# Towards an analytical framework for graphic scores, and a proposed typology.[1]

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## 1. Challenges of — and rationale for — analysing graphic scores

Graphic scores pose significant challenges for analysis, which is perhaps why systematic attempts to analyse — as opposed to simply describe — such notations are rare. The weakest of weak work-concepts means that the problem of locating the piece's musical identity is exacerbated far beyond the extent to which this is an issue in other music. Graphic scores tend to be visually fixed, so analysing them as solely visual artefacts is conceptually straightforward. Yet music is understood as sound, and the musical sounds arising from graphic notations can be highly unpredictable. Nevertheless, as Virginia Anderson notes, performances of graphic pieces such as Earl Brown's *Four Systems* tend to share a distinct sonic identity. (Anderson 2013: 132) Where is this essential identity is to be located? And how is its nature to be discovered? These are the primary questions faced by the graphic score analyst. That it does exist seems confirmed by the fact that publishers of graphic scores — at least when they are music publishers (which they usually are) — successfully register copyright claims not only in the printed notations but in the musical concepts which underly them.

In this short paper I take Anderson's article as a starting point in attempting to outline some potential methods of analysing graphic score compositions, and suggest the beginnings of a typology. She doesn't present a complete analytical methodology and nor shall I, but I develop some of her approaches and add my own, at the same time asking why it matters. Anderson provides a rationale which is largely historical; writing of the 60s heyday of experimental notations she claims that: 'To understand this music today as the practitioners understood it, we need to examine these scores in close detail by patrolling the border of possibility and impossibility that lies within them.' (: 130) I too will start with the classic period of innovation in graphic score composition, from the early 1950s to the late 60s — using some of the most famous examples of the genre but also more neglected byways of the repertoire as my initial dataset. But this practice hasn't gone away — in fact, several signs of its resurgence suggest that musical graphics can't be written off as a historical anomaly and therefore safely consigned to the analytical dustbin. I recall in the 1990s, at an event for young composers presented by SPNM (the predecessor of

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the UK-based new music promotion organisation Sound and Music), composer Stephen Montague chided those present for being too conservative and Thatcherite, exclaiming in despair 'when was the last time anyone submitted a graphic score to SPNM?' Yet even then schoolchildren across the country were notating their own compositions using simple graphic methods as part of the National Curriculum. As Jean-Yves Bosseur wrote in the early 1990s, 'much remains to be discovered in scores and notational principles that permit the overcoming of divides between different types and levels of musical education'. (Bosseur 1993: 22) This radically democratising tendency continues, affording musical expression to those unable to access traditional instrumental tuition. It also creates useful; essential, even, links between music and other artforms, lending it a broader cultural perspective. As for its resurgence within professional music circles, a key moment is Theresa Sauer's influential volume *Notations 21* (2009) — a compilation of short graphic notations with descriptive notes and essays. Ensembles have arisen specialising in realising graphic scores and other experimental musical concepts, such as Apartment House and the Vocal Constructivists. (In collaboration with the 2015 Stoke Newington Contemporary Music Festival, the Vocal Constructivists launched a call for graphic scores which attracted 34 entries from 21 composers from across the world.) These performing ensembles have in turn — like the Sauer book — stimulated the use of graphic notations by younger contemporary composers.

## 2. Approaches to graphic score analysis

Ontologically, Simon Shaw-Miller identifies graphic scores as a cross-disciplinary transformation: a 'hybrid art form ... characterised by an unstable relationship between its constituent elements'. (Shaw-Miller 2002: 17) While acknowledging both their visual and their musical properties, he defines them as a 'particular case' when compared with conventionally-notated music on account of the difficulty of transcription (or transfer into another format). (:18) Conventional scores can change their layout considerably in, for instance, the transfer from handwritten manuscript to printed publication; yet the sounding result when performed might be identical. I say 'might' because most conventional notations will leave some parameters open to interpretation, so human performance will always vary — perhaps considerably depending on the level of detail in the notation (consider the varied renditions of medieval music). That said, despite the visual variants between one format and another, the visual *morphology* will remain the same. Shaw-Miller notes that graphic scores 'do not allow simple transfer into another format (as conventional notation can be written out in another hand)'. (: 18) Nevertheless, we can find thought-provoking counter-examples from the repertoire: Cardew redrawing parts of *Treatise* as his ideas developed (much as composers sketch ideas for what will become conventional notations); Cage recopying his own scores following the sale of pages exhibited at the Stable Gallery. (Bosseur: 125) Cage even made the fair copy of Feldman's *Projection IV*; Cathy Berberian went as far as commissioning a cartoonist — Roberto Zamarin — to draw out her ideas in *Stripsody*; neither process compromised Feldman or Berberian's status as primary author (and copyright owner) of the work. So while graphic scores have often been conceptualised and

