Playing the changes: rediscovering the lexicon of electronic organ performance practice from 1943 to 2015

Playing the Changes:
Rediscovering the Lexicon of Electronic Organ Performance Practice from 1943 to 2015

CHRISTOPHER STANBURY

A thesis submitted in partial fulfilment of the requirements of
The University of West London for the degree of Doctor of Philosophy

February 2017

Contents

Acknowledgements

My thanks go to the many people that have helped and supported me during the course of this research. Firstly, I would like to thank my supervisors for their help and guidance: Robert Sholl, who has provided exacting and inspirational assistance throughout, and Francis Pott, whose advice and patience benefitted the work significantly. I would also like to acknowledge with gratitude the support of Maria Pennells and the rest of the INSPIRE team at the University of West London.

Some of my earliest memories are of my parents, Colin and Lynne, giving up their time to take me to organ concerts, exhibitions and countless music lessons. Their unending support encouraged an interest in me that was to form the basis of my professional life. I will always remember and be hugely grateful for their unquestioning confidence and generosity. I would also like to thank my sister, Alix, who provided assistance in the early stages of this project.

Thanks are also due to my colleagues and friends who have found the time to listen to my ideas and offer guidance. In particular, I would like to pay tribute to the enthusiasm and interest shown by two dearly missed teachers: Tony Back and the inimitable Eddie Harvey.

Finally, I would like to thank my wife, Natalie, for her help and understanding throughout the duration of this project. Her encouragement and faith proved essential for the completion of this work.

Abstract

This thesis explores the historical development of the electronic organ via the survey, analysis and comparison of stylistic practices heard in historic recordings.

This project establishes that the instrument went through several significant stages of development since its introduction in 1935, which have hitherto been undocumented in scholarly work. As this thesis will show, the changing design of the instrument can be aligned with an evident expansion in the stylistic lexicon of musical arrangement and performance.

This aural-based micro-genre of electronic music is rediscovered via a multi-faceted survey model that triangulates the results of transcribed recordings, reconstructive performance on period instruments and practitioner survey. This addresses the typical challenge of historical instrument study: that of defining the degree to which technology shapes musical performance.

Chapter One places the instrument within a cultural context via a review of literature. The reason for the instrument's lack of appeal to musicologists is explained as the result of an image problem: the instrument is often regarded as a dated appliance of home entertainment and exists within a method of practice which aligns more closely to that of jazz than Western art music. By removing stereotypes and establishing the displaced cultural values that the instrument embodies, it is possible to see the true value of the research process.

Chapter Two begins to present the findings of the survey by examining some of the earliest recordings made on the Hammond organ. The chapter illustrates how certain design flaws in an instrument that was originally

intended as a low-cost replacement for a pipe organ led to an entirely different trajectory than the inventor's initial ecclesiastical application.

Chapter Three details further updates to the original Hammond design whilst correcting and expanding upon previous definitions of features that are defined in literature. The Lowrey organ is also introduced, along with an illustration of why the unique features and tonal qualities of the instrument resulted in a different approach to musical arrangement and performance.

Chapter Four documents the introduction of emulative voicing, whereby instruments of the nineteen seventies and early eighties were designed to imitate the sound of other acoustic instruments. The resultant change in arrangement and performance style is illustrated and compared to the results of previous chapters.

Chapter Five details instruments made by the Yamaha Corporation that feature digital synthesis technologies. The vast distance between these instruments and previous models, both in terms of technological profile and resultant performance practice, is illustrated and discussed.

Chapter Six provides a summary of the survey findings and re-examines the evident changes in the instrument and performance practice. The nature of the relationship between organist and instrument is discussed, along with a return to some of the literature reviewed in Chapter One. Discrepancies between the conclusions of some authors and those of this thesis are outlined and discussed.

Introduction

> Electronic organs designed for concert use fall into two categories – those for classical music (similar to and usually interchangeable with church models) and those for light music (which often resemble the earlier cinema and theatre pipe organs)… The other important type of electronic organ is the small home or entertainment organ, which usually includes performance aids and special effects to enable inexpert players to create a good impression (Davies, 2016).

> More practically oriented keyboard instruments included the organs by Laurence [sic] Hammond. These organs became popular and found their way into churches and religious congregation halls as good-sounding and relatively cheap replacements for pipe organs (Rudi, 2015, p.30).

To date, there is little scholarship on the electronic organ beyond brief summaries of the type shown above, which are usually found in musical encyclopaedias or works concerning broader topics of music technology.

Definitions such as these refer to the electronic organ as either an emulation of the classical or theatre pipe organ, or dismiss the instrument as a domestic appliance that supports rudimentary performance in the home. Rudi (2015) misrepresents the instrument, referring only to one early type and not mentioning the electronic organ's later substantial stylistic and technological

development.[1] Additionally, a fundamental error in misspelling Laurens Hammond's name promotes a certain suspicion that the work is not as thorough as it perhaps could be.[2] Davies (2016) is a further example of a work that provides little insight into the true diversity of the instrument and associated performance practice.

As this thesis will show, there is a lot more to the electronic organ and its music than that described by current literature. Continued product development led to substantial changes in the tonal capabilities of each generation of instrument, creating new opportunities for musical expression and practices that are not identified or documented in any extant scholarly work.

This lack of interest in the instrument and the resultant vacuum in knowledge leaves current assumptions untested, in part because the instrument is no longer regarded within a supportive cultural and artistic context.[3] This is mostly due to the fact that evidence of what these metamorphosing instruments can achieve, and how it is achieved, is now very difficult to come by. This perpetuates a cycle of assumed irrelevance, which is an injustice to the highly skilled musicians that participated within this niche genre of modern keyboard music. This is a pity since, whether these

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[1] Other examples of this practice are found in Davies (2006, pp.164-169), Riley (2005, pp.60-61) and Holmes & Holmes (2002, p.70).

[2] In addition, the assumption that Hammond organs were considered 'good-sounding' in church venues is challenged by Vail (2002, p.49).

[3] Taylor (2001, p.16) describes similar concepts as belonging to the 'general significance' of technological artefacts. According to Taylor, such artefacts are ascribed value and meaning based on 'existing social relations and cultural forms'. It therefore follows that, once these social and cultural forms change over time, technological artefacts either loose their significance or become symbolic of past trends.

instruments are liked or not, the cultural sphere in which they occupy offers several musicological possibilities which are attractive: the investigation of an aural-based, undocumented musical subculture; the opportunity to study the alignment of technological development with early electronic music performance practice and the chance to triangulate these observations with ethnomusicological forms of research.[4]

This thesis explores the potential of this very domain by identifying and documenting important stylistic practices within a newly established history of electronic organ development. These practices are related to the recorded performances on which they are heard and are aligned with the distinctive technological profile of the instruments on which they were made.

Much of the performance practice related to the instrument exists in non-textual form as historical performances preserved on long-deleted vinyl records and in the personal experience of surviving organists. With most of these practitioners approaching their senior years, this thesis aims to curate and recognise their skills in performing on instruments that were some of the vanguard electronic musical devices of the twentieth century.

[4] For example, a typical method could address the adoption of digital technologies in electronic organ performance by first recreating recorded performances on original instruments and drawing a primary set of conclusions which are then verified by interviewing the original artiste. This would give a better insight into the way the musician works with the technological profile of the instrument than solely via transcription or what Nicholas Cook (2013, p.255) calls ‘Elvis impersonation’.

Specifically, the research addresses the following questions:

1. How did the practice of electronic organ playing as demonstrated in recordings change between the instrument's introduction in 1935 and 2015?
2. What were the important changes to the design of the instrument during this period?
3. Can it be demonstrated that any identified elements of instrument design had agency[5] over musical practice?

This aim is realised in the following ways:

1. By collating, transcribing and analysing a series of historical recordings via reconstructive performance on period instruments.
2. By exploring what parameters can be used to understand what is meant by 'performance practice' in electronic organ music and how these parameters can be used to define elements of the performance art.
3. By using these established parameters to contextualise and define the change in practice during the past eighty years of electronic organ performance, referring to the selected transcriptions.

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[5] Taylor (2001) uses the term 'agency' to define the degree to which a technology essentially affects or shapes the product of its use. Reflecting on Taylor's definition, musicologist Andrew King (2016, p.47) affirms its relevance within musical contexts, providing the example of 'digital technologies in the recording studio [that] have influenced workflow and within this decision-making that has directly affected practice.'

This research uses recordings, scores, interviews and instrument surveys in order to address these questions and, ultimately, gain an understanding of the development of the electronic organ and its music. The comparative use of historic recordings is an emerging discipline in musicology and this study will prove valuable not just in the data collected but also as an example of successful interdisciplinary musical research. Given the comparatively recent historical focus, there is opportunity for this study to have the results of reconstructive performance being affirmed and supported by the views and opinions of surviving organists, or 'practitioners', from the period. As will be discussed later, this is a relatively unusual scenario within the sphere of historical performance practice research.

Outline of Thesis Structure

This thesis consists of six chapters. Chapter One begins with a discussion that contextualises the electronic organ and offers a summative history of the instrument to date. A critical evaluation of stereotypes surrounding the instrument follows: relevant theories on cultural iconicity, historical aesthetics, musical democratisation and consumerism are used to explain why the electronic organ suffers from an inauspicious image in both popular culture and musicology.

An engagement with relevant considerations of technology, recording, orality and performance within musicology forms the basis of a subsequent literature review and the framework of enquiry for this study. The chapter

concludes by outlining the selected research method and its associated parameters.

Chapters Two, Three, Four and Five contain the main body of investigative research and analysis generated in this study. Each of these four chapters surveys a different class of electronic organ that is demonstrably different in tone, operation and core technology to those illustrated in other chapters.

Chapter Two begins by examining the first models of electronic organ made by an American manufacturer, the Hammond Clock Company, between 1935 and 1962. The technological profile of an instrument that was originally designed to be a cheaper alternative to a pipe organ is outlined, together with an exploration of why certain flaws in design and sound production limited initial ecclesiastical appeal. A description of the Leslie rotating speaker and its pivotal role in the subsequent success of the Hammond organ follows, illustrated with reference to the results of organist interview. Early recorded performances are recreated and analysed in order to show how performers of this era dealt with the shortcomings of early instruments. Definitions of certain functions of the organ in current literature are evaluated with reference to the new research carried out by this survey. The chapter concludes by defining common elements of performance practice and evaluating their alignment with points of concept identified in the literature review.

Chapter Three investigates selected electronic organ recordings made between 1963 and 1973. A survey of newer instruments produced by Hammond and those of the Lowrey Organ Company is conducted, with the workings of new features documented for the first time. Differences of design

between the two makes of instrument are evaluated and aligned via reconstructive performance with stylistic points heard on the selected recordings of the period. Instrument modification by organists is identified and discussed, along with other identified practices, in the final concluding remarks.

Chapter Four describes early orchestral organs made by Lowrey, Wersi and Yamaha that imitated acoustic instruments as well as organ tones. The impact of this change in design on performance practice is evaluated by means of performance reconstruction and organist survey. The chapter concludes with a critical evaluation of these new techniques and an assessment of their significance.

Chapter Five illustrates the results of regenerative efforts by the Japanese company, Yamaha, to realign the design of its Electone organs with that of a synthesiser. Now described as ‘multi-keyboards’, these instruments made extensive use of real-time digital processing, improved sound quality and process automation. The ways in which this gave players the flexibility to perform arrangements of increased complexity is discussed and demonstrated by means of two filmed performances.

Chapter Six summarises the findings of the investigative middle chapters and revisits the points of concept discussed in the literature review in light of the new research. The effectiveness of the multifaceted research model is also evaluated.

Chapter One

1.0 Introducing the Instrument, its Music and the Research Method

An important component of this thesis is the survey and description of the electronic organs used in each reconstructive[6] performance and associated period recording analysis. Later chapters will provide greater detail regarding the design and features of each relevant instrument, but a summary of the instrument's history and promotion by manufacturers is provided here in order to serve as a concise overview and an introduction to intertwined issues of cultural value and retrospective appreciation.

The purpose of this discussion is to establish that, as one of the first mass produced electronic instruments of the twentieth century, the electronic organ embodied a range of cultural semiotics[7] which were not aligned or

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[6] As will be explained further in Section 1.6, the reconstructive element of these performances refers to the transcription and recreation of various historical performances heard on audio recordings made between 1943 and 2015.

[7] The study of semiotics has roots in the work of, amongst others, linguist Ferdinand de Saussure (1857 – 1913). In a work published posthumously, Saussure suggests that any object or text can be interpreted as a sign that unites a sound-image and a concept, the 'signifier' and the 'signified' (Saussure, 1915, pp. 66-67). As social scientist Arthur Berger states, 'in semiotic analysis, an arbitrary and temporary separation is made between content and form, and attention is focused on the system of signs that make up a text. Thus a meal […] is not seen as a steak, salad, baked potato and apple pie but rather as a sign system conveying meanings related to such matters as status, taste, sophistication and nationality (Berger, 2014, p.6). If the electronic organ and its music is regarded as a 'sign system', to use Berger's terminology, then it therefore follows that elements of a performance, live or recorded, such as the sound of the instrument, the choice of music, the use of studio recording techniques and various musical parameters could all be interpreted as signs.

shared with the values of mid-century Western art music (hereafter referred to as WAM) and its associated musicology. This is the principal reason for the instrument's rejection by musical research: its unusual and largely unknown ontology in terms of aesthetics, performance practice, and the way in which its music was disseminated place the instrument outside of any 'high culture' hegemony, which has been the traditional field of musicology up to the last decade of the twentieth century.[8] Furthermore, this chapter establishes that, despite significant advances in design and capability, the instrument remains disconnected from contemporary culture and as such is now often used as a comedic signifier for banal seniority and kitsch domestication.[9] This in turn closes down, or at least dissuades any attempt to study the instrument objectively.

This chapter shows why this maligned set of cultural semiotics must be understood and circumnavigated in order to discover the true meaning of the instrument, the music performed and the performers themselves. An evaluation of associated issues related to the wider concept of performance in

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[8] According to musicologists David Beard and Kenneth Gloag, although 'recent developments, such as critical musicology, have helped to form new insights into popular music that positively subvert the separation of music into categories of 'high' and 'low' […] one common interpretation of popular music has viewed it as inherently inferior to the 'high' culture of classical music.' (Beard and Gloag, 2005, p.133). As will be explained in Sections 1.3 and 1.4.1, there are elements of electronic organ music that align with the practices of jazz and popular genres.

[9] At the time of writing, the most recent example is to be found in a television advertisement for retailer TK Maxx: An octogenarian, 'Doris', spins around a car park playing an electronic organ on wheels whilst watching a motorcyclist do the same. However, this also shows how distorted and cliché the image has become: the 'organ' has two manuals, no pedalboard and produces a piano tone (TK Maxx, 2016).

interdisciplinary research follows and forms the basis of a literature review. The chapter concludes by drawing together different methods of enquiry and defining the survey method used in this study.

1.1 A Summative History of the Electronic Organ

The first electronic organ was introduced by the Hammond Clock Company of Chicago on April 15, 1935 (Faragher, 2011, p.8). Designed initially as a cheaper and low-maintenance replacement for the pipe organ, the Hammond Model A organ was met with some criticism by church organists of the time (Vail, 2002, p.14). This initial reproach was an objection to the design of the instrument, as there were significant discrepancies in the design of Hammond's instrument when compared to a conventional pipe organ console.

Whilst further product revisions attempted to address these design issues, the fact that the Hammond organ produced sound by electrical means rather than with organ pipes meant that the tone produced was very different, both in terms of frequency content and attack (the speed of sound onset). Later technical modifications by Hammond and third parties that were meant to give the Hammond organ tone more of a pipe organ aesthetic had a contrary effect, inadvertently opening up new applications for the instrument in popular and jazz music genres.

Initially marketed to municipal halls and places of worship, the Hammond Organ Model A cost $1193 USD at its launch in 1935, the equivalent to $20,989 at the time of writing (Coinnews, 2008). To coincide with the later switch to selling instruments to domestic homes, smaller and

cheaper instruments, known as ‘spinet’ organs, were introduced. These used the same technology as larger instruments but in more limited combinations of complexity and luxury. In order to create and support demand for its expanded product line, the Hammond company produced its own monthly newsletter, *Hammond Times*, organised public concerts and set up regional organ societies and teaching studios in order to stimulate interest in its products (Vail, 2002, p.4).

Competitors to Hammond entered the American market shortly after, such as the Lowrey Organ Company. As this thesis will show, Lowrey produced instruments that were distinctly different in design to Hammond, incorporating tones that sought to emulate the sound of acoustic instruments such as the trumpet, violin and guitar.

After the lifting of the ban on American imports by the British government on 4 November 1959, (Thompson, 2008, p.39 and Veysey, 1959, p.9), electronic organs began to be exported to the United Kingdom where they were promoted to the domestic market using the same marketing methodology as used in the United States.

An international market soon became established and the technological race was on to develop instruments with unique selling points: new features that would not only entice new customers to buy but also, for the first time in the music industry, persuade existing customers to part-exchange their current instrument for a newer model year after year (Théberge, 1997, p.34). By the end of the nineteen sixties, electronic organs in America were selling in the hundreds of thousands, nearly matching sales of acoustic pianos (Majeski, 1990, p.159).

At the beginning of the nineteen seventies, the electronic organ market saw new manufacturers enter from Japan; namely Yamaha, National Panasonic, Acetone and JVC. The entry of such competitors, with a manufacturing superiority that was similar to their counterparts in the Japanese car industry (Cusumano, 1988), saw the promotion of more elaborate 'easy play' features[10], improved sound quality and technical facility owing to manufacturers' development of custom-made microchips and computer processors.

The Japanese organ manufacturer Yamaha became dominant in the nineteen eighties, as the company had diversified into other instrument markets such as synthesisers and digital pianos[11]. This brought benefits both from economies of scale and the results of joint research and development across different company divisions. As a result, the company was able to employ superior technical resources into the design and development process of cheaper electronic organs, a practice that could not be used by competitors who had remained solely organ manufacturers, such as Lowrey and Hammond. This had two net results; the demise of these founding American

[10] Those termed 'performance aids' by Grove online (Davies, 2006) had existed in a simpler form in earlier instruments, such as the Hammond Chord Organ (Théberge, 1997, p31). The introduction of digital technology facilitated more advanced note processing options however, leading to more sophisticated accompaniments that could be generated automatically by playing a static chord on the organ.

[11] Yamaha's success in establishing the *Clavinova* digital piano brand as fourth in the 'The 50 Most Influential Gadgets of All Time' is testament to the company's achievement in this sector (Time Magazine, 2016).

companies from the market and the production of instruments by Japanese manufacturers that had an almost entirely different technical profile.[12]

By the end of the nineteen nineties, the electronic organ market was in steep decline. Many European and American manufacturers had ceased production or had been acquired by Japanese competitors. Owing to their investment in other areas of music technology, many Japanese firms were able to continue to manufacture electronic organs using parts developed primarily for synthesisers and other electronic instruments. Today, most electronic organ manufacturers are Japanese or Chinese, apart from small artisan studios in Germany.

By 2016, all of the established brands, including Yamaha, Technics and Roland had withdrawn from American and European markets. At the time of writing, Yamaha continues to market electronic organs in Asia and South America, its only competitor being the Ringway Corporation in China.

Ironically, current Hammond Organs now utilise digital technology to copy the sound and behaviour of the original models of eighty years ago. Crucially however, today's Hammond organs are marketed to the professional or semi-professional organist and keyboard player rather than the enthusiastic amateur: the 'easy play' features have been removed. The significance of marketing approaches by organ manufacturers is discussed in the next section of this chapter.

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[12] Today, both Lowrey and Hammond continue to manufacture electronic organs as subsidiaries of Japanese musical instrument companies: Lowrey forms part of Kawai Musical Instruments (Lowrey, 2016) and Hammond forms part of Suzuki Music Corporation (Hammond USA, 2016).

1.2 Bikinis, Safari Suits and Little Black Dresses: Icons of Culture

To wild applause, an effeminate and gangly character skips on to the stage: ‘Hello Shoppers!’ he shouts, ‘I’m Barry Morgan from Barry Morgan’s World of Organs!’ Climbing on to the organ bench, dressed in a grey safari suit and white moccasin shoes, Barry tells the audience he is going to show them his ‘one finger method, so as you can make beautiful music yourself in the comfort of your own home even if you’re a complete beginner’. Proceeding to play a few bars of a variety of classical themes on the ‘Hammond Philharmonic Symphonic String Orchestra… That’s right, the Hammond Aurora Classic puts an entire orchestra at your fingertips!’ complete with a driving rock drum beat and a number of technical insecurities and note errors, the audience erupts into laughter as Barry punctuates each new incongruous sound with a look of naïve ecstasy and amazement.

Figure 1.1 Stephen Teakle as Barry Morgan (BBC Radio 1, 2012)

The previous description is that of a performance by Australian comedian and session musician, Stephen Teakle at the BBC Radio 1 ‘Fun and Filth’ show at the Edinburgh Fringe Festival 2012 (BBC Radio 1, 2012). The entertainment aesthetic that Teakle seeks to create is obviously absurdist, but what is interesting to note is the way in which various cultural aspects are brought into focus via Teakle’s act. A discussion of this sketch is included as it engages head on with the issue of cultural relevance and displacement, an awareness of which is important in order to understand the reasons for the electronic organ’s image problem today. This thesis will show that the culmination of various negative cultural topics has been detrimental to the image of the instrument and that there is more complexity and value in the instrument than that parodied.

The first topic, which arises via Barry Morgan’s reference to the ‘one finger method’ and ‘making beautiful music in your own home’, is that of music domestication and the democratisation of musical skill. Théberge (1997, p.31) presents the Hammond Organ as a later embodiment of what began as nineteenth century domestic music making, of which the parlour piano was the most notable earlier symbol of middle-class aspiration. However, according to Théberge (1997, p.31), manufacturing instruments for the home and thus making music more accessible creates ideological rifts:

> The tension between the belief that acquiring musical skills requires concentrated effort (a work ethic) and the marketing requirement that all music-making be seen as a form of entertainment (a leisure ethic) has become one of the more

> enduring ideological and economic conflicts for the musical instrument trade during the twentieth century, both in its internal and external market relations. With the advent of electronic technologies designed for domestic entertainment, this conflict has become ever more acute.

There are similar parallels drawn by sociologist Robert Witkin (2003, p.107) in his description of popular music:

> The mechanized work process denies to many an experience of novelty or genuine change. They crave novelty in their leisure time but the strain experienced at work leads people to avoid making the effort which is necessary to any genuine experience of change. In place of this the individual craves ‘stimulation’. Popular music is one of the forms that this craving for stimulation takes.

Bearing the above quotes in mind, it is easy to see how the electronic organ falls very easily into the ‘leisure ethic’ contextual classification: the success of the instrument as a product relied on it being seen by consumers as a novelty: easy to grasp and requiring little musical skill to enjoy, in much the same way as the player piano of a few generations before was promoted. With the establishment of the *Hammond Times* and other monthly publications featuring product advertisements that highlighted the ‘easy play’ features (Théberge, 1997, p.100), it is no wonder that this image pervades as it was an important marketing strategy used by all electronic organ

manufacturers during the nineteen sixties through to the nineteen eighties. Obviously, this stereotype of a popularised, consumer-based instrument, aimed at enthusiastic amateurs is at odds with the basic concept of high-culture WAM, which is 'largely the product of an elite' (Cook, 2013, p. 225).

Figure 1.2 supports the view that Teakle's ridicule of the topics used by manufacturers' promotional material of the time is quite perceptive: the Yamaha advert on the left places the electronic organ firmly within the domestic lounge setting, whilst the included description of the instrument as the 'consummate console' depicts luxurious, domestic grandeur. The image on the right clearly shows the promotion of the 'one finger method', an embodiment of the democratisation topic, which is recalled in Teackle's depiction of Barry Morgan[13].

Figure 1.2 Organ advertisements from the mid nineteen-seventies

[13] Teakle's Barry Morgan is also a parody in characterisation, making visual reference to the marketing techniques used: note the wide grins both in Figure 1.1 and 1.2.

The parody of the ‘one finger method’ is a perceptive observation, but it does not reflect the reality that the instruments, in the right hands, could facilitate accomplished and imaginative musical performances’. In an interview for BBC Radio Four (DesignbyHemingway, 2012), Andrew Gilbert, demonstrator for Kawai Electronic Organs, recalls:

> We always used to promote the idea that it was easy to play and indeed they were. But, if you really wanted to learn to play properly then you really had to work quite hard at it. [Promotional events, which are the subject of Teakle’s parody] were always followed up by the in store parties, the wine and cheese evenings, and this was the hard sell.

To anyone who experiences Teakle’s routines, it is fair to say that the musical content is anything but ‘beautiful’. This is as much to do with the quality of electronic sound heard in Barry Morgan’s demonstration as it is to do with the dubious accuracy of the playing.

In other videoed performances available on YouTube (SoulJuiceTV, 2012), Barry Morgan demonstrates the individual sounds available on the organ to the audience for comedic effect. Barry’s expressions of wonder are at odds with what is heard: the quality and character of the banjo, saxophone and trumpet sounds that emanate from the organ are far removed from the tone of the true acoustic instruments. Clearly, when heard in an age where even a smartphone can be used to produce sophisticated musical compositions in software applications such as *Garageband*, the primitive and

basic imitations from an instrument produced forty years ago pale in comparison.

This therefore begs the question of how consumers could ever have been persuaded into thinking that the imitative sounds of the electronic organ were acceptable. As musicologist Nicholas Cook establishes, every generation has its own perception of sound fidelity, particularly when concerned with listening to sound recordings. This provides a credible explanation as to why ‘we hear the same technology quite differently from how it was heard in the early years of the twentieth century’ (Cook, 2013, p.361).

The implication here is that ‘early listeners willed the technology to work, connived in its illusions’ (Cook, 2013, p.363), even though to our twenty-first century ears these recordings sound scratchy and totally unrepresentative of an acoustic performance.

The sound of the electronic organ, similarly an appliance of domestic music like the gramophone and the later hi-fi system, benefits from this same phenomenon created by technological innovation: as David Wills proposes, ‘because technology evolves faster than culture, it is necessarily experienced as a particularly alienating form of disorientation’ (Wills, 2006, p.247). It is therefore understandable that, at the time of experience, the facilitating dimension of new technology can affect our scope of perception and objective analysis. In this case, the attraction and novelty of a paradigm shift offering improved access to domestic musical involvement (as both the gramophone and electronic organs certainly embodied) can soften critical judgement.

The influence of new technology embodied and symbolised in a sound recording, which can be replayed many times at the command of the listener, contributed to this false perception of sound fidelity: the convenience of being able to play music in the living room, instantly and at any time of day occludes the cognitive dissonance in the listener concerning sound quality. According to Guberman (2008, p.26), a similar phenomenon occurred at the beginning of the twenty-first century, which he defines as the era of 'post-fidelity', where sound quality in digital recordings diminished. Popular MP3 media devices, such as the Apple iPod promoted the ability to carry '1000 songs in your pocket'[14] using compressed audio files, giving an inferior sound quality to conventional compact discs in return for improved convenience and reliability.[15]

For David Wills, these 'technologies of instant interactivity have exiled us from ourselves and made us lose our ultimate physiological reference' (Wills, 2006, p.258).[16] He continues that 'there is now raised the possibility of a radical exteriorization and mechanization of certain linguistic functions, comparable to that of certain arithmetical functions that occurred with the

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[14] The strapline used by Apple to promote its iPod products (Isaacson, 2011, p.391).

[15] This is also described in Hepworth-Sawyer & Golding (2012, p.33). According to Daniel Chua, the iPod's functionality achieves the nineteenth century notion of the sonic rendering of the individual self: 'a machine that makes the inner audition the Romantics yearned for a consumer reality' (Chua, 2011, p.345). Chua continues: 'The iPod is a nano-sized TARDIS with vast internal storage; it not only replicates the spaces within the self, but is designed to create a huge invisible force-field that insulates the self from the outside world through sounds that are inaudible to everyone else' (2011, p.345).

[16] In a similar vein to Witkin's (2003, p.107) observation of the desire for stimulation without effort, Willls describes a similar phenomenon, whereby the skill and individuality of the self is diminished with the use of such technology.

invention of electronic calculators.' The sentiment here then is very much of the loss of certain skilled cognitive functions (of which the experience of crafted, complex musical performances both as a listener and performer is a natural extension) to a technological prosthesis that leaves the body 'without soul'. This resonates both with Cook's narrative of listeners marvelling at an early recording technology, which gave false fidelity, and with the recollections of Paul Carman, chief demonstrator for Orla Organs in Italy, that 'it didn't matter that the trumpet tone on the organ didn't really sound like a trumpet. It was all in our heads anyway' (Carman, 2015).

The reasons for the acceptance of the primitive sounds of the electronic organ *at the time* were therefore similar in principle to why early recordings were successful: it was new, it was a device that facilitated interactive music making, its new sound and concept was so different that it perplexed many and it appealed to the domestic pleasures of a buying public that, as will be discussed later, were newly-engaged with using technology in the home.

The broader perception of technology within the field of musicology will be discussed further, but to conclude this point it must be remembered that the electronic organ is an object that exists in a time and is of a 'temporal culture' (Taylor, 2001, p.113). By definition, the culture in which it belongs is different to that in which we now find ourselves and, in order to properly understand the device we must accept that it is an artefact that is 'clearly situated in a cultural context defined by time and place' (Thompson, 2008, p.7).

Referring to the cultural distance between the nineteen sixties and the present day, Thompson (2008, p.v) suggests that:

> A common joke among adults of a certain age insists that if you remember the sixties, you weren't there. Like many effective one-liners, this one plays on various kinds of truth. The primary premise of this gag references the substance abuse of the era, suggesting widespread brain damage and the inability to remember. However, the sixties transformed Western culture such that, in many ways, the people we are today *weren't* there: we *are* different.

If an audience member at Stephen Teakle's show laughs at Barry Morgan, it could be because they are reminded of a time when the instrument was popular and an organ salesman's technique was not too dissimilar from the caricature, hence the cultural distance between the then and now is embarrassing. However, it is more likely that, given the generally young demographic of audience members in Teakle's shows, they are made to feel uncomfortable by the cultural distance between themselves and what they see as being signified on stage: the electronic organ sounds absurd and facile when compared to today's perception of sound fidelity. They may also find Barry's wonderment at the way in which the instrument tethers elementary domestic music making to the confines of the domestic lounge uncomfortable and at odds with their lifestyle. Either way, Teakle's act establishes that the electronic organ in the guise featured in the show is of a different time.

Therefore, an understanding of the values of ‘displaced meaning’, ‘when cultures place their ideals elsewhere, available to be recalled at a moment's notice’ (Taylor, 2001, p.112) is vital in explaining how this instrument and its music was accepted as part of the popular culture of the nineteen sixties and seventies. In essence, although both the instrument and its music may sound trite and artificial to our ears, the concept of displaced meaning suggests that the impact of external, cultural factors at the time meant that its aesthetic was received in a different way. In other words, we now hear this form of popular music as being separate from its cultural associations and ideals that the consumer of the time would have been immersed in, and it therefore has no meaning to us.

To further this discussion, a brief consideration of popular culture in mid twentieth-century Britain is necessary. The Western world experienced a huge cultural revolution during this period that was not limited to the sphere of music. With the United Kingdom having just broken free of post-war austerity, ‘many eager young British aspirants saw an opportunity to succeed where birth right and class might have previously denied them access’ in emulation of the American demonstration of ‘how initiative and money could purchase position and privilege’ (Thompson, 2008, pp.17-18).

Much of the popular culture of the time reflected these socio-economic changes. Whilst the rise to national prominence in 1963 of the Beatles signified the rise of the newcomer over the British upper class, the popularity of keyboard-based records such as *Telstar* by the Tornados in 1962 signified the space race that would eventually put man on the moon by the end of the decade.

The role of technology in popular culture of the time should not be underestimated. Taylor (2001, p.96) suggests that this movement began as early as the beginning of the nineteen fifties. The spectre of the atomic bomb menaced the globe during this decade, from the appalling events over Hiroshima and Nagasaki in 1945 to the near-catastrophe of the Cuban missile crisis of 1962. Simultaneously an icon of terrifying total destruction and new technology, the atom also symbolised the forward-looking perspectives of 'free market capitalism, coupled with technological growth, [which] were thought to be able to solve all social and economic ills' (Taylor, 2001, p.41). Some commentators also suggest that the atom symbolises the beginning of the gender equality movement: the 'blonde bombshell' in a bikini, with obvious references to atomic warfare and nuclear testing, being a symbol of new status and sexual freedom for the independent woman (Taylor, 2001, p.93 and Toop, 1999, p.99).[17] This focus on new science can be found in the domestic environment too with the emergence in the same period of new labour-saving appliances such as refrigerators, vacuum cleaners and hi-fis. In effect, the softer side of science was used to promote 'commodity scientism', gradually introducing more technology into the home (Taylor, 2001, p.79).

A similar science-focused movement can be found in popular music of the nineteen fifties, termed 'space-age pop'. As an antidote to the exuberance of rock music, space-age pop was 'very meticulous, played with precision and skill' with an aesthetic that 'flies in the face of rock 'n' roll, which values energy and spontaneity over technique' (Taylor 2001, p.99). Whilst the ethereal and often strange combinations of instruments and Latin American rhythms may

[17] Defined by Toop as 'Bomb Culture' (1999, p.99).

sound ‘rather embarrassing [and] trite, despite the evident expertise and inventiveness’ (Taylor 2001, p.107), the displaced meaning ascribed to this music must be considered (Taylor 2001, p.114):

> The space-age pop revival is a complicated kind of displacement into the temporal culture of the 1950s, which holds displaced meanings of a better present in which there would be no nuclear war and technology would be cheap and simplify our lives.

Taylor also suggests that displaced meaning can be attributed to objects, their presence reminding the consumer of an idea or era that is now removed from reality.[18] To use this terminology, the electronic organ had at the time significant displaced meaning, as an example of new technology that had found its way into the domestic lounge (commodity scientism), which could be mastered by the beginner (democratisation of music and social revolution) and produced a variety of ‘other worldly’ sounds (the space race).

The hi-fi, another domestic appliance that became popular in the same period, has a multitude of displaced meanings. Apart from being another symbol of technological advancement in the domestic environment, the hi-if and space-pop were well suited, as the latter made use of the stereophonic separation effects that the equipment was able to provide. The fact that recordings were ‘in stereo’ was often stated on the front cover as a form of

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[18] Feldman implies a similar concept when recalling British Mod culture: ‘If a post-60s recall of Mod—imbued as it can be with nostalgic, wishful thinking—can transport us back to a better version of modernity, then it is the Vespa [motorcycle] that can take us there’ (Feldman, 2009, p.170).

marketing and appealed to the commodity scientism movement (Taylor, 2001, p.88). The front cover of the space-pop record is also an area of cultural interest, as its imagery often reflected the same sociological trends. Taylor (2001, p.89) draws these cultural themes together:

> Sometimes the atom is a threat to domestic tranquillity, sometimes it is a protector; sometimes the voluptuous woman who adorns so many of these space-age album covers is a threat to domestic tranquillity, sometimes she is a mate. These images also vouched for the male hi-fi owner's heterosexuality.

As Figures 1.4 and 1.5 show, album covers of electronic organ music share much of this iconography, signifying the same aesthetic links both in terms of genre and in displaced cultural meaning. The instrument was also another ideal associate for stereophonic sound and, as will be detailed in forthcoming chapters, organists and record producers often opted for stereo and other studio-derived effects in recordings.

Naturally, an iconic object can only belong to one cultural era, whether that be Coco Chanel's 'little black dress', signifying the modernism of the early twentieth century (Cook, 2013, p.212), or the mirror-adorned mod Vesper motorcycle of the nineteen sixties (Feldman, 2009, p.170). Consequently, such objects can phase in and out of popular favour and nostalgia depending on whether certain aspects of the past cultural age align with that of contemporary culture. During the nineteen eighties, electronic organ manufacturers made significant efforts to reinvent the instrument and support

it with a new ethos, seeking to promote the product more in terms of an instrument for aspiring musicians rather than an appliance of home entertainment. The ambition to create ‘an instrument with much more diverse and profound musical functions’ (Kawakami, 1981, p.67) was central to the design of Yamaha’s Electone range of electronic organs of this period, as was the genuine movement by the Yamaha Music Schools system to promote the Electone as ‘the most perfect instrument […] no longer limited to bringing the joy of entertainment to the general public. We are witnessing a move toward the direction of creating real art using the Electone’ (Kawakami, 1981, p.79). Figure 1.3 illustrates how this approach was adopted by Yamaha in its promotional literature for the instrument.

Figure 1.3 Later examples of promotional material used between 1987 and 2015.

Despite these efforts by Yamaha and other manufacturers, Teakle's stereotype of Barry Morgan and dismissive summaries in scholarly works pervade, both in the collective public culture and WAM musicology. Whilst the electronic organ was supported by sympathetic cultural values of the 1960s, this association ultimately hampered later longevity and contributed to an image of obsolescence in the following decades, particularly after the synthesiser became accessible to the consumer. By the nineteen eighties, the stigma of an out-dated leisure appliance that was 'hidden behind suburban bay-window curtains' (Moore, 2014, p.191) was difficult to shake off

despite later changes of marketing strategy and educational endeavour by Japanese manufacturers.

Figure 1.4 Electronic organ record sleeves, with examples of displaced cultural meanings: popular fascinations with space, technology, science and sexual freedom.

Figure 1.5 Album covers of similar 'space pop' recordings, sharing the same iconography as electronic organ recordings from the same period.

1.3 Considerations of Technology, Recording and Performance

As well as being tied to obsolete cultural aesthetics, it is also the case that the musical genre and practice discipline embodied in the instrument places the electronic organ outside of what is most often addressed by traditional musicology. This section discusses these topics with reference to current literature.

In *Beyond the Score: Music As Performance*, Nicholas Cook gives a well-researched summary of musicology to date. Describing the development of musicology over the past hundred years, Cook observes that 'histories of classical music represent music as something made by composers rather than performers' (Cook, 2013, p.9) and that meaning was generally ascribed to a work of musical composition embodied as a musical score rather than a particular ephemeral performance or performer (Cook, 2013, p.15). Citing the words of organist and composer Marcel Dupré as an example of early

twentieth-century thinking in WAM, Cook establishes that performers were regarded merely as part of the aural realisation process and should aim for as transparent and self-effacing an interpretation as possible: 'The interpreter must never allow his own personality to intrude. As soon as it penetrates, the work has been betrayed' (Dupré cited in Cook, 2013, p.15). This is a generally sound argument, supported with a wealth of references to scholarly work that echoes a similar sentiment up to the mid twentieth century, including accounts of Schoenberg and Adorno expressing a desire to remove performers completely and replace them with mechanical means of sound production, which Cook says is further evidence to support the textualist stance of WAM (Cook, 2013, p8). Ironically, in overlooking a more practical possibility for Schoenberg's objection to performance, namely that performers of the day often had difficulties in realising such abstract works thus compromising integrity (Rosen, 2002, p.151), Cook proves his own point: performance practice and the study of historical performance really should be a larger stakeholder in musicology than it is already.

Similarly, the idea that composers should metaphorically lean on instruments, allowing them to guide the compositional process, has long been frowned upon in musicology (Cook, 2013, p.16 and Rosen, 2002, p.14). However, recent works by performing scholars (Levin, 2006; Skowroneck, 2002 & 2010; Yearsley, 2012 and Rosen, 2002) have at least begun to acknowledge the fact that the keyboard instrument, specifically the quality and character of its timbre and key action, may have guided compositions and should therefore afford more consideration. Interestingly, all the aforementioned studies date from the beginning of this century. It is only

during the last two decades that published works have begun to look at the agency of instrument design in the stylistic traits of WAM composers. This reluctance to acknowledge the role of instruments supports the status of the composer in WAM: to accept that the instrument may have an effect on musical output challenges both the traditionally unassailable role of the composer and the textualist basis upon which their work is discussed.

The role of the instrument in musical authorship is much more readily accepted in the field of pop music. As musicologist and composer Albin Zak points out, the gimmickry of electronic sounds and the effects available in the recording studio are an integral part of the genre (2010b, p.319).[19]

Whilst the greater role of the instrument is one differentiating factor between WAM and popular music, so too is the way in which musical recordings are regarded. In popular music, recordings are a means of dissemination and the primary medium upon which the genre lives (Zak, 2010, p.324). Much of the artistry heard in recordings by artists such as the Beach Boys, the Beatles, Marvin Gaye, Queen and Madonna comes from the manipulation and processing of instrumental and other sounds within a recording studio environment, in ways which would be impossible to achieve in an acoustic, live performance (Zak, 2012, p.82). Katz (2006, p.84) also points to the role of jazz recordings as being the primary method of worldwide dissemination of jazz music.

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[19] For a specific example relating to the electronic organ, see Vail's interview with organist Tom Coster (Vail, 2002, p.165). Coster fuses his musical ideas with recollections of specific instrument settings, implying that the two elements are symbiotic.

The concept of the recording being the primary ‘sonic canvas’ and the degree to which the recording process, whether it be in the field of jazz, pop, rock or classical music, can add an extra executive dimension to a performance is still an infrequently visited area of music research. The lack of understanding required in order to conceptualise this element has led some leading musicologists to make wrong-footed conclusions.

For example, both Cook (2013, p.218) and Leech-Wilkinson (2010, pp.252-53) point to the increased use of vibrato in early twentieth-century violin recordings as an example of a stylistic practice termed ‘expressive inflation’ (Cook, 2013, p.217) which was becoming widespread in performance at the time. However, Mark Katz, an academic specialising in audio technology and history, looks at the same era from a more pragmatic perspective (Katz, 2006, p.93):

> First, [vibrato] helped accommodate the distinctive and often limited receptivity of early recording equipment. Second, it could obscure imperfect intonation, which is more noticeable on record than in a live setting. And third, it could offer a greater sense of the performers’ presence on the record, conveying to unseeing listeners what body language and facial expressions would have communicated in concert.

Of course, it is impossible to know whether the factors identified by Katz are indeed relevant without asking the musicians themselves. However, given that the pressures of recording still affect performers today (Rosen, 2013,

p.143), it is likely that at least some of these factors are likely to be at play, which lead us to question whether Cook and Leech-Wilkinson's conclusions are the whole truth.

Similar differences of perspective occur elsewhere in Nicholas Cook's book on performance (Cook, 2013). Cook sites similarities in a published score of Louis Armstrong's *Cornet Chop Suey* with that of instrument solos heard in earlier recordings of the same piece to suggest that jazz improvisation is not as spontaneous as it is supposed to be (Cook, 2013, p.231). Again, Katz (2006, p.76) examines the same recordings and acknowledges that the similarities appear to 'challenge traditional assumptions about the role of improvisation in jazz'. However, the studio environment and the challenges of executing a recording may well have contributed to this scenario (Katz, 2006, p.76):

> Live performances tended to be longer than recorded ones, with the extra time usually going toward additional solos. If a musician were to play several solo choruses in a live performance, it is unlikely that all the solos would've been fixed. In other words, the longer the performance and the more solos played, the more performers were apt to improvise… Knowing that time was short and aware of the permanence of recordings, performers and their bandleaders would want not only to choose their best work to commit to shellac but also to ensure that all solos stayed within the prescribed time. To do either would require careful planning and thus militate against extensive improvisation.

