

NOTATION FOR ORGAN EXTENDED TECHNIQUES

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ABSTRACT

The notation of extended techniques on the organ do not have a clear standard. Composers use their own notation or guiding rules to express their sonic expansion on the instrument. Since 1960, the most prolific period on organ experimentation, Ligeti, Kagel and Cage were the first to become known for using non-standard notation on the organ. From this collection of works, the ones from Ligeti are paramount. From the graphical score of *Volumina*, the long clusters of *Harmonies* to the fast torrent of notes of *Coulée*. Kagel develops further with other notations for clusters and graphical gestures in *Phantasie für Orgel*. Finally, with Cage we find a simpler way of notating long notes and stop changes. Kurt Stone has a chapter on his book, *Music Notation in the Twentieth Century*, regarding notation on the organ, but it not describes half-drawn registers, half-depressed keys and does not present anything regarding motor or other air manipulations. A clearer notation and explanation is needed for these extended techniques. In an instrument so tied to a functionality, it is pertinent nowadays to re-incorporate these techniques in the contemporary organ repertoire. A new simple notation is presented, alternative to graphical notation or lengthy performance notes. This will create an easy understandable approach.

1. INTRODUCTION

The protean Hungarian composer György Ligeti (1923-2006) caused a paradigm shift on the organ in the 1960s. His work with electronics in the WDR¹ shaped his mind to use his findings through acoustic instruments. His seminal organ work, *Volumina* (1961/62, rev. 1966) is fully written in a graphical form [1]. In this way, several clusters that need elbows, hands, and feet, are layered down with massive black and white shapes. Each sign representing a chromatic, diatonic or pentatonic cluster.

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In the middle section we see a chaotic graphical form. This represents something akin to a guided improvisation. Webbed lines and dots form several patterns with a healthy guide note of how to perform them. It quickly becomes cryptic for the unprepared organist [2]. A composer that would choose this way of writing, even nowadays, would meet a hard reception on any organ composition contest. In *Volumina* a vertical line coincides with the organ compass and establish the only guiding notes. The graphical score reminds works in a same vein of Cornelius Cardew [3]. A decade later a similar graphical score is done, by Rainer Wehinter for Ligeti's electronic work *Artikulation* (1958). Nevertheless, after *Volumina*, Ligeti worked on two organ studies. The first *Harmonies* (1967), contains a fanning out of ten pitches from a tonal centre, C, decreasing in several voices towards the end. Ligeti had the idea to 'starve'² the wind supply to achieve an unnatural sound. These extended techniques and resulting sonority are not written on the score, but detailed on the performance notes. Also, special advises are added regarding the registration, dynamics, tempo, and even practicality considerations like octave transpositions and specific registration needed, which none are indicated on the score itself [4].

In the second study, *Coulée*, like the previous one, he also indicates exact pitches of notes. They should be played as fast as possible, to sound like a cluster. Although every note is a suggested eight-note in a continuous stream, one can assume the influence of his harpsichord piece *Continuum* (1968). At the end exists a remark on the full duration of the work, about 3' 30'' [5]. This annotation is also present in *Harmonies*, in this case 6' to 9', what can be a clear influence of Bartok.

This article will neglect Ligeti's first organ work *Ricerca per organo, 'Hommage to G. Frescobaldi'* (1953) since it does not bring anything new regarding notation. Written in the style of a chromatic *ricercare*, the original manuscript is owned by Ove Nordwall, using standard notation. A special note that this work is almost identical to the eleventh movement of *Musica Ricercata* (1951/53) for piano [6, 7]. Ligeti planned to work on further studies (*Zéro* and *Le son royal*) but they were not done, and no information remained to create a fair assumption of what path he will take [7].

The Argentine-German composer Mauricio Kagel (1931-2008) wrote several organ works with his own

¹ Westdeutscher Rundfunk – West German Broadcasting, Cologne.

