



## The Meaning In The Mix: Tracing A Sonic Narrative In ‘When The Levee Breaks’

**Prof. Aaron Liu-Rosenbaum**

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### Introduction

In his article, ‘Rock Aesthetics and Musics of the World’, Motti Regev defines ‘studio craftsmanship’ as one of rock music’s ‘wider aesthetics’ (2004, 125). Given the growing importance attached to the study of recorded sound in recent scholarship, one may argue that studio craftsmanship comprises part of rock music’s core aesthetics. The emergence of a dedicated musicological subfield on the art of record production is evidence enough of this trend. In comparison to other approaches (harmonic/melodic, cultural, historical, etc.), studies dedicated to rock’s sound were relative latecomers, despite its nascence in recording technology.

Varied forays into understanding recorded sound have been underway for some time by musicians, musicologists, recordists, and others, though not under a unified rubric: Albin Zak III argues for the importance of considering recording studio aesthetics in discussions of musical meaning (2001); Serge Lacasse explores the ‘staging’ of the voice, which he defines as

‘...any deliberate practice whose aim is to enhance a vocal sound, alter its timbre, or present it in a given spatial and/or temporal configuration with the help of any mechanical or electrical process, presumably in order to produce some effect on potential or actual listeners’ (2000, 4).

Francis Rumsey has laid out a method for evaluating spatial attributes in recordings (2002); Simon Zagorski-Thomas has proposed a musicology of record production as a ‘subset of musicology’ that could ‘interact with other subsets, such as harmonic analysis’ (2008: 192); William Moylan has worked toward a systematic evaluation of recorded space (2009); and Nicholas Cook has surveyed several technological tools that enable ‘new ways of working with recordings’, including visualizations of musical space, analysis of frequency spectra, and tracking of tempo and dynamic changes in a recording (2009, 221). Codifying the above and numerous other like efforts (to which this analysis owes much), Stephen Cottrel coined the term ‘phonomusicology’ as ‘the study of recorded music’ (2010, 15).

My goals here are threefold: first, I will offer an analytical example of an expanded notion of staging which applies not only to the voice, but also to instruments, as suggested by Zagorski-Thomas (2010, endnote 3); secondly, I will demonstrate how a multiplicity of staged musical elements can function as a cohesive whole, forming a ‘sonic narrative’ in a song; and thirdly, consequentially, I hope to valorize the experimental side of Led Zeppelin by highlighting some rather unusual applications of recording studio technology and working practices for their time.

Positing a sonic narrative hinges on how one defines ‘narrative’, for there is more than a little contention about whether or not music is capable of being narrative at all. For a few representative opinions, Jean-Jacques Nattiez (1990, 257), Carolyn Abbate (1989, 230), and Lawrence Kramer (1991, 143) have argued against it. Serge Lacasse allows for ‘narrative strategies’ in music

(2006, 12), while Filimowicz and Stockholm support the idea that ‘sounds can be interpreted or experienced as characters in a story’ (2010, 13).

This essay does not seek to settle that question; instead, I will demonstrate how, in the specific context of a recorded rock song with lyrics, the sounds can be heard as ‘characters’ within a sound-based narrative that animates the narrative of the lyrics. Importantly, there is no claim of intentionality on the part of the artists or recordists, though elements of a sonic narrative may indeed be so, as will be shown below. Rather, a sonic narrative results from a mode of listening that seeks to tie together hermeneutic aspects of musical perception (of both words and music) to specific sound parameters (timbre, tempo, spatialisation, volume). This is not to say, however, that alternate hearings are not possible; sonic narratives, like literary narratives, may have multiple interpretations. Further, I believe that the nature of recorded music, due to the tremendous control over sound that it affords, warrants a reconsideration (and perhaps a reconciliation) of the question of musical narrativity, for reasons that will be elaborated below. Before proceeding, however, it is first necessary to clarify some of the terms used in this analysis. Effects will be explained as they are discussed.

## Definitions

According to Gérard Genette (1980, 25-26), there are three types of narrative:

1. The telling of ‘an event or series of events’
2. The ‘succession of events’ themselves (without regard to how we are made aware of it)
3. The ‘event that consists in someone recounting something’

In the most general sense, then, narrative involves characters that are put in situations. Part of the problem of musical narrativity lies in its habitual reliance on a literary model, where characters (protagonists, antagonists) and situations abound; musical structures, on the other hand, appear to be innately devoid of characters and, consequently, narrative. Kramer summarized this dilemma, and succinctly defined narrative as ‘an acknowledged story’ (1991, 143).

Byron Almén synthesizes various approaches to narrative musical analysis taken by Tarasti, Frye, Momigny, McClary and others, defining the narrative paradigm as displaying ‘a particular set of hierarchical relations subjected to crisis’ and tracking ‘the consequences of the crisis’ (2008, 22). In his definition, Almén allows for ‘the attainment of registral, formal, harmonic, and/or temporal goals’ to substitute for the presence of ‘actorial elements’ in a musical narrative (23). His understanding permits both referential narrativity, where meaning is conveyed through extramusical associations, and what I will call ‘absolute’ musical narrativity, where meaning is derived from the relationships among musical structures. This opens the door to a sound-based understanding of musical narrative rather than a text-based one, where changes in spatial or timbral qualities of an excerpt could conceivably convey a sense of goal-oriented movement that may be likened to characters in a situation. This is what is meant by ‘sonic narrative’. Moylan also discusses current research that supports this assertion (2009, 9).

Just as lyrics or functional harmonic progressions have narrative aspects—think of Nicholas Cook’s description of the classical sonata as a kind of ‘conventionalized “plot”’ (1990, 44)—so, too, can the recording and production process exhibit narrative-like features, only rather than being a product of harmonic and melodic considerations, a sonic narrative is primarily an artifact of the recording process. There is much interesting research currently underway in music perception and cognition that may ultimately affirm (or deny) music’s inherent narrativity, but as mentioned above, this analysis does not rest on that contention, given the presence here of a textual narrative rich in associations.<sup>1</sup>

The word ‘mix’ is polysemous and has been discussed with growing frequency in recent popular music studies (for a few examples, see Clarke (2007); Everett (2010); Moore (2010); Stefani and Lauke (2010); Zagorski-Thomas (2010); Dockwray, Moore & Schmidt (2011). In essence, a mix is a particular version of a multitrack song’s volume levels, spatialisation, and timbral characteristics. To complement this, I turn to Roey Izhaki, who defines a mix as ‘a sonic presentation of emotions, creative ideas and performance’ (2009, 5). This tidily sums up how I will think about the mix in the context of this analysis.

## Methodology

After a brief background on the group and the song, I will examine the lyrical narrative, after which I will analyse the recording by parsing the tracks, based on their spatialisation, timbres, prominence, and musical gestures, into ‘protagonist’ and ‘antagonist’

characters in the sonic narrative. With the aid of spectral analysis, I will illustrate how the protagonists undergo a process of timbral decay during the course of the song that can be understood as depicting their experience of the levee breaking. Afterwards, I will argue that, at a mutual point in the lyrics and recording, the levee breaks, giving rise to a sonic portrayal of ‘catastrophe’ including the destruction of the protagonists and the flooding of their home via the fragmentation of the instruments and voice, the application of disorienting timbral effects, and extreme mixing effects that overturn their prior fixed positions in the stereo field.

To circumvent lengthy descriptions of spatial relations, I provide ‘mix maps’ to convey my hearing of the mix. A related concept, the ‘soundbox’, is employed by Dockwray and Moore (2010), but while the ‘soundbox’ is a fixed ‘normative’ model of a mix, a mix map tracks mixing changes over time, which was necessary here. For reasons of practicality, the continuous stereo field is represented as a left-middle-right scenario. The limitations of this division notwithstanding, I believe the mix maps will prove useful in visually grasping at once the complexity of a mix.

It should also be noted that different mastered versions of the album exist, and with them, the potential for different hearings of this song. While a comparison of the various extant versions is beyond the present scope, I can attest to the audibility of these phenomena on the original 1971 vinyl LP as well as the 1990 CD box set remastered by Jimmy Page and George Marino, both of which were referenced for this analysis. Although sonic differences have been observed between the initial 1984 CD release mastered by Joe Sidore and the 1990 box set,<sup>2</sup> these do not appear to be on a scale that would preclude this hearing. Indeed, the later remasters may be thought of as palimpsests of the original LP.<sup>3</sup> There are also apparently versions where the stereo channels are reversed.<sup>4</sup>

For spectral analyses, the formidable open source application, Sonic Visualiser, was used. All spectrograms appertaining to a given figure were set to the same magnification and resolution, though settings may vary among figures.

## **Background**

### **Led Zeppelin**

Much of Led Zeppelin’s recorded sound can be ascribed to guitarist Jimmy Page, who founded, produced, and led the group with a unique vision from 1968 until the band’s dissolution in 1980. Because Page was already an adept studio musician from his pre-Zeppelin days as a highly regarded session player and, later, as guitarist for the Yardbirds, he had a clear idea from the start of the kind of sound he wanted from Led Zeppelin. Of the group’s first album, Page said ‘I knew exactly what I wanted to do in every respect. I knew where all the guitars were going to go and how it was going to sound—everything’ (Tolinski: 1993, 46).

Page viewed himself more as a composer/performer than a songwriter/guitarist, and he was particularly proud of ‘When the Levee Breaks’, calling it ‘the most subtle [track on the album]...as far as the production goes because each twelve bars has something new about it, though at first it might not be apparent’ (Schulps: 1977, 20). In apparent reference to Page’s claim, Dave Headlam ‘finds no musical evidence’ to support it, correctly noting that the song is not even in twelve-bar units (1995, 358 in footnote). However, if one takes ‘12-bars’ to loosely mean ‘each verse’—not inconceivable in the context of a 12-bar blues remake—then one finds musical evidence to support Page’s claim, for the sonic quality of the recording, especially the vocal track, is subtly processed differently in each of the verses, as will be shown below. In a later interview, Page repeats the claim, only he uses the word ‘verse’ rather than ‘12-bars’ (Tolinsky, 1993).

### **When The Levee Breaks**

In ‘When the Levee Breaks’ (henceforth WtLB), an adaptation of the blues song by Kansas Joe McCoy and Memphis Minnie, a deceptively simple drone-like harmonic and rhythmic accompaniment forms the backdrop for a sonic breaking of the levee that seems to grow more and more chaotic as the song draws to a close. Erik Davis has described the song as a ‘relentless undertow [that] gets thicker and weirder and darker’, and whose sounds ‘swamp Percy’s [Plant’s] voice at the end of the song’ (2005, 156 & 163). Dave Headlam describes the song as a combination of ‘the pounding drums, overdriven guitar sounds, and backward echo effects of rock with the moaning vocals, harmonica, and text of an old blues’ (1995, 356). Susan Fast mentions Plant’s engulfment in the mix, ‘where lyrics hardly matter’ (2001, 165). She also categorizes certain Zeppelin songs as ‘mythic’,

and goes on to say that ‘these pieces deserve close analytical attention in order to determine how the mythological has been created through the use of sound’ (60). Andy Fyfe calls WtLB ‘arguably the second most important track that Led Zeppelin ever recorded’, and describes how it was the only track salvaged from the album after a Los Angeles mixing session gone awry, which left the tracks sounding ‘muddy and indistinct’ (2003, 88). Ironically, it would seem these defects were not, in themselves, reason enough to discard the original mix of WtLB, which raises questions about their contribution to the song’s dark narrative of being inundated with water.

