

## Notes on potential realizations of *Scambi*

### Introduction

This text will, it is hoped, guide composers who might be interested in realizing new versions of Henri Pousseur's *Scambi*. However, it is, of course, not my intention to influence the decisions of any composer in the actual stages of realization. All quotations are taken from the 1959 article 'Scambi' written by Pousseur and published in the *Gravesaner Blätter*<sup>i</sup>. This appeared in the periodical in both German and English. The English is perfectly comprehensible but there are passages where some important omissions from the German text can be identified. Thus, there are various sections which are, perhaps, more accurately described as 'summaries' rather than word-for-word translations. I am in the process of preparing a new translation with my collaborator Christine North. The version from which we are working is the French text recently published in Pousseur's writings: *Écrits Théoriques 1954-1967*<sup>ii</sup>. There is some uncertainty as to the text's original language, but as this French text has been subjected to extensive (and recent) editorial revisions I believe it can now be regarded as the authoritative text. However, until the new translation is complete all quotations are from the 1959 English translation.

### The 'rules' for the realization of *Scambi*

In the article Henri Pousseur suggests his aim for *Scambi* was 'complete continuity' between the sections (Pousseur, 1959: 53). He also refers to the versions made by Luciano Berio (which I have heard) and Marc Wilkinson (which is still unknown to me). Pousseur generously states that Berio '(...) successfully disregarded the connecting rules which I had established, which are after all but a guide to the making of a unified whole, it being left open to assemble a meaningful event without their help.' (Pousseur, 1959: 54). While this appears to give composers more or less complete freedom, the 'rule' of 'complete continuity' should nevertheless be acknowledged. The article describes how Pousseur arrived at his 32 sequences. He wrote: 'Complete performances could be had in many different ways, for the beginning and end of each separate sequence could serve as the beginning or end of the whole, with suitable dynamic modulation. I saw that two sequences could be joined if their respective end and beginning were of like quality (e.g. both high, fast

and homogeneous); complete continuity was thus possible with not the slightest sign of the join (...)’ (Pousseur, 1959: 53). Bearing in mind his intention to compose an ‘open’ work he continues: ‘There were four sequences with the same commencing characteristic, to diverge into four different directions and to reach four different goals, while four other sequences, coming from various directions, finished at the same point.’ (Pousseur, 1959: 53). In order to determine which sequences had beginnings and endings which were of ‘like quality’ one could take the time and trouble to listen to each of them – an obvious if time-consuming strategy! This is not a trivial matter (nor is it an attempt to impose a form of electroacoustic ‘ear-training’ on composers) particularly as the role of perception in Pousseur’s work methods must be considered. At several points in the article he emphasises the importance of being able to assess the results of his methods in real-time whilst working in the Milan studio. This contrasts with the methods of, for example, Stockhausen at the WDR studio whilst composing his *elektronische Studien I* and *II*. Fortunately, composers do not need to assess these sequences by ear. Dr Pascal Decroupet has provided an analysis of the sections of *Scambi* from his extensive study of Pousseur’s sketch materials and these facilitate any subsequent compositional activity.

Figure 1 is reprinted from an article by Dr Decroupet in *MusikTexte* from August 2003<sup>iii</sup>. He has tabulated the sequences and their start and end characteristics.

Pousseur’s four ‘parameters’ are: the relative pitch (low ‘0’ to high ‘1’), the statistical speed (slow ‘0’ to fast ‘1’), the homogeneity of sound material (dry ‘0’ to reverberated ‘1’) and continuity (inclusion of pauses ‘0’ to continuous sound ‘1’).

These have been indicated as columns 3 to 6 in figure 1. Thus sequences 1 and 2 (identified in column 2) both start with low pitch (0), fast speed (1), reverberated material (1) and interrupted sound (0) or 0110. These are the numerals to the *left* of the forward slash. The figures to the *right* of the slash indicate the *end* condition of the sequences. In the case of sequences 1 and 2 this is: 1100.