In both cases, it can be seen that expert knowledge of the recording process, assured familiarity with the genre and consideration of the practicalities of recording are essential in order to arrive at a fair conclusion. As Cook (2013, p.208) later acknowledges, the acceptance of recording practices in historical performance analysis within WAM musicology is still in the early stages of development:

> Narratives of a decline resulting from recordings, however, draw on many resonant cultural values: distrust of technology and the industries built on it, the standardisation that forms part of an increasingly bureaucratic society, the alienation that results from the replacement of human presence by the mechanical, and the waning or betrayal of an esteemed cultural tradition.

Whilst this would seem to indicate that WAM musicology is inherently distrustful of recordings as evidence, a fairer way to read this is perhaps to say that WAM has, in the same way as looking to instruments as indicators of performance practice, only just begun to form a relationship with historical recordings.

For jazz musicians, the recording is a crucial resource for learning and, in contrast to the practices of WAM, has a status above that of the printed score (Katz, 2006, p.78). However, the use of notated transcription has been established as a common practice within the sphere of stylistic analysis. Furthermore, the combination of recorded music with textual evidence, in the

form of an accompanying CD (e.g. Sturm, 1995; Townsend, 1999 and Katz, 2006) or audio download (Vail, 2002) is frequently used to support stylistic observations. Specific examples related to this field of study can be found in Vail (2002) and Townsend (1999). This is indicative of both the aural objectivity of the genre and the importance of recorded music in knowledge dissemination. The use of this practice also implies that the score by itself has limitations with regard to a true representation of the genre.

By means of illustration, Figure 1.7 shows a transcribed excerpt from Vail (2002, p.184). Whilst the extract is notated with a fair degree of precision, the result is complex and difficult to auralise [20]:

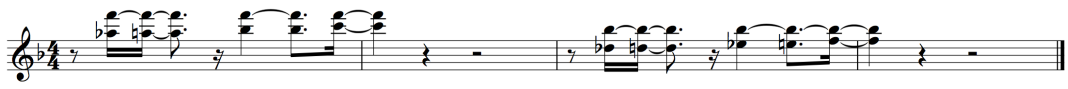

Figure 1.6 Vail's *Classic Fill*

The first instinct for many musicians of the jazz or popular genre would probably be to try to 'hear' a phrase such as that above and to try to find a recording of how it should be played and shaped.[21]

Further evidence of the aural tradition of jazz and popular music can be found in the design of current jazz and pop exam syllabi, where examination

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[20] As defined by Richard Rastall (2003, pp.71-72), 'auralising a score – that is, hearing the written music in one's head – is a skill that takes very considerable experience and practice […] Many musicians can auralise a simple score with considerable accuracy, but as the complexity of the score increases the process demands increasing mental concentration and understanding of the written score. Most would probably admit that with very complex scores a precise auralisation is not possible'.

[21] In this case, readers are encouraged to download audio recordings of the extracts (Vail, 2002, p.176).

candidates build their performances on emulations of iconic, recorded performances. [22]

In contrast to the WAM ideal of the score representing the primacy of thought and structure over substance (Taylor, 2001, p.59 and Cook, 2013, p.17), a score in jazz music is largely a functional *aide-memoire*, a partial route-map, from which the jazz musician will extemporise or deviate from as desired (Katz, 2004, p.78). The performer is free to decide not only the tempo, phrasing, dynamic changes and articulation (as in a WAM performance) but will also be expected to extemporise melodic or harmonic extensions and improvise according to their taste. In other words, a jazz musician has a greater degree of authorship in a performance or arrangement than their WAM counterpart.

The relatively low regard for the status of scores amongst jazz musicians has led to a lack of interest in their preservation and the subsequent loss of historic arrangements over time. Jazz scholar and arranger Fred Sturm writes that 'tragically, the manuscript of many landmark renditions is permanently lost' (Sturm, 1995, p.8). The net result therefore is, as there are relatively few scores aside from lead sheets[23] to refer to, the identification of performance style as heard on recordings becomes central to performance classification and differentiation.

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[22] For example, LCM Exams' current *Diploma Syllabus in Jazz Performance* includes a discography and recommended listening list, from which candidates are encouraged to transcribe performances (LCM Exams, 2016).

[23] Defined by Berliner as a 'hypothetical, skeletal' representation of the main melody and chord changes only (Berliner, 1994, p.8).

The concept of emulating and studying other musicians, either via recordings or live performance in a collective musical space is far more ubiquitous in jazz and pop music than classical music[24]. It is perhaps no coincidence then that, in traditional musicology, the field survey of non-WAM genres that are built largely on oral rather than textual practices is termed 'ethnomusicology'.[25]

As the term suggests, one of the main features of ethnomusicological studies is the use of non-textual research methods, primarily in the form of interview to gain insight direct from practising musicians. Whilst this practice is not solely limited to jazz and popular music, the ability of researchers to derive evidence using this method is usually the privilege of contemporary music scholars, since WAM composers are, to use Nicholas Cook's phrase, 'safely dead' (Cook, 2013, p.13).

Interestingly, ethno-musicologist Jonathan Stock's study (Stock, 2009) gives some valuable insight into how the use of recordings can enhance the results of practitioner interview. Stock writes of his experience in the use of recordings as documents of field research. The recordings are not of musical performances but of interviews with music practitioners: in this case, the interviewees are Taiwanese instrumentalists. This method provides a full,

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[24] Most textual jazz resources will include both interviews and ascribed excerpts from established jazz musicians, acknowledging the performer as the executive agent of authorship and a contributor to the stylistic lexicon. As an example, see the website of Keyboard Magazine (Keyboard Magazine, 2016) which contains a section entitled "Play like….", where readers can study notated transcriptions of performances by leading keyboard players and attempt to copy their performance.

[25] However, Beard & Gloag (2016) point out that 'as musicology begins to question its exclusive focus on Western concert music, so the boundaries between the two disciplines begin to blur and the number of shared concerns increases' (Beard & Gloag, 2016, p.135).

qualitative and immediately accessible article that can be replayed and disseminated effectively.[26]

In his second illustration, Stock considers the use of recordings as tools in performance research. Recalling the common practice of a music student recording lessons given by their teacher, Stock explains that this method is of use to ethnomusicologists, who often participate in the music performances that they are studying. 'Such participation, it is hoped, leads to a deeper understanding of the intentions, experiences and artistry of those involved, and so to a better quality of research insight in the nature and qualities of the wider contexts of musical performance' (Stock, 2010, p.187).

Finally, Stock describes the use of recordings in practitioner interview. By referring to and playing relevant musical recordings during this process, responses from practitioners become more qualitative and focused: 'allow[ing] characteristics implicit within the performance practice to be exposed and brought out into explicit discussion' (Stock, 2010, p.188).

1.4 Considerations of Methodology and Structure

Having previously examined relevant literature, this chapter now turns to presenting the research method that will be used in this study. Beginning with the classification of electronic organ music in relation to jazz and popular music genres as established in Section 1.3, various metrics used within the

[26] A similar technique is used by Beale (2001). Recorded interviews also form the primary method of the extensive audio collection entitled *Oral history of Jazz in Britain,* part of the British Library Sounds project (Oral history of jazz in Britain, 2016).

survey are then defined and their relevance to various research methods are evaluated. This section concludes by stating the methodology and structure of the study.

1.4.1 Classifying Electronic Organ Music

Bearing the topics discussed in Section 1.3 in mind, it is possible to observe a number of similarities between the previously identified practices of jazz music and electronic organ performance, as will be established by this thesis.[27] These are namely a general preference for the internalisation of musical arrangements over the written manuscript and the aural method of knowledge dissemination (Katz, 2004, p.78), together with the attribution of arrangement style as a unique identifier (Sturm 1995; McGowan, 2011; Krieger, 1995). In addition, the technological nature of the instrument suggests the strong possibility of correlation with Théberge (1997, p.198) and Walser (2014, p.41) regarding the interdependency of electric instrument tone and performance practice. As has already been mentioned in Section 1.2, there is also some correlation suggested between the prominence of studio processing in pop music (Zak, 2009b, p.309) and the methods of production in some electronic organ recordings.

[27] As will be demonstrated in subsequent chapters, electronic organ music refers to the jazz repertory.

1.4.2 Stated Aim Of Research and Relevant Musical Parameters

The aim of this thesis is to survey various performance styles of electronic organ music as heard in recordings made between 1943 and 2015 in order to establish hitherto undocumented developments in practice.

Similarities between the practices of jazz music and that of electronic organ music have been proposed in Section 1.4.1. The two most important similarities here being the primary status of the musical arrangement as the key identifier of musical skill attributed to the performer, and the aural way in which these musical arrangements are disseminated via recordings. It is therefore appropriate to adopt similar methods of enquiry in this thesis to those used in studies of jazz performance style.

Although the concept of musical style is quite subjective, it can be defined and discussed quite objectively when considering jazz arrangement. Jazz musician and scholar, Peter Elsdon, establishes that there is usually no definitive arrangement or textual source of a jazz piece (Elsdon, 2010, p.147) and that any discourse or comparative analysis is usually framed by identifying differences in tonal language, textures[28], articulation and melodic extemporisation[29] when discussing arrangement.

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[28] As will be illustrated later, chord textures and harmonic language are key identifiers and points of discussion amongst electronic organ players.

[29] This method was the basis for Krieger's (1995) analysis of jazz recordings of the jazz standard *Body and Soul*. The study used the transcription and subsequent analysis of historical recordings by nine different jazz musicians to compare and contrast stylistic elements. Similar methods of enquiry can be found in the study of popular music e.g. Walser (2014, pp. 80-81) where tonality, melodic contour, and rhythmic displacement are simultaneously discussed as points of style.

In addition to Krieger (1995), works by Sturm (1995) and Vail (2002) are perhaps the most similar in methodology to this thesis as they both involve the transcription of historic recordings in order to discuss points of musical style in jazz arrangement. The commonly delimited parameters used by Sturm and Vail are listed in Figure 1.7 alongside those used in this thesis.

Sturm (1995)	Vail (2005)	Stanbury (2017)
Melody and Rhythm	Articulation & Ornamentation Rhythmic Displacement	Melody, Articulation and Rhythm
Harmonic Variation Voicings and Vertical Sonorities	Harmonic Language and Voicings	Voicings, Harmony and Texture
Orchestration	Registration	Registration and Expression
		Employment of Studio Techniques
Form and Structure		Form and Structure
Unifying Components		

Figure 1.7 Comparing survey methods of musical arrangement.

In order to clarify each parameter of enquiry and the rationale for inclusion, each is defined as follows:

1.4.3 Melody, Articulation & Rhythm

In recognition that rhythmic and melodic variation can be an important device in musical arrangement, the degree to which each performer develops the

melodic material in addition to that established by the original text is observed. The use of ornamentation and articulation is frequently illustrated in the analysed extracts of organ performance by Vail (2005, p.177) and is an element of style and idiom (Poulter, 2008, p.51 and Berliner, 2009, p.67). The employment of different rhythmic devices, both in the melody and accompanying parts is also an established indicator of style in this context (Sturm 1995, p.11).

1.4.4 Voicings, Harmony and Texture

These parameters are also established as stylistic indicators within jazz. Scholars often refer to the practice of 'voicing' i.e. the different aural effects that can be achieved via the vertical configuration of harmonies.[30] Different voicing configurations are often described by means of ascribing them to the arrangers or performers who established them.[31]

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[30] The term 'voicings' is used in Levine's enquiry into jazz piano styling (Levine, 1989, p.16).

[31] See Stewart's description of a big band orchestration as 'Count Basie-style' (Stewart, 2004, p.183), Martin and Waters' description of the 'George Shearing' piano sound (Martin & Waters, 2008, p.162) and Levine's illustration of Bill Evans' 'So What' chords (Levine, 1989, p.97).

1.4.5 Registration and Expression

As established by Vail (2002, p.161-216) and Théberge (1997, p.186), musicians working with electronic keyboards place a high degree of importance on finding innovative sounds, particularly if their discoveries become established as contributions through which they can gain recognition amongst their peers.[32] Both authors suggest that the chosen sound combinations, referred to in the electronic organ community as 'registrations', affect the way in which a musician will produce their arrangement.[33] For this reason, it is important that some enquiry is made into the type of sounds used in each featured performance.

1.4.6 Employment of Studio Techniques

Zak (2009b, p.309) establishes that the use of studio techniques and effects in recording and mixing has become so central to popular music production as to become thematic, expanding the traditional conceptions of musical content, meaning and style. As this thesis will show, these practices were widely used in recorded electronic organ music, whereby the use of multitrack recording[34]

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[32] For example, Vail attributes particular sound combinations to particular organists, such as the 'Jimmy Smith sound' (2002, p.186) and 'the ELP sound' (2002, p.174).

[33] In this chapter, Vail (2002) presents the results of interviews with organists, all of whom mention their commonly used registrations.

[34] Multitrack recording is defined by musicologist Timothy Warner as a process which 'involves the use of a tape recorder or other storage device, either analogue or digital, which allows the user to record each distinct instrument or voice separately and in series […] for a single piece of music. Each instrument or voice that is recorded is stored on a

and stereo separation effects became integral to the style and musical arrangement of a recorded performance.

1.4.7 Form and Structure

Subtle moderation of form in jazz has been shown to be a defining element of arrangement (Sturm, 1995, p.14 and Berliner, 2009, p.88) and it is therefore included as an indicator in this study where a significant contribution can be demonstrated.

1.5 Defining the Research Process

This study investigates a genre of music that is established as an aural (and oral) tradition, whereby the extant sources of knowledge are found in musical recordings and surviving musicians rather than in conventional texts or scores. Consequently, musicological principles found in works discussed in Section 1.3 that engage with similar anthropological concepts have shaped this methodology, hereby termed 'Informed Reconstructive Transcription and Performance Analysis' (IRTPA).

This thesis aims to obtain and curate information on how historic instruments were used in performance, how these instruments sounded and how musical arrangements can demonstrate a varying stylistic lexicon. IRTPA

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separate 'track' of the tape recorder […] and, once recorded, returns as a separate signal to a particular channel on the mixer' (Warner, 2003, pp.22-23).

aims to facilitate this not only via the research method but also in the presentation of results. In acknowledgement of the established format used by jazz and popular music studies (as mentioned in Section 1.3), a key component of this work is the presentation of recorded performances. In this case, these are filmed in order to give both an aural and visual representation of the transcribed recordings and also to support significant points that are discussed in the supporting text.

The use of the term 'informed' within IRTPA refers to two different topics. Firstly, an informed performance analysis is one which considers the agency of instrument design over musical output and, secondly, one which incorporates the thoughts and recollections of the performer.

The use of practitioner survey, conducted both without the use of reference recordings (as can be found in Beale, 2001, p.298; Vail, 2002, p.174 and Berliner, 2009, p.321) and with the use of recorded material (Stock, 2010, p.187) has been shown to be useful in textualising many elements of music with an aural history.

The use of musical score is frequently used to illustrate components of musical style.[35] Other methods of mapping musical structure have been established, which show various performance parameters using graphical means (Cook 2013, p.188 and 2009, p.229). However, such studies focus upon making empirical measurements of dynamics, tempo and phrase structure in a performance, rather than abstracting knowledge of contextual musical style within a comparative, linear enquiry.

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[35] For example, in Rosen (2013, p.49), Berliner (1994, p.350), Sturm (1995, p.13) and Walser (2014, p.74).

The mediation[36] of musical thought and thus musical style of the performer via the instrument is under-represented by the current body of research and there is as yet no consensus towards establishing a credible methodology. The current methods of investigation can be categorised as belonging to one of two possible routes of enquiry: conclusions gained from performance on period instruments which, when used in isolation of any supporting evidence, risks accusations of superimposed invention (Levin, 2006; Yearsley, 2012 and Skowroneck, 2010) or observations from practitioner survey. The results of practitioner survey can provide tantalising insight into musicians' experience, but existing studies using this method generally fall short of significant detail on musical style as the discourse becomes weighted in favour of narrative (as in Walser, 2014, p.67) or instead forgoes reference to transcriptions of historic recordings in preference to new and subjective compositions (as in Vail 2002, p.79) in order to demonstrate points of style.

Studies that discuss historical musical instrument design and style are bound by obvious and unavoidable limitations to their practice-based methodology: the inability to build a cross-domain, supportive enquiry structure in order to avoid subjectivity. In other words, survey findings via one method of enquiry cannot be confirmed or supported by findings from other

[36] The use of this term relates to the work of musicologist, Georgina Born. Describing music as 'favour[ing] associations or assemblages between musicians and instruments, composers and scores, listeners and sound systems – that is, between subjects and objects' (Born, 2005, p.7), Born suggests that mediation is the process by which a musical work is shaped by various social and technological factors. In this study, the term applies to the association between the sound generating capabilities of the electronic organ and the resultant musical possibilities afforded to the organist.

routes, as these alternative routes are no longer available. Put simply, there can be no reference to historical musical recordings in Yearsley's (2012) study of the instruments available to Bach, for example, since no audio recordings of the composer exist and it is impossible to ask Mozart if Levin's (2006) opinions on the composer's creative evolution in relation to the Stein pianoforte are correct.

The comparatively recent historical focus of this study presents a unique opportunity to triangulate a cross-domain methodology that is usually unavailable to music researchers: the opportunity to support practice-based observations via practitioner survey with reference to historic recordings of period instruments and the use of the same instruments for reconstructive performance.

1.6 Statement of Methodology

This thesis adopts the hypothesis that the development of musical style is linked to the development of musical instrument technology. In the field of electronic organ music, this development process can be aligned to the introduction of new technologies into the marketplace, creating a new era of instrument. Figure 1.8 shows how each technology and its associated recorded and reconstructed performances are examined within a separate chapter of this thesis.

Chapter	Organ Technology
2	The Hammond Tonewheel Organ (1943-1962).
3	Early Spinet Organs by Lowrey and Hammond (1963 to 1973).
4	Early Orchestral Emulations (1974 to 1984).
5	Digital Synthesis and Sampling (1985 to 2016).

Figure 1.8 The development of the electronic organ, marked by chapter.

Within the four eras of technological development, example recordings from each technological era are chosen from a collection of over two thousand recordings and used as case studies. The same model of instrument used in the original recordings is obtained and used during the transcription process of two case study pieces taken from the main sample group, essentially remodelling the recorded organist's performance in order to gain insights into the technological profile of the organ. Once each transcription is completed, an interview with the recording organist or a surviving colleague is conducted and the results are combined with an analysis that references the stylistic parameters defined in Section 1.4 of this chapter.

Evidence of linear stylistic development and technical mediation is subsequently presented, together with results gained from interviews conducted with surviving organists of the period where possible. The final chapter in this study draws conclusions from the analyses of the four

investigative chapters and presents an assessment of the research outcome. The entire research process is illustrated in Figure 1.9 below.

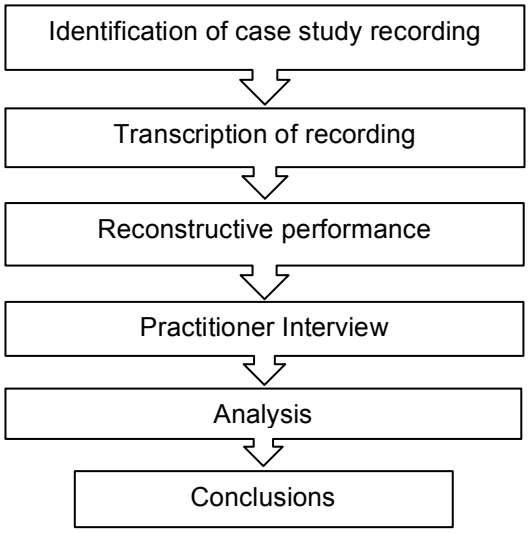

Figure 1.9 Outline of the selected research process.

1.6.1 Sourcing Instruments and the Transcription Process

The reconstructive process begins with the selection of a relevant recording from which to transcribe a piece. There are two guiding principles used in this process: the availability of some contemporaneous recordings of the same piece, so that a stylistic comparison may be conducted, and the availability of the original instrument upon which the recorded performance was made.

In all cases, instruments were sourced from internet auction site, eBay. Owing to the rarity of the models, sourcing the instruments took several months in every case and was often compounded by the fact that instruments

were eventually located in different parts of the United Kingdom, including Brighton, Coventry, Yeovil and Southampton.

Once collected, all instruments were found to be in various states of disrepair, having been neglected for many years. Frequent engineer visits were required to rectify faults and to provide maintenance to instruments throughout the duration of the project.

After the instruments were returned to working order, the transcription process of each selected recording began in turn. The original performance recording (which was often in the form of a vinyl record) was digitised by being played into a USB mixer desk, rerecorded and transferred via Apple MacBook to an Apple iPad. Once on the iPad, the new digitised version could be processed using an application called *Amazing Slow Downer* (Roni Music, 2017). This had distinct advantages over the playback of the original vinyl version. Primarily, playing the digitised version reduced the chances of scratching the vinyl original, which would have meant damage to an irreplaceable item. Other advantages of this method included being able to adjust the pitch of the recording (as the rotation speed of vinyl records occasionally meant that the notes heard were a quarter tone out of tune with the original instrument), and the ability to loop and repeat sections to aid transcription.

Transcription was always performed at the original instrument, meaning that the tone of the organ and its technical and ergonomic characteristics were always being observed during the process.

Once an initial transcription was completed, it was recorded and reviewed in order to identify any discrepancies in the melodic shape,

harmonic language, textures, tone and the use of expression. Any identified differences between the transcription and the original performance were noted and used to guide subsequent refinements, which culminated in a filmed, reconstructed performance.

During this process, all observations regarding the instrument's characteristics were noted, linked to specific areas of the transcribed piece and later mentioned and verified in practitioner interview.

1.7 Summary

The established image of the electronic organ is one that is indistinct and currently lacking any clarity or depth of understanding. Stereotypes in popular culture are re-enforced by the cultural, aural and technological chasm which exists between the modern day and that displaced within instruments of the nineteen sixties and seventies. The associated cultural values ascribed to electronic organs of over fifty years ago, such as commodity scientism, the space race, nuclear warfare and sexual liberation no longer signify sociological progress as they once did. Attempts by manufacturers to realign later instruments with a stronger work ethic, that of a true musical instrument rather than that of an appliance of domestic entertainment, has had limited success outside of the electronic organ's new cultural epicentre of Japan and Southeast Asia. Consequently, digital orchestral organs such as Yamaha's 'Electone' range have become virtually invisible to potential European and American consumers as they are no longer imported to these regions. This lack of recent exposure has also contributed to a distorted general perception

both in Western popular culture and musicology: the archetypal Hammond organ and its cultural associations are readily recalled, either with ridicule or with narrow scholarly enquiry, whereas contemporaneous and later instruments employing different performance practices are not.

As a vanguard of music technology, the electronic organ is not a natural member of WAM hegemony and it is therefore commonly overlooked by associated musicology. The instrument-centric, self-authored nature of work that constitutes an electronic organ performance is also different to the generally textualist WAM musicological mode. This chapter has shown that some recent attempts to alter this established basis by authors who are not fully aware of historical music technologies, aural methods of dissemination and integrated recording practices can misrepresent this alternative paradigm and non-WAM performance in general. With this in mind, there is clearly work to be done in order to promote a greater knowledge of the electronic organ and in developing a scholarly approach to the study of aural-based, micro genres.

What this thesis will now do, therefore, is to investigate the different types of electronic organ that have been developed in the past eighty years in order to achieve a more detailed understanding of the performance practices heard on historical recordings. The use of a multi-faceted methodology as detailed in Section 1.6 of this chapter will be employed to gather and collate observations in order to find out more about each instrument. Once it has been established as to ‘how’ each instrument is different, it should be possible to find out more about ‘why’ the style of playing is different via the use of transcription, reconstructive performance and organist interview.

Chapter Two

2.0 The Hammond Organ (1943 – 1962)

This chapter marks the beginning of the investigative survey into electronic organ performance styles by examining two case study recordings made on the first commercially available instrument, the Hammond organ. A brief history of the instrument and a concise explanation of the key technological concepts used in its construction are presented, followed by the survey results and concluding observations.

Figure 2.1 The Hammond Model A organ. [37]

[37] Photograph used by kind permission of John Rust.

2.1 The Development of the Hammond Organ

The first electric organ was produced in 1935 by the Hammond Clock Company of Chicago, Illinois[38] and premiered at the Industrial Arts Exposition at the Rockefeller Centre, New York City in the same year. The Hammond organ embodied the fusion of recent 'transectoral innovations' (Théberge, 1997, p. 28) in the fields of radio and electrical science that were developed initially for industrial purposes but had also facilitated new innovations in domestic life.[39]

Developed to be a lower cost alternative to a pipe organ (Vail, 2002, p.63), the Hammond Model A organ contained a series of spinning metal wheels which were located near to electric pickups. Each steel wheel had notches cut into its perimeter, varying the pickup efficiency and resulting frequency of the electrical feedback that was amplified to make a discernable tone (Irwin, 1939, p.2).

This technique produced a harmonic series that was close to that produced by a typical pipe organ. The mixture of harmonics could be varied

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[38] During the period between 1930 and 1935, inventor and company director Laurens Hammond (1895 – 1973) had successfully produced a synchronous motor that was stable and reliable enough to power electric clocks with a very high degree of reliability and accuracy (Vail, 2002, p.62). Hammond's expertise in creating stable electric motors lead to the development of the 'tonewheel' used in the later Hammond organ (Faragher, 2011, p.6).

[39] Such innovations had also contributed to the development of other electric instruments during the nineteen twenties and thirties, such as the Ondes Martenot (Marcuse, 2008, p.377), Neo-Bechstein electric piano (Schils, 2011, p.120), the Theremin (Glinsky, 2000, p.73) and Hammond's own Novachord polyphonic synthesiser (Holmes, 2015, p.31).

by pulling out any of the nine sliding stops, or ‘drawbars’, which varied the volume of each tone fundamental (Vail, 2002, p.42).

Figure 2.2 illustrates the concept of fundamental and multiplied frequencies that is used in pipe organ design and how the Hammond drawbar system replicates this. The diagram shows how, when a Middle C note is pressed, other pitches can be introduced to sound simultaneously. For example, a pipe organist may select the stops marked ‘Principal’, ‘Octave’ or ‘Bourdon’ to achieve Middle C and each C an octave above and below. A Hammond organist would pull out the drawbars marked 16’, 8’ and 4’ drawbars to achieve a similar effect.

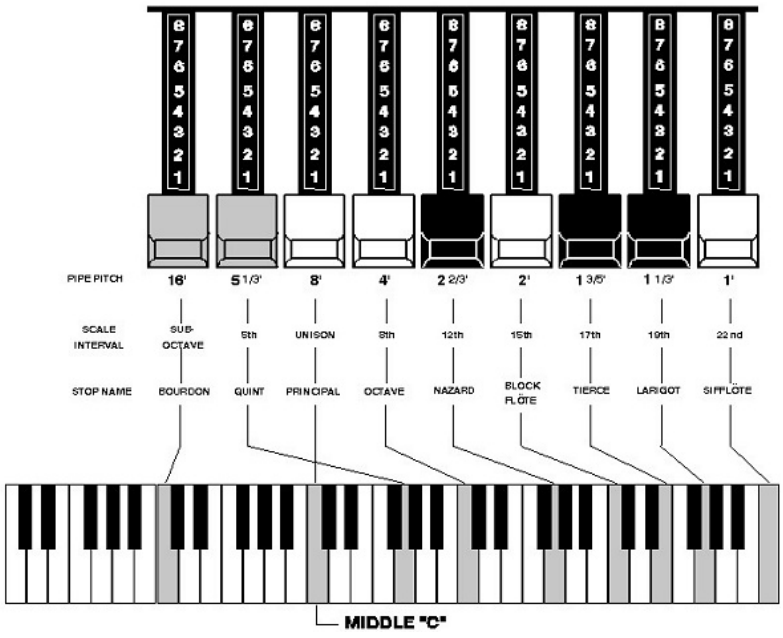


Figure 2.2 – The Hammond drawbar system compared to conventional organ pipe pitch.[40]

However, there is an important distinction to be made between the pipe organ stop and the drawbar design. A pipe organ stop switches a pipe on or off, giving no individual control of volume except by means of the swell pedal,

[40] Diagram from www.hammond-organ.com. Used with permission.

which affects a combined section of the instrument.[41] In contrast, each drawbar on the Hammond organ offered nine increments of volume, from zero (off) to nine (full volume). Hammond theorised that this mixture of different harmonic tones and the unique potential for varying the volume of each fundamental gave an infinite amount of tonal variety and the ability to copy the sounds and timbres of a pipe organ (Faragher, 2011, p.9). Figure 2.3 is an excerpt from a *Dictionary of Hammond Organ Stops* (Irwin, 1939, p.38), showing an example drawbar configuration. The long number at the bottom of the diagram refers to the position of each of the drawbars from left to right i.e. the first two drawbars should be left at zero, whilst the third should be pulled out to position six, the fourth drawbar at position two and the remaining bars left at zero. Figure 2.4 shows other examples of stop listings.

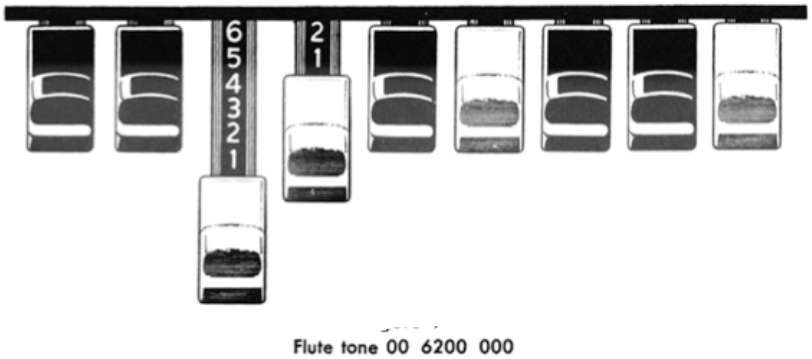
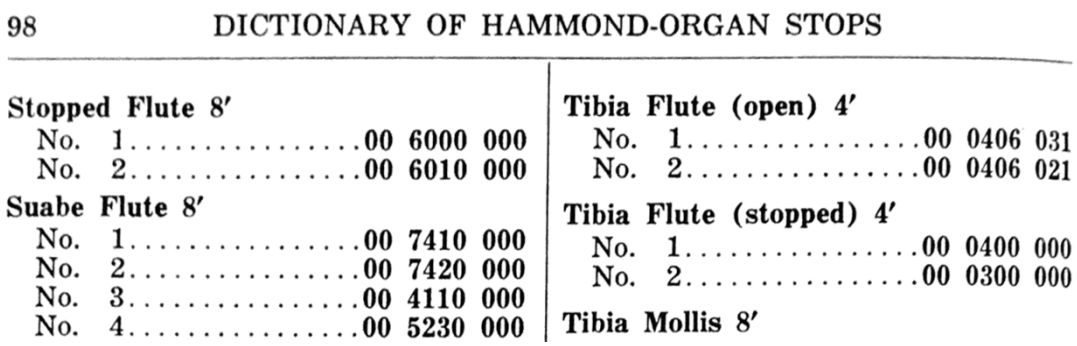


Figure 2.3 A drawbar configuration shown in pictorial and numerical form.[42]

[41] Hurford describes the swell division of a pipe organ as 'a division of the organ which was totally enclosed in a box, one side of which resembled a venetian blind and could be opened and closed by a device operated by the player's foot' (Hurford, 1990, p.36).

[42] From *Dictionary of Hammond Organ Stops* (Irwin, 1939, p.38). Used with permission.



98 DICTIONARY OF HAMMOND-ORGAN STOPS

Stopped Flute 8′
No. 1.....00 6000 000
No. 2.....00 6010 000

Suabe Flute 8′
No. 1.....00 7410 000
No. 2.....00 7420 000
No. 3.....00 4110 000
No. 4.....00 5230 000

Tibia Flute (open) 4′
No. 1.....00 0406 031
No. 2.....00 0406 021

Tibia Flute (stopped) 4′
No. 1.....00 0400 000
No. 2.....00 0300 000

Tibia Mollis 8′

Figure 2.4 An extract from *Dictionary of Hammond Organ Stops* (Irwin, 1939, p.98), showing how pipe organ stops could be emulated as drawbar settings.[43]

The assertion that the Hammond organ offered 'literally millions of tone qualities and endless shades of dynamic level' (Irwin, 1939, p.1) did not go unchallenged however. The claim was disputed by the American Federal Trade Commission, who ruled that Hammond's invention did not have an infinite combination of sounds (Faragher, 2011, p.9). For a classical organist, the Hammond Model A was not a true pipe organ replacement owing to a number of ergonomic and acoustic issues:

1. The Hammond organ produced a tone with an immediate response rate (the rate at which a sound is produced in full after a key is pressed) that was very different to the comparatively slower response produced by a traditional pipe organ (Vail, 2002, p.14).

[43] *Dictionary of Hammond Organ Stops* (Irwin, 1939, p.98). Used with permission.

2. As the sound from the Hammond organ was produced from one loudspeaker, rather than a more widely dispersed rank of pipes, the tone was often perceived to be thinner and purer: there was a notable lack of the natural chorus effect produced by a number of separately tuned pipes sounding from different parts of an organ chamber (Vail, 2002, p.63).

3. The tremolo effect of the Hammond Model A organ did not successfully emulate a pipe organ tremulant. The Hammond organ tremolo effect was a fluctuation in volume, whereas a pipe organ tremulant produced a cyclic variation in pitch (Faragher, 2011, p.42).

4. To cut costs, the Hammond pedalboard was reduced from thirty two notes to twenty five notes. Whilst the fan-like arrangement of pipe organ pedals was copied, the higher elevation of the outermost pedals on a pipe organ console was not (Faragher, 2011, pp.43-45).

5. The design of the keys was also different: the Hammond organ had very lightweight, sprung keys that were arranged in a step or ‘waterfall’ design to save money in production (see Figure 2.5). These keyboards were unlike that of the traditional pipe organ, where the keys of the upper manual overhung the lower and were usually much heavier to press. This ergonomic difference proved unpopular with some organists, who found the key action and arrangement too dissimilar to that of a conventional pipe organ console (Vail, 2002, p.64).

6. Most Hammond organs were destined for small community churches that often had poor acoustics: early instruments offered no artificial reverberation to compensate and were consequently perceived as producing a ‘dead’ sound (Vail, 2002, p.65).

Figure 2.5 Differences in design between Hammond organ keyboards and pedals (left) and a conventional pipe organ console (right). Note the difference in key shape, manual arrangement and pedalboard design[44].

Despite the perceived shortcomings in the design of the Model A Hammond organ, the instrument was a commercial success owing to its comparatively low cost and successful marketing by the now renamed Hammond Organ Company (Vail, 2002, p.64). Many of the churches that

[44] Photographs used by kind permission of Adam Behringer and Park Avenue Congregational Church, MA.

installed the Hammond organs were in the southernmost American states, populated by mostly black congregations with a rich cultural heritage of blues music (Vail, 2002, p.14 and Faragher, 2011, p.9). Many churches at the time installed Hammond organs to attract inquisitive new members to their congregations, who joined just to hear the Hammond organ (Ford, 2016).

When the first generation of gospel musicians moved from the church to secular venues, the Hammond organ moved with them. Its powerful, electro-acoustic sound forming a perfect complement to the newly emerging styles of music that were to captivate America and the world during the late nineteen forties and fifties (Ford, 2016).

2.2 The Development of the Leslie Speaker

One of the most commonly used accessories that was fitted to a Hammond organ was the Leslie Vibratone speaker (Vail, 2002, p.11), the use of which can be heard in most of the Hammond organ recordings examined by this thesis.

Designed by Donald Leslie (1911 – 2004) in an attempt to improve the sound of the Hammond organ, the speaker directs sound through rotating loudspeaker horns within a wooden cabinet to modulate the sound of the Hammond organ. By utilising the acoustic effect produced by this method, combined with the sound reflections from nearby surfaces, the Leslie speaker creates a richer, more complex and exciting tone (Vail, 2002, p.11).

Figure 2.6 The Leslie speaker, showing the rotating speaker horns (top right).[45]

Organists interviewed for this study regarded the speaker as an indispensible addition to the technical profile of the instrument. British Hammond organist Glyn Madden (2011) recalls:

> I find it difficult to disassociate [a Hammond organ and Leslie speaker] .. For me, a decent model Leslie speaker breathes life and excitement into the instrument.

Whilst Andrew Gilbert, chief demonstrator for Kawai organs UK, would also hesitate to separate the two (2014):

[45] Photograph by the author.

> There are a couple of [later] Hammonds that I like 'sans Leslie', the inimitable X66, of course, and the H100, but I'm afraid for me the other models are pretty lacklustre without the added sparkle that the Leslie delivers so well.

The use of the Leslie speaker by national broadcasting organists on radio and television programmes (Faragher, 2011, p.9) ensured that the sound of the speaker was heard across North America during the nineteen forties, creating demand for the product.

2.3 Presentation of Survey Results

This chapter examines various electronic organ recordings of two pieces of popular music that were made between 1943 and 1962: the *St Louis Blues* by W C Handy and *Moonglow* by Hudson and Mills. All recordings were made using the Hammond organ, either the Model A as shown in Figure 2.1 or the slightly revised Model B series[46]. The reconstructive performances, which support the two selected case studies, were made using a modern replica of these instruments: a Hammond XK-3c and, where required, a Leslie speaker model 147.

[46] Model B Hammond organs included two new functions: a chorus generator, designed to recreate the sound of pipe chorus, and variable vibrato in place of the Tremolo function found on the Model A (Vail, 2002, pp.46-48).

2.3.1 Analysis 1: St Louis Blues (W C Handy)

Published in 1914, W C Handy's *St Louis Blues* is an established work of the jazz and blues idiom and is one of the genre's most recorded pieces (Powell, 1997, p.111), 'recorded in almost every pre-World War II style' according to film historian Peter Stanfield (2005, p.83). Powell highlights the habanera style rhythms within the piece as an indication of the 'hybrid nature of jazz even at this early stage' (1997, p.111).

The recordings analysed by this study are:

- Fats Waller, *St Louis Blues*, Ristic 23, 1943 (Filmed as Performance One).
- Ethel Smith, *St Louis Blues*, Decca 9-30991, 1959.
- Lenny Dee, *St Louis Blues*, Decca 46263, 1950.
- Wild Bill Davis, *St Louis Blues*, Everest SBDR 1125, 1959.

2.3.1.1 Articulation, Melody and Rhythm

This section analyses the different approaches to articulation, melodic phrasing and rhythmic extemporisation heard in the recordings listed above in order to differentiate the different styles of electronic organ playing. Observations from the instrument survey and reconstructive performance are

then combined in order to illustrate where various technical facilities support these stylistic traits.

One of the most striking elements of Fats Waller's recording is the very quick tempo, measured at an average of 228 crotchet beats per minute. A regular, driving left hand accompaniment plays chords on every crotchet beat, creating inertia and energy that lasts throughout the whole performance. A bass pedal part is also heard, playing on every other crotchet beat. Vail defines Waller's playing as 'stride-driven' (Vail, 2002, p.18), although the rhythmic style heard in this arrangement is in reality quite different from the typical 'stride piano'[47] style, of which Waller was a leading exponent (Pick, 2016).

Upon reconstructing the performance on an original instrument, it is clear that the fast, predominantly staccato style of playing heard on Waller's recording follows the tone of the instrument quite naturally: to play at a slower tempo exposes the plain, unwavering tone of the Hammond organ, creating an unnatural tonal uniformity. The direct method to mediate this undesirable tone is to play staccato and at a faster tempo, in order to create as much energy and drive within the performance as possible.[48]

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[47] The principal difference, according to Robinson (2016), is that stride piano places chords on beats two and four, whereas Waller's style in *St Louis Blues* places chords on every crotchet beat of the bar.

[48] Davies (2006, p.168) comes to a similar conclusion during his summary of electronic organs, mentioning Waller's technique as 'in part caused by the inability of early models [of Hammond organ] to control the attack of notes'. This is slightly ambiguous, however, as this survey's reconstructive performance has found that the staccato approach was mediating the invariable tone rather than the degree of note attack. A later reference to 'swirling chords' (2006, p.168) is also inaccurate. This would be a valid and apt description of a performance that used a Leslie Vibratone speaker, since this is exactly the acoustic

In other words, the rhythmic pace and energy in Waller's recording is mediated by the unique properties of the Hammond organ tone. However, there are other acoustic parameters which must be considered when attempting to understand Waller's use of articulation and ornamentation. These other parameters are commonly referred to within keyboard instrument design as 'attack transients'. This term concerns the first few milliseconds of an audible tone, which is heard before the main body of the instrument's sound. It is this distinctive and harmonically rich attack transient that makes a sound recognisable as a flute, trumpet or xylophone (Campbell and Greated, 1994, p.157). Reconstructive performance revealed that the Hammond organ had little in the way of any varied attack transient when compared to a pipe organ or other acoustic instrument. [49]

As can be seen from Transcription One in Appendix A and seen in Performance One on the accompanying DVD, Waller creates substitute attack transients by means of frequent grace notes[50]. These are combined with

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effect achieved although Waller did not use such a device when recording, as established by Stephen Taylor (2006, p.86).

[49] As identified by audio engineer Stefan Vorkoetter, 'Hammond notes have a nearly instantaneous attack … followed by steady volume, followed by an instantaneous decay' (2011). The full tone of this particular instrument was heard immediately after the key press, unlike other instruments such as the pipe organ, where the attack transients are demonstrably different and separate from the main instrument tone (Campbell, Greated and Myers 2004, p.419).

[50] Grace notes are defined by the Grove Dictionary of Music as 'Ornamental notes written or printed smaller than the 'main text' and accorded an unmeasured duration which is not counted as part of the written bar length. Speed of execution depends on the nature of the ornament they represent and to some extent on the tempo of the music but, except in the case of appoggiaturas, grace notes are usually performed lightly and very quickly' (Grove Online, 2017e).

extensive rhythmic extemporisation: the sustained notes included in published scores[51] of *St Louis Blues* are frequently replaced with quaver patterns in Waller's arrangement (e.g. bars 20 to 32 in Transcription One), whilst the narrow melodic range ensures that the focus remains on Waller's articulation and rhythmic effects in order to maintain interest and vary the otherwise unvarying tone.

These techniques shown above are elements of practice that emerge from an awareness of the tonal characteristics of the instrument. As will be shown in following chapters, practitioner interviews conducted for this study have revealed that electronic organists are distinctly aware of every dimension of the instrument's sound production, defined by Théberge (1997) as the 'accumulated sensibilities of the instrument', a combination of 'selected characteristics – physical, acoustic, stylistic or aesthetic' which 'interact with a variety of musical and extra-musical factors to create innovations in musical form' (Théberge, 1997, p.159).

