

Is notation for the Hammond organ a help or a constraint?

Critical Commentary for Special Project (music composition)

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Abstract

This commentary explores the notational demands of composing for the Hammond organ. The aims of this research have been to develop existing notation for the Hammond, find new performance techniques for the instrument with notation for these, and to develop a notation system to suit the specific needs of the Hammond organ in contemporary classical music. Also, to explore the relationship between composer and performer when writing for the Hammond organ, a relationship that needs to balance the composer's desire for structure with the performer's freedom of artistic expression. My compositions for this project are *Philly '63* for Hammond organ and jazz orchestra and *Seven Last Words from the Cross* for solo Hammond organ. The notation of these pieces contrast greatly. *Philly '63* uses an adaptation of conventional left to right music notation and allows artistic freedom for the organist to improvise within guidelines. *Seven Last Words from the Cross* uses a hybrid notation system of flowchart systems with established music notation conventions and allows the organist freedom in interpretation only.

Acknowledgements

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Introduction

Is notation for the Hammond organ a help or a constraint?

The use of the Hammond organ has developed largely within the aural traditions of jazz, gospel, and rock music, so notation has yet to be fully developed. The scarcity of such material has led me to the following questions. Does the Hammond organ lend itself to conventional music notation? Which genres of music are more suited to providing notation for the Hammond? Are there categories of notation for the Hammond that work in different situations? Are there new notations that could be used?

Background of the Hammond Organ

Fig.1. Hammond Organ B3 model, introduced in 1955.



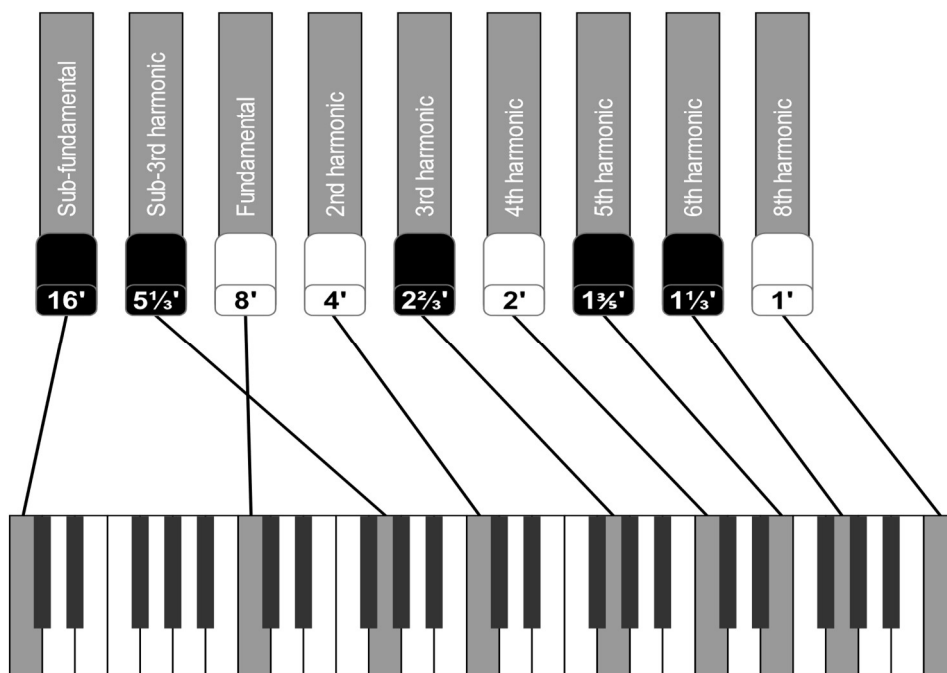
The Hammond organ was invented by Laurens Hammond (1895-1973) and first manufactured in 1935. It consists of two manuals, a pedalboard, and an expression pedal. The sound is created by making an electric current by rotating a metal tone wheel near an electromagnetic pick up, which is then amplified. The B3 model, (see fig.1) introduced in 1955, and made popular by Jimmy Smith,¹ has become the most used in jazz and gospel music. This is the model, or similar, for which I've chosen to notate. Most Hammond players use the organ with a Leslie speaker cabinet, which utilizes the Doppler effect by rotating a horn speaker and drum.² Rather than the stop system present in pipe organs, the

¹ Jesse Whiteley, *Hammond Technique and Methods: Music written for the Hammond organ*, 2013, p.8.

² Steve Lodder, *Classic Hammond Organ*, 2008, p.17.

Hammond has drawbars that represent organ pipe lengths, in feet. There are sets of nine for the manuals (see fig.2), and two for the pedalboard. The 8' drawbar is the fundamental and is the notated pitch, even if not drawn. A drawbar setting is a set of nine numbers. For example, a Jimmy Smith setting is 888000000,³ the first number being the 16' drawbar setting and the last the 1'. This setting allows the uncluttered delivery of bebop melodic material because the drawbars drawn are few and adjacent.

Fig.2. Diagram of Hammond drawbars showing possible harmonic textures.