displayed as 2D visual fine artworks — like paintings — in their own right, I would reject that notion and instead conceive of the notation more as *graphic design*, for the following reasons:

1. Unlike visual fine artworks, the singular artefact is not fetishised. Graphic score manuscripts seem not to command higher prices (comparatively) than conventional handwritten manuscripts; the use of copyists seems not to compromise authorial integrity (as with the Feldman and Berberian examples); re-copying (as with Cardew and Cage) seems not to create a new work-concept.

2. Like conventional scores — and unlike most visual fine art — graphic scores are conceived, originated and made for potentially unlimited reproduction.

3. Graphic scores are not complete artworks in themselves. Their potential is only realised through performance as (musical) sound.

## 2 (a) The score itself

The visual aspect of a graphic score, then, is best conceptualised as a graphic design. At which point it's useful to identify how the elements of conventional notation appear viewed likewise through this lens.

Conventional notation itself of course contains pictorially graphic, as well as symbolic elements, alongside others borrowed from different realms of thought (ie numbers, and letters or words together with their conventionalised abbreviations). Text (and numbers), by the way, I take to have the same range of functions and meanings across both conventional notations and graphic scores.

The most prominent feature of conventional notation viewed as graphic design is the omnipresent visible grid of the stave lines. In fact lines generally dominate the design of modern standard notation — horizontal, vertical, angled, diagonal, curved. Next in prominence are variants of circles. Rectangles follow, with triangles and diamond shapes being the rarest. The overall design language of modern common-practice notation is strikingly monochrome, with strong black and white (figure and ground) contrast.

Turning now to the semiotics of visual page composition, standard notation seems to fit the given-and-new paradigm for the left-right axis, and the ideal-and-real (or abstration and detail) trajectory from top to bottom. For instance: 'given' elements which define fundamental parameters, such as clef, time and key signatures, are placed left; the 'new' elements — the notes themselves — follow along the left-right axis. Similarly, if we picture the notation of a piano sonata (for instance), abstract 'ideals' — from the title to the primary theme — appear at the top, with developments, variations or subsidiary themes appearing below.

The centre-and-margin visual paradigm, where a core subject is surrounded by peripheral elements lacking any particular internal hierarchy, is not found in traditional notation; but this is an area where graphic scores may come into their own. This paradigm may therefore form a useful starting-point for analysis in visual

terms. In studying the pictorial aspects of visual page composition, common design elements such as balance, consistency, contrast, proximity, (varied) repetition and space can all be examined.

## 2 (b) The sounding result

Whatever the value of such an analytical approach in understanding more deeply the visual composition of graphic score pages, this will tell us nothing about the score as music. Which brings me to the sound of the music in performance. In addressing this, Anderson implies an approach which is partly ethnographic and partly musicological to explore aspects of the performance practice and reception history of certain indeterminate scores. She takes Jean-Jacques Nattiez's (1990) semiotic model of the composer's poietic (intentional) practice passing to the listener's esthesic reception process via the 'neutral' level of the trace (score):

| | | | | |
|---|---|---|---|---|
| **Poietic process** | **—** | **Trace** | **—** | **Esthesic process** |
| **(composer's intentions)** | | **(score)** | | **(listeners)** |

Rightly, Anderson critiques Nattiez's neglect of the perfomer in this equation — while they will form part of the esthesic process through listening to their own performance, a performer's role in any music is more than simply listening, yet can neither be written off as 'neutral' nor wholly fitted into the composer's poiesis. Her solution is to propose a new model with additional levels for the 'performing process' and 'musical result' — ie the performance. I would go further and propose two separate communication processes:

1. Between composer and performers:

**poietic (composition) — trace (score) — esthesic (reception by performers or other readers of the score such as analysts);**

2. Between performers and listeners:

**performers' poesis — channel (live performance event or recording) — esthesic (reception by listeners — audience, analyst)**

In my proposed analytical framework, the approach to the score itself mirrors the Shannon-Weaver (1949) model used for visual communication through graphic design:

| | | | | |
|---|---|---|---|---|
| **sender** | **—** | **channel** | **—** | **receiver** |
| **(composer)** | | **(score)** | | **(analyst)** |

This is very similar to Nattiez's (sender [composer] — channel [score] — receiver [analyst]), while the approach to the sounding result is based on my performer-to-listener communication model. The gulf between score and realisation could even be compared to the 'noise' which is inherent to the channel in this model (originally designed to schematise telephone communication).

As with other music, composers' poietic processes are best accessed initially through their public interviews, statements and other writings such as diaries — Cardew's *Treatise Handbook* (1971), a sporadic journal of the composition's gradual unfolding with notes on realisation, and a log of early performances, is a particularly rich resource in this regard. The depth and complexity of performers' poietic processes are comparatively under-documented, though information can be gleaned from programme notes and recording liner notes. Public discussions and interviews are other possible avenues of enquiry. Interviews with publishers involved in the printing and reproduction of graphic score composition are a potentially fruitful resource for understanding in more detail the physical properties of the channel.

Sounding results are most conveniently embodied in sound recordings, so I would propose the analysis of recordings of graphic score realisations as a complement to the analysis of the score designs themselves. This follows the work of (for instance) Cook (2009) and Cottrell (2010) in acknowledging the importance of, and suggesting methodologies for, focussing on recordings as analytical objects. For graphic scores with a number of recorded interpretations, the possibility arises of comparative analysis — via (for instance ) spectograms — to build up a picture of that elusive work identity. For these, and also any graphic scores which have been recorded at all, the recording(s) could be analysed in their own right using (for instance) Tagg's (2013) musematic technique. A comparison of the aural semiotics with the visual semiotics could prove illuminating.

## 2 (c) The link between score and sounds

But the holy grail of graphic score analysis is to find a method of linking the fixed visual identity of the score with the musical identity of — not a particular performance or performances, but an imagined ideal encompassing *all* potential performances. This, at least, is what published analyses of pieces notated with graphics of some kind tend to do. For instance, in his analysis of Cage's *Variations II* Alexandre Popoff initially rationalises his mathematical, statistical approach as addressing a 'purely geometric problem'. (Popoff 2013: 38) Later however he presents his findings as a 'structure of all possible structures' as well as relating them specifically to Pritchett's analysis of David Tudor's realisation of the score. (: 38) And John Welsh assures us his analysis of Feldman's *Projection I* 'will characterise all realizations of the work regardless of any performer's choice'. (Welsh 1996: 35) Given the inherently indeterminate nature of graphic notation, relatively few of the fixed properties of the score image can be confidently linked with the totality of conscientious (or as Anderson has it 'happy') performances — and therefore the distinct identity of the music itself. However:

1. One property which may be reliably deduced is the scope of the work — a 193-page score like Cardew's *Treatise* will imply, through its physical magnitude, a longer duration that a one-page score like Brown's 'December 1952' or Anestis Logothetis's *Labyrinthos* (1967). Depending on the type of graphic score (I'll return to this in my typology later), physical space may delineate internal structure as well as overall scope.

2. Another is density: the visual density of the page design can be convincingly correlated with the aural density of the imagined performance. Here we can even delineate a scale of values: at one end a completely filled-in black image, comparable with Malevich's black square paintings. The aural analogue of this is a sound which is completely saturated, such as the total chromatic cluster at the beginning of Ligeti's *Volumina* (1962) for organ - and this is indeed notated with a completely black field (see illustration below).

At the other end of the scale: a completely white space, such as the white paintings of Robert Rauschenberg — which themselves inspired Cage's silencing of the performer in 4'33", whose score utilises predominantly blank white space.