² Term used by Ligeti for decreasing the air supply.

notation. *Improvisation Ajoutée* (1962), the cycle *Rrrrrr....* (1980/81) and *Phantasie für Orgel mit Obligation* (1967). None have the same scope of graphical notation we found in *Volumina*, having instead a careful mix of clear notation and only a few graphical forms. *Improvisation Ajoutée* uses regular staves for the assistants, choir and stop changes, besides the manuals and pedal. Of special note, which this article reflects, is *Phantasie* where we find a more audacious approach, regarding organ techniques. A ‘tablature like frame’ fills the score consisting of; Register, manuals, pedal and tape-machines. The score is divided by in seconds. In the manual and pedal section we find only three lines indicating a tonal area with regular rhythms written, but without bar lines. The tape part, for two tape-machines, indicates start, stop, and dynamics. The tapes consist of previously recorded sounds in a theatrical vein (typical of Kagel); Rain, Hail, Flushing of Toilet, Breakfast, Organist Walk and a big finale of Baptisms, Marriage, and Funeral services. In general, it is heavily scripted with fast-paced changes. The clusters are regularly notated, although, without a standard staff only a general idea of the tonal range is given. We can find a direct quote to the graphical *Volumina* in the middle section with black triangles filling the score. After this middle section appears a regular notation, a *pastiche* of Frédéric Chopin’s *Étude op.25* mov. VIII, superimposed with the VI and X movements. Except for this piano quotation, all the rest would be quite cryptic for the uninitiated on vanguard techniques on organ.

In *Rrrrrrr... we find usual notations for several manuals with the special mention to the technique of slowly releasing the keys, changing the air flux.*

Regarding John Cage, his most known organ work is definitely *Organ²/ASLSP* (1987), an adaptation of *ASLSP* (1985) for piano solo (that can also be played in organ). In both titles the abbreviation stands for “As slow as possible”. The inspiration for the title refers to “Soft morning City! LSP!” the first exclamations in the last paragraph of *Finnegan’s Wake* by James Joyce. They are coined has one of the longest pieces in existence, since Cage did not mention the duration. This piece is still being played in the *John Cage Organ Project*³ in Halberstadt (Germany), and it will be continuously played until 2640.

The impact of the *ASLSP* variants his unavoidable to the organ, but his other works are also pertinent, although with few remarks regarding notation. In *Some of ‘The Harmony of Maine (Supply Belcher)* (1980) for one organ and six registrants (assistants that will change the organ stops) we see a clear change of scenery. Special care was given to the stops changes teamed with indeterminacy methodology and a clever *pastiche* use of known American musical themes. In *Souvenir* (1983), commissioned by the American Guild of Organists, the same thematic use of a motif can be seen, but with a clear path to the *ASLSP* variants, regarding notation, duration and clever use of manual and pedals. But there is not much new re-

garding notation techniques, so the idea of using weights to achieve long notes (and notate then) is the most pertinent one.

From Cage’s works we can see the usefulness of weights for the long notes of *Organ²/ASLSP*, but further indications are needed for the correct use of weights, concerning, placing and removing them. Besides taking into account the preparation need by the organist. A note can be said about using pencils or *ohashi*, that depend on the disposition of the keyboard and console. The word ‘weight’ will be used in this article to generalize the idea of depressing a key with an object. This technique needs a carefully thinking from the composer since you need two movements, limiting the gestures of the organist, one movement to fix a note (or group of notes) and another to remove it [1].

These examples will be used to introduce extended techniques and their notations. Each delve on a new approach that result in new sounds. Taking into account all techniques created by the mentioned composers one can summarize that they use:

- Changing air pressure (by manipulating the keyboard or stops),
- Using weights for long notes (therefore liberating one or two hands for other manipulations),
- Turning on and off the motor engine (cutting the air supply).

One could easily mix these three approaches creating a *bric-à-brac*. For example, one can use different weights (that would not fully depress the keys, causing a smaller air flux) to fix certain notes, with already prepared registers half-drawn and after a few seconds turning the engine off. One could imagine a score that would have the notes to be played (or in this case, fixed) and some notation for the stops and turning off the engine. But that would not be clear to every organist. At a first glance this kind of performance would need thorough notes from the composer with a possible debate with the organist and his insight of the instrument that would be used. This task is cumbersome to each part, so a simpler notation will be presented in this article.

