# NOTATION FOR ORGAN MUSIC: BALANCING PRESCRIPTIVE AND DESCRIPTIVE MODELS FOR AN INSTRUMENT WITHOUT STANDARDISATION TO UNLOCK COMPOSITIONAL AND PERFORMATIVE POTENTIAL

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## ABSTRACT

A unique challenge in notating music for the organ lies in the instrument's inherent site-specificity. Pipe organs are not mass-produced or standardized, unlike most musical instruments. This variability presents a core dilemma for composers: how to notate music for an instrument that defies treatment as a fixed or portable entity. Notation must therefore engage not only with abstract musical ideas but also with the physical, mechanical, and spatial realities of each unique instrument.

Composers have responded to the challenges of organ notation through a range of strategies that reflect both notational detail and the function of the score itself. These approaches often fall along a spectrum between prescriptive and descriptive notation.

This paper examines a range of organ notation examples, from the early modern period to recently premiered works, highlighting how composers tailor their methods to the specific demands of each composition. We argue that the most effective notational choices emerge from a sensitivity to the sonic goals, technical requirements, instrumental mechanics,and contextual conditions of each individual piece.

## 1. INTRODUCTION

The pipe organ's lack of standardization presents a unique challenge for composers, who must find ways to notate for an instrument that varies widely in construction, tuning, playing range, timbral possibilities, action type, and acoustic environment. Each organ is custom-built for a specific space, reflecting not only the architectural and acoustic context, but also often historical, technological, and liturgical considerations. These factors result in substantial diversity among instruments, complicating the development of any universally viable notational system. Composers are then left to choose between a prescriptive approach, which offers precise, instrument-specific instructions, and a descriptive approach, which prioritizes the intended sonic outcome.

This variability leaves composers with a fundamental notational dilemma: how can one communicate musical ideas for an instrument that does not exist in a fixed or standardized form? One way to approach this challenge is to explore their work on a continuum between prescriptive and descriptive notation. At one end of this spectrum, prescriptive notation offers precise, instrument-specific instructions that maximize clarity but limit portability. At the other, descriptive notation prioritizes the intended sonic outcome, while introducing a degree of ambiguity.

A prescriptive score, such as tablature, specifies exact instructions often tied to the physical and mechanical features of a particular instrument. Such notation precisely describes the performer's actions on the instrument's interface but can severely limit portability between instruments. In contrast, descriptive notation seeks to define the intended sonic outcome rather than prescribing exact technical means. In practice, most organ works blend prescriptive and descriptive methods. Composers must navigate this spectrum, balancing the need for clarity with the desire for flexibility and interpretive freedom. This paper explores how composers have addressed these notational challenges from the early modern period to the present day, analyzing specific examples to illustrate the diverse strategies employed. [1]

Notational systems therefore reveal which musical parameters a composer considers essential. The Western staff notation system originating with Guido of Arezzo in the eleventh century designated pitch as primary musical substance, reducing other sound qualities such as timbre, articulation, or dynamics to secondary attributes. [2] In a 2016 lecture at the Darmstadt Ferienkurse, Klaus Lang described the impact that Guido's system would have on music:

> Guido of Arezzo's system of notation transformed a process into an object and took one aspect of this process, namely pitch, and defined it as substance. All other aspects of sounds, like duration, dynamics, sound qualities, became attributes attached to this substance. [3]

This system evolved into the notation still used in most Western classical music today. Pitch is widely treated as

the central unit of representation. Notation constructs what aspects of a work are considered most important. We examine how composers have approached this challenge by adopting notational strategies that balance compositional intention and the physical and acoustic realities of the organ.

Our goal is not to propose a universal or codified notational system for the organ. Instead, we focus on how composers from the early modern period to today make notational choices in response to the specific sonic, spatial, and technical demands of each work. Through this lens, notation emerges not just as a tool for transmitting music, but as a form of documentation that reflects the aesthetic values and priorities of a composer, a tradition, or a period. We analyze how composers have confronted these organ-specific notational choices. This analysis goes beyond a simple survey of options to provide a critical guide for composers, clarifying the strengths and weaknesses of various approaches and highlighting how a composer's notational decisions directly impact a work's realization. Ultimately, we argue that by understanding these established precedents, composers can make more informed and intentional choices, ensuring their musical ideas are effectively communicated and realized regardless of the attributes of a specific organ.