Fig. 1

| Family | Sequence | Pitch | Speed | Hom. | Cont. | Dur. |
|--------|----------|-------|-------|------|-------|------|
| 1      | 1-2      | 0/1   | 1/1   | 1/0  | 0/0   | 42”  |
| 2      | 3-4      | 0/1   | 1/1   | 0/1  | 1/1   | 42”  |

|    |       |     |     |     |     |     |
|----|-------|-----|-----|-----|-----|-----|
| 3  | 5-6   | 1/0 | 1/1 | 0/0 | 0/1 | 42" |
| 4  | 7-8   | 1/0 | 1/1 | 1/1 | 1/0 | 42" |
| 5  | 9-10  | 1/1 | 1/0 | 1/0 | 1/0 | 30" |
| 6  | 11-12 | 1/1 | 1/0 | 0/1 | 0/1 | 30" |
| 7  | 13-14 | 1/1 | 0/1 | 0/0 | 0/0 | 30" |
| 8  | 15-16 | 1/1 | 0/1 | 1/1 | 1/1 | 30" |
| 9  | 17-18 | 0/0 | 0/1 | 1/0 | 0/1 | 30" |
| 10 | 19-20 | 0/0 | 0/1 | 0/1 | 1/0 | 30" |
| 11 | 21-22 | 0/0 | 1/0 | 0/0 | 1/1 | 30" |
| 12 | 23-24 | 0/0 | 1/0 | 1/1 | 0/0 | 30" |
| 13 | 25-26 | 1/0 | 0/0 | 1/0 | 1/1 | 42" |
| 14 | 27-28 | 1/0 | 0/0 | 0/1 | 0/0 | 42" |
| 15 | 29-30 | 0/1 | 0/0 | 0/0 | 1/0 | 42" |
| 16 | 31-32 | 0/1 | 0/0 | 1/1 | 0/1 | 42" |

To facilitate the identification of similar end- and start-conditions I have provided another table (figure 2) with the appropriate conditions for all sequences extracted from Dr Decroupet's diagram.

Fig. 2

| Start | sequences    | End  | sequences    |
|-------|--------------|------|--------------|
| 0001  | 19-20, 29-30 | 0001 | 21-22, 25-26 |
| 0010  | 17-18, 31-32 | 0010 | 23-24, 27-28 |
| 1000  | 13-14, 27-28 | 1000 | 9-10, 29-30  |
| 0101  | 3-4, 21-22   | 0101 | 5-6, 17-18   |
| 0110  | 1-2, 23-24   | 0110 | 7-8, 19-20   |
| 1100  | 5-6, 11-12   | 1100 | 1-2, 13-14   |
| 1011  | 15-16, 25-26 | 1011 | 11-12, 31-32 |
| 1111  | 7-8, 9-10    | 1111 | 3-4, 15-16   |

Figure 3 is another table by Dr Decroupet from *MusikTexte* and indicates that Pousseur did not use all possible combinations of parameters. The ones chosen by Pousseur are indicated with an asterisk. Thus, reading from top to bottom, he *did* use 1111 (for the beginning of sequences 7, 8, 9 and 10 and the end of sequences 3, 4, 15 and 16) but he did *not* use 0000 nor 1110.

Fig. 3

|             |   |      |        |      |   |
|-------------|---|------|--------|------|---|
| pitch       | 1 | 1110 | 111000 | 1000 | 0 |
| speed       | 1 | 1101 | 100110 | 0100 | 0 |
| homogeneity | 1 | 1011 | 010101 | 0010 | 0 |
| continuity  | 1 | 0111 | 001011 | 0001 | 0 |
| selected    | * | *    | * **   | * ** |   |

For the sake of clarification an example can be used from a previous analysis of part of *Scambi* which Dr Decroupet and Dr Ungeheuer wrote in *Musik und Technik*<sup>v</sup>. He identified the first few sequences of the recorded (and best-known) version of *Scambi* (an analysis done solely by ear using cassette tape recorders and infinite patience!). This has been reproduced in figure 4. Thus, the composition starts with sequence 6 which then branches into ‘polyphonic’ combinations of 4 and 22 followed by 8 and 30 then 24 and 28 after which they converge on the single sequence of 17. If we examine the start/end characteristics of these sequences they do indeed conform to maximum continuity. These characteristics are shown in figure 5 (only the concluding characteristics of sequence 6 and the initial ones of 17 have been indicated).