The above descriptions roughly summarize the extent of investigations into the sound of WtLB. No one has, to the author’s knowledge, explored in depth the sonic underpinnings of these impressions—that is to say, what, precisely, is happening in the mix to account for them. Nor have these impressions been considered as part of a larger, coherent whole. The sonic narrative is thus the agglomeration of sounds we encounter in the song that may be heard as conveying the story of the breaking levee. The relationship between narrative and sound is particularly interesting in the case of WtLB, due to the unusual recording and production techniques upon which the two depend. In an interview, Page said of WtLB, ‘There’s a lot of different effects on there that at the time had never been used before. Phased vocals, a backwards echoed harmonica solo’ (Schulps: 1977, 19). I will argue the ‘relentless undertow’ that Davis perceives is not only a result of textual associations, but also due to the sound of the rhythm section. I will further demonstrate how Fast’s observation of the singer’s ‘engulfment in the mix’ likely results from the gradual weakening, in both volume and timbre, of singer Robert Plant’s voice in the mix.

According to Andy Fyfe, the opening few seconds of the drum introduction have gained such currency, by virtue of their distinctive sound, as to become one of the most sampled drum parts ever—second only to James Brown’s ‘Funky Drummer’ (2003, 85). Clearly, it is worth examining more closely the sound of WtLB, but first, I will outline the implicit narrative structure of the lyrics.

### **The Textual Narrative**

The lyrics to WtLB (see Appendix A) are a personal recounting of the pain and horror of the Great Mississippi Flood of 1927. Without embarking upon a detailed textual reading, it will suffice for this analysis to establish a basic chronology that proceeds from pre- to post-breaking of the levee. Though the tone is ominous at the beginning of the song, it is clear that the levee is still intact: ‘If it keeps on rainin’, levee’s goin’ to break’. By mid-song, the lyrics become more fatalistic: ‘Cryin’ won’t help ya, prayin’ won’t do ya no good’. The fourth verse shows the protagonist in his most anguished state as he accepts that the levee will break and reflects on the possible loss of his ‘happy home’. Even at this late stage in the song, it would seem the levee is still intact, as we are told the protagonist ‘sat on the levee’ all night.

In the following chorus, however, the lyrics drop out, while the singer repeats, ‘Ah’. This interjection, which functions as an interruption in the narrative and as an emotive outburst, signals that the levee has broken. Supporting this interpretation, the outro immediately follows with the lines, ‘Goin’, I’m goin’ to Chicago’, and we were told earlier that ‘when the levee breaks...you got to move’ (verse 3). Independent of the recording, the lyrical narrative thus implies a chronology: The levee may break (‘if it keeps on rainin’) → The levee will break (‘cryin’ won’t help ya’) → The levee broke (‘I’m goin’ to Chicago’). There is also a psychological element to the narrative: the emotional state of the lyrics intensifies as the song progresses and the flood becomes more imminent. This intensification in the text is manifest as a series of timbral changes in the recorded vocal and instrumental tracks, which will be elaborated next, as characters in the sonic narrative.

### **The Sonic Narrative**

According to their shared musical and sonic treatment, the recorded tracks in WtLB may be grouped into ‘protagonist’ and ‘antagonist’ characters in the sonic narrative of the levee breaking. The protagonist tracks are those whose collective role is to serve as storytellers, whether via words or melodic gestures, and they are foregrounded with solos, namely, the voice, harmonica, and slide guitar. Significantly, both instrumental protagonists can also be said to signify the blues, on which WtLB is based. The antagonists, on the other hand, are those tracks that may be heard as background tracks representing the river (drums, rhythm and bass guitars). They constitute the rhythm section, and though the foreground-background distinction is not always maintained—one of the unique features of this song—their relentless rhythmic movement in unison clearly separates them from the other instruments and the voice.

With the exception of the voice, the protagonist and antagonist tracks are also separated in the stereo field: the protagonists are

relegated to the left channel while the antagonists occupy the remaining space. Only during the final minute of the song is this order overturned. During the course of the narrative, I will show how the protagonists are gradually weakened in the mix, their timbres becoming distorted and fragmented. Simultaneously, the antagonists grow stronger in the mix, occasionally masking the protagonists through their louder levels, and ‘flooding’ the entire stereo field, ultimately usurping the protagonists’ space. Staging, then, is central both in differentiating and animating the characters in the sonic narrative.

## **The Protagonists**

The voice, as primary protagonist in the sonic narrative, is the sound associated with the singer, the narrator, and the character within the narrative. These are not the same in narrative theory, though distinctions between them are not always clear. Lacasse, in discussing Simon Frith, refers to them as, ‘personne, persona, personnage’ (2006, 13). The voice, however, is not the first protagonist heard in *WtLB*; the song opens with an extended harmonica solo. Along with the voice, the harmonica plays an important role in the sonic narrative. It is not only temporally prominent—its solos occupy nearly two of the song’s seven minutes—but also its gestures are more representational than melodic, as they mimic the wails of a person suffering through the crisis of the narrative. Their emotive quality lies predominantly in their shape (ascents, descents and bends), speed (fast flurries and sustained notes), and timbre (breathiness and scratchiness). Through these gestures, the harmonica acquires agency, taking on the role of a protagonist, a ‘co-singer’. According to Licht, this is well within the tradition of harmonica performance practice (1980, 214).

The slide guitar is the other co-singer in the song, with its own solo gestures that lead into the choruses (see Appendix B). During the first chorus (2:39), the voice and slide guitar engage in a ‘duet’ where their timbres approach each other; Plant adopts the distorted tone of the guitar, not only through his extreme vocal effort, but also because his microphone level has exceeded the distortion threshold of the recording equipment. This combination of both natural and electronic distortion lends his voice a mechanical air, ‘instrumentalising’ him—something Waksman described as ‘the disturbance of the boundary between voice and guitar, and the manner in which Plant’s voice is effectively denaturalized’ (1999, 274) (hear Excerpt 1).

### *Excerpt 1*

At the second chorus (5:09) where the two engage in another duet, Plant vocalizes entirely without words, placing both singer and slide guitar on more equal footing and diminishing the voice’s stature as sole storyteller. This instrumental capacity of Plant’s voice was actually noted by the press early in the band’s career: ‘[Robert Plant] has a strange voice. He sings more tones than words and lets the tones and intensity stand in for the songs’ contents’ (Godwin: 2003, 40). As with the harmonica, the gestures of the slide guitar, while idiomatic, can also be heard as mimicking wails and cries as part of the narrative. The voice, harmonica, and slide guitar all tend to close their phrases with undulating figures reminiscent of wailing, reinforcing their common role as protagonists (see Figures 1a-c; hear Excerpts 2a-c). The vocal example (Figure 1a) sounds particularly prolonged.

### *Excerpt 2a*

### *Excerpt 2b*

### *Excerpt 2c*

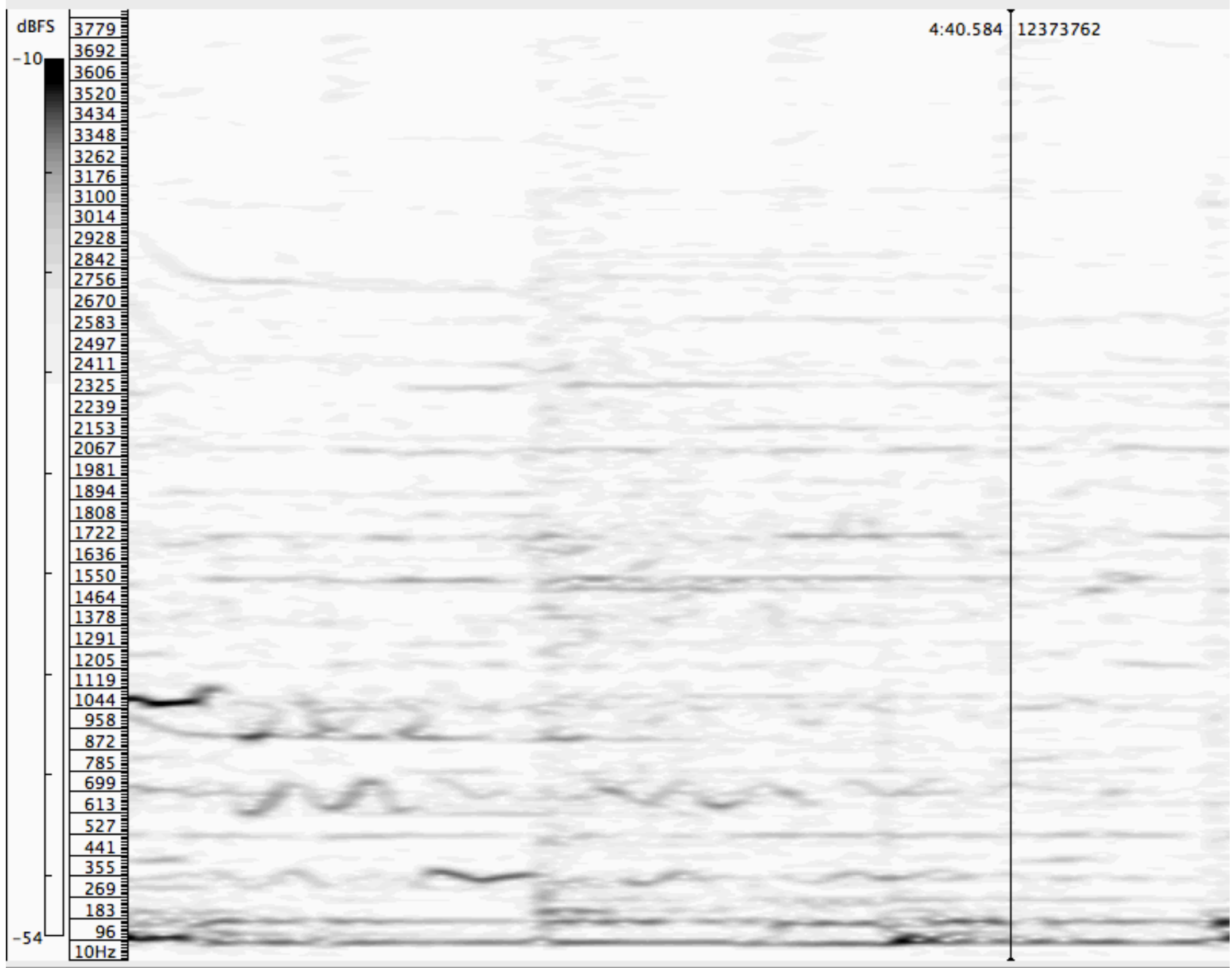


Figure 1a: vocal wailing gesture on word 'moaned' (4:40) indicated by dark wavy lines

