Normative jazz: An Assessment of Studiocraft's Prescriptive Practices

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In its simplest lexical form the verb *to record* is a synonym for the verb, *to document*. It signifies a process that captures and fixes, giving permanence to what might otherwise be temporary. Yet it's no secret that sound recording is a crafty trade. And few would question the claim, least of all within the realm of popular music, that it is also creative. On the other hand, the role played by the recording engineer of acoustic music - by which I mean to denote music that is generally performed without recourse to amplification - is more opaque. Although ostensibly based on scientific knowledge its empirical practices are thought to be at once more natural, and more abstruse. The myth that the classical music recording engineer simply and naively captures musical performance is an enduring one; it is nonetheless a delusion. Any form of mediation indubitably and inevitably alters that which it seeks to document.

The character of a recording is determined by the environment and practices surrounding its creation. Although much jazz is performed largely on acoustic instruments, its representation in recordings nowadays differs fundamentally from the way classical music, for example, is portrayed, which generally seeks to capture the sounds of musical performance within a characterful acoustic space. In the early days of recording no great efforts were made to characterise or represent musical genres differently; only with the coincident development in the mid 1920's of electrical recording technology and the style of singing that came to be known as crooning did popular, and what I'm calling acoustic music recording techniques and practices diverge – and even then, only with regard to the voice. Later, when rock music emerged, a distinct, popular music recording discipline was forged in new studios specifically designed to be acoustically neutral. The corollary of this powerful re-formulation was, as Susan Schmidt Horning has observed, that the period roughly between the 1940s and 60s witnessed *"the disappearance of acoustical space in recorded music"* [1] The difference between the two approaches is fundamental: if the acoustic music approach aims, in some sense, to simulate lifelike acoustic experience, the popular music approach forges a fictive, idealised soundscape[2].

Calling upon testimonies from engineers of the 50s and 60s and supported by quotations from an online survey of jazz musicians set up toward the end of last year, this paper takes a practice-as-research approach, based upon my professional experience as an acoustic music recording practitioner, to assess these two divergent forms of recording style. It questions whether the approach that has become normalised over the past 40 or so years really is conducive to the needs of jazz music and its creators. Many of the most acclaimed and admired recordings of the past were made using techniques akin to those still invoked in the recording of classical music. So how is it that we revere these recordings, as well as the engineers and the producers who made them, yet disregard the creative practices they employed and, by implication, disparage their craft?

Columbia's 30th Street Studio C in New York City was widely lauded as one of the finest recording studios anywhere[3]. Not only was it where many of the classic jazz albums of the 50s and 60s were made - Miles Davis recorded almost exclusively here while under contract to CBS [4] - but it was also the preferred venue for many classical music recording artists such as Glenn Gould, Stravinsky, Bernstein and Bruno Walter.[5]



Columbia 30th Street Studio C New York City

The studio, formerly a Presbyterian church, and far larger than most studios available to jazz musicians today covered a similar surface area to Abbey Road Studio 1.[6]



Abbey Road Studio 1, London

(AR 451.68 m² compared with CBS 495 m²) [7] Frank Laico, one of the engineers famous for his recordings at 30th St. made explicitly clear in several interviews that the musicians recorded without the aid of headphones or isolation booths; accoutrements now deemed essential. As he explained in an Audio Engineering Society interview in 2008;

> *"Everyone was very close to each other so that they can hear. The rhythm feel it and also hear each other. And that was the secret to this kind of recording."* [8]

Almost as instructive as Laico's commentary is the apparent incredulity of the AES members interviewing him who clearly find it hard to credit what they're hearing. One asks how Laico miked the bass,

> *" I never enjoyed the practice of putting a microphone inside the f hole. It never sounded like a bass to me. So … I put the mic where I thought would be the best sound..."*

The interviewer then asks whether he used baffles/screens - clearly struggling to comprehend how he managed the spill between instruments;

> "*I would have baffles - low baffles - in front of the drums and the saxophone would be.. one behind him, but not tight, back. And also Miles had a baffle behind him. And again, not tight, because I wanted him to hear the rhythm section and also Wayne Shorter on sax. He was very comfortable with it so that's what we did. And other albums I did with him we followed the same routine.*"

Laico is further questioned about the use of a so-called '*room mic*' – a technique used by pop engineers to add some ambient sound to help blend the very direct, dry sound of close spot mics.