3. Thirdly, (varied) repetition: a graphic element which is repeated can be taken to denote some kind of musical repetition. So a series of isolated dots on the page might give rise to a series of short sounds, their potential variation in pitch and time-points (if the usual notational axes for pitch and duration are assumed) mirroring their variation in visual meaning occasioned by proximity to other visual elements.

## 3. Graphic score typology

Erhard Karkoschka's *Notation in New Music* (1966) provides the following taxonomy for 'musical graphics':

a) Exact framework with subordinate graphic effects

b) Dominating graphic effects with a few precise indications

c) Graphics:

1. with pitch and duration lattice

2. without pitch and duration lattice

3. free choice between 1 and 2 (: 77)

Drawing on but developing this, I propose a more systematically detailed hierarchical taxonomy in Table 1 below. Roman numerals I II and III are similar to Karkoschka's categories c, b and a. My Ia and Ib are likewise related to his sub-categories 'without' and 'with duration lattice'.

**Table 1: Graphic score typology**

| I Graphics lacking musical signs | II Graphics incorporating some musical signs | III (Determinate) graphic elements hybridised with conventional signs/meaning |
|---|---|---|
| 1 single page | | |
| 2 multiple pages | | |
| a) No axes ('pitch and duration lattice') implied | a) Not (necessarily) usual symbolic meanings | |
| b) Axes implied | b) Usual symbolic meanings | |
| i) No verbal information (instrumentation/ instructions/explanations) | | |
| ii) With verbal information (instrumentation/ instructions/explanations) | | |

I.1.a.i is the 'purest' form of graphic score — the closest to abstract graphic design, and as Bosseur notes the most potentially subversive in terms of relationships between composer and performer, between trained and untrained performers, and indeed between visual design and musical outcome. (Bosseur: 14) 'Pure' graphic scores are in fact vanishingly rare, as even the floating black rectangles of Brown's pioneering 'December 1952', which imply no particular axes, are partly elucidated by Brown's verbal notes (making it type I.1.a.ii). Although Karkoschka, who witnessed an early performance of this score first hand, suggests even these may be disregarded: 'Brown wants the player to be stimulated by any interpretation whatsoever; anything goes.' (: 90) He recounts that at a performance in Darmstadt in 1964 the composer conducted a performance which demonstrated 'without question that it was the movements of his hands and arms, and not the score, that stimulated the musicians, especially as wave-like sequences and big crescendi can only be seen in the score by an imagination also capable of seeing Strauss's Eulenspiegel theme in it'. (: 91)