One difference between stops and drawbars, is that several drawbars would have to be drawn to emulate the pulling of a stop.⁴ For example, a flute stop could be assimilated by the drawbar setting 007410000.⁵ The preset keys to the left of the manuals (reverse white and black keys, see fig.1) enable the Hammond player to engage multiple drawbar settings at the touch of a key. I elected not to use presets for my compositions, as I wanted the timbral changes to evolve, in a manner that the pipe organ's timbre can't.

³ Brian Charette, *101 Hammond B3 Tips*, 2014, p5.

⁴ Nelson Hutchison, *Hammond B3 Organ Trios and Soul Jazz*, 2017, p.8.

⁵ Stevens Irwin, *Dictionary of Hammond Organ Stops*, 1939, p.98.

The Hammond in Big Band Jazz

The Hammond trio (Hammond, drums, and guitar or saxophone) became a jazz phenomenon in the 1950s and 1960's.⁶ Jimmy Smith (1925-2005) and Jimmy McGriff (1936-2008) were both Hammond organists from the Philadelphia area who played in trios. They both worked occasionally with larger ensembles. Two albums that I have drawn inspiration from are Jimmy Smith's *The Cat* (1964) and Jimmy McGriff's *The Big Band* (1966). Both these albums use orchestral ensembles with the Hammond as the lead instrument. The orchestral parts are arranged. The Hammond parts are a combination of simple melodic lines and improvisation that is sometimes complex. The British organist, Christopher Stanbury, aptly described a score in jazz as a functional aide-memoire and a partial route map.⁷ In composing *Philly '63* for Hammond organ and jazz orchestra my aim has been to follow this tradition and notate a Hammond part that allows the organist improvisational freedom within the framework of a jazz orchestra arrangement. The Hammond part should be successfully played at first or second sight, as is the tradition in big band music. Yet, a Hammond player who reads little or no music notation should still be able to play the organ part.

Established Hammond Organ Techniques and their Notation

Hammond specific techniques such as squabble, triplet slap, rake, palm glissando, thumb glissando, have yet to be notated for the professional player. However, notation of some of these techniques exist in educational books such as *Classic Hammond Organ*.⁸

Squabble technique is where the organist octave doubles a melodic line with thumb and fifth finger, sometimes with a tremolo, whilst playing an indistinct harmony in the middle consisting of partial note presses.⁹ Players often achieve this by bending their middle fingers so that that the knuckles face down.

⁶ N. Hutchison, p.8.

⁷ Christopher Stanbury, *Playing the Changes: Rediscovering the Lexicon of Electric Organ Performance Practice from 1943 to 2015*, 2017, p.43.

⁸ Steve Lodder, 2008.

⁹ B. Charette, p.8.

A typical drawbar setting for a squabble would be 800008888, but there are subtle variations. The Leslie speaker which has three settings, slow, fast, and off, should be set on fast. The resultant timbre is akin to trumpets playing with wah-wah mutes. In *101 Hammond B3 tips* a squabble is notated as in fig.3.¹⁰

Fig. 3. Squabble notation, *101 Hammond B3 tips*, p.8.



In *The Hammond Organ, Beauty in the B*,¹¹ a squabble is notated as in fig.4.

Fig.4. Squabble notation, *The Hammond Organ, Beauty in the B*, p.190.



Both the above notations are study aids. They are too cumbersome to be used in a Hammond score part. It is difficult for a composer to be precise with squabble notation as each organist has a different take on the technique. A suitable alternative would be to write a melodic line, chord symbols, and the word squabble. If it's an improvisation, only the chords and the word squabble would suffice. I took this approach in *One Cool Cat*, composed for Specialised Studies I. (see fig.5.)

Fig.5. Alternative squabble notation, *One Cool Cat*, b.53.



¹⁰ Brian Charette, p.8.

¹¹ Mark Vail, *The Hammond Organ, Beauty in the B*, 2002, p.190.

Another notated example in *101 Hammond B3 Tips* is a triplet slap. (see fig.6) This is where the organist slaps a cluster of keys with the left hand on one manual in between pitched right hand chords on the other manual.

Fig.6. Triplet slap. *101 Hammond B3 Tips*, p.52.



This notation could easily be used for a Hammond score part and a degree of accuracy achieved. If, however the composer wanted to allow the organist more flexibility in chord voicings and give a degree of rhythmic freedom, the lead sheet with the instruction triplet slaps might achieve better results.

Glissandi are a staple of the Hammond organist.¹² This is in part due to the waterfall style keys (smooth edged) with a square face. Piano keys have a lip which makes glissandi physically more arduous. Pipe organ keys have a diving board shape which doesn't allow smooth movement over the keys. Glissandi are used so frequently in jazz, soul, gospel, and rock Hammond playing that they are not regarded as a special effect. If notated, a straight or wavy line is used, as is the general music convention. There are however distinct types of glissandi. The rake uses the forefinger flat. The palm glissando uses the palm of the hand flat to the keys. The thumb glissando uses the tip of the thumb.

In *The Afrological Soul of Jazz Organ*,¹³ Darren Heinrich makes a transcription of a Jimmy Smith solo in *Moonlight in Vermont* and specifies a thumb glissando. (see fig.7)

Fig.7. Thumb glissando, *The Afrological Soul of Jazz Organ*, p.97.



¹² Mark Vail, p.181.