## 2. ORGAN NOTATION OVERVIEW AND PRECEDENTS OF MODERN ORGAN NOTATION

Organ music lacks a fixed notational standard, as a result of the instrument's inherent variability. Aspects such as layout, registration, and dynamics can vary widely from piece to piece. The most common historical layout features two staves for the manuals (hands) and a third for the pedals (feet), though this configuration is not universal. Organs often include multiple stops that affect both timbre and octave displacement (e.g. $16'$, $8'$, $4'$ stops). However, organ notation always reflects the played pitch, not the sounding pitch. Additional instructions, such as which manuals to use or which stops to engage, are often conveyed through textual annotations in the score.

A brief overview of how the organ produces sound is necessary in order to contextualize the notational precedents that follow. A mechanical pipe organ typically includes one or more keyboards (manuals), a pedalboard, ranks of pipes constructed from wood or metal, and a system (such as bellows or an electric blower) for directing air into the pipes.

Stops, which are controlled by drawknobs, buttons, or levers, control the flow of air to specific ranks of pipes. Each rank produces a distinct timbre, often modeled after specific instruments; engaging or disengaging stops alters the organ's overall timbre. Sound can be produced only when a stop is activated and a corresponding key is pressed. Since there is no default sound or registration, performers must either follow composer-specified timbral directions or make their own registration choices.

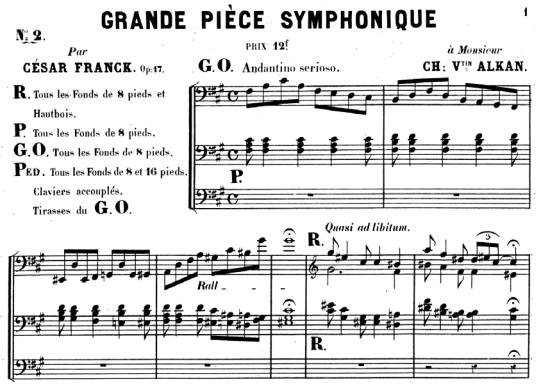


**Figure 1**. César Franck's organ music exemplifies the complex registration practices of the late Romantic period using symbols and text indications in the score.

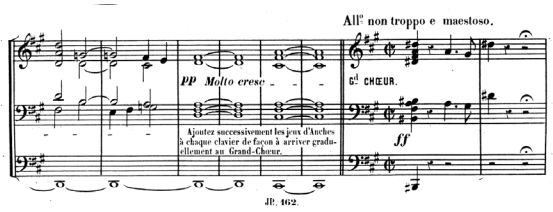


**Figure 2**. César Franck: text indications in the score.

### 2.1 Organ notation in the late romantic and early modern period

One of the earliest challenges in organ notation is how composers communicate registration, or which types of pipe or pipes should sound when a key is pressed. Composers began to expand the role of the organ beyond the church in the 19th century, recognizing its potential to fill large concert halls and contribute to the breadth and timbral richness of Romantic orchestral traditions. Registration of organ music started to be depicted in scores to reflect this. In the example above (Figure 1), from César Franck's Grande Piéce Symphonique (1860–62) general registration information is given in the score on the first page, with general indications next to each manual and pedal (R = récit, P = positif, G.O. = Grand Orgue, Ped. = Pedal). Length of pipes (and thus sounding octave) is specified. Further information in the score is provided using dynamic levels and text instructions (see Figure **??**). While the composer's intention regarding volume and overall sound quality and transposition is made clear, the specific timbre remains the responsibility of the performer.

Olivier Messiaen is widely recognized as one of the first composers to approach the organ as an experimental instrument, pushing the boundaries of both its sound and its notation. He was also among the first to produce organ works with highly specific registrations, written with a particular instrument in mind. Messiaen defines the exact registration for each manual at the beginning of the score with the abbreviations for the manuals that Franck also used. Messiaen's descriptions are very precise. For example, in the récit (R): „cymbal 3 rangs" indicates that the cymbal 3 rangs (a mixture with 3 ranks) stop should be pulled