> *"No, I didn't use a room mic 'cause I never miked everything tight. I hate that sound. I want the room to be part of the tune and also the musicians are happier that way. Once we started with headphones their musicianship went the way of all things. They said, oh, they'll fix it in the mix, don't worry about it! Whereas, if they have to do it live – I hate that word but that's what it is – they hear each other and they play with each other."*

Laico's approach to recording was akin to that of the classical music balance engineer in as much as the sound balance depends upon the physical layout of musicians with regard to each other and within the surrounding acoustic space. His microphone technique aims, not to isolate each instrumental sound from every other, but to capture the sound of each instrument in its spatial relation to other instruments within the ensemble; the onus on musical balance and dynamics remaining firmly within the musicians' domain. Instead of blending the very close, direct sound that Laico disliked, with the diffuse sound captured by room mics of which he was equally disdainful, each microphone is positioned so as to capture the most propitious blend of direct and diffuse sound, including the sounds of other instrumentalists in the ensemble – or spill, as it's disparagingly denominated by the pop engineer.

One can be forgiven for presuming that Laico, like the musicians he recorded, was somehow exceptional. The few interviews he gave toward the end of his life, and articles about him based on those interviews, have tended to focus on certain classic recordings such as Davis' Round Midnight. But this is no reason to fetishize either Laico or 30th St Studio C , which has been referred to as 'the Stradivarius of recording studios'.[9] Laico was certainly a skilled, perhaps gifted engineer, but other engineers employed similar techniques equally successfully, and in other studios too.

Around the same time, Rudy Van Gelder – perhaps the most iconic jazz recording engineer - was making a name for himself in his own studio, which was inspired, in part by the same Columbia

studio, as he describes here;

> *"I did go to some sessions at 30th St Columbia Studio, in Manhattan, and of course that really was a strong influence as to the actual structure of the studio, not the control room but the structure of the room where the music, the performer would be. That influenced me very strongly, I must admit that. I would say that's probably the only thing as far as the studio structure that really influenced me; 30th St plus a few concert halls that I had been in. I just like the way it sounds."* [10]

It seems clear that Van Gelder held in his mind an ideal space that he was striving to achieve; an ideal that had formed years before while making some classical music recordings in Boston,

> *"I was recording some solo stuff for Vox records at Symphony Hall, so I was there for a week. You stand on the stage of a place like that and you hear the sounds, not all musical, just little sounds. Shuffling your feet, clanking your music stand. The way sound is spread into that room, I fell in love with that."* [11]

Van Gelder's studio is nevertheless much smaller than Columbia's Studio C. So it's not simply the capaciousness, or even the length of the reverberation that marks out these studios or distinguishes them from the modern commercial studio. The distinction encompasses both acoustic space and his recording technique; a technique that, like Laico's, eschewed the use of monitor headphones, and that purposefully and deliberately embraced ambient sound in all its unpredictable complexity. [12]

The Swedish jazz recording engineer Gert Palmcrantz is another outlier worthy of mention, not so much for pioneering techniques as for adhering to well-established practices which, for him, come closer to realising what he calls natural sound (naturliga ljud)[13]. Palmcrantz came to public notice in 1976 with the release of his Jazz at the Pawnshop; a live album made principally with a stereo pair of microphones successfully capturing the ambience of the Stockholm jazz club in which it was recorded. It has since become Sweden's best-selling jazz record of all time having sold more than half a million copies, and continues to sell around 4000 each year.[14]

There are of course others even today who buck the trend and explore acoustic approaches to recording. The point is not that there are no exceptions: but that such outliers are the exceptions that prove the rule. While Laico, Van Gelder and Palmcrantz are deservedly accorded the greatest respect, they seem to have been set aside as genial, gifted legends whose quaint, archaic skill sets are no longer relevant.