¹³ Darren Heinrich, *The Afrological Soul of Jazz Organ*, 2017. p.97.

In *The Hammond Organ Beauty in the B*,¹⁴ glissandi are notated as in fig.8 & 9. The 'X' noteheads are of approximate pitch. Here the type of glissando is not specified, though I envisage palm glissandi would work best.

Fig.8. Glissandi, *The Hammond Organ, Beauty in the B*, p.183, Ex.22.

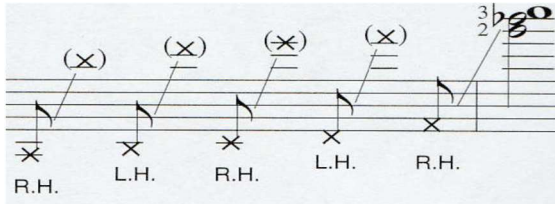


Fig.9. Glissandi, *The Hammond Organ, Beauty in the B*, p.183, Ex 23.

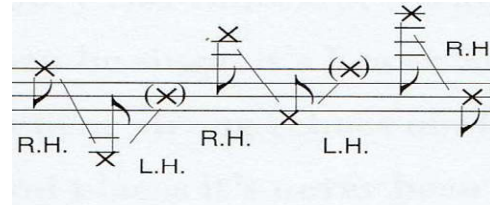


Fig.7. is a transcription and by nature accurate. Fig.8 & 9 are study aids; something that might be practised in isolation with the intention that it may be used in an improvisation at some stage. Could either of these notations be used in a Hammond score part? Quite possibly, but care would have to be taken. In *Thoughts on Composition and Improvisation*, Chris Dobrian asks whether an increase in notation frees the performer from decision making or overburden them with responsibilities.¹⁵ In the Hammond jazz genre, the hazard of overburdening is to be avoided.

Jazz Hammond notation development

I composed *One Cool Cat*, for Hammond organ and big band, and *I Sing my Song* for gospel choir and Hammond organ in research and development of Hammond notation. Here is a sample of the notations used with a description.

Fig 10. Rake.



Rake. (see fig.10) The forefinger is held flat to glissando. More than one note should be held creating a blurred sound. Here, the mode is specified.

¹⁴ Mark Vail, p.183.

¹⁵ Chris Dobrian, *Thoughts on Composition and Improvisation*, 1991, ch.1. para. 5.

Fig.11. Palm gliss.



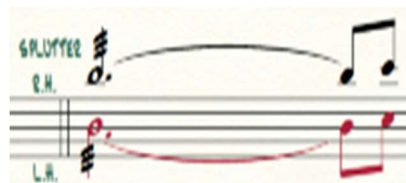
Palm gliss. (see fig.11) The palm of the hand is held flat, with mode specified.

Fig.12. Cat.



Cat. (see fig.12) A quick palm glissando up and down, here with the left hand on the lower manual, sounding like a cat's screech. This is a new notation.

Fig.13. Splutter.



Splutter. (see fig.13) This is a tremolo on one note usually sporadic. This example is 8ve doubled. This technique is easier on the Hammond due to the keys' high trigger point whereupon partial note presses are possible.¹⁶

These notations could be reused and adapted given the correct circumstances. However, if composing for jazz, fully notating a whole piece in this manner would be akin to forcing one player to imitate another player's transcription. In *The Jazz Solo as a Virtuous Act*, Stefan Caris Love writes "Motivic coherence is a virtue, but formulaic recurrence is aesthetically neutral".¹⁷ A purely neutral performance by the Hammond organist in *Philly '63* is something I was keen to avoid.


¹⁶ Giulio Moro, Andrew P McPherson, Mark B. Sandler, *Dynamic temporal behaviour of the Hammond organ and its perceptual significance*, 2017, ch.III B.

¹⁷ Stefan Caris Love, *The Jazz Solo as a Virtuous Act*, 2016, p.66.

Philly '63

Philly '63 for Hammond Organ and Jazz Orchestra portrays a day in Philadelphia in 1963. The jazz orchestra's parts are mostly arranged. The Hammond part is a mixture of notational styles. The aim of this notation is to guide rather than constrain the organist. This is to allow the organist a large creative stake in the piece. The pedalboard is not required as there is a bass in the jazz orchestra. All drawbar, Leslie, percussion, and chorus settings are suggestions only. Any conventionally notated music should be played as written. The rest of the organ part is improvised. A framework of instructions is provided as a guide. The Hammond organist assumes the role of a reactive observer, so textual artistic stimuli are given to help the organist perform this role. Fig.14 shows the notations/instructions used in the Hammond part.

Fig.14. Table of Hammond organ notation in *Philly '63*.

Bar no.	Notation/Instruction	Description
<i>b.1</i>	UPR 888000000 LWR 505000000	Suggested drawbar registrations for upper and lower manuals.
<i>b.1</i>	LESLIE <i>slow</i>	Rotating speaker on slow.
<i>b.1</i>	V/C (C2) <i>on</i>	Vibrato/Chorus setting.
<i>b.1</i>	PERC <i>on</i>	This gives a xylophone-like ping to the attack of each musical phrase. ¹⁸
<i>b.1</i>	You're the eye in the sky	Artistic direction to aid interpretation.
<i>b.3</i>		Tremolo on one note with thumb and forefinger, sporadically in this example.
<i>b.20</i>	Weaving through traffic	Artistic direction. ¹⁹

¹⁸ Giulio Moro, Andrew P McPherson, Mark B. Sandle. ch. IV.