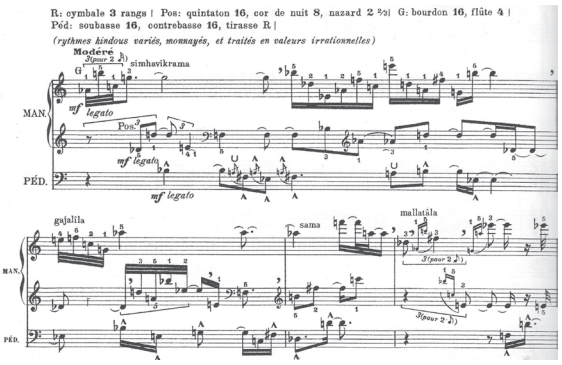


**Figure 3**. Olivier Messiaen: precise registration indications in the score as used for the organ at Sainte-Trinité in Paris.

rather than using a more general description like mixture 3. Messiaen is also very specific in notating the fingerings for hands and uses symbols in the pedal notation to depict which notes should be played with the heel, which with the tip, and which foot should be used, as seen in Figure 3.

Although many organs share similar stop types, instruments are not designed with identical collections in mind, and stop names often vary significantly. This means that Messiaen's works cannot always be realized exactly as instructed; performers must interpret his instructions and adapt them based on the stops available on the instrument at hand. In this way, the performer engages in an active interpretive process, translating the composer's intentions through the lens of a specific instrument. As an example of interpreting Messiaen's organ music on different organs, Adam Ravian notes: "there is a similar challenge that will be interpreted differently on instruments that are French by design or built according to other national styles. On the French organ, the manuals from lower to upper are Grand Orgue, Positif, and Récit, whereas on instruments that are outside of the French organ building tradition, the order of the two lower manuals is reversed." [4]

Organ notation not only guides interpretation but also shapes the expectations placed on the performer. It assumes a familiarity with organ-specific idioms, registration practices, and instrument mechanics. Conversely, composers must understand how organists interpret scores, so that their intentions can be realized across a range of instruments. The practice of organ notation is important to the composers, but it is also important for performers to be familiar with and understand. The composer must have some understanding of organ interpretation if they wish to surmise how an organist might register the piece with the available information in the score. Messiaen was trained in the tradition of Marcel Dupré that prioritized strict adherence to the written sign, however the interpretations of his own works displayed considerable flexibility. This divergence leads Ravian to conclude that "Messiaen had ideas that could not be adequately conveyed through notation." [4] This highlights the inherent limitations of notation in capturing the full range of interpretive possibilities available to organists, and the need for composers to consider how their notational choices will be realized in practice.

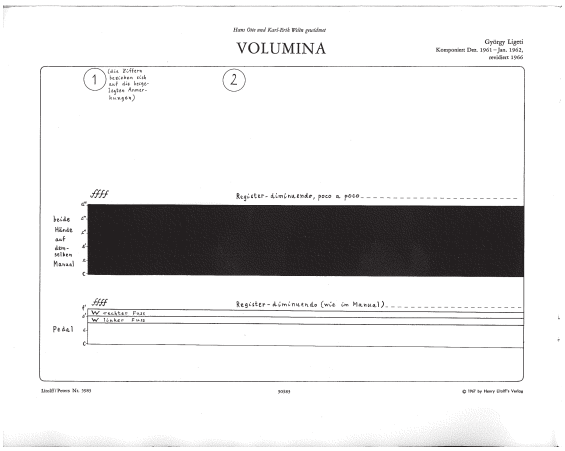


**Figure 4**. György Ligeti: graphic notation in the score of Volumina (1962).

### 2.2 Second Half of the 20th Century

Messiaen did not employ extended techniques in the strict sense, but his attention to registration and timbre opened the door to later composers' explorations of the organ's full sonic potential. In the latter half of the 20th century, composers such as György Ligeti pushed the limits of organ composition by incorporating extended techniques, unconventional textures, and experimental (graphical) notation. Ligeti's *Volumina* (1962) remains one of the most well-known experimental organ works of the mid-twentieth century, featuring graphic notation. As seen in Figure 4, Ligeti specifies actions by hand and foot and while the information is primarily conveyed through a combination of graphic notation and text, the score is appended with four pages of performance notes.