2. LIGETI

Ligeti used vanguard techniques that need to be further analysed. Musical notation can be defined in very different ways, quoting Cornelius Cardew and his definition that which determines what you can say and what you want to say, determines your language [3]. But not all can be translated well for an unprepared organist or composer. In *Volumina*, it is possible to perform with the graphical notation, after careful consideration of the performance notes. Although the graphical form is more helpful regarding stationary and moving clusters.

In contrast, *Harmonies* uses two treble clef staves to indicate specific pitches contained in each cluster. This style of notation, very different from *Volumina*, tries to achieve a similar sound palette, but this time with fixed notation on a score. The black or white note heads are

³ <https://universes.art/en/specials/john-cage-organ-project-halberstadt>

just a marker for performance. Since the tempo value of the notes and bars are not fixed, the change of note heads aids the performer to follow the score. A special note to the use of several *fermatas* to emphasize the duration [8].

Quoting Ligeti regarding the performance notes of *Harmonies*: “Nowhere in the piece should the chord successions create an impression of meter or periodicity”. The notion of passing chords and the value that they can represent is left to the performer. Since the changes are always in minor seconds, one could assume a contra-punctual resolution of leading voices or passing notes. *Harmonies* does not follow any harmony rules. All the note changes are made to have a direct consequence on the resulting starved sound. Another quote from the performance notes: “The whole piece is soft to very soft. Pale strange, ‘vitiated’ tone colours must predominate. Denaturing the sound is achieved by ‘greatly reduced wind pressure’”.

At the end, a single note is added by the pedal, further decreasing the air flux. There is no meter signature and no time value given to the notes. Only a mark: “Rubato, sempre legatissimo”. Nevertheless, there are bar lines. The moving pitch is notated with a white head and the black notes slurred continuously on overlapping bars. Both note heads are stemless and beam less, indicating no rhythm whatsoever. The ten note chord decreases in number towards the end, remaining a three note cluster. Ligeti warns that the ‘passing notes’ are always a minor second away. The final thirteen bars use *fermata* (few of them stacked), while the texture is being thinned in the amount of voices. It can also be said, that the last thirteen bars are akin to a filtering technique, like an electronic filter would cut the sound in few parcels. In the score there is no indication of registration or assistance needed and dynamics are also absent [9].

In second study — *Coulée*, the continuum motion of eight-notes contrast to the suspended clusters of *Harmonies*. It does not appear to be a cluster or micropolyphony composition, but when we take into account the reverberant space of a large church and a carefully chosen registration we can listen to a sound result akin to a cluster. Only when we listen to several recordings we truly perceive the diverse interpretations of *Coulée*. Each hand is playing *arpeggiated* groups of 2, 3, 4 to 5 notes. No bar lines exist, merely a suggestion has a dotted line. These clusters continue to evolve until m. 100, where they contract to a single pitch, the tonal centre, Ab. This effect is maintained in a few bars with a movement similar to an octave string tremolo. The correct tempo should keep the duration within 3 and a half minutes. The stream of notes abruptly stops at the end, near the high limit of the instrument (much like *Continuum*, which follows the same composition methodology, albeit in harpsichord) [9]. The pedal notes are near inaudible and only reaffirms a cluster like a freeze convolution effect [11]. The repose and tension, unlike *Harmonies*, are implied by the lack or varying of pitches and number of notes. From this density of superimposition, a binary form can be deduced, A — Repose and B — Rhythmic tension.

3. A NEW NOTATION

It is clear that there are important aspects for the performance of Ligeti organ works outside the notation. Without the performance notes, it is impossible to perform them. The main concern of this article is proposing a clearer and concise notation for extended techniques on the organ, based on the mentioned repertoire, and without the aid of performance notes.

The sound morphology of the pipe organ does not permit the same interpretation has in other instruments. The key connected to the pipes, brings a sound with always the same envelope. The way it plays, a performer can only adapt articulation between the keys and the acoustics of the space to bring forth a degree of expression. The same applies to dynamics, the organ can only add or subtract registers in layers. Albeit some instruments have a volume pedal, that either brings more registers or open/closes certain cabinets of pipe ranks, thus mimicking a *crescendo* [11].