Fig. 4

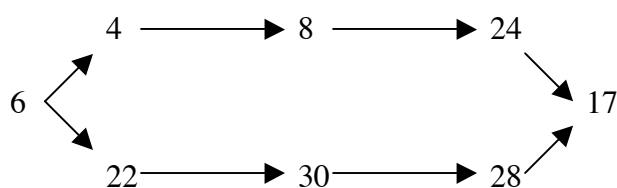
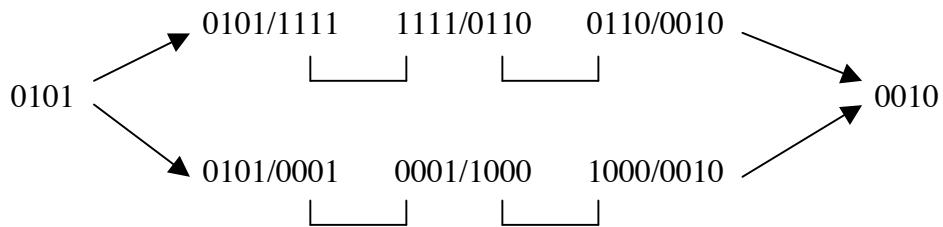


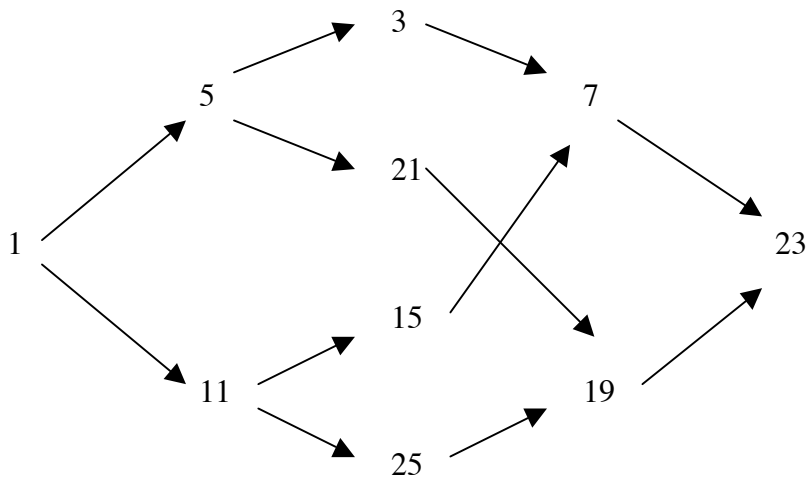
Fig. 5



Figures 1 and 2 should, therefore, assist any composer who wants to create new versions of *Scambi* using the principle of continuity. It would be possible simply to join various sequences together in a monophonic line, though the polyphonic ‘branching’ suggested by Pousseur is an important aspect of his notion of ‘waves’ as the densities of layers will rise and fall.

Other aspects of how the materials can be used should also be considered. Figure 6 is an example I have devised of another, more complicated branching structure:

Fig. 6

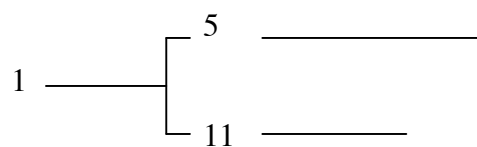


I have started arbitrarily with sequence 1 and concluded with 23. The arrows indicate which sequences connect with each other. This is obviously more complex than the situation in figure 4! At one point there are four layers proceeding simultaneously – which is perfectly acceptable. One interesting strategy for composers to consider is how these branching structures might be emphasized *spatially*. Thus, in figure 6, sequence 5 could go to the left and 11 to the right (for this example upper levels are initially mixed to the left and lower levels to the right). 3, 21, 15 and 25 could be positioned at various locations in the stereo mix (respectively: far left, mid-left, mid-right, far right). A potentially interesting situation could occur as sequence 21 moves (continuously or discontinuously) from mid-left to connect to sequence 19 which is mixed to the right... and so on. The choice of position in the mix is, therefore, a viable parameter for composers (I cannot begin to envisage the enormous potential for multi-channel versions!).

