

“Switch Blade” (Duke Ellington)

Spectrographic Analysis

by Jonathan Dimond

Recording examined: Money Jungle. Blue Note CD 7-46398-2 (1967)

*B*ackground / Introduction

Switch Blade is a track initially unreleased on the original Blue Note record from September 17, 1967. The players are:

Duke Ellington - piano

Charlie Mingus - bass

Max Roach - drums

The track lasts 5:22 but is faded out at the end, so perhaps was initially longer but truncated for use on the rereleased CD. The bass solo that concludes this track starts getting quite ambiguous and one can only guess that some kind of unsatisfactory playing in the 6th chorus denied the track's inclusion in full on the original record.

The “composition” is a 12-bar blues in F, but my interest in this track is not for the preplanned compositional content (which seems restricted to the 1st chorus's piano melody) but rather the improvisational content. Most of all, I am interested in the temporal organization of the three musicians, and how their time feel effects the feeling of how the music flows.

It is worth noting here that Roach limits the instruments in his drum kit:

- the high-hats (played on beats 2 and 4) keep the back-beat”;
- two ride cymbals render the swing pattern and keep the beat - one is used in Chorus 1-4, and a “sizzle” ride cymbal is used in Chorus 5-6.

There is no use of bass drum or tom-toms. The only membrane drum used is some snare drum, which is delayed until the turnaround into Chorus 4. The result is that each instrument has its own spectral territory, creating an almost meditational clarity.

*S*tructural Overview

An overview of the formal organization of Switch Blade is as follows:

Track Time

0:00	unaccompanied bass introduction Duration: 33”
0:33	chorus 1 walking bass, drums (swing) and a minimalistic piano melody comprising the “head” Duration: 35”
1:08	chorus 2 walking bass (with more inflections and rhythmic variations), drums (swing) and piano improvisation Duration: 36”
1:44	chorus 3 walking bass (with more inflections, rhythmic variations, pedal points, wider use of registration, and generally more soloistic), drums (swing) and piano improvisation Duration: 36”
2:20	chorus 4

walking bass (with more inflections, rhythmic variations, pedal points, wider use of registration, and generally more soloistic), drums (swing, and introduce snare drum “dribbles”) and piano improvisation

Duration: 35”

2:55 chorus 5

walking bass (with more inflections, rhythmic variations, wider use of registration, and generally more soloistic), drums (swing - changes to the “sizzle” ride cymbal, with some snare drum “dribbles”) and piano improvisation

Duration: 36”

3:31 chorus 6

bass and piano exchange phrases, with the bass taking more of a soloistic role. Drums continue.

Duration: 36”

4:07 chorus 7

bass solo (unaccompanied, and in double time feel, predominantly)

Duration: 32”

4:39 chorus 8

bass solo (mostly unaccompanied - except some piano notes, and in double time feel, predominantly)

Duration: 29”

5:08 chorus 9 (fade out)

bass solo (unaccompanied except for initial piano and drum notes)

The introduction and all choruses are based on a basic 12-bar blues progression with the following structure:

I	IV	I	I
IV	IV	I	I
V	IV	I	V

Introduction

The introduction features a full range of expressive techniques by Mingus, which are to be employed throughout the track. These include:

- slides and microtones.
- varied dynamics. These range from strong attacks (with fingerboard noise, activating the acute frequencies of 3-4kHz), to soft attacks (whose range is more grave, contained below 800Hz.)
- tremolo.
- vibrato.

From 0:27 Mingus cues in the rest of the band by reverting to a more cliché walking bass line turnaround pattern, which is normally played in the 11th and 12th bars of the blues. It is this pattern which communicates the tempo that the players enter and the piece is subsequently played. However, some surprises are to be found in Switch Blade!

The tempo that Mingus plays in bar 11 (92 bpm) is modified in bar 12, decreasing to 88 bpm for 2 beats, and then even more to 80 bpm for the final 2 beats. {See Plate C for the spectrographic detail, and also the manuscript Excerpt 1}.

Excerpt 1: Introduction (from 0:27)

11 12

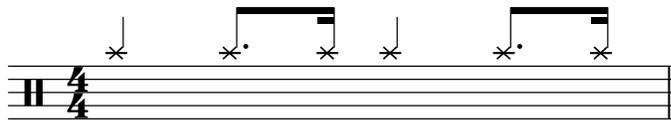
Chorus 1

The first chorus undulates between 77 bpm and 86 bpm. What intrigued me was the relationship of the drums and the bass, most of all, who together drive these tempo changes and create the tune's overall feel.

The first 2 bars of chorus one appear in detail in Plate C (0:33-0:38). The ride cymbal is a constantly acute sound, occupying its own spectral region high above the bass and piano (3.5kHz to the top of the spectrograph, around 16 kHz). The beats the cymbal pronounces are clearly delineated here, as (fairly) evenly-spaced bands. The "back-beat" reinforcement by the high-hat is also apparent, with the stronger bands on beats 2 and 4, especially around 5kHz. Using a right-angled set square, one can observe what one hears in the vertical relationship between the bass' quarter notes and the drummer's: The drums are dragging, or "laying back".

During the first 2 bars of Chorus 1, the ride cymbal rhythm plays a standard swing pattern, only the placement of the triplet eighth is delayed somewhat, making it occur around the last sixteenth note instead, thus:

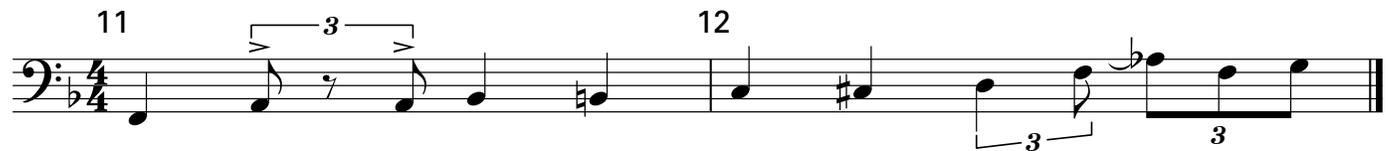
Excerpt 2: Chorus 1 (from 0:33)



It is interesting that after these 2 bars Roach abandons this pattern in favour of straight quarter notes, until the final bar of the chorus.

During the last 2 bars of Chorus 1, Mingus plays a variation of the turnaround pattern he played last chorus, and pushes the tempo from the previous bars of 79-82 bpm up to 84 bpm. Simultaneously, he amplifies this push by "digging in", playing loud notes with high noise content, as evidenced by the spectrograph detail at 1:03 {See Plate D}.

Excerpt 3: Chorus 1 (from 1:01)



During these two bars, Roach's beat lags noticeably, and one can see the high-hat spectra (on beats 2 and 4) follow the bass attacks. {See Plate D.}

It is worth noting that Ellington plays almost entirely monophonically in this chorus: the melody is a single lyrical line that could in fact be sung. No accompanying chords are sounded, making the voice distinction clear: bass, melody, cymbals.

Chorus 2

Ellington kicks off the chorus with more rapid gestures and also double stops. Sparse left hand chords also accompany his lines now, building up the density.

Roach plays more of the swing pattern in this chorus (rather than straight quarter notes - see Excerpt 2), which increases the sense of "push". This suits Mingus' more ornamental playing well, and the result is a more stable tempo, which fluctuates less rapidly between 78 and 84 bpm.

Chorus 3

I sense that Roach's sixteenth-note (rather than triplet) subdivision in the swing pattern is actually a

foreshadowed double-time feel, which Mingus begins to introduce in this chorus with his contrapuntal lines (such as at 1:51). {See Plate G.}

The role of the bass continues to sway from walking to soloing as Mingus climbs up to Ab3 (207Hz) for a b7 pedal on the IV chord {See Plate G at 1:56}.

Chorus 7-8

When left unaccompanied, Mingus again takes more tempo liberties and leaves the tempo of 80 bpm for a more intense double-time feel improvisation. His overall tempo increase is reflected in the total duration of these choruses - down from 35-36" to 32" and 29" respectively.

Conclusion

What is interesting about this track is that the ride cymbal and the bass' quarter notes push and drag continuously, creating continuous undulations of tempo. Furthermore, these undulations are not always in concert between the players. Despite this, the overall feel is quite pleasing. My analysis has begun to reveal some patterns in the chaos:

- The time drags in bars 9 and 10 of the form. This is where the V and IV chord appear, and is the point in blues compositions where a 'B' statement is introduced that gives the listener the resolving line and subject (in the case of lyrics).

E.g. "When I woke this morning, I saw a terrible thing;

When I woke this morning, I saw a terrible thing;

My girl has left me, What heart-ache does she bring!"

- The time pushes in bars 11 and 12 of the form (building excitement towards the top of the form.)
- During periods of straight (unornamented) quarter notes, emphasis on 2 and 4 is coupled with dragging these beats, creating a laid-back swing feel.
- 8th-note triplets are typically rushed, pushing the beat slightly, building excitement.

I was interested to read Mingus' own words about time feel, in his book "Beneath the underdog"*:

"Swing went in one direction; everything had to be played with an obvious pulse and that's very restrictive. But I use the term 'rotary perception.' If you picture the beat existing within a circle you're more free to improvise - each guy can play his notes anywhere in that circle and it gives him a feeling he has more space. The pulse is inside you. When you're playing with musicians who think this way you can do anything."

Rotary perception describes the musical feeling well, and it is the organic relationship of the periods that the musicians are so solidly feeling which gives this performance a sense of unity.

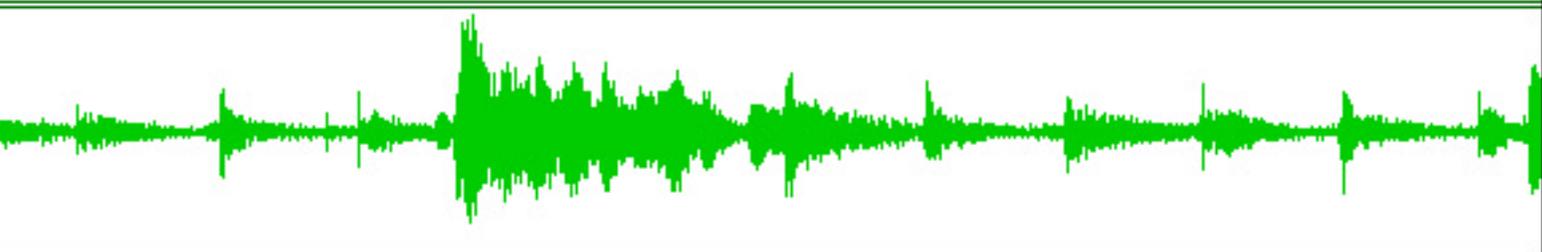
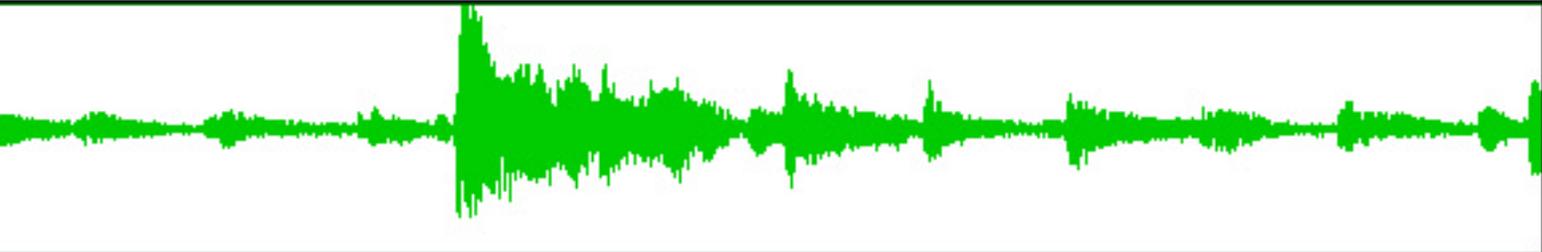
* Mingus, Beneath the Underdog, First Vintage Books, 1971. pp.359-361
also: Cogan, Music Seen, Music Heard, PCI, 1998. pp. 68