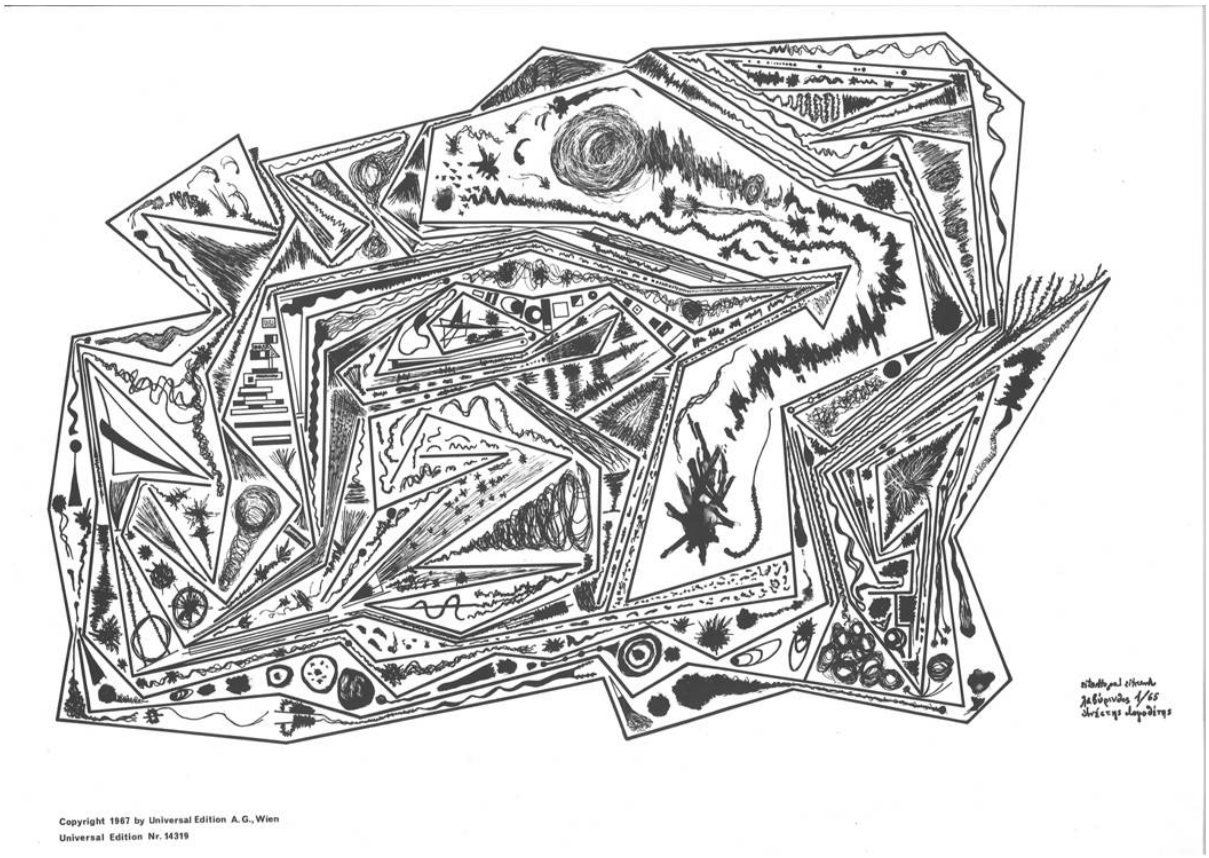
This emphasises the role of performance practice and hence the need for ethnographic work with performers to complement study of the score artefact; the music's transmission here resembles more the folk tradition.

Anestis Logothetis's *Labyrinthos* provides another example of this type (I.1.a.ii: illustration 1). Interestingly, this category also encompasses Ligeti's *Volumina*, which — while it uses no musical signs at all — is furnished (like Ligeti's other scores) with such copious verbal instructions (making it type I.2.b.ii) as to make it highly

determinate (see illustration 2 and Table 2). Which suggests there is no direct correlation between the presence or absence of musical symbols in their notations and the level of indeterminacy in graphic score compositions.

Scores which incorporate at least some musical signs into the graphic design form my category II, which includes such classics of the repertoire as Cage's *Concert for Piano and Orchestra* (type II.2.a/b.ii); Cardew's *Treatise* (type II.2.a/b.i), and Berberian's *Stripsody* (II.2.a/b.ii). The conventional symbolic meaning of the musical signs may or may not be carried over (I have differentiated these situations by using a and b, although in practice it can be difficult to determine the intention or limit of possibilities here). Of particular interest is when normally 'mute' signs which frame or modify parameters — staves, clefs, accidentals — are clearly intended to become sounding elements (illustration 3).