¹⁹ Here, artistic directions are verbal improvisational stimuli for the organist.

Fig.14. cont.

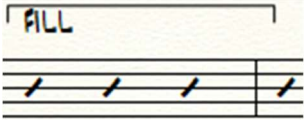


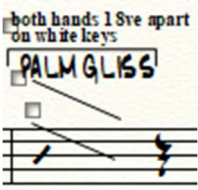
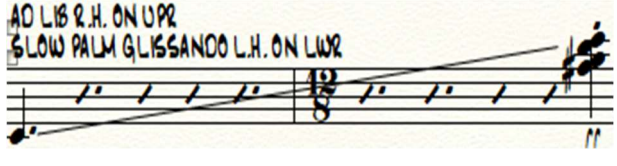
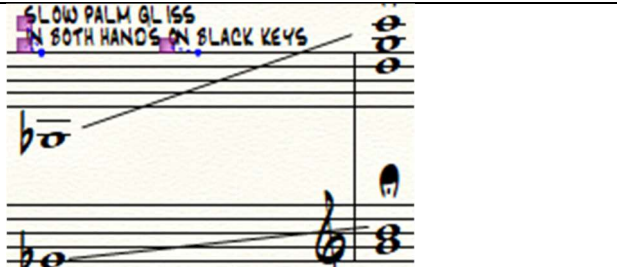
Bar no.	Notation/Instruction	Description
b.20		Ad lib solo for the bracketed time. This is standard terminology in big band jazz notation.
b.25		As a fill but shorter with significant dynamic impact. (new notation)
b.32	Fills on upr manual Comp on lwr manual	Comping with left hand on the lower manual thickens the harmonic texture here.
b.56		Ad lib solos can spill over the bracketed time, here over the orchestral parts. (new notation)
b.75	ORGAN TACET	This tacet overrides any other instructions given for the bracketed time, even if slash notation is used at the same time. In this example there are rests, but the tacet emphasises this.
b.77		Use the palm of the hand flat to gliss. Here, both hands one 8ve apart on white keys.
b.88	SOLO AD LIB SQUABBLE	As described on p.5, para.3.
b.88	Chillin' out	Artistic direction.
b.108	Gradually melt into the crowd	Artistic direction.
b.170	A pre- eviction holler	Artistic direction.
b.170	Free solo ad lib on C minor blues on upper manual blues with r.h. only	Guidance in the performance notes suggests a monophonic solo to emphasise the vulnerability of the individual.
b.179	PALM SMUDGES	A palm slap lands flat on the keys, a gliss glides over them. A palm smudge is a mixture of the two and imparts a slight gliss to the slap. (new notation)
bb.179,187 & 195	Frantic, More frantic and Desperate	Artistic directions.

Fig.14. cont.

Bar no.	Notation/Instruction	Description
b.201		<p>Slow palm glissandi are good for dramatic effect and as such are useful at the beginning or end of a piece or section.</p>
b.203	<p>A post- eviction holler Free solo instruction</p>	<p>As b.170 but the suggested drawbar settings use only harmonics and not the fundamentals. This creates a timbre of resignation.</p>
b.205	<p>Walkin' the night streets</p>	<p>Artistic direction.</p>
b.254	<p>Sittin' in on the Chitlin'</p>	<p>Artistic direction. The organist is soloing with the house band. The Chitlin' Circuit was the name given to African American owned venues that wanted music that entertained the masses rather than avant garde jazz that entertained the few.²⁰</p>
b.292		<p>As b.201, but with both hands, and on black keys. The pitch interval between the hands is not important here, but the origin and target notes are notated exactly.</p>

Evaluation of Hammond notation in Philly 63

I asked two other Hammond organists to play the Hammond part along with a mock up midi recording. Each performance was different but equally effective. They commented that it was good to read the performance notes and registrations, but that it was sensible that these were suggestions as Hammond players' drawbar settings are a very personal and sometimes even a secretive matter.

²⁰ Darren Heinrich, p.8.

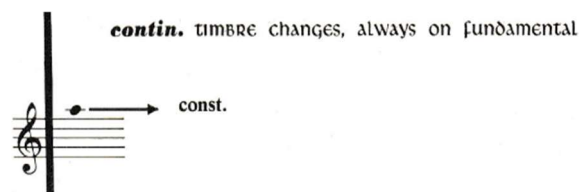
The Hammond organ in contemporary classical music

There is a scarcity of material composed for the Hammond in contemporary classical music – only three pieces in published circulation: Jon Lord’s *Durham Concerto* (2007), Anders Koppell’s *Concerto for Hammond Organ and Orchestra* (2018) and Karlheinz Stockhausen’s *Mikrophonie II* (1965). Having researched all three, it was the non-standard notation of *Mikrophonie II* that showed scope for development.