## 3. CONTEMPORARY NOTATION FOR ORGAN

While the pipe organ never occupied a central position in the postwar avant-garde, composers of the late 20th century continued to expand its technical and expressive possibilities, including innovations in notation. The organ experienced a revival in the early 21st century, with more composers embracing its sonic potential. New performance and research venues, such as Orgelpark, provide platforms for experimentation and documentation of this renewed interest in organ exploration. Contemporary approaches often build on 20th-century precedents, but with a shift in notational priorities. Particularly the use of stops as compositional material is an aspect that is more prominent in contemporary organ works. Whereas mid-20th-century scores often emphasized visual complexity and aesthetic appearance, including Ligeti's *Volumina*, many 21st-century composers now prioritize practicality and clarity in their notation. Below we discuss several contemporary techniques and considerations and some of the solutions that composers have developed to approach them.

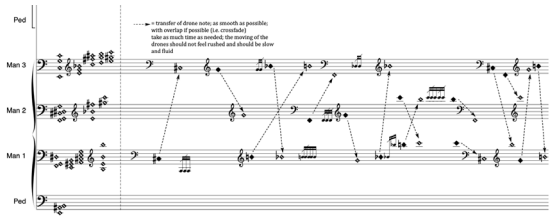


**Figure 5**. Martin Ritter: *Saturate*.

### 3.1 Staves and Layout

The traditional layout for organ notation consists of three staves, as described previously: two for the manuals and one for the pedalboard. However, this configuration is frequently adapted to fit the specific needs of each piece. A common development in contemporary organ notational practice is the use of separate staves for each manual, allowing for greater visual clarity, especially when different manuals are used simultaneously or manual-specific gestures are sustained. When manual changes are frequent or sustained pitches like drones appear across systems, separate staves prevent visual clutter and help the performer track held notes and manual assignments clearly.

The choice between manual-based and hand-based notation depends on the demands of the piece and how much manual-specific information plays a critical role. Using notation with two manuals highlights the importance on specific sounding results and is therefore more descriptive, whereas the standard keyboard layout is more prescriptive, placing emphasis on performative aspects (which hands to use). Some scores also use additional staves to notate elements such as stop changes. This is particularly useful when registration changes occur frequently or evolve over time as part of a musical gesture. The examples discussed below will use various forms of the layout, and demonstrate that different pieces have different layout needs.

### 3.2 Keyboard Action and Drones

One of the most widely used extended techniques in contemporary organ writing is the sustained drone. On the organ, keys can be held down using external objects, allowing the performer to play other material simultaneously.

In Martin Ritter's *Saturate* (2017), Figure 5, filled diamond note heads indicate pitches to be sustained as drones, while empty diamond noteheads signal their release. Dotted lines connect these gestures, indicating their temporal trajectory.

Another feature of this type of drone notation is the *grace measure* at the beginning of each system that reflects all keys currently being held down as drones. This is an example of a composer combining both prescriptive and descriptive notation in a meaningful way: the actions of the performer placing and removing drones are depicted, as are the existing sounding pitches at the beginning of each system.

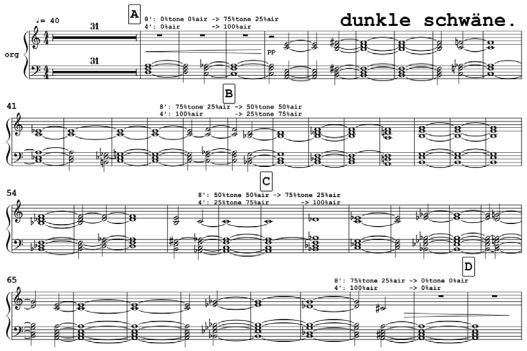


**Figure 6**. Klaus Lang: *Sadunkle schwäne*.

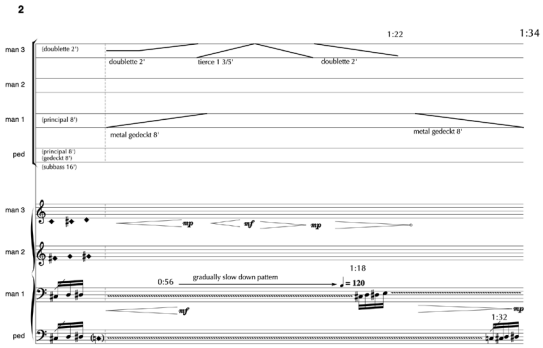


**Figure 7**. Alyssa Aska: *looped.(dynamic).*.

### 3.3 Registration and Stops

Registration is a crucial aspect of organ notation, as it determines the timbre and character of the sound. Contemporary stop notation takes multiple forms. Traditional text-based instructions are still common, especially when a composer seeks a general timbral result or when registration changes are infrequent.