Théberge also observes that the physicality of playing an electronic instrument can also mediate musical style (1997, p. 199). One of the main components of performance physicality is the ergonomic design and weight of an instrument's keyboard (Rosen, 2013, p.85). Reconstructive performance on the Hammond organ confirmed three surprising physical characteristics in this area: the very low resistance of the keys, meaning that very little physical force was required in order to depress them; the high trigger point of the key, meaning that sound is produced almost immediately after touching the key,

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[51] E.g. as found in Hal Leonard (1988, p342).

well before the key reaches the keybed, and the comparatively short key depth.[52] This facilitates Waller's technique of brushing keys adjacent to the melody note so as to execute grace notes and rapid appoggiaturas e.g. in bars 21 to 24 of Transcription One. Clearly, Waller embraces the immediate sound and light touch of the instrument and uses it to his advantage, with one improvisation section at bars 85 to 97 consisting entirely of rhythmic chords, played with the right hand on the lower manual in syncopation with the left. Although the tone is immediate, facilitating rapid rhythmic figures, the lack of upper frequencies within the lower manual registration limit the harmonic content so as to provide rhythmic direction rather than harmonic interest. Overall, there are a number of passages that prioritise rhythmic exploration e.g. bars 77 to 96 and bars 97 to 108, all of which are made possible by these unique elements of the Hammond organ's design. The lightweight keys also facilitate manual glissandi, which become a core part of the thematic material (as shown in bars 121 to 128 of Transcription One).

The identified short key length, which affects both white and black keys, also facilitates a particular playing technique wherein Waller uses the thumb to slide a descending semitone in arpeggios. This can be seen in Bars 73 and 75 of Transcription One, where the movement from C sharp to C

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[52] Interestingly, contemporary marketing techniques used by Hammond-Suzuki focus on all of these identified ergonomic qualities of the Hammond organ keyboard (which is a reproduction of the original design) and portray them as unique selling points (Hammond USA, 2016). Organists endorse the product by mentioning that the new instruments capture the unique 'feel' and 'tradition' of the older models. Although this has been the marketing technique used by Hammond and its competitors for the last twenty years at least, the fact that feel and ergonomics are mentioned support the view that these are important factors in organ performance.

natural is made less precarious (owing to a shorter key and low key resistance) than the same movement would be on a conventional organ keyboard.[53]

Organist Lenny Dee also recorded the *St Louis Blues* on the same model of Hammond organ in 1950 (Faragher, 2011, p.244). Dee's recording is remarkably similar to Waller's with regard to the use of staccato articulation, the primacy of rhythmic content over melody and the frequent use of grace notes for melodic decoration. A tempo of 189 beats per minute approaches the same energetic direction of Waller's recording and it can be shown that both recordings on the same model of instrument share common stylistic traits: the extended, staccato melodies at 00'43'' and 00'48'' that recall a similar style to Waller (e.g. bars 10 to 32 of Transcription One), the very similar crotchet-based chordal accompaniment throughout, an improvisation based purely on stabbed, staccato chords at 02'34'' and the exploration of a high 'whistle' sonority beginning at 02'06'' are all remarkably similar to bars 61 to 72 and 85 to 97 of Waller's arrangement.

Whilst Waller and Dee's recordings have several stylistic similarities, Bill Davis' 1959 recording exhibits significant stylistic contrast. The main reason for this difference in style is the use of an upgraded Hammond organ, the B3 model, complete with a Leslie Vibratone speaker. The addition of a Leslie speaker is the leading contributory factor to Davis' style which, as will be detailed later, provides an expanded palette of timbre and volume to explore.

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[53] Such arpeggio figures as described above are not found in Waller's earlier pipe organ recording of the same piece (Waller, 1926).

In terms of articulation, the same staccato approach to playing as previously attributed to Waller and Dee can be heard in this recording e.g. at 00’00” to 00’30” in a more extreme form: the Leslie Speaker modulates the tone of the organ (which has a very loud registration consisting of every drawbar pulled out to maximum level) to such an extent that to hold static chords for too long is overbearing. Combined with a reverberant recording space, the staccato, stabbed chords such as those heard between 02’00’’ and 03’00’’ ricochet in between the solo saxophone and guitar parts. Davis’ melody is simpler, both in terms of melodic extension and rhythmic variation, and is played at a more laid-back tempo of 110 beats per minute. With a more interesting and varied tone at his disposal, Davis uses more of the empty space between melodic phrases to balance the harmonically rich timbre of the instrument combined with Leslie speaker.

Waller’s technique of regular repeating chord patterns are not used on the lower manual here. Instead, a legato bass line is played with the left hand, providing a rhythmic pulse against which further syncopated cluster chords, formed from handfuls of keys, are occasionally slapped down on the lower manual with the right hand. Davis exploits the sonority of using a single drawbar registration, in this case the sixteen-foot drawbar, on the lower manual that provides harmonic support without a distracting higher frequency content or percussive transient. Via experimentation on the Hammond organ, it was discovered that the lightweight keys also facilitate Davis’ technique of ‘slapping’ the lower manual with the palm of the right hand.

Davis is heard to exploit a specific point of design with regard to the Hammond organ, termed ‘foldback’ by Vail (2002, p.89) but not defined

further. Through reconstructive performance, it was discovered that the lowest octave on the Hammond keyboard would transpose up an octave when played using a sixteen-foot registration. In other words, when playing a descending C major scale (C4 to C2) using the lowest two octaves with a solo sixteen-foot drawbar, one would actually hear C4 to C3 twice. This effect is used by Davis to produce intervallic leaps that would otherwise be more difficult to execute e.g. playing a stepwise movement down from C3 to B2 actually sounds a leap of a major seventh, from C3 up to B3.[54]

The *St Louis Blues* was also recorded in 1959 by Ethel Smith, on a Hammond B series organ. Smith records without a Leslie Vibratone speaker and instead makes use of the vibrato effect on the instrument, which also mediates her use of articulation and melodic phrasing.

Vail (2002, p.70) states that the vibrato function is widely considered to be an obsolete feature on Hammond organs, superseded by the 'far more exciting animation' offered by the Leslie speaker. However, the vibrato effect can be seen to be an integral part of the performance style heard on Smith's *St Louis Blues*.[55] Melodic phrases are longer throughout the first half of the piece, with a more legato and sustained melodic shape than Waller, Davis or Dee. Glissandi and grace notes are used only very occasionally and noticeably less

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[54] Foldback is also defined by Limina, but the effect is erroneously explained as occurring an octave lower than that stated above.

[55] Smith's reason for choosing the vibrato effect is not known. However, as a sponsored demonstrator for Hammond Organs (Vail, 2002, p.16), Smith's recording output was carefully vetted by the company. Although Vail does not make the connection, Hammond's recorded opposition to the Leslie speaker and the desire to promote music that 'used the organ as Hammond intended' (Vail 2002, p.15) probably guided the decision.

frequently than the other three recordings. The legato articulation combines with these longer melodic phrases, giving prominence to the undulating vibrato in the organ tone.

In the second half of the recording, where the piece moves to double time with a larger accompanying jazz ensemble, Smith chooses a more detached articulation and includes more rhythmic extemporisation. However, the staccato notes and rhythmic figures lose their clarity and immediacy: the vibrato effect gives an approximate tuning which blurs the pitch of the shortest notes.

2.3.1.2 Voicings and Vertical Structures

Both Waller and Dee adopt what McGowan (2011, p.158) defines as a 'conventional blues dialect' in their approach to harmony, with the use of dominant seventh voicings throughout the accompaniment. As mentioned previously, these harmonies are employed in a regular rhythmic pattern that lasts throughout the recordings. However, Transcription One shows that Waller's arrangement contains a significant amount of textural diversity in the melody, which explores the different ergonomic and tonal qualities of the Hammond organ.

After the initial 'head section', Waller's arrangement continues with various improvisations, all of which are experiments not only in rhythm but also in texture, range and sonority. From an exploration of the tenor range in bars 21 to 32, where a rhythmic melody based around A3 calls to brass-like chordal responses (facilitated by the fast tonal attack of the organ), a

sustained whistle throughout bars 61 to 71 (emphasising the plain and unwavering tone), two-octave glissando in bars 122 to 128 (exposing the lightweight keys) and the four-note chords that emulate a jazz band 'shout chorus'[56] in bars 133 to 144, there are a variety of textures evident which utilise the unique qualities of the instrument.

Davis' arrangement uses a different textural model to Waller and Dee, but the origins of which can still be seen as a response to the ergonomics and technical profile of the instrument. One of the main textural differences in Davis' recording is the omission of any bass pedal playing. Via reconstructive performance, it was discovered that Hammond bass pedals had the same acoustic performance as the keyboards i.e. a distinctive lack of any decay or sustain. With Waller and Dee, the quick tempo and regular left hand chord patterns provide the rhythmic impetus and drive, meaning that the bass pedals were used only for providing a regular harmonic fundamental. As can be heard in Davis' recording, the legato 'walking' bass provides not only the harmonic basis but a greater degree of the forward momentum also. In this case, the smooth walking bass line is achieved by using the keys of the lowest octave of the lower manual. Trying to achieve the same effect on the bass pedals is impossible, since the physicality of playing with the left foot alone dictates that legato phrasing between intervals of more than a tone is very difficult: a choppy, staccato line is the result.

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[56] A 'shout chorus' is a loud, spirited, climactic chorus in a performance by a big band (Baker, 1987, p.137 and Sturm, 1995, p.209).

As the left hand is employed by the bass part, the right must somehow provide melodic and harmonic content. Davis does this by voicing every melody note as a five-part chord, a technique that would be impossible to execute were it not for the lightweight properties of the Hammond organ keys.[57] Mark Vail (2002, p.17), states that Davis was the first organist to 'play the organ like a big band' although this statement is not explored further. However, Vail's suggestion can be substantiated via reference to Davis' recording of the *St Louis Blues*. In this case, the five-note chordal melody emulates the close voicings of a big band horn section (Sturm, 1995, p.209), whilst the bass played on the lower manual, combined with palm slaps, provide an effect which is similar to bass and rhythm guitar configurations. A filmed example of this technique is shown as Technique Example One on the accompanying DVD to this thesis.

The recall of familiar parallel configurations when discussing texture (such as in Vail's description of playing the organ 'like a big-band') is not wholly dissimilar from McGowan's concept of harmonic dialects. In all three arrangements, the aural suggestion of an emulated context can be identified, whether it be a rhythmic Harlem blues ensemble (in the case of Waller and Dee) or a broader big-band configuration (as used by Davis).

Smith's recording exhibits an entirely different and varying textural configuration to the other arrangements discussed above. As previously

[57] As can be seen in Technique Example One, playing phrases consisting of successive five-note chords requires that the hand shape is kept mostly fixed throughout. Movement between different chords is achieved largely via the wrist. This approach is made much easier on a Hammond B3 organ, since the high trigger point of the key, shorter key length and the low physical resistance mean that notes can be played with the lightest and briefest of key presses.

stated in Section 2.3.1.1, the use of vibrato and an initial legato articulation creates a peripheral quality in which there is little contextual connection to jazz or blues. The same observation applies to the use of texture: sometimes the melody is played in bare octaves, in thirds or in various contrapuntal configurations that do not reflect the typical textural configurations of a jazz mode. The accompaniment too is often played in patterns that have no characteristic swing rhythm, instead forming single line countermelodies that provide little in the way of harmonic foundation. The recording also features two bass lines; one played on the Hammond organ and another provided by an acoustic string bass, which produces a very strange effect indeed. Altogether, referring to the use of McGowan's metrics, the harmonic dialect is as unclear as the textural context.

2.3.1.3 Registration and Expression

As can be seen from the reconstruction of Waller's performance in Performance One, the drawbar configuration remains unchanged throughout. The reasons for this are related to ergonomics and were confirmed by experimentation during the preparation of the filmed performance.

Whilst the Hammond organ has a method of changing the drawbar configuration instantaneously via the black preset keys on the far left of the instrument console, these are not used in Waller's performance. The reason being that their location made access very difficult whilst performing at such a quick tempo. Similarly, whilst the central placement of the drawbars made

these easier to access, changing their configuration was impossible without interrupting either the accompaniment or melody.

However, this is not to say that changes of tone do not occur in Waller's performance. Instead of using drawbars or presets, the right hand can be seen to drop to the lower manual in order to effect a quick contrast of melodic tone e.g. at bars 33 to 44. Davis also uses the same technique, at 01'23" for example, as does Dee[58]. In all cases, swapping between manuals can be achieved relatively easily as both the upper and lower keyboards have the same sixty-one note compass.

In recordings by Dee and Smith, occasional dynamic swells can be heard whereby the volume of the organ momentarily increases in order to accentuate a note or chord. Mark Vail (2002, p.16) recalls an interview with organist Moe Denham, who describes Dee's use of this technique:

> That is the way to do it now in jazz, blues and pop music, because the expression pedal is very important. It's how you get a dynamic feeling when you play, like a pianist, by pumping it with the rhythm. Lenny Dee worked the expression pedal so much, it sounded like he had a rhythm section[59] when he really didn't.

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[58] Dee also makes use of an additional smaller keyboard fixed underneath the main Hammond organ console, called a Solovox. This addition adds the reed-type sounds heard at 01'31.

[59] The term applied to the rhythm, or accompanying instruments within a band i.e. piano, guitar and double bass (Grove Online, 2017).

Whilst it is true that the expression pedal[60] is used for accentuation, Dee's recording of the *St Louis Blues* doesn't exhibit any form of regular, rhythmic alternation of the expression pedal of the type that is suggested in Denham's quote above. In addition, reference to some of the filmed performances of Dee will show that, whilst the expression pedal is used for occasional accentuation, it is not utilised in the regular rhythmic sense that Denham claims.[61] Ethel Smith uses the expression pedal in a similar fashion to accentuate chords e.g. during 00'16'' to 00'18'' of her recording. In fact, this effect becomes so pronounced in places, e.g. at 00'40'', 00'48'' and 01'10'', that it surpasses Dee's use. Smith also uses what can be best described as the reverse technique, whereby chords and glissandos are suddenly cut short by rapidly closing the expression pedal e.g. at 00'05'' and 01'35''.

Similar accentuating effects are also heard in Davis' recording e.g. at 0'19'' and 0'32''. As organist Glyn Madden recalls (Madden, 2011), using this technique on a Hammond organ connected to a Leslie speaker (as was Davis' configuration) created an even more dynamic effect:

> The sharp acceleration of the expression pedal [became] keener … and this is easily noticeable (particularly when block chords are played) in many recorded performances where the sound of each chord is given an almost explosive attack.

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[60] Using a similar concept to that found in pipe organ design, the expression pedal is controlled with the right foot. Pushing the pedal forward (using the toes of the foot) increases the volume of the organ, whilst pushing the pedal backwards (using the heel of the foot, towards the floor) decreases the volume.

[61] E.g. such as that found online (Mr Entertainer - a tribute to Lenny Dee at the organ, 2008).

2.3.1.4 Ensemble and Studio Techniques

Waller and Dee's recordings are both recorded in an acoustic with very little audible ambience or acoustic reverberation. This suits the rapid, staccato style of playing and exposes the rhythmic patterns and clipped articulation.
Davis' performance has some audible ambience, obtained by placing the recording microphones further away from the Leslie speaker. This adds some decay to the staccato chords, which provide a greater sense of melodic continuity at the comparatively slower tempo. As discussed in Chapter One of this study, producer Albin Zak (2009b, p.309) states that the recording and production techniques used in popular music are as important as more obvious performance components, such as instrumentation or indeed the musical content of the song.

Vail's discussion (2002, pp.152-54) of various microphone placement techniques, affirmed by organist interview, lends further credit to this statement: the character and musical style that Davis achieves in this recording owes as much to the energy and 'bounce' of the studio acoustic and recording configuration as to the capabilities of the Leslie speaker and Hammond organ.

Ethel Smith's recording also incorporates reverberation, although its application differs from that of Davis and the ultimate result is not as successful owing to two main faults. Firstly, the amount of reverberation added is quite extensive: the audible decay heard after each note tends to add a high degree of sustain to the staccato chords in the later half of the

performance. Secondly, poor microphone placement results in a distant-sounding instrument. Although Smith's Hammond organ has reverberation added, this practice is not extended to the accompanying acoustic instruments. As a result, the organ is placed into a segregated aural dimension that sounds incongruous. This mismatch of articulation and overall sound suggests that, unlike Davis, there is no sense of symbiotic interplay between the instrument and the studio process. In parallel to the concept of McGowan's harmonic dialects, the effects used in Smith's recording do not add up to a clear or familiar lexicon, thus the listener is always left wondering what they are hearing. Furthermore, the use of multitracking[62] on Smith's recording is somewhat disconcerting: an additional organ part fades in and out without any obvious relation to a point of juncture or climax, which confuses an already puzzled listener.

In recordings by Davis, Dee and Smith, the use of additional instrumental parts gives a greater degree of tonal contrast than is possible via a solo performance alone. As such, it is not surprising that Waller's performance, as the only truly solo recording, is the shortest of the four but the most varied in terms of textural configuration.

[62] A term applied to a recording technique in which separate tracks (in this case, multiple recordings of Smith playing the Hammond organ) are recorded successively and then combined in the studio so as to be heard simultaneously (Horning, 2012, p.57).

2.3.2 Analysis 2: Moonglow (Husdon & Mills)

Composed in 1933 by Will Hudson and Irving Mills, *Moonglow* is a thirty-two bar piece, with an AABA structure.

The recordings analysed by this study are:

- Jessie Crawford, *NBC Television recording*, 9 February 1949 (Filmed as Reconstructive Performance Two).
- Buddy Cole, *Ingenuity in Sound*, Warner Bros. BS 1442, 1962.
- Ethel Smith, *Ethel Swings Sweetly*, Decca DL 74095, 1958.

2.3.2.1 Articulation, Melody and Rhythm

Although the style and tempo of Crawford's *Moonglow* are entirely different to that of Waller's *St Louis Blues*, there are significant similarities in articulation between both recordings.

Like Waller, varying articulation is clearly one of Crawford's main stylistic tools. Staccato figures always follow an overtly legato-phrased melody and are used frequently to punctuate rhythmic chords at the end of phrases e.g. bars 7 to 8 and 15 to 16 of Transcription Two. As previously discussed, this brings the immediate tonal characteristics of the Hammond organ to the fore.

Glissandos are used frequently in this arrangement, both to connect intervallic leaps in the melody (e.g. bars 2,4 and 5) and to provide a point of

interest, emulating a descending harp glissando during longer melody notes that would otherwise be rather staid e.g. in bars 2,4,6,10 and 12. As mentioned in the previous analysis of Waller's *St Louis Blues*, descending glissandi can be executed easily due to the lightweight keys on the Hammond organ.

Mark Vail quotes organist Rosemary Bailey's description of her general approach to Hammond organ playing as 'play[ing] a lot of glisses[63], a lot of arpeggios[64], to connect one chord to the next' (Vail, 2002, p.163). Whilst Crawford's arrangement contains frequent glissandi, the lack of any arpeggios doesn't detract from Bailey's implied need to essentially 'fill the space' and connect melodic elements together in the absence of any natural acoustic decay. The glissandi in Crawford's arrangement addresses this purpose and provides interest in an otherwise fairly slow-moving arrangement.

As with Davis, Crawford also uses a Leslie speaker to inject essential energy into otherwise unornamented and straightforward playing. Via reconstructive performance (shown as Performance Two), it became clear that the Leslie speaker played a vital role in the performance aesthetic: the complex fluctuations in pitch and amplitude add interest to the tone of the instrument. This is in turn facilitates a slower tempo and a legato approach to articulation.

Buddy Cole's general approach to melodic articulation is very similar to Crawford's: the use of the Leslie speaker similarly supports a simple and

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[63] An abbreviation of the term 'glissandos' also used by blues keyboard player, Merrill Clark, to describe 'rapid scales played by sliding fingers over the keys' (Clark, 1992, p.48).

[64] Defined by the Grove Dictionary of Music as 'the sounding of the notes of a chord in succession rather than simultaneously' (Grove Online, 2017a).

undecorated approach to melody and rhythm, with glissandi evident between the same intervals bridged by Crawford and within the same comparative two octaves.

Smith's arrangement is perhaps the most rhythmically diverse, although the rather deliberate, wooden swing in the middle eight section of the piece seems an odd choice. In contrast to her recording of the *St Louis Blues*, Smith uses a Leslie speaker in this performance, which lends more interest to the tone of the organ. However, this recording has the most basic approach to melody of the three studied, containing no glissandi or additional supporting material. Instead, held notes at the end of phrases are left to drone on and, consequently, tend to drag down an already pedestrian tempo.

2.3.2.2 Voicings and Vertical Structures

The use of the Leslie speaker also provides Crawford with new opportunities regarding the voicing of harmonies and the construction of chord textures. As can be seen from Transcription Two, Crawford's use of accompanying harmony during the A sections of the piece is predominantly chordal. The Leslie speaker makes a significant contribution to the effectiveness of this style, giving the static chords tonal variation and animation.

Most of the melody in Crawford's recording of *Moonglow* is presented as a single line, using a carefully balanced drawbar registration to project over the accompaniment played on the lower manual. However, the melody of the B section is configured differently, voiced as four-note, open harmony chords (beginning at bar 17 in Transcription Two). This is an interesting textual

contrast and, according to Mark Vail (2002, p.175), one that organist Rosemary Bailey ascribes to Crawford:

> The Jessie Crawford setting? You take the middle notes of each chord you're playing and put them one octave lower. That amounts to having spaces of four or five notes between each note in a chord, so it's best to play with both hands on one manual.

However, examination of the transcribed chord voicing beginning at bar 17 reveals that Vail's description is not sufficient. Firstly, Transcription Two shows that whilst it is true that there is generally a gap of four or five notes between the two voices in each hand, there is no information given regarding the type of harmonic dialect: the results of this transcription reveal that Crawford would often use harmonies containing thirteenth, ninth and minor seventh extensions[65] in order to achieve the desired harmony. Secondly, the two 'middle notes' that Vail refers to above need to be inverted after transposition, rather than simply moved down an octave. In addition, evidence gathered by this survey challenges the assertion that Crawford would have used both hands on one manual. In this transcription, the open harmony is spread between two manuals.

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[65] As defined by Baerman (1998, p.26), chord extensions are 'extra notes stacked on top of a chord to give it extra colour.' These are each named after the relevant interval from the root of the chord e.g. the thirteenth extension refers to a note which is a major thirteenth above the root.

It is difficult to make any overall observations regarding Cole's use of texture in his recording, as the use of multitracking means that, as with Smith's recording of the *St Louis Blues*, multiple organ parts can be heard at once and the extended textures achieved are therefore unrepresentative of what can be achieved at the instrument.

However, it is possible to hear a remarkable similarity in the texture of one of the organ parts in Cole's recording with that of Crawford's. During the middle eight section, Cole chooses exactly the same open harmony[66] configuration that is shown in Crawford's arrangement in Transcription Two.[67] In addition, Cole also uses a different two-handed, close harmony technique that is the same as that attributed to organist Milt Buckner (Martin and Waters, 2008, p.162 and Myers, 2009). Martin and Waters provide scored examples of this style of playing, defined as 'locked-hands', whereby the melody is voiced as a four-note chord, with the uppermost note doubled an octave lower in the left hand. This configuration forms the basis of what Myers (2009) refers to as a 'rambunctious organ style … that transformed a generation of players' which, according to his use of this technique, included Buddy Cole.

Ethel Smith's use of texture and chord voicings is wholly different: the melody is mostly presented as a single line, with frequent contrapuntal

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[66] According to the Grove Dictionary of Music (Grove Online, 2017b), open harmony defines a texture 'in which notes of the chords are widely spread'.

[67] Whilst it is not possible to establish a definitive link between Crawford and any influence on Cole, it is quite likely that, as a highly regarded and popular 'idol of organists' (Hall, 1962, p.15), Crawford's ideas and practices would have been studied by others via his recordings and broadcasts, affirming Katz's hypothesis of stylistic dissemination (2008, p.84). The fact that Crawford's open harmony style is mentioned in Vail (2002, p.175) also suggests his popularity.

melodies played on the lower manual. This creates an open, thin texture which, when combined with the straightforward approach to melody creates a general impression of ethereal emptiness. The voicing of the melody in thirds[68] e.g. at 2'07'' also contributes to this alternative other-worldliness and, once again, the arrangement seems to fall between trying to establish a convincing jazz context or offering something unique and compelling.

2.3.2.3 Registration and Expression

An analysis of Crawford's use of registrations revealed that there were no changes made during his performance. Reference to the video of this performance, shown as Performance Two on the accompanying DVD, demonstrates that both hands are at the keyboards throughout the performance in order to main a legato phrase structure. The reason for the lack of registration change is rooted in the same ergonomic considerations as that discussed in the analysis of the *St Louis Blues*: reconstructive performance revealed that it was not possible for the player's fingers to manipulate drawbars or presets without lifting the hands from the keys, thus breaking the legato phrasing or interrupting the chordal accompaniment.

Although Crawford is unable to effect any tonal change via registration, contrasts are achieved by varying dynamics via the expression pedal. As can be seen and heard from Performance Two, the dynamic changes usually take

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[68] A third is defined by the Grove Dictionary of Music as 'any two notes that are two diatonic scale degrees apart' (Grove Online, 2017c). In this instance, both notes are played together.

the form of sudden reductions in volume, executed at the same time as the descending manual glissandos to emphasise their effect e.g. in bars 2 to 3 of Transcription Two. Pronounced swells in volume are also used to accent the rhythmic chords e.g. in bars 7 and 8.

Ethel Smith's recording does make use of registration changes via the Hammond organ's preset keys, which change the sound of each manual when selected, in the same way as registration pistons recall a certain configuration of stops on a pipe organ. Smith has opportunity to use these owing to the slower tempo of her arrangement and a largely unornamented melody, which leaves plenty of space at the end of each melodic phrase. This in turn gives her time to operate the presets and drawbars before a new phrase or section begins[69]. The support of her backing group also allows time away from playing the keyboard, so as technical changes can be made without interrupting the flow of the music.

Cole establishes a wide palette of tonal colours via different drawbar combinations, with which he seems to switch between frequently. However, these changes in registration are achieved by studio means as experiments with the original instrument revealed that the frequency of such registration changes was unachievable in live performance.

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[69] E.g. at 0'47", 1'33" and 1'56", where changes of registration can be heard (Smith, 1961).

2.3.2.4 Ensemble and Studio Techniques

Crawford's recording of *Moonglow* is the only solo performance analysed and the shortest of the group, being of only 1'15'' in duration. Cole and Smith both use an accompanying rhythm ensemble to support their solo parts, which offers more creative possibilities and thus lengthens the arrangements: Cole's performance, which adds drums, guitar and bass is 2'20'' and Smith's, which uses the same configuration is 3'04''.

Cole's recording utilises extensive post-production studio effects to enhance the tonal range of the organ: separate parts are heard simultaneously, using different registrations at varying volumes, with different levels of reverberation and at changing positions within the stereophonic field of sound. All these effects are added in the studio, since experimentation on the original instrument revealed that there was no possible method of achieving this on the organ. [70]

Ethel Smith's rhythm group provide a supportive accompaniment of drums, bass and guitar harmonies, although her favoured single note, contrapuntal style of playing remains at odds with a band configuration that suggests a jazz context. As with Smith's *St Louis Blues*, additional reverb is

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[70] According to musicologist, Timothy Warner, 'the complete separation of each track offered by multitrack recording is attractive to artists partially because of the access and control of each sonic detail that it offers […] these modifications can range from clearly audible and often dramatic changes in the signal to extremely subtle changes that are barely perceivable by the listener. The startling changes, often known as "effects", most notably include artificial reverberation […] Signal processing offers the pop musician a wide range of facilities which enhance audio signals in a variety of ways, producing sounds that are fundamentally more interesting because they are more varied and complex (Warner, 2003, pp.23-24).

added to the organ part only, which results in a similar acoustic separation between acoustic instruments and the Hammond organ, disconnecting Smith's musical role from that of the accompanying jazz ensemble. The pronounced, expressive swells in volume that occur towards the middle or end of phrases, e.g. at 0'53 and 1'53'' are also an unusual aesthetic.

2.4 Conclusions

This chapter has used two case studies as a means of rediscovering the aesthetic properties of the Hammond organ and various parameters of design encountered by players. In reconstructing the performances of Fat Waller's *St Louis Blues* and Jessie Crawford's *Moonglow*, with additional reference to other contemporaneous recordings as further evidence, this survey has made some unique observations regarding the practices employed by organists in order to accommodate and exploit the tonal characteristics of the instrument.

The evidence gathered from these reconstructed performances and subsequent stylistic analysis has made it possible to identify elements of common practice that are found frequently in the majority of the recordings examined:

- **Frequent glissandi** - The use of ascending and descending glissandi is a common stylistic feature found frequently in most of the recordings studied in this chapter. This technique is facilitated by the rounded, lightweight keys that are used on the Hammond organ, enabling the fingers to glide quickly over the keys without any significant resistance.

The sixty-one note compass of both manuals makes two-octave glissandi possible. Smaller range glissando was also used in Cole and Crawford's *Moonglow* which, as Vail (2002, p.163) recalls in an interview with organist Rosemary Bailey, was a method of connecting and ornamenting intervallic leaps.

- **Grace notes** - The use of grace notes was found to be common practice in performances of a medium to fast tempo, such Waller, Dee and Smith's *St Louis Blues*. Facilitated by the Hammond organ keys, grace notes are used frequently to provide an additional transient to a melody note, creating accentuation. Grace notes were not used in Davis' recording as the use of chordal textures throughout the melody prevented their execution.
- **Clipped articulation** – A predominantly staccato[71] playing style, commonly found in rhythmic pieces of moderate and fast tempo, facilitated by the immediate sound of the Hammond organ. Examples can be found in Waller, Dee, Davis and Smith.
- **Accentuation with the expression pedal** – The wide dynamic range offered by the Hammond organ, controlled by the expression pedal, encouraged players to introduce momentary movements with the right foot, rapidly opening and closing the expression pedal to create sudden surges in volume. This technique was used to accentuate certain

[71] As defined by Chew and Brown (2017), staccato describes an event that is 'of an individual note in performance, usually separated from its neighbours by a silence of articulation.'

chords or notes and can be heard in the recordings of Smith, Dee and Crawford.

- **Textural variation** – In the absence of making significant changes to registrations, organists would interchange different vertical structures during a performance in order to effect some differentiation. The analysed recordings suggest that there are four main textural configurations:
    - **Solo Melody and Chords** – The melody played on the upper manual with accompanying harmonies played on the lower.
    - **Two Handed, Open Harmony** (Jessie Crawford Setting) – Melody and harmony are integrated within a four-note, chordal block. This method is also used in the same configuration by Cole.
    - **Two Handed, Close Harmony** (Buddy Cole) – Used by Cole in the A sections of *Moonglow*. As described in Section 2.3.2.2 above, Cole uses a two-handed technique on one manual, consisting of a four-note chord voicing in the right hand with the melody doubled an octave lower in the left hand, creating a five-part ensemble.
    - **Full Chordal Melody** (Bill Davis) – Each melody note is placed at the top of a five-note chord, played with the right hand on the upper manual. The left hand plays an accompanying bass line on the lower manual.

As well as hitherto unrecorded observations on performance style and technique, the results gained from this exercise have also facilitated a re-evaluation of some points of performance practice that are misinterpreted in other works, such as the configuration of Crawford's open harmony technique, the function of 'foldback' on the Hammond organ and the incorrect description of Waller's organ playing style as being derived from stride piano. This work has also begun to build a case for the existence of a stylistic canon, demonstrated via the identification of Buddy Cole's emulation of textural styles pioneered by the earlier recordings of Crawford and Buckner, in alignment with the concept of a 'collective musical space' created by recordings defined in Section 1.3 of Chapter One and Katz's concept of stylistic dissemination via recordings of jazz music (Katz, 2008, p.78).

The results presented in this chapter also build a consensus with some general points of concept identified in Chapter One of this thesis regarding the hegemony of artistic and aesthetic processes as embodied in recordings of jazz or popular music. Théberge's concept of the instrument being a fused component of a performer's intuitive musical style that 'can only be separated in theory, not of practice' (1997, p.184) is found here. Examples cited in Section 2.3 of this chapter, such as the varying approaches to articulation and textural configurations, demonstrate a link between the ergonomic and aural characteristics of the instrument and musical style (as described by Théberge, 1997, p.186 and Walser, 2014, p.67).

According to Théberge (1997, p.198), this nature of interaction between the musician and instrument challenges the WAM model of 'subjective, internal listening that guides the act of sound making, whereas

this more recent form of practice suggests the opposite: an external form of listening where the objective character of the pre-existing sound strongly influences the manner in which it should be played'.

Organist and Hammond demonstrator Peter Holt (2011) implies this concept in his description of the relationship between instrument and performer:

> The attraction to the Hammond organ for me is that it feels alive. As a musician you can add feeling and soul to your performance in a way that brings your emotions into the music.

Holt's choice of words in the above is interesting and implies support for Théberge's point. By being 'alive', the instrument has elevated itself from being a passive and transparent tool of musical endeavour (the conventional WAM perspective) to an entity which motivates, develops and sometimes confounds the organist's own musical thought. A similar viewpoint is expressed by Mark Vail (2002, p.10), using similar terminology:

> What's so special about the [Hammond] .. and other tonewheel organs? Most important is their sound. Their output is more alive, organic, if you will.

However, the results of this chapter suggest that there is a duality of process to be understood when considering the performance practice of musicians of this genre. Whilst the instrument undoubtedly influences the

organist, they must retain overall executive control and be aware of the target medium: the sound recording.

Zak (2012, p.87) and Horning (2012, p.57) establish that studio processing can afford as much musical integrity and impact as the instrumentalist when the medium of recording is concerned. Even at this historically early stage of studio production, it is interesting to note that such tools are integral even to some of the recordings studied in this chapter.

In the case of Waller, Dee and Crawford, the only mediating factor that could be attributed to a studio environment is the way in which the performance is recorded i.e. with an absence of any ambient sound reflection. However, the stylistic success of Davis' recording arguably relies on the acoustic 'bounce' and the correct placement of the microphones to capture this effect as much as the use of a Leslie speaker and a full organ registration. Cole's recording demonstrates the most complex use of studio processing effects: the multi-tracked recordings and extensive use of stereo placement, mixing and echo effects represent what Nick Mason, studio engineer and drummer for Pink Floyd, refers to as the 'studio album' (Mason, 2009, p.215).

This is the antithesis of the approach taken by Waller and Crawford, whereby the process of recording is treated as an auxiliary factor, a method of journaling live performance similar in approach to that set out by Stock (2010)[72], albeit with consideration of the practical constraints mentioned by Heaton (2009, p.218), Rosen (2003, p.167) and Katz (2008, p.76) that are

[72] It is worth remembering that Crawford's 'recording' is in fact that of a live television broadcast, complete with continuity announcements.

inseparable from the practice of performing for a microphone, whether it be for recording or live transmission.

With Cole's recording, the Hammond organ and Cole's playing are but a bit part in a whole new sub-genre of production which, as discussed in Chapter One, promoted the stereo effects and artificially created textures as a unique selling point, targeting a clientele that was newly engaged with commodity scientism and the 'hi-fi'. [73]

When listening to this album today, over fifty years since its release, it is easy to feel a similar type of bewilderment that one may experience when watching Stephen Teakle's Barry Morgan: the continuous echo, fading and other effects heard on Cole's recording are different to the type of production techniques heard in contemporary popular music, not to mention the unfamiliarity of the instrument's tone. It is for this same reason of cultural displacement, embodied by Barry Morgan, that some of the production techniques heard on Ethel Smith's recordings may appear poorly chosen today, but may well have made sense half a century ago.

Mason (2009, p.215) states that Pink Floyd went through different stages of preferred recording practice:

> Over a number of years, we moved from a position of thinking that the studio album was something very different to playing live, and separation of instruments was critical – before coming full circle to

[73] Referral to Figure 1.4 in Chapter One reveals that these themes are embodied in the imagery on the record sleeve: multi-coloured, quasi-scientific symbols dominate a wide expanse of space, simultaneously suggesting an arcane precision and form which is other-worldly, very much like the character of music heard on the recording.

> thinking that it made better sense to try and get some spirit of playing together.

If musicians change their preferred method of studio practice over time, this ultimately means that these changing trends will be received by the consumer, supporting the concept proposed by Moorefield (2005, p.xiii): the linear development of the ‘producer’s purview’, which records and produces for ‘the modern ear’ (Rosen, 2003, p.150). Therefore, it becomes necessary to re-examine Nicholas Cook’s concept of ‘historical fidelity’ (2013, p.361) and to expand its remit to acknowledge that it is not only historical sounds and levels of fidelity that become distanced over time, but also configurations and types of studio processing too.

2.5 Summary

This chapter has introduced the Hammond organ and used reconstructed performances to discover varying forms of practice. The filmed performances accompanying this thesis serve to support the observations made herein and, to acknowledge Nicholas Cook’s concerns that ‘much of what we want to say [about performance] slips between our words’ (Cook, 2013, p80), to illustrate by means of demonstration.

In addition to elucidating matters of style and practice, this chapter has also begun to address the work of Théberge (1997) and Walser (2014) regarding the interplay between instrument, musician and musical style and the investigations by Katz (2008) and Zak (2012) into the artistic agency of

studio production. In both areas, there is a broad correlation between the overall findings of this chapter and these previous studies, although the comprehensive evidence presented in this chapter develops the more general conclusions made by others.

Regarding the use of studio production techniques, this chapter has identified the existence of a sub-genre of electronic organ recording: that of studio-processed, multi-tracked works e.g. the recordings of Smith and Cole. These recordings integrate such techniques to a greater extent than the recordings of Waller, Davis and Crawford, which can be termed to be comparatively closer to the concept of live performance.

This thesis will now examine a later type of electronic organ, referred to as the ‘spinet organ’, using the same methods of investigation. As well as identifying any developments in performance practice, the following chapter studies the development of studio-processing techniques and the stylistic influence of newly introduced technological features.

Chapter Three

Spinet Organs by Lowrey and Hammond (1963 - 1973)

3.0 The Lowrey Organ

This study's survey of electronic organ performance styles continues with an investigation into the impact of technologies that were introduced during the nineteen sixties and featured in products manufactured by the Lowrey Organ Company. Later Hammond models are also featured in the comparative analysis of case studies.

Lowrey pioneered the development of the 'spinet' organ: a smaller and cheaper alternative to the larger Hammond instrument. In order to cut costs, the keyboards of Lowrey spinets were of a smaller forty-five note compass and used a similar square-shaped key design found on Hammond console instruments. Spinet pedals were smaller, making up a pedalboard of only thirteen pedal keys.

The Lowrey spinet organs featured in this chapter are the DSO Heritage organ (used in recordings by British organists Harry Stoneham and Alan Haven) and the TBO-1 Berkshire, as used by British organist Jerry Allen.[74] All Lowrey organs used a different control system to the Hammond

[74] Lowrey organs were also used in British recording studios during this decade. A Lowrey Heritage was used in the Beatles' 1962 song *Lucy In The Sky with Diamonds*, (The Beatles Bible, 2016) whilst The Who used a Lowrey Berkshire in 1971 for *Baba O'Riley* (Whotabs, 2016).

organ: instead of drawbars, a series of rocker switches[75] turned different tones on or off.

Figure 3.1 Two Lowrey spinet organs used in reconstructive performance in this chapter. The Lowrey Heritage DSO-1 (left) and TBO-1 Berkshire (right) both have small compass keyboards, pedalboard and rocker tab switches.

As will be detailed later, the use of rocker switches did not offer the same level of volume and harmonic control as the Hammond organ drawbar system.[76] However, the addition of tones that were not based on organ flutes, such as those named ‘Strings’, ‘Trombone’ and ‘Clarinet’ meant that different combinations of timbre were possible. These bore very little acoustic resemblance to the actual instruments that they were claiming to represent, but they did offer a significant tonal contrast to the Hammond organ, as Andrew Gilbert (2014) remembers:

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[75] Engineer John Hughes (2015, p.137) describes the operation of a rocker switch thus: ‘A rocker switch employs a plastic or metal piece shaped in a shallow V so that when one end is up, the other is down. In other words, it rocks from one position to another.

[76] As detailed in Section 2.1, the Hammond organ drawbar design made it possible to assign any one of eight volume levels to each of the nine flute harmonics. In contrast, the volume of any flute harmonic found on Lowrey instruments could only be increased to a predetermined level via the Solo control.

> The Lowrey had a totally different sound. The Hammond had this lovely clear, percussive sound but [the Lowrey sound] is more laid back. You'd deliberately not play it like a Hammond, you'd put Strings and Clarinet through it, whack it through the Leslie and it would fizz.

Another main advantage of the Lowrey instrument over the traditional Hammond organ was the development of pedal sustain. This function added a slow decay to the pedal tone, creating a similar effect to that heard when an acoustic string bass is plucked. As an organ demonstrator, Andrew Gilbert (2014) recalls the addition of pedal sustain as being the reason for his preference to sell Lowrey instruments over the Hammond organ:

> The Hammond [console models] didn't have that [sustained pedal] facility and they grunted. You could kick the Hammond to death because it didn't have sustain.

In his earlier comments above, Gilbert also reveals the continuing use of the Leslie speaker in organ performances of this period. As discussed in Section 2.2 of Chapter Two, the speaker was regarded by organists as being an essential addition to an organ's tonal character and one that extended the stylistic capabilities of the instrument.

Lowrey's spinet design proved to be advantageous: increasing organ sales within the domestic home market significantly (Gilbert, 2014). However,

the popularity of the Lowrey organ was due not only to the comparatively lower price when compared to the Hammond organ and the inclusion of pedal sustain, but by another significant and unique facility named Automatic Orchestra Control. Dennis Awe (NAMM Oral Histories, 2016), a Lowrey organ salesman working in New York City in the nineteen sixties, recalls the impact of its introduction:

> In 1962, the Lowrey company changed the organ industry. Technology has always and will always be a part of the home organ industry. They created a feature they called AOC – Automatic Orchestra Control…With one finger in the right hand, you could play perfect harmony. All the people that came in [to the organ shop] played one note and heard a complete harmony. Wow! At that time, people were just blown away.

Designed as an 'easy play' feature as defined in Section 1.2 in Chapter One, AOC was also popular with professional players. In an interview for *Sound on Sound Magazine,* organist Rory Moore (2014, p.191) explains how AOC transferred the notes of a chord held on the lower manual into the melody of the upper manual:

> AOC is a kind of 'wonderchording' – a single note played on the upper manual, for example, fires whatever chord you're playing with your left hand on the lower manual. So, if you're playing a rather jazzy lower–manual D9 flat 5 with your left hand, and

> playing the note F with your right hand on the upper manual, you obtain from that single note, well, something rather odd. But what a glorious odd it is.