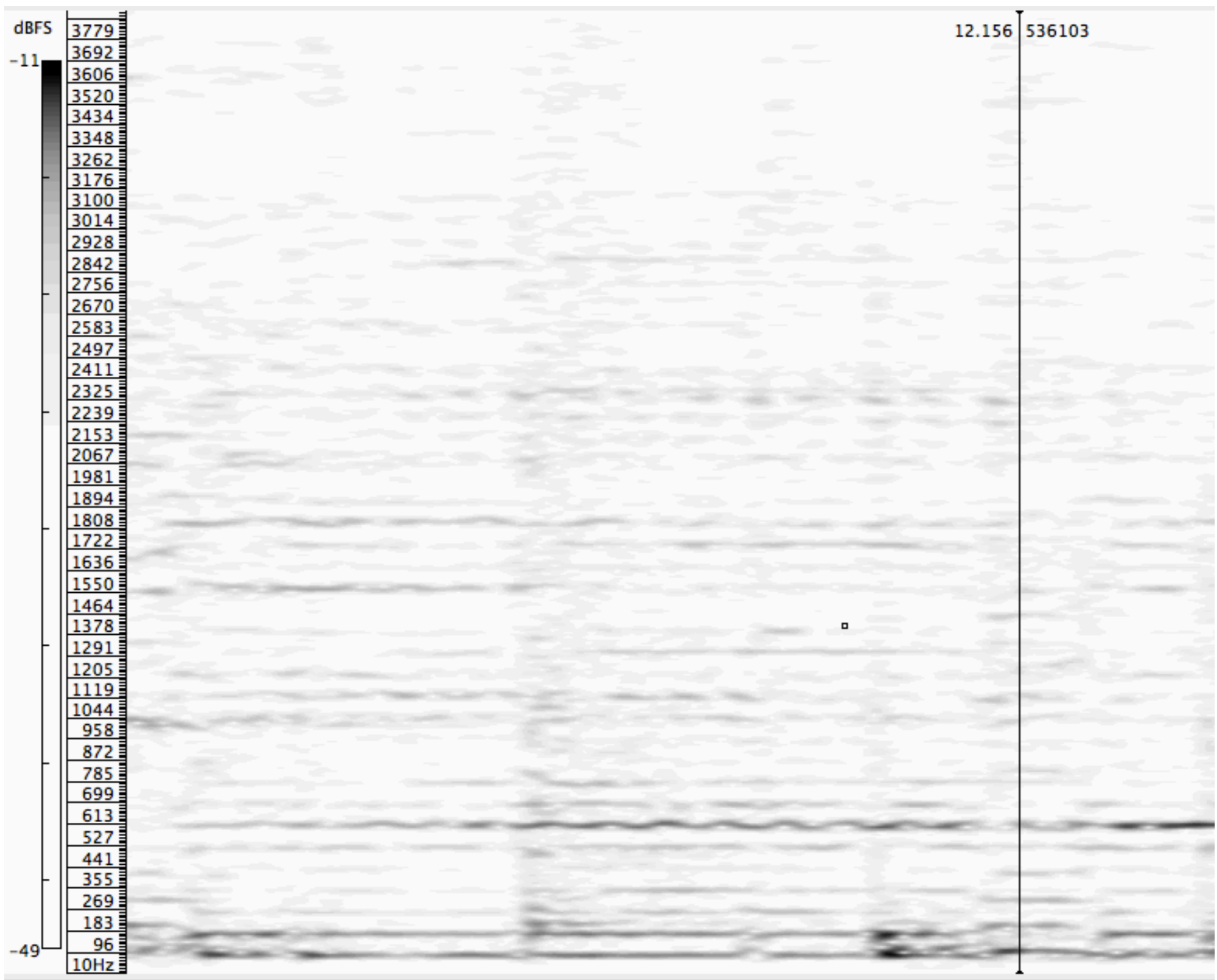


Figure 1b: harmonica wailing gesture in first solo (0:11)



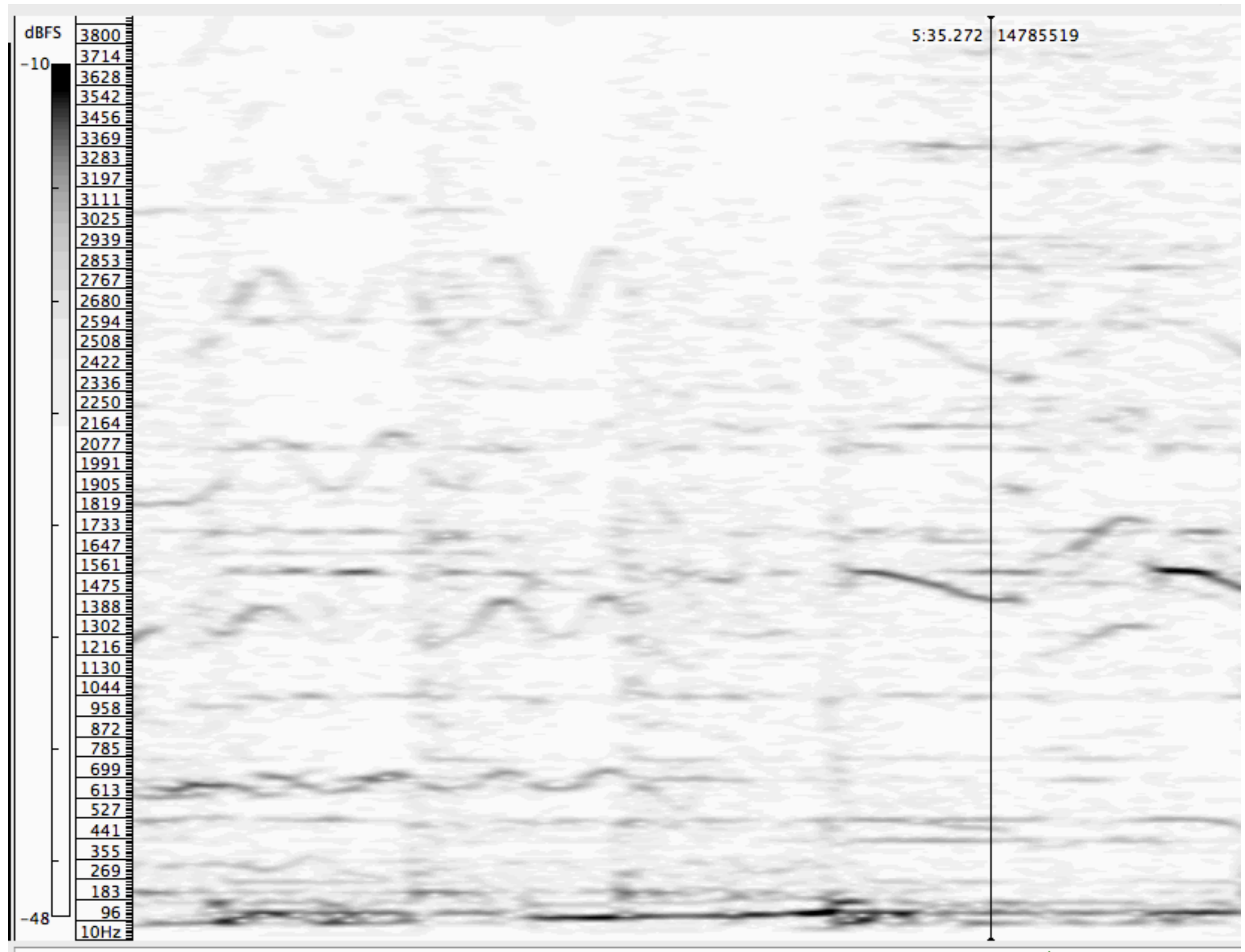


Figure 1c: slide guitar wailing gesture in 2<sup>nd</sup> chorus 2 (5:30)

Besides their gestural connection to each other, the protagonist tracks also share a common spatial treatment in the mix. This use of stereo space as a means of delimiting characters in the sonic narrative is an extension of the growing importance attributed to the use of space in recorded music. Allan Moore sees narrative potential in ‘unused’ stereo space, as it can be filled by later musical material. He even allows for ‘degrees of density’ in this kind of development (2001, 106). William Moylan also states that ‘image location can be extended to be a primary musical idea in itself’, and can ‘create musical interest just as the patterns of changing pitches, timbres or harmonies’ (2009, 9). The filling of space is a fundamental component of a sonic narrative.

After the drum introduction in the center of the stereo field, the harmonica solo enters panned hard left, while the rhythm guitar is heard on the opposite side. The harmonica’s emotive gestures, in contrast to the rhythm guitar’s drone, immediately draw one’s attention to the left (hear Excerpt 3).

### Excerpt 3

After more than a full minute of soloing in the left channel, the harmonica’s departure (1:05) leaves a palpable imbalance in the stereo field that ensues through the following bridge, while the rhythm guitar continues in the right channel. There is no change in the mix to remedy this imbalance until the voice enters with the first verse (1:24). Because the rhythm guitar remains in the right channel throughout, the voice’s entrance, while mostly centered, is perceived with a left bias, creating the impression that the voice has taken over the former space of the harmonica in such a way as to assume its role, lending it words, so to speak. When the voice drops out after the first two verses (2:12), the left channel again sounds ‘unfilled’ in comparison to the right. This imbalance again persists until the entrance of the slide guitar (2:32), which is panned hard left (compare Excerpts 4a: imbalance



& 4b: balance restored). This sharing of space among the harmonica, voice, and slide guitar establishes a sense of co-identity between them that is passed back and forth during the course of the song, always in the left channel (see Figure 2). The left channel thus becomes a stage where the protagonists tell their story.

Excerpt 4a

Excerpt 4b

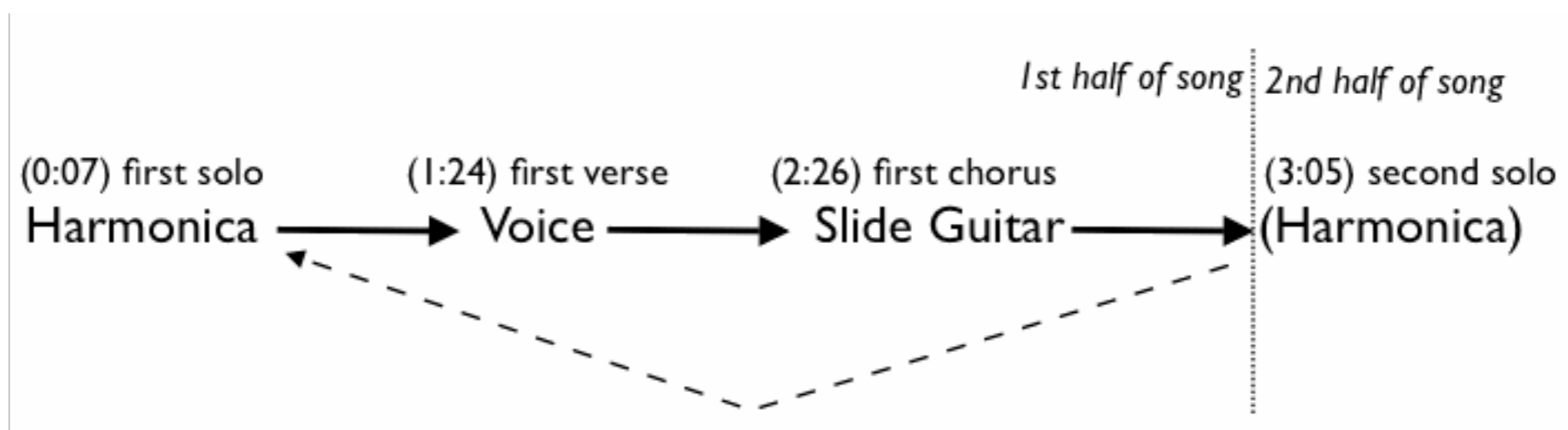


Figure 2. Arrows indicate swapping protagonists in the left channel. By the second half, the exchange has come 'full circle'.

## The Antagonists ('The River')

It is difficult to have a protagonist without an antagonist, and the insistent pounding of the rhythm section is readily interpreted as the threatening river of the textual narrative. There are other factors than rhythm, however, that contribute to this impression. The two-bar drum introduction that opens the song, while rhythmically relatively simple, is timbrally complex (hear Excerpt 5). How this sound was achieved is quite unusual and worth exploring further.

Excerpt 5

When the Levee Breaks', along with the rest of Led Zeppelin IV, was recorded at Headley Grange, an 18th-century manor situated in rural Hampshire, England. During the recording sessions, Jimmy Page said he was trying to avoid the sound of conventionally recorded drums:

When I was playing sessions, I noticed that the engineers would always place the bass drum mic right next to the head...I discovered that if you move [the] mic away from the drums, the sound would have room to breathe, hence a bigger drum sound. I kept exploring and expanding that approach, to the point that we were actually placing mics in hallways, which is how we got the sound on 'When The Levee Breaks. (Tolinski: 1993, 58).