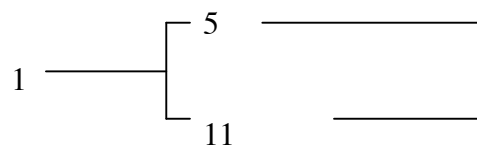
In conversation with Pascal Decroupet at a seminar on *Scambi* held at Middlesex University on December 3<sup>rd</sup>, 2004 I suggested the possibility of repeating a sequence and then connecting with a different one. Thus, sequence 1 (ending with 1100) could be followed by 5 but at a later stage in the realization it could be re-visited in the manner of a ‘recapitulation’ and then be followed by sequence 6. Both 5 and 6 start, of course, with 1100 and the condition of maximum continuity would not, therefore, be compromised. Dr Decroupet was unsure if this was a good idea. In retrospect I think his reservation was based on the fact that rather than repeating sequence 1 and place a different sequence after it, a composer could instead use sequence 2 (sequence 2 also ends with 1100) and thus avoid repeating a sequence in the first place. Nevertheless, explicit ‘recapitulations’ are an option.

If the creation of new versions now seems fairly easy there are two important provisos. Firstly, the general dynamic level of each sequence should be considered carefully by the composer. Henri Pousseur states: ‘(...) the *free dimension of dynamics* had been left quite undefined, giving rise to the following possibilities: dynamic changes could be worked out in advance, and recorded before montage; it

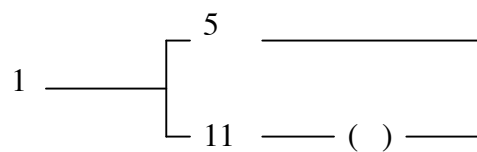
could be left until the performance to start *interpreting*, either to a plan or just improvising; in fact each polyphonic layer could here be controlled separately, if desired, by a group of interpreting artists.’ (Pousseur, 1959: 54). Thus, there is great potential for the creative use of dynamic levels. Secondly, figure 6 raises another issue: the different durations of the sequences (these are indicated in column 7 of figure 1). For example, in figure 6, sequence 1 branches out to produce a two-layer polyphony created by sequences 5 and 11, but 5 is 42” long and 11 is only 30”. So, should these sequences start together and end at different points? Should sequence 11 start after 5 so that when they continue to the next sequences they do so after a synchronised conclusion or should the composer create a ‘window’ or ‘parenthesis’ during the course of the shorter section? These situations are illustrated diagrammatically below:



or...



or...



Once again, only the composer can make these decisions.

One comment by Henri Pousseur is particularly intriguing. He wrote: ‘(...) I would have no objection to the use of other tape speeds: the structures can easily take a transposition an octave down without loss of interest – on the contrary, some details which tend to become lost in the homogeneous surfaces are suddenly brought out by

the loss of speed, which is thus balanced by an increase of inner movement.’  
 (Pousseur, 1959: 54). This strikes me as an interesting idea which, as far as I can tell, has not been exploited.

Lastly, Dr Decroupet suggested something which I (as an unrepentant serialist) liked immediately. (He elaborated this idea in the symposium held on March 18<sup>th</sup> 2005.) Rather than join the sequences with precise characteristics (i.e. the principle of maximum continuity) composers can control the progress of the sequences’ changing parameter values according to a precise scheme. This is, of course, an application of a scale of *Veränderungsgrade* (à la Stockhausen!) to the notion of ‘parameter change’. For example, a ‘scale’ can be constructed ranging from complete continuity (value = 1) where each end-characteristic matches the appropriate start-characteristic, to discontinuity in one parameter (value = 2), discontinuity in two parameters (value = 3), discontinuity in three parameters (value = 4) to complete discontinuity (value = 5). These are illustrated below (for the sake of clarity I’ve used monophonic sequence-chains):

Continuity-scale value 1

|                 |      |           |             |
|-----------------|------|-----------|-------------|
| Sequence        | 1    | 11        | 25          |
| Characteristics | 1100 | 1100/1011 | 1011 etc... |

In this situation there is an exact correspondence between the end and start condition of the sequences.

Continuity scale value 2

|                 |      |           |                  |
|-----------------|------|-----------|------------------|
| Sequence        | 1    | 27        | 23               |
| Characteristics | 1100 | 1000/0010 | 0110/0010 etc... |

Slight discontinuity is achieved by ensuring a mismatch in *one* parameter only. Thus, in joining sequence 1 to 27 the second parameter (speed) does not correspond. Likewise, sequence 27 and 23 lack continuity in the same parameter. By contrast, all other parameters do match exactly.