Organist Tony Pegler (2015) also recalls his experience of AOC and points to its versatility in performance:

> AOC only works on 8,4 and 2 [flute footages]. What a brilliant idea! So, if you were using something like 16, 8 and 2 [flutes] with AOC only on the 8 and 2 foot, you get a kind of George Shearing[77] thing.

A review of literature revealed that, apart from Rory Moore's interview, the function of AOC has hitherto been unexplored. Experimentation at the Lowrey Heritage for this study has enabled the precise workings of this system to be established for the first time: AOC added all left-hand chordal notes below the melody within an interval of a major seventh, except a tone or semitone below the melody note. Figure 3.2 illustrates this by showing the notes that would be heard with the Lowrey AOC effect enabled compared to the keys pressed.

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[77] A widely recognised technique of chord playing (Baerman, 2003, p.94). Note also Pegler's recall of a textural idiom by name or context, an identified practice amongst musicians of jazz and popular music.

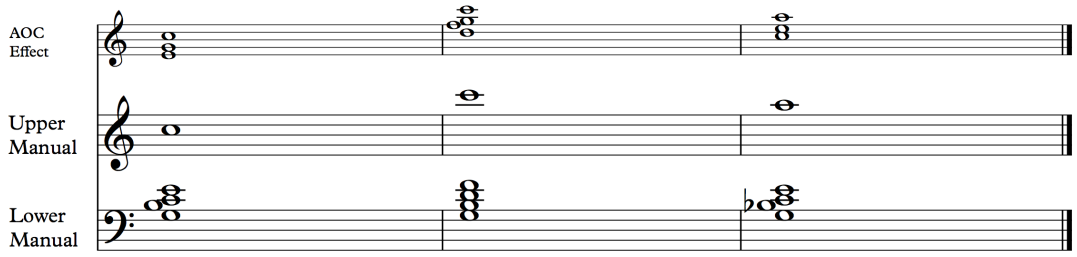

Figure 3.2 An illustration of the Lowrey AOC effect when using a single eight-foot registration. The lowermost staves indicate the notes as played on the upper and lower manuals respectively, whilst the uppermost stave shows the actual notes heard on the upper manual, including those added automatically by the instrument.

3.1 Hammond Organs of this Period

The models of Hammond organ examined in this chapter are the Hammond B3/C3 console and the smaller M100 spinet. Both of these later models included chorus effects to add extra tonal interest. Additionally, a feature called Manual Percussion added extra high frequency transients; best described as percussive 'pings', to the initial attack of the drawbar tones. The Hammond M100 also included artificial reverberation and pedal sustain. However, as Figure 3.3 shows, the Hammond C/B3 was otherwise similar in design to the earlier model A and B models (Vail, 2002, p.65).

Vail (2002, p.45) describes Manual Percussion as a 'pitched attack transient to enhance the [Hammond organ's] tone quality'. However, some details are missing from this description: Manual Percussion added a short, percussive tone to a single key press that was derived from the 4 foot drawbar or from the $2^{2/3}$ drawbar. With experimentation at the original instrument, it was discovered that the percussion effect decayed immediately after a key was held down, leaving the main drawbars to sound. Vail does not describe

the other aspect of this feature, which is how the Manual Percussion effect only responds to the first key press in a legato phrase, meaning that the first note is accented with a percussion tone, but the following joining notes are not. Conversely, a detached, staccato approach will activate percussion on every note.

Figure 3.3 Two models of Hammond organ used in the recordings analysed in this chapter. A Hammond C3 console model[78] (left) and M100 spinet (right)[79].

The following analyses of two case studies continue this project's research into the newer technological features mentioned in Section 3.0 and 3.1. Using reconstructive performance, transcription and organist interview, this thesis continues to assess the agency of these new aspects of electronic organ design in performance practice of the nineteen sixties.

[78] Photograph used with the kind permission of www.hammond-organ.com

[79] Photograph used with the kind permission of Mario at Hollow Sun Studios.

3.2 Presentation of Survey Results

3.2.1 Analysis 1: *Satin Doll* (Ellington, Strayhorn & Mercer)

Composed in 1953 by Duke Ellington, *Satin Doll* is recognised by jazz musicians as a 'standard' (Berliner, 1994, p.53) of the genre. Based on sequences of ii-V chord progressions and a middle eight structure known as the 'Montgomery-Ward bridge',[80] the piece is in thirty-two bar AABA structure. The examined organ recordings of *Satin Doll* are taken from the following albums:

- Jimmy Smith (1969), televised performance, playing Hammond B3 organ.[81]

- Alan Haven (1965), *The Knack*, Fontana records, TF590, playing a Lowrey Heritage organ.

- Kenny Salmon (1966), *Sounds Organised*, Decca, MOR19, playing Hammond C3 organ.

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[80] As defined by Holbrook (2008, p.104).

[81] A video link to this performance is referenced as (Wladi Plus, 2016).

- Harry Stoneham (1967), *Two Fellas to Follow*, TePee records, TPR LP 100, playing Lowrey Heritage. Filmed as Performance Four.

- Dick Delany (1964), *Once Upon A Hammond*, Ace Records [Catalogue unknown], playing Hammond B3. Filmed as Performance Three.

- Dick Hyman (1963), *Electrodynamics*, Command Records, RS856 SD, playing Lowrey Heritage.

3.2.1.1 Articulation, Melody and Rhythm

In this section, the use of articulation, melodic extemporisation and rhythmic development within the six recordings is analysed in order to find any evidence of stylistic canon i.e. the continued use of prior performance practice identified in Chapter Two. In addition, approaches that are facilitated by new technological features found in the later generation of instruments described in Section 3.0 and 3.1 of this chapter are also discussed.

As will be detailed later, the six recordings can be divided into two subgroups by means of instrument differentiation: this section will demonstrate that the two different makes of instrument had specific and unique sensibilities that encouraged different techniques.

In order to provide a clear and concise method of comparison, Figure 3.4 makes use of notation in order to provide an overview of the differences in approach taken by each organist. Ellington's original melodic outline is also included for illustrative purposes and can be found on the uppermost line on

both staves. By comparing Ellington's melody to that played by each organist in turn, examples of rhythmic extemporisation and use of ornamentation can be ascertained at a glance.

One of the elements of common practice identified in Section 2.4 of Chapter Two was the use of ornamentation, specifically the grace note, which was established as a method of adding an attack transient. Figure 3.4 reveals that this practice continues to be evident in most, but not all, recordings and with varying degrees of frequency. In order to find reasons for this differentiation, the instrument used in each performance was determined and experimentation in the form of reconstructive performance took place.

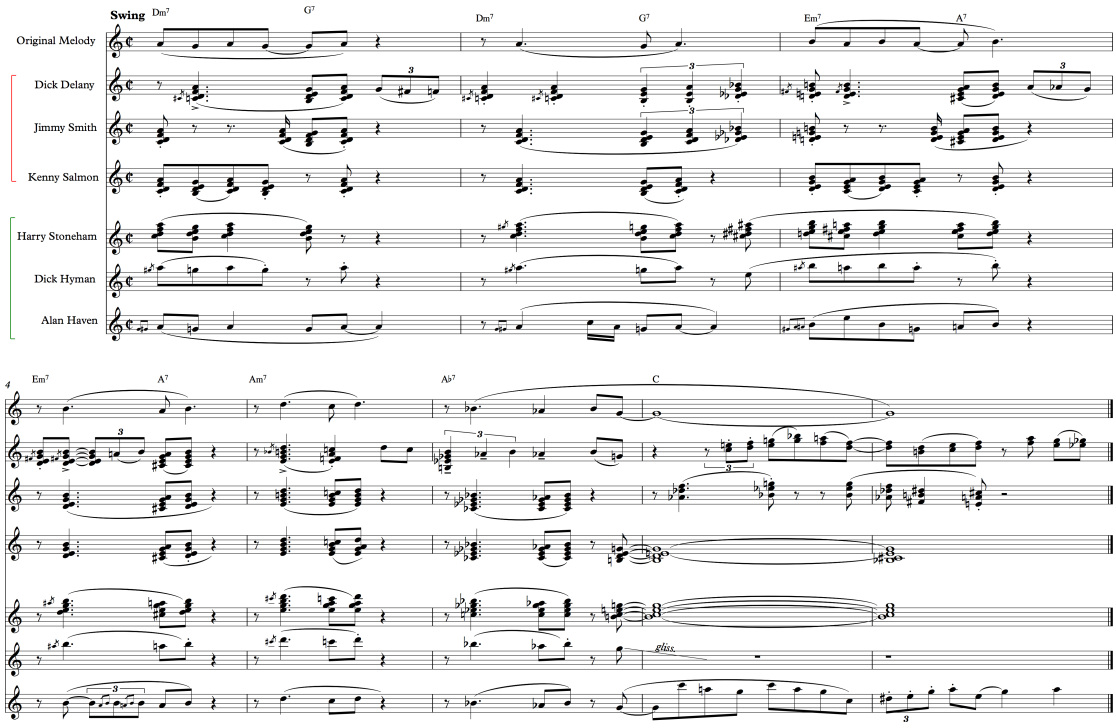

Figure 3.4 An overview of articulation, ornamentation and rhythmic style evident in the first eight bars of *Satin Doll* as played by six organists, compared with Ellington's original melody. Note the different approach to phrasing adopted by players of Hammond organs (bracketed in red) to that of Lowrey organs (bracketed in green).

Delany's performance (shown as Transcription 3 in Appendix A and videoed as Performance 3) uses a Hammond C3 which, as described in Section 3.1 of this chapter, was similar in design to the earlier Model A used by Waller and identical to that used by Cole. Reference to Transcription 3 shows that Delany uses a similarity of approach to these aforementioned organists with the use of grace notes for melodic accentuation e.g. bars 22, 25, 26 and 31, the fluid interchanging of staccato and legato articulation and extensive rhythmic variation. The use of manual glissando, another identified stylistic element found in Chapter Two, is also found in bar 32 of Transcription 3. Passages in close harmony, showing the same configuration of that used in sections of Cole's *Moonglow*, are executed without ornamentation. Legato phrasing brings the exciting tone of the Leslie speaker to the fore, whilst the staccato chords e.g. at bars 10,12,13 and 18 have the same explosive effect as heard in Davis' *St Louis Blues*.

As Figure 3.5 shows, Jimmy Smith's technique of voicing every melody note as a chord appears to be similar to that of Bill Davis. However, Smith's articulation demonstrates a significant difference of approach that relates to the use of Manual Percussion. Reconstructive performance, filmed as Technique Example 2 on the Hammond organ, revealed that this new feature added a high-frequency transient to the first note of a legato phrase but not on subsequent others. Smith can be heard to exploit this feature, often dividing up Ellington's melody into quaver couplets rather than longer phrases to create rapid patterns of percussive accent as shown in Figure 3.5 below:

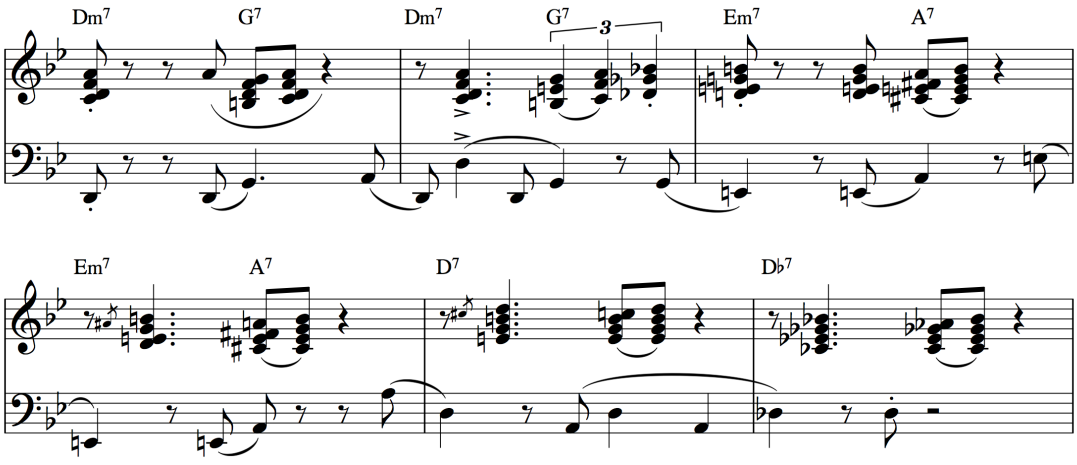

Figure 3.5 The first eight bars of Jimmy Smith's *Satin Doll*, showing the legato couplet phrasing which accentuates the Manual Percussion effect.

A comparison of the extract shown above with Smith's earlier 1965 recording (Jimmy Smith, 1965), where Manual Percussion was not used, reveals a different approach to articulation and rhythmic development: the melody consists of longer, legato phrases and a more conventional rhythmic approach. In the earlier recording, Smith explores a sonority that, without the use of Manual Percussion, has a noticeably slower rate of attack.

In Salmon's recording, there is minimal use of ornamentation: only a few grace notes are evident in the middle eight. As a multi-tracked recording, the simultaneous presentation of the melody on an electric guitar as well as the Hammond organ provides the percussive interest and accentuation instead. This is further supported with the increased volume of the guitar over the Hammond organ in the overall 'mix' of sound, creating an audible emphasis on the guitar tone, which has the effect of demoting the Hammond organ tone. The omission of ornamentation on Salmon's recording, combined with the lack of rhythmic diversity and a slow tempo results in a tone that soon

becomes monotonous and lacking in any distinguishing character despite the use of the Leslie speaker.

Figure 3.4 also indicates that there are some differences in approach concerning recordings made on Lowrey instruments: phrase lengths are noticeably longer and the rhythmic patterns are closer to Ellington's original melody. This aligns with Andrew Gilbert's (2014) recollection in Section 3.0 that the overall tone of the Lowrey instrument was a 'different sound' that encouraged a 'laid-back' style of playing.

In order to unpack Gilbert's statement, further reconstructive performance of Stoneham's *Satin Doll* (filmed as Performance Four) facilitated the following conclusions: firstly, the tonal response from the Lowrey Heritage was noticeably different to a Hammond organ in terms of its immediacy and percussive delivery. Manual Percussion was not available to Lowrey players, which accounts for the frequent use of grace notes (shown in Figure 3.4) to create a change of attack transient[82] for accentuation in a similar practice to that of early Hammond organists established in Chapter Two. Secondly, this slower response combined with a timbre which was richer in harmonics (created with the use of stops such as Strings and Clarinet) encouraged a less rhythmically diverse playing style, instead promoting the sound through longer phrases.

This more relaxed style of playing is also indicated by differences in performance tempo: Figure 3.6 shows that both Lowrey recordings were indeed slower in comparison to the two Hammond recordings.

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[82] Described by Campbell, Greated and Myers (2004, p.37) as 'the beginning of a note', to which the human ear is particularly sensitive.

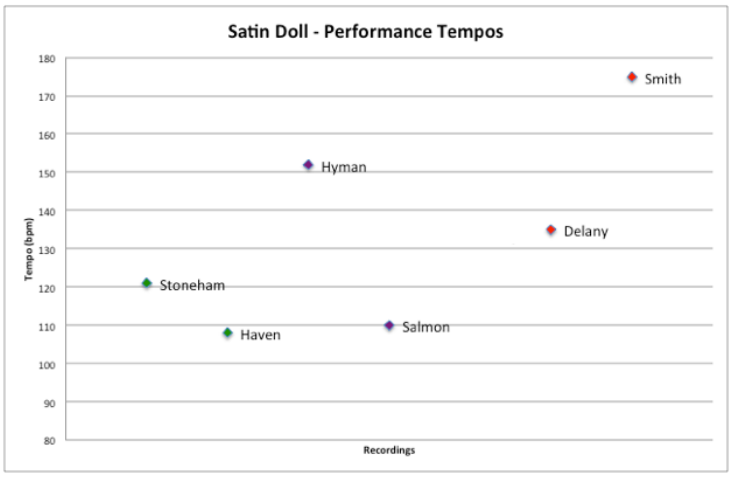

Figure 3.6 Performance tempos of surveyed recordings of *Satin Doll*. Lowrey performances are shown in green, whilst Hammond organ performances are shown in red. Recordings featuring significant use of multitracking and other studio enhancements are shown in purple. A clear distinction between tempos of live performances on Lowrey and Hammond instruments can be seen.

The third category shown in Figure 3.6 is that of multi-tracked performances. These are separated so as to align with the findings of Chapter Two, in which it was established that the use of such techniques, in addition to studio effects, created performances that embodied the concept of the 'studio album' i.e. one in which studio processing is explicit and structurally integral, rather than a recording which was more closely representative of a live performance.

With regard to the parameters discussed in this section, it can be demonstrated that multitracking and studio augmentation gives vital support to the musical styles heard both in Salmon and Hyman. Salmon's unornamented and rather lumbering approach is lifted by the use of a second melodic line in the guitar, whilst Hyman's detached articulation is facilitated by echo, stereo

separation and the use of a xylophone, bass guitar and timpani to create a sustained melodic line.

Finally, the use of manual glissandi, another common stylistic feature identified in Chapter Two, was also evident in recordings of this period e.g. in bar 32 of Delany (Transcription 3) but more commonly in Hyman [83], Stoneham [84] and Salmon [85]. In all cases, glissandi are performed on instruments with square front keys [86]: an element of design that was established in Chapter Two as facilitating this technique.

3.2.1.2 Voicings and Vertical Structures

In parallel to the differences of articulation, melody and rhythmic approach according to instrument, there is also evidence to suggest that a distinction also applies with regard to chord voicing and the use of texture.

Delany's recording, played on a Hammond C3, shows frequent interchanges between two textural configurations which this study has previously identified: Milt Buckner's 'locked hands' technique (played on the upper manual as described in Section 2.4 in Chapter Two[87]) e.g. bars 9 to 12, and a single-line melody with supporting harmonies on the lower manual e.g.

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[83] E.g. at 0'52'', 1'18'', 2'24'' and 2'27'' of the original recording.

[84] E.g. at 2'00'', 2'15'' and 2'30'' of the original recording.

[85] E.g. at 1'27'', 1'40'' and 2'54'' of the original recording.

[86] In contrast to keys found on a conventional pipe organ console, which overhung any manual located below them, square front keys resembled the shape of piano keys and were arranged in a 'stair-step fashion' (Vail, 2002, p.50).

[87] As identified in Chapter Two, Section 2.3.2.2, Cole also emulated this technique.

bars 21 to 27. This method of changing textures achieves a contrast without changing registration and was established in Chapter Two as a point of style.

Jimmy Smith's recording also recalls a previously established configuration of texture: that of the chord voicing of Bill Davis combined with manual bass playing. This is not a direct emulation however, since additional features available on the newer Hammond B3 enabled Smith to extend Davis' configuration. Via reconstructive performance, it was discovered that Smith's use of the Chorus feature thickened the sound of the instrument, meaning that the registration required in order to define the chord voicings could be simpler and contain less harmonics. In doing so, the effects of Manual Percussion could then be used and heard.

This enables the same combination of melody and harmony in the right hand, but without the sheer scale of sound heard in Davis' recording. The echo acoustic heard in Davis' recording is no longer present either, promoting longer melodic lines with extended improvisations. This aligns with Vail's observation that Smith's playing style was 'more linear' than previous playing styles (Vail, 2003, p.19).

The legato bass lines played on the lower manual are another important component of Smith's playing style. Like Davis, the bass line provides rhythmic as well as harmonic impetus and, via reconstructive performance of Figure 3.5 (filmed as Technique Example 2), it was discovered that the only practical method of achieving a walking bass line such as that shown was to use the keyboard instead of the organ pedals (owing to the lack of any sustain function on the bass pedals of the Hammond B3).

Given these findings, it may seem surprising to find a walking bass written in Delany's recording shown in Transcription 3, as the instrument used is the same as Smith's. However, an important distinction must be made here as to what the pedal line represents: upon listening to the recording, it becomes clear that the bass part is played by an acoustic string bass, thus achieving an authentic, sustained walking bass.

When discussing his use of the bass pedals, Delany (2012) recalls that he 'was playing the pedals, but there was also a bass player for a clear and sharper sound', which implies a weakness in the tone of the Hammond organ bass, analogous to the 'grunt' identified by Gilbert (2014) in Section 3.0. Upon listening to the original recording, the acoustic string bass largely occludes the Hammond bass part, although the occasional organ note can be heard e.g. at 0'17'', which is audibly weak and lacking a substantial bass fundamental. Despite the organ bass pedal part being redundant, it is included both in Transcription 3 and Performance 3 in order to be authentic to Delany's original performance configuration.

The combination of organ and additional acoustic instruments as described above reflects a practice that has been established by this study as occurring earlier, in the performances of Davis, Dee, Cole and Ethel Smith in Chapter Two. Previously, it had been demonstrated that these studio recordings augmented what was possible with the organ alone, thus making a recording that had more stylistic variety and contrast.

However, both Delany's stated reason for recording with a bass and Gilbert's objection to the Hammond pedal tone suggests that the instrument was perceived to be inadequate in some applications. Whilst it may be true

that technical features facilitate new styles of playing, Delany and Gilbert remind us that the interaction between instrument and musician is complex and, whilst musicians are often inspired by new technical innovations to develop new stylistic practices, an inner sense of what they wish to achieve musically will often override technical limitations (Walser, 2014, p.68).

In Delany's recording, the addition of an acoustic bass enabled a *preconceived* stylistic approach to be recorded, as the lack of bass sustain and tonal fundamental from the Hammond meant that a solo organ recording in the style desired was not possible.

Other textural emulations can be found in Delany's recording, such as the swap from upper manual to lower in order to provide a contrast of sound e.g. bar 16, which suggests Waller's similar use. The frequent movement of the left hand between manuals to support different accompaniment textures i.e. close-harmony and single-line melody configurations recall those found in Crawford.

The use of texture in recordings made using Lowrey instruments can be seen to be different in approach when compared to the techniques employed by Hammond organists. One of the main factors in this differentiation is the use of the Lowrey AOC function as defined in Section 3.0.

After reconstructive performance of Stoneham's recording (an extract of which is filmed as Performance Four), it was possible to learn more about the precise workings of AOC and how it was employed in performance. Moore's description in Section 3.0 of this chapter was found to be missing some important observations: for the AOC effect to continue to work during a melodic phrase, the left hand chord must be held down for the entire time.

This limits any rhythmic approach to left hand accompaniment. As can be seen from Figure 3.7, this is the configuration that Stoneham adopts when AOC is in use, producing three and four-note harmonies that appear to follow the melody. Experiments at the original instrument revealed that such harmonies are impossible to achieve without the use of AOC. With this feature switched off, the wide-ranging melodic line and fast tempo make it impossible to execute the hand movements that would otherwise be required to play the chord textures heard below each melody note (particularly in bars five and six of Figure 3.7). Furthermore, it proved impossible to achieve these textures and maintain a legato articulation such as that heard in Stoneham's recording.

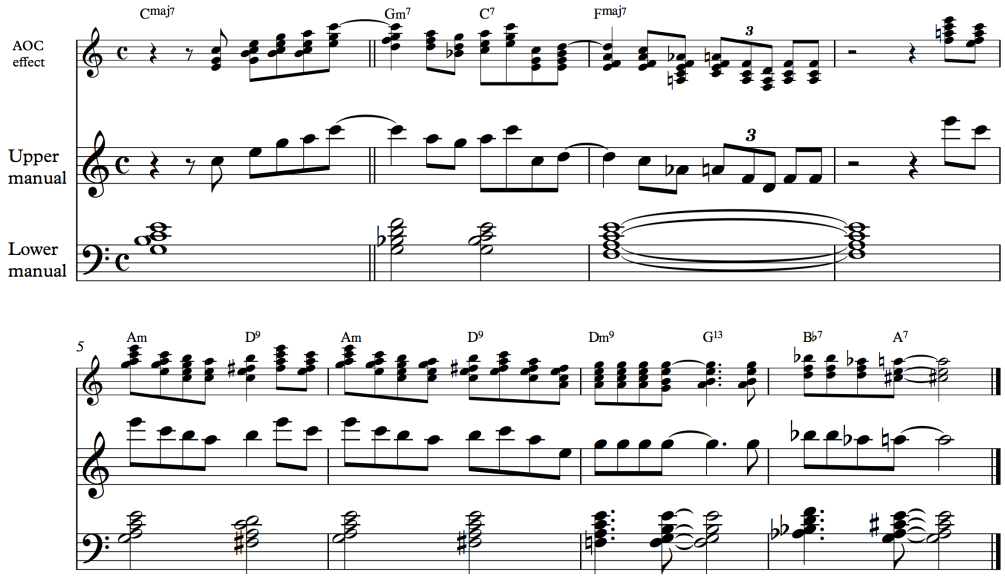

Figure 3.7 The two lower staves represent the notes as played by Stoneham, whilst the smaller upper staff refers to the resultant melodic texture heard when AOC is switched on.

The use of static, left-hand chords was not limited to passages where AOC was used however. Transcription Four also shows that Stoneham's accompaniment has a texture of sustained chords throughout.

In reconstructing Stoneham's performance, it was possible to obtain evidence as to why this texture may have been adopted. As mentioned in Section 3.0 of this chapter, the design of the Lowrey instrument used rocker tabs, switching tones either on or off with no degree of volume variation. Unlike a Hammond organ, the volume balance between the different footages heard on a manual could not be changed, but the overall volume of the lower manual could be altered between 'soft', 'medium' and 'loud' settings. By means of experimentation, it was discovered that both the soft and loud settings produced an undesirable level of volume that was either very quiet or too loud, leaving 'medium' to be the only option available. As can be heard in Stoneham's recording and in Performance Four, the upper manual is still louder than the lower, even with the 'medium' volume level engaged. According to Tony Pegler (2015), this was often a deliberate choice:

> On the Heritage, you chose a stop called 'Solo', which boosted the volume of the top keyboard voices over the lower, especially the red [brass sound] switches! This really made it sing: you could just sit back, whack on the Leslie and play.

Both Gilbert's comments in Section 3.0 and Pegler's comments above show an enthusiasm for the tone of the organ and there is a sense gained through expressions such 'just sit back' (Pegler, 2015) and 'it would fizz'

(Gilbert, 2014) that the main focus in a Lowrey organ performance is to expose the tone of the instrument in performance.

The priority of tone over rhythmic and melodic extemporisation may be one reason for the static chords in the left hand, but there are other practical reasons too: when the configuration suggested by Pegler above was used in Performance Four, it was discovered that the lower manual tone was comparatively weak in volume. Any rhythmic figures that were attempted were muddled by the strident sound of the upper manual with the solo tab activated. Sustained chords were the only way of providing a supporting harmony that could be heard in between gaps in the melody.

As can be seen in Figure 3.8, the textures used by Haven are very similar to Stoneham. The sustained left hand chord technique can be clearly heard e.g. at 0’26’’ to 0’58’’ and seen in Figure 3.8. As with Stoneham, chordal and single-line approaches to the melody are used interchangeably. Both recordings also utilise a technique of changing octaves, rather than changing manual as in the Hammond recordings, in order to effect a quick change of timbre. This can be seen in Transcription Four and also heard in Haven’s recording e.g. during 0’12’’ to 0’21’’.

There are observations to be made regarding the origin of this technique: firstly, that the smaller compass keyboards place an ergonomic limit on what the right hand can do if it swaps to the lower manual (since there are fewer keys than a Hammond console organ). Secondly, the two manuals are not of a balanced volume: moving down to the quieter lower manual results in an indistinct melody. The correlation between the textures used by Stoneham and Haven, combined with Pegler’s comments that the player was

encouraged to ‘sit back’ and ‘whack on the Leslie’ supports the hypothesis that the tone produced by the Lowrey Heritage lead to this simpler textural configuration.

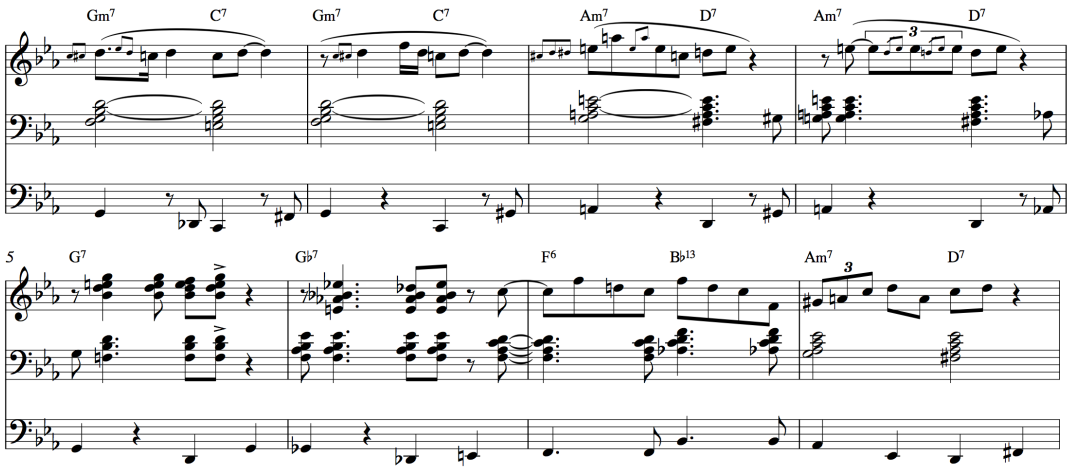

Figure 3.8 The same static chord configuration used on the lower manual by Stoneham (1967) is found throughout Haven’s (1965) recording also, as shown above.

As with Cole’s recording in Chapter Two, the recordings of Hyman and Salmon use multitracking and studio processing which make assessments regarding the interplay between texture and organ profile more difficult. However, references to earlier stylistic practices can be heard: in Salmon’s recording, the textual configuration emulates the ‘locked hands’ technique illustrated in Section 2.3.2.2 as used by Cole. Hyman makes use of the Lowrey AOC feature throughout the recording, which features a single-line melody and chords configuration similar to that used by Stoneham and Haven.

3.2.1.3 Registration and Expression

As detailed in Section 2.2 of Chapter Two, the results of interviews with organists conducted for this study suggest that the Leslie speaker was regarded as an essential piece of additional equipment that enhanced the tone of electronic organs considerably.

Varying the speed of the Leslie speaker, from fast rotation to slow rotation, and thus changing the rate of pitch fluctuation that resulted is an emerging practice found in performances by Stoneham, Smith and Delany (bar 8 of Transcription Three). Figure 3.9 shows Stoneham's use of the varying speed effect, often co-ordinating the change in rotation to demark a transition to a different section of the piece. This can also be seen demonstrated in the extract filmed as Performance Four.

Time Index	Leslie Speaker Rotation Speed
00’00’’	Introduction. Leslie speaker on Slow.
00’39’’	Beginning of Section B. Leslie on Fast.
00’55’’	Final A Section. Leslie on Slow.
01’09’’	First improvisation. Leslie on Fast.
01’34’’	Leslie on Slow, end of first improvisation.
01’44’’	Beginning of second improvisation. Leslie on Fast.
01’59’’	Last 8 bars of second improvisation. Leslie on Slow.
02’21’’	Climax of second improvisation. Leslie on Fast to heighten drama and excitement.
02’38’’	End of bridge section, dynamics reduce and Leslie on slow.
03’01’’	Return to A section, Leslie on Fast to denote a return to original material.

Figure 3.9 Stoneham’s use of switching Leslie speaker rotation speed[88] in *Satin Doll* (1967) shown as a time index. This can be seen to often outline formal structure, using the change of speed to mark a transition to a different section of the piece.

[88] The Leslie speaker horns (as shown in Figure 2.6) have two different speeds of rotation which the organist can control from the organ console (Faragher, 2011, p.102).

As established in Chapter Two, the rapid opening and closing of the expression pedal in order to create accentuation is an established point of style which can also be heard in recordings studied in this chapter and also seen demonstrated in Performances Three and Four. Whilst the effect is occasionally heard in Delany's performance, the use of expression pedal accentuation is far keener in Lowrey performances. By reconstructing Stoneham's performance, it was discovered that the dynamic range offered by the Lowrey expression pedal was far greater than that of the Hammond, making a larger contrast of sound possible. In Stoneham's recording, the expression pedal can be heard creating rhythmic swells of sound e.g. between 0'39'' and 0'53'', where the swells are in perfect time with the musical pulse. This effect is also employed by Haven and recalled by Tony Pegler (2015):

> You listen to early Alan Haven, and it's fearsome. In *Annie's Room*[89], [the expression pedal is] going up and down like nobody's business. That's adding percussion, but it's quite bizarre!

3.2.1.4 Ensemble & Studio Techniques

As established in Chapter Two, the use of multitracking and studio processing was used extensively in some recordings studied by this survey. The recordings by Salmon and Hyman in this chapter represent a practice

[89] Haven (1966).

established by Ethel Smith and Buddy Cole of integrating the sound of the Hammond organ with a larger studio ensemble. As mentioned previously, Salmon and Hyman utilise effects and configurations of sound that are not possible or achievable from the organ itself.

When compared to the other recordings of *Satin Doll*, Salmon's recording is devoid of any distinctive style or context insofar as there is no distinguishing ornamentation, tonal change or textural variety. Indeed, the sound of the organ is replaced with a piano during the middle eight, with the main melody always doubled by a guitar. In effect, the listener is left wondering what the main focus of the recording is as the organ tone is frequently occluded.

In Hyman's recording, there is a clearer sense of context. In a similar approach to Cole, the use of ornamentation, varying articulation, AOC and manual glissando give a stronger indication that the Lowrey organ is the centrepiece. In other words, the listener hears enough organ playing to make it an 'organ record', both in terms of familiar textures and stylistic signification.

Conversely, new technological facilities introduced in instruments surveyed in this chapter can be seen to have facilitated performances that aided the configuration of a live performance, such as that demonstrated in the recordings of Harry Stoneham and Alan Haven. With both of these recordings, the use of pedal sustain gave players more musical scope to recreate the three essential requirements of musical texture: melody, accompaniment and bass was possible via the instrument without additional ensemble support apart from a drummer. However, Stoneham (1987) recalls

that some modifications were made to his instrument in order to produce a more pronounced bass tone:

> I used the Heritage for years and it was a classic organ, I don't care what anyone says – it still is today. In those days I had the Heritage, two [Leslie] 145s and I had the bass split into a bass speaker.

During the reconstructive performance of Stoneham's recording, it was discovered that the registration combination used would produce distortion[90] when playing through the Leslie speaker. Andrew Gilbert (2015) recalls that the distortion heard on Lowrey recordings was deliberate and engineered by the players:

> You could make them distort. If you wound up the gain on the Lowrey and floored it you'd get that lovely gritty sound which Harry used and Alan Haven too.

The evidence above is a further indication that performing on an electronic instrument is a parallel process: the technological profile of the

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[90] According to musicologist Peter Elsea (2013, p.6), the sound of distortion 'is difficult to describe, but it's usually grating or rough. Some types of distortion give the impression that the sound is louder than it actually is, other types make it hard to identify the sound [...] After years of exposure, many people have developed a taste for distortion, at least for certain types such as that associated with tube amplifiers'.

instruments undoubtedly offered inspiration and new musical possibilities, but Stoneham, Gilbert and Delany suggest that this was always moderated by a degree of preconceived design regarding the character and style of the musical arrangement desired by the organist.

3.2.1.5 Form and Structure

As stated in Section 3.2.1 of this chapter, *Satin Doll* is a standard vehicle for improvisation and all performances surveyed featured solo sections in this tradition. In some performances however, it can be demonstrated that certain facilities shape the outcome and format of the improvisations.

In addition to the observations made in Figure 3.9, it is also possible to observe occasions where Stoneham alters the content of the improvisatory material in relation to the speed of the Leslie speaker. For example, the improvised melody line at 1’00’’ with the Leslie speaker switched to a fast rotation is noticeably more rhythmic and energetic than that which follows it at 1’26’’: a descending motif made out of chromatic figures combined with the Leslie speaker slowing down, played high so as to exploit the distorted upper range provides an antithesis to the energy and drive of the previous improvisation.

In parallel with Stoneham and Haven, Jimmy Smith’s style of improvisation is shaped by the tonal facilities of the instrument e.g. during 24’27’’ to 25’18’’ (Eriksson, 2015), where syncopated rhythmic figures, tremolo chords and quaver triplet figures expose the tonal interest created with the Manual Percussion feature.

3.2.2 Analysis 2: *Moon River* (Mancini)

Moon River was composed by Henry Mancini in 1961, with lyrics by Jonny Mercer. The work won Mancini and Mercer Grammy awards and Oscar Awards for Record of the Year and Song of the Year in 1962. The organ recordings of *Moon River* analysed by this survey are:

- Keith Beckingham – *Hi Flying Hammond*, Ad-Rhythm ARP-1000, 1967, ARP (Filmed as Reconstructed Performance Five), playing Hammond M100.

- Jerry Allen – *Plays Some of the Oscars,* Fontana 6438-027, 1971, Philips Records (Filmed as Reconstructed Performance Six), playing Lowrey TBO-1 Berkshire.

3.2.2.1 Articulation, Melody and Rhythm

In parallel to Section 3.2.1.1, investigations into the approach to articulation, melodic extemporisation and rhythmic development in both recordings of *Moon River* have produced evidence to establish that stylistic differentiation occurred according to whether the performance used a Lowrey or Hammond organ.

The most obvious aspect of Allen's performance is the use of a solo Melodeon tone for most of the recording, with just a brief introduction and

ending using organ flutes. According to Tony Pegler (2015), who worked extensively with Jerry Allen, the Melodeon setting was a preferred sound:

> It was a favourite sound of his, the Melodeon sound. He used it on a lot of the early Lowreys. Before they had the presets […], some of them had a button that just said 'Slow Attack'. Slow Attack certainly changes the way you play.

As suggested by Pegler, reconstructive performance of Allen's recording established that the Slow Attack setting was used. This feature reduced the amount of attack transient heard in the instrument's tone, meaning that the full onset of the sound was perceptibly slower to achieve after each key press. In essence, this is an emulative effect that attempts to mimic the behaviour of an acoustic instrument: in the case of the Melodeon setting, the delay between squeezing the bellows and producing sound.

The use of Slow Attack has implications for the type of ornaments used and their execution. Reference to Performance Six and Transcription Six reveals that the type of ornament commonly found in Allen's performance is different to that found in earlier investigations: grace notes, frequently heard in previous recordings, are used less. Instead, Allen employs what can best be described as appoggiatura e.g. during bars 18 and 29 of Transcription Six. Through reconstructive performance, it was possible to ascertain that ornamentation took longer to execute due to the Slow Attack setting, requiring the new, slower format to be used. This aligns with Pegler's statement that the function 'changes the way you play'.

In contrast, Beckingham's use of ornamentation consists of quickly articulated figures, responding to the faster speaking tone of the Hammond organ e.g. as found in bars 9, 10 and 12 of Transcription Five.

3.2.2.2 Voicings and Vertical Structures

One of the most intriguing aspects of Beckingham's performance is the voicings of the accompaniment harmonies used. Andrew Gilbert (2014) recalls:

> If you watch Keith, he's got this lovely [technique] where there's one finger that's always glued down. And he's got this lovely little counter melody sort of sitting behind all his chords. And, that's a Hammond and [Leslie] 122, which is his distinctive sound.

Gilbert's comments are interesting from a variety of perspectives. Firstly, they are further evidence of the oral nature of the micro-genre that is electronic organ music and the tendency to ascribe certain sounds and styles of playing to the authoring musician as defined in Section 1.3 of Chapter One. Secondly, the comments offer a tantalising insight into the structure of Beckingham's chord voicings which, through reconstructive performance, can be further explored. Finally, the comments also suggest a strong connection between musical style and the choice of instrument.

Figure 3.10 shows an extract from Transcription Five, showing Beckingham's approach to the supporting harmonies used in *Moon River*.

Reference to this extract and the whole of Transcription Five reveals that Gilbert's description of having 'one finger stuck down' is relatively true. Certainly, it is the case that Beckingham often combines two sustained notes with moving extension notes in order to provide movement where the melody is static:

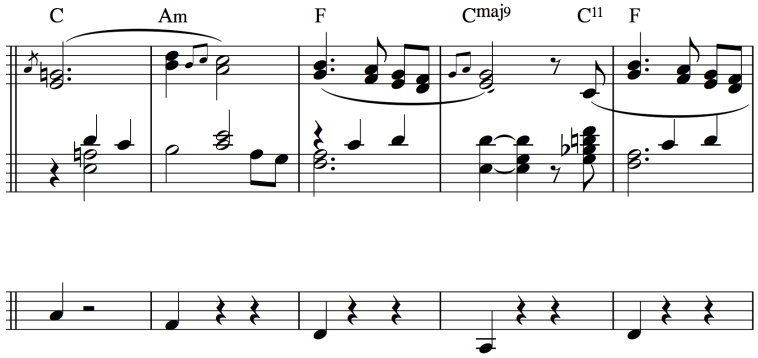

Figure 3.10 Extract from Keith Beckingham's recording of *Moon River*, bars 9 to 13.

As can be seen above, the usual configuration of three notes in every chord rarely becomes become four. Through reconstructive performance, it was discovered that three-note voicings combine well with Beckingham's choice of lower keyboard registration, which consisted of a combination of the 16', $5^{1/3}$ and 4 foot drawbars that was only available on Hammond organs. The extended use of four-note chords was deemed to be overpowering, creating a texture that would often occlude the melody. These findings were confirmed by Beckingham (2015):

> I modelled my approach to harmony on the style of Eddie Layton, who perfected three part harmony. Two or three note accompaniment chords work much better than four note chords on electronic organs. Big chords appear to clog the speaker!

As well as confirming the findings of the reconstructive performance, Beckingham's acknowledgment that his approach was an emulation of Eddie Layton's technique suggests the existence of a shared stylistic canon, whereby organists would listen to and study the arrangements of their peers (as discussed in Section 1.4.1) and attribute certain unique characteristics of chord voicings, registrations or other elements of arrangement style with the name of the originating musician, a common practice in oral-based music dissemination, as identified by Katz (2004, p.78). Beckingham's observation that big chords 'clog the speaker' also confirms an awareness of a link between the capabilities and facilities of the instrument and musical style. Here, Beckingham confirms that the tone of the accompaniment guides his choice of harmonic voicing.

An examination of the accompaniment chord voicing as used by Jerry Allen reveals a similar awareness of instrument timbre and balance via the use of chord voicing which is sympathetic to the tone of the instrument.

The use of four-note chord voicing throughout most of the arrangement (transcribed as Transcription Six) shows a clear contrast from Beckingham's approach. However, reconstructive performance revealed that a thicker chord texture was required to balance with the strident sound of the solo Melodeon setting on the upper manual and to support an accompaniment tone on the Lowrey organ that could not offer the same complexity of harmonics as Beckingham's Hammond configuration.

In the absence of any harmonics in the accompaniment section, Allen compensates by playing thicker, block harmonies throughout the first chorus.