Excerpt 4: ProTools tempos (from 1:01 to end of Chorus 7)



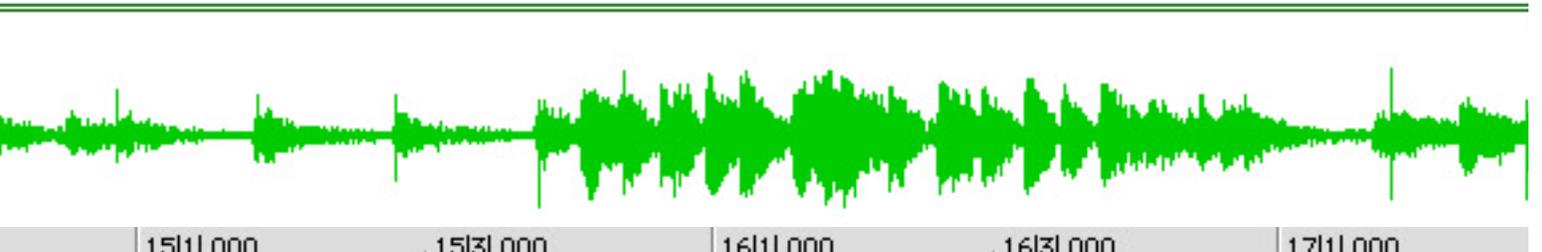
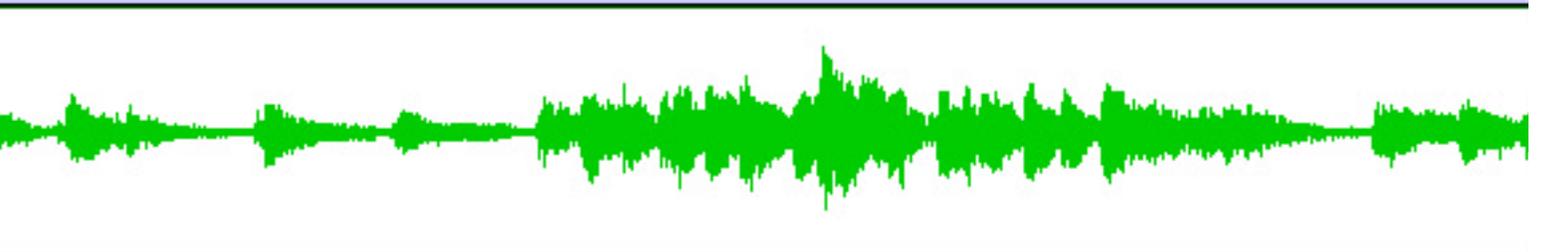
4|1| 000 4|3| 000 5|1| 000 5|3| 000 6|1| 000 6|3| 000