### Continuity scale value 3

|                 |      |           |                  |
|-----------------|------|-----------|------------------|
| Sequence        | 1    | 21        | 14               |
| Characteristics | 1100 | 0101/0001 | 1000/1100 etc... |

Note that the end of sequence 1 and the beginning of 21 are dissimilar in *two* parameters: pitch and continuity. This degree of discontinuity is maintained between sequences 21 and 14.

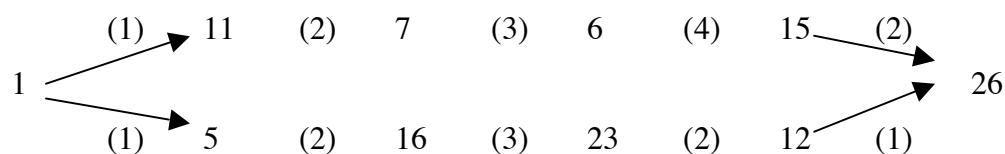
### Continuity scale value 4

|                 |      |           |                  |
|-----------------|------|-----------|------------------|
| Sequence        | 1    | 31        | 12               |
| Characteristics | 1100 | 0010/1011 | 1100/1011 etc... |

In this final example only the *last* parameter (continuity) matches the end of sequence 1 and the beginning of sequence 31. In joining sequences 31 and 12 only the first parameter (pitch) conforms to the notion of continuity.

As Pousseur does not use all the possibilities for the parameter values (see: figure 3) it is impossible to get a value of 5 (unless, during the course of this experiment, my calculations have gone hideously wrong!). Thus, Pousseur guarantees that continuity in at least one parameter is inevitable. This is an excellent example of Pousseur's intelligence as a composer and how he – as a subjective composer interacts with his objective system. Following this reasoning, it would be possible, therefore, to have a serially-controlled and independent progression in two (or more) different layers simultaneously. One layer (the top one in figure 7 below) could become increasingly *discontinuous* with scale values increasing between sequences whilst the other layer becomes slightly discontinuous (or 'unstable') but then returns to continuity (and 'stability'). In figure 7 I have included the scale value in brackets between the sequence numbers. The top layer has an increasing set of scale values then a sudden decrease in the final value: 1, 2, 3, 4, 2. The lower layer has a symmetrical rise and fall in values: 1, 2, 3, 2, 1 (another 'wave' shape favoured by Henri Pousseur perhaps?).

Fig. 7



### Conclusion

I hope these pages will facilitate the creation of new realizations of *Scambi*. As far as durations are concerned, the two I have by Pousseur are the recorded version, which lasts 6'37", and a shorter version lasting 3'56". Berio's version is 3'25". I have no information about the version realised by Marc Wilkinson<sup>v</sup>. It is not necessary, therefore, to create a composition of Wagnerian proportions. Composers are not obliged to use all sequences!

I would be grateful if composers would share their compositional strategies with me as it will be helpful for my AHRB research project (contact details are given on the web site). For example, will you attempt a sparse monophonic composition or will there be moments of 'tension' and 'release' as dense polyphonic structures give way to lighter textures? I'd be interested to know what you did – and how conscious your decision-making processes were.

John Dack, December 2004, Istanbul/London

<sup>i</sup> Pousseur, H. (1959) *Scambi* in *Gravesaner Blätter IV*, pp.36-54

<sup>ii</sup> Pousseur, H. (2004) *Écrits Théoriques 1954-1967* (selected and edited by Pascal Decroupet) Sprimont: Mardaga

<sup>iii</sup> Decroupet, P. (2003) *Vers une théorie générale – Henri Pousseurs "Allgemeine Periodik"* in *Theorie und Praxis* in *MusikTexte* 98, pp.31-43

<sup>iv</sup> Ungeheuer, E. & Decroupet, P. (1996) *Technik und Ästhetik der elektronischen Musik* in *Musik und Technik*, Mainz: Schott

<sup>v</sup> Marc Wilkinson wrote in some detail about his realization of *Scambi*. See: Wilkinson, M. (1958) Two Months in the 'Studio di Fonologia' in *The Score* 22/Feb, 41-48