THE PRE-PRODUCTION PROCESS OF NEW YORK COUNTERPOINT FOR CLARINET AND TAPE WRITTEN BY STEVE REICH

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ABSTRACT

New York Counterpoint for clarinet and tape (1985) is a mixed music composition, without electronic treatment, in which the interpreter records all the parts himself. We analyzed the compositional processes of this 3-movement work using repetitive motifs and resulting patterns. Then, we designed the sound system for the performance by taking into consideration the structure and the composition of the piece, as well as the performer’s requests. Our spatialization and recording choices aim to emphasize resulting melodies for each section of the piece, as well as the rhythmic characteristics of the different grooves. Furthermore, in order to keep this repetitive piece organic, we recorded the virtual ensemble without looping the repeated measures or using a metronome reference for the 10 clarinet parts.

1. INTRODUCTION

The concert production of New York Counterpoint for clarinet and tape, written by Steve Reich, can be classified in the genre of “mixed music”, defined by M. Chion as an attempt to reconcile electroacoustic and instrumental music by summing both genres into something more than their combination [4]. The general approach of a mixed music piece is quite different than any other traditionally written music, simply because some elements of the electroacoustic part, i.e. effects or recordings, will be constructed during the pre-production, and will remain intact until the performance. This challenge requires the performers to be directly involved in the sound creation and spatialization of the electroacoustic part.

The trained classical musician who wishes to play mixed music must integrate new sound concepts, new technical knowledge and possibly a new “digital lutherie”, the concept that “programming the instrument with the objective of making new sounds is now a part of the musician’s work, whether as composer or interpreter” [7]. In practice, the live performance becomes only a small element of the entire production process. Consequently, the quality of the final output will depend on the performer’s understanding of the work in its entirety, which may encourage him or her to collaborate with a technical team right from the beginning of the project.

In the same way that “a recording can’t be a transparent process” [8] to present music, all the technical choices affect the artistic quality of a mixed music concert. Therefore, the director of the production needs to take into consideration the aesthetic of the project before making any technical decisions. Indeed, the different agents of the production need to discuss the analysis of the piece, both from a musicological and an interpretive point of view. Then, they must plan for the pre-production aspects as well as design the live sound system and decide which equipment they are going to use.

In this article, our purpose is to document the pre-production process of our interpretation of New York Counterpoint for clarinet and tape. In the first part, we will highlight Steve Reich’s aesthetic, and then present an analysis of the piece. In the second part, we will explain our sound choices for each section of the work. Finally, we will explain our studio planning process in light of the artistic constraints of the project.
2. STEVE REICH'S ÆSTHETIC AND ANALYSIS OF NEW YORK COUNTERPOINT

2.1. Music as a Gradual Process

In 1968, Reich wrote a significant essay, entitled *Music as a Gradual Process* [10a], in which he develops the idea of process music. He argues for “a compositional process and a sounding music that are one and the same thing”[10a]. In order to facilitate perception of the process and each detail, change should happen very slowly and the material should be relatively simple. Such music may seem superfluous to some listeners, and interesting to others, but, as Reich explains: “even when all the cards are on the table and everyone hears what is gradually happening in a musical process, there are still enough mysteries to satisfy all. These mysteries are the impersonal, unintended, psychoacoustic by-products of the intended process”[10a]. In fact Reich’s music is incredibly rich because of the multiplicity of melodic-rhythmic patterns it offers.

2.2. Importance of Resulting Patterns

Steve Reich’s pieces, as with many other minimal and repetitive compositions, are constructed with individual melodic-rhythmic motifs. These motifs are relatively simple so that pulsation and tonality (or modality) are usually constant. Played alone, each motif is easily perceived and recognized. Played together, they give birth to a complex polyphony whose constituent parts become indistinct. The interlocking of similar motifs at different points produces an additional series of patterns changing as the relationship between the constituent parts changes. These resulting patterns emanate from the mix of two or more voices played on the same instrument.

In his early works, from *It’s Gonna Rain* (1965) to *Drumming* (1971), Reich used the gradual phasing technique, also called the phase-shifting technique. In short, the composer juxtaposes one individual motif with multiple delayed statements of the same motif. Then the composer gradually changes the delay time between the original and repeated voices: at the beginning the two voices are in unison, then one is slowly shifted and become delayed from one beat up, then two beats up, until the whole length of the pattern until voices are again in unison. By this means the resulting canon is constantly being modified [6].