Mikrophonie II, was composed by Karlheinz Stockhausen (1928-2007) and first performed in Cologne in 1965. The instrumentation is for 12 voices, Hammond organ, 4 microphones, 4 ring modulators, and 1 tape recorder.

The Hammond is barely audible in this piece. Its electrical signals put together with the vocalists’ output through microphones are distorted by ring modulators, having the effect of placing the listener in a ‘sound bath’.²¹ Here is a sample of Hammond specific notation used.

Fig.15. Sustained note, *Mikrophonie II*, moment 1.



The arrow notation in fig.15 uses the instrument’s capacity for sustained notes.

Fig.16. Drawbar notation, *Mikrophonie II*, moment 20.

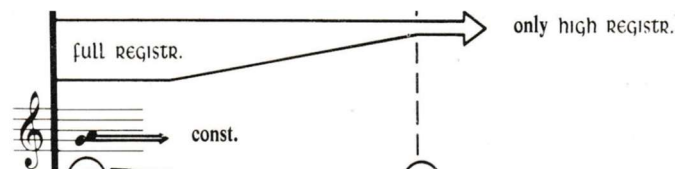


Fig.16 shows Stockhausen’s notation for the drawbars. Here all the drawbars are pulled out, then the lower pitched drawbars are gradually pushed in leaving only the high register. This could be more accurately notated by specifying exactly which drawbars move.

²¹ Larson Powell, *The Differentiation of Modernism: Post-war German Media Arts*, 2013, p.10.

Fig.17. Cluster Glissandi, *Mikrophonie II*, moment 26.



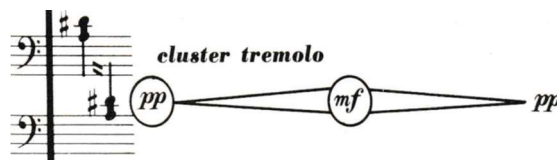
Fig.17 is an example of the composer's notation for cluster glissandi, similar to palm glissandi in jazz Hammond.

Fig.18. Very rapid struck clusters (hand's breadth) around E, *Mikrophonie II*, moment 28.



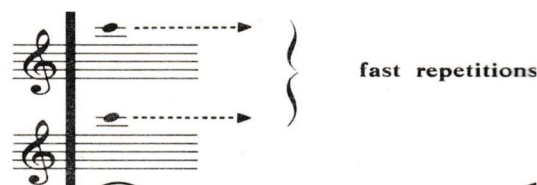
The composer's clusters in fig.18 suggest something similar to palm slaps, a technique used in funk Hammond.

Fig.19. A cluster tremolo between one hand on the upper and the other on the lower manual. *Mikrophonie II*, moment 30.



With the cluster tremolo in fig.19 Stockhausen makes use of the Hammond's two manual set-up. This cluster tremolo would be difficult on an instrument with only one manual/keyboard.

Fig.20. Fast note repetitions, *Mikrophonie II*, moment 33.




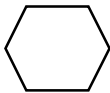
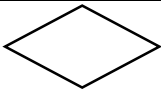
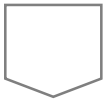


In fig.20 Stockhausen notates fast note repetitions. This is called a splutter in jazz Hammond, though some splutters are sporadic and others are constant.

In *Mikrophonie II*, according to Kevin Svenson, the choir and the Hammond organ modulate each other.²² Together with tape recordings and distortion this creates an overall output. In this piece, the timbral possibilities of the Hammond organ as a solo instrument have not been utilised. However, Stockhausen's innovative approach to notation for the instrument provided me with developmental ideas for *Seven Last Words from the Cross*.

Contemporary classical Hammond notation development

In research and development, I composed *Exorcystem* (see fig.22) for solo Hammond organ. For this, I chose flowchart systems (see fig.21) as the skeleton for the notation.

Fig.21. Table showing basic flowchart shapes and their functions.²³

Shape	Function	Shape	Function
	A process		A preparation
	A decision		An off-page connector
	A delay		A connector