While there is conflicting information about the number of microphones used to capture the drums (compare Cross and Flannigan (1991, 132) and Fyfe (2003, 84)), according to engineer, Andy Johns, they were recorded at the base of a staircase, with two microphones « about halfway up the first set of stairs », after which the signal was heavily compressed and put through an echo effect.<sup>5</sup> In an interview, John Paul Jones provides more insight into the setup, specifying that the two mics were not placed together in a traditional stereo pair arrangement, but were instead separated, « one [mic] hanging on the first floor and one hanging on the second floor ».<sup>6</sup> Given that multi-miking drum kits was already in practice (Oswinski, p.182; Zagorski-Thomas, 2010, 254), and that the band was accustomed to using four microphones to record Bonham's drums as early as their

second album,<sup>7</sup> this setup of two distanced microphones was a bold departure from convention. It was also distant from the Beatlesque, cloth-covered drumhead sound that was de rigueur at the time (Oswinski, 182).

Regarding the effects, a compressor suppresses the loudest parts of an audio signal, and in so doing, allows the overall level of the signal to be raised, though with some loss of dynamic range (the difference between the softest and loudest sounds). Compression makes the drums sound denser and louder, and the combined effect here with echo yielded an exaggerated sense of space where the drums appear potent, yet distant and indistinct. The aesthetic focus of the recording was thus displaced from the isolated sound of the drums to their sound within the performance space. This is a prime example of Moylan's observation that 'The sound qualities of environments fuse with the timbre of the instrument' (2009, 9),

Figures 3a-b illustrate, both in notation and spectrally, how our perception of the drums' rhythmic pattern is altered by the recording environment as echoed repetitions of drum hits blend with actual drum hits. These effects, then, are not merely qualitative, but quantitative as well.



Figure 3a. Notated drum intro without and with echo (hollow noteheads indicate echoes)

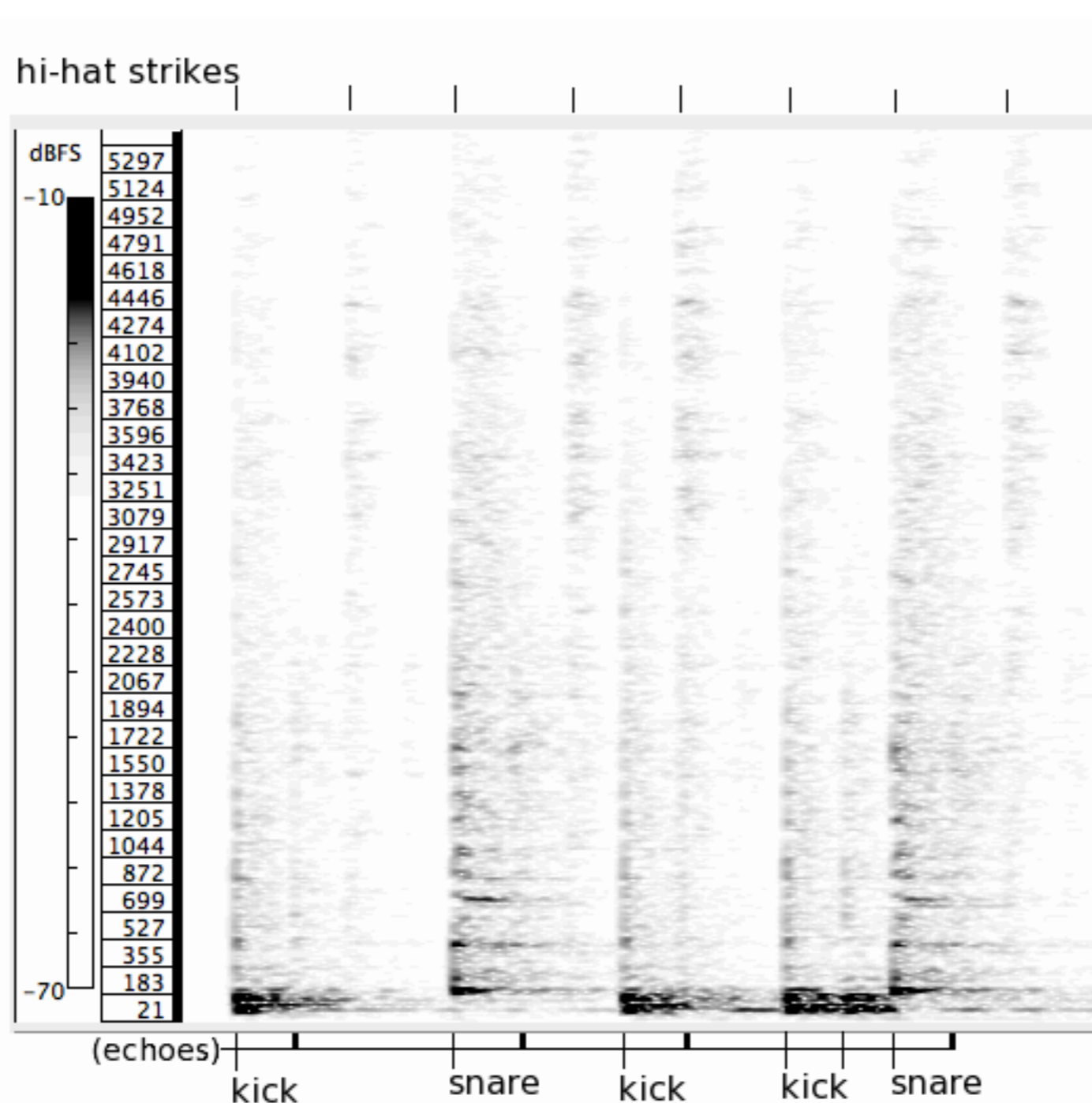


Figure 3b. Recorded drum intro with echo

According to Andy Fyfe, the drum sound on WtLB was the result of Jimmy Page's 'master plan for the track, which he set out to make sound as ominous as possible' (2003, 85). The antagonistic quality perceived by listeners appears to have been an intended aspect of their identity. In addition, the instrumental tracks were originally recorded at a slightly faster speed, then

slowed down, lending the song a sluggish, eerie quality (Eddy: 1997, 74). Besides the altered speed, the band's performance includes slight accelerations in tempo around the choruses that contribute to the song's elastic feel. Using beat-detection in Sonic Visualiser, these variations in performance tempo have been plotted in Figure 4.

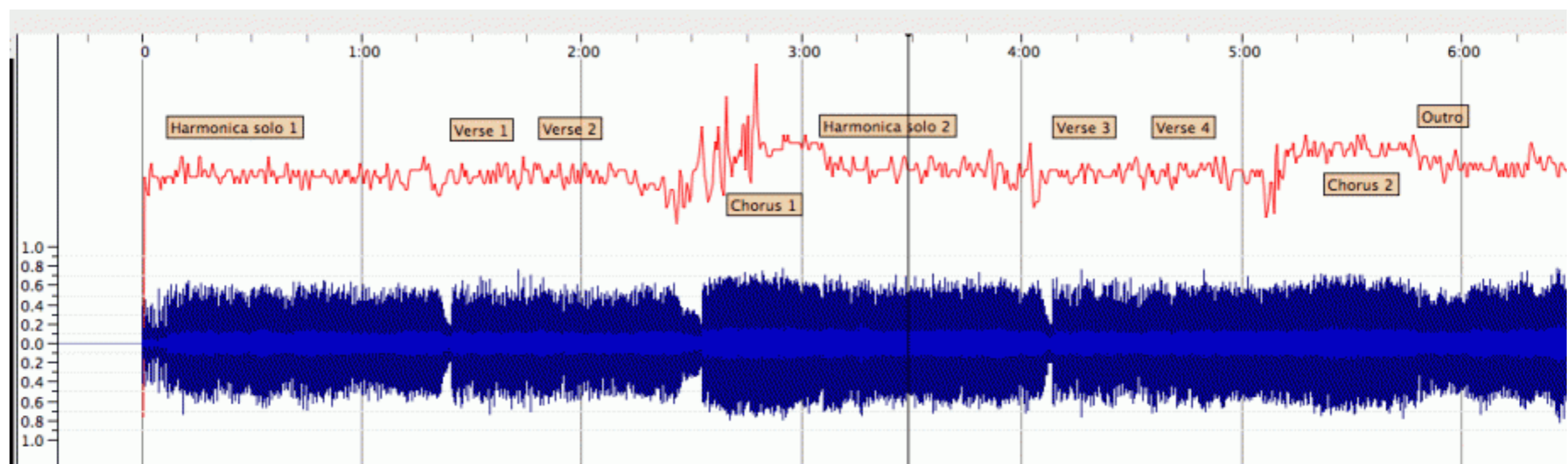


Figure 4. Tempo variations in *WtLB* indicated by red curve above waveform. Note fluctuations in tempo around choruses and preceding third verse.

Also important to the drums' sound is their flanged effect, which is most noticeable on the hi-hat cymbal. Flanging is a wave-like effect that results from a signal being mixed with its own slightly time-shifted frequencies (Izhaki: 2008, 403). The effect periodically alters the sound of the cymbal hits, making them sound alternately farther, then nearer, every few seconds. Early album reviews such as, 'I don't know what a levee is but it has the sound of surf to it and so does the song', testify both to their subtlety and potency (Godwin: 1997, 207).

The sonic quality of the drums adds layers of meaning to the text. Besides rendering the drums unfamiliar and 'antagonistic', it subverts traditional recording aesthetics by devaluing clarity in favor of an echoey wash of sound waves. These techniques are appropriate, however, in the context of a song about being inundated with water and, metaphorically, with emotion, both of which have obfuscating properties.

In addition, I believe the exaggerated sense of space in the drum opening serves as a metaphor for temporal distance. Clarke has observed that familiar timbres can recall the period from which they came, such as how the Beatles' 'Honey Pie' recreates the sound of a 78-rpm record 'to specify historical distance' (2007, 56). Zak writes that reverb ('ambience') has the ability to distance the sound world from the listener (2001, 84). Lacasse, too, has noted how reverb creates a 'virtual environment ... as a kind of theatrical rampe... listeners on one side, the artist on the other' (2000, 240). In a controlled study, he further demonstrates that reverb has the potential to connote 'the past' (2000, 161). Drawing on these, I would suggest that the spatial distance in the drums' sound signifies temporal distance, the reverberance serving as a kind of timbral time-frame—a sonic sepia tone—within which there is less pretense to authenticity; this is a story of a story, so to speak, a new take on old blues. The more altered a copy of song is, the more that copy's identity becomes about its difference from the original and less about its similarity to it. Headlam implies this in his discussion of « covers » and « recompositions » (1995, 362-3).

While very technical, another important consideration in the recorded sound of *WtLB* is its track placement at the end (closer to the center) of the LP side. Songs cut closer to the center of the album experience greater levels of distortion as well as treble 'roll off', or loss of high frequency content, due to the physically shortened path of the stylus while spinning at the same rate of motion (Gray: 1997). It is the equivalent effect of reducing the sample rate in a digital recording; one loses definition, and the faster vibrations (higher frequencies) suffer the more for it. *WtLB*'s placement at the end of the side meant that it would have a darker sound than the earlier tracks on the same album side. There is no way to know if this placement was for technical or aesthetic reasons or both, but the consequence is nonetheless congruent with the emotional feel of the track. It is a dark song and as such, it can be said to belong at the end of the album side.