By privileging the direct sound of individual instruments the new popular music studios facilitated the capture, usually with monophonic spot microphones, of the individual instrumental strands which could then be recorded discretely on separate tracks of the new technologically advanced multi-track tape recorders. Screens or baffles that had long been part of the engineer's armoury as well as the increasingly common isolation booths were frequently utilised to achieve still greater isolation or, as Horning striking expresses it, *"[to] obliterate the sound of the room"* [15]. Many musicians accept such practices but their resignation to the prevailing methodology should not be mistaken as approval. One respondent to my Jazz Musicians' Recording Experience Survey commented,

> *"Often there is no willingness on the recording engineer's part to try and record without separation and with*[out] *the use of headphones. This can be frustrating."* [16]

Isolation between instrumental voices facilitates several practices. Firstly, it allows sounds to be re-combined at arbitrary dynamic levels. It's not unusual, for example, to hear a recording of a pop vocalist singing in a soft, intimate, even whispering voice without threat of being overwhelmed - even momentarily - by the supporting rock group: clearly an impossible experience in the acoustic world. The application of this technique to acoustic jazz recording allows for example, very loudly played drums to be contained; their level reduced to one that seems proportionate in order to prevent the drums drowning the band. Alternatively, the technique might allow the isolated sound of a softly played piano to be heard distinctly above the dense cacophony of a big band.

Nevertheless, a loud sound replayed softy is easily distinguishable from a genuinely soft sound – not so much by amplitude, but from indicators such as attack transients, timbre, and, not least, reflected sound. Consequently, recordings made with isolated instruments whose dynamic level has been manipulated, inevitably demand of the human auditory cortex a process of cognitive assimilation without which their context will never sound entirely *natural* or convincing.

Musical dynamics then, clearly embody much more than simple loudness. At least they do so in the kind of ambient listening environments we're used to in everyday life. In the deliberately neutral acoustic of a commercial recording studio on the other hand, sound propagates more or less according to the inverse square law, which predicts a 50% (6.02dB) reduction in loudness with each doubling of distance**.** A recording made in such an environment at a distance of say 2m from a sound source will sound virtually identical to a recording made at 1m if the replay level of the former is increased by 6dB. Without reflected sound, our sense of aural perspective, or depth is rendered inoperable.

A similar recording carried out in a resonant or reverberant acoustic will yield an altogether different result. A more distant microphone position here will render the source sound in a deeper perspective. In this case, an increase in replay level of a recording made at 2m will inevitably be accompanied by a commensurate increase in reverberant sound such that it will always seem more distant than a recording made at 1m, regardless of the replay level. The inverse square law that describes what happens in anechoic conditions does not fully describe *real world* situations. In fact, neuro-scientific experiments have demonstrated that in a small auditorium, while direct sound levels do indeed fall by 6dB with each doubling of distance, the level of reverberant sound reduces by only about 1dB. (Zahorik 2002a) [17]. As a result, the acoustic music engineer is able to do comparatively little to alter the internal musical balance of an ensemble because a level increase in any one particular instrumental spot mic will ineluctably add more reverberation, and spill from other instruments. Raising the level of a spot mic adds presence, or focus to the sound of that instrument but without producing a marked increase in that instrument's perceived loudness. Acoustic music recordings do not facilitate the straightforward manipulation of musical dynamics in the way that is commonplace in commercial studio recordings.