Klaus Lang's *dunkle schwäne* (Figure 6) demonstrates how mechanical stop action can be used for fine control, including partial engagement of a stop to create slight detuning effects. These gradual stop movements are notated verbally rather than graphically. For example, a change in the $8'$ stop is notated using the following text:

$$8' : 0\%\ \text{tone}\ 0\%\ \text{air}\ \rightarrow 50\%\ \text{tone}\ 50\%\ \text{air}$$

This indicates that the specified $8'$ foot stop should be pulled out gradually and slowly until the sound consists of half tone and half air.

In Alyssa Aska's *looped.(dynamic).* (2017), stop movements are notated on their own staves above the keyboard staves (Figure 7). The performer reads keyboard action from the lower staves and stop motion from the upper staves. Each line represents a stop being drawn or closed over time: an ascending line indicates a gradual opening, while a descending line shows a stop being pushed back in.

This notational choice reflects the musical priorities of the piece. In *dunkle schwäne*, stop changes are also gradual, but the notation only gives verbal instructions and does not indicate precise timing.

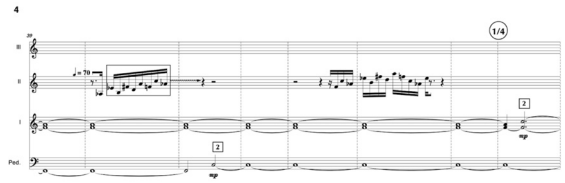

**Figure 8**. Alyssa Aska: *stagnation.transmutation*.

The emphasis in that case lies on the overall sonic effect and a general sense of transition rather than exact alignment of tuning or timing. Aska's use of graphical notation indicates that the timing and trajectory of each stop movement are structurally important. The score demands coordination between stop movement and manual activity, suggesting that the resulting timbral balance between manuals and their changes over time is central to the composition's structure.

### 3.4 Intonation and Tuning

One of the defining characteristics of the pipe organ is that each instrument is tuned individually, often to suit the acoustics, repertoire, or historical context of its location. As a result, most organs are actually slightly out of tune and the precise tuning system can vary greatly between individual organs. This presents a particular challenge for composers: the same score may sound in a different temperament or tuning system depending on the instrument on which it is performed.

When writing for mechanical organs, composers must decide whether to accommodate this variability by leaving tuning details more open or to write for a specific instrument whose tuning and temperaments are known in advance. While detailed intonational instructions can be provided in the latter case, such precision is only meaningful when the performance instrument matches the one for which the piece was composed. In general, mechanical organs cannot be retuned during performance.

Electronic and MIDI-based organs often include tuning presets or other features that allow for real-time pitch control. For example, the custom built Rodgers organ at University for Music and Performing Arts Graz, includes several built-in tuning modes, similar to systems found in the commercially available Viscount e-organ series. In Alyssa Aska's *stagnation.transmutation* (2019) (Figure 8), tuning changes are indicated with simple text above the staff, similar in style to stop annotations.

The symbol ¼ above the staff instructs the performer to switch to quarter-comma meantone. More advanced tuning changes are possible using external control systems or hyper-organ extensions.

One such extension is The Frescobaldi[2], attachment, which expands the traditional keyboard by adding five additional keys per octave, enabling performers to distinguish between enharmonic pitches such as G♯ and A♭. This system allows for precise microtonal and historical tunings that would otherwise be impossible on a standard 12-note octave layout. [5, 6]

Rather than inventing a new notational system, composers

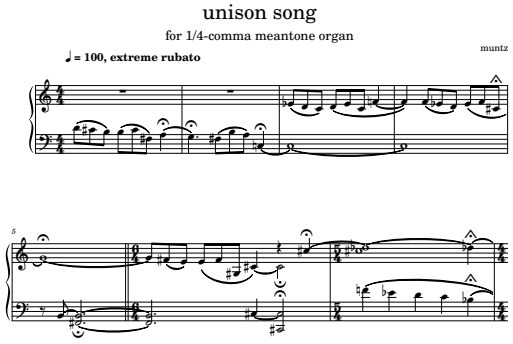


**Figure 9**. Mat Muntz: *unison song*.

writing for the Frescobaldi[2] typically continue to use conventional accidentals in the score (e.g. G♯ vs. A♭), treating them as distinct enharmonic pitches rather than enharmonically equivalent. In this way, the notation itself remains familiar, while the instrument provides access to the expanded pitch set. A similar approach can be used for historical organs with split keys, where notes such as D♯ and E♭ are assigned to physically distinct keys. Standard notation is adapted in both of these cases to instruments with non-standard tuning layouts, allowing composers to write microtonally without altering the notational language. In Figure 9 from *unison song* (2024) by Mat Muntz, the composer specifies that the work is for quarter-comma meantone organ, and pitches with both enharmonic spellings are used.