▼ ♪ 81.00 ▼ ♪ 77.00 ▼ ♪ 86.00 ▼ ♪ 84.00



9|3| 000 10|1| 000 10|3| 000 11|1| 000 11|3| 000

▼ ♪ 83.00 ▼ ♪ 84.00 ▼ ♪ 81.00 ▼ ♪ 79.00

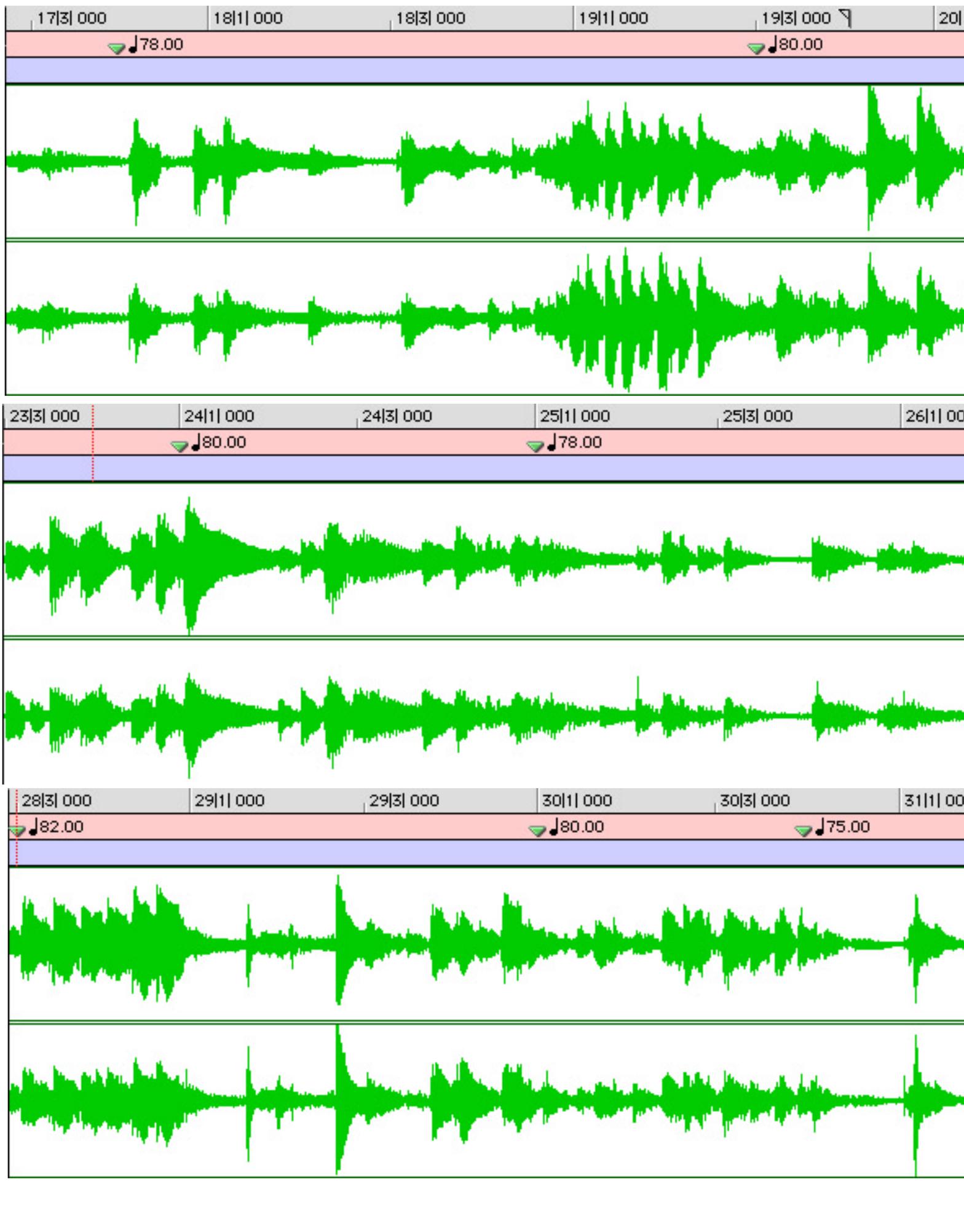


15|1| 000 15|3| 000 16|1| 000 16|3| 000 17|1| 000

▼ ♪ 82.00 ▼ ♪ 84.00

🛡 Chorus 2





1| 000 20|3| 000 21|1| 000 21|3| 000 22|1| 000 22|3| 000

▼ ♪ 86.00 ▼ ♪ 82.00



0 26|3| 000 27|1| 000 27|3| 000 28|1| 000 28|3| 000

▼ ♪ 82.00

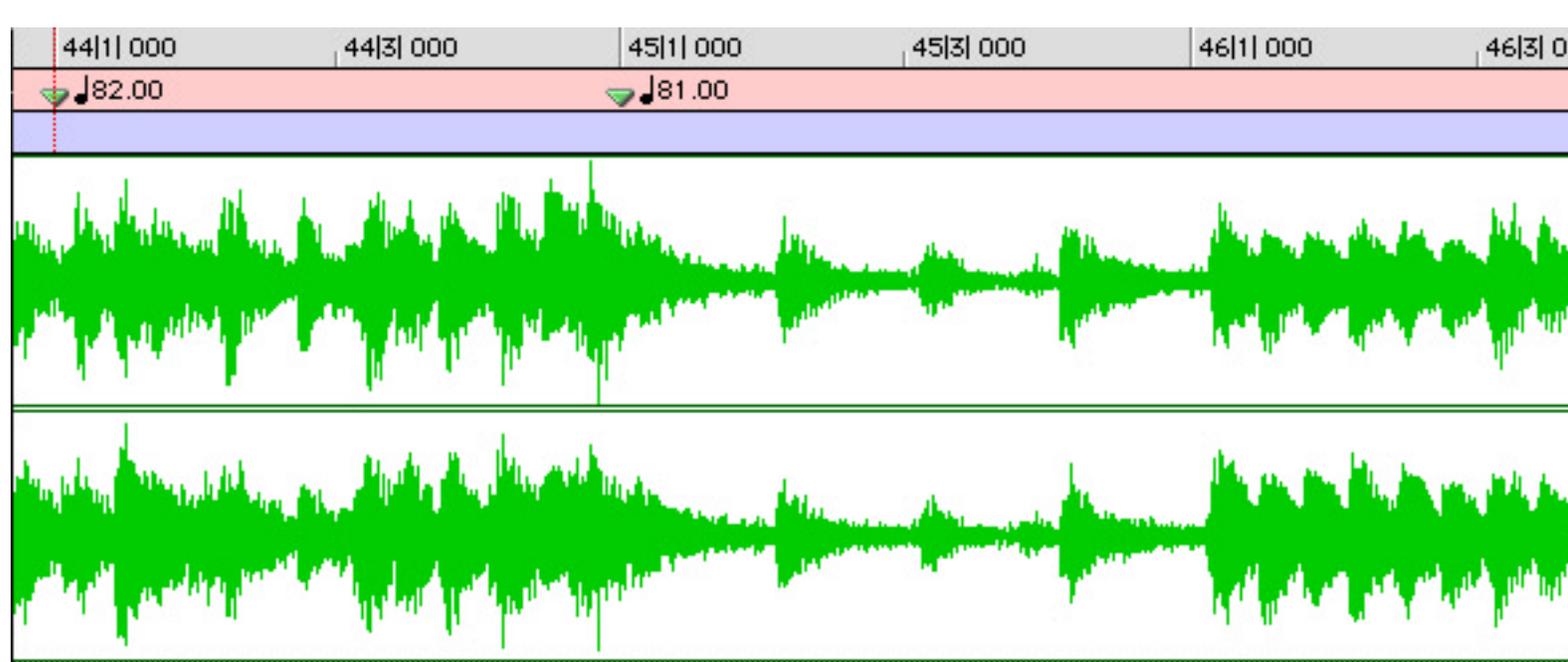
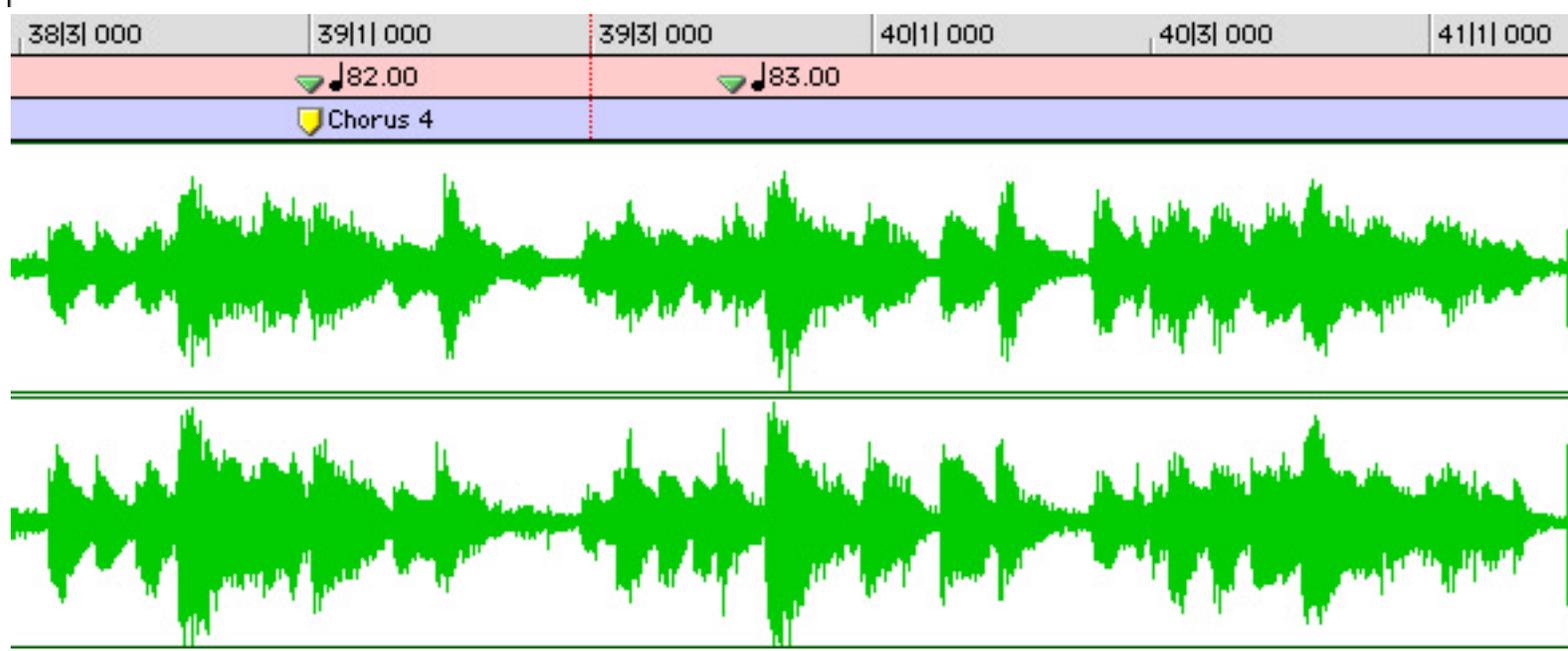
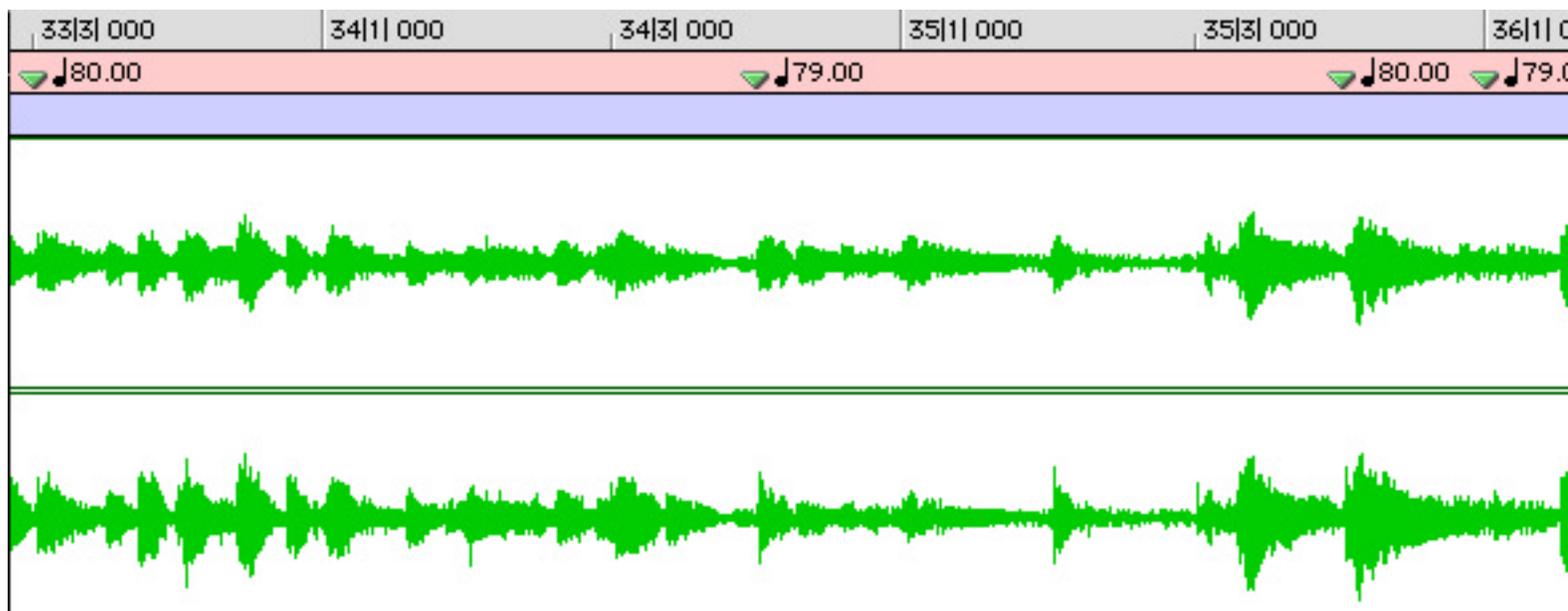
🛡 Chorus 3

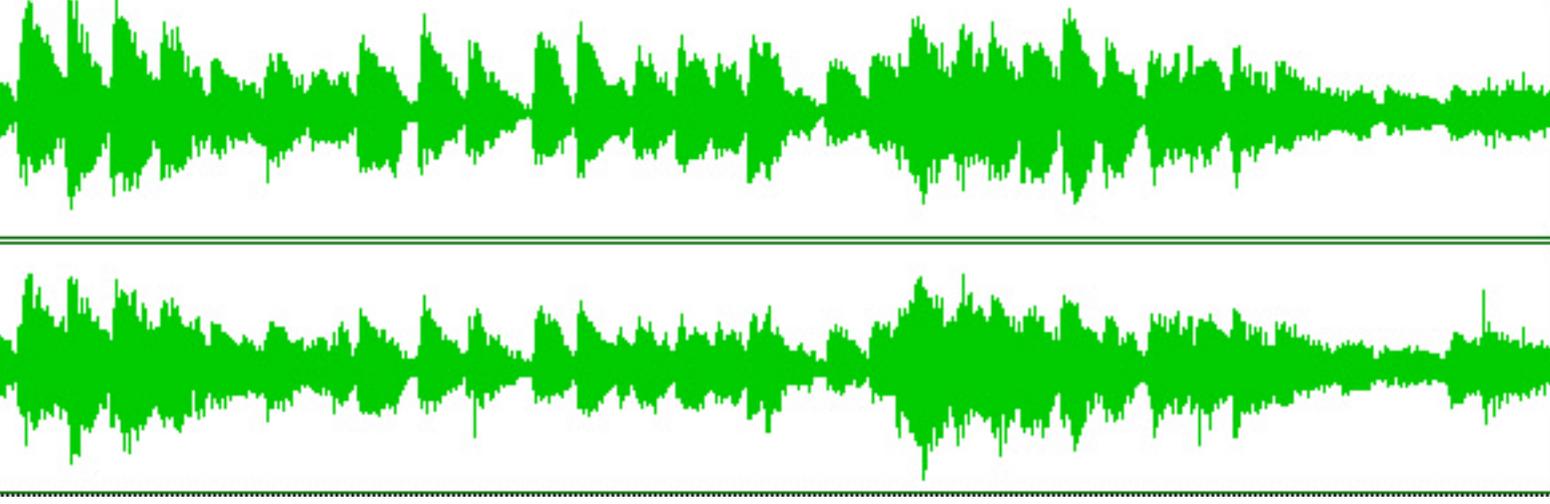
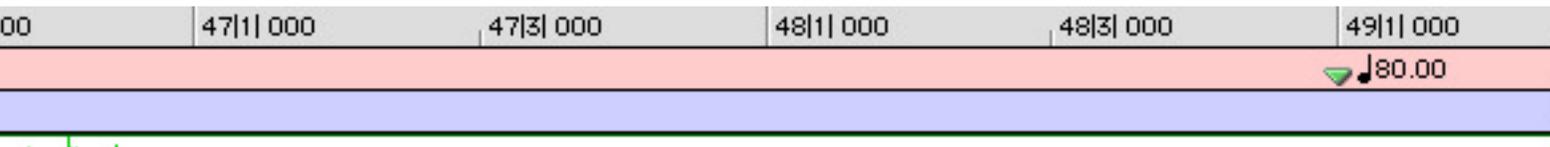
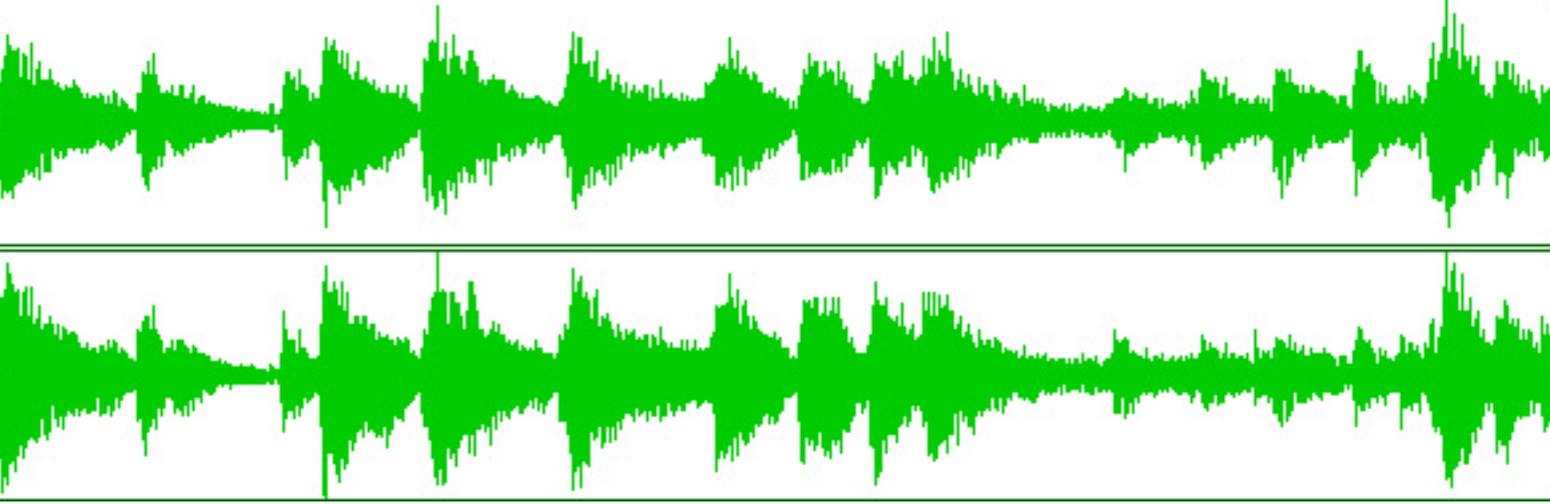
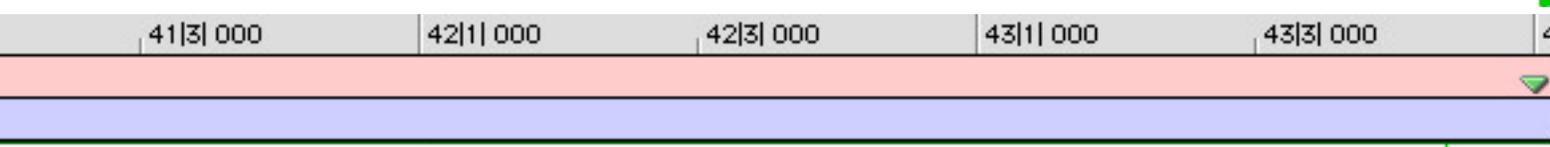
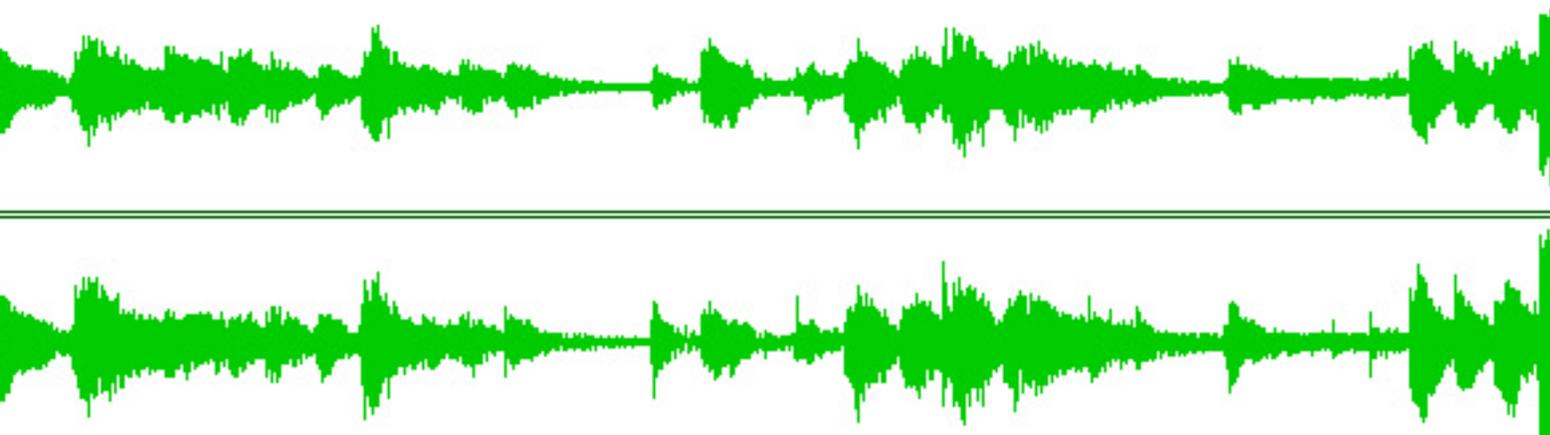
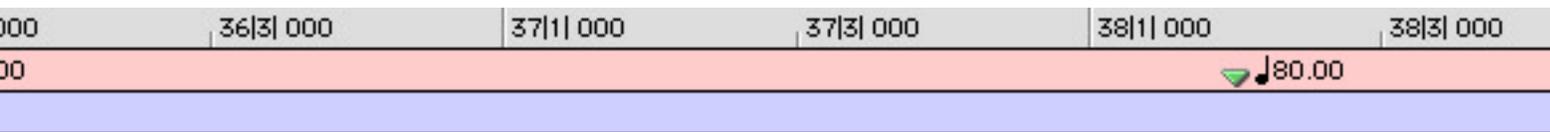


0 31|3| 000 32|1| 000 32|3| 000 33|1| 000 33|3| 000

▼ ♪ 78.00 ▼ ♪ 80.00 ▼ ♪ 82.00 ▼ ♪ 80.00







49|1| 000 49|3| 000 50|1| 000 50|3| 000 51|1| 000 51|3| 000

▼ 80.00

Chorus 5



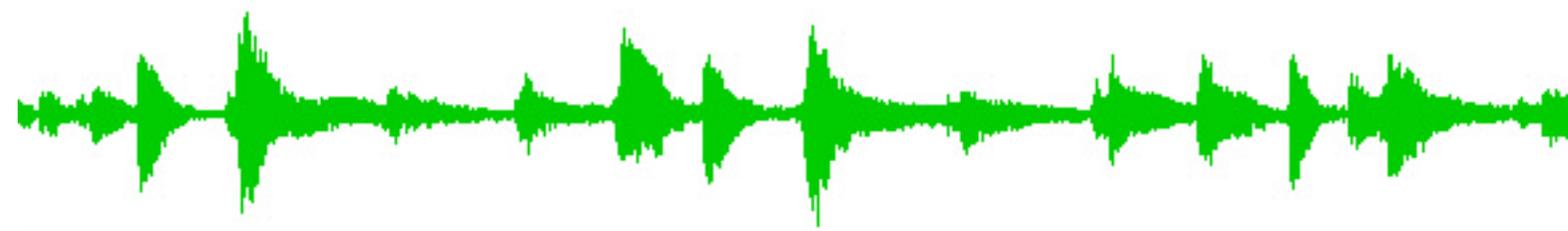
54|1| 000 54|3| 000 55|1| 000 55|3| 000 56|1| 000 56|3| 000

▼ 79.00



59|1| 000 59|3| 000 60|1| 000 60|3| 000 61|1| 000 61|3| 000

▼ 82.00



000 | 52|1| 000 | 52|3| 000 | 53|1| 000 | 53|3| 000 | 54|1| 000

81.00



0 | 57|1| 000 | 57|3| 000 | 58|1| 000 | 58|3| 000 | 59|1| 000

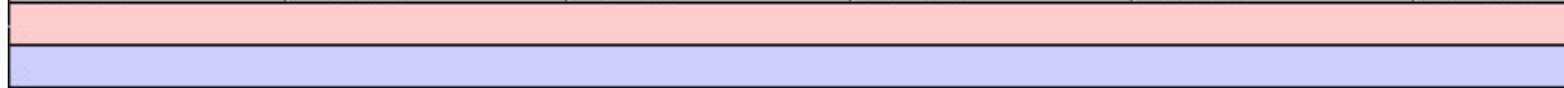


3| 000 | 62|1| 000 | 62|3| 000 | 63|1| 000 | 63|3| 000 | 64|1| 000

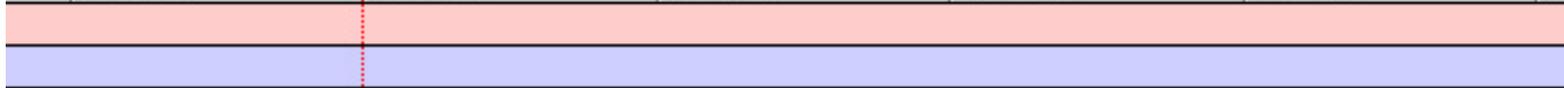
Chorus 6



64|1| 000 64|3| 000 65|1| 000 65|3| 000 66|1| 000 66|3| 000



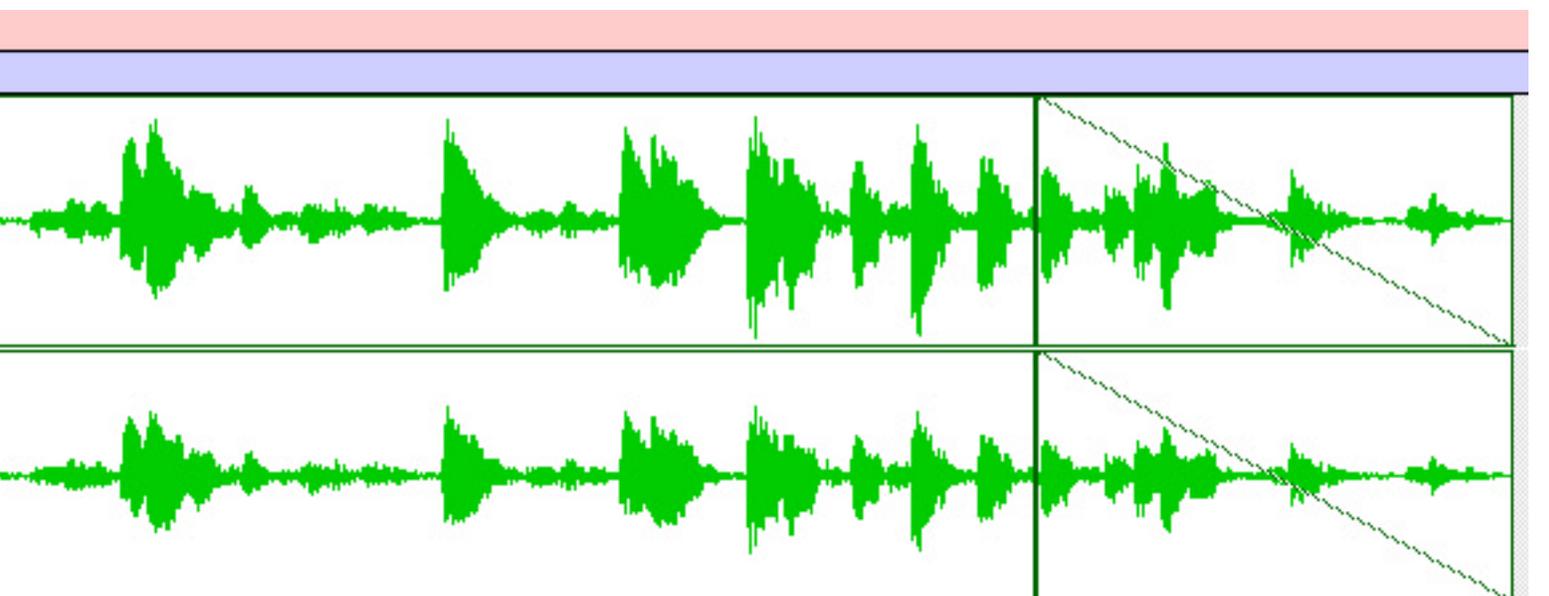
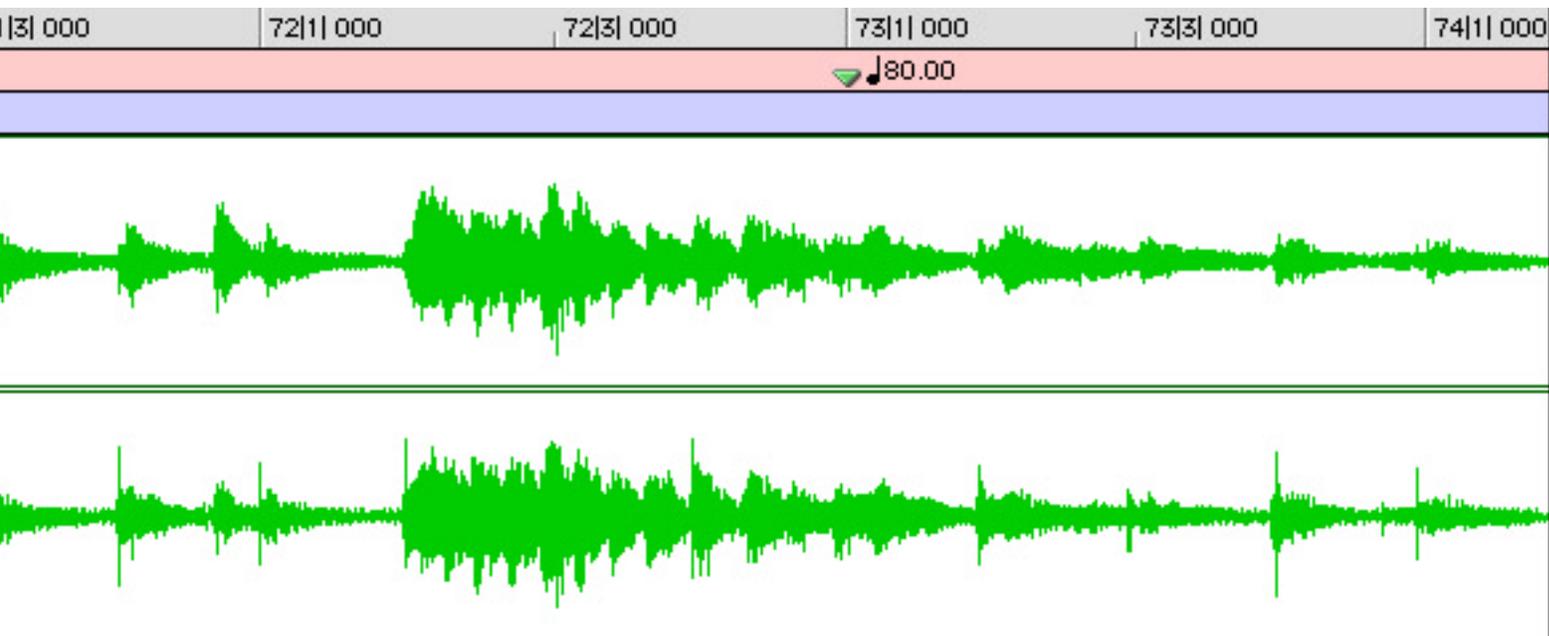
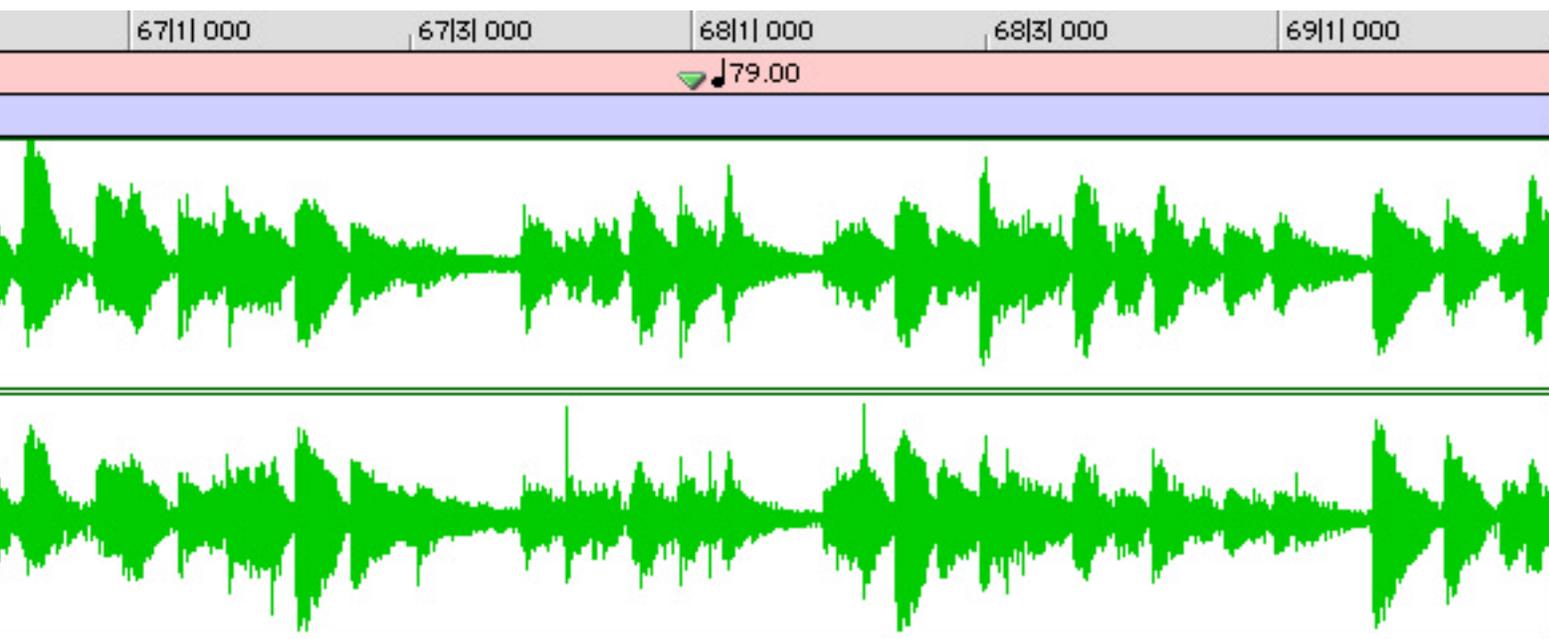
69|1| 000 69|3| 000 70|1| 000 70|3| 000 71|1| 000 71|3| 000



♩ 80.00

Chorus 7





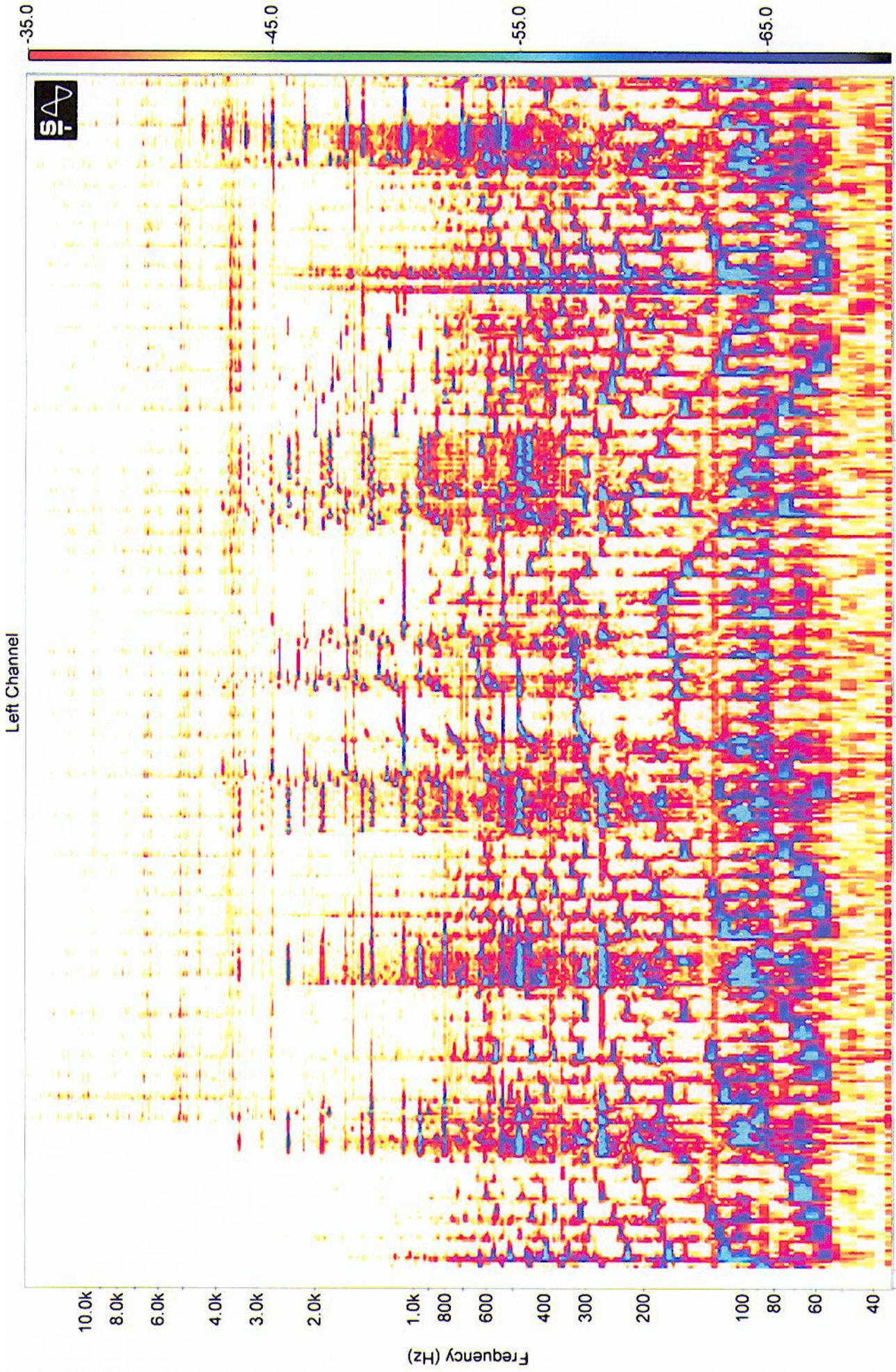
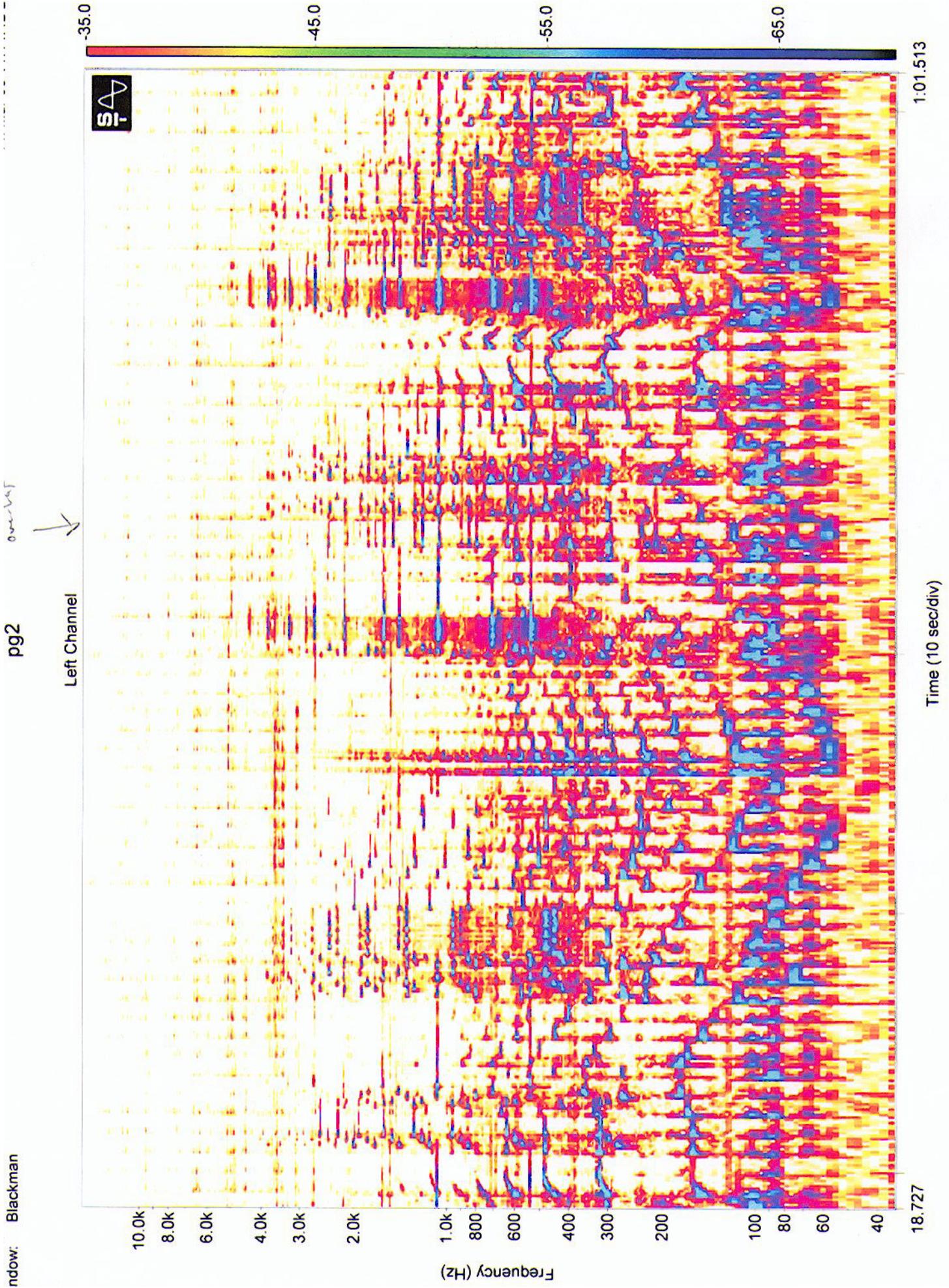


Plate B



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ellington mingus detail 27"

Sampling: 44100 Hz
FFT size: 32768
Averaging: 1
Window: Blackman

Left

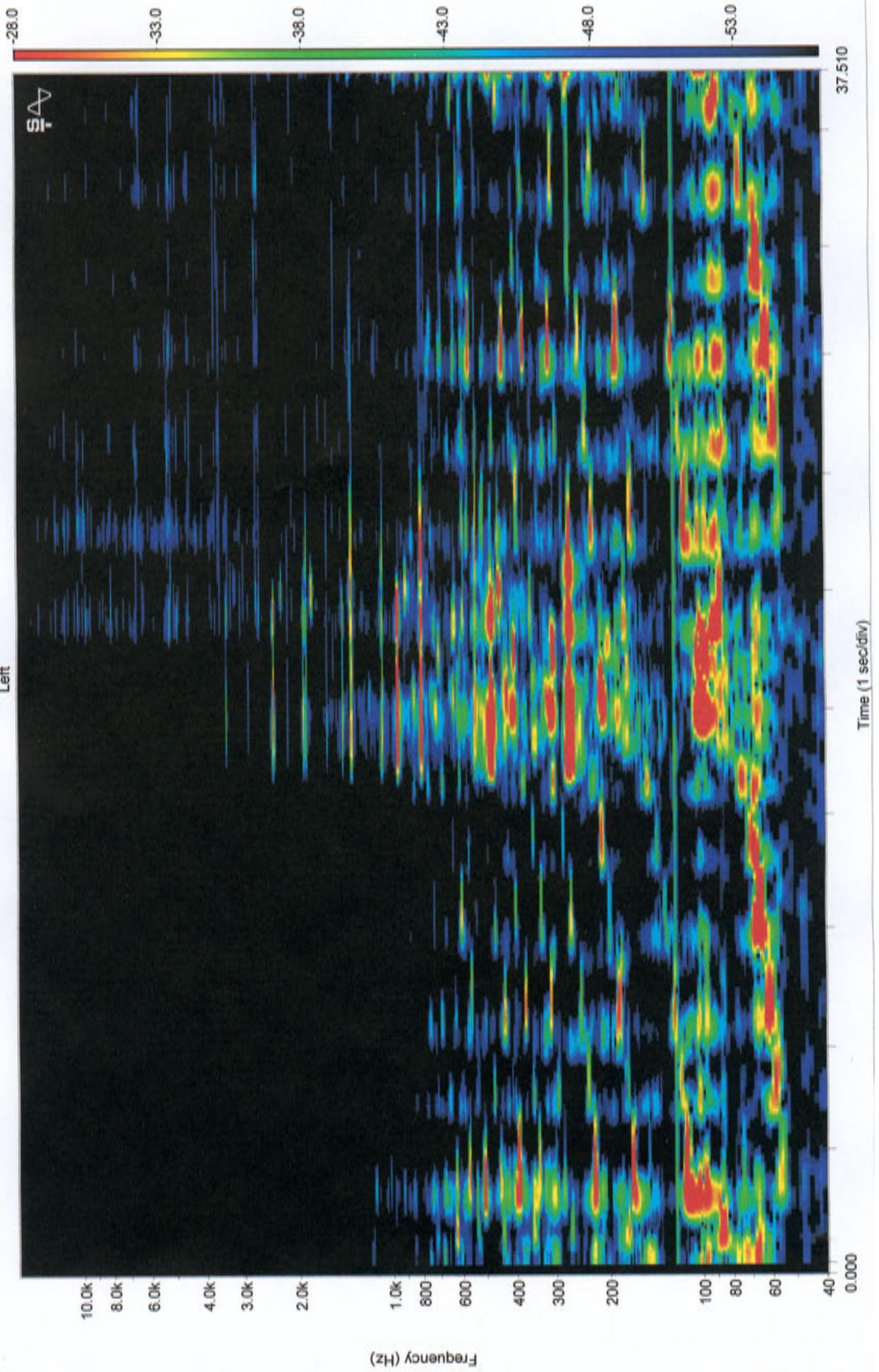


Plate D

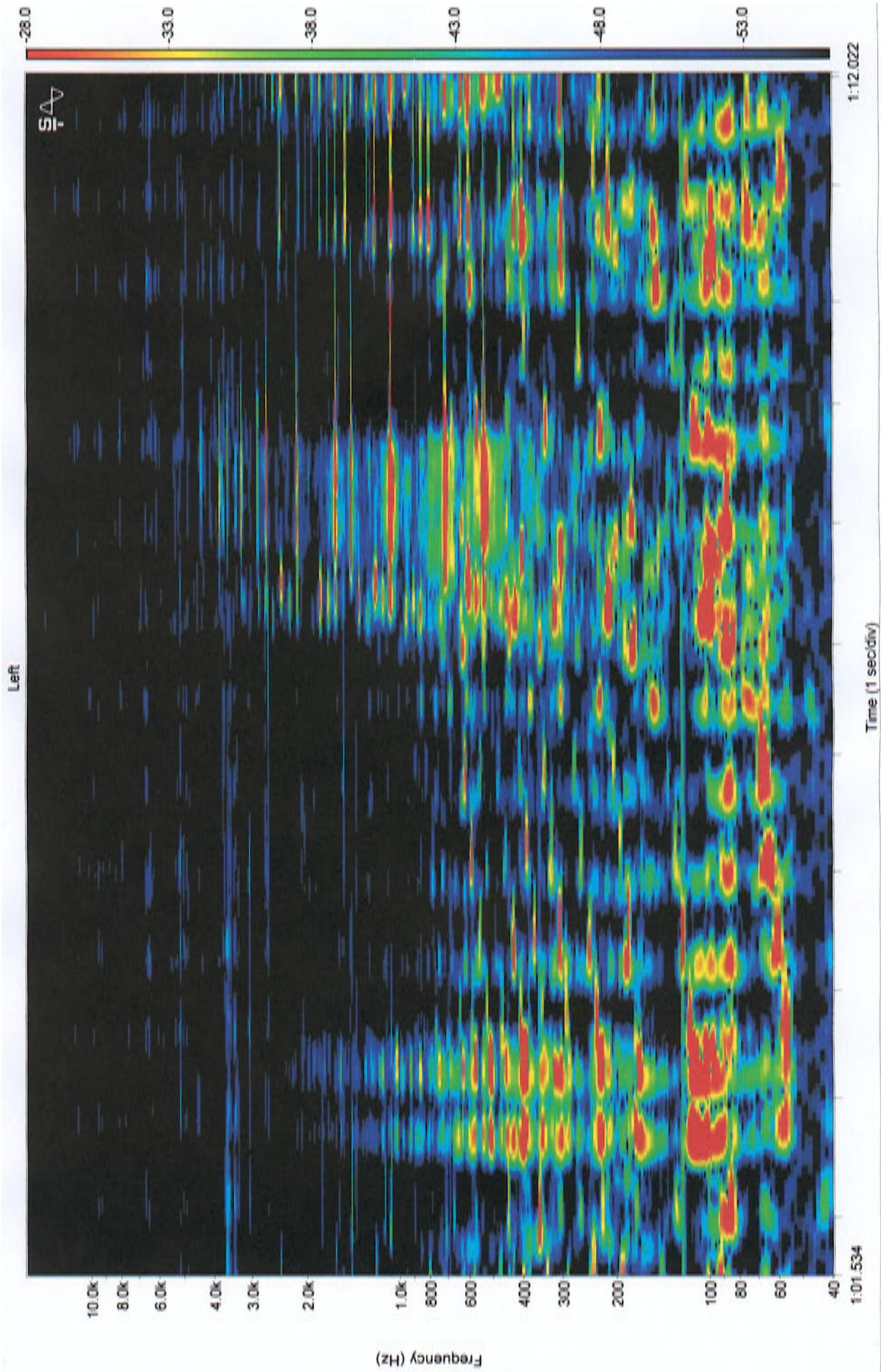
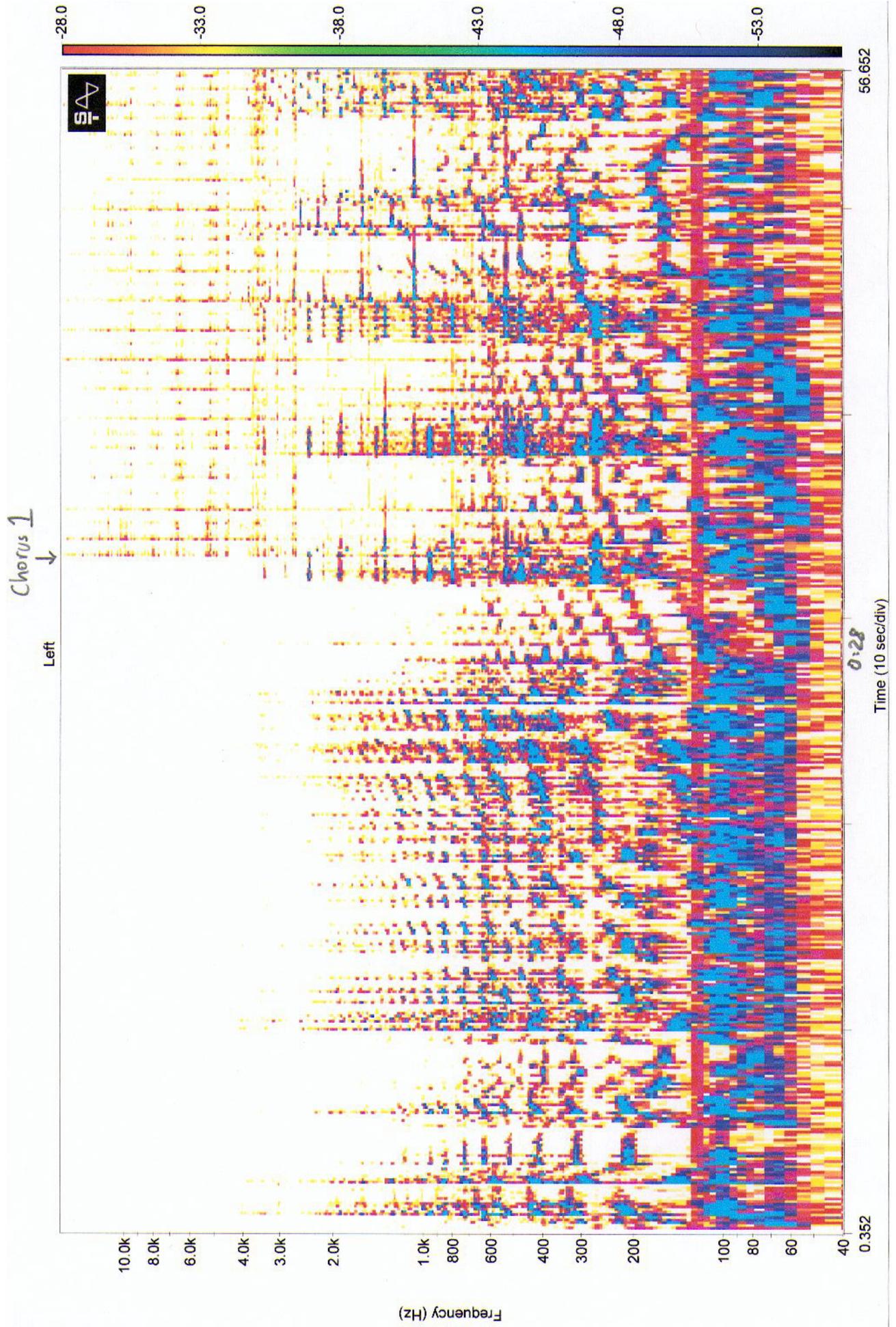


Plate E



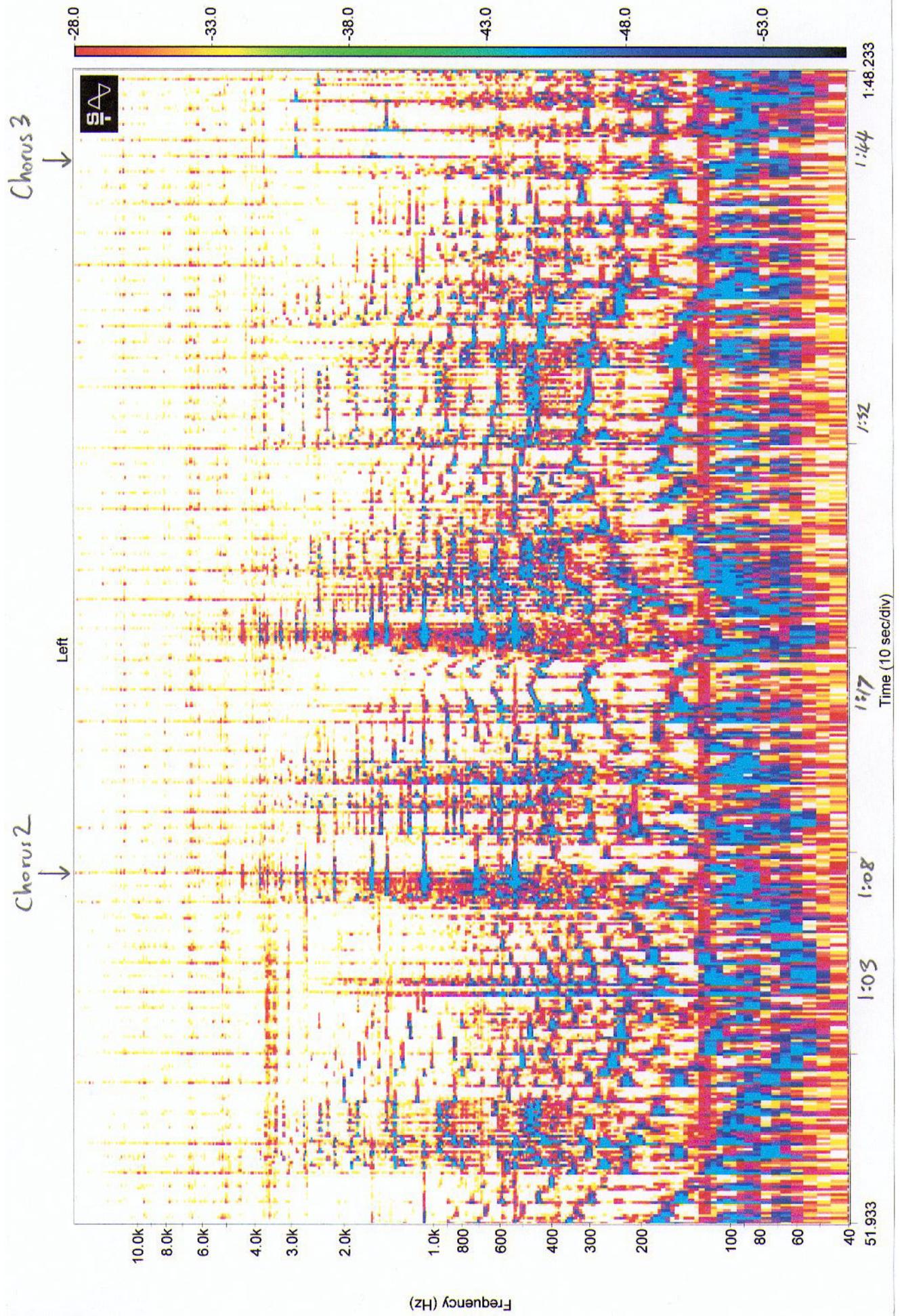


Plate G

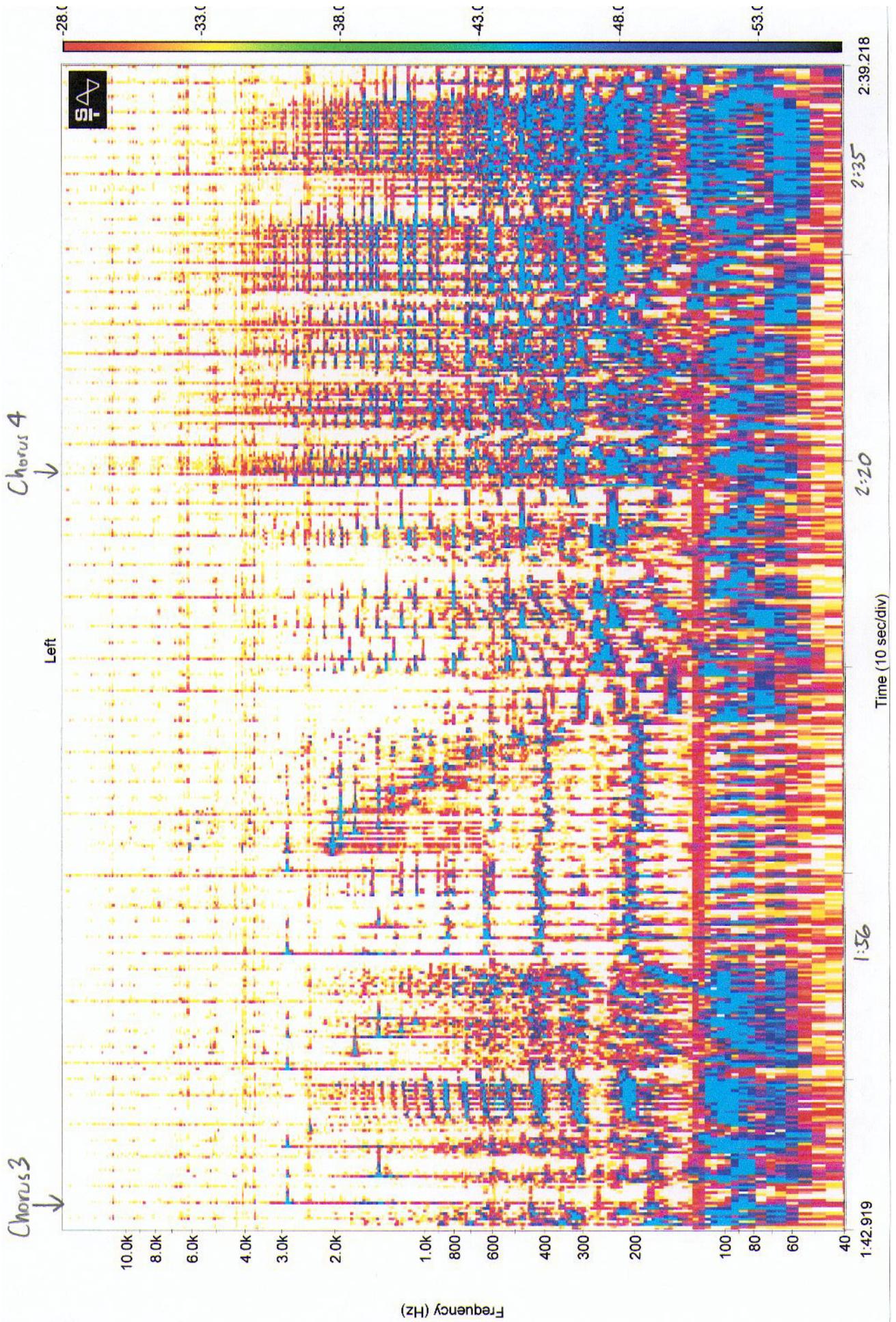


Plate H

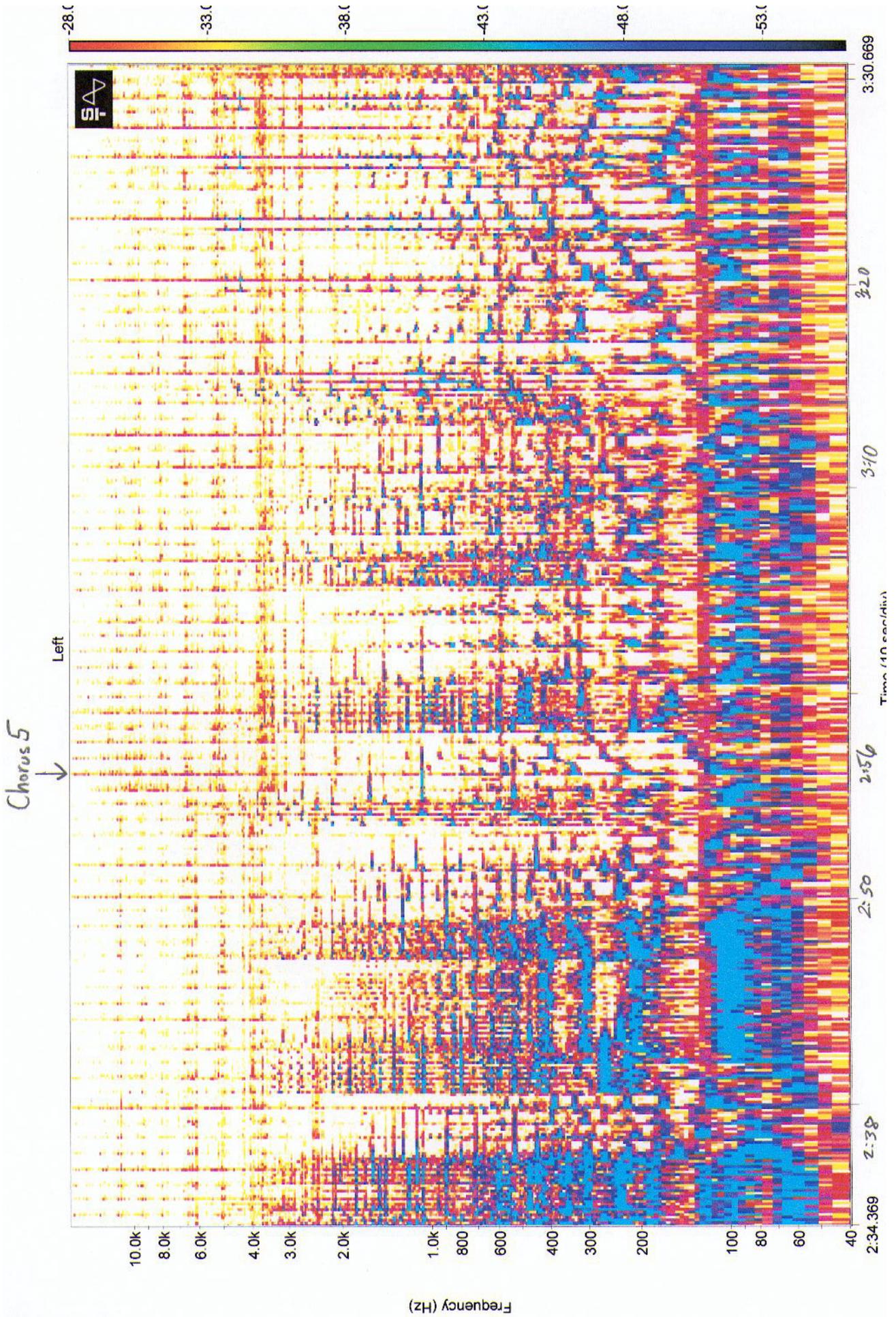


Plate I

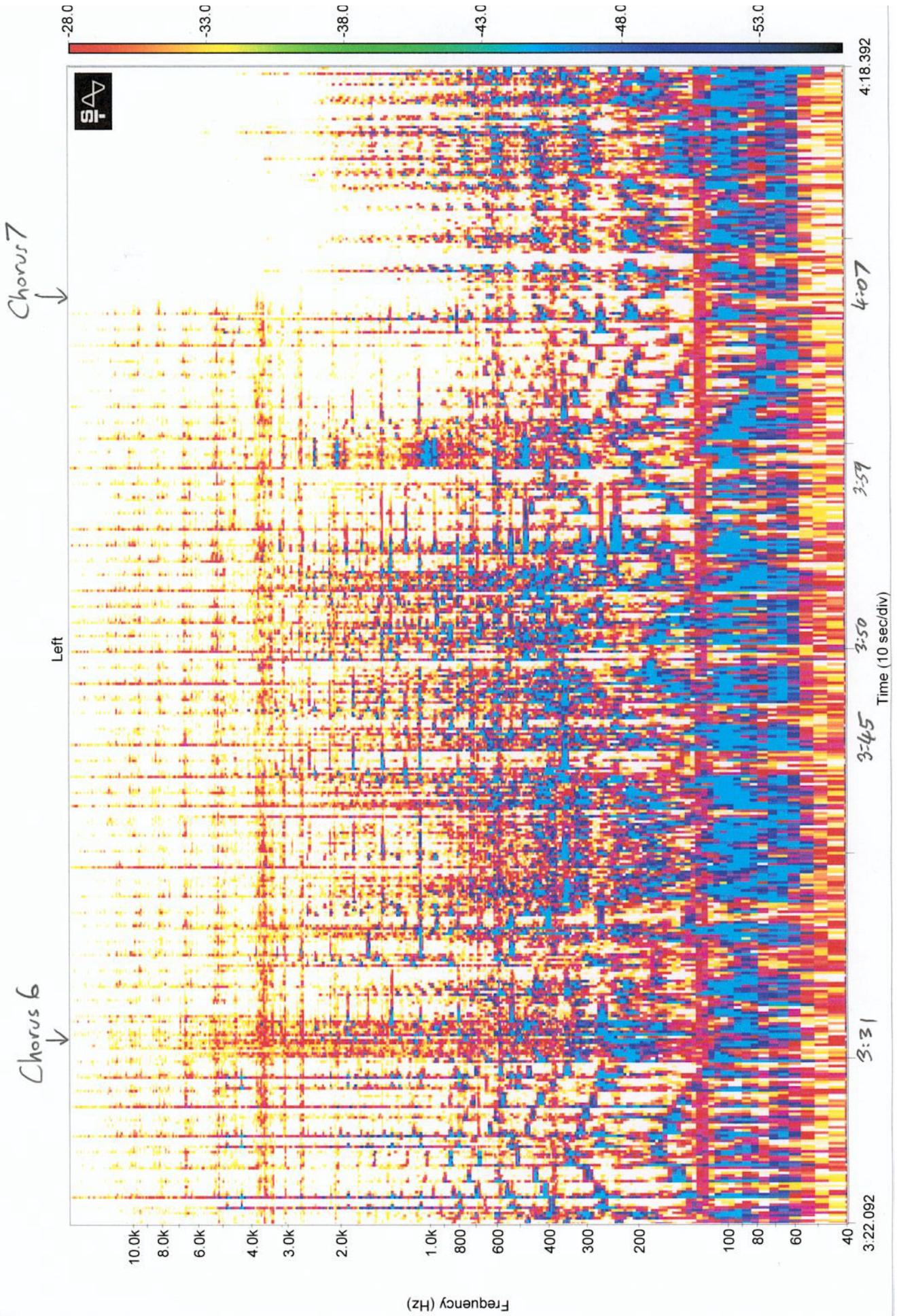


Plate J

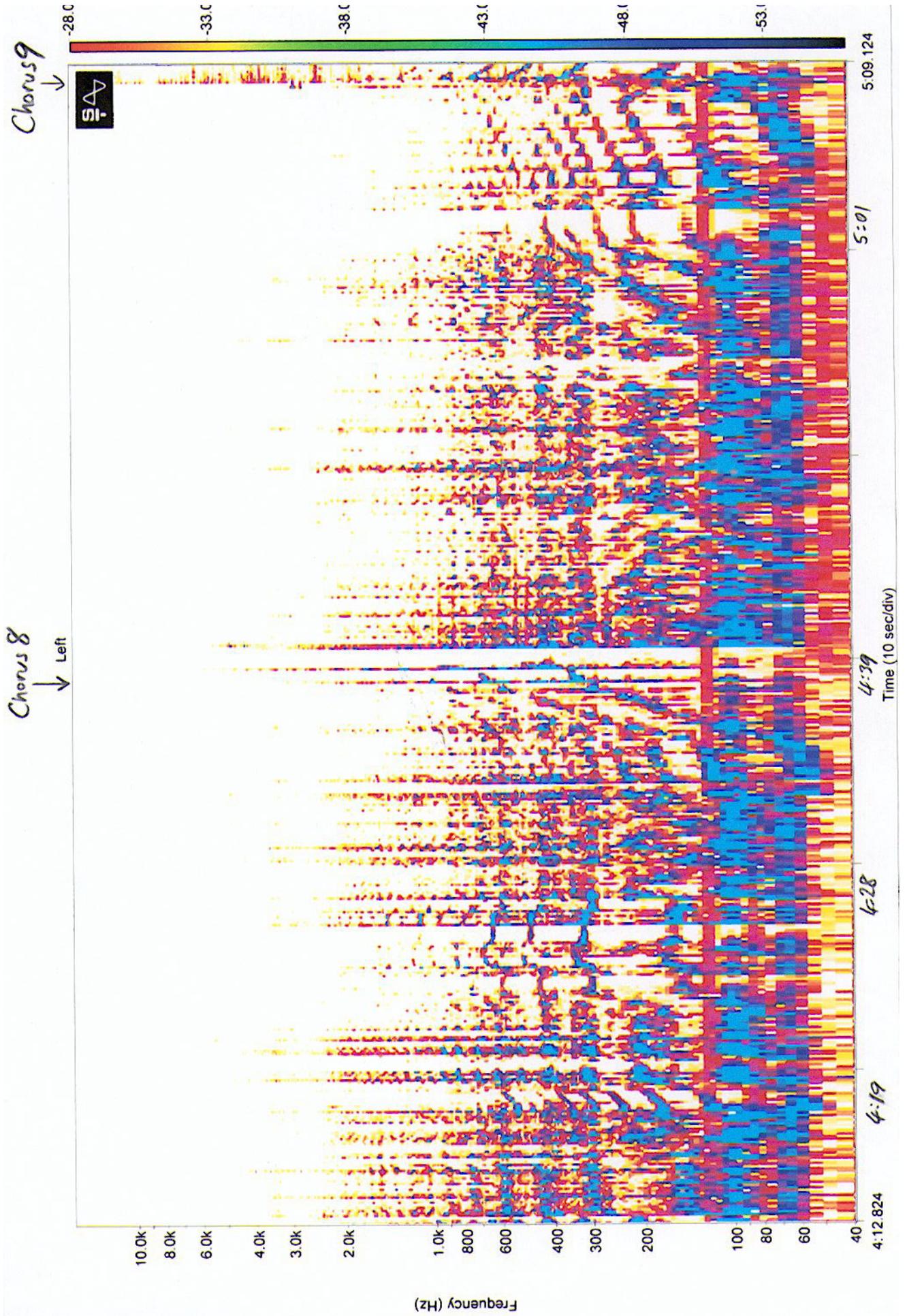


Plate K