The isolation of instrumental voices and their segregation into discrete strands facilitated by the new commercial music studios brought other aspects of musical performance within the sound engineer's sphere of control. Aspects of performance that had formerly fallen exclusively within the performer's ambit – dynamic range, tone quality, togetherness, even intonation – were now considered the discretely stratified objective criteria of performance, and were devolved, at least in part, to the sound engineer. Musical dynamics fell within the realm of mixing and compression; tone quality morphed into equalisation, multi-track editing techniques would come to facilitate the

fabrication of absolute synchronisation, while pitch correction software is now used to recalibrate intonation.

Rather than discredit such practices, which have unquestionably proven their validity and appositeness to the recording of popular music forms as well as some types of jazz, my aim is simply to question the dominance of this mode of recording at the expense of other methodologies. As one survey respondent commented,

> *"Jazz is a wide spanning genre and different recording techniques will be more suitable for certain types of jazz than others. There could be more co-operation with engineers for recording acoustic jazz. Often there seems to be an insistence in recording everything the same way regardless of style, basically with isolation booths and screening as the normal modus operandi."* [18]

Another makes the point explicitly;

> *"Usually some screening is necessary, but ideally it should be minimal. Isolation booths maybe make the engineer's job easier but it makes the musician's job harder. There should be a willingness to work with mic spill, in the long run it will create a better blended sound and the musicians would be more relaxed. No one records a string quartet or orchestra with isolation booths after all, and jazz is still acoustic music that was once recorded in this way."* [19]

Effective performance in acoustically neutral studios demands of the musician a degree of adaptation and complicity. One particularly prolific session musician remarked recently in a personal communication,

> *"the problem with some studio designs is that sound doesn't carry across the room, so a set of cans over half an ear can help."* [20]

Part of the expertise in playing an acoustic instrument as any accomplished musician knows intuitively - and as I'll endeavour to make explicit - rests upon the largely unconscious cultivation of a system of feedback wherein one's playing is continuously informed by what one hears: a facility that is key to the ability to adapt rapidly to the various acoustic environments in which musicians find themselves. The mechanisms by which this occurs – like other acoustic phenomena - don't lend themselves to controlled, reductive analysis. However, speech studies in the early 70's exploring the involuntary tendency to increase vocal effort when speaking in a noisy environment afford some specificity by establishing the Lombard Effect, which demonstrates an increase in performance loudness in proportion to a rise in ambient sound level. [21] Subsequent work has shown that the Lombard Effect also has a bearing on the singing voice; from which one might reasonably posit a similar causal link with respect to instrumentalists.[22]

The Lombard Effect involves more than mere sound intensity though. It has also been shown to induce changes in the spectral or tonal balance of frequencies and formants in speech. Supposing it could be shown to affect instrumentalists in the same way as it affects singers, one might anticipate changes in ambient sound levels to actuate variation in a musician's timbre.

The Haas Effect or Precedence Effect as it's sometimes called describes how a sound's early reflections (10-40 milliseconds) fuse with, and reinforce direct sound [23]. These early reflections, correlated as they are to the direct sound, are important spatial and temporal cues needed for accurate 3-dimensional spatial positioning. As complex to quantify and analyse as they are straightforward for the human auditory cortex to interpret, these cues provide one means by which we're able to navigate everyday life. Naturally occurring reverberation is correlated to direct

sound in a way that simulated artificial reverb is not. Uncorrelated reverb adds blend and affords a certain impression of spaciousness. But without the critical phase, spatial, and temporal cues embedded in early reflections, artificial reverb is rendered pure effect. This explains why recordings such as Palmcrantz's Jazz at the Pawnshop - the success of which depended primarily upon the deployment of a stereo pair of microphones - allude to real experience more convincingly than do multi-microphone recordings, notwithstanding other shortcomings that may be adduced.