**Illustration 1: *Labyrinthos* (Anestis Logothetis)**



## Illustration 2: *Volumina* (György Ligeti) page 1

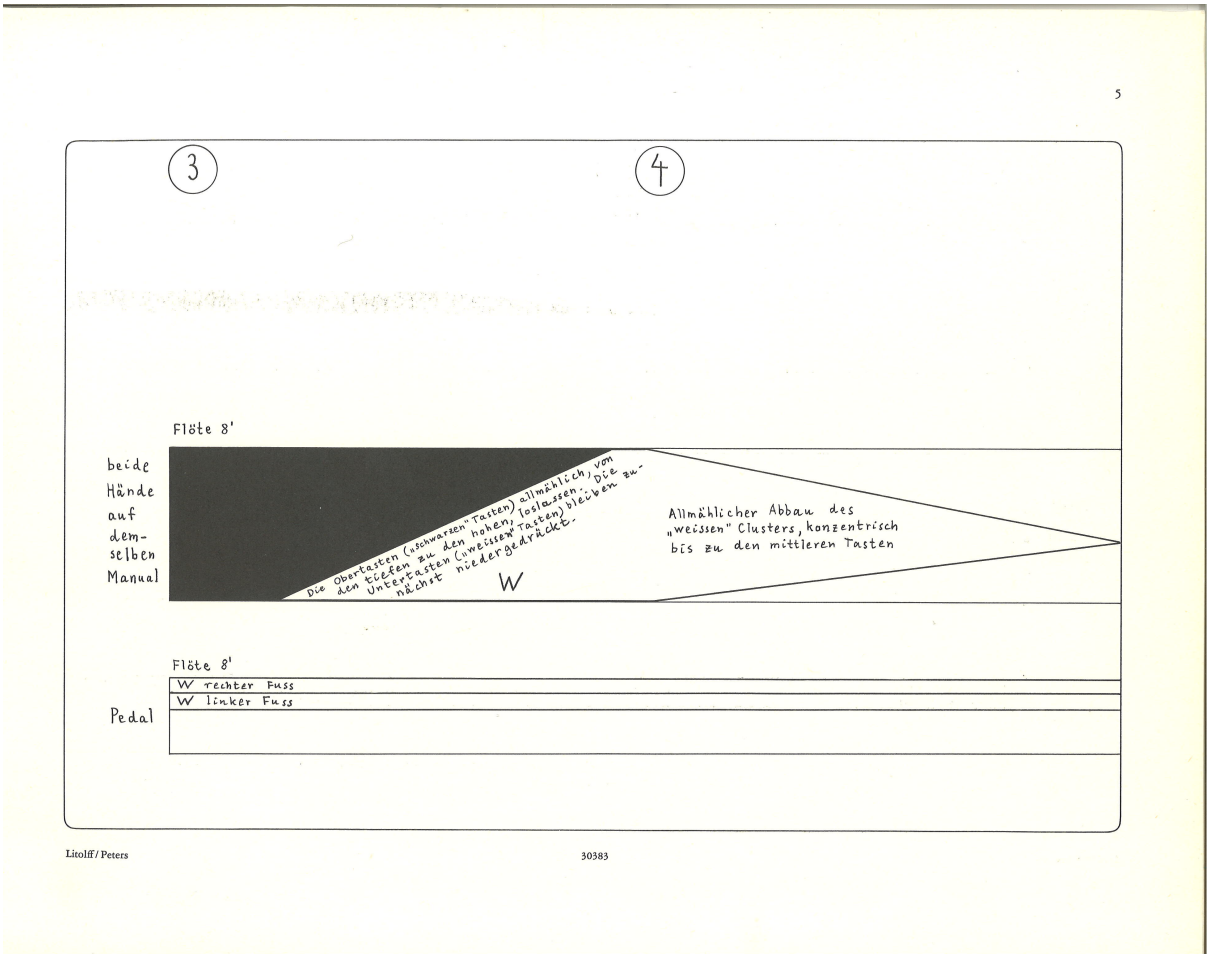
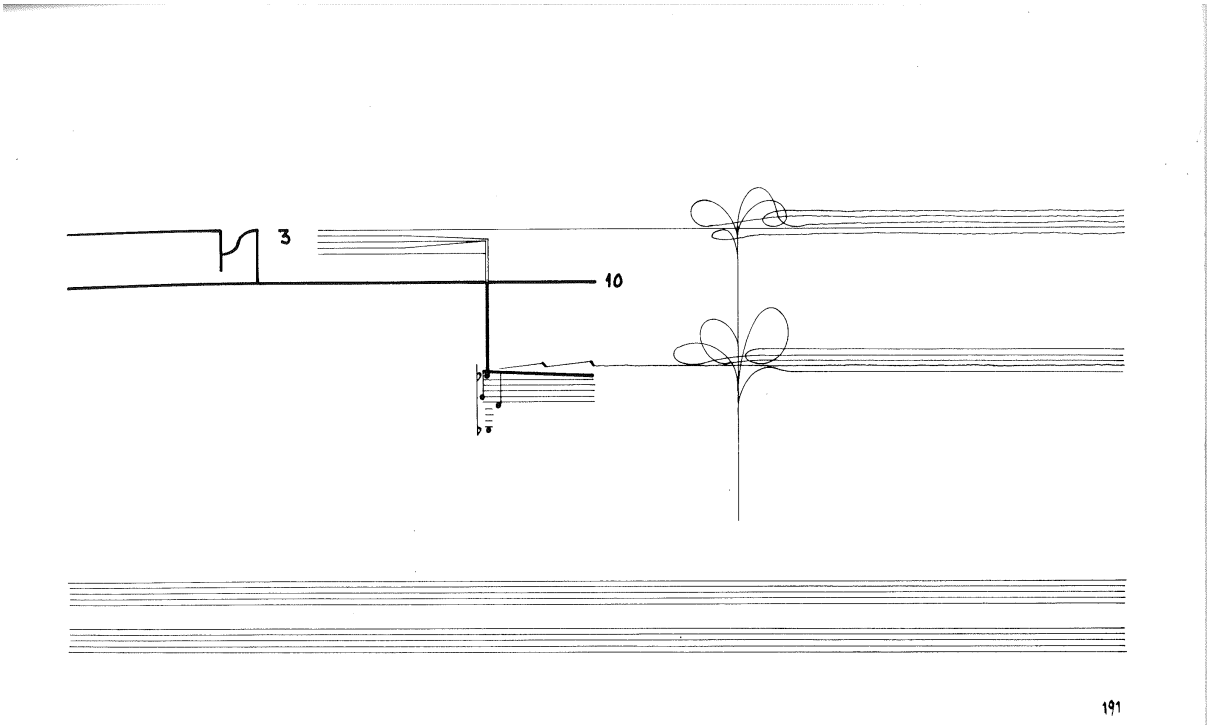