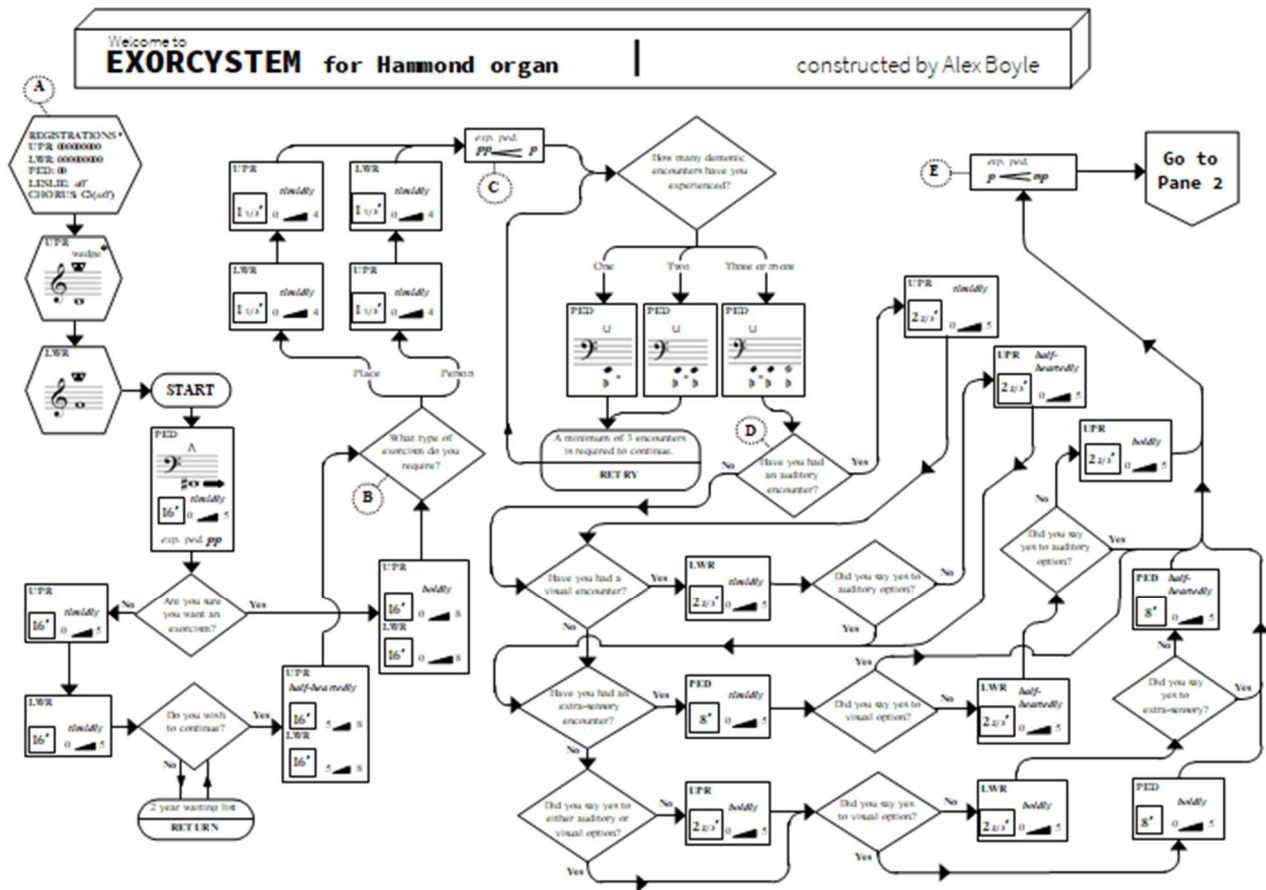
I evaluated the musical potential of these symbols. A rectangle (process) could contain conventional notation or instructions to engage or disengage the Hammond's functions (drawbars, Leslie speaker, percussion, and expression pedal). A hexagon (preparation) could contain Hammond registration settings before commencement or the wedging of keys before allowing sound via the drawbars. A diamond (decision) could involve making a musical choice before entering a musical process. An elongated D-shape (delay) could contain rests or brief respite to something that was previously continuous. A triangle ended

²² Kevin Svenson, *Lord of the Ring Modulators*, last accessed 16/08/2022, p2.

²³ rff.com/flowchart_shapes.php, last accessed 16/08/2022

square (off-page connector) could be used to aid page-turns. The arrows (connectors) could bring order and direction to the piece.

Fig. 22. *Exorcystem*, (pane 1).



One advantage of the compositional flowchart is that multiple notational ideas could be used across one format. The use of decision diamonds in *Exorcystem* allowed the piece to be multi-directional at the performer's behest, but in this case, with the same inevitable outcomes. However, for *Seven Last Words from the Cross*, I needed a system that gave the composer more control over form.

Seven Last Words from the Cross

The seven last words (or sayings), are a collection of expressions of Jesus Christ on the cross, collected from the first four gospels of the New Testament. These sayings are called words of Forgiveness, Salvation, Relationship, Abandonment, Distress, Triumph, and Reunion. My intention was to reflect these human states that might be compressed in time when coming to terms with one's earthly demise.

There have been at least thirty musical interpretations of these sayings, the earliest known being a cantata by Heinrich Schütz in 1645.²⁴ Pamela Decker, Charles Tournemire, and Ruth Zechlin are among composers who have written versions for the pipe organ. I have found none composed for the Hammond.

Seven Last Words from the Cross for Hammond organ is a meditation for Holy Week. Though nominally divided into seven 'words', it is one piece without breaks.

Traditionally, perceived silence has been used to punctuate music. Conversely, I wanted a continual flow of sound in this piece. Here, sound is reflecting emotion. There is an assertion that emotions are ubiquitous to human life, and that contrasting emotions can be experienced simultaneously.²⁵ The ability for the Hammond organ to sustain notes and evolve them via the drawbars proved invaluable in portraying this feeling of unerring mixed emotions. The only perceived silence should be before the piece has started and when the piece ends.

I used a notational system that was a hybrid of conventional left to right music notation and flowcharts. Using a flowchart allowed the presentation of Hammond specific notation enclosed within process shapes. Using conventional left to right notation helped communicate pitch and duration.