Without the complex phase correlations inherent in ambient recordings listeners have only amplitude signals by which to determine the direction of a particular sound. However, such cues do nothing to prevent the sound of one instrument masking or obscuring that of another. Faced with this problem, a simple re-balancing of levels is the usual expedient, but straightforward level adjustment fails to address the root cause of temporal and amplitude masking. Experienced pop engineers know how to introduce delays and filters to circumvent its most egregious effects, but without recourse to this kind of remedial intervention and the technological impositions it necessitates mix engineers have little recourse but to accord absolute equivalence to all instruments in an ensemble to ensure that each can be heard without any one dominating. Such rigidly consistent equivalence tyrannises musicians and listeners alike, flattening perspective and musical dynamics, annihilating the natural give and take, the foregrounding and backgrounding of acoustic performance.

Alan Williams aptly describes the situation in the modern commercial recording studio when he writes;

> *"As musicians are separated by baffles and isolation booths, a singular soundscape of the performance space no longer exists, each isolated audioscape appears autonomous to the musician who inhabits it."* [24]

A concept he later refers to in passing as a "*division of space*"[25]. Though perhaps unintended, this term calls to mind the industrial concept of *the division of labour*, wherein production is broken down into its constituent parts to facilitate the most effective management of time and resources.[26] The very practice of modern studio craft does indeed seem akin to those of industrial production where performance is disassembled into individual sound sources, each sub-divisible into its constituent attributes. The alienating use of headphones, isolation booths, and denatured acoustics are merely some aspects of the process that facilitates the dissolution of musical performance in order for it to be re-constituted as a commercial product stylistically congruent with the precepts of contemporary technologically mediated sound.

Acoustic jazz, like other acoustic musics, depends and thrives upon the interaction between musicians. Anything that impedes or otherwise hinders that process can only diminish the music and the way musicians' experience performance, and the documenting of performance through recording. It's surely ironic that the musical genre most closely associated with counter-cultural bohemian decadence has come to be bound and characterised by the dogma of commercial music production.

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1. p30 Sounds of Space: Studio as Instrument in the Era of High Fidelity- Susan Schmidt Horning. The Art of Record Production: An Introductory Reader for a New Academic Field - Dr Simon Zagorski-Thomas, Professor Simon Frith Ashgate 2012

[2] Soundscape – coined by R. Murray Schaffer *The Tuning of the World (The Soundscape)* (1977)

[3] Wikipedia https://en.wikipedia.org/wiki/CBS_30th_Street_Studio accessed 6/12/18

[4] A forum about the studio that currently runs to 93 pages is constantly updated. https://forums.stevehoffman.tv/threads/history-of-cbs-records-30th-street-studio-nyc-many-pictures.388186/ accessed 7/12/18

[5] Ibid See also https://en.wikipedia.org/wiki/Category:Albums_recorded_at_CBS_30th_Street_Studio accessed 6/12/18

[6] Abbey Road Studio 1 Floorplan https://s3-eu-west-1.amazonaws.com/images.abbeyroad.com/techequip/Studio%20One%20Floorplan%20A4.pdf downloaded 3/1/19

[7] p34 Sounds of Space: Studio as Instrument in the Era of High Fidelity- Susan Schmidt Horning. The Art of Record Production: An Introductory Reader for a New Academic Field - Dr Simon Zagorski-Thomas, Professor Simon Frith . Ashgate 2012

[8] https://www.youtube.com/watch?v=KJbhGHmY_UA 49'14"- 57'00" accessed 7/12/18 audio also available at http://www.aes-media.org/sections/pnw/pnwrecaps/2008/franklaico_dec08/

[9] Vincent J. Liebler, '**A Record Is Born!**' *Columbia Records* (1959), p.4. Quoted in Sounds of Space: Studio as Instrument in the Era of High Fidelity - Susan Schmidt Horning. The Art of Record Production: An Introductory Reader for a New Academic Field - Dr Simon Zagorski-Thomas, Professor Simon Frith . Ashgate 2012