Since *Clapping Music* (1972), Reich has ceased using the phasing technique. His interest in gradual processes as well as in African polyrhythm (during the summer of 1970, Reich went to Ghana to study drumming) led him to conceive a layered music in which dislocated counterpoint springs from several melodic motifs longer than those used in the phase shifting pieces. His music is always constructed with delays between voices but the shifting between the beats is no more gradual.

By affecting the number and order of tones in each initial motif as well as the number of motifs juxtaposed and the delays between them, the composer can create myriad complex polyphonic structure that individual listeners can interpret differently: indeed, each listener can identify prominent melodic or rhythmic structures, called resulting patterns, by focusing on different tones played in different layers. But the composer can also guide the listener by doubling one of these patterns. To illustrate all these compositional techniques, we present here an analysis of the piece *New York Counterpoint*.

2.3. Description of New York Counterpoint

2.3.1. Multiple representations of a single instrument

*New York Counterpoint* (hereafter “NYC”) was composed in 1985 for the American clarinetist Richard Stoltzman (Reich later wrote versions for saxophone solo or saxophone quartet). In the original version of *NYC*, the performer pre-records 10 clarinet parts: Bb clarinet on tracks 1-7, Bb bass clarinet for tracks 9 and 10, and both for track 8. The eleventh part is performed live. This piece demonstrates a predilection for the multiple representation of a single instrument, an old idea Reich explored for the first time in *Violin Phase* (1967) for violin and tape (or 4 violins).

In *Violin Phase*, there is just one single short motif played by the performer and replayed on different tracks of the tape. In 2 stable sections of the piece, *i.e.* those in which each layer has an identical beat, the violinist is invited to underline some of the pre-existing resulting patterns. Several of them are actually suggested by the composer, while others are selected by performer.

In *NYC*, Reich doesn’t use the gradual phasing technique and doesn’t let the performer choose the resulting melody. In fact, *NYC* is a continuation of the ideas developed in the counterpoint series, pieces in which a soloist is invited to play against a pre-recorded tape. The first of them was *Vermont Counterpoint* (1982) for amplified flute and tape (or 8 flutes), followed by *New York Counterpoint* (1985) for clarinet and tape (or 11 clarinets). Later, Reich composed *Electric Counterpoint* (1987) for electric guitar and tape (or guitar ensemble) and more recently *Cello Counterpoint* (2003) for amplified cello and tape.

2.3.2. Compositional technique

Many technical processes used in his earlier music are included in *NYC* [10c]. For example, the piece utilizes melodies resulting from the combination of several individual motifs, as in Reich’s gradual phase-shifting instrumental pieces (1966-1971). The pulse session at the beginning of the first movement and the conception of a harmonic cycle are directly connected to *Music for 18
Musicians (1976). As in Drumming (1971), patterns are gradually constructed by substituting notes for rests in a pre-defined motif: only one or a few attacks of the motif are played, then new attacks are added with each iteration until the motif is completed. As in Octet (1979), NYC is in 12:8 meter and “exploits the ambiguity between whether one hears measures of three groups of four eighth notes or four groups of three eighth notes” [10c].

2.3.3. Structure

The 3 movements of NYC [fast-slow-fast] are played straight through without a break. The change of tempo has the simple ratio of 1:2 (quarter note = 184 in the fast movements and 92 in the slow movement). As in many other pieces, Reich doesn’t restrict his music to a perfectly defined tonality. By avoiding cadence and constructing patterns, he constantly maintains the ambiguity between modality and tonality. However, in this paper we will focus more on the rhythmic aspect and patterns construction than the harmonic and modal/tonal structures.

The score excerpts are written in Bb, so that Bb clarinets are sounding a major second lower and Bb bass clarinets are sounding a major ninth lower. Clarinet 1 to 10 are pre-recorded on tracks 1 to 10; clarinet 11 refers to the live performer. Numbers (N) correspond to the markers on the original score from Boosey & Hawkes (1985). We define “Groove” as a rhythmic effect resulting from the superposition of several motifs. M1x, M2x and M3x refer to individual melodic motifs used in the 3 movements respectively. RM3x refers to the rhythmic motifs appearing in the last movement.

