
A=30	A=32	A=34
G=34	G=36	G=38
F=32	F=34	F=36
E=30	E=32	E=34
D=28	D=30	D=32
Drop and Retain Tension		
A=24	A=26	A=28
G=26	G=28	G=30
F=24	F=26	F=28
E=22	E=24	E=26
D=20	D=22	D=24
Drop and Retain Tension		
A=18	A=20	A=22
G=20	G=22	G=24
F=18	F=20	F=22
E=16	E=18	E=20
D=14	D=16	D=18
Drop and Retain Tension		
A=12	A=14	A=16
G=14	G=16	G=18
F=12	F=14	F=16
E=10	E=12	E=14
D=8	D=10	D=12
Drop and Retain Tension		
A=8	A=10	A=12
G=10	G=12	G=14
F=8	F=10	F=12
E=6	E=8	E=10
D=4	D=6	D=8

So, for example, for a guitar down-tuned to dropped C, the following gauges would retain a similar string tension to a medium-gauge string set at pitch: 54/36/26/18/14/10. And for a guitar down-tuned to straight B, the following gauges retain a similar string tension to a light-gauge string set at pitch: 52/38/30/22w/14/11 (the 'w' denotes a wound third, which improves the pitch stability of this often-problematic string).

The scale length of the guitar also impacts on these tension-compensating gauges; tuned to the same pitch, and with all other things equal, longer scale lengths provide greater string tension. But pitch isn't the only consideration: heavier gauges tend toward providing a thicker, more 'rounded' tone, while lighter gauges tend to provide brighter tones and are generally easier to play.

Down-tuned Bass

Due to the larger steps between bass string gauges, and the larger scale lengths involved, it's harder to be precise about the gauges required to retain string tension for down-tuned bass. Also bear in mind the differing abilities of four-string basses to withstand particularly heavy-gauge sets and that, as with guitar, the success of down-tuning is heavily influenced by the musician's performance ability to compensate for the loss of string tension.

As a very broad principle, for every semitone a bass is down-tuned, a gauge thickening of 0.005 inches (referred to as whole numbers by string manufactures: 100, 105, 110 etc) may be appropriate. A medium set of bass strings is generally considered as 105/85/65/45. Therefore, the thickest 105 string at standard pitch (E) could be

compensated to a 125 when pitched down four semitones to C, or to a 130 when pitched down five semitones to B.

Accurate Intonation

Many bassists and guitarists seem blissfully unaware of just how detrimental poor intonation and tuning is to this style of production, but it's hard to overstate the importance of well set-up instruments with accurate intonation. Even when counterbalanced with thicker strings, down-tuning impacts on the action and intonation of a guitar/bass quite heavily, since the nut often needs re-cutting to accommodate the broader gauges properly. Poor setup and tuning contribute to poor tone, as well as instruments that, regardless of processing, are very difficult to 'sit' in a mix. What's more, pitch-shifting is not a viable option in post-production, as intonation/tuning inaccuracies are non-linear across the fretboard. These issues must be addressed if you're to avoid tuning problems, as well as playability and sound issues (namely, excessively high action or fret buzz), and they should be taken care of during pre-production rather than at the recording session — importantly, this allows time for a bassist/guitarist to adjust to the modifications that are made, which can impact the instrument's 'feel' significantly.

All this said, though, note that problems you initially identify as intonation or tuning issues could actually be performance-related — bad technique, such as picking in an uncontrolled manner, or accidentally bending fretted notes, results in unpredictable, inconsistent pitch. So do try to be sure of the source of the problem you're trying to address!

Clicks & Tempo Maps

For recording purposes, there's almost always a perfect tempo for every riff, and every part, of every song. This needs to be worked out in order to establish the right bpm for the click, for each section. In some instances, a constant tempo can be appropriate, with variations in energy and intensity achieved through different performance characteristics, such as half- or double-time drum patterns, or moving from a closed hi-hat during the verse to a crash/ride during the chorus. But when a song has natural shifts in performance pace, for example pushing up the tempo of the choruses to provide increased drive and energy, the click should be tempo-mapped to replicate this. That said, if there are challenging gradual tempo increases (*accelerando*) or decreases (*ritardando*), it might be worth taking the click out for these sections.

Masking

Masking is the phenomenon whereby spectral energy in one sound obscures the same frequencies in another. It occurs when two or more signals share frequency content in the same regions, with the quieter or weaker sound having this content obscured or made inaudible by the louder, denser, or more dominant signal. The likelihood of masking increases with dense sounds and concentrated performances, and it becomes more pronounced within the lower frequency ranges where it's more challenging to allow sounds their own spectral space. Minimising masking is fundamental to intelligibility, perceived loudness, and optimising the low end of a mix.

Fresh Heads!

For any serious recording project, new drumheads are a must. If a drum kit's batter heads are significantly 'pitted', or have simply become unresponsive and lost their 'bounce' due to the amount they have been used, the drum will sound dull and flat, and be very difficult to tune. The cost of new drumheads is incidental in comparison with the additional time spent tuning the drums and processing the resulting signals in an attempt to compensate for the sub-standard recording.

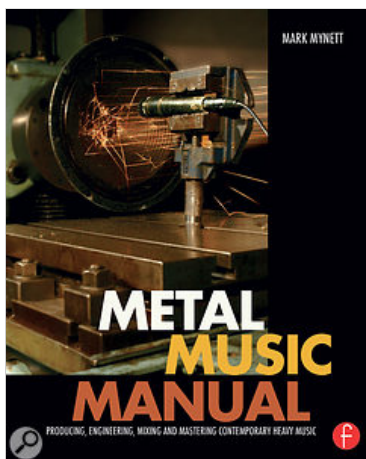
About The Author

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Manual: Producing, Engineering, Mixing and Mastering Contemporary Heavy Music.

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Cymbals

Due to the heavy-hitting nature of most metal drummers, cymbal durability is an important factor, so thicker crashes are often used. But for recording, thicker cymbals tend to be loud, resulting in more problematic bleed, as well as being a bit dark and 'gong-like'. Thinner, brighter crashes are preferable, despite their less durable nature.

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