The following modifications were required: There was no need for the diamond shape used for decisions as there was to be a set course. I had no need for the D-shaped delay command - sound is constant. I used small rectangles for

²⁴ Vaughn Roste, *The seven last words of Christ: a comparison of three French romantic musical settings by Gounod, Franck, and Dubois*, 2013, p.47.

²⁵ Debra Trampe, Jordi Quoidbach, Maxime Taquet. *Emotions in Everyday Life*, 2015.

musical processes within larger rectangles that functioned as a replacement for the conventional music system. I used large off-page connector shapes (see fig.23) to connect each 'word', and small off-page connectors to connect each musical system – This aids reference within the piece.

To supplement key strikes as being a mode of musical delivery, I used the notation for the drawbars devised in *Exorcystem*. In preparation hexagons, (see fig.23) registrations are set, and instructions given to wedge down keys on the upper and lower manuals – for this task, a clarinet reed works well, or a weight for multiple keys. The wedge symbol used was conceived in *Exorcystem*. The wedged or weighted notes do not have a heard existence until the drawbars realise them.

Fig.23. Preparation hexagons, *Seven Last Words*, 1a.

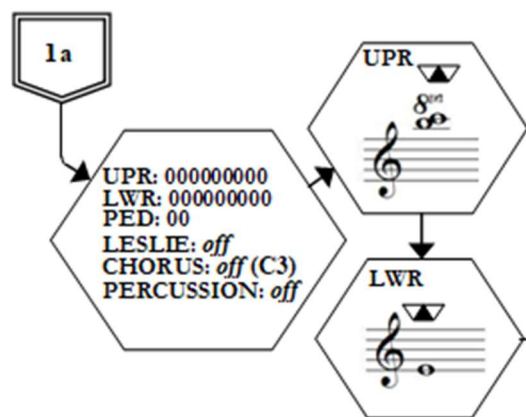


Fig.24 shows the notation used for drawbar application.

Fig.24. Drawbar notation, *Seven Last Words*, 1st process rectangle of 1a.



This indicates moving the 1' drawbar from 0 to 8 on the upper manual in the space of 5 units, a unit being approximately the time between heartbeats. This should vary from person to person and with emotional state.

Multiple instructions within the same process rectangle should be made simultaneously.

The use of drawbars in this piece is not merely the control of timbre. They create musical motifs. The first two process rectangles of 1b present a motif representing a two syllable utterance. A child instinctively cries for help with such an utterance, often interpreted as Mama or Dada, so this motif suggests helplessness. Variations of this 'Mama' motif appear near the beginning of each 'word', either by drawbar movement (see fig.25 & 27) or key strike. (see fig.26)

Fig.25. Opening 'Mama' motif 1b.

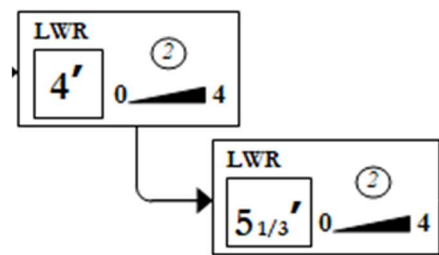


Fig.26. 'Mama' motif using key strike 3b.

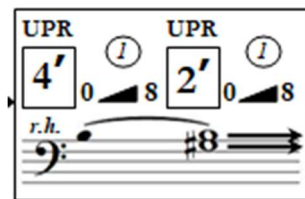
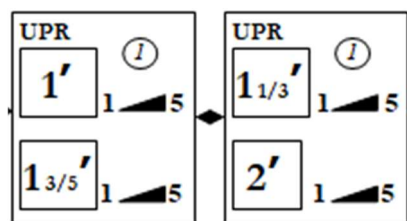


Fig.27. Return of 'Mama' motif 4b.



Key strikes with either finger or foot are notated with the use of noteheads on cleffed staves. Crotchet noteheads last approximately one unit, or notes not to be dwelt upon. Minim noteheads last approximately three units, or notes that should be moderately dwelt upon. A semibreve notehead is a note that is sustained until instructed to release, or to play another note. Unless accompanied with a wedge sign, (see fig.23) semibreve noteheads have thick black lines with arrow heads or circle heads following them. (see fig.28 & 29)

Fig.28. Sustained note, 2nd process rectangle. 7b.

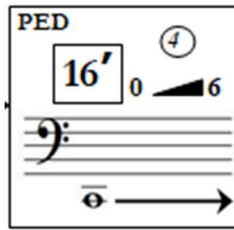


Fig.28 shows a note sustained until further instruction.

Fig.29. Sustained and curtailed note, 2nd process rectangle 4o.

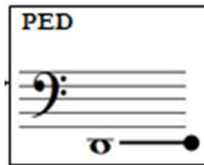


Fig.29 shows a note that should be sustained and curtailed.

Fig.30. Splutter, 2nd process rectangle of 5e.



Fig.30 shows a note that should be spluttered before being curtailed. (see fig.13 for splutter description)

Character of each of the seven 'words'

Forgiveness uses a high pitched wedged minor second (2nd preparation hexagon of 1a) to signify a constant piercing pain. The drawbar usage forms a fanfare showing triumph through adversity.(1b-1l)

Salvation begins with the 'Mama' motif (3rd process rectangle of 2a) rising in pitch representing hope, but is this hope created by delusion from a lack of water? This is shown by the 'dripping' tone row in the second process rectangle of 2g. A repeated 'paradise' motif at the 1st and 4th process rectangles of 2h, and 2nd process rectangle of 2i, attempts to mentally suppress the thirst.