2.3.4. First movement – fast

Section 1 (Beginning – 5 measures after N07)

As in Music for 18 Musicians, the piece begins with a pulse session we call Groove 1. Six Bb clarinets (live performer + tracks 1-5) and 3 bass cl. (tracks 8-10) repeat single eighth notes whose combinations constitute a pulsing chord. Four different chords form a harmonic evolution that is repeated twice. Each chord is constructed from a perfect chord on which Reich adds fifths.

Thanks to a fade in / fade out technique and overlapping between voices, the sound result is constantly flowing. Each chord seems to come from far away, approach the audience, and disappear again in order to let a new chord emerge. This produces strange coloring, almost like electronic sound. After traveling in Ghana, Reich became aware that “acoustic instruments could be used to produce music that was genuinely richer in sound than that produced with electronic instruments” [10b].

Section 2 (5 measures after N07 – N36)

A motif is played by cl. 1. The live performer then plays a new motif that creates resulting patterns in combination with the pre-recorded music. Individual motifs are built up little by little (see Figure 1) and, once completed, they are handed over to one of the pre-recorded tracks. The live performer builds up 5 motifs, so at the end of this section, a six-part counterpoint (Groove 2) is played by tracks 1-6.

![Figure 1. New York Counterpoint, mvt. 1 – An example of a melodic motif gradually built up by live clarinetist.](image1)

Beat-class sets (a rhythmic analog of pitch-class sets denoting which beats are attacked in the motif) are related according to the following time transposition. The 6 motifs (M1a, M1b, M1c, M1d, M1e, M1f) are identical rhythmically but some of them are shifted by 5 or 8 beats (see Figure 2): M1a=M1d, M1b=t5M1a=M1e and M1c=t8M1a=M1f (equality refers only to the rhythmic structure and t refers to the time lag in number of beats, i.e. eighth notes, between each motif). For more details concerning accentual properties of the patterns and their combination in NYC, see the excellent paper written by Roeder in 2003 [11].

![Figure 2. New York Counterpoint, mvt. 1 – Groove 1 (tracks 7-10) is a pulse chord. Groove 2 (tracks 2-6) is a six-part counterpoint. Live performer plays a resulting melody (each note is coming from Groove 2).](image2)
Section 3 (N36 – N44)

At this moment, the performer plays a resulting melody that is created by this complex polyphonic counterpoint, but which has not been previously played individually. Cl. 7-10 then start a new pulse session. Three layers are perceived: Groove 2 (tracks 1-6), Groove 1 (tracks 7-10), and the resulting melodies (live performer).

Groove 1 is repeated twice: each chord is constructed in the same way as in the first section. The live performer plays 4 resulting melodies separated by one-measure breaks. The first 3 melodies are constructed inside one measure and are played during the first iteration of Groove 1. The last resulting melody begins as a one-measure pattern and quickly becomes a two-measure pattern. In comparison with the first resulting pattern, this one is repeated many more times as it is played during the entire replication of Groove 1.

2.3.5. Second movement – slow

In this movement Reich divides the tempo by 2 and uses 2 new, almost identical motifs (M2a and M2b): the beat-class and melodic curve are similar but certain tones are transposed (see Figure 3). These 2 motifs are more melodious since they are played legato and are longer than the motifs used in the first movement (2 measures vs. 1). Consequently this movement seems quieter and softer edged, rather than slower. The presence of both quarter and sixteenth notes tends to underline this effect.

Figure 3. New York Counterpoint, mvt. II – The 2 original motifs M2a and M2b have identical rhythmic structure and melodic contour.

Section 1 (N44 – N53)

At the beginning, the 2 homo-rhythmic motifs are played by cl. 7 and 8 and later by cl. 1 and 4. Then the live performer, paired with cl. 1, builds up M2a and M2b gradually, delayed by one eighth note (t1M2a and t1M2b), which induces an echo impression. Once complete, the live part is handed to another track. This dual build-up procedure is repeated one more time with a quarter note delay (t2M2a and t2M2b). Harmonic and polyphonic structures are gradually developed by the constellations of the multiple instrumental parts and become more and more complex. Here Reich uses only 2 melodic motifs to construct a six-part counterpoint.