As with registration, there is currently no standardized system for notating microtones on the organ. However, composers often adapt one of several established microtonal notation systems such as arrows, accidentals (e.g., half-sharp, three-quarter flat), or extended symbols depending on their aesthetic goals. Since most organs do not include microtonal intervals by default, performers typically interpret these notations flexibly, selecting the closest available pitches on the instrument. On instruments with extended tuning systems, such as split-key historical organs or enhanced digital organs, microtonal notation can correspond more directly to actual pitch options. In all cases, the feasibility of microtonal realization depends on the specific instrument, and composers must consider this variability when scoring microtonal material for the organ.

### 3.5 Electronics and Technological Extensions

In addition to expanding the possibilities afforded by organs through the use of technique development, organs themselves can also be expanded with hyper-organ extensions and technological interfacing. One work that expanded the possibilities of an organ beyond even extended techniques is Pablo Mariña's *dba_2* (2022) (Figure 10) for organ and electronics. The piece is instrument and system-specific.

The registrations are intended for the Rodgers organ, and the electronics are designed to work with the existing multichannel system. The notation is primarily prescriptive for the organ and the electronics. Mariña provides succinct

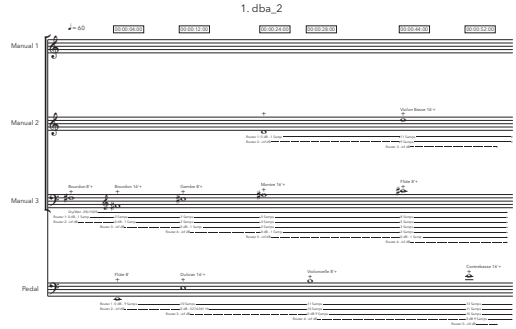


**Figure 10**. Pablo Mariña: *dba_2* score example.

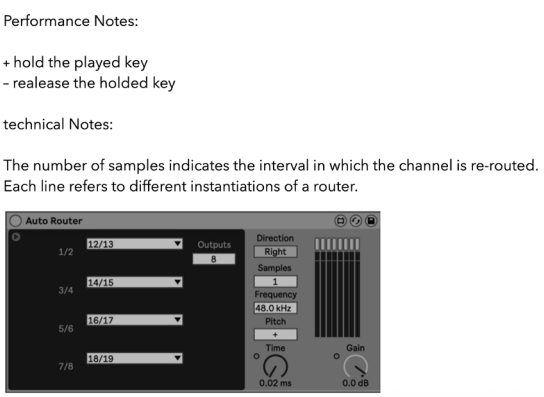


**Figure 11**. Pablo Mariña: *dba_2* program note.

but precise indication in the program notes (Figure 11). As can be seen in the second image, this information is easily annotated under the staff. The sample and router information is indicated under the corresponding pitch. Mariña also chooses to use a separate staff for each manual and the pedal. This layout choice emphasizes the independence of each manual and the pedal.