Relationship shows that the pain of dying is not a sole experience. The use of harmony reflects this. The piercing pain of the minor second returns for this 'word'. (1st hexagon 3a)

Abandonment uses the 'dripping' tone row in the bass, (from 4c) with variations, but this row is abandoned each time without culminating in its twelfth component. The sense of frustration at this, is heightened by erratic pumping of notes. (see fig.31) This is not the same as an accent. The peak of the pump comes after the key strike. This should have the feel of a pounding headache.

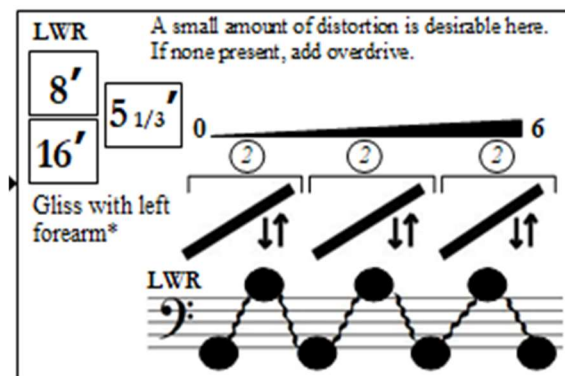
Fig.31. Pumping symbols, 3rd process rectangle 4d.



The tone row is eventually completed at 4n, (2nd process rectangle) showing that maybe he/she has not been abandoned.

Distress has a sedate pace where variations of the 'dripping' tone row return in harmony, (5b) interrupted periodically by the recurring 'paradise' motif. (e.g. 2nd process rectangle 5c) The forearm glissandi, with its discord and distortion, portray the apparent futility of the fight for life. (4th process rectangle of 5a. See fig.32)

Fig.32. Forearm glissandi, 4th rectangle of 5a.



Triumph consists mostly of rapid key strikes as elements from previous 'words' return. This depicts someone's life rushing before their eyes, before they finally

give up the ghost. New more hopeful material replaces the torment at 4th 'bar' of 6n. This is more a release than a tragedy.

Reunion repeatedly uses the 'paradise' motif (beginning 5th rectangle of 7b) ascending within a whole tone scale. This suggests a reunion with a greater being. The 'Mama' motif returns as the inner child is now reunited with his/her parent. (2nd and 3rd process rectangles of 7a) This 'word' contrasts with the previous six, as the rising dynamic does not meander, so conveying unearthly power. This culminates with the 'paradise' motif in layered perfect fourths representing spatial awe. (3rd process rectangle of 7h)

Expression Pedal Indicator

The Hammond organ is not a touch sensitive instrument. Dynamic control is exercised by different means. Switching the Leslie speaker to slow or fast, (or chorale to tremelo) has the effect of adding volume as well as modulating the frequency. The drawbars control volume - as does the volume dial. However, it is the expression pedal that has the most instant way of controlling volume. Rather than bundling all these controls together using conventional hairpin or piano/forte style notation, I used different dynamic notation for each component. The expression pedal indicator uses a grey scale, with black to indicate a loud dynamic on the expression pedal and very light grey to indicate a soft dynamic. (see fig.33) Bulges appear at apex moments.

Fig.33. Expression pedal indicator, 2e.



Evaluation of Hammond notation in Seven Last Words

I asked two other Hammond organists to perform this piece. I asked them to read the performance notes and practise the piece for an hour before performance. Their renditions were very similar to what I had envisaged. Most of the variation was time related – either in length of individual processes or in length of the whole piece. Between the three of us, the shortest performance was 21 minutes and the longest was 25 minutes. This difference was anticipated.

Conclusion

The Hammond Organ Company were successful in marketing their products to the domestic market.²⁶ Notated music was printed for this end. The instrument's potential has been constrained by these notations. In the jazz, gospel, and rock genre, Hammond use has flourished. Here the instrument's potential has been released by the skill of the performers. But a lack of any detailed notation of these skills has made the transfer of them problematic. In *Philly '63* I chose not to notate exactly every Hammond specific technique available. I felt this would be an imposition on the performer and would not achieve musical success.

The composition process for *Seven Last Words from the Cross* shows that a new approach to notation is useful in realising the Hammond's potential in contemporary classical music. This approach to notation may well have to be tailor-made to the requirements of each piece composed. However, though there are many Hammond players, fewer are content to read music – conventional or graphic.

Music notation primarily exists to communicate between composer and performer. If the skills of the performer vary from genre to genre, the composer must take this into account. Because of this, my notation for both compositions contrast vastly. The scope for some common ground between the aural tradition of Hammond playing and the traditional classical desire to notate is limited by keyboard notation designed for the piano and pipe organ – not the Hammond. A more nuanced approach to notation for the Hammond organ is needed. Further research would expand these notational possibilities and could help establish Hammond specific notational conventions.

²⁶ Scott Faragher, *The Hammond Organ*, pp.15-27, pp.15-27.

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