Section 2 (N53 – N61)

In this section, 3 different layers can be distinguished: pulse chords (Groove 1 on tracks 7-10), six-part complex counterpoint constructed in the preceding section (Groove 3 on tracks 1-6) and resulting melodies played by the live performer (see Figure 4).

Thanks to the six-part counterpoint, many different resulting melodies can be underlined by the live performer. He repeats 4 of them until the end of the movement. In the sound diffusion, these resulting melodies form a new spatial layer or are mixed with the counterpoint.

The series of 3 pulse chords, played in low tessitura, is repeated twice. These chords, perfectly separated from the counterpoint and the resulting melody, form a new spatial layer and are reminiscent of the beginning of the piece. At the end of the movement, Reich employs a fade out on Groove 1, and then Groove 3.

Figure 4. New York Counterpoint, mvt. II – Groove 1 (tracks 7-10) is a pulse chord. Groove 3 (tracks 1-6) is the six-part counterpoint constructed with the 2 initial motifs (M2a and M2b). Live performer plays resulting melodies.

2.3.6. Third movement – fast

Section 1 (N61 – N67)

Reich gradually constructs a six-part counterpoint by using 3 motifs (M3a, M3b, M3c) which all share, once again, the same contour and same beat class. As in the first movement they include several up-beat notes, which create a percussive character. The tape plays M3a and M3b, then the live clarinetist, paired with cl. 6, builds up these 2 motifs delayed by 2 beats (t1M3a and t2M3b). Once
complete, the live performer hands the pattern to a new track and plays \(M_3c\) (no build up is used in this case) while cl. 4 plays the same motif delayed by 2 beats \((t_2M_3c)\). At the end of the section, a six-part counterpoint (Groove 4) is created by the live clarinetist and tracks 2-6 (see Figure 5).

Section 2 (M67 – M85)

At this moment, Groove 4 is played more quietly in order to let the rhythmic layer played by the bass clarinets (tracks 9 and 10) enter the foreground (Groove 5).

The rhythmic layer uses only two chromas (Eb, A natural) forming octave or tritone. It is impossible to separate the 2 instruments since they play almost the same initial motif. Furthermore, the rhythmic structure is the same at each measure. Reich composes 3 different versions of this rhythmic motif: \(RM_3a\), \(RM_3b\) are in duple meter but \(RM_3c\) is in compound meter (see Figure 6). Cl. 10 plays exactly the same melodic-rhythmic structure for \(RM_3a\) and \(RM_3b\): differences arise from cl. 9, which is playing an identical rhythmic motif delayed by 8 beats in \(RM_3a\) and 2 beats in \(RM_3b\). \(RM_3c\) radically changes the position of the accents because of its compound meter.

Groove 5 is always subject to small changes that affect the global rhythmic structure and which give the illusion that Groove 4 is radically modified. As Reich explains, “the effect is to vary the perception of what is in fact not changing” [10c]. In reality, some little modifications in Groove 4 occur when \(RM_3c\) appears.

Until \(RM_3a\) is completely built up, the live performer is constantly repeating the same melodic motif \(M_3a\). When the bass clarinetists have finished constructing \(RM_3a\), then he begins to play, in high tessitura, melodies that are not the result of tones shadowed in the complex polyphony. When \(RM_3c\) is played, several tones in the counterpoint are changed and motifs initially delayed by 2 beats are now delayed by 3 beats. The superposition of duple and compound meter motifs pushes the rhythmic complexity to its paroxysm.

Furthermore, Reich also employs in this section perfectly distinguishable modulation, which we won’t describe. When modulation occurs, the three rhythmic motifs are not changed, but tones are transposed: \(Eb \rightarrow F#\) and \(A \rightarrow A\) or \(C#\) (by using A, Reich facilitates the transition between modulations).

Section 3 (M85 – end)

After the complex polyrhythmic section constructed with the 3 layers (Groove 4, Groove 5 and melodies played by live performer), the musical space is gradually compressed. This section begins after the fade out of Groove 5. Then, the 5-part counterpoint accompanying the high pitched melody is gradually reduced. \(M_3b\) and \(t_2M_3b\) played respectively by tracks 3 and 6 disappear. At this moment the live performer stops playing an independent melody and replays \(M_3c\), forming a 4-part counterpoint with track 4 \((t_2M_3c)\), track 2 \((M_3a)\) and track 5 \((t_2M_3a)\).