During the second chorus, the arrangement transforms from a waltz into a rhythmic style that resembles a Latin American rhumba. This change of style, relying on rhythmic interplay between the chord and pedal parts, is facilitated by the use of pedal sustain. Combined with a barely noticeable Leslie speaker that is set to slow for most of the arrangement, the overall texture offers a configuration that is new.

As if to affirm this contrast, Allen's introduction from bars 1 to 8 and the coda from bars 84 to 109 are the only passages where organ flutes are used, framing the new approach with more traditional tones. Furthermore, the textures used at these points resemble the organ-derived, close harmony structures of Buckner, clearly signifying a departure from and a later return to 'organ style'.

3.2.2.3 Registration and Expression

In both recordings of *Moon River*, observations can be made to support the hypothesis that the tonal capabilities of each instrument and their method of control mediate the musical style of each arrangement.

Tony Pegler (2015) recalls that Beckingham's playing 'was very lyrical, it was very smooth … a lot of that is to do with his registrations'. Through reconstructive performance, it was established that the harmonically rich combination used on the lower manual is balanced with a registration of 8 and 4 foot flute footages on the upper manual. Beckingham also makes use of the Hammond organ preset keys in order to change upper manual registrations during the performance (as shown in Performance Five).

Reconstructive performance and referral to the original recording also determined that the use of reverb was an integral part of Beckingham's style, as confirmed by Tony Pegler (2015):

> If you listen to the reverb on that, it's something like a [Leslie] 147 but it's not a 147RV where the reverb went to straight speakers. Here, unless I'm mistaken, the reverb is going through the Leslie and so I think that definitely changes it. I think that's also studio reverb. I think it changes your playing because, I suppose, it's a little bit like a sustain pedal on a piano. You can use that when playing legato and make everything blend just a little more… It would certainly help that style and that is Keith's style. So I think you could say that reverb is actually quite important.

However, experimentation at the original instrument revealed that it was not possible to use reverb through a Leslie speaker, as the output signal from the Hammond organ did not have reverb added. Beckingham (2015) confirmed that this was the case and that Pegler's assessment was correct: extra modifications had been made to the instrument in order to achieve this effect:

> I have always modified Hammonds whereby the reverb signal goes through the treble horn of the Leslie speaker. This gives the 'spinning reverb' effect.

3.2.2.4 Ensemble and Studio Techniques

Notwithstanding the use of a drummer in both recordings, both Beckingham and Allen produce recordings that do not make any overt use of multitracking or studio processing.

3.2.2.5 Form and Structure

Upon examination of the form and structure of Beckingham's recording, it was observed that the original form of Mancini's score was adhered to.

In contrast, the form of Jerry Allen's Lowrey arrangement is extended to a great degree, being in ABCABC form together with an introduction and ending. As previously mentioned, the arrangement contains two contrasting rhythmic styles: the traditional waltz format and a rhumba style in common time. In both sections, it can be seen that the features available on Lowrey instruments play a part in supporting the execution of Allen's playing style and provide more opportunity for experimentation. The Slow Attack and Manual Balance features are used to project a slow-speaking solo melody line over the chordal accompaniment, whilst the use of pedal sustain facilitates a more dominant, forward-moving bass line which is particularly effective in the rhumba section.

3.3 Conclusions

This chapter has used two case studies as means to make further observations regarding the development of electronic organ design and the subsequent change in technical and ergonomic profiles encountered by players. As has been demonstrated, the introduction of the Lowrey organ offered organists a new combination of unique facilities, most notably the AOC function and Pedal Sustain. It has been shown that these newly developed features were embraced by styles of performance and arrangement that were different to techniques applied to the Hammond organ.

By transcribing and reconstructing selected performances of *Satin Doll* and *Moon River*, with additional references to other contemporaneous recordings and practitioner interview, this chapter is able to contribute new and significant knowledge to the study of electronic organ performance practice.

Overall, the results gathered from the reconstructed performances have suggested that the recordings studied in this period supported the further development of a shared stylistic lexicon[91] within electronic organ music, particularly concerning textural forms and registrations. Some identified practices used by organists of this period have been shown to be emulative of older forms of arrangement and performance, whilst other

[91] Musicologist Richard Ashley (2016) expresses similar ideas when discussing the development of jazz music, which has some parallels of ontology with electronic organ music (as identified in Section 1.4.1). Ashley states that jazz 'develops in a community rather than with isolated individuals […] and it involves acquiring and becoming fluent with a kind of musical vocabulary of lexicon of patterns (Ashley, 2016, p.670).

techniques can be distinguished as being new and derived from the instrument's technical development. Factors that have been identified as making a significant contribution to this lexicon are discussed below.

3.3.1 Manual Percussion

The addition of the Manual Percussion feature to Hammond organs developed in this period has been demonstrated to have facilitated Jimmy Smith's approach to articulation, namely the creation of 'legato couplets' as described in Section 3.2.1.1. Furthermore, the research conducted by this thesis has also been able to identify shortcomings in previous definitions of the Manual Percussion effect and has contributed new knowledge as to its use. Smith's substantial rhythmic development is also linked to this new feature.

3.3.2 Differentiation in Articulation Between Instruments

The results of practitioner interview, such as Andrew Gilbert's remarks in Section 3.0, suggest a clear belief that the tone of a Lowrey instrument was fundamentally different to that of a Hammond organ and that an organist's approach to articulation would be required to be different.

Differences of approach were indeed found: the more frequent use of grace notes in Stoneham and Haven's performances and the mediation of the Slow Attack function, producing different types of appoggiatura in Allen's

performance of *Moon River,* have been shown to be derived from the unique technological profile of the Lowrey organ.

Conversely, the reduction of ornamentation in Jimmy Smith's recording of *Satin Doll* (1965) can be linked to the use of the Hammond Manual Percussion facility, as described in Section 3.2.1.1.

3.3.3 Instrument Specific Vertical Structures

Some of the most significant yet hitherto undocumented differences between Hammond and Lowrey performances concern the use of harmonies and vertical structures.

As identified in Section 3.0, the Lowrey AOC was a ground-breaking facility which was used by consumers and professional musicians alike to achieve harmonic voicings which would otherwise be impossible. For the first time, this study has been able to fully explore the workings of AOC and to contribute some corrections to Rory Moore's previous definition (Moore, 2014, p.191).

Section 3.2.1.2 has described how AOC facilitated new textural structures that were found in the Lowrey organ recordings of Stoneham and Haven and the reduction of rhythmic accompaniment patterns. Allen and Stoneham's Lowrey performances are also shown to include the use of the Solo feature, facilitating the projection of single-line melodies over larger chordal structures played on the lower manual.

Beckingham's unique approach to harmonic voicing has been demonstrated to show alignment with the chosen Hammond organ

registration, which is supported by the evidence gained from interview. This a further example of a practice which can only be executed on a particular type of instrument, thus supporting the view that different designs of instrument mediate musical style.

Other uses of texture have demonstrable links to prior practice, such as the use of close harmony configurations by Delany that recall Cole and Buckner. The use of manual swapping by Delany also recalls Waller's similar technique identified in Chapter Two. Jimmy Smith's configuration of playing on the manuals only has been demonstrated to extend Bill Davis' original concept: the addition of the Manual Percussion feature in the later Hammond B3 facilitated Smith's switch to a reduction in registration strength and a more linear approach to melodic lines.

3.3.4 New Approaches to Registration and Expression

Practitioner interviews conducted for this study revealed significant evidence regarding the relationship between the organist and instrument. Instead of accepting the capability of instruments at face value, thus implying that musical inspiration is "prescribed" from the technological profile of the organ, interviewed organists suggested that this process was more complex. Whilst the use of AOC as described in Section 3.2.1.2 certainly aligns with this hegemony of process, this study has found examples of where this is reversed: Stoneham's use of an extra bass speaker and Beckingham's 'spinning reverb' modifications are all examples of where the organist has made attempts to change the capability of the instrument to suit their own

musical demands. This aligns with Albin Zak's perspective of studio musicians and producers arriving at methods of tone production via experimental means (Zak, 2009b, p.318) and the practice of British guitarists of the nineteen sixties fitting all kinds of electrical paraphernalia to their instruments in order to achieve a distinctive tone (Thompson, 2008, p.39).

As identified in Chapter Two, the use of the expression pedal for providing accentuation is established as a prior point of style. However, what is not documented is that this practice was more prevalent in Lowrey performances. As detailed in Section 3.2.1.3, the rhythmic use of rapid expression pedal movement is an important element of Haven and Stoneham's style of playing.

The Leslie speaker is also identified as being integral to all performances. Examples have also been found of the incorporation of different rotation speeds into formal structures e.g. Stoneham's performance described at Figure 3.9.

Finally, the use of pedal sustain has been demonstrated to be an important technical addition. From supporting the rhythmic interplay in Allen's rhumba-styled *Moon River*, to Stoneham's walking bass figures in *Satin Doll*, pedal sustain has been demonstrated to be integral to these musical devices.

3.3.5 The Duality of Studio Effects: An Integral Creative Practice and Compensatory Prosthesis

The results of an enquiry into the use of studio effects and processing show a broad correlation with that established in Chapter Two, namely the existence

of two distinctly different approaches to the use of studio processing. In this case, recordings by Salmon, Hyman and Delany can be said to fully utilise multitrack recording and its associated effects, such as stereo separation and artificial reverberation, to the extent that the structure of these arrangements relies on the opportunities afforded by such technology. Conversely, recordings by Haven, Allen, Smith and Stoneham make more subtle use of recording technology, where the emphasis is on capturing the format of live performance.

Delany's use of studio processing is worthy of note, since its use supports the concept of musicians having demonstrated some preconceived idea of musical style. As detailed in Section 3.2.1.4, Delany's use of studio processing was to replace under-performing elements of the Hammond organ's design with studio musicians in order to support his choice of stylistic approach.

3.4 Summary

This chapter has provided significant evidence to demonstrate that the diverse range of musical practices examined was guided by a keen awareness of tone and a sense of the way in which different technical facilities and playing techniques could be combined.

This chapter has introduced the Lowrey organ and defined its main technological differences to that of the Hammond organ. An addition to the feature set of the Hammond organ, Manual Percussion, has also been detailed and the effect demonstrated. These features have been shown to

add to the stylistic lexicon substantially by facilitating new practices that are entirely dependent on these technical innovations.

Evidence of personalised style endorsement (similar to the methods identified in Section 1.3 used to identify and differentiate playing styles) has been found via practitioner survey and documented within this chapter.

This study will now examine a later type of electronic organ: that which uses analogue synthesis technologies to produce emulations of orchestral instruments.

Chapter Four

Early Orchestral Emulations (1974 - 1984)

4.0 The Lowrey TGS-1

This study continues to survey electronic organ performance practice by examining one such instrument from this era, the Lowrey TGS-1.

Produced a decade after the Lowrey instruments surveyed in Chapter Three, the TGS-1 was the first instrument to include stereophonic effects, meaning that certain sounds would emerge from either the left or right organ speakers.[92] Lowrey also integrated a string synthesiser section in the instrument in an attempt to offer an improved imitation of orchestral strings. Other orchestral tones were also made available, such as the Vibraphone, Piano and a number of Brass sounds. However, as Andrew Gilbert (2015) recalls, these emulative tones produced some questionable effects:

> The TGS-1 had the usual flutes and Leslie, plus the Symphonic Strings. I always felt Lowrey went overboard with the phasing of the strings and they were very mushy. Not at all realistic but they blended well with the flutes in a theatrical manner. These sounds

[92] The use of such effects mirrored the pioneering use of the stereo field in popular music of the late nineteen sixties, the development period of the Lowrey TGS-1 organ (Katz, 2006, p.42). The Grove Dictionary of Music defines stereo recording as ‘a term applied to techniques of sound recording (and playback) that produce the effect of sound coming from different directions in three-dimensional space’ (Grove Online, 2017d).

> only really worked one at a time, adding them together often produced weird effects!

James Sargeant (2015), organist and demonstrator for Yamaha Music UK, has a similar recollection to Gilbert:

> It was the first of the orchestral Lowreys. [Lowrey] were very much the leaders at that time [but] … it was very difficult to play. You'd need the Leslie on the flutes though.

Sargeant's comments above suggest that the instrument presented some ergonomic challenges, which is confirmed by Andrew Gilbert (2015):

> [The Lowrey TGS was] a bit of a pig to play. To go from organ to solo sounds meant switching off all the flutes and strings and selecting the required solo voice, for example. An awful lot of rocker switch pushing! But the overall sound was very smooth and quite loud, so in a hotel environment or home it was more than enough. I wouldn't have wanted to play a concert on one though.

Sargeant and Gilbert's comments are quite revealing, indicating that the Lowrey TGS-1 was an instrument that offered some new and significant tonal possibilities yet with some flaws in design.

Figure 4.1 The Lowrey TGS-1 Organ.[93]

4.1 Other Instruments Included in this Chapter

Both case studies that use reconstructive performance are performed on the Lowrey TGS-1. Other instruments that are used in comparative recordings are: the Hammond B3, Wersi Helios, Eminent E10 and Yamaha E50.

[93] Photograph used with the kind permission of Lowrey Organs UK.

4.2 Presentation of Survey Results

Analysis 1: *Tuxedo Junction* (Hawkins & Johnson)

Tuxedo Junction was written in 1939 by Erskine Hawkins and Bill Johnson. The piece was recorded frequently by the big bands of the nineteen forties, such as the Glenn Miller Orchestra (Glenn Miller, 1940). The organ recordings of *Tuxedo Junction* examined by this thesis are taken from the following albums:

- Harry Stoneham (1976) *This Is Harry Stoneham*, DJM Records, 22045, playing Lowrey TGS-1 (Filmed as Performance Seven).

- Jimmy Smith, (1978) *Jimmy Smith: The Boss*, Verve 2317 018, playing Hammond B3.

- Klaus Wunderlich (1977) *In A Miller Mood*, Telefunken 623026, playing Wersi Helios.

4.2.1.1 Articulation, Melody, and Rhythm

In a similar format to Chapters Two and Three, an analysis of approaches to articulation, melodic extemporisation and rhythmic development was undertaken of the three recordings listed in Section 4.2.

The most distinctive style of melodic execution is perhaps that found on the recording by Jimmy Smith on the Hammond B3 organ. Figure 4.2 shows a transcription of Smith's playing as heard from 0'04 to 0'16, which demonstrates the use of same three stylistic practices discussed previously in Section 3.2.1.1 of Chapter Three.

Firstly, Smith makes some subtle changes to the melodic line: additional melodic notes such as those shown at bars 2, 4 and 5 of Figure 4.2 exploit the tonal difference between the start of a legato phrase and notes that follow without added percussion.[94] Secondly, notes of longer duration (such as the dotted minims in bars 1, 3 and 5 of the lead sheet version) shown in Figure 4.2 are frequently diminished in value[95] and repeated, which also exploits the Manual Percussion effect. Furthermore, the practice of truncating phrases, creating what was defined in Chapter Three as 'legato couplets' can also be seen in the transcription below e.g. bar 2.4, 4.2 and 4.4. Through reconstructive performance, it was determined that all these identified techniques rely upon the use of the Manual Percussion feature for their execution, exposing the tonal differences provided by the facility.

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[94] As detailed in Section 3.1, Manual Percussion added an extra attack transient to the first note of a legato phrase. By embellishing the melody, specifically by adding extra notes, Smith not only adds extra melodic interest but also introduces more variety of tone: Manual Percussion adds extra emphasis to every first note of these phrases, but not the following notes that are played legato.

[95] This practice can also be heard in Smith's 1965 recording of *Satin Doll* (Jimmy Smith, 1965).

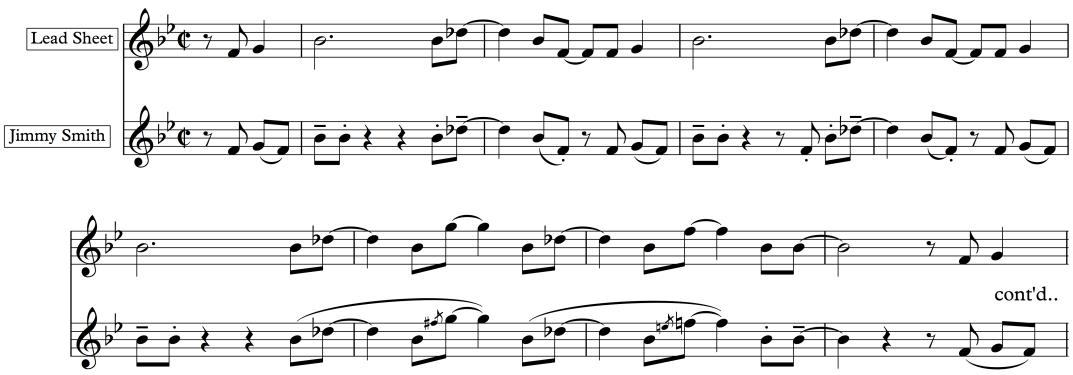

Figure 4.2 A comparison of Jimmy Smith's approach to phrasing and articulation in *Tuxedo Junction* compared with an example lead sheet[96] melody.

Whilst a strong stylistic connection can be demonstrated between Smith's recordings of *Satin Doll* (1965) and *Tuxedo Junction* (1978) in terms of approach to articulation, Harry Stoneham's recording demonstrates a marked change in articulation between the same two pieces.

As illustrated in Section 3.2.1.1 of Chapter Three, one of the main stylistic features of Stoneham's performance in *Satin Doll* was the use of grace notes in order to provide an extra attack transient to a tone that lacked any initial percussive transient. In *Tuxedo Junction*, this practice is substantially reduced, being evident only very briefly in bars 15 and 16 of Transcription Seven. This begs the question of what had changed between the recordings, given that the organist and the context of piece remained largely the same.

The answer lies with the changed configuration of the newer instrument. James Sargeant's recollection that the TGS-1 represented the 'first of the orchestral Lowreys' (Sargeant, 2015) suggests a different type of

[96] Transcribed from *The Ultimate Jazz Fake Book* (Hal Leonard, 1988, p.399).

instrument to the previous models examined in Chapter Three. Through experimentation at the original instruments, it was possible to compare the tonal quality of the instrument to that of the Lowrey Heritage and Berkshire, following the suggestions of Gilbert and Sargeant that the TGS-1 had a different quality and character of tone. From these surveys, it was possible to make two conclusions: firstly, the attack speed of the organ flutes on the TGS-1 was found to be noticeably slower and less percussive than that of the Berkshire or Heritage. Secondly, the quality and range of orchestral sounds, such as Vibraphone, Trombone and Trumpet had improved on the later TGS-1 model.

Performance Seven reveals that the type of sound heard in Stoneham's performance is markedly different to that of *Satin Doll* (Harry Stoneham, 1965). In *Tuxedo Junction,* the organ flutes and distorted Leslie speaker have been replaced by tones which are imitative of a big band: Stoneham switches between trombones, trumpets, vibraphone, clarinet and a full brass ensemble throughout the performance.

Having established that the character of the sound of the TGS-1 is different, it is important to consider the agency this would have towards musical style. Tony Pegler (2015) suggests that selecting a sound can influence the articulation employed by an electronic organist:

> It's an interesting thing that I don't think other instrumentalists appreciate... that you can take a guitar sound, and then play the same thing with a flute sound and it almost feels like the keys press differently. It's spikey for guitar and you can almost imagine

> that there's a pick that you kind of click through. That must affect the way you play.

Pegler's description of imagining a pick whilst playing a guitar sound is important. It establishes that, when using orchestral sounds, the electronic organist would be imagining the sensibilities of the acoustic instrument and transferring these to their performance.[97] Pegler's recollection that he 'imagines' that the keys feel different to play depending on the sound chosen indicates that this transference occurs at a fundamental level. Furthermore, if Paul Carman's view that the sound was 'all in our heads anyway' (Carman, 2015) is true, this would seem to suggest that the actual quality of sound was immaterial and that most of the emulation was in the mind of the player. Recalling Cook's concept of historical fidelity (Cook, 2013, p.361) and David Wills' proposal of the disorientating effect of technology (Wills, 2006, p.247), this acceptance of elementary emulative sounds may well be a further example of connivance between a new technical paradigm and the consumer: the emulations appeared to sound better than they were as the technological concept was new and different.

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[97] Théberge (1997) defines the 'accumulated sensibilities' of an instrument to be a combination of 'selected characteristics – physical, acoustic, stylistic or aesthetic' which 'interact with a variety of musical and extra-musical factors to create innovations in musical form' (Théberge, 1997, p.159). In this case, Pegler imagines that some of the physical characteristics that make up the sensibilities of playing the guitar (such as feeling the physical resistance of a string) transfer to the organ keyboard when selecting a guitar sound.

With this in mind, Stoneham's change of approach to articulation becomes understandable. Chapters Two and Three have identified that there are certain types of articulation that contribute to the sensibilities of playing an organ, such as the use of grace note and glissando. As well as the tone of the organ, these lend an essential context to what is heard, identifying the type of instrument used. It therefore follows that if the instrument tone is no longer an organ flute tone, these sensibilities become redundant. As can be seen in Performance Seven and Transcription Seven, Stoneham uses different melodic effects for each solo instrument sound, attempting to mimic not only the tone of the emulated instrument but the character also, such as the semitone portamento in the trombone section, achieved with the use of the glide switch (shown in bars 1 to 9 of Transcription Seven); repeated semitone semiquavers, imitating the alternate sticking of a vibraphone player (shown in bars 63 and 64) and the solo sustained notes of the clarinet in the uppermost register in bar 75. Direct melodic quotations also reinforce the emulative nature of Stoneham's recording, such as the trumpet melody heard in bars 10 to 17, which is a direct quote of Glenn Miller's arrangement.[98]

This technique of emulating the sensibilities of an acoustic instrument as well as the tone via imitative articulation and melodic styling can also be found in Wunderlich's recording, as Figure 4.3 shows:

[98] As heard at 00'18 in Miller's original recording (Glenn Miller, 1940).

Time Index	Melodic Feature
00:00 – 00:18	The use of trombone and horn tones imitate the sound of an open and closed trombone mute. The same melodic quote from Glenn Miller's arrangement as used by Stoneham is also heard here at 00'18.
00:48 – 01:07	Jazz organ solo, using drawbar registrations with Manual Percussion. Frequent ornamentation including grace notes and manual glissando recall organ sensibilities.
01:56	Piano solo, using the Manual Sustain function to imitate the use of a piano damper pedal. This facilitates frequent octave jumps in the melody, and idiomatic 'stride-voicings'[99].

Figure 4.3 Examples of emulative melodic effects used by Wunderlich in *Tuxedo Junction* (1977).

4.2.1.2 Voicings and Vertical Structures

In parallel to the emulation of instrumental sensibilities mentioned above, the recordings of Stoneham and Wunderlich also duplicate the typical textural patterns that might be heard in a recording of big band music. As defined by Sturm (1995, p.56-90), the configuration of texture is a key stylistic identifier in the big band genre, with the origin of different configurations being ascribed to particular bands or arrangers.

Wunderlich's recording has many textural similarities with that of the Glenn Miller orchestra. This suggests that, in addition to selecting registrations on the Wersi organ which emulated the sound of the Big Band,

[99] As defined by Levine (1989, p.156).

the intention of the arrangement was to duplicate the vertical structures of Miller's arrangement as closely as possible. For example, the harmonic voicing of the initial trombone section heard at the beginning of the recording duplicates that used in Miller's arrangement (Glenn Miller, 1940). However, the emulation of texture is more than a mere passing reference: Wunderlich also integrates the majority of Miller's thematic material in his own recording e.g. the call and response material between trumpets and saxophones heard at 0'36, the trumpet improvisation at 0'54 and the melody of the instrumental break at 1'58.

Via reconstructive performance on a Wersi Helios organ, it became clear that in order to maintain these emulative structures, such as the combination of four-part brass sections with solo instruments heard at 1'17'', Wunderlich must have resorted to multitracking. In addition to the musical imperative i.e. the desire to emulate the forces and rapidly changing textures of a big band, the reasons for doing so are also ergonomic: despite there being a range of different instrumental sounds available on the Wersi organ, the time taken to manipulate the switches to select them during a simulated live performance scenario proved too great and disrupted the flow of the performance. Furthermore, there are more independent musical lines evident in Wunderlich's recording than could be played by two hands at once.

Andrew Gilbert's recollection, stated in Section 4.0, that the Lowrey TGS-1 was 'a bit of a pig to play' and that there was 'an awful lot of rocker tab pushing' (Gilbert, 2015) suggests that Stoneham would also have encountered significant ergonomic difficulties. As can be seen from Performance Seven, Stoneham made use of the rocker tabs although certain

sections are played entirely on the lower manual to avoid the issues that Gilbert describes e.g. bars 33 to 41 of Transcription Seven. A full ensemble is used on the lower manual, whilst solo instruments are played on the upper, demanding a fair degree of manual switching. Gilbert's observation that the orchestral voices on the upper manual 'only worked one at a time' (Gilbert, 2015) i.e. in solo configuration bears out in Stoneham's arrangement and it is the reason behind this practice. This configuration of playing is different to the type seen in Stoneham's earlier Lowrey performance of *Satin Doll (*Harry Stoneham, 1967).

Despite these ergonomic challenges, Stoneham's textures are also imitative of big band voicing: the use of 'close position saxophone voicings'[100] e.g. at bars 1, 9 and 26 of Transcription Seven clearly recall a Miller-era configuration. However, there are occasions, such as in bars 38 to 40, where the harmonic language becomes less emulative, using dominant ninth and augmented harmonies which, according to Sturm (1995, p.80), would suggest a more modern context. The voicing of the melody as chords in bars 18 to 33 emulates Miller's brass voicing, with octave leaps suggesting a call and response pattern between trombones and trumpets. Keith Beckingham's observation that four note chords 'clog the speaker' (Beckingham, 2015) no longer applies here: Stoneham uses four-note chords in both hands to imitate the full texture of a big band as shown in bars 26, 28 and 34 of Transcription Seven.

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[100] Defined by Sturm as a key harmonic identifier of Glenn Miller's arrangement technique (Sturm, 1995, p.59).

Transcription Seven also shows that the range of the bass part in Stoneham's arrangement spans more than an octave. Via transcription and reconstructive performance, it was discovered that an additional electric bass part was used instead of the Lowrey pedals, owing to the limited range available on the instrument. As the TGS-1 was built on a spinet design, the included pedalboard was only of a one octave compass (C0 to C1). As can be seen and heard in Performance Seven, the wide range of the bass and the swung quaver anticipations, complete with octave jumps in bars 33, 43 and 52 contributes energy and impetus to the arrangement.

In parallel to the similarities of articulation as described in Section 4.2.1.1, the use of voicings and vertical structures in Jimmy Smith's recording is exactly the same as that described in Section 3.2.1.2 of Chapter Three. Smith plays a manual bass throughout, whilst the use of the same registration and ensemble as that used in *Satin Doll* (Wladi Plus, 2016) results in a textural profile that is identical.

4.2.1.3 Registration, Expression and Studio Techniques

As has been established in Section 4.0, Stoneham and Wunderlich use instruments which are configured differently to those studied in Chapters Two and Three. Whilst Stoneham does use a Leslie speaker with the Lowrey TGS-1, reconstructive performance established that only the organ flute tones are routed through the device: the remaining brass sounds are directed through the internal speakers on the instrument. As a result, the use of different Leslie

rotation speeds, an established point of style in Stoneham's performance of *Satin Doll*, is no longer applicable.

As stated in Section 4.2.1.1, both Stoneham and Wunderlich's arrangements use sounds that are emulative of acoustic instruments. In addition, the recordings examined here demonstrate a new, emerging practice of making significant changes to instrument registration during performance. Despite Andrew Gilbert's observations relating to the difficulties encountered in operating the Lowrey TGS-1, Stoneham manages to achieve a variety of contrasts in sound: a trombone section, solo trumpet, full ensemble, vibraphone and clarinet are all audible and can be seen in Performance Seven.

Wunderlich's recording harnesses the potential of multitracking in order to produce simultaneous combinations of sounds which, through experimentation at the original instrument, were found to be impossible to achieve in a live playing configuration. The combination of piano, saxophone and trombone as heard at 2'00'' was not only impossible to play simultaneously (since there are more notes heard than can be played by two hands and feet) but also unachievable to produce when playing the instrument in a live performance, as only two of the three instrumental groups heard at this point could be selected at once in real time.

Section 4.2.1.2 describes Jimmy Smith's approach to vertical structures as being identical to that of his recording of *Satin Doll* (Vladi Plus, 2016). Experiments at the original instrument revealed that his choice of registration in *Tuxedo Junction* (Jimmy Smith, 1978) was also identical. This is confirmed by Vail (2002, p.186) who, by providing information on what he

calls ‘the Jimmy Smith sound’ implies that Smith had a certain registration combination that he would use frequently. The results of this survey support this statement.

4.2.1.4 Form and Structure

The overarching concept of emulation can also be seen to apply to form and structure in Wunderlich and Stoneham’s recording. As has been established, both recordings emulate big band ensembles by means of their approach to articulation, vertical structures, the choice of registrations and direct quotation of Glenn Miller’s thematic material. It therefore follows that both follow the format of a big band arrangement. In Stoneham’s recording, this can only be demonstrated in general terms: various textural structures are heard in a sequence that would suggest a big band arrangement, such as the use of solo improvisations, large ensemble ‘shout’ choruses and, as stated in 4.2.1.1, the use of some of Glenn Miller’s melodic themes.

Wunderlich’s use of form is a more exacting copy of Glenn Miller’s arrangement, using the same extended configuration of $ABA^1A^1A^1A^2A^1A^2A^1A^2$ where A^1 is an improvised solo and A^2 is an expanded A section, incorporating an additional two bars.

4.2.2 Analysis 2 – *Wave* (Jobim)

Wave, a song in *bossa nova* style, was written and recorded in 1967 by Brazilian jazz musician, Antonio Carlos Jobim. The organ recordings examined by this thesis are taken from the following albums:

- Harry Stoneham (1976) *Latin Lowrey*, Studio 2 Stereo TWO 383, playing a Lowrey TGS-1 organ (filmed as Performance Eight).

- Glyn Madden (1979) *Glyn Madden Plays the Fantastic Yamaha E50 Organ*, London, SRT Productions Ltd, playing the Yamaha E50 organ.

- Brian Sharp (1974) *Strings and Swings*, Grosvenor GRS1027, Birmingham: Hollick & Taylor, playing an Eminent 310 organ.

4.2.2.1 Articulation, Melody and Rhythm

Having established and illustrated a new approach to articulation in *Tuxedo Junction*, the evidence gathered by reconstructive performance of Stoneham's *Wave* (Harry Stoneham, 1976a) suggests a complete stylistic contrast that recalls an earlier approach to playing. In addition to the use of organ tones throughout the recording, Stoneham also adopts an approach to articulation that is in alignment with that of his recording of *Satin Doll* (Harry Stoneham, 1967): that of using grace notes to provide extra attack transients.

Chapters Two and Three have previously established that this method of ornamentation is a frequently used element of common practice amongst organists of these prior eras. However, as noted in Section 4.2.1.1, this approach is not used in *Tuxedo Junction* (Harry Stoneham, 1976), where articulation is emulative of the orchestral tone selected and representative of a newer style of playing.

Glyn Madden's recording of *Wave* (Glyn Madden, 1979) contains imitative articulation also, which is evident during the first main theme of the piece, where the melody is played using a flute sound and decorated with appoggiatura and octave leaps. Madden recalls that the inclusion of orchestral voicing did prompt a different approach and that 'there were some sounds, like the flute on that recording, that, at the time, sounded like a real flute and I tried to play like one too' (Madden, 2011).

The recollection of emulative sounds being convincing 'at the time', an acknowledgment of a sound quality that was once considered to offer lifelike reproductions of acoustic instruments but has long been superseded, resonates strongly with Cook's concept of historical fidelity (Cook, 2013, p.361). Furthermore, Madden's recollection that he 'tried to play like' an orchestral instrument has parallels with Tony Pegler's comments in Section 4.2.1.1, regarding the awareness of emulative sensibilities: where the organ keys become a guitar pick whilst that particular sound is selected (Pegler, 2015).

If organists can be aware of the sensibilities of acoustic instruments, it therefore follows that they can also be aware of the sensibilities that constitute playing an organ. Glyn Madden demonstrates an awareness of the new

duality of approach that an instrument such as the Yamaha E50 offers: in addition to the emulative articulation heard when a flute tone is selected, where a transition to an organ flute sound occurs e.g. at 0’50, grace notes and staccato chords are all employed to give the impression of playing an organ.

Brian Sharp’s recording (Brian Sharp, 1974) demonstrates a similar concept also. Indeed, Sharp’s recording demonstrates a similar imitative practice to Wunderlich’s *Tuxedo Junction:* the flute and trombone sounds at the beginning of *Wave* are used to emulate Jobim’s original orchestration exactly (Antonio Carlos Jobim, 1967) and the same thematic material is heard from the outset. Some further instrumental emulations combined with appropriate articulation are evident: such as the use of trombone with portamento beginning at 0’09’’ and flute glissando at 2’49’’.

4.2.2.2 Voicings and Vertical Structures

Returning to observations regarding Stoneham’s use of articulation in *Wave* (Harry Stoneham, 1976a), it would be logical to assume that, if the approaches to articulation are the same as *Satin Doll* (Harry Stoneham, 1967), the use of texture and vertical structures would recall Stoneham’s earlier practice too. However, an examination of Transcription Eight reveals that this is not the case. Instead of the static chords heard in the recordings of Haven (Alan Haven, 1965) and Stoneham (Harry Stoneham, 1967), the accompaniment of *Wave* appears to incorporate a rhythmic *bossa nova* pattern that recalls Jerry Allen’s experiment with this style in *Moon River* (Jerry Allen, 1971).

Through the use of reconstructive performance, it was possible to ascertain that the configuration used is more complex and involves the use of multitracking. At Bar 34 in Transcription Eight, the thickness in melodic texture is achieved with the use of the Lowrey AOC feature although the rhythmic chords in the left hand are heard to continue. This is contrary to the mode of operation defined in Section 3.2.1.2 in Chapter Three, where it was found that the notes of the accompaniment must be held down on the lower manual for the AOC function to work. Clearly, the accompaniment that was heard was incompatible with the technique required in order to activate the AOC feature, as rhythmic chords would cause the AOC function to become intermittent. Therefore, the only conclusion that can be arrived at is that multitracking was used in order to achieve a configuration of rhythmic chords and a sustained AOC effect in the melody, which was confirmed by James Sargeant (2015):

> There were a few things that you can hear on *Latin Lowrey* that, as you've found out, can't actually be done live. Certainly, there was no way to get the AOC to sustain when you're playing a left hand pattern like that.

The exact multitrack configuration used was confirmed by means of experimentation at the instrument, as shown in Performance Eight. The effect heard in Stoneham's recording was produced by means of two multitracked left hand parts played on the lower manual. The first plays the rhythmic chords that can be heard throughout, whilst the second is silent and only used

occasionally, activating the AOC function when required on the upper manual.[101]

In a similar approach to Wunderlich, Sharp's recording of *Wave* imitates not only the instrumental tones but also emulates the textural structures of Jobim's original arrangement e.g. the combination of flute, trombone, guitar and bass at the beginning of the piece (which quote Jobim's thematic material), the use of solo trombone and guitar at 0'09, the string voicing at 0'30 and the use of octave piano for the middle eight section at 0'49''. All of these structures are achieved via multitracking.

In contrast, the structures heard in Glyn Madden's recording are not enhanced with any multitracking. By using a new feature on the Yamaha E50 named 'Orchestral Presets', Madden is able to change the volume balance of the two sounds heard on the lower manual, resulting in a strident guitar that demarks a change of harmony and provides syncopated rhythmic interest, whilst softer organ flutes provide harmonic support without becoming overbearing.

4.2.2.3 Registration and Expression

Sections 4.2.2.2 and 4.2.2.1 have made some observations regarding the similarity of practice between Stoneham's recordings of *Wave* and *Satin Doll*. The sole use of organ flutes in *Wave* (Harry Stoneham, 1976a) also points to an emulation of prior practice, as does the use of the variation of Leslie

[101] As can be seen at 01'11' of Performance Eight.

speaker rotation speed (which was established as an element of style in Section 3.2.1.3 of Chapter Three).

Glyn Madden's approach is entirely different however, relying on changes of registration to achieve a musically diverse and contrasting result. Experimentation at the original instrument revealed that the fast changes of registration are facilitated by the Orchestra Preset function, whereby the solo flute sound can be heard solo or layered with the organ tone.

The comments made in Section 4.2.2.1 regarding the emulation of organ sensibilities can also be expanded to include another point of prior performance practice; that of expression pedal accentuation. During the 'organ style' sections of Madden's performance, the same technique employed by Haven and Stoneham in Chapter Three is heard in Madden's recording: that of opening and closing the expression pedal in time with the musical pulse, further indicating a deliberate reference to organ sensibilities.

Sharp's use of registrations is in complete contrast to Stoneham and Madden insofar as there is no organ tone featured, marking a complete departure from prior practice in favour of a wholly emulative approach.

4.2.2.4 Ensemble & Studio Techniques

As identified in Section 4.2.2.2, the use of studio techniques and multitracking was used in the recordings of Sharp and Stoneham.

In order to unpack the process of multitracking, and to gain an understanding of how Stoneham managed to produce the effects heard, Performance Eight was reconstructed using similar techniques. Figure 4.4

shows the solution arrived at: Track 1 includes all the melodic material plus a silent static chord part (used to activate the AOC function, as demonstrated in Performance Eight) whilst Track 2 contains the additional rhythmic chords. These are then combined using digital audio software and, for means of demonstration, synchronised with the film.

Track	Material Played
1	**Upper**: The melody is played throughout, including changes of flute registration, with AOC switched on and off at the desired points. **Lower**: Only sustained chords required for AOC sections are played, with no stops selected. This provides the chord notes for the upper manual without any audible material.
2	**Upper**: No material played. **Lower**: Rhythmic chords played throughout.

Figure 4.4 Showing the division of material played by Stoneham in *Wave*.

Madden's recording exhibits an entirely different approach however, being closer to that of a live recording insofar as no multitracking is evident. The only audible studio addition is that of a drummer, whilst the bass part is provided by Madden, who uses the extended compass of the Yamaha E50's twenty-five note pedalboard.

4.3 Conclusions

From the analysis of recordings featured in this chapter, it is possible to draw the conclusion that the introduction of instruments such as the Lowrey TGS-1 and Yamaha E50 represented a point of juncture for the established stylistic lexicon of electronic organ music. This section reviews the main

developments as established by organist interview and reconstructive performance.

4.3.1 Emulative Practices

An analysis of the case study recordings cited in this chapter and the results of practitioner interview reveal that organists sought to support the elementary emulation of an acoustic instrument by giving an impression of its sensibilities which, as this chapter has shown, can apply to the use of articulation, melodic phrasing and textural configuration.

Along with this new approach, there is also evidence of an encapsulation of previously established stylistic practices of organ playing. This is demonstrated by Glyn Madden in his recording of *Wave* (Glyn Madden, 1979), where emulative, instrument-specific articulation and ornamentation is interchanged with that of previously established organ practice i.e. grace notes, staccato chord playing and expression pedal accentuation. In other words, instruments of this era supported a duality of practice that could be emulative not only of orchestral instruments but also of past methods of organ playing.

4.3.2 Development of Studio Techniques

The recordings in this chapter demonstrate different methods of assimilating the new possibilities offered by this newer type of orchestral electronic organ.

The recordings of Wunderlich and Sharp develop the prior multitracking methods used by Cole, Hyman, Ethel Smith and Salmon illustrated in

previous chapters. Improvements in sound quality offered by the instruments studied in this chapter may sound primitive today, but they enabled organists of the period to strive for more exact imitations of tone and texture, showcasing the degree to which electronic organs could copy other ensembles, such as the Glenn Miller big band or the orchestrations of Antonio Carlos Jobim's *Wave*. This degree of orchestral emulation is different from prior studio practices insofar as the use of organ flute tones is reduced: in the multi-track recordings featured in this chapter, organ flutes are used only partially in Wunderlich's *Tuxedo Junction*, and removed completely from Sharp's recording of *Wave*. In addition, associated textural configurations that signify earlier styles of organ playing, such as Cole's use of the 'locked hands' technique in his recording of *Moonglow* (as identified in Section 2.3.2.2) are either not present (in the case of Sharp) or encapsulated within other emulative textures (as in Wunderlich). The emulation of orchestral textures is further signified with the quotation of thematic material found in the original recordings.

Stoneham's *Tuxedo Junction* and Madden's *Wave* are both examples of attempts to utilise the new timbres and facilities offered by this latest generation of instrument in forms of performance that are closer to that of a live configuration.

4.3.3 An Extension of Stylistic Range

As indicated above, the introduction of a greater number of improved orchestral sounds motivated organists to attempt to recall acoustic ensembles

within their arrangements. Consequently, practices that were commonly applied to older instruments and associated with organ flute-based tones, such as the manipulation of the Leslie speaker speed, manual glissando, expression pedal accentuation and the use of grace notes had now become encapsulated within a wider stylistic lexicon.

In a movement that started perhaps as early as Jerry Allen's *Moon River* (Jerry Allen, 1971), when initial experiments in emulative Melodeon playing and Latin American rhythm styles are 'framed' with an introduction and ending that draws on organ-style sensibilities and textures, some recordings surveyed as part of this chapter momentarily recall older styles of organ playing by adopting these sensibilities mentioned above e.g. in the analysed recordings of Wunderlich and Madden.

Jimmy Smith's recording of *Tuxedo Junction* (Jimmy Smith, 1978) represents an antithesis of this movement however. As established in Sections 4.2.1.1 and 4.2.1.2, Smith's approach to articulation and textural formats in *Tuxedo Junction* (Jimmy Smith, 1978) are similar to that of his earlier recording of *Satin Doll* (Wladi Plus, 2016). This is unsurprising perhaps, given that the instrument used remains the same for both recordings.

4.4 Summary

This chapter has described the technical facilities of the instruments used in reconstructive performances and other recordings of this era and illustrated some significant developments in design. Specifically, these developments

relate to the increased number and improved quality of emulative tones in comparison with the instruments surveyed in Chapter Three.

The results of this research have established that emulative voicing encouraged players to begin to explore and imitate the sensibilities of other acoustic instruments via different approaches to articulation, texture and registration. At the same time, the formulation of an ‘organ style’, which incorporated some commonly-used points of prior practice such as the grace note, manual glissando and expression pedal accentuation, began to be encapsulated within a more broader stylistic range.

This study continues by surveying later developments in emulative instruments that used digital synthesis, automated control systems and data storage technologies.

Chapter Five

Digital Multi-Keyboards (1985 - 2015)

5.0 The Yamaha Electone

This chapter details the results of research that refers to the final chronological period of electronic organ performance practice as defined in Section 3.3 of Chapter One.

As established in Section 1.1, the development of the electronic organ during this period was led by Japanese manufacturers who, despite a decline in sales, were able to continue production by utilising pre-existing technology that had been developed for use in synthesisers.[102] Companies that were not able to benefit from this method found it difficult to compete and gradually withdrew from the market.