By virtue of their rhythmic synchronization with the drums, the rhythm and bass guitars also form part of the rhythm section and, by extension, share the role as 'antagonists' in portraying the river. According to Page, the rhythm guitar was a 12-string guitar and was also timbrally affected with phasing and backwards echo (Cross and Flannigan: 1991, 132). The phasing effect, which essentially alters the phase, or time-relation, of certain frequencies of a given sound, results in 'peaks and dips along the

frequency spectrum' which can then be modulated to create a wave-like sweeping sound (Izhaki: 2008, 404). The thick texture of the 12-strings, combined with the phasing effect, help the rhythm guitar to blend into the rhythm section as a unified force and to evoke the sound of water.

The bass guitar, by virtue of its low register in lock-step with the rest of the section is more felt than heard, but when the levee breaks, it makes its presence known, as will be discussed below. Our perception of the rhythm section as a single character is reinforced at the end of the first and third bridges, where the instruments are struck together and left to resonate as a single fading chord (1:21 and 4:04) (hear Excerpt 6).

### *Excerpt 6*

Now that I have laid out the characters in the sonic narrative and explained why I have divided the tracks in this manner, I will focus on the narrative itself as manifest through the sounds of these characters. That is, I will track the sonic changes as a sequence of events in the voice, harmonica, and rhythm section.

## **Staging Robert Plant's Voice**

I demonstrated above how the lyrics evidence a psychological progression that grows in intensity as the inevitability of the flood approaches. In tandem with the intensifying lyrics, the vocal track becomes progressively distorted and disfigured during the course of the song. At the singer's moments of greatest anguish, his voice becomes the most distorted and electronically altered. Because the changes are subtle and occur gradually, they are not easily evident upon listening to the song, but when one performs a side-by-side comparison of the vocal track at different points in the song, the changes become more obvious (compare 1:24 and 4:35, Excerpts 7a & 7b).

### *Excerpt 7a*

### *Excerpt 7b*

According to Robert Walser, 'distortion functions as a sign of extreme power and intense expression by overflowing its channels and materializing the exceptional effort that produces it' (1993, 42). An important distinction must be drawn here between distortion level and volume level. For example, a heavily distorted sound at a low volume can signify 'intense effort' though 'with weak results', or vice versa. Although Plant's distorted voice signifies extreme emotion and great effort against the flood, it is the river's volume in the end that trumps the voice and reveals the weaker party. What is also unusual here is that the distortion serves not as a sign of power, but rather as a sign of the protagonist's powerlessness, as it diminishes the voice's presence in the mix, which may explain observations of the singer's 'engulfment' in the song. With the aid of spectral analysis, we can observe the comparative lack of spectral energy in the voice between verses 1 and verse 3 (compare Figures 5a-b).



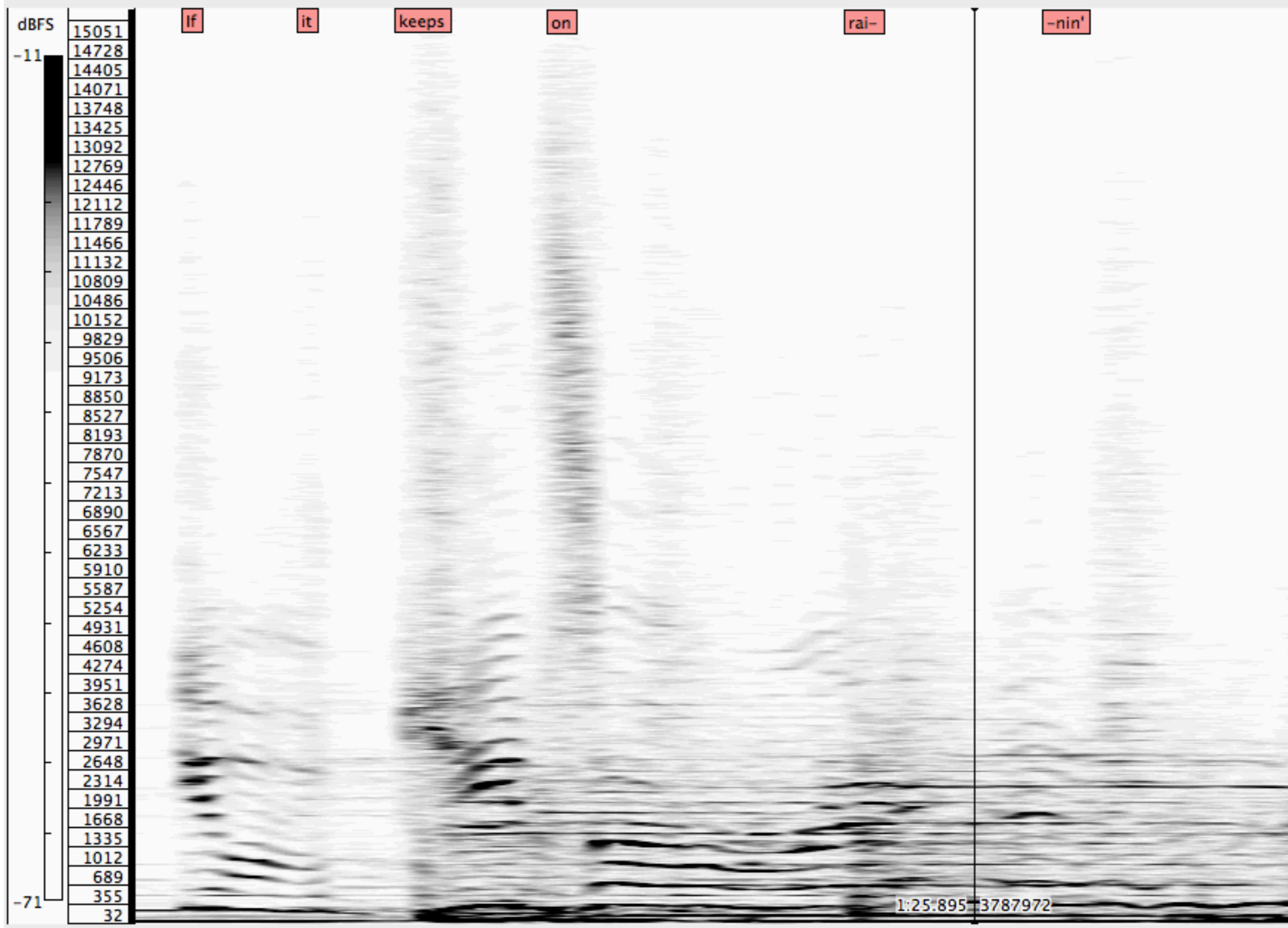


Figure 5a. Spectral energy showing Plant's voice at start of verse 1 (1:24)

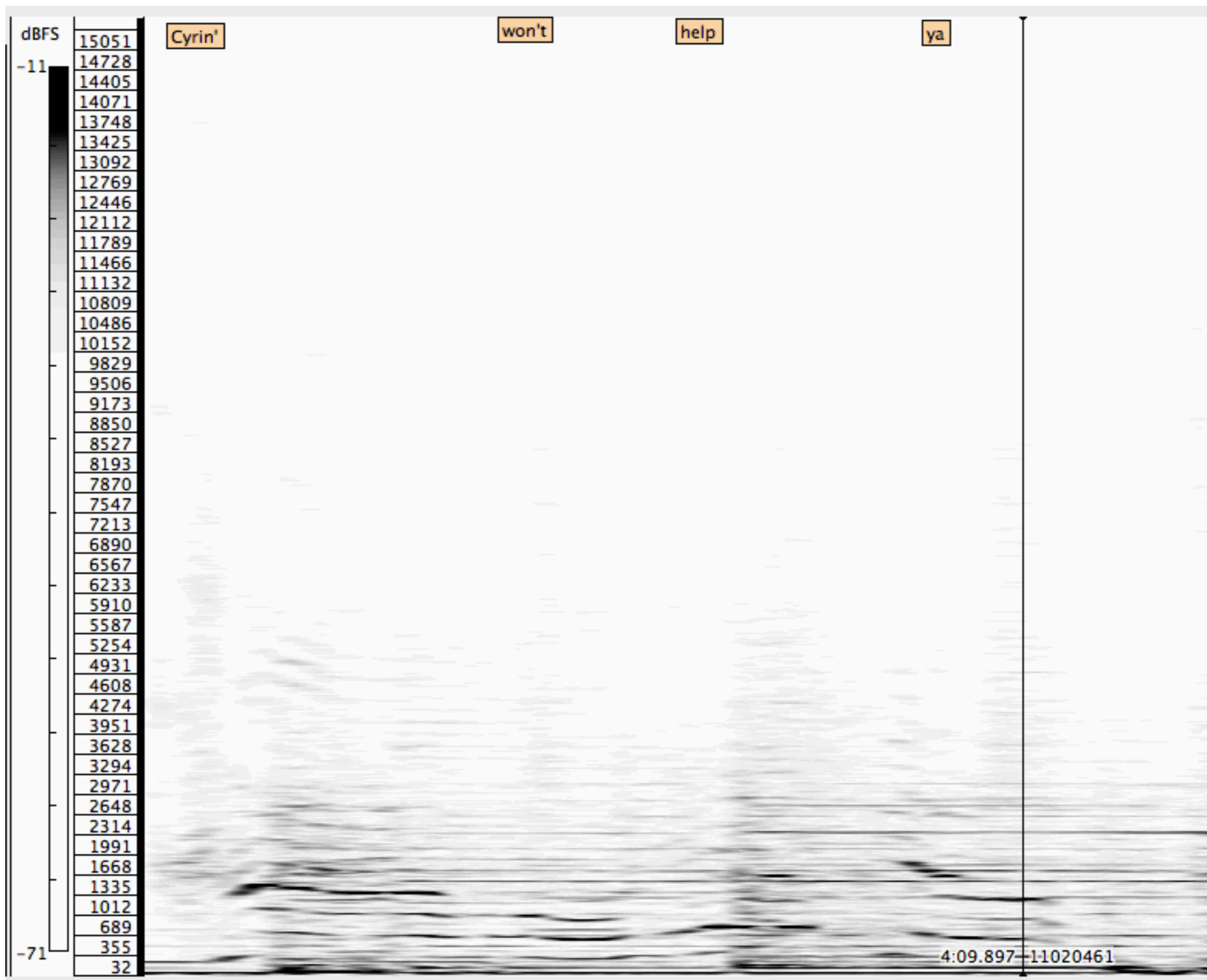


Figure 5b. Spectral energy showing Plant's voice at start of verse 3 (4:08). Note decrease from verse 1.

Contributing to the weakened vocal track is the phasing effect that was applied (Cross and Flannigan: 1991, 65). The phasing appears to slur the sung words. Lacasse links this effect with 'inner turmoil' or 'malfunction', which aptly suits the sonic narrative (2000, 135). Through these progressive changes to the voice's timbre, we are made aware of the protagonist's demise.

## Staging The Harmonica

As mentioned above, I believe it can be fruitful to extend the idea of vocal staging to instruments as well, especially instruments that function as narrative voices, as I hear them in this song. Just as the voice undergoes a gradual timbral transformation, so, too, does the harmonica, whose second solo at the song's midpoint is more heavily processed and marked by an extreme echo effect not present during its first solo. The newly added echo alters the harmonica's sound in two ways: first, it causes the harmonica's initial, longer notes to overlap with themselves, disfiguring them—the contrast is striking between the nervous, choppy phrases of the first solo and the sustained, plaintive 'moans' of the second solo (compare Excerpts 2b: first solo (0:06) & 8: second solo (3:06)); secondly, later in the solo, the echo causes a kind of melodic fragmentation where past phrases cascade into new phrases, creating a tumultuous wash of sounds (hear Excerpt 9 (3:32)). Because echoes that follow a sound at around 50ms or less are heard as prolongations of the sound (reverberation), while those that follow at longer intervals are heard as distinct repetitions (echoes), the lengthy delay time here of over 200ms was central to achieving this cascading effect.