While keeping the rhythmic structure, the performer plays a similar, higher motif: at the same time, cl. 7 starts playing the same motif delayed by 2 beats. At the end of the piece, performer and track 7 double cl. 2 and 5 one octave up. Although the music becomes less dense, more and more tension is created as a result of the gradual passage to the high tessitura. The patterns are more jagged but tend to unify their rhythm: the piece concludes suddenly with the superposition of \(G#\) and \(D#\).

2.4. Auditory Process in Reich’s Music

The mechanical and incantatory character of *New York Counterpoint*, and in Reich’s music generally, develops a singularly ecstatic sound world where the audience is invited to choose its own magical trip and be immersed in the hypnotic effect. The multiplicity and the similarity of
all the motifs give birth to many psychoacoustic effects that can be more or less controlled. Each listener can arrange and guide his/her hearing by focusing on different layers of the music or by making his/her own choices. But his/her position in the concert hall may have an influence on the perception.

Bregman was very involved in research concerning auditory scene analysis and streaming formation: many scientific experiments were done to understand how the human brain makes these groupings and which parameters can affect them [1, 2 for audio illustrations]. Slight modification of pitch, timbre, spatial localization or intensity of each tone, but also modification of tempo, can completely interfere with the perceived result and destruct the homogeneity of the resulting pattern.

In the 1950s, composers like Earl Brown (1926-2002), John Cage (1912-1992), André Boucourechliev (1925-1997)... developed the concept of aleatory music and mobile forms, inviting performers to make their own choices inside a compositional structure. These kinds of pieces are never played the same way twice. In New York Counterpoint, no such technique is used because each tone is perfectly notated. Yet hearing such music, there are many perceptual possibilities that the performer, in collaboration with the sound engineer, can modulate and orientate. Reich’s music is mobile on the perceptual level.

### 3. SOUND CHOICES

#### 3.1. General Choices through the Piece

The recording of the tracks will be completed in Summer 2009 in the Performance and Recording Lab of CIRMMT in Québec, following the plan described below. The use of recorded clarinetists instead of a real ensemble allows us to change voice location and sound color throughout the piece. In fact, the first decision we made was to diffuse the recorded clarinetists on a multi-track sound device, which offers a great deal of freedom with the sound’s breadth, and makes possible virtual movements of the voices in the diffusion space.

According to our analysis of the piece, NYC is not a mixed music work by its writing (aesthetic), nor its digital lutherie, but rather a work that uses time mixity, defined as “the overlap of two different time realities” [4]. The mixture of live and pre-recorded clarinets gives the illusion of the multiplication of the same clarinetist with the exact same sound and idea. Thus, to create this virtual ensemble of clarinet clones, we will use the same recording techniques (same microphones, placement and acoustics) for all the different clarinet parts in the same Groove. However, we will sonically characterize the 5 different Grooves of the composition by using appropriate recording techniques according to the specific ambience we want to create for each Groove (see Table 1).

<table>
<thead>
<tr>
<th>Groove</th>
<th>Ambience</th>
<th>Recording techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Enveloping, like waves, not too rhythmic</td>
<td>Non-coincident pair of omni-directional microphones with natural reverb (DPA 4006)</td>
</tr>
<tr>
<td>G2</td>
<td>Very rhythmic and percussive, dry</td>
<td>Coincident pair of cardioid microphones in proximity (DPA 4011)</td>
</tr>
<tr>
<td>G3</td>
<td>Melodic, smooth but still precise</td>
<td>System MS, balance between direct sound and reverb (M149 &amp; AKG414)</td>
</tr>
<tr>
<td>G4</td>
<td>Very precise, dry</td>
<td>System ORTF in proximity (AKG 414)</td>
</tr>
<tr>
<td>G5</td>
<td>Only bass clarinets Precise, “slap” effect</td>
<td>Non-coincident pair of omni-directional microphones (MKH8020) in proximity</td>
</tr>
</tbody>
</table>

Table 1. Recording techniques for each different Groove.

To avoid localized mono sources in individual loudspeakers, we will record and diffuse every clarinet tracks in stereo. Indeed, the creation of “ghost” sources between loudspeakers causes more envelopment for listeners, while mono sources tend to allow the public to focus on the sound system itself, rather than the music [9].