This chapter investigates the technical profile of two instruments made by the Yamaha Corporation, one such manufacturer that incorporated much of the technology developed for synthesisers in their range of Electone electronic organs.

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[102] Examples of this convergence of technology can be found when comparing Yamaha's HX1 Electone organ with the DX7 synthesiser, both of which utilise a technology called Frequency Modulation (FM). A later example of this practice can be found in the technical similarities of Yamaha's EL900 Electone organ with the VL range of synthesisers, both of which featured a form of acoustic modelling technology called Virtual Acoustic Synthesis (VA) developed by Stanford University.

Yamaha's investment in synthesisers since the early nineteen eighties had produced advancements in a technological facility called 'sampling'[103], whereby recordings of acoustic instruments tones such as a piano or guitar were digitised and stored in the memory of the instrument. This method advanced the emulative aspect of the electronic organ considerably, as key presses now replayed recordings of selected acoustic instruments, rather than synthesised or electrically-generated approximations. This chapter features reconstructed performances on two Yamaha Electone instruments that use sampling as their core method of tone production: the EL900 (launched in 1998) and the later ELS-01 (launched in 2004).

Figure 5.1 The Yamaha Electone organs used in reconstructive performance. The EL900 (left) and ELS-01C (right). [104]

[103] According to the Grove Dictionary of Music, sampling has 'been widely used in the production of individual voices for commercial synthesizers: instead of generating sounds artificially from first principles, short extracts from acoustic instruments or other suitable sources are digitized, edited, and stored in a memory bank' (Grove Online, 2017f).

[104] Photographs used with the permission of Yamaha Music Corporation.

The net result of the implementation of new synthesiser technologies in electronic organ design was a significant expansion in the variety and number of sounds that could be created and combined, together with a marked improvement in quality.[105] As Yamaha organist and demonstrator Janet Dowsett (2015) recalls, this change of design was perceived as a paradigm shift in the scope offered by the instrument:

> People didn't think they were organs anymore, because they became orchestras. Yamaha went through a phase of calling them 'multi-keyboards' because they weren't organs as we knew them. Here we were with technology which, for the first time, gave you realistic sounds. We didn't have to pretend anymore.

Via an examination of both instruments, it was possible to ascertain that the essential method of Electone operation lay in the use of registration presets, which were similar in function to that used on a pipe organ: by pressing a numbered button between the keys, the entire tonal configuration of the instrument could be changed immediately to a different prearranged combination.

As this thesis has revealed in Section 4.0 of Chapter Four, the design of earlier electronic organs prohibited such large-scale changes of registration in real time. Therefore, the ability of the Electones to facilitate such changes

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[105] For example, the Yamaha EL900 has 207 different sounds, where up to four different sounds could be played simultaneously on the top manual, three on the lower manual and two on the pedal section. The Yamaha HS8, an instrument of a decade earlier, had only 90 sounds (Electone Zone, 2017).

during performance, and in a virtually limitless number owing to the storage of these settings on to removable media, had significant implications according to Dowsett (2015):

> It transformed my playing, because I could register things intricately for the first time. It was the first time I found myself capable of long medleys with good, proper registrations. Your registrations started changing, because instead of having a general registration which was ok and very pleasant that you used for everything, you could actually work out registrations for each and every arrangement in advance and say 'on bar four, beat three, I'm going to have a crash cymbal and it's going to be exactly this loud with exactly this level of sustain'. You had to stay away from the usual *Girl from Ipanema* bossa novas or the *Colonel Bogey* march, in fact anything that would work on a theatre organ.[106] Suddenly, we were into the theme from *Superman* and *Raiders of the Lost Ark,* which would not have worked without lots of intricate registrations.

Dowsett infers an increase in the variety and potential complexity of registrations, but also implies that these facilities made the performance of

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[106] Theatre organs are based on the same principles as that used in a conventional classical pipe organ, albeit with different pipe designs to produce a tonal range that is more suited to popular and light entertainment music. A common sight in cinemas of the nineteen twenties and thirties, theatre organs featured regularly in BBC radio broadcasts from the same era. The most prominent theatre organ in British popular culture is perhaps the Wurlitzer organ installed in the Blackpool Tower Ballroom.

popular orchestral music, such as film scores, more practicable and thus expanded the range of repertoire available. However, her recollection that the arrangement had to be worked out 'in advance' implies a change of performance dynamic, lessening the opportunity for ad hoc ideas to be integrated into the prearranged performance (Dowsett, 2015):

> The technology was completely different and the possibilities were incredible. The sounds were quite stunning [...] but you couldn't play it on the fly. With older instruments, such as the D85 [produced in 1980], you could register it as you went along and you could do something different every time you played [a piece]. With the EL900 there was no earthly way of doing this: once you started, you had to do what your registrations dictated.

Experimentation at the instrument revealed the nature of the registration preset system and the reasons behind the change in performance dynamic to which Dowsett refers. For both models of Electone studied, the number of parameters that could be set for each individual sound preset was found to be exponentially more advanced than that offered by technologies discussed in previous chapters.

As would perhaps be expected from an instrument that was derived from a synthesiser, every component of each registration could be altered in a myriad of different ways. For example, pressing the Violin tone button on the EL900 produces a menu on the central LCD screen, asking the user to select one of eight different violin sounds. This selection can then be refined by setting specific levels of vibrato, volume, reverb, stereo panning, touch

sensitivity or octave transposition. This is compounded by the fact that there can be a further three tones added to the upper manual, for example, and that this overall combination can be one of sixteen registration presets, stored within a virtually limitless number of files located on removable media. As Dowsett suggests above, reconstructive performance revealed that the complexity of registrations used in Electone performance meant that the instrument could essentially be preconfigured with a number of highly detailed registration presets that were tailor-made for each piece.

However, the inclusion of a high number of instrumental tones controlled via an LCD screen presents a fundamental change in ergonomics: unlike the use of drawbars, tabs or rocker switches, the screen-driven method of navigation demands that every change of tone be pre-planned and stored in a registration memory before the performance commences. James Sargeant (2015) recalls a conversation with Martin Harris, a past winner of the International Yamaha Electone Competition and present product designer for Yamaha Japan, which also points to the high level of integration that registrations had within an Electone performance:

> I remember Martin saying to me that, if he sat down at an EL900 with his disks and tried to play some of his arrangements from fifteen years ago, he couldn't. Not because he wouldn't remember the music, but because he wouldn't recall how the sequence of registration changes worked within the piece.

Both Dowsett and Sargeant's comments above give significant insight into the perceived importance of registration sequences within an Electone

performance and, in the minds of Dowsett and Harris at least, the belief that the use of such was an indispensible practice i.e. without 'his disks'[107] containing pre-programmed registration combinations, Harris would not be able to perform the piece. As will be explored in the following case study analysis, these comments further support the view that every aspect of the musical arrangement in an Electone performance was inseparable from the pre-programmed sequence of registration changes employed within it.

Via experimentation at the instruments, it was possible to determine that registration changes could also be executed by means of a foot switch, thus reducing the need for the hands to be removed from the keyboards in order to press the registration buttons between the keys. This was confirmed by Dowsett (2015):

> That was the other revolutionary thing, because the registration changes could be done with the foot and therefore the intricacy of registrations was available for the first time. It was a totally different way of thinking.

With the use of reconstructive performance, it was possible to investigate Dowsett's claim that the footswitch offered an 'intricacy' of registration 'for the first time'. By experimenting with the footswitch on both instruments, it was possible to ascertain that a pre-programmed sequence of

[107] The EL900 stored registration data to floppy disk for instant recall. Owing to the vast number of variables and settings that formed the registration memories, the use of floppy disks were integral to the instrument's operation, as to reprogram the sound combinations required without reloading previously prepared data would take many hours.

registration changes could be stepped through with each 'kick' of the registration footswitch. This removed all the ergonomic obstacles associated with making changes of registration during performance: essentially, these were 'remote controlled' by the footswitch, meaning that no additional buttons or settings needed to be changed whilst playing.[108] By removing the need for the hands to leave the keys in order to operate buttons or switches, the compromises inherent in changing registrations (of the type encountered in Stoneham's performance of *Tuxedo Junction,* as detailed in Chapter Four) are removed, thus allowing more frequent changes and, as will be illustrated later, an associated increase in the fluidity of textures.

As indicated above and in Section 3.3 of Chapter One, the Electone and its associated performance practice originated in Japan. Dowsett (2015) recalls that she perceived this approach to be distinctly different to prior methods of working:

> We were influenced by the Japanese [...] We saw what they were doing, what the possibilities were [...] I seem to remember Glyn [Madden] being sent to Japan to learn how to play the instrument [...] they changed things quite considerably. It was revolutionary. In fact, we forgot how to play organ sounds for such a long time. I remember us all getting accused of not playing organs anymore.

[108] As will be detailed later, reconstructive performance found that the footswitch presses themselves could be sequenced and pre-programmed to occur at certain points during a performance, meaning that changes of sound could be completely automated.

In addition to the large number of instrumental tones available, the 'revolutionary' qualities that Dowsett refers to can also be seen to extend to the extensive degree of control that the organist has over expression and articulation. Via experimentation at the instrument, it was possible to affirm that the EL900 and ELS-01 Electones incorporated touch sensitive [109] keyboards that responded to 'Initial Touch' (the velocity of the initial key press), 'After Touch' (the subsequent pressure placed on the key after it is pressed) and 'Horizon Touch' (where lateral movements in the key could produce shifts in pitch similar to that of producing vibrato on a violin string). Further pitch effects could also be achieved with the use of the glide pedal, a footswitch attached to the expression pedal that produced a semitone portamento on the upper manual when used.

In addition to a large number of instrumental voices and touch sensitive keyboards, both instruments incorporated features which had hitherto only be available in the studio: a drum pattern sequencer, enabling the production of original percussion tracks, and a variety of effects, such as reverb, delay and stereo panning.

[109] Using a similar concept to the digital piano, touch sensitive keyboards on an electronic organ sense the velocity of every key press and translate this into a volume level, thus facilitating a greater potential for expressive playing as each note can be varied in dynamic.

5.1 Presentation of Survey Results

Analysis 1: *Tea for Two* (Youmans and Caesar)

This section compares three organ recordings of *Tea for Two*, found on the following albums:

- Max Takano, *Full Score*, Grosvenor, CDGRS1205, 1988, playing Yamaha HS8 Electone.

- Michael Wooldridge, *Favourites*, Merlin Productions, MPCS101, 1989, playing Yamaha HX3 Electone.

- Masa Matsuda, *The Best Of Masa Matsuda*, Yamaha Corporation GTE744260, playing Yamaha EL900 (filmed as Performance Nine, with registration data provided by Matsuda). This performance uses a score published by Yamaha Music Media (Matsuda, 1998) which is shown in Appendix A.

In addition, this chapter also uses observations taken from a reconstructed performance of the *Overture from the Marriage of Figaro*, arranged by Electone organist, Genta Utsumi (2005). An extract of the score is printed in Appendix A.

In a departure from previous survey practice, the reconstructed performance of Masa Matsuda's *Tea For Two* is based upon a published score with registrations provided by Matsuda. The reason for this is linked to

the complexity of the registrations used: initial attempts to copy the tones heard on the audio recording proved difficult as all of the synthesised sounds were designed specifically by Matsuda and were not found within the instrument's default library. Furthermore, the large amount of data stored in each registration memory meant that copying the entire set 'by ear' would have been impractical and approximate at best. Using the score and data provided by the arranger ensures a reliable and accurate basis from which to base a performance.

5.1.1 Articulation, Melody and Rhythm

The conclusions reached in Section 4.3 of Chapter Four establish that early emulative instruments such as the Lowrey TGS-1 and Yamaha E50 expanded the stylistic lexicon of electronic organ playing. Although these instruments are comparatively basic when compared to the capabilities of those surveyed in this chapter, the emulative tones of these instruments prompted the formation of an approach to articulation and melodic styling that was separate from practices developed on Hammond and earlier Lowrey organs, as identified in Chapters Two and Three of this study.

Despite the technological advancement of the Electone instrument used in Michael Wooldridge's recording of *Tea for Two* (1989), the performance recalls some of the 'organ-style' practices that were investigated and illustrated in Chapters Two and Three, namely the use of organ flute tones and the adoption of articulation that would be employed in a Hammond organ performance. From the use of staccato chords at 0'06, which recall

Delany's approach to articulation in *Satin Doll* (Delany, 1964) e.g. bars 23 and 24 of Transcription Three; the use of manual glissando at 0'33'', 2'17'', 2'32 and 3'01'' and the frequent employment of grace notes, Wooldridge's approach is clearly a deliberate recollection of previous performance practice.

In contrast, Max Takano's recording (1988) is wholly emulative of orchestral sensibilities. A variety of constantly changing methods of articulation can be heard which are linked to the imitative orchestral sound at hand e.g. a whole keyboard glissando in combination with the harp tone at 0'04'', staccato chords emulating pizzicato strings at 0'37'' and a legato oboe solo at 01'22. Takano also makes extensive use of the touch-sensitive keyboards to add continuously variable dynamics, such as the swells of volume whilst playing strings at 0'34'' and the dynamic shaping of the trombone counter melody at 0'54'', whilst the touch-sensitive pedals are used at 2'24'' to provide a crescendo in the contrabass voice. All these techniques are facilitated both by the improved tonal qualities of the instrument and the Electone's touch response.

Masa Matsuda's performance represents a similar approach to Takano, whereby contrasting articulation techniques are used in conjunction with the changing tone of the instrument. Via reconstructive performance, it was possible to ascertain a link between the type of articulation used and certain technical features activated within the instrument: Figure 5.2 shows the results of this survey and can be read with reference to Performance Nine.

Time Index	Articulation Heard	Effect Employed
0:07	Sustained notes on the upper manual are given a wavering pitch by varying key pressure. Moving the key from side to side creates vibrato.	After Touch Horizon Touch
0:20	Synth chords in the melody gradually slide up to pitch.	Glide Pedal
0:32	Accented staccato chord creates echo and variable pitch effects, which fill in the drum break.	Delay
0:34	Percussive, marimba-like electronic tones heard in the lower manual. Notes are heard echoing in between the spaces created by staccato articulation, creating double note textures.	Delay
0:45	Percussive tones in the lower manual are given variable overtones, brought out by changing key velocity.	Initial Touch
1:25 1:41	The solo synthesiser melody uses portamento, activated by legato playing. Notes are 'bent' up and down in pitch whilst sustained.	Lead slide Horizon Touch
1:56 1:58 2:15	The synthesiser melody becomes distorted, promoting an exploration of timbre over pitch. Sustained notes are given vibrato effects. Melody notes are each given different tonal characters by linking pitch control to touch response.	After Touch Horizon Touch Initial Touch and After Touch

Figure 5.2 Articulation effects used in Masa Matsuda's performance of *Tea for Two* (1998).

Overall, the recordings demonstrate three very different approaches to articulation and reflect diverse contexts. To borrow Cook's term (Cook, 2013, p.306), both Wooldridge and Takano 'signify' traditional organ performance or orchestral emulation in their respective arrangements, whilst Matsuda uses the facilities on the instrument to produce an arrangement that is unique in

approach and character. As Figure 5.2 and Performance Nine make clear, such facilities contribute to the thematic core of each arrangement.

5.1.2 Voicings and Vertical Structures

The use of emulated sensibilities can also be seen in an analysis of the use of texture in all three recordings. As can be seen in Figure 5.3 below, Wooldridge's arrangement contains numerous emulative 'organ-style' textures that recall those defined in Chapters Two and Three:

Time Index	Vertical Structure Used
00:00 – 00:34	Rhythmic chords played in the left hand on the lower manual with the melody voiced as chords on the upper manual recall Waller.
00:16	Playing the melody on the lower manual recalls the manual swapping technique of Waller and Delany.
00:35 – 00:49	The solo melodic line over rhythmic chordal accompaniment becomes thicker in texture when approaching a cadence point, recalling Delany.
00:50 – 00:56	Emulation of Buckner's 'locked hands configuration.
00:57 – 01:02	Solo melody with rhythmic chords to end recalls Waller.
01:20	Glissando between melody notes emulates Crawford.
01:53	Further use of close harmony.
02:00	Solo melody with frequent grace notes, supported by rhythmic chords.

Figure 5.3 The configuration of vertical structures heard in Wooldridge's *Tea for Two* (1989).

In contrast to Wooldridge's use of clearly defined textural modes that are organ-derived, Figure 5.4 below details the greater textural fluidity in Takano's arrangement. Multiple changes of texture are evident, signifying the varying of texture that would perhaps be expected from an orchestral ensemble. This aligns with Dowsett's (2015) recollection of using numerous, 'intricate' registrations within an Electone arrangement:

Bar Number	Vertical Structure Used
1	Melody played as solo bassoon. Lower accompaniment of four-part pizzicato string chords
9	Melody voiced as three-part string chords on the upper manual. String pizzicato chords continue, with a solo bassoon counter melody.
17	Melody voiced as four-part strings and woodwind. Brass and string chords in the accompaniment.
25	Both hands play four-part chords, imitating a brass section.
29	Melody reduces to solo oboe with sustained string accompaniment.
33	Broken chords in both hands, imitating glockenspiel and celesta.
41	Melody voiced as chords, imitating strings and celesta.
45	Melody voiced in thirds on the upper manual, imitating flute duet. Broken chords heard on the lower manual, imitating a celesta.
49	Recall of texture used in bars 1 – 8 (solo melody and chords).
52	Recall of texture used in bars 9 – 16.
56	Recall of texture used in bars 25 – 28.
60	Solo melody imitates a clarinet. Chordal accompaniment imitates strings.
63	Recall of brass chords in both hands.
65	Melody voiced as chords, imitating strings. Broken chord accompaniment imitates harp.
69	Both hands play broken chords, imitating celesta.
71	Return to solo bassoon melody and pizzicato chordal accompaniment.

Figure 5.4 Use of different textures in Takano's *Tea for Two* (1987).

The use of registrations also supports the vertical structures heard in Matsuda's arrangement. As Performance Nine and the included score in Appendix A shows, the use of texture appears unusual, with the left hand playing mostly octave figures up to the introduction of the synthesiser solo.

Instead of using chordal textures on the lower manual, Matsuda combines harmony with melody on the upper manual for the first half of the piece, voicing every melody note as a chord. An examination of the registration data provided by Matsuda indicated that the bass pedal part is configured to use a function called 'Automatic Bass Chord' (ABC), whereby

the Electone elaborates the pedal part automatically, inserting extra notes according to a preconfigured rhythmic pattern. In other words, the bass part heard in Performance Nine is being provided automatically by the Electone rather than by the player. The thin texture used on the lower manual exposes these complex bass figures, which could not have been produced without the ABC feature, and is a further example of technological mediation in textural arrangement.

5.1.3 Registration and Expression

The findings of Sections 5.1.2 and 5.1.1 show that registrations are of prime importance to the execution of Matsuda's arrangement. By means of reconstructive performance and further experimentation, it was discovered that the complex configuration of sounds used were all created specifically for the arrangement and were not available via the Electone's main sound library. Instead, the voice data had to be loaded from floppy disk before each performance. This confirms Harris and Dowsett's perception in Section 5.0 that, without disks and preconfigured registration data, a performance is not possible. Furthermore, the changes of registration data are automated and synchronised with the drum sequencer, meaning that the player's hands do not have to leave the keyboard to perform this function during performance. The obvious disadvantage of this method, however, is that all aspects of technical control are taken away from the player and there is no opportunity to alter the preprogramed structure during performance (as referred to by Dowsett in Section 5.0).

Takano's arrangement is also reliant on the use of frequent registration changes to produce the desired configurations of instrumental tone and texture. By experimenting at the original instrument, it was discovered that such combinations required significant programming, specifically the selection of numerous orchestral sounds from within the instrument's library, which could not be executed in real time without the use of presets.

Wooldridge also has to rely on presets, despite his performance emulating an instrument style that, as established in Chapter Two, did not always utilise them. The registration changes heard at 0'57'' are pre-programmed, since experimentation at the Yamaha HX Electone revealed that the instrument did not have any drawbars. The organ tones heard in the arrangement were accessible via the LCD menu screen only.

5.1.4 Ensemble and Studio Techniques

When compared to recordings in previous chapters, all the arrangements analysed in this chapter demonstrate a paradigm shift in terms of the use of studio production. From one perspective, the performances represent a self-contained ensemble for the first time: there are no supporting musicians nor studio enhancements evident in any of the three recordings. However, whilst it could be argued that these extra elements have simply been internalised by the improved technical facility of the instrument, there is a clear expansion of practice evident. In other words, as the instruments now offer the potential for complex drum patterns and studio-quality effects, the organist has now assumed the role of drummer and studio producer also. Indeed, as has been

demonstrated in Figure 5.2 in Section 5.1.1, the use of effects (and a pre-programmed percussion track) has become part of the thematic core of Matsuda's arrangement.

5.2 Conclusions

In order to provide a further illustrative example, the conclusions made in this chapter will be discussed in combination with observations taken from Performance Ten, an extract of a performance reconstruction of Genta Utsumi's arrangement of Mozart's *Overture from the Marriage of Figaro K492*. Performed on a Yamaha ELS-01 Electone, with registration data provided by Utsumi, this arrangement can be seen to be an example of the type of complex orchestral emulation that can be achieved using recent models of electronic organ.

Via the results of reconstructive performance and organist survey, this chapter has established that electronic organs in the form of Yamaha Electones embodied a different set of practices and concepts to earlier designs of instrument. The use of digital technology, specifically the facility to store and recall numerous prepared registrations and the improvement in sound quality aided an expansion in the number of tonal combinations available. The introduction of registration memories and the registration footswitch function solved the ergonomic difficulties of earlier emulative instruments identified in Section 4.2.1.4 of Chapter Four, namely the inability to switch between sounds or make large scale changes of tone configuration whilst performing. The improvement in tonal quality and effects processing,

evident in Utsumi's performance, has propelled the Electone further down the path of emulative practice.

Via analysis of the performances by Takano, Matsuda and Utsumi, it has been possible to establish how the new functions and capabilities of Electone organs have been used in performance.

5.2.1 Touch Sensitive Keys

The use of touch sensitive keys is a common element of practice, having been shown to be integral to both Takano and Matsuda's performances. The use of Initial touch and After touch, defined in Section 5.1, is also found throughout Utsumi's performance e.g. at bar 16 and 17 of the score included in Appendix A, where accentuating the accompaniment at this point increases the volume of the brass tones, thus bringing them to the fore of the orchestral texture. A further example of this practice can be found in bars 34 and 35. As discussed in Section 5.1.1, Matsuda also makes use of the Horizon touch feature to make pitch changes to certain notes.

5.2.2 Internalised Studio Processes

The use of effects such as reverb, delay and stereo panning are particularly evident in the arrangements of Utsumi and Matsuda. As established in Chapter Four, such processes were used in older recordings but added as part of an auxiliary, post-production process. For the first time, these facilities

are integrated into the design of the organ, thus making them a core component of tonal and textual practice.

Evidence of the use of the delay effect can be found in Matsuda's arrangement e.g. in bars 9 and 10 and in Utsumi at bars 43 and 44. Utsumi makes extensive use of the reverb and stereo panning facility on the ELS-01 Electone throughout the arrangement in order to replicate the acoustic of a concert hall and the on-stage positioning of orchestral instruments: violins are heard through the left speakers of the instrument, whilst the contra bass is heard from the right.

The use of an integral drum sequencer, whereby a percussion track can be pre-programmed into the instrument, can also be seen to be a leading element of Matsuda's arrangement. Performance Nine makes clear that the numerous two-bar drum 'loops' used can be assembled according to a pre-prepared sequence in a similar fashion to a registration sequence. Whilst this results in an exciting and varied drum track, this practice is a further example of predetermined form and structure, since to deviate from the pre-established arrangement whilst performing would lead to a loss of synchronisation between those elements played live i.e. the melody, accompaniment and bass pedals, and the drum track.

5.2.3 Automation of Registration Changes

As indicated by the results of organist survey in Section 5.0, the most significant development in digital organ technology was the use of registration memories and the ability to switch between different registrations with one

kick of the footswitch. This was confirmed by reconstructive performance of Matsuda and Utsumi's arrangements. In Matsuda's *Tea For Two*, registrations are changed automatically in synchronisation with the drum sequencer, whilst Utsumi's *Marriage of Figaro* uses the registration footswitch extensively to make micro adjustments to the orchestration heard in order to recreate a fluid, emulative texture. There are no less than a hundred and thirty four changes of registration in Utsumi's arrangement, which illustrates the precision of emulative orchestration and texture that can be achieved when using this practice, particularly when some registrations are only to be played for one or two beats e.g. in bar 18 of the score extract. Such changes would be impossible to achieve without the use of sequenced registration memories.

5.2.4 Fluidity of Texture and Registration

As described above, one of the most striking elements of Matsuda, Takano and Utsumi's performances, in contrast to Woodridge's, is the short duration in which individual registrations are utilised before being replaced with another (as can be seen from Performance Ten, where the lighted registration buttons between the manuals change number frequently). This is a result of the use of removable media for expanded data storage, as described by Dowsett and Sargeant in Section 5.0, meaning that organists could create a virtually limitless number of registrations for one particular piece, contrary to prior practices (Dowsett, 2015). Therefore, the design of the Electone meant that economy and compromise with regard to registration could be virtually eliminated from an arrangement: a piece could contain any number of

registrations, configured to support a variety of specialised effects and textures, no matter how ephemeral. Evidence of this practice can be found in Takano's arrangement of *Tea for Two,* as shown in Figure 5.4, and Utsumi's *Marriage of Figaro.* Both of these arrangements display a rapidly changing combination of registration and associated texture.

Registration memories are also able to enhance textural structures. This study has found evidence that the organist does not always control some of the vertical structures heard in Electone arrangements. Specifically, this refers to Matsuda's use of the Automatic Bass Chord feature to provide a bass pattern, which in turn facilitates the complex bass patterns that are integral to the textural configurations seen in that arrangement, as detailed in Section 5.1.2. Utsumi also uses registration memories to affect changes of texture, such as at 1'54'' of Performance Ten, where registration memories one, two, three and two are switched in quick succession: each registration memory has a pedal voice transposed to a different pitch interval, thus creating a countermelody from a static bass pedal as each memory is activated sequentially.

5.3 Summary

This chapter has described the introduction of digital technologies in electronic organs and established via organist survey and reconstructive performance that the facilities included in such models offered a substantial advance in terms of sound quality and capability. Specifically, the introduction of sequenced registration memories afforded benefits in terms of making quick and efficient changes of sound albeit at the expense of spontaneity.

This enabled a greater variety of texture and, in combination with associated digital effects, advanced sequencing and automatic functions, facilitated new approaches to vertical structures and configurations of sound.

This thesis will now examine the findings of these investigative chapters and revisit the research questions as stated in the introduction to this study.

Chapter Six

6.0 Conclusions

In this concluding chapter of the thesis, the findings relating to two components that have been prevalent throughout this research are presented. They are entitled ‘The Instrument’ and ‘Practice’. The literature reviewed in Chapter One is then revisited before an evaluation of the research questions concludes the work.

6.1 The Instrument

From the research conducted in Chapters Two to Five of this thesis, it can be seen that the design, tonal character and capabilities of the electronic organ changed significantly between 1943 and 2015.

Chapter Two details the history and design of the archetypal Hammond Model A organ and Leslie speaker, citing interviewed organists that described the speaker as an indispensible addition to the instrument. A specific feature referred to by Vail (2002, p.89) and Limina (2009, p.19) as ‘foldback’ is identified as being integral to the stylistic practice of organist Bill Davis and Jimmy Smith. However, this study has established that both of these definitions of foldback are incorrect. By means of reconstructive performance, this study was able to provide a correct account of the workings of the system.

Chapter Three described later revisions to the Hammond organ models C3 and B3, identifying the use of the Manual Percussion and Chorus feature

as an important element of practice for jazz musician, Jimmy Smith. The percussion feature is incorrectly described by Vail (2002, p.46) and the drawbar combination that Vail ascribes to Smith omits the settings for Chorus and Manual Percussion that are required in order to emulate the registration effectively (Vail, 2002, p.186). Contrary to Théberge's view that such features were 'relatively minor innovations' (Théberge, 1997, p.47), this thesis has shown that the use of these particular features was integral to Smith's performance practice.

Chapter Three also describes two models of Lowrey organ: the Heritage and Berkshire. Via organist interview and reconstructive performance, the different tonal quality of the Lowrey organ to that of the Hammond was identified and established as having significant agency in performance dynamic. The same methods were used to produce a full description of the workings of the Lowrey AOC feature, which was shown to be an essential part of Harry Stoneham and Alan Haven's stylistic practice. The use of the Solo Volume setting, an additional feature that was unique to Lowrey instruments, was also documented.

Chapter Four detailed the introduction of instruments that were capable of producing elementary emulations of acoustic instruments. Organist survey and reconstructive performance confirmed that these developments, embodied in the Lowrey TGS-1, presented organists with some ergonomic difficulties.

Chapter Five detailed the use of digital Electone organs manufactured by Yamaha. Organist interview and reconstructive performance was again combined to produce evidence that indicated an exponential improvement in

the quality and realism of the instrument's tonal library, but at the cost of spontaneity of operation. Via reconstructive performance and experimentation at the original instrument, it was discovered that much of the potential of these models of electronic organ could only be realised by programming registrations in advance and storing the data on removable media. Whilst this meant that the instrument could be reconfigured instantly for every piece, facilitating highly specialised and frequent changes of sound combinations, such practice introduced a high level of automation and prior preparation to performance that had not been applicable to instruments of earlier eras.

6.2 Practice

In addition to researching the technical profile of the instrument, this study found new evidence to support a greater understanding of the alignment between performance practice and technical features.

Via reconstructive performance on a Hammond organ as detailed in Chapter Two, it was possible to conclude that there were elements of the instrument's design that could be shown to have agency over stylistic practice. Section 2.3.1.1 pointed to the frequent use of glissandi as being facilitated by the square-cut, rounded keys, whilst grace notes added attack transients to an organ tone that was otherwise unwavering and lacking any natural percussion. The use of what is termed 'clipped articulation', a predominantly staccato style of playing, was demonstrated to be a response to the immediate sound of the instrument. Other identified elements of style included the use of textural variation in order to provide some form of

differentiation in performance and the use of the expression pedal for accentuating notes.

Chapter Three identified significant differences in practice between recordings that used Lowrey organs and that of the upgraded Hammond instruments. Surveyed organists confirmed that the sound of Lowrey organs were deemed to be harmonically richer, whilst reconstructive performance confirmed that the use of the AOC function resulted in unique textural configurations that were distinctively different to those produced by Hammond organists. The use of the Lowrey pedal sustain feature was also established as being integral to performance style.

Interviews with Hammond organist Keith Beckingham confirmed that his instrument was modified to produce reverb effects which were not otherwise available via the instrument's controls. A similar practice of modification was also established as being used by Harry Stoneham in order to improve the bass response from his Lowrey Heritage organ. The implications of this practice are discussed in Section 6.3.

Chapter Four recorded organists' observations of the challenging ergonomics of the Lowrey TGS-1. The concept of emulative articulation was established as part of a new and emerging imitative practice by organists, whereby an impression of the sensibilities of playing an acoustic instrument, such as a guitar or flute, was demonstrated in organists' technical execution where appropriate. The stylistic encapsulation of what this thesis has defined as 'organ-playing' sensibilities i.e. the use of stylistic traits such as grace notes, glissandi, expression pedal accentuation and detached articulation was

demonstrated as being portable for the first time, signifying earlier performance styles in a deliberate contrast to newer emulative techniques.

The use of multitracking, a practice that has been established by this research as being extant from the earliest period of electronic organ history, was observed as being used to emulate textural configurations that were not possible to achieve in a live performance configuration.

Chapter Five detailed the newly-developed features available on digital instruments. Organist interview confirmed that registration memories, which afforded the organist the ability to switch instantaneously from one sound combination to another, were deemed to be the most useful and distinctive feature. The use of highly complex registrations, often incorporating effects that were hitherto only possible via external means in a studio, created new textural possibilities. As mentioned in Section 6.1, such methods required a high degree of programming and preparation that was in contrast to the methods of practice illustrated in previous chapters.

The use of Initial Touch and After Touch, enabling a greater degree of expression and dynamic control, was established as a further point of style, as was the use of features such as Automatic Bass Chord and Horizon Touch.

6.3 Revisiting Literature

Section 1.3 in Chapter One proposed parallels between the shared nature of electronic organ practice and the oral-based pedagogy and dissemination of Jazz music via recordings (Katz, 2006, p.84). This proved to be a strong alignment, with clear parallels of concept demonstrated: all organists

interviewed could readily identify the style of the performer in question upon listening to a recording[110] and were then able to make further references to similar recordings.[111] These results also correlate with Beard & Gloag's concept of an aural canon in jazz music, whereby 'individual recordings and performers are elevated above their context' (Beard & Gloag, 2005, p.89).

As can be seen from the results of interview, all surveyed organists were able to discuss various technical parameters of their instruments and indicate a sense that such technical features had agency in resultant musical style e.g. Andrew Gilbert's recollection (Gilbert, 2014) of Keith Beckingham's use of the Hammond organ[112] as being integral to his chord voicings and Beckingham's own recollection that four note chords 'clog the speaker'.[113]

As stated in Chapters Two and Three, such viewpoints suggest a partial alignment with Théberge's concept of external listening and a connection between the sound of an instrument and resultant musical style (Théberge, 1997, p.198). The method used by this study has found evidence to suggest that this was the case up to a point: early electronic organ performance practice (that which existed before emulative voicing) was shaped largely by the tone and the ergonomics of the instrument.

However, early emulative voicing as described in Chapter Four demands that the organist adopt a different approach to Théberge's 'external

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[110] When using the methodology proposed by Stock (2010, p.188) of integrating recorded performances within practitioner interview.

[111] Such as Tony Pegler's reference to Alan Haven's recording, *Live In Annie's Room* (Haven, 1966) in Chapter Three.

[112] The same point was also made by Tony Pegler in Section 3.2.2.3.

[113] See Chapter Three, Section 3.2.2.2.

listening'. In essence, the primitive reproduction of orchestral instruments required the player to first formulate an internal abstraction of the sensibilities and capabilities of the signified acoustic instrument, which would then be communicated at the organ. An example of this practice would be that described by Glyn Madden, when intending to make a flute tone on the Yamaha E50 sound 'like a real flute' (Madden, 2015). Any shortcomings in the external sound reproduction were secondary to the musical intentions that were driven internally: to recall Paul Carman's opinion, 'it was all in our heads anyway' (Carman, 2015).

Both Théberge and Walser's (2014, p.68) assertions on the interplay between electric or electronic instrument and musician assume a degree of tonal distinctiveness, or morphology: the degree to which an electric instrument has its own unique, malleable and identifiable 'sound'. In the case of the synthesiser, electric guitar or pre-emulative electronic organ, each has a distinctive tone that is individual and free of any artificial signification. The fact that the musician hears a unique sound characteristic affords more freedom and flexibility in choosing what can be achieved musically. This thesis has established that it cannot be assumed that this degree of distinctiveness is the same for each electronic instrument: Théberge does not acknowledge this, nor that some electronic keyboard instruments e.g. the digital piano have a very low level of tonal individuality. Indeed, the distinguishing factor of a modern digital piano, for example, appears to be how closely it can emulate the sensibilities of its acoustic counterpart.[114] This

[114] For example, the Casio *Grand Hybrid* digital piano boasts keys 'using exactly the same wood as acoustic piano keys', a hammer action and tone designed by acoustic piano

would perhaps be in contrast to a synthesiser, where a wide spectrum of tonal possibilities and contexts would be desirable.

As can be seen and heard from the reconstructed performances included in this thesis, the uniqueness or individuality of tone in electronic organ design decreased as the instrument became able to reproduce orchestral sounds with ever increasing realism. Instruments such as the Yamaha EL900 embodied a technical profile that was designed to emulate orchestral sounds, rather than be a clone of the Hammond or Lowrey organ. Whilst this facilitated access to a new repertoire and encouraged an increased complexity of musical arrangement, the introduction of such instruments prompted a departure from many of the stylistic practices established in the nineteen sixties and seventies. This is acknowledged by Janet Dowsett (2015) when she states that Electone players had to 'stay away from […] anything that would work on a theatre organ'. Keith Beckingham (2015) uses the same qualifier in stating his opinion:

> For many years the Americans led the field selling organs to a middle-aged market. Then the Japanese took over where their domestic market was much younger and where there was no tradition of theatre organs. This is why Yamaha and Technics concentrated on orchestral multi-keyboards, not even calling their products 'organs'.

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manufacturer, C Bechstein. The website pictures the digital piano next to a Bechstein D282 grand piano, making the association clear (Casio, 2016).

What this thesis has shown therefore, is that electronic instrument design and practice are inseparably linked and can only be properly researched through the combined primary methods of reconstructive performance and practitioner interview. Whilst Théberge does gain some insights from the use of published interviews, the lack of any detailed examination of the electronic instruments in question (which would be gained via reconstructive performance) means that there is a danger that some important observations may be missed. For example, as stated in Section 6.1, the dismissal of Manual Percussion on the Hammond organ as a 'relatively minor innovation' (Théberge, 1997, p.47) negates its importance in the formulation of Jimmy Smith's stylistic practice.

The difference in practice implied by Beckingham and Dowsett in their distancing of the Electone from a theatre organ (which represents popular entertainment, a leisure ethic and the tradition of organ-based tones and sensibilities) is in parallel with Kenichi Kawakami's desire for 'real art using the Electone' (Kawakami, 1981, p.79). As described in Section 5.0, the high degree to which the organist must prepare each registration prior to performance on an Electone, which has been demonstrated to be necessarily tied to a preconceived order of texture and articulation, has some degree of alignment with the primacy of abstract design and textual dominance that Cook ascribes to WAM (Cook, 2013, p.24). The way in which an Electone arrangement can only be performed using these registrations in the same manner each time also aligns with the concept of a prepared 'work' rather

than the flexible performance model that performers such as Jimmy Smith and Stoneham demonstrate.[115]

This contrast in practice between pre-prepared, automated registrations which drive the Electone player along a predetermined arrangement and the practice of earlier Hammond and Lowrey organists as detailed in Chapters Three and Four is most noticeable when considering the aspect of spontaneity in performance. This is an area that is identified by composer Jeff Carey (Carey, 2017, p.270) as being at the heart of an instrument's 'modality':

> I find it is imperative to be working with a tool that allows you to discover the musical landscape you are creating, whilst in the making of it. Not having to separate the planning and execution of a sound or sound event into different moments, but allowing for an actual interpretation of the context the moment you are experiencing it.

Carey's observations above regarding modality relate to the use of software synthesisers on a modern computer platform. However, it is interesting to note the similarity in sentiment between his viewpoint above with that of organists remembering the introduction of registration memories

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[115] An example of the flexibility of approach afforded by earlier instruments can be found in Jimmy Smith's *Blue Bash* album (Jimmy Smith, 1999). Here, a number of alternative takes of the same piece are included as different tracks, using different improvisations and some textural variance.

in instruments that were produced over twenty years before Carey's research.

Combined with the huge array of different settings and options for each individual sound (as described in Section 5.0), which can produce the same degree of 'options paralysis' that producer Martyn Ware describes as existing in the modern studio (Ware, 2009, p.78), the design of the Electone creates a dynamic which is far removed from that of an earlier electronic organ. It is this identified contrast in dynamic which is perhaps the most fundamental difference between the modern instruments of today and the pre-emulative models of the nineteen sixties and one which is not established in any other scholarly work to date.

As has been shown, the multifaceted approach taken by IRTPA has made significant insights into the stylistic practices evident in electronic organ playing. It has been possible to demonstrate a variety of different performance practices and align them with the various designs and functions found in electronic organs from the past seven decades.

The use of reconstructive performance and practitioner survey has proved invaluable in this endeavour, allowing conclusions to be made that would not have been possible purely from examining the instrument in isolation. In addition to making corrections regarding previously defined workings of the Hammond organ by Vail and Limina in Chapters Two and Three, the IRTPA method also facilitated a redefinition of the Lowrey AOC function and an investigation into its stylistic usage. The same approach also uncovered the increasingly complex use of emulative practices in instruments detailed in Chapters Four and Five, establishing that the degree of variation in

electronic organ stylistic practice is far greater than that cited in works discussed in the introduction to this thesis.

Above all, this thesis has illustrated the wealth of information and insight that a triangulated approach such as IRTPA can produce. As well as establishing an authoritative perspective towards previous instrument-orientated observations, this method has also demonstrated the importance of qualifying assumptions of instrument design and development with practice-based indicators such as interview and reconstructive performance. A combination of these elements facilitates the discovery of true instrument-specific practice.

Throughout the investigative chapters of this study, it has been possible to gain evidence to suggest that performance practice was influenced by the introduction of new design features, such as the Lowrey AOC system, emulative voices and registration memories. However, it is important to clarify that the subsequent response to the introduction of these features was not always foreseen by manufacturers and that this survey has found examples of applications that differed from their original design intention. For example, Stoneham and Haven's extensive use of the Lowrey AOC in jazz improvisation belies its existence as an 'easy play' feature to aid inexpert chord playing. In addition, the earliest recordings of Waller and Crawford have been shown to contain practices that are responses to the tonal and physical characteristics of the earliest Hammond organs, such as the use of grace notes to create attack transients and the frequent use of glissandi via the lightweight keys.

This study has avoided a full exploration of how instrument makers responded to performance practice. Primarily, this is because it remains outside of the scope of the methodology to establish whether organ manufacturers were guided by a desire to produce the most musically advanced instruments or to develop products that would maximise sales. However, this study has uncovered some details that suggest the answer lies somewhere between these two positions: practitioner survey did reveal that there were occasions where innovations were introduced to further the musical potential of the instrument i.e. the introduction of sampled orchestral sounds (Dowsett, 2015), but also instances where manufacturers produced features that had limited appeal to the proficient organist, as Tony Pegler (2015) recalls:

> Don't forget that we were paid to make these instruments sound good, when sometimes they really were tricky to play. I remember Jerry [Allen] demonstrating the Lowrey MX1, which was a huge advance because it had automated computer backings for the first time. It was designed for home players who just held the chords down. But, it only works with the most basic chords, like a minor seventh and so on. So, all these lovely chords, he couldn't play. It sounded terrible when he tried and he hated it. He wouldn't play it.

Such qualitative data derived from IRTPA does require certain abilities of the researcher however, which are important to identify in order to define other scenarios where such an approach might be appropriate.

Above all, IRTPA requires a high level of musicianship in order to conduct the transcription process, and an ability to understand the technological facilities which are a core part of the instrument's practice. Furthermore, the researcher must be knowledgeable enough to conduct the practitioner interviews in such a way as to ask the appropriate questions, being familiar with the correct terminology, and to be able to interpret the musical and technological variables that may be given in response. In other words, what is being described is very much the necessity of the researcher to know the field thoroughly, to be able to operate at a level of musicality that is equal to that of the interviewed practitioner and to be able to navigate and observe details that are specific and specialised.