## 4. SOLUTIONS, IMPACT ON PERFORMANCE AND COMPOSITION

There are many possibilities for notating different aspects of organ music. Even something as basic as the number of staves can vary widely between different pieces. This means that organ music has some of the largest variance in notation from piece to piece. This is largely due to the lack of instrumental standardisation. However, this aspect is also what makes the organ such a unique and interesting instrument to compose for. Each new organ is a completely new instrument, with different technology and different sound possibilities. In Western art music, sign and sound (notation and performance) are traditionally considered to be poles of a dialectic [7] that can be modified over time but not suspended, because the music is both "text that is fixed by the medium of writing, so that it can be passed on, and sound event, which is momentary and ephemeral." [8] We are not prescribing a specific type of notation or saying that one is superior to another for organ writing. However, the impact that notation has on both the musical composition and the performative realisation is extremely important. The relationship between notation and importance of musical materials was already discussed, and the many examples highlight how diversity of organ notation contributes to a diversity of foregrounded or blended musical material. This also means that organists need to have a specific relationship with interpretation. Because organs are not standardised, organists need to be adept at both interpreting a score, and having the tools to realise a score on any given organ. Understanding organ interpretation involves not just bringing musical pitches on a staff to life, but also finding solutions when an indicated registration is not possible, or when a given technique is not available on the instrument. Not even the number of manuals is standardized across organs, meaning that organists sometimes have to arrange compositions to be playable on fewer manuals than indicated. This places extreme importance on clarity and efficiency in notation, so that composers are able to get their intentions across effectively in such a way that an organist can understand not just what is written, but what is intended. Decisions such as indicating specific names of stops (i.e., Blockflöte $8'$) or simply categories (i.e., Flutes $8'$) require much more careful consideration than one may anticipate. The former indicates that the sound should have specifically the characteristics of a recorder, likely a wooden pipe with a soft sound and muted overtones.

An organist can understand this, and make a decision to choose a stop with a similar characteristic on a given organ, even if "Blockflöte" is not exactly available. Writing "Flutes" leaves the decision more open for the performer. There is a certain quality of sound expected, and definitely not a reed-based sound, but it could be something with a brighter sound than what Blockflöte would indicate. That doesn't mean that either is superior to the other, but that the choice of how to notate will have a very large impact on the performer's choices. It is possible that the composer does intend for more of a general flute sound, and prefers to keep this aspect more general. But it is also possible that the composer wishes for a precise timbre of the Blockflöte, in which case they would indicate this very specific sound, even if it might not be available on a given instrument.

In *Notation for Organ Extended Techniques* [9], Claudio Pina outlines solutions for standardizing the notation of organ extended techniques, including play and pause symbols for motor control and dynamic lines to indicate gradual stop changes.

While such standardization offers the benefit of immediate legibility and potentially reduces the need for extensive performance legends, our analysis suggests that a universal approach may not always be the optimal solution. The primary concern with eliminating legends or imposing a single notational standard is the potential to inadvertently obscure a composer's specific intentions. As demonstrated by examples like Klaus Lang's *dunkle Schwäne* and Alyssa Aska's *looped.(dynamic)*, the choice of notation, whether that be in the form of verbal instructions or precise graphical lines, directly reflects the composer's em-

phasis on particular musical parameters, such as the overall sonic effect versus the exact timing of a stop movement. A standardized symbol, while clear, might result in the inadvertent prioritizing of one aspect (e.g., volume change) over another (e.g., subtle timbral evolution or intonational nuance), thereby reducing the notational framework's capacity to convey the full breadth of a composer's musical ideas. The diverse and often unique characteristics of individual organs necessitate a flexible notational approach, one that allows composers to tailor their instructions to specific instrumental possibilities and artistic goals, rather than being constrained by a one-size-fits-all system.

## 5. CONCLUSION

We have examined a spectrum of notational strategies for contemporary organ music, from the broad dynamic indications of César Franck to the highly specific stop registrations of Olivier Messiaen, and to the graphical and text-based innovations in works by contemporary composers such as György Ligeti, Martin Ritter, Klaus Lang, and Alyssa Aska. Each approach reflects a deliberate choice by the composer regarding what constitutes the *substance* of their musical ideas, whether that be pitch, timbre, gesture, or spatial effect. Rather than advocating for a singular, universal standard, we argue that the efficacy of organ notation lies in its adaptability and its capacity to precisely convey the composer's priorities for a given work, even if this means embracing ambiguity or requiring significant interpretive agency from the performer. Ultimately, the ongoing evolution of organ notation underscores the dynamic interplay between composer, performer, and the instrument itself. Understanding the historical precedents and contemporary innovations in notation provides a robust toolkit for composers to make informed decisions that ensure their musical visions are effectively communicated and realized across the diverse landscape of pipe organs. A nuanced understanding of these notational choices empowers performers to navigate interpretive challenges, adapt works to specific instruments, and ultimately bring the composer's intentions to life. As new technologies and compositional approaches continue to emerge, the dialogue between notation and performance will undoubtedly continue to shape the future of organ music, highlighting its unique position at the intersection of fixed text and ephemeral sound.

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