We tried different brands of condenser microphones and chose based on the clarinetist’s timbre for each Groove and on the acoustics of the studio.

#### 3.2. Spatialization of the Pre-recorded Parts in the Diffusion Space

In keeping with Steve Reich’s recommendations, the performer will play on stage, in front of the whole audience. First, we have elaborated plans to spatialize the 10 pre-recorded clarinet parts according to the analysis of the piece as well as the performer’s requests (see Table 2). Then, to finalize our live sound system, we will take into consideration the concert hall’s architecture and acoustics, as well as other technical constrains. Indeed, by conceptualizing the spatialization first, our interpretation of the piece can be adapted to other concert halls.

To emphasize the subtleties of the composition, we adapted the spatialization for each section of the piece. We provided a dedicated concept for each movement, with different ways to deal with the overlap of 2 different Grooves. When it occurs that 2 clarinets have to play exactly the same motif at the same time, we will create a “phase-shifting” effect by placing these 2 voices in opposition from the audience’s perspective (e.g. one is placed front-left while the other is placed surround-right). Regarding Mvt. I, the idea is to largely contrast the first 2 Grooves as they are based on 2 very different motifs, thus we will alternate envelopment around the public (G1) and focused sound in front (G2). Regarding Mvt. II, we want to outline the effect of echo created by the counterpoint of the melodic motif (G3) so we will place the echo voices in...
loudspeakers located behind the performer. Regarding Mvt. III, the bass clarinets (G5) need to be located in a different spot than the rest of the ensemble (G4) so we have proposed the elevation system as another dimension of the diffusion space.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Effect</th>
<th>Spatialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-1 (G1)</td>
<td>Envelopment, soft transitions</td>
<td>Around the performer and the public (front/sides/surround)</td>
</tr>
<tr>
<td>I-2 (G2)</td>
<td>Voice entrance in front, loud and very present, then moves to the side</td>
<td>Around the performer for the voice entrance then moves to the sides</td>
</tr>
<tr>
<td>I-3 (G2 - G1)</td>
<td>Envelopment as Mvt I-1 with soft entrance</td>
<td>+ G1 around the public</td>
</tr>
<tr>
<td>II-1 (G3)</td>
<td>Start simply, become broader with more voices</td>
<td>Around and behind the performer, then broader to the sides</td>
</tr>
<tr>
<td>II-2 (G3 - G1)</td>
<td>Basses enveloping as Mvt I</td>
<td>+ G1 around the public</td>
</tr>
<tr>
<td>III-1 (G4)</td>
<td>Voices fill out the space</td>
<td>Around the public</td>
</tr>
<tr>
<td>III-2 (G4 - G5)</td>
<td>Basses large in another space</td>
<td>+ Elevation speakers and sub</td>
</tr>
<tr>
<td>III-3 (G4)</td>
<td>Elevation/amplification until the end</td>
<td>Around the public and elevation speakers</td>
</tr>
</tbody>
</table>

Table 2. Spatialization plan per Mvt-Sections.

Therefore, we assume that the mixture between characterized recording techniques for each Groove and characterized spatialization for each section will captivate the listener while respecting the repetitive composition of Steve Reich and the idea of the multiplication of the same clarinetist.

3.3. Live Sound System and Equipment

For our first representation of *New York Counterpoint*, we may use up to 16 similar loudspeakers (UPJ-1P Meyers Sound) and 1 subwoofer (USW-1P Meyers Sound). Based on the spatialization choices, we designed a sound system that can be divided into three different spaces: 1) Eight speakers in a circle around the public and the performer; 2) A stereo system behind the performer to create echo effects with the front; 3) A stereo system elevated above the performer to create another dimension in addition to 1 or 2 subwoofers at floor level.

To mix the multi-track tape during the live performance, we will use a Yamaha DM10000 console. Each fader on the console will control the level of each loudspeaker in the system. The different tracks will be routed to the appropriate loudspeakers in the sound mixing software during rehearsals.

As Steve Reich mentioned in the score, the performer needs to be amplified. To do so, we will use the 2 loudspeakers around him (the placement will be optimized to avoid feedback with his microphones).