The use of extended techniques breaks some of these paradigms. One can use a half-key technique for creating a small *glissando* and *crescendo*. Manipulating the stops, one can achieve a tremolo effect, or bring non-pitched sounds. Like in *Volumina*, by turning on and off the engine while some keys and registers are drawn, achieves another kind of sound, more akin to synthesis programming in a computer (an out-of-the-box comparison would be the Deep Note⁴) [11]. For the proper use of these techniques, a systematization of notation is needed to help composers and organist understand better what is happening, instead of reading performance notes. In this way, it furthers develop the interest on these techniques.

Several compound examples will be described, that are suitable for a clear perception and reading. Many of the composers that where quoted have their own notations, and some of their ideas are put into practice. One can and should adapt them to the purposes needed for the intended purpose.



Figure 1. Turning off and on the engine. Weights noteheads.

In Figure 1 we have a clear logical sign for turning the motor on and off. The duration of the decay/rise of the sound is proportional connected to the amount of pipes that are feed by the wind. This means that many keys and/or many pulled registrations will behave differently. An introductory test is highly advised. By applying weights to the keys, with a notated rhythm, by only changing the note-head, creates a new way of interacting with

⁴ A trademark of THX Ltd used previews in cinema theatres.

the keys. Using *arpeggio* to remove the weights in a certain order is a natural consequence.

Another possible way is to use words like *FIX*, used in *Australpnea* (2010) by Frederik Neyrink (1985) or simply use an *ossia* staff for longer values or keys on another manual [9].

In Figure 2 are examples aimed to gradually open stops. These can only be made with organs that have mechanical stops. The mechanics of stops are quite sensitive and different from each stop and organ, so once again, prior experiments are advised.

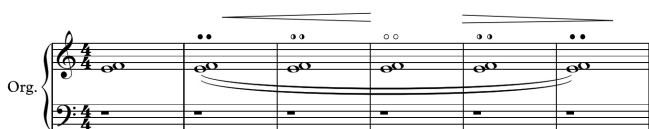


Figure 2. Gradually opening stops.

The *crescendo* and *decrescendo* lines helps the organist, assistant or composer in having a general idea of the dynamics that happen with half-drawn stops. This technique is compounded with the dot sign, gradually white, black or half-black. The use of a dot for the least amount of pressure is also correlated to the way the holes are closed in wind instruments. The white dot is the most amount of pressure on the key (or the usual amount of air to play a regular note).



Figure 3. Stop tablature. Dynamic lines.

Using a staff (or tablature) for the stops brings another level of creativity and expression. One can notate rhythms to be ‘played’ by opening and closing the stops. Usual note-head for opening, cross-head for closing. When one needs to gradually open/close the stop, we use the same dot sign. In this case it is directly correlated to the way the registers work inside the organ, again, like keyholes in wind instruments. Again, dynamics marks are here to guide the organist, assistant and/or conductor concerning the general dynamic. The dynamics should follow the amount of open stops and their quality.



Figure 4. Applying weights. Mixed use of engine and stop manipulations.

In Figure 4 we can examine a compound use of several techniques. Using weights brings the possibility to the organist to ‘play’ with the stops. It also frees the hands to control the engine or prepare for the next stop change. The *glissandi* lines on the last measure are the indication of slowly removing the weights, mimicking the half-drawn stop technique mentioned before. It is similar to the slowly risen key example from *Rrrrrrrr...* by Mauricio Kagel [8].

It is still possible to use a more usual way of notating stop changes with + or – signs. For a specific stop change this is clearly the most understandable. Since organs have several manuals and ranks this notation helps differentiate them from half-drawn stops. The same applies to organ with combination or feet piston that activate or deactivate several ranks, like in Figure 5.



Figure 5. Stop changes.

This is the usual way of notating registrations changes in Portuguese historical organs, that is similar to other historical instruments. A subtraction or addition sign is used to call certain families of registers and is also present on modern organs. Some can even save entire stop changes that can be called upon with pistons beneath the manuals or pedal board. In these organs there are usually some feet control for families of stops, being reeds and mixtures the most common in historical instruments. Some organs can also couple or decouple manuals and also store entire performances on demand with electronic means. All of this does is already attended for in regular notation for organ. Even though there are a few exceptions, like the organ of St. Peter Station or Kassel in Germany, that can easily control the air flux, making it easier to perform extended techniques, these notations will help even on these modern instruments. This is outside the scope of this article, but nevertheless, with inventiveness, one can achieve the same sounds with a not so modern organ, being historical or not.