## Excerpt 9

Zagorski-Thomas writes of this period that echoes ‘were often timed so that they reinforced the rhythm of the music rather than conflicted with it’ (2010, 256). It is noteworthy here that the echo is employed in the opposite sense, to generate sonic interference, creating a dense wash of sound in the second solo that signals the gradual destruction of the harmonica as protagonist. In the hands of Page and engineer Andy Johns, this effect was put to creative ends, yielding a wholly unique, if not disorienting, result.

Adding to the disorientation here is the fact that the echoes are louder than the signal that precedes them (listen to 3:30–3:41). Page discussed his application of what he calls ‘backwards echo’ to the harmonica, a process that consisted of adding echo to a recording being played in reverse and then righting the direction of the recording, resulting in an echo that preceded the signal itself (Tolinski: 1993, 99). This effect can be viewed spectrally in Figure 6, where the first instance in each pair of repeated sounds is weaker in amplitude (indicated by their lighter hue), than the original signal that (visually) follows it.

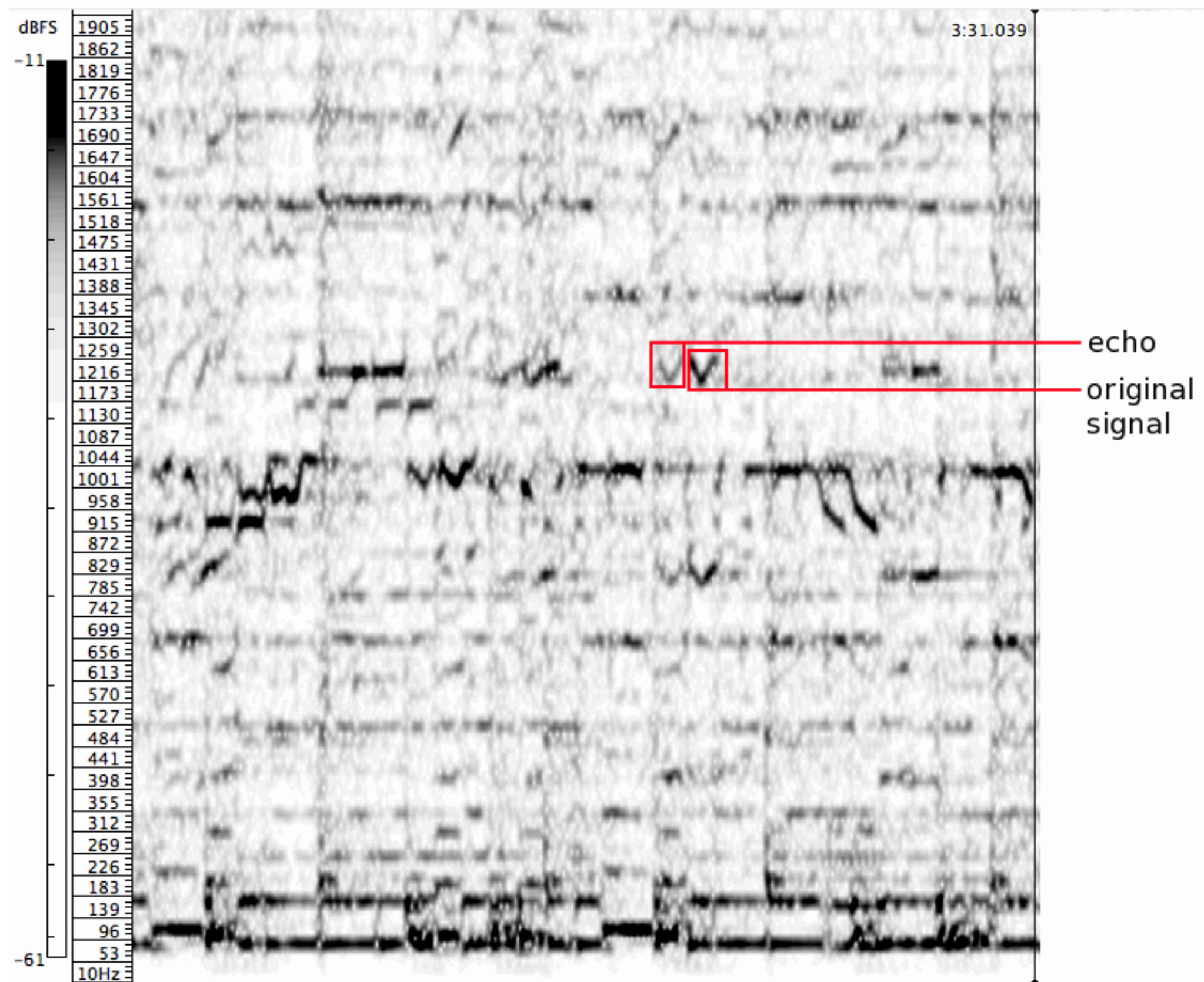


Figure 6. Backwards echo in harmonica solo 2 (3:30). Note echoes (lighter) precede original signals (darker).

## When The Levee Breaks: Staging The Event

At the second chorus (5:09), the point in the song where I argue the levee breaks, the music is most explosive, including a run of thirty-second notes in the drums that culminates in a cymbal crash (the gestural breaking of the levee). Sonically, the drums sound slightly more sustained, which emphasizes the cymbals’ resonance (hear Excerpt 10). The high frequency cymbal crashes

are an effective analogue to the sound of crashing waves. In the language of musical semiotics, they are a 'sonic anaphone', that is, an "onomatopoeic" stylization of "non-musical" sounds' (Tagg, 1999, 24)

#### *Excerpt 10*

At the same time, the voice is no longer clearly the most prominent element in the mix; rather, the slide and rhythm guitars in the left and right channels respectively, rival it in volume and are heard more consistently. While I still hear the slide guitar and harmonica as co-narrators with the voice, they may also be heard here as taking on antagonistic qualities of the river, and thus in opposition to the voice. My hearing is based upon their own fragmentation and spatial displacement during the outro, which will be discussed below. Plant thus sings 'Goin' down' with a triple-entendre of going to Chicago, drowning, and being enveloped in the mix.

At the outro, the mutual point in the textual and sonic narratives where the river begins to flood the plains, forcing the protagonist to 'move', the chaos that ensues in the narrative is reflected in a variety of disorienting and transforming sonic effects with heretofore unheard of frequency. At 5:48, we begin to hear faint, fragmented, backward echoes of the harmonica in the left channel, resembling gurgling underwater sounds (hear Excerpt 11). Within a single phrase, words approach and then recede back into the mix (listen to 'Goin...I'm goin' to Chicago' in Excerpt 11).

#### *Excerpt 11*

The following phrase, 'Sorry, but I can't take you' (6:01) initiates a series of spatial changes in the mix that make it abundantly clear something catastrophic is happening. The doubled vocal tracks are, for the first time, placed just enough out of phase for them to be heard as two separate tracks (hear Excerpt 12). This fragmentation is yet another method of illustrating the protagonist's demise.

#### *Excerpt 12*

Also significant, the bass is suddenly boosted in the lower register, adding the force of compounded overtones and contributing a menacing quality to the mix. The deep pitch space that opens up beneath the singer is an ominous metaphor for the depth of the waters engulfing the singer (listen to just before Plant sings 'Sorry...' in Excerpt 13). As a recording studio practice, boosting extremely low frequencies on vinyl (the song's original medium) has to be treated carefully, since too much low frequency energy could potentially cause the phonograph needle to jump out of the groove (Gray: 1997). The spectral traces of the bass boost are shown in Figure 7.

#### *Excerpt 13*

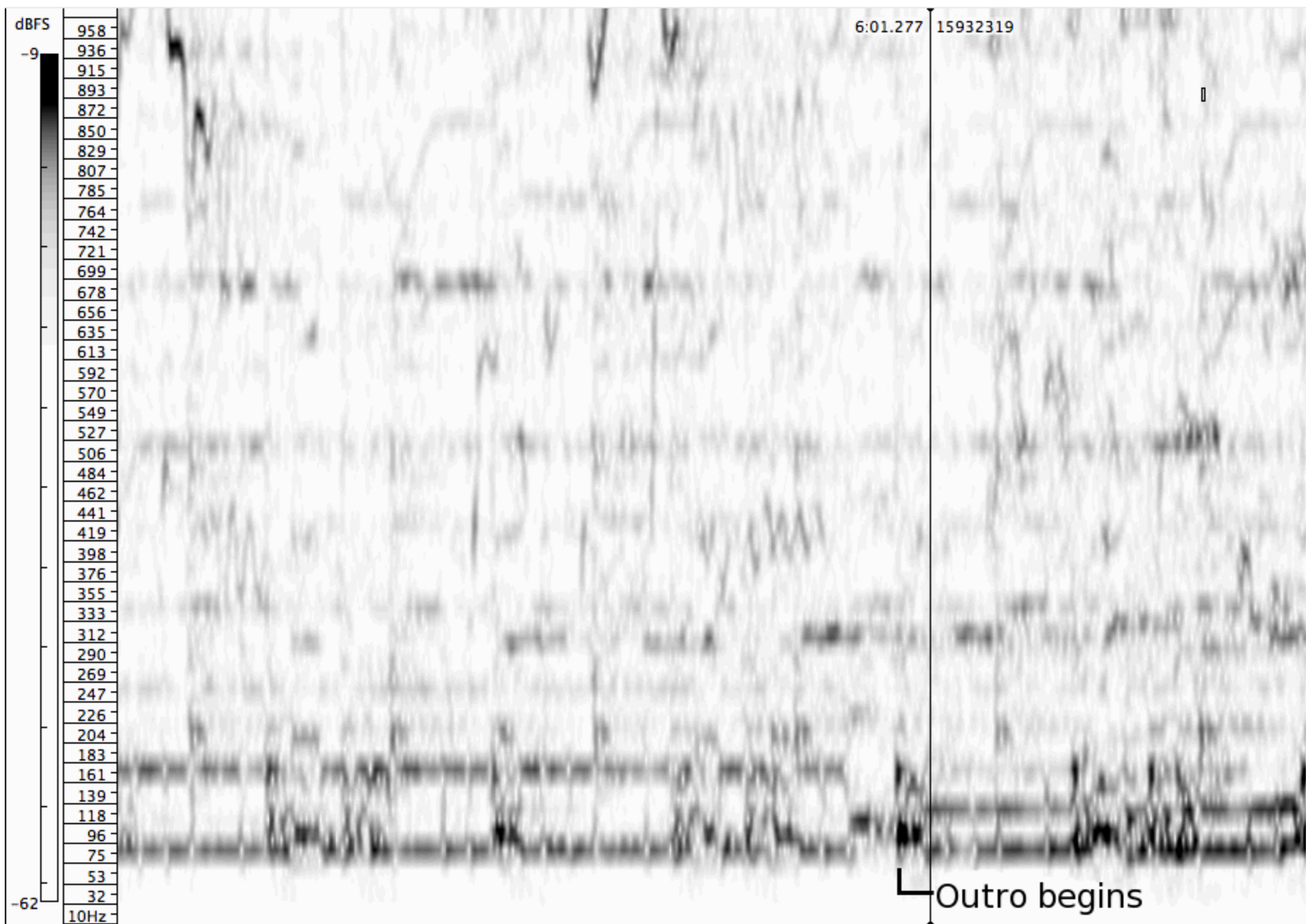


Figure 7. Bass register is boosted at the start of the outro (6:00) following point at which 'levee breaks' in the sonic and textual narratives.