**Illustration 3: *Treatise* (Cornelius Cardew) page 191**






Category III accommodates hybrids of various types, where (determinate) graphic elements are hybridised with conventional signs and their associated meanings, as in many postwar works of Penderecki, Stockhausen, Berio and others; as Bosseur notes these may constitute expansions and/or simplifications of common practice. Published 'postscriptive' scores for pre-recorded electronic music such as Stockhausen's *Elektronsiche Studie 2* (1954) and Ligeti's *Artikulation* (1958; score designed by Rainer Wehinger) could constitute a fourth category (IV and, where hybridised with conventional notation, IVa).

Finally, without wishing to promulgate a restrictive or exclusive 'canon' of graphic scores, certain well-known works from the 50s and 60s do form a useful starting-point. In table 2 below I list a selection of such works, using some very rough indicators of performer and listener interest (as revealed by the PRS/MCPS database[2]), which does seem to confirm their 'greatest hits' status.

[2] Originally in November 2015; updated December 2018

**Table 2: 'Canon' of classic graphic scores?**[3]

| Composer | Piece (date) | Publisher | Most recent UK performance activity indicator [updated 12/2018] | Commercial recordings licensed in/ from UK & Ireland | Durations |
|---|---|---|---|---|---|
| Brown | 'December 1952' (1952) | Associated Music Publishers (in *Folio*) | 12/2018 | - | - |
| Cage | *Concert for piano and orchestra* (1957-8) | Peters | 12/2018 | 9 | 19'03" – 27'44" |
| | *Aria* (1958) | Peters | 12/2018 | 4 | 6'12"- 10'30" |
| Ligeti | *Volumina* (1962) | Peters | 12/2018 | 5 | 14'41"- 17'36" (registered duration 14'30") |
| Berberian | *Stripsody* (1966) | Peters | 12/2018 | 7 | 4'04"-6'58" (6' according to score) |
| Cardew | *Treatise* (1963-7) | Gallery Upstairs; Peters | 12/2018 | 7 | 32'07"- 57'40" |

## 4. Conclusion

To briefly conclude: far from being a niche within a niche (contemporary music) within a niche (classical music), graphic scores form a vital and actually bigger part of our musical culture than is usually acknowledged, providing continuing relevance for composers and performers and a largely untapped phenomenon for music analysis.

[3] Table created November 2015; updated and corrected April & December 2018

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