However, if these criteria are met, it is likely that IRTPA would be successful in other applications associated with historical performance practice. Naturally, the use of practitioner interview limits its use to contemporary styles of music within the last 60 years, but there could be to significant gains to be made if this methodology were applied to other areas of aural-based popular music genres, the study of other electronic instruments or indeed a further exploration of the types of electronic organ design as described in this study.

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Appendix A (Transcriptions and Excerpts)

Transcriptions of Reconstructed Performances

1. Fats Waller, *St Louis Blues*
2. Jessie Crawford, *Moonglow*
3. Dick Delany, *Satin Doll*
4. Harry Stoneham, *Satin Doll*
5. Keith Beckingham, *Moon River*
6. Jerry Allen, *Moon River*
7. Harry Stoneham, *Tuxedo Junction*
8. Harry Stoneham, *Wave*
9. Masa Matsuda, *Tea for Two*[116]
10. Genta Utsumi, *Marriage of Figaro Overture*

Filmed performances of these transcriptions are available to view at:

http://tinyurl.com/CStanbury

[116] Items Nine and Ten are reproduced with the kind permission of Yamaha Music Media, Japan.

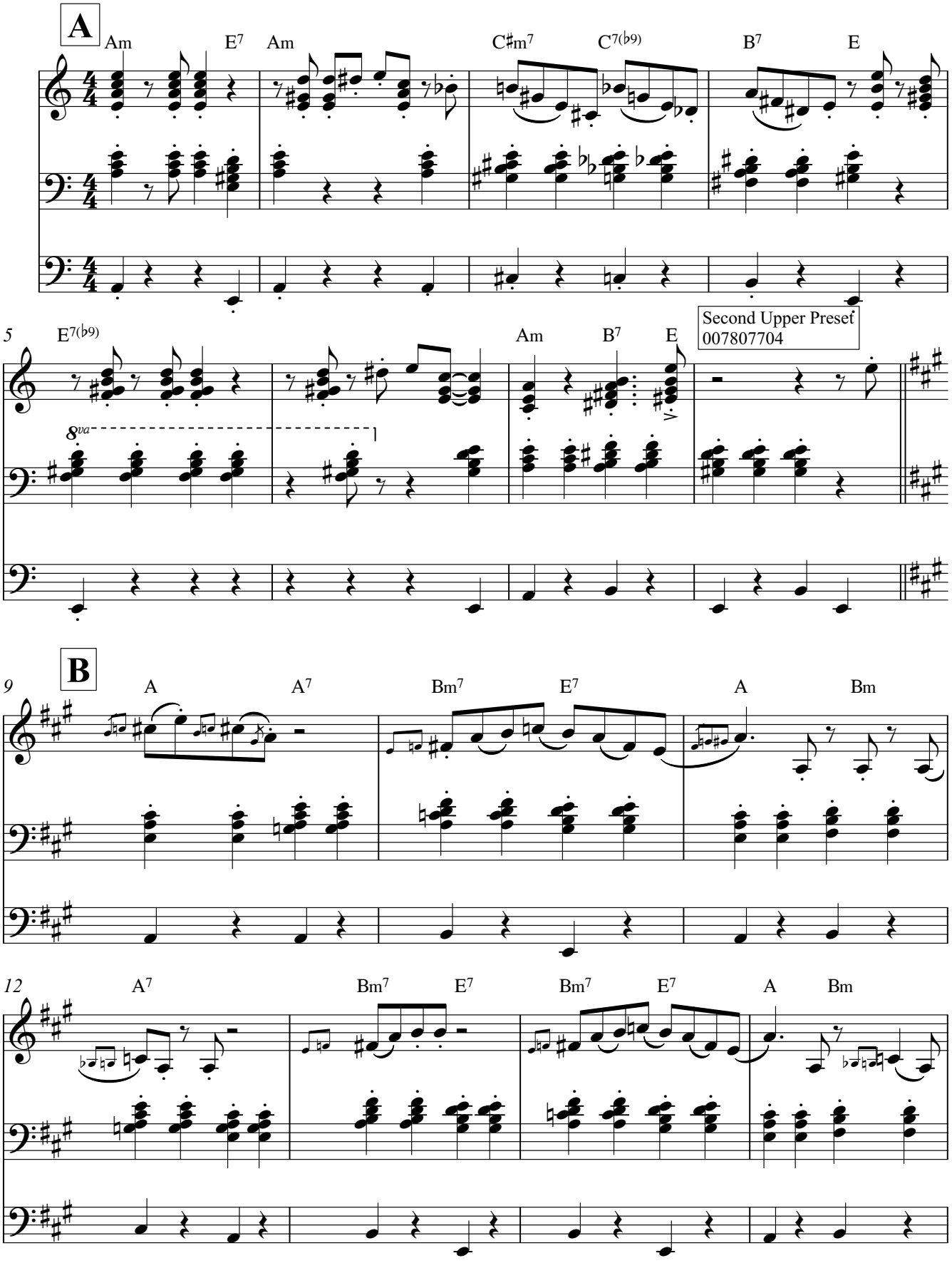
Drawbar Settings
Upper: 007807004
Lower: 008000000
Pedal: 08

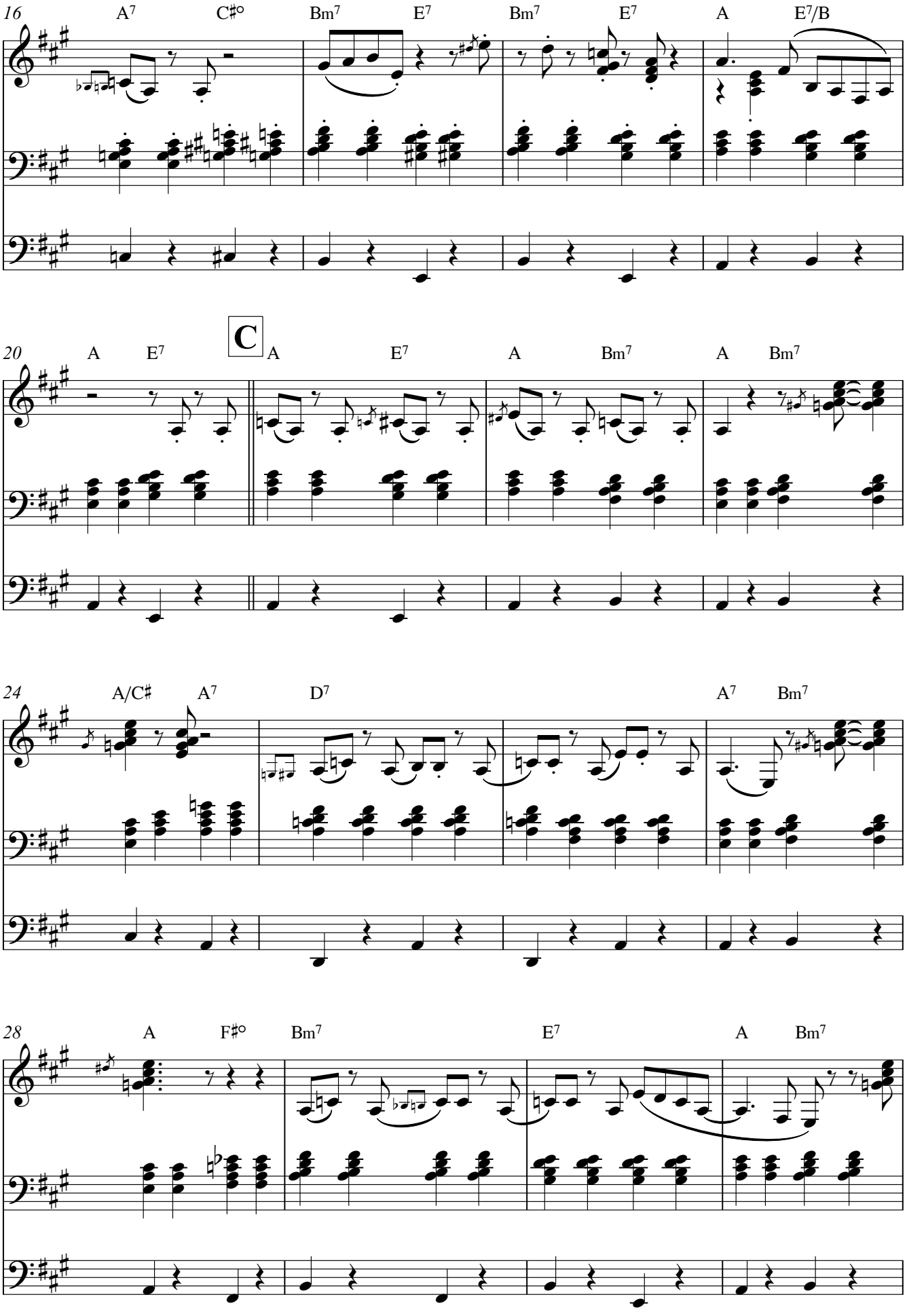
St Louis Blues

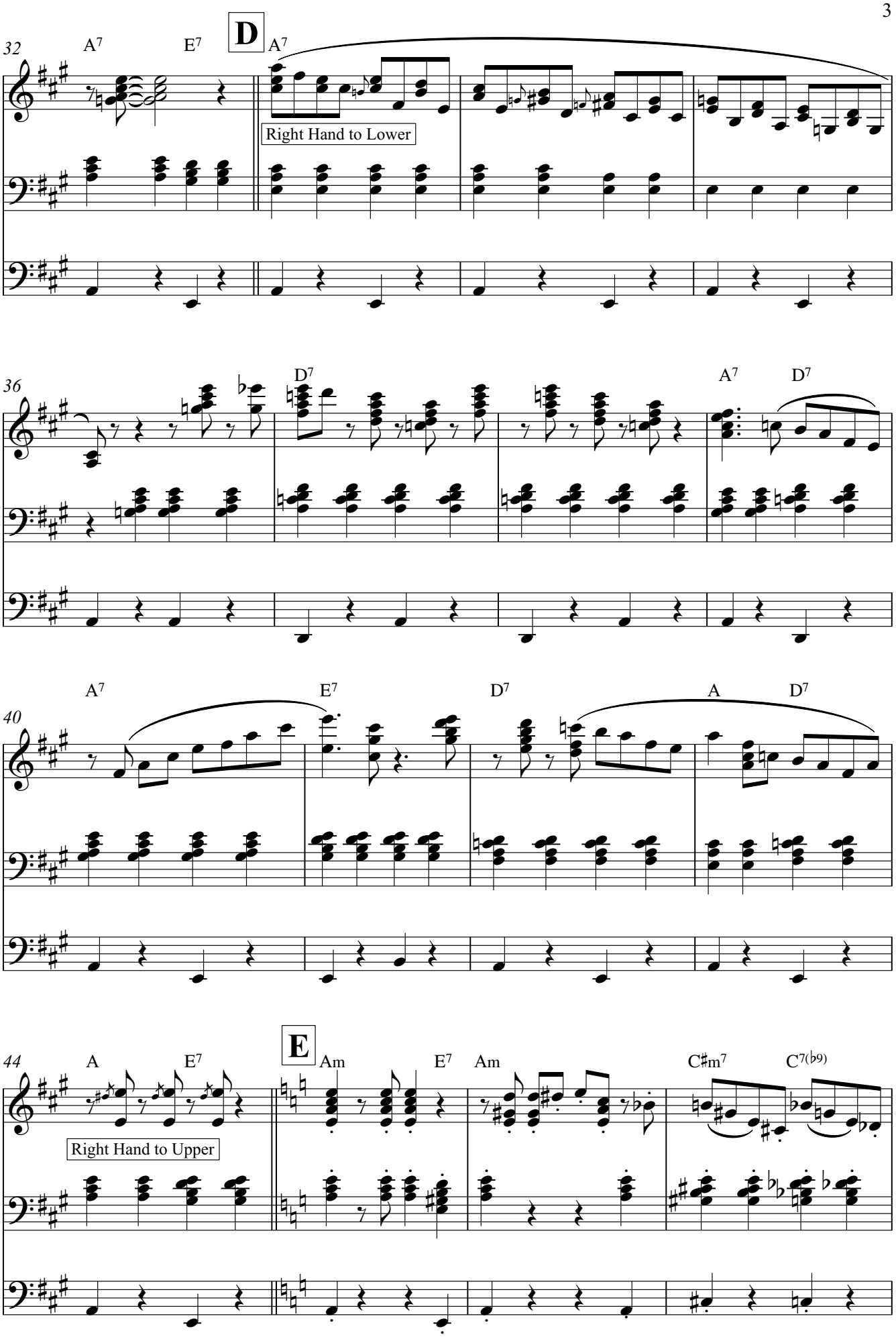
As Performed By Thomas "Fats" Waller (1943)
on Ristic Records No. 23

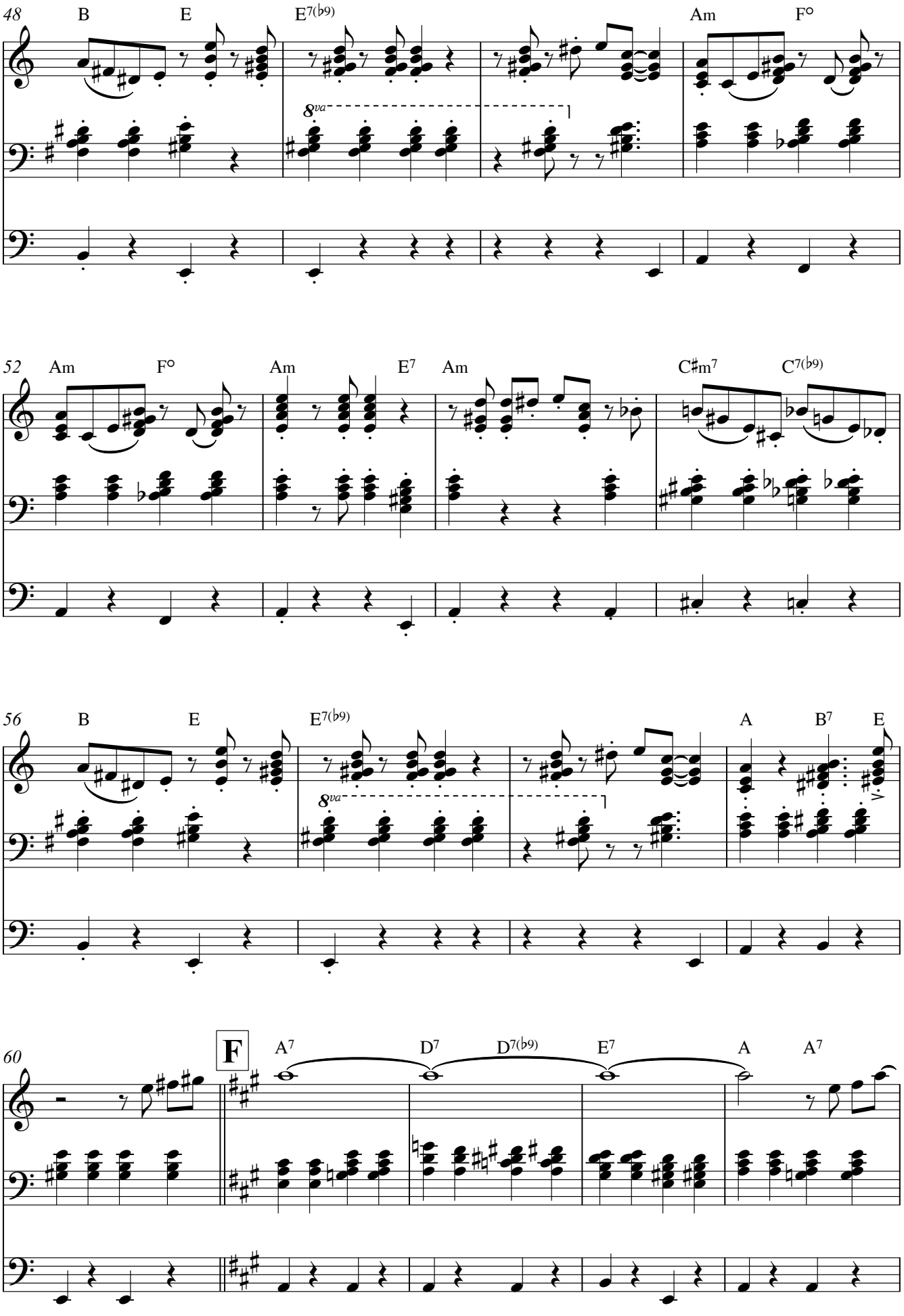
W C Handy
Transcribed by C Stanbury

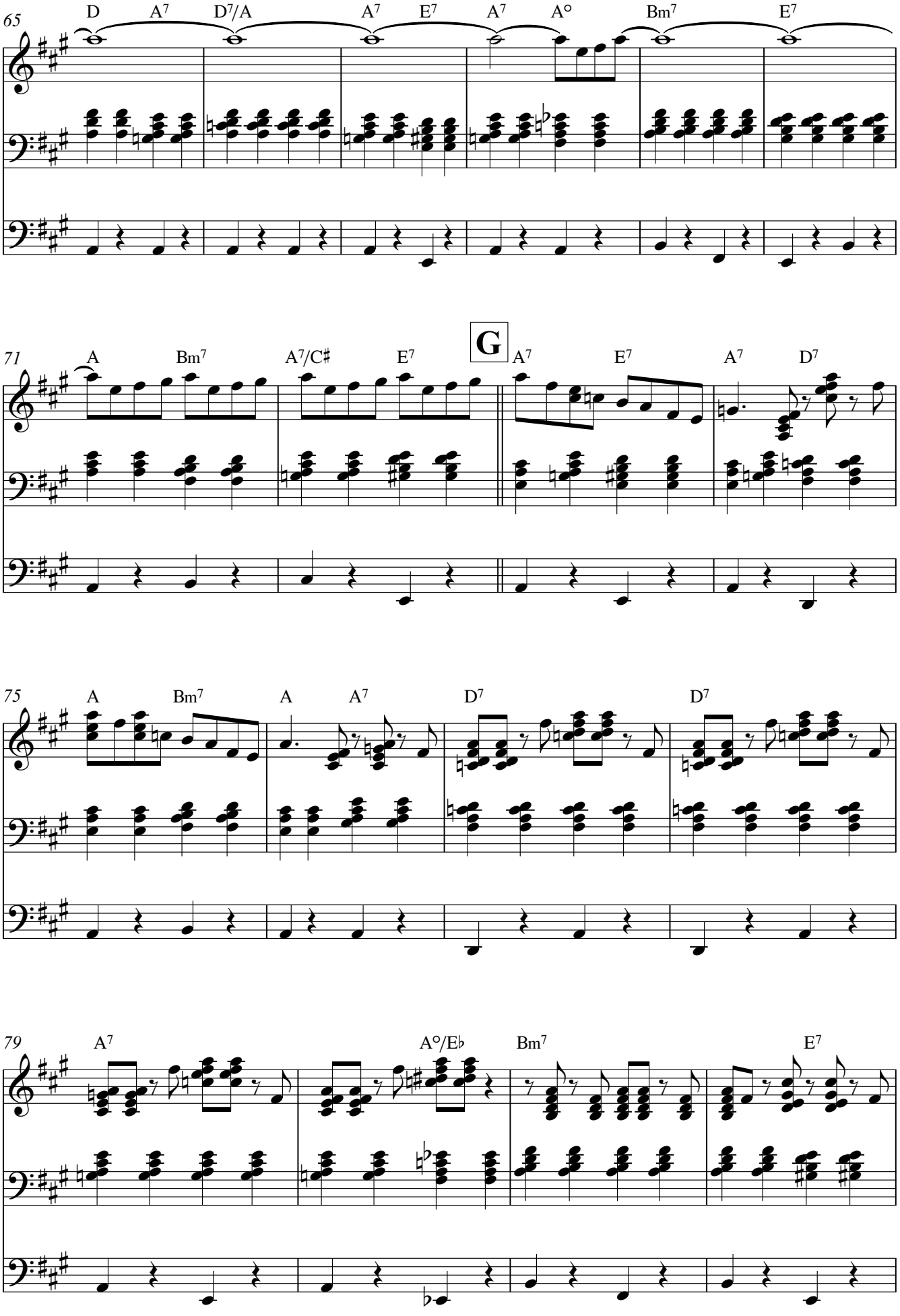
♩=220

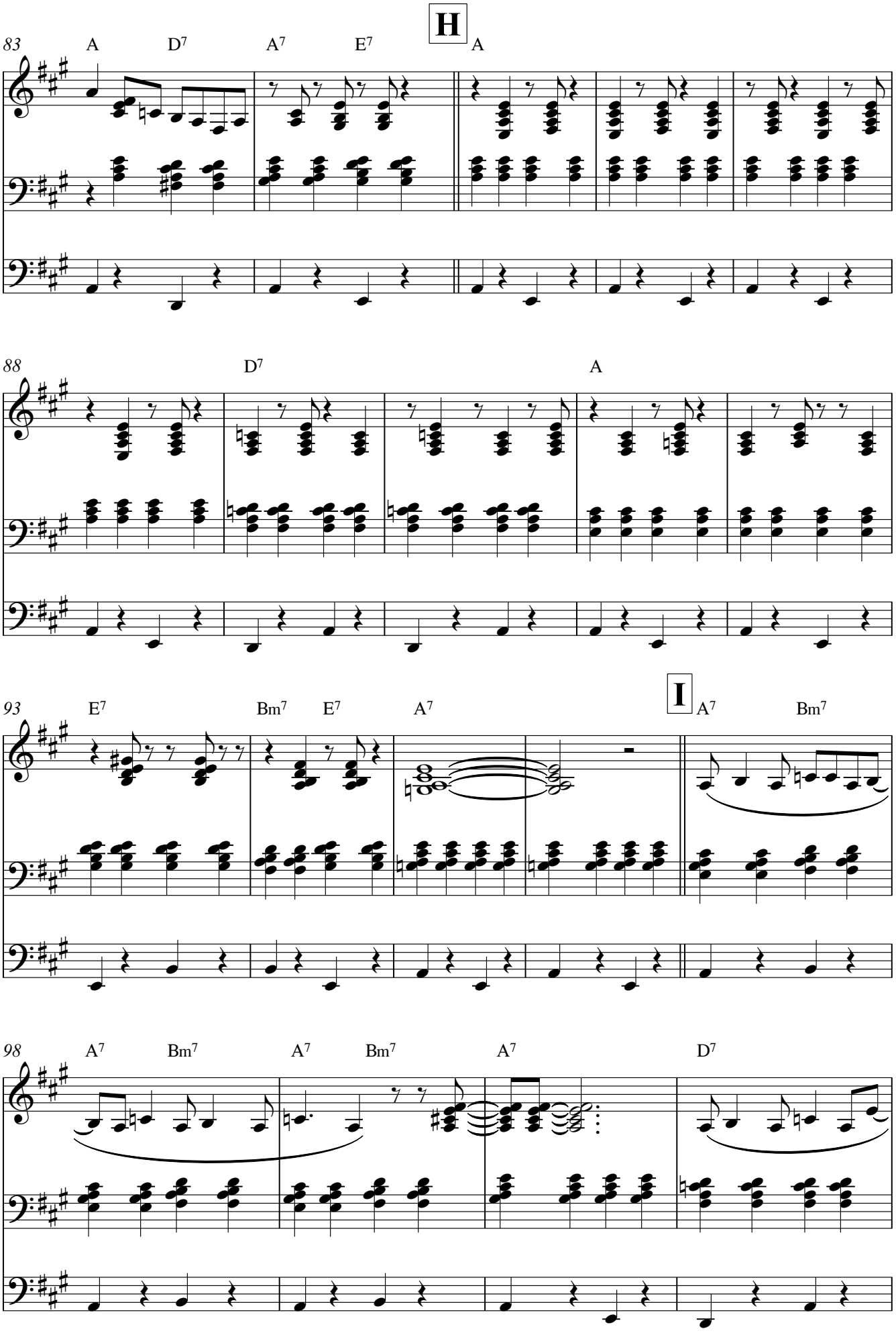


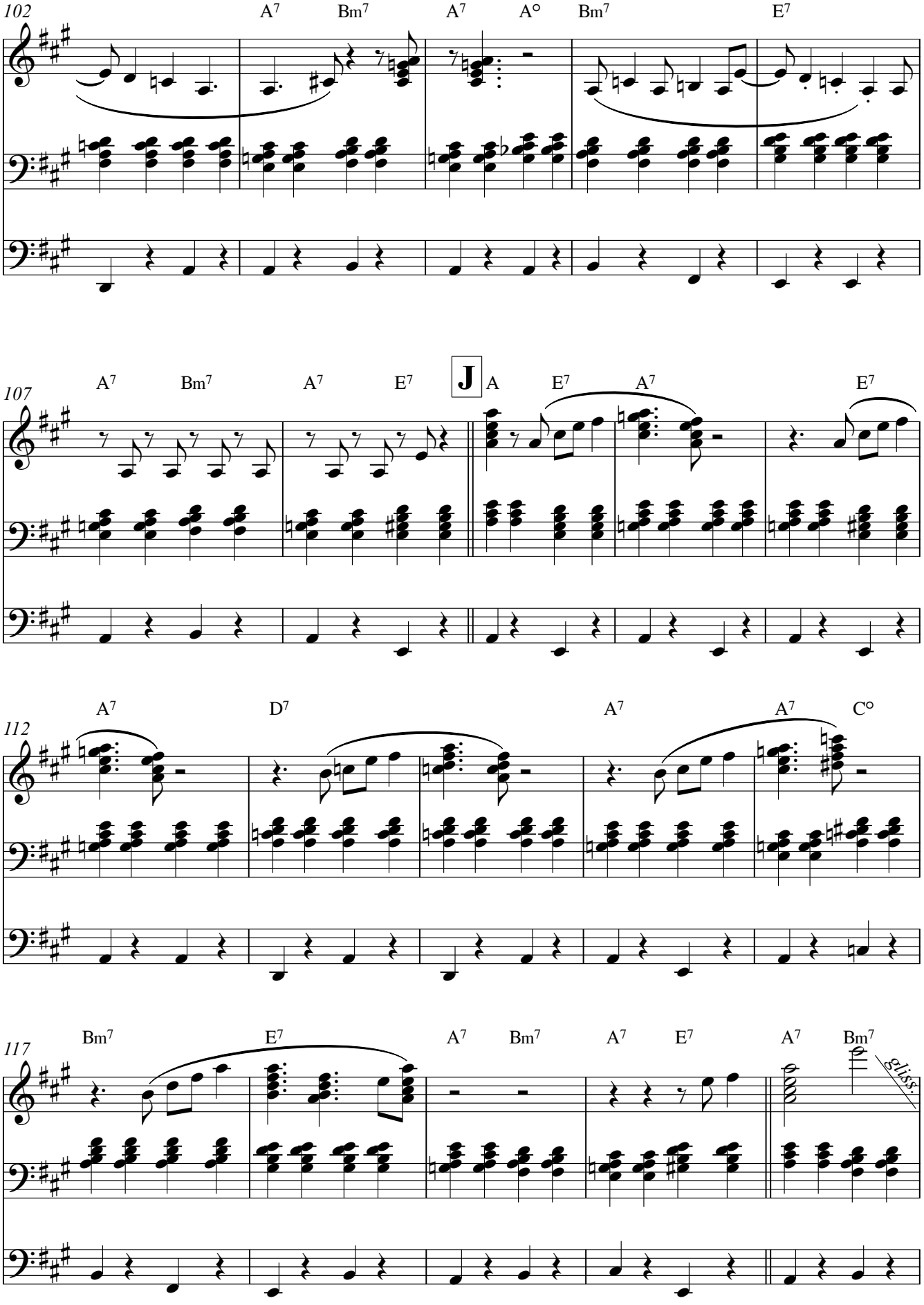

16
A7
C♯°
Bm7
E7
Bm7
E7
A
E7/B
20
A
E7
C
A
E7
A
Bm7
A
Bm7
24
A/C♯
A7
D7
A7
Bm7
28
A
F♯°
Bm7
E7
A
Bm7

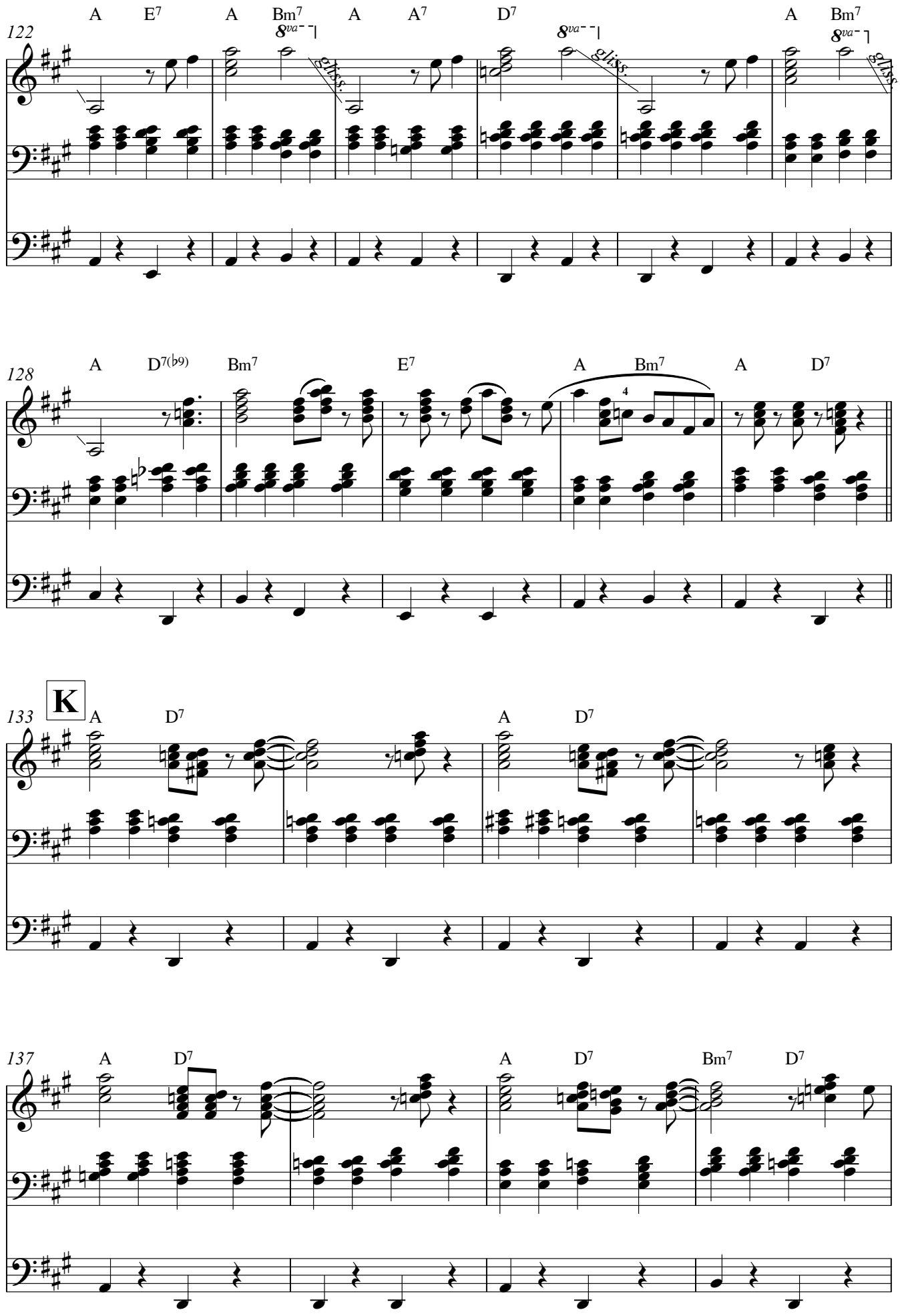

32
A7
E7
D
A7
Right Hand to Lower
36
D7
A7
D7
40
A7
E7
D7
A
D7
44
A
E7
E
Am
E7
Am
C♯m7
C7(♭9)
Right Hand to Upper

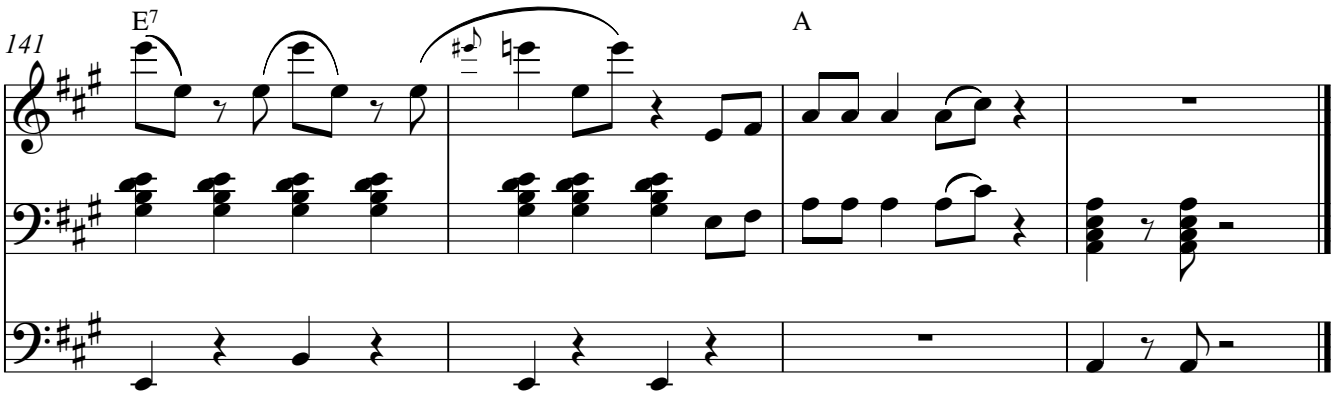

48
B
E
E7(♭9)
Am
F°
8va
52
Am
F°
Am
E7
Am
C♯m7
C7(♭9)
56
B
E
E7(♭9)
A
B7
E
8va
60
F
A7
D7
D7(♭9)
E7
A
A7


65
D
A7
D7/A
A7
E7
A7
A°
Bm7
E7
71
A
Bm7
A7/C♯
E7
G
A7
E7
A7
D7
75
A
Bm7
A
A7
D7
D7
79
A7
A°/E♭
Bm7
E7


H
83
A
D7
A7
E7
A
88
D7
A
93
E7
Bm7
E7
A7
I
A7
Bm7
98
A7
Bm7
A7
Bm7
A7
D7


102
A7
Bm7
A7
A°
Bm7
E7
107
A7
Bm7
A7
E7
J
A
E7
A7
E7
112
A7
D7
A7
A7
C°
117
Bm7
E7
A7
Bm7
A7
E7
A7
Bm7
gliss.


122
A E7 A Bm7 A A7 D7 A Bm7
8va
gliss.
128
A D7(♭9) Bm7 E7 A Bm7 A D7
4
133
K
A D7 A D7
137
A D7 A D7 Bm7 D7

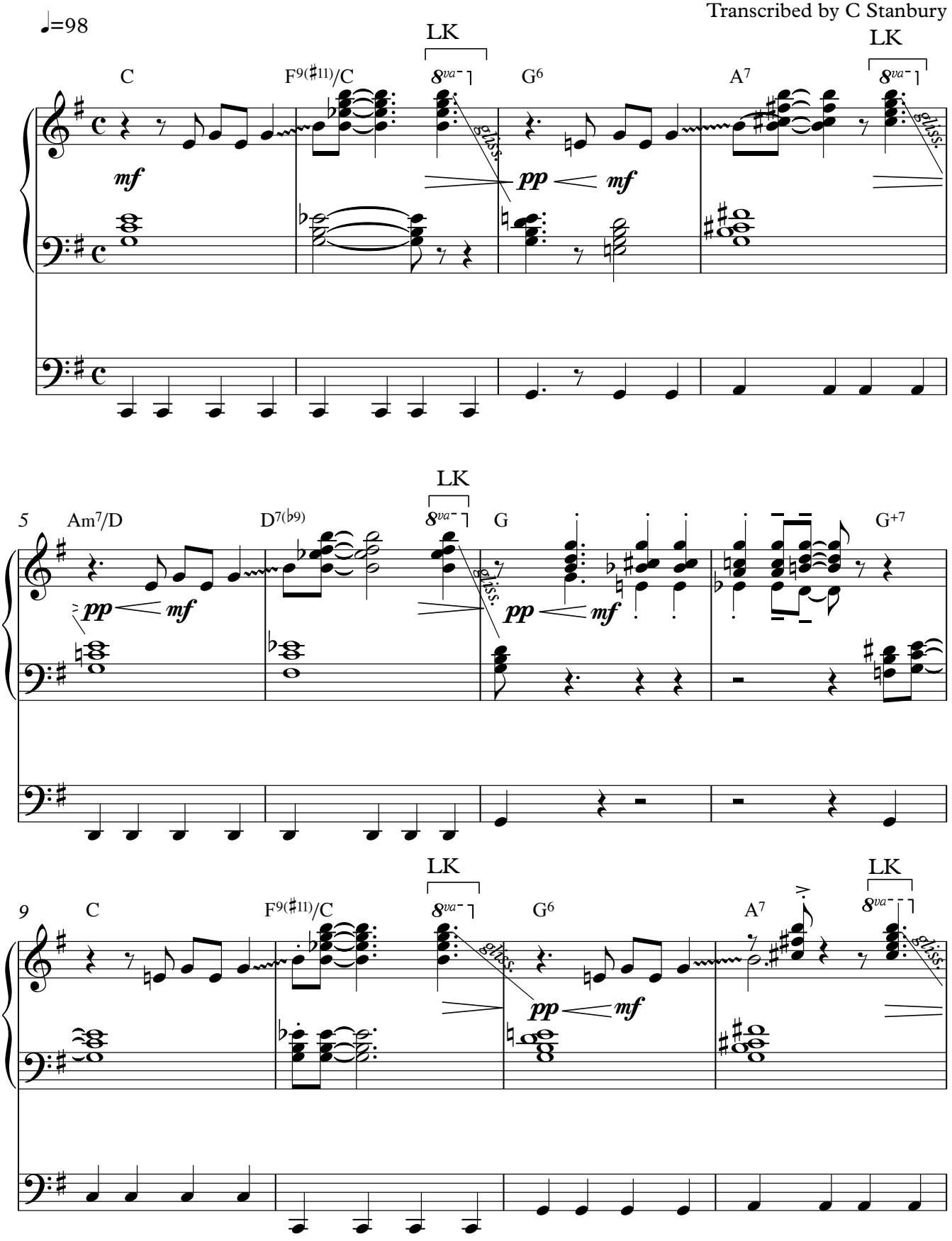

141
E7
A

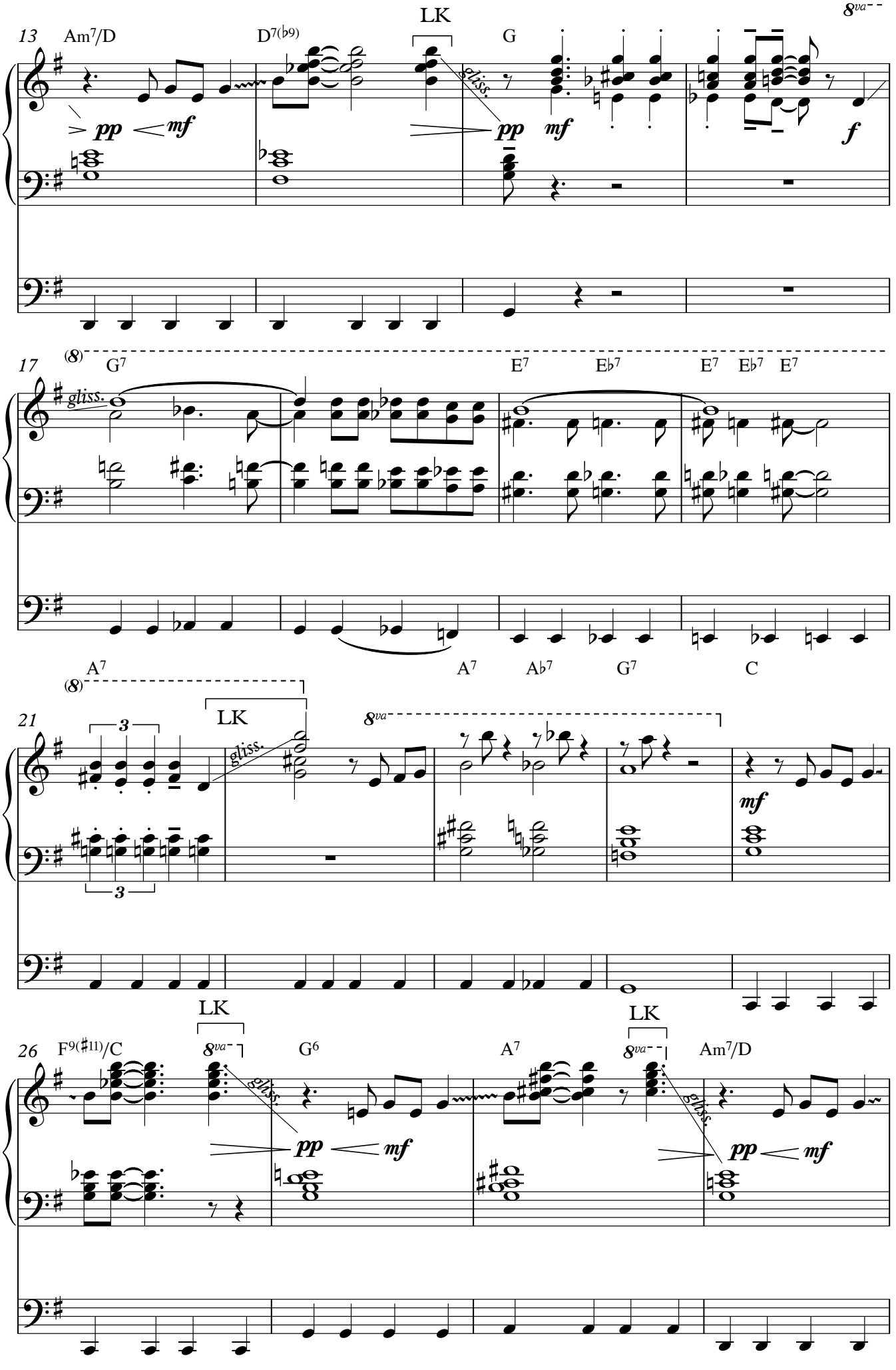
Drawbar Settings
Upper: 888645404
Lower: 008664222
Pedal: 28
Leslie: Fast