4. RECORDING PLAN

To optimize the perception of the rhythmic aspects of *New York Counterpoint*, the tape resulting from the recording of the 10 clarinet tracks is expected to sound both precise and natural. By natural, we mean that the listener can believe that a real ensemble of 10 clarinetists is playing the piece in its continuity. For example, instead of manipulating dynamics electronically, we will record all the excerpts with real nuances in order to preserve the natural aspect of the clarinet’s tone color changes. However, we want to optimize the rhythmic precision of the virtual ensemble. As “visible effort is something that often enhances a performance” [13], if small time lags go unnoticed in live performance, they may sound like a flaw in the pre-recorded tape. To achieve precise and natural recordings, we propose avoiding two production processes often used to make the recording process easier: using a metronome while recording the 10 clarinet parts and looping all the repeated measures. Indeed, the actual repetition of the same pattern creates interesting and organic rhythmic variations keeping the listener attentive [9], compared to looped excerpts described by electroacoustic composers in the mid-20th century [3, 10].

However, it is important to reduce the sensation of tiredness during the recording, which may happen to a musician who plays the same measure for several minutes without the presence of an audience. To do so, we have divided the piece into 24 short sequences (mean of 26 sec) as a working plan for the recording process. To define the sequences, we took into account the structure of the piece as well as specific performance difficulties.

Furthermore, to avoid the difficulty of recording the 10 clarinet parts without a metronome reference, we will create a reference track consisting of 1 or 2 clarinet parts per sequence to be recorded and edited with a metronome. Then, the clarinetist will record all the other parts according to this reference track. In order to reduce rhythmic issues (time lags between the different clarinet tracks), the clarinet parts for the reference track change throughout the piece and have been selected based on two criteria: 1) Composition specificities: the chosen part(s) should be easy to play along with, rhythmically and harmonically; 2) Instrument issues: the chosen parts’ range has to be comfortable to play.

To sum up, the recording process happens in two stages: first we record the reference track with a metronome, and then we overdub per sequence all the other clarinet tracks on the reference track. These two stages of the recording process are separated by at least a month, to allow enough time for the clarinetist to practice every track with the reference track. Finally, to avoid looping the repeated measures, we edit together selected takes of entire sequences to create each track. If time lags are still noticeable, we may make slight modifications to the takes.
In a recording context, musical timing differs from concert situations: interruptions, repeated takes [3] and focus on isolated details hinders homogeneity throughout the piece. Furthermore, overdubbing adds difficulties or constraints that do not exist in acoustic music: playing with headphones, following a metronome or a reference track, as well as the “dryness” of the studio. Indeed, music that will be diffused through loudspeakers in a concert hall cannot feature a strong room effect. However, the lack of reverberation of the recording studio changes the performer’s perception of his or her sound and must affect his or her playing. Thus, he or she must be prepared for these realities in order to achieve good takes with articulation and rhythmic precision.

Given this recording process, we anticipate ending up with 10 hours of recording data drawn from more than 1500 takes. In order to facilitate the editing process as well as the blocking of the score, we have defined a way to name the different takes during the recording: Sequence letter, Groove number, Clarinet part number, Take number (e.g. D2C9T13 means the 13th take of the 9th clarinet playing Groove 2 in sequence D).

5. CONCLUSION

New York Counterpoint for clarinet and tape is a mixed music composition in which the interpreter records all the parts himself, without adding any electronic treatment. Like other mixed music projects, the majority of the work needs to be artistically planned and “finished” a long time before the live performance. This impels the performer to analyze the work and to collaborate with other professionals right from the beginning of the project.

We have shown that Reich uses clear compositional applications because he wants to be able to hear the process happening throughout his music. In New York Counterpoint, the virtual ensemble plays pulse chords (G1), melodic counterpoints (G2, G3 and G4) and rhythmic counterpoint (G5). During the piece, the role of the live performer changes. As an architect, he builds up individual motifs used in the counterpoint, but he also behaves like another track by contributing to the groove. However, the live performer’s main role is to play resulting patterns.

To design the live sound system, we took into consideration the structure of the piece as well as the main aspects of Steve Reich’s composition. Our spatialization choices aim to emphasize the rhythmic aspects of the different grooves as well as the development of resulting patterns and melodies. Furthermore, in order to keep this repetitive piece organic, we record the virtual ensemble without either looping the repeated measures or using a metronome reference for the 10 clarinet parts.

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7. REFERENCES