Most significantly, as Plant repeatedly sings 'Goin' down', a series of extreme shifts in the stereo field take place during which the left and right channels are repeatedly swapped, sonically portraying the chaos of the flood (hear a brief example in Excerpt 14). The dramatic nature of these exchanges is revealed when comparing Appendix C, the first six minutes of the song, with Appendix D, the last minute of the song.

#### Excerpt 14

Page was especially proud of the latter device; he said, 'One of my favorite mixes is at the end of 'When The Levee Breaks', when everything starts moving around' (Tolinski: 1993, 58). The climactic ending of the song was apparently mixed with headphone listening in mind.<sup>8</sup> Expanding upon Richard Middleton's discussion of how a listener can become 'assimilated' into the space of a recording as a 'participating actor', Dockwray and Moore assert that listening through headphones would only emphasize this effect, due to the detachment of the listener from the surrounding environment (Dockwray and Moore: 2010, 220). These novel sounds would have been rendered all the more powerful in headphones.

During the outro we hear only fragmented sounds of instruments as they and the voice are tossed around the stereo space—a sonic metaphor for their plunging below, and grasping above, the water's surface. Their timbres are distorted and their cries are mixed with their own reversed echoes as they are enveloped in the chaos of the flood. In short, they have become 'wetter' (via reverb) and 'muddier' (via echo).



One event in the outro that highlights the experimental nature of these recording studio techniques occurs at 6:15, where a thunderous drum roll simultaneously masks the harmonica's exit and the (backwards) slide guitar's entrance, creating an aural illusion that one instrument has been transformed into the other. Adding to the complexity of this event, the voice, which is masked by the drum roll (the 'waters'), immediately emerges mid-scream from beneath the sound waves. As the primary antagonistic character in the song, the drums (as the river) become a catalyst in the literal mixing of the instrumental sounds, throwing the three protagonists about as playthings. This aural effect is illustrated in Figure 8 (hear Excerpt 15).

#### Excerpt 15

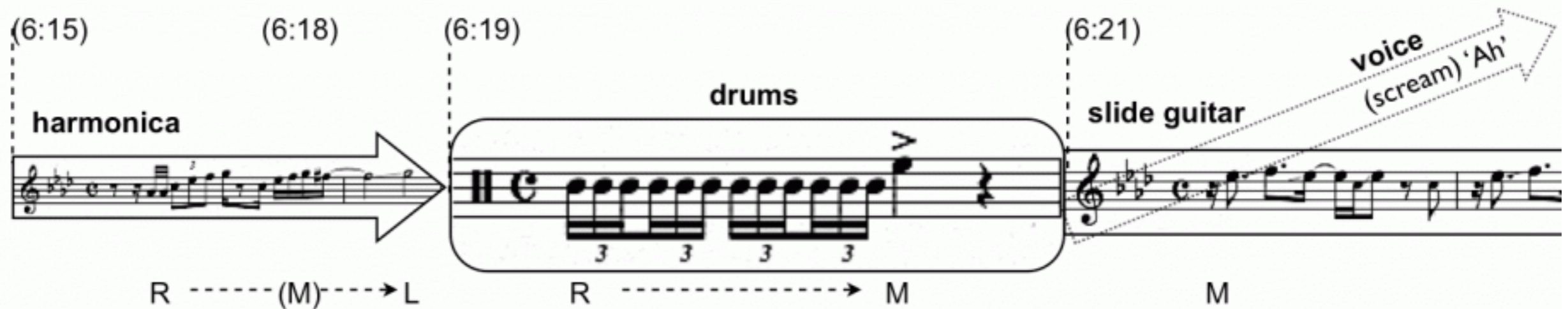


Figure 8. (6:15–6:26) The harmonica is ‘transformed’ into the slide guitar via the masking effect of the drum roll, which also covers a low volume scream that grows in prominence.

At the end of the song, the instruments are engaged to close out the emotive pleas of the song, rather than the singer, who has presumably succumbed to the events of the narrative. Both the harmonica and slide guitar eventually depart via the left channel, their stage of choice. The drums’ mid-measure exit at 6:58 only underscores the abruptness of the departures. As a final gesture by the ‘tides of the river’, the rhythm guitar sweeps conclusively to the left channel before the song ends—noteworthy, since this is the opposite side from where it had been situated during the entire song up to that point (hear Excerpt 16). The river has indeed moved from its starting point at the song’s opening, and in so doing, it has washed away all the left side protagonists, leaving only their resonance in the form of echoes. In the end, only the waters remain, triumphantly occupying the vast, reverberant space that was once the protagonists’ home.

#### Excerpt 16

### Conclusion

In her book on narrative, *Unsung Voices*, Carolyn Abbate asks, ‘How does this constructed “they” seem to speak? Why do we hear them? What is their force? Precisely which musical gestures can be read as betraying their presence?’ (1991, xiii). These are the questions I asked in this essay. I have tried to examine audible phenomena that may account for some of the common impressions people have described, and to relate them not only to their sources in practices and technologies, but also to a coherent narrative (my poietic contribution, to be sure). My choice of the terms ‘protagonists’ and ‘antagonists’—as opposed to ‘agents’, for example—is intended to underscore the cooperation between textual and sonic narratives. It is worth reiterating that this analysis represents one possible hearing of WtLB; alternate narratives could certainly be construed, and different interactions of characters propounded. Referring again to Philip Tagg, I have explored some of the ‘channels’ used to convey ‘intended messages’ received by a community of ‘competent receivers’ (Tagg: 1999).

Susan Fast remarked that ‘The fluid approach to text in Led Zeppelin...requires an equally fluid, polysemous approach to analysis (2001, 47)’. WtLB is a rich source of musical meaning, whose multifacetedness cannot be revealed by any single analytical model, including this one. I have hardly touched upon harmonic and rhythmic aspects of the song, its semiotics,

cultural meanings, etc. Rather, I have tried to retell (again) the story of the levee breaking, only this time through the recorded sounds encountered in the song. This is, of course, a hermeneutic process, but that does not preclude the verifiability of these observations. My inclusion of spectral analyses and excerpts is meant to assist in this process.

In their semiotic study of twenty utopian and dystopian songs, Tagg and Collins observe that ‘dystopian songs featured much stronger sounds in the lower middle, bass and contrabass registers than did their utopian counterparts. The former were characterised by the sound of old machines’, several of which included a guitar, ‘which was typically played like a machine—power chords delivered with repetitive down-strokes (2001, 5)’. By these standards, the boomy, reverberant rhythm section, accompanied by the monotonous drone of the rhythm guitar, certainly paints a dystopian picture in WtLB.

The close relationship between textual and sonic narratives is especially pertinent with regard to popular music, for while the overriding aesthetic in classical music recording has traditionally been to capture great live performances in their ephemerality (at least ostensibly), rock music recordists have typically approached the recording process not as an end in itself, but as a ‘gathering of raw material’ to be treated and assembled into a composition (Clarke: 1983, 199). In the case of ‘When the Levee Breaks’, the song was so heavily produced in the studio that it was no longer viable as a live song (Lewis: 2004, 39). It would be difficult to imagine a similar situation in the traditional classical repertoire.

In historically contextualizing Led Zeppelin’s song, it is interesting to note that in an early interview, drummer John Bonham positioned the band’s music as ‘raw and basic pop’ in opposition to ‘experimental pop music’, while at the same time, the band was being described as part of the ‘English underground’ scene by some media (Godwin: 2003, 100 & 111). Even after their first gig, the Swedish Daily News (3/15/69) remarked about the experimental aspect of their music (Godwin: 2003, 40). The band was conscious of, and promoted, the kind of fans who were willing to listen more carefully to their albums that, by their own admission, took ‘a bit of listening’ to fully appreciate. (Godwin: 2003, 49).

The group’s adoption of these extreme mixing techniques in 1970 is also historically significant. In their study of over 1,000 songs between 1966-1972, Moore and Dockwray observe that in 1970, ninety-three percent of the mixes surveyed were not dynamic (involving movement of the instruments in the stereo field), and of the examples provided, none evidenced the kind of movement found in WtLB (2010, 228). This, combined with their early focus on mixing for headphones, suggests that Led Zeppelin may have played a more important historical role with regard to sonic experimentation than is generally acknowledged.

Hopefully, I have provided a convincing case where the recorded sounds play an integral role in the meaning of this song. The music of Led Zeppelin—in fact, any music that has gone through the recording studio process—demands a consideration of recording studio aesthetics, for it is there that a whole realm of still mostly unexplored meaning is created.

## **Acknowledgments**

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## **About The Author**

Prof. Aaron Liu-Rosenbaum

Faculté de Musique

Université Laval

Québec G1V 0A6

**[aaron.liu-rosenbaum@mus.ulaval.ca](mailto:aaron.liu-rosenbaum@mus.ulaval.ca)**

## Notes

1 For some interesting directions in this line of research, see Phillips-Silver (2009) and Fletcher (2011).

2 See <http://www.stevehoffman.tv/forums/archive/index.php/t-915.html>

3 I would like to acknowledge one of my reviewers (and mentioned student) for this interesting observation.

4 See <http://www.stevehoffman.tv/forums/showthread.php?t=63657> and <http://www.stevehoffman.tv/forums/archive/index.php/t-159471.html>

5 Interview with Andy Johns, Available at : [http://www.youtube.com/watch?v=MP2w3wbkpKY&feature=results\\_video&playnext=1&list=PL0573B9CD7B1E64CA](http://www.youtube.com/watch?v=MP2w3wbkpKY&feature=results_video&playnext=1&list=PL0573B9CD7B1E64CA) (Accessed: July 2012)

6 Interview with John Paul Jones, Available at : <http://www.youtube.com/watch?v=qZnomekzqbc&feature=related> (Accessed: July 2012)

7 Interview with engineer Christopher Huston, Available at: <http://www.youtube.com/watch?v=XZfrxZR-rAE&feature=related> (Accessed: July 2012)

8 BBC Interview w/ Jimmy Page on recording the 4th album, Available at: <http://www.led-zepplin.org/reference/index.php?m=int5> (Accessed: Nov 2011)