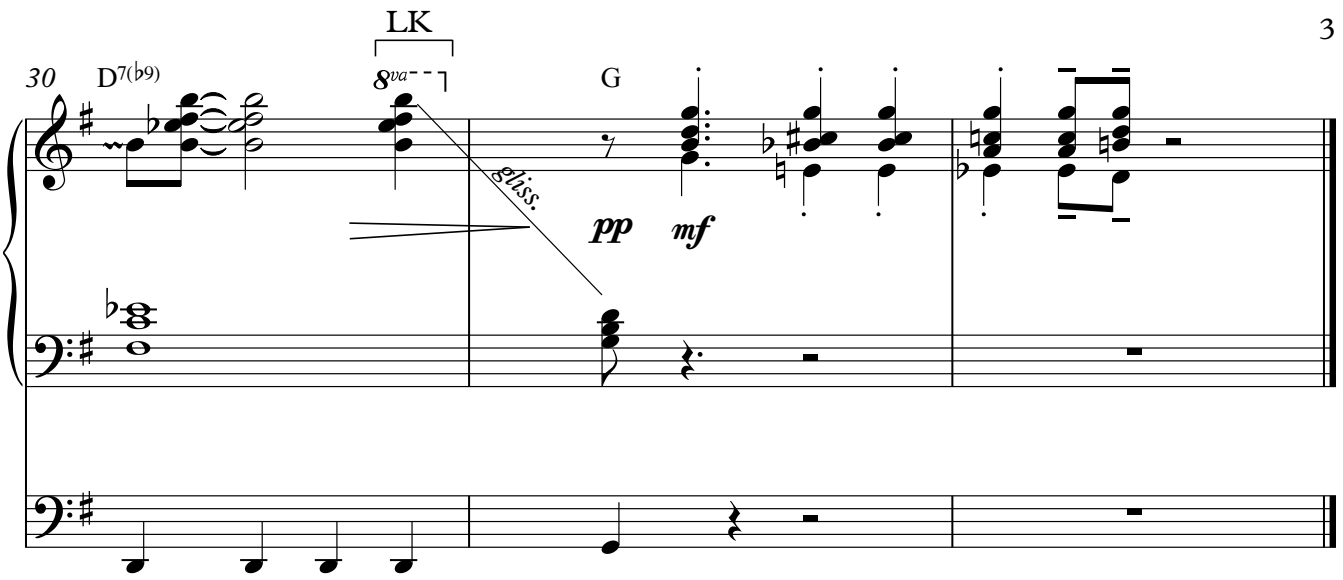
Moonglow

Arrangement: Jessie Crawford
(NBC Television Recording, 9th February 1949)

Hudson, De Lange and Mills
Transcribed by C Stanbury




13
Am7/D
D7(♭9)
LK
G
8va
pp
mf
gliss.
pp
mf
f
17
(8)
G7
E7
E♭7
E7
E♭7
E7
gliss.
A7
A7
A♭7
G7
C
(8)
21
3
LK
8va
gliss.
mf
3
LK
LK
26
F9(♯11)/C
8va
G6
A7
8va
Am7/D
gliss.
gliss.
pp
mf
pp
mf


LK
30
D7(♭9)
8va
G
gliss.
pp
mf

Drawbar Settings
Upper: 708847006
Lower: 008876000
Pedal: 08

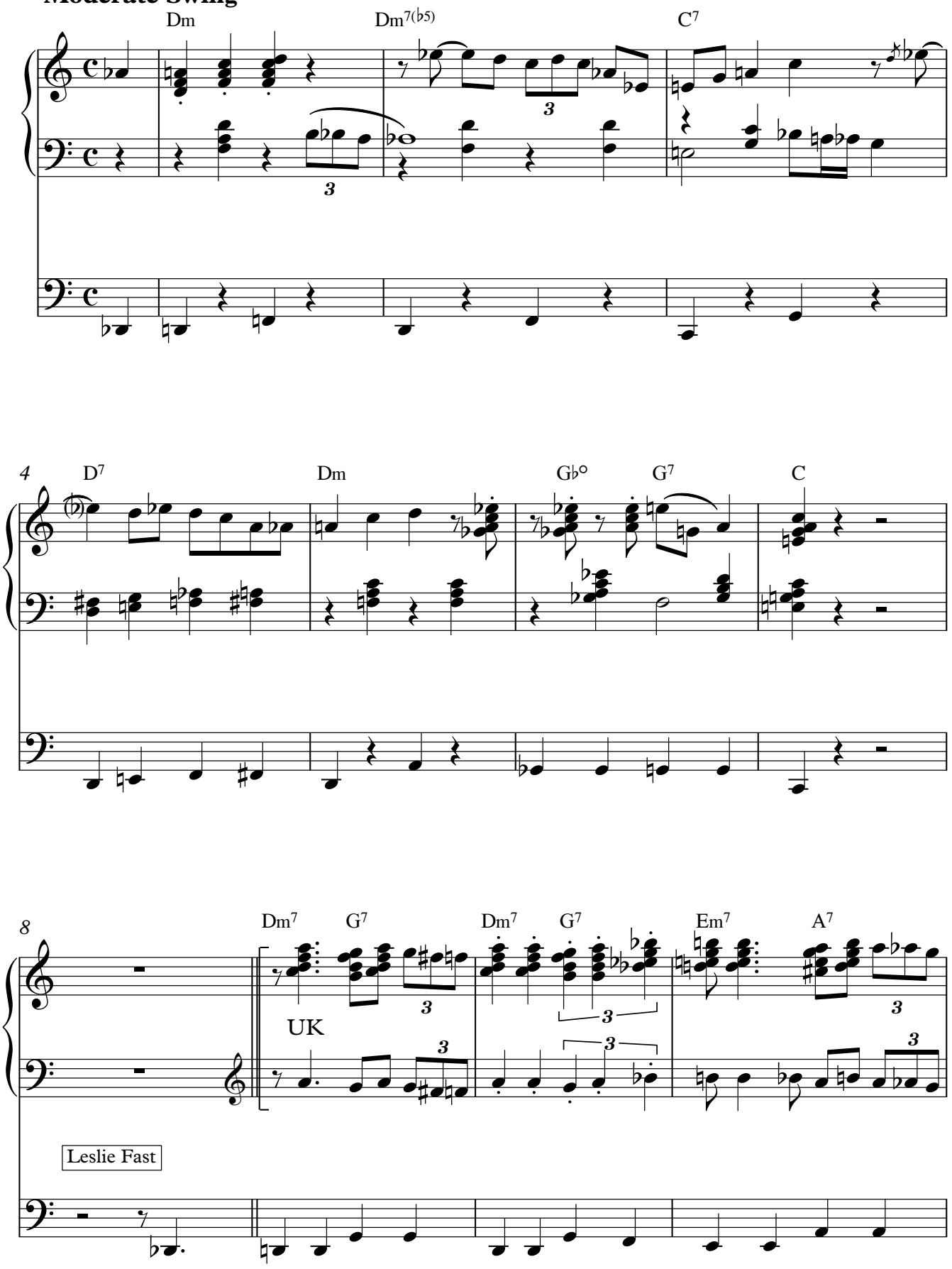
Leslie: Slow

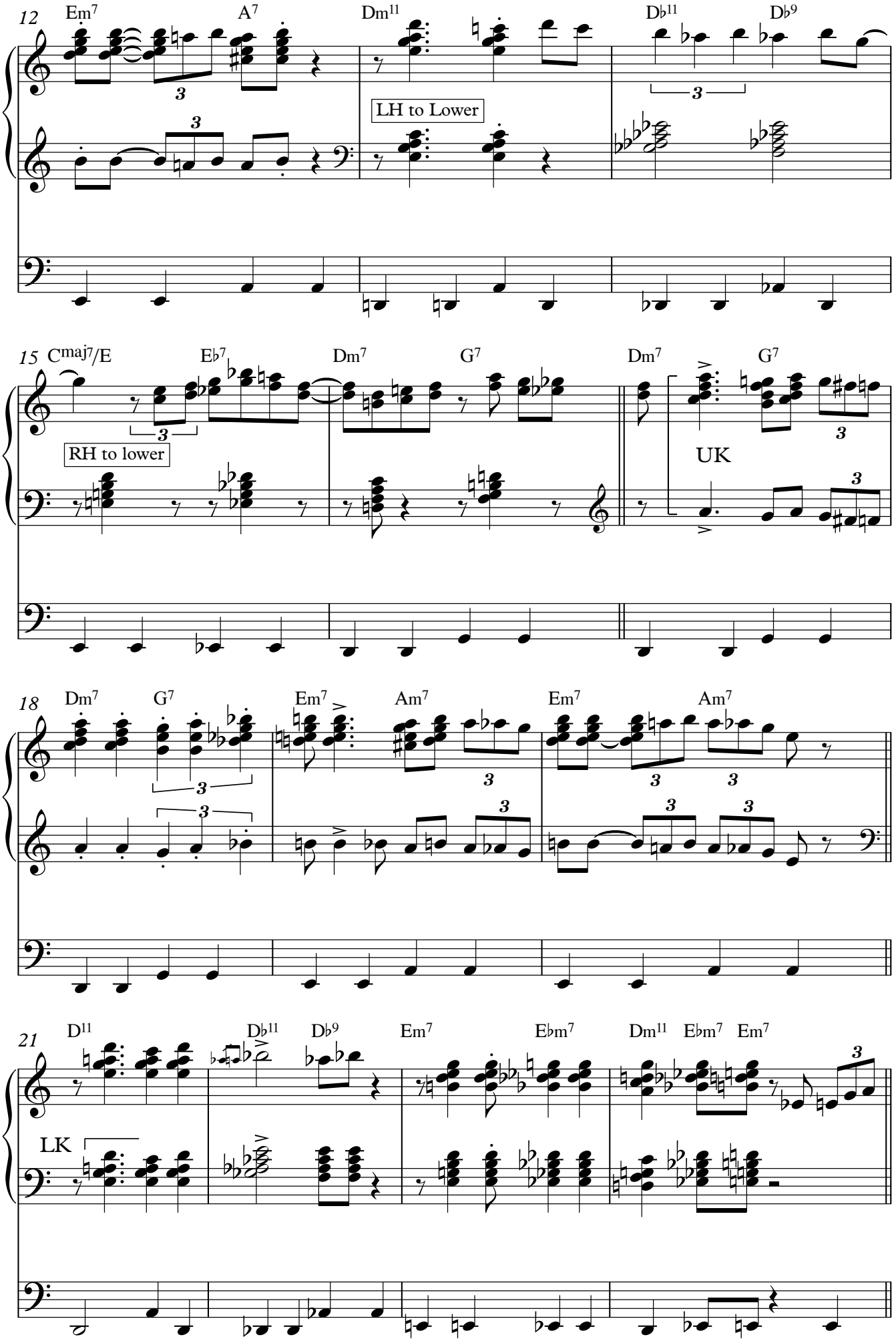
Satin Doll

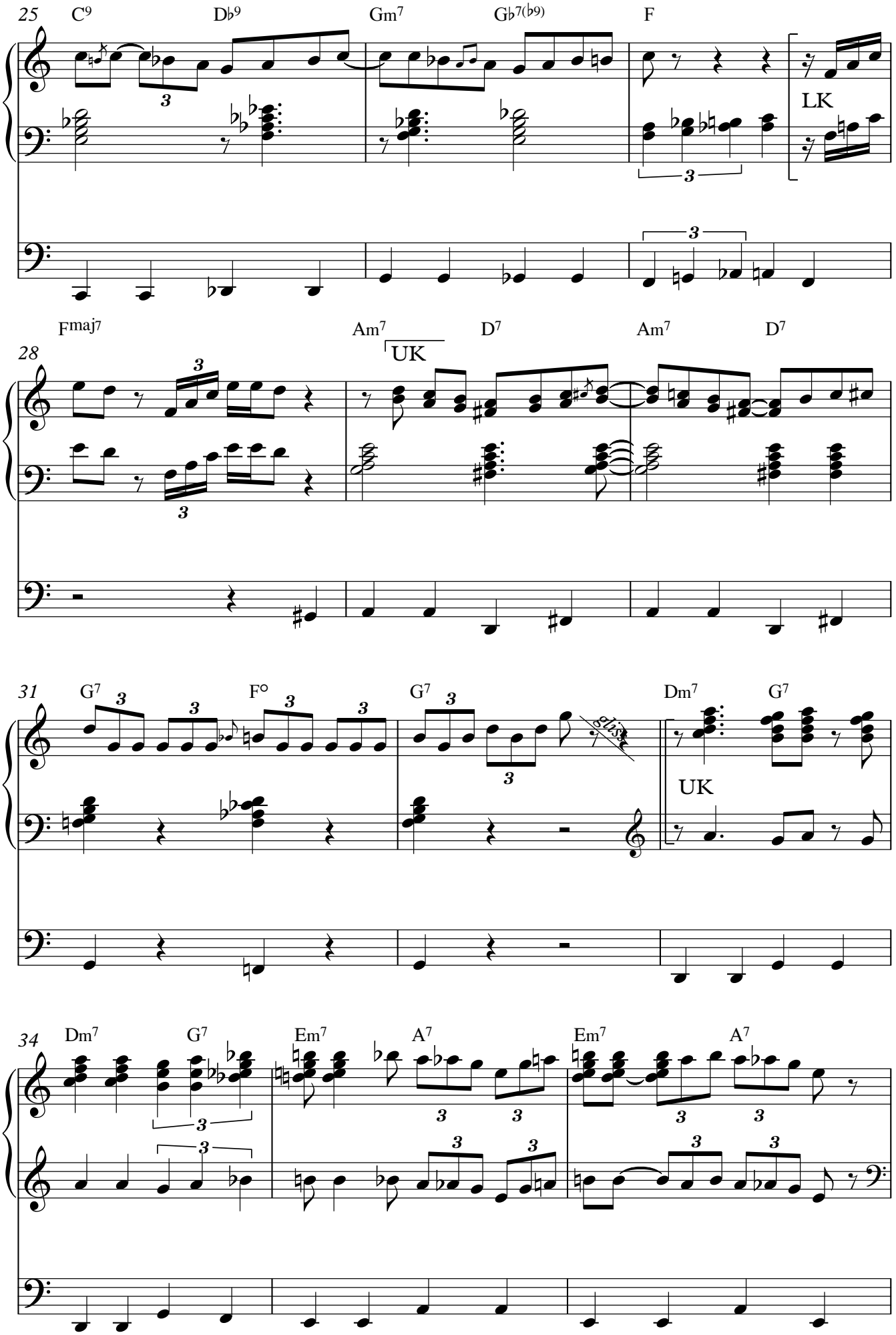
As Played by Dick Delany
on *Once Upon a Hammond* (1964)

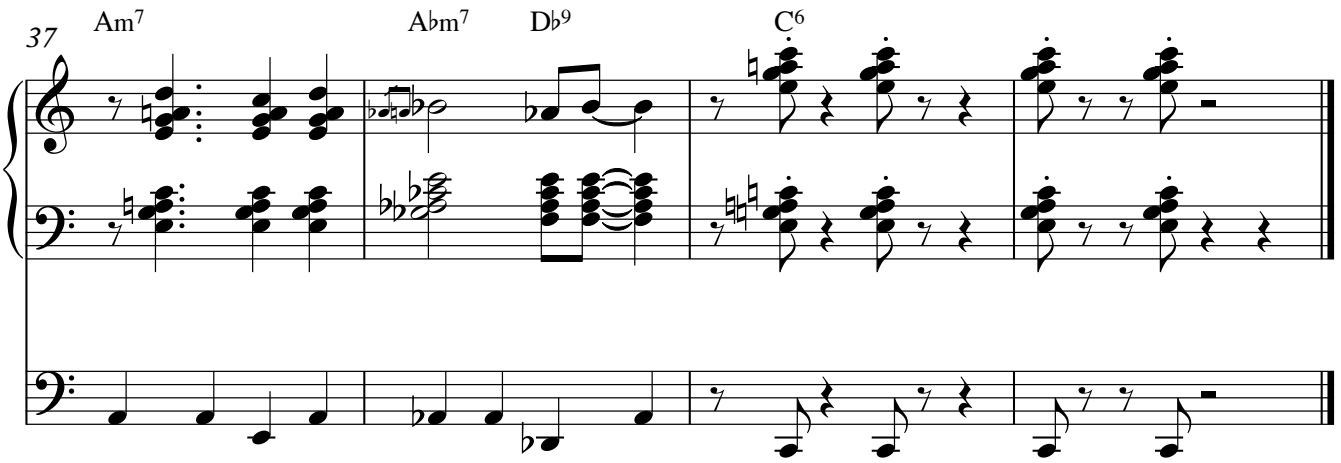
Ellington & Strayhorn
Transcribed by C Stanbury

Moderate Swing




12
Em7
A7
Dm11
Db11
Db9
LH to Lower
15
Cmaj7/E
Eb7
Dm7
G7
Dm7
G7
RH to lower
UK
18
Dm7
G7
Em7
Am7
Em7
Am7
21
D11
Db11
Db9
Em7
Ebm7
Dm11
Ebm7
Em7
LK


25
C9
Db9
Gm7
Gb7(b9)
F
LK
Fmaj7
28
Am7
D7
UK
Am7
D7
31
G7
F°
G7
Dm7
G7
UK
34
Dm7
G7
Em7
A7
Em7
A7

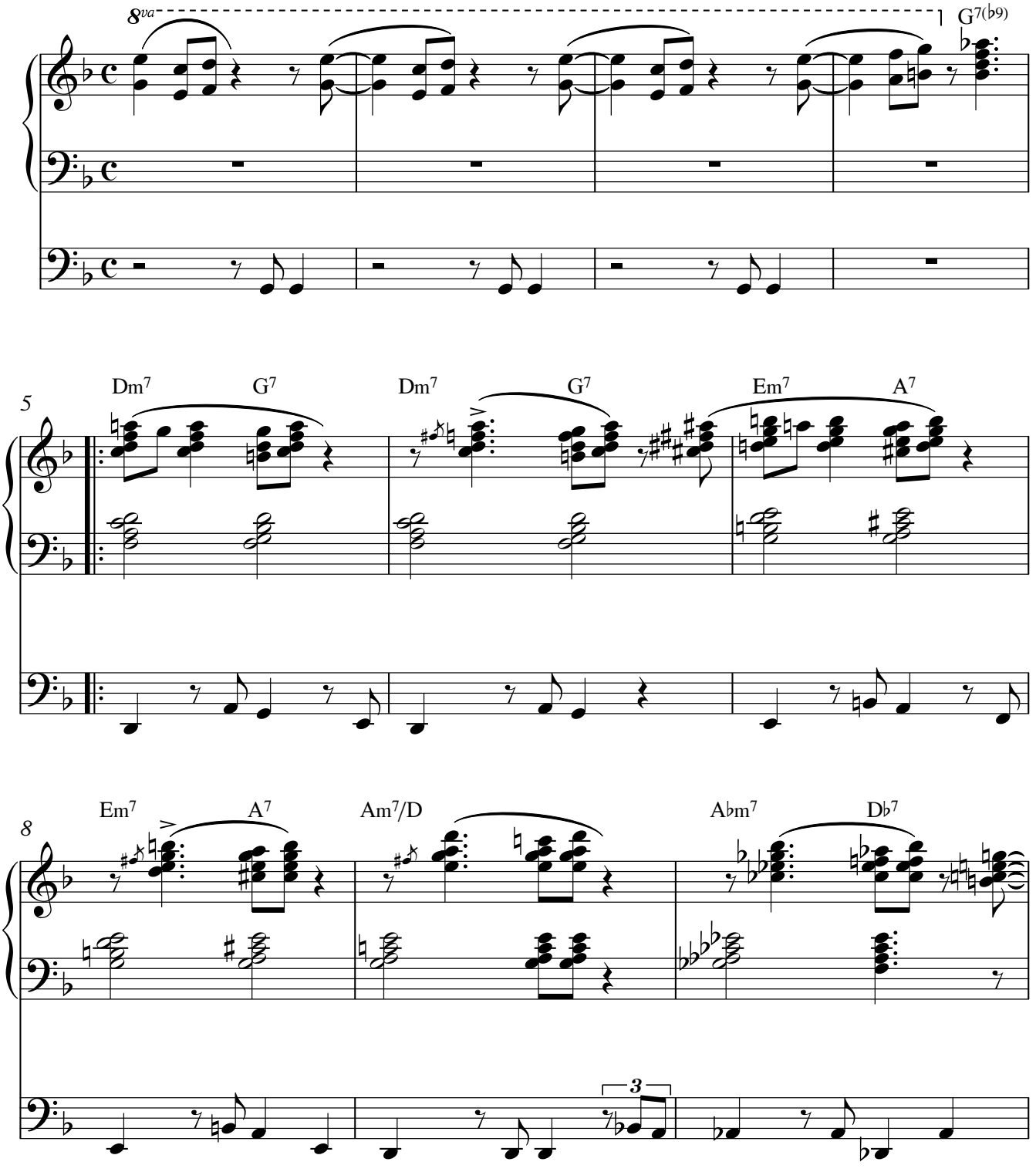

37
Am7
A♭m7
D♭9
C6

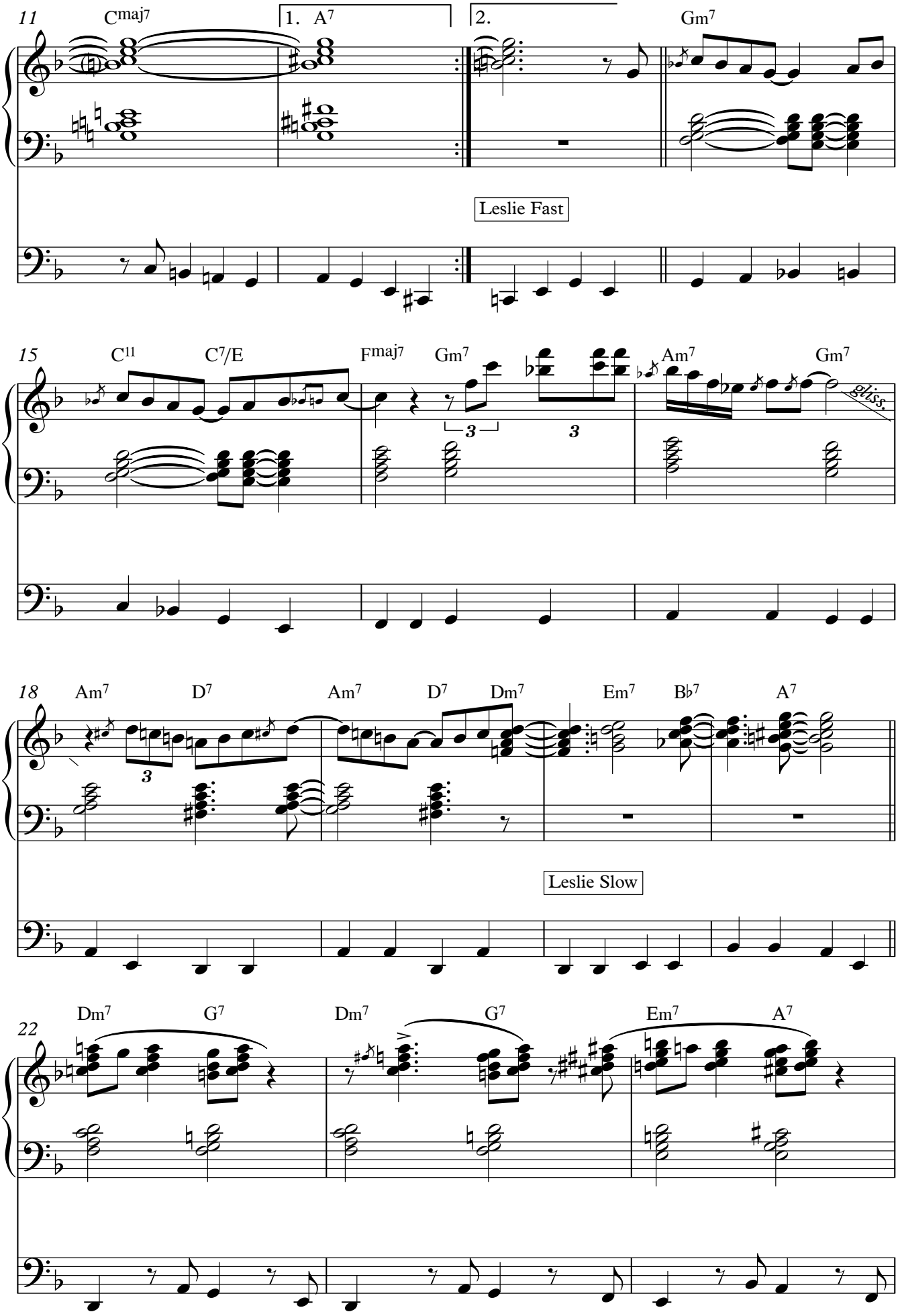
Upper:	Quint + Octave
	Flute 16', 8'
	Oboe 8'
	Clarinet 8'
	Saxophone 8'
	Solo 8'
	Trombone 16'
	Full Brilliance
Lower:	Diapason 8'
Pedal:	Bourdon 16'
	Sustain: On / Long
	Volume: Medium

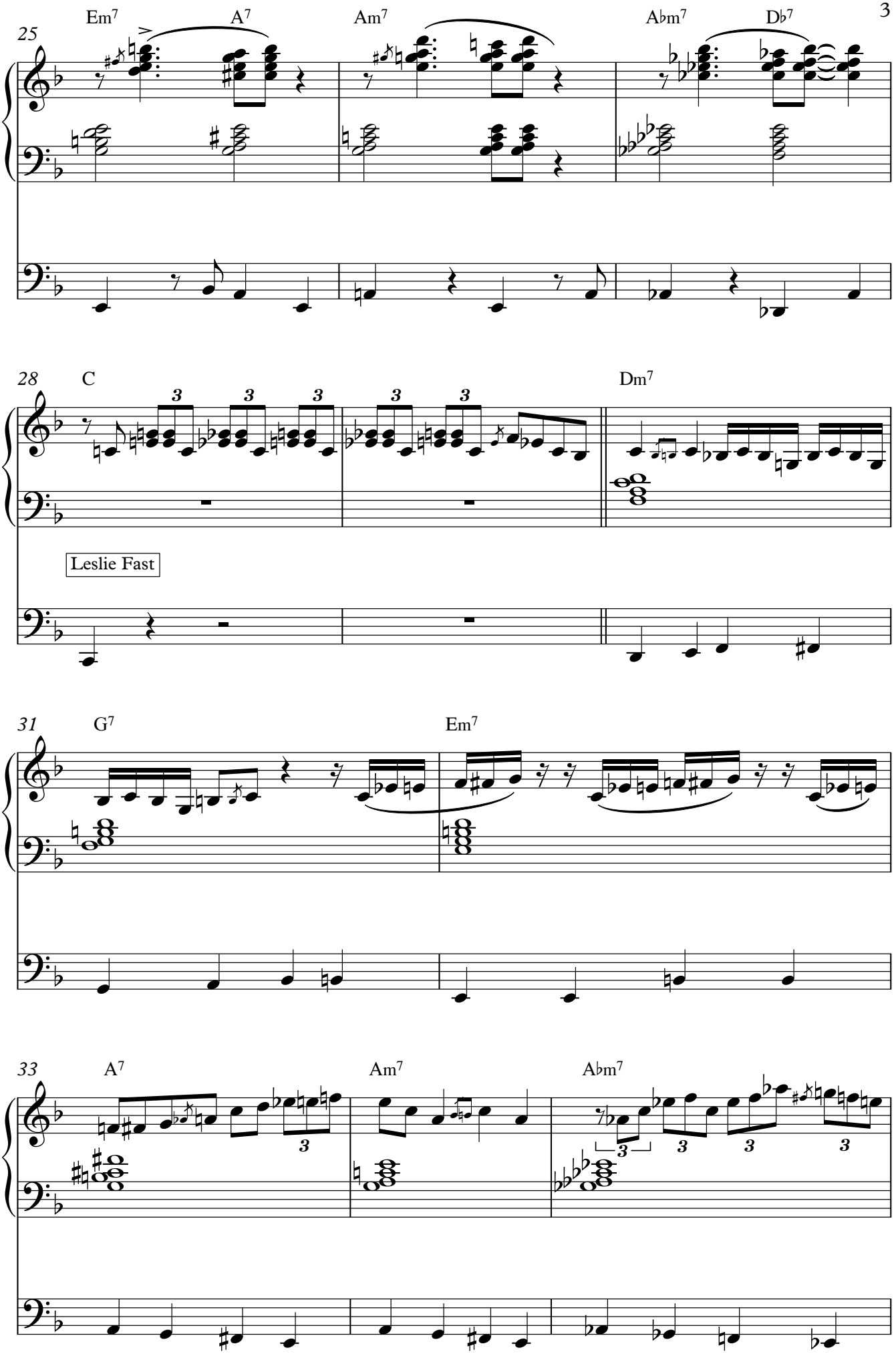
Satin Doll

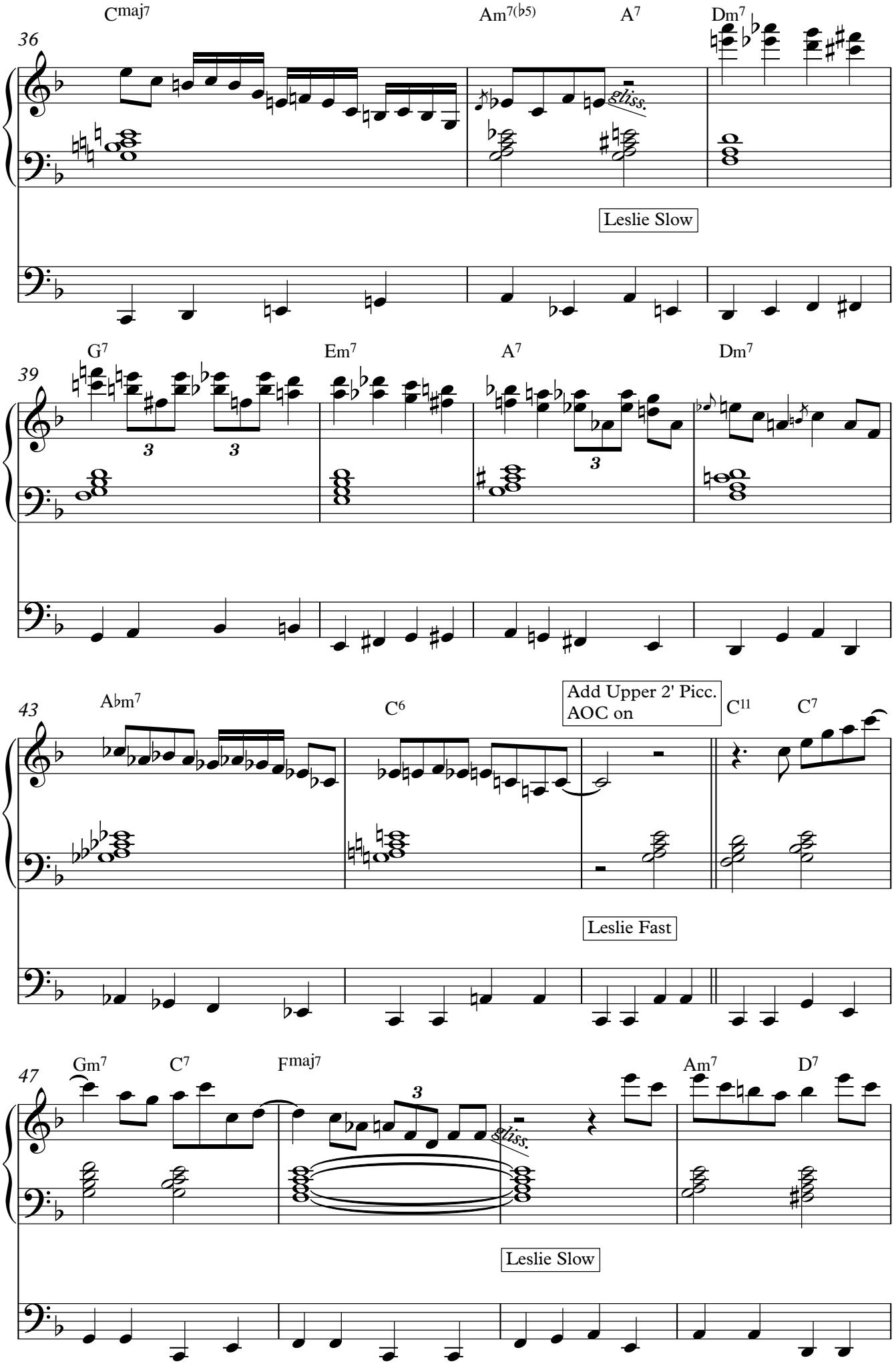
As played by Harry Stoneham
on *Two Fellas to Follow* (1967)

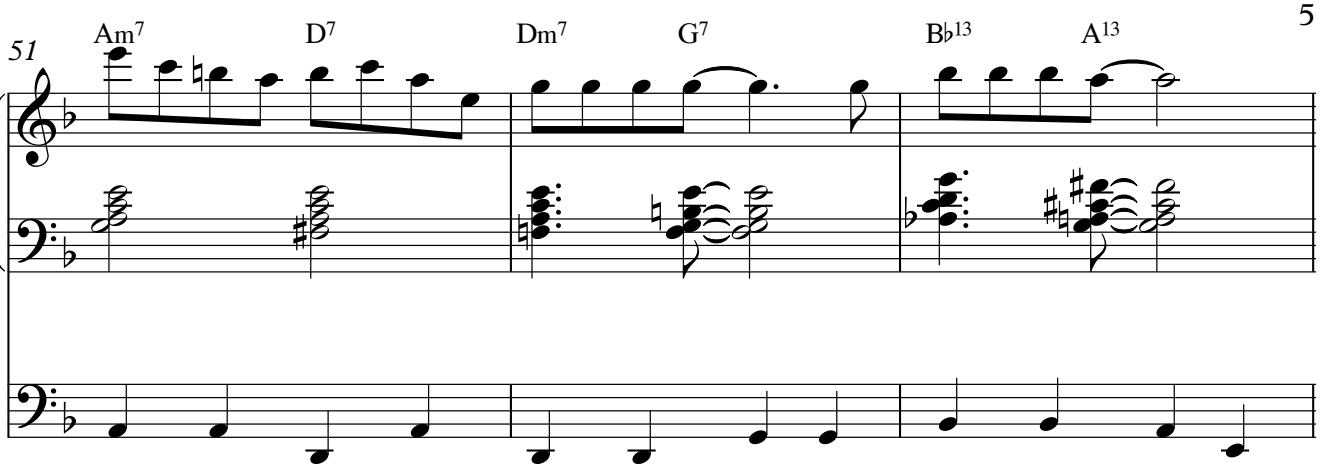
Ellington & Strayhorn
Transcribed by C Stanbury




11
Cmaj7
1. A7
2.
Gm7
Leslie Fast
15
C11
C7/E
Fmaj7
Gm7
Am7
Gm7
gliss.
18
Am7
D7
Am7
D7
Dm7
Em7
Bb7
A7
Leslie Slow
22
Dm7
G7
Dm7
G7
Em7
A7


25
Em7
A7
Am7
Abm7
Db7
28
C
Dm7
Leslie Fast
31
G7
Em7
33
A7
Am7
Abm7


Cmaj7
Am7(b5)
A7
Dm7
36
gliss.
Leslie Slow
G7
Em7
A7
Dm7
39
3
3
3
Abm7
C6
43
Add Upper 2' Picc.
AOC on
C11
C7
Leslie Fast
Gm7
C7
Fmaj7
47
3
gliss.
Am7
D7
Leslie Slow



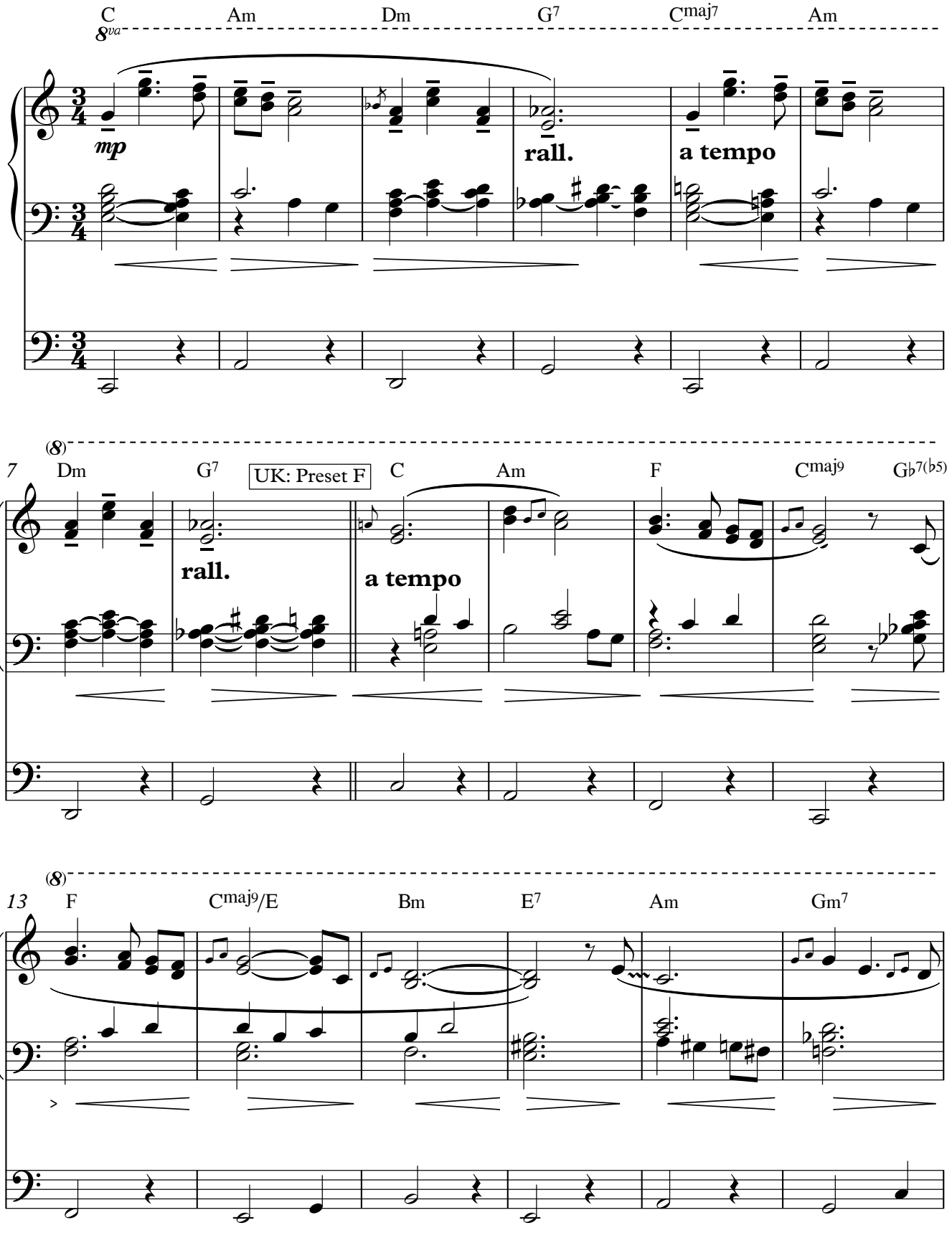
[continues ...]

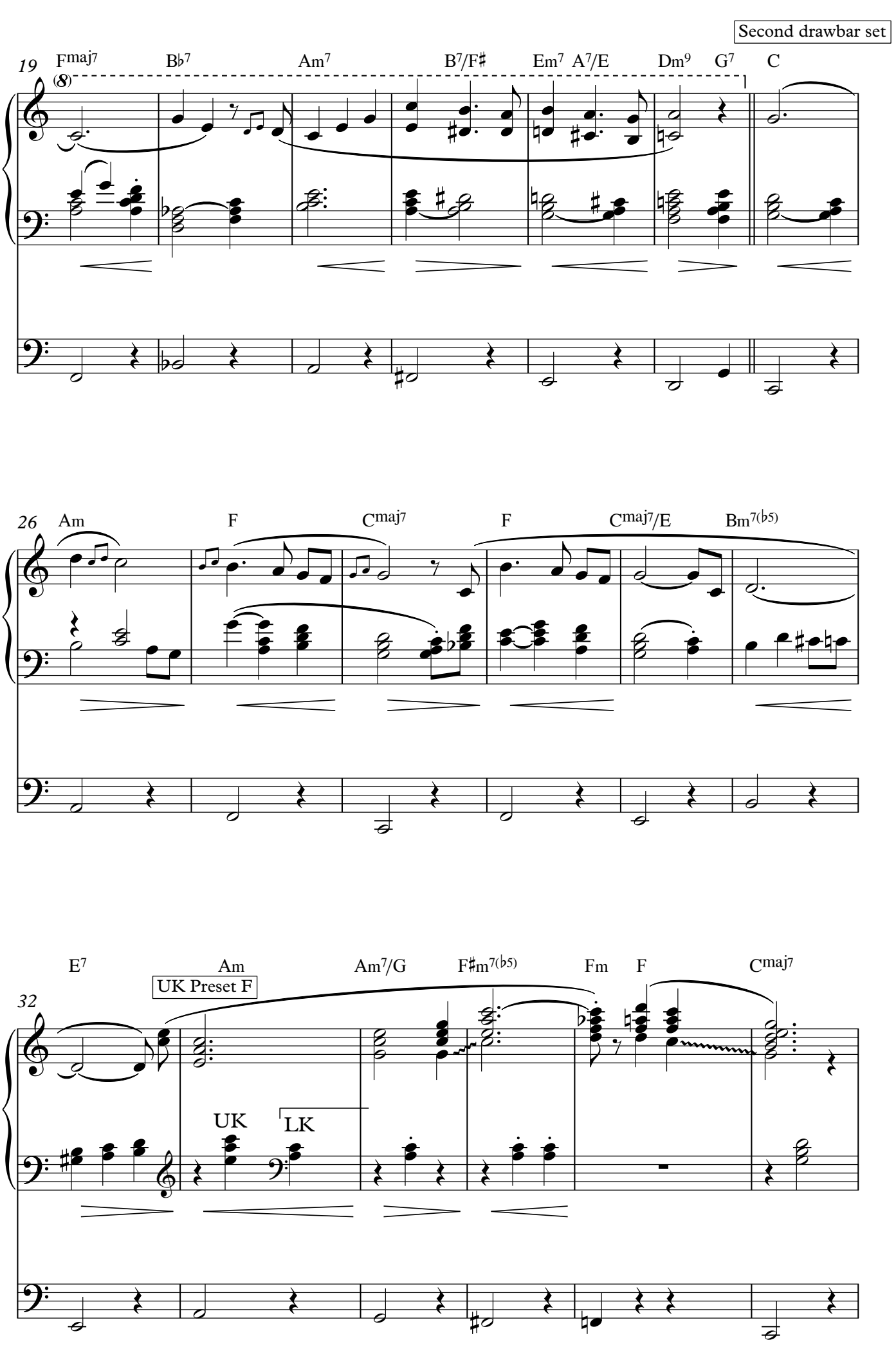
Drawbar Settings
Upper: 800000000
2nd Perc only
2nd Set: 008080800
Lower: 045640000
Pedal: 03
Leslie: Fast
Pedal Sustain On