CONCLUSIONS

These techniques have a high amount of permutations and iterations with each other. This article presents a compound sample. A secondary objective is to make it easier to experiment with them. Since the result of this notation for extended techniques are based in the work of the quoted composers, an audition of this repertoire is advised. It is also recommended comparing new and old interpretations, like original recordings by Zsigmond Szathmáry, and recent ones by Dominik Susteck (both published by Wergo, Schott)⁵.

Detaching this notation from a pure graphical form will defeat the inertia of composers and performers regarding extended techniques on the organ. This way is easier to understand and will not further intimidate young students. Besides being straight forward to all levels of organ technique. The potential of using this notation for young organists will assist both the teacher and apprentice, creating a common ground of notation that can be easily done in manuscript. New repertoire could be easily created this way, without the need of special vector graphics software or other, closing the gap of contemporary music on the usual repertoire of the instrument. These proposed signs and symbols are available in the most used notation software (Sibelius, Finale and Dorico), and if not, they are easily created. They can easily be drawn using pencil and paper, still a proven way to draft a musical idea quickly. With this notation one could change the paradigm of writing contemporary music for the organ during the undergraduate studies of young composers, who most see writing for this instrument has a daunting task.

A note could be said that even with modern organs who can produce extended techniques easily this notation will help (Orgelpark⁶, St. Peter⁷ and Kassel⁸). From a point of view of the composer, one should use a level of logical that can be used in any case. From the point of view of the organ teacher, one can assume the pedagogical benefits of using a simpler notation, to prepare the students to deal with certain techniques on the instrument. The same sign codification has other contemporary repertoire, with some logical signs added, can also help anyone, with sufficient musical reading proficiency to have a clear idea of what his happening and how to play.

This article proposes notations and techniques that can be used in any organ. In fact, most of these instruments are entirely mechanic in nature and the degree of control of the keys and stops are directly connected to the organ innards, providing a sense of direct connection to instrument. In some cases they indulge a deeper experimentation. Follow these guidelines has a recipe with the mind set that Ligeti purposed: “be inventive.”

⁵ <https://en.schott-music.com/wergo/>

⁶ <https://www.orgelpark.nl/>

⁷ <https://www.sankt-peter-koeln.de/wp/kunst-station/ubersicht/>

⁸ <http://www.ekkw.de/kassel-mitte/martinskirche.php>

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REFERENCES

- [1] S.C. Anderson (ed) *Twentieth-Century Organ Music*. New York: Routledge, 2012.
- [2] G. Ligeti, *Vorwort zur Partitur Volumina*, Frankfurt: Peters, 1967.
- [3] C. Cardew, *Notation – Interpretation*. Tempo LVIII. 1961.
- [4] G. Ligeti, *Vorwort zur Partitur Étude n.º 1 – Harmonies*, Mainz: Schott, 1969.
- [5] G. Ligeti, *Vorwort zur Partitur Étude n.º 2 – Coulée*, Mainz: Schott, 1969.
- [6] G. Ligeti, *Vorwort zur Partitur Volumina*, Frankfurt: Peters, 1967
- [7] P. Albèra, C. Fourcassié, P. Michel (ed), *György Ligeti L'atelier du compositeur - écrits autobiographiques – commentaires sur se oeuvres*. Gêneve: Éditions Contrechamps, 2013.
- [8] A. Blackburn, *The Pipe Organ and Real-time digital signal processing*, doc. diss. Melbourne: Griffith University, 2011.
- [9] G. Collins, *Avant-garde Techniques in the organ works of György Ligeti, A lecture recital, together with three recitals of selected works of J. Alain, J. S. Bach. W. A. Mozart, M. Reger, and others*, doc. diss. Texas: North Texas State University, 1980.
- [10] G. Ligeti, “Was erwartet der Komponist der Gegenwart von der Orgel?”; in *György Ligeti, Gesammelte Schriften*, Mainz: Winterthur. 2007.
- [11] H. Olson. *Music, Physics and Engineering*, New York: Dover, 1966