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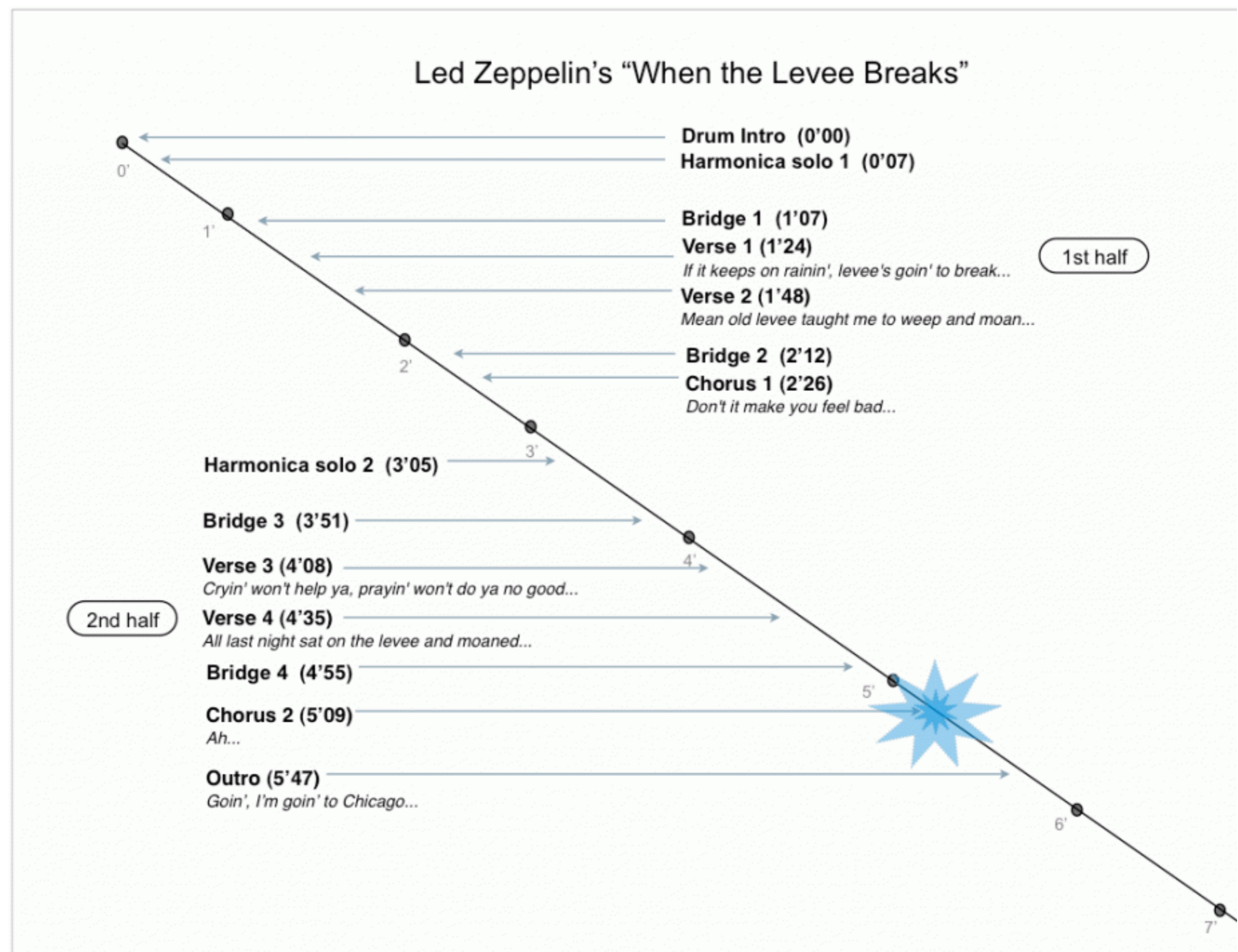
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Discography

Led Zeppelin, 'When the Levee Breaks', Led Zeppelin Box Set [CD] Atlantic Records, 1990.

## Appendix A – Songmap Of 'When The Levee Breaks'



## Appendix B – Lyric Sheet For 'When The Levee Breaks' (Bonham/Jones/Page/Plant/Memphis Minnie)

## INTRO

(Instrumental)

## VERSE 1

If it keeps on rainin', levee's goin' to break, (X2)  
When the levee breaks I'll have no place to stay.

## VERSE 2

Mean old levee taught me to weep and moan, (X2)  
Got what it takes to make a mountain man leave his home,  
Oh, well, oh, well, oh, well.

## CHORUS

Oh, Don't it make you feel bad  
When you're tryin' to find your way home,  
You don't know which way to go?  
If you're goin' down South  
They got no work to do,  
If you're goin' north there's Chicago.

## VERSE 3

Cryin' won't help ya, prayin' won't do ya no good,  
Now, cryin' won't help you, prayin' won't do you no good,  
When the levee breaks, mama, you got to move.

## VERSE 4

All last night sat on the levee and moaned, (X2)  
Thinkin' about my baby and my happy home. Oh...

## CHORUS

Ah...

## OUTRO

Goin', I'm goin' to Chicago... Goin' to Chicago... Sorry but I can't take you...  
Goin' down... goin' down now...(2x)  
Goin' down (4x)  
Goin' down... goin' down now...(3x)  
Goin' dow-, dow-, dow-, dow-, down, ooh...

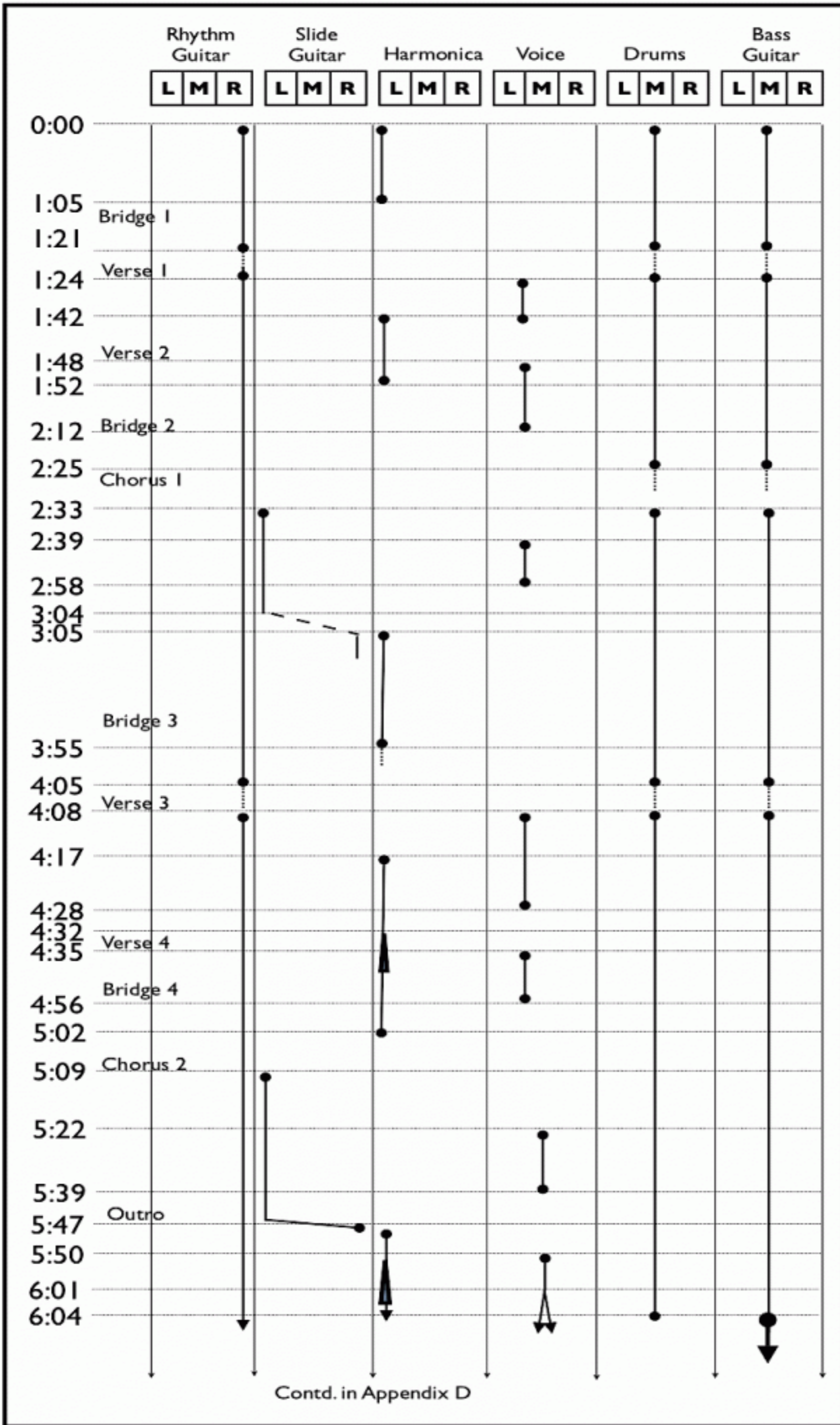
## Appendix C – Mix Map 1

Stereo placement (left, middle, right) during the first six minutes of 'When the Levee Breaks'.

The forked line in the voice at 6:01 indicates the voice's fragmentation in two.

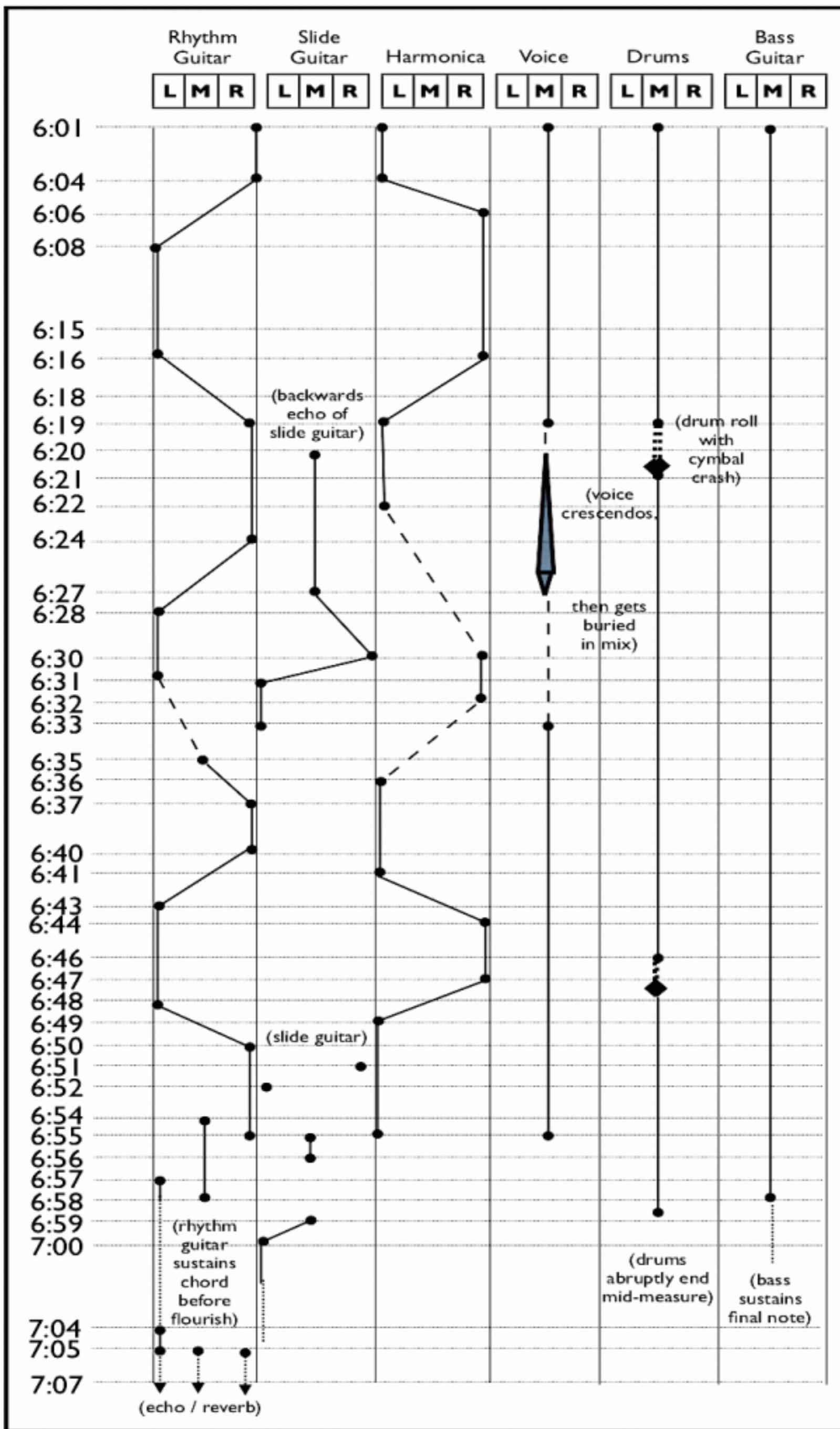
Thicker lines indicate prominent crescendos. The arrow at 6:04 in the bass indicates a low register boost.





## Appendix D – Mix Map 2

Stereo placement during the final minute of 'When the Levee Breaks'



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