[10] *"Perfect Takes"* Rudy Van Gelder interviewed by producer Michael Cuscuna *DVD* also available online at https://www.youtube.com/watch?v=BpmA2VcpP0w 15'50"- 16'22" accessed 1/12/18

[11] Rudy Van Gelder interview with Don and Maureen Sickler for Smithsonian Jazz Oral History Program NEA Jazz Master interview http://amhistory.si.edu/jazz/VanGelder-Rudy/Rudy_Van_Gelder_Interview_Transcription.pdf p 37 downloaded 30.11/18

[12] p24 ibid

[13] Ljudfadern Gert Palmcrantz https://sverigesradio.se/sida/avsnitt/1158122# First broadcast 30 Sep 14.00
"Jakten på det naturliga ljudet har varit ljudteknikern Gert Palmcrantz ledstjärna"{The hunt for natural sound has been Gert Palmcrantz's leading star – Trans AHallifax}

[14] Wikipedia https://en.wikipedia.org/wiki/Gert_Palmcrantz accessed 30/11/18

[15] The Sounds of Space: Studio as Instrument in the Era of High Fidelity- Susan Schmidt Horning pp30-31 The Art of Record Production: An Introductory Reader for a New Academic Field - Dr Simon Zagorski-Thomas, Professor Simon Frith

[16] Anonymous respondent to *Jazz Musicians' Recording Experience Survey.* Ethical Clearance Reference Number: MRA-18/19-8665 Oct 2018-Jan 2019

[17] Zahorik, P. (2002a). Assessing auditory distance perception using virtual acoustics. The Journal of the Acoustical Society of America, 111, 1832–1846 and Auditory distance perception in humans: a review of cues, development, neuronal bases, and effects of sensory loss Andrew J. Kolarik1,2,3 & Brian C. J. Moore3 & Pavel Zahorik4 & Silvia Cirstea2 & Shahina Pardhan2 Kolarik, A.J., Moore, B.C.J., Zahorik, P. et al. Atten Percept Psychophys (2016) 78: 373.

[18] Anonymous respondent to *Jazz Musicians' Recording Experience Survey.* Ethical Clearance Reference Number: MRA-18/19-8665 Oct 2018-Jan 2019

[19] ibid

[20] Personal communication 11/10/2018

[21] https://en.wikipedia.org/wiki/Lombard_effect accessed 10/12/18

[22] *The Lombard Effect on vocal technique is explored in The Effect of Two Different Rooms on Acoustical and Perceptual Measures of SATB Choir Sound – Katheryn S Hom Kansas 2013* The Journal of the Acoustical Society of America **134**, 3969 (2013); https://doi.org/10.1121/1.4830457 *On the Voice: Why Do We Sing So Loud? - Reflections on Reflexes That Deceive and Tendencies That Can Harm – Rebecca Sherburn, Greta Stamper and Tiffany Johnson. The Choral Journal, Vol. 54, No. 8 (March 2014), pp. 57-63 JSTOR, stable link www.jstor.org/stable/23646275*

[23] For a summery of the Haas effect, (also known as Precedence Effect) why it's significant in stereo recordings and why stereophonic recordings in dry acoustics are not successful, see Bob Katz p234 Chap 18 How to Achieve Depth and Dimension in Recording, Mixing and Mastering. Mastering Audio – The Art and the Science. Focal Press 2002. For Precedence Effect see Wallach, H., Newman, E. B., & Rosenzweig, M. R. (1949). "The Precedence Effect in Sound Localization," The American Journal of Psychology, 62, 315–336

[24] Alan Williams - I'm Not Hearing What You're Hearing The Conflict and Connection of Headphone Mixes and Multiple Audioscapes Chap. 8 p113 The Art of Record Production: An Introductory Reader for a New Academic Field - Dr Simon Zagorski-Thomas, Professor Simon Frith . Ashgate 2012

[25] ibid p126

[26] https://www.britannica.com/topic/division-of-labour (accessed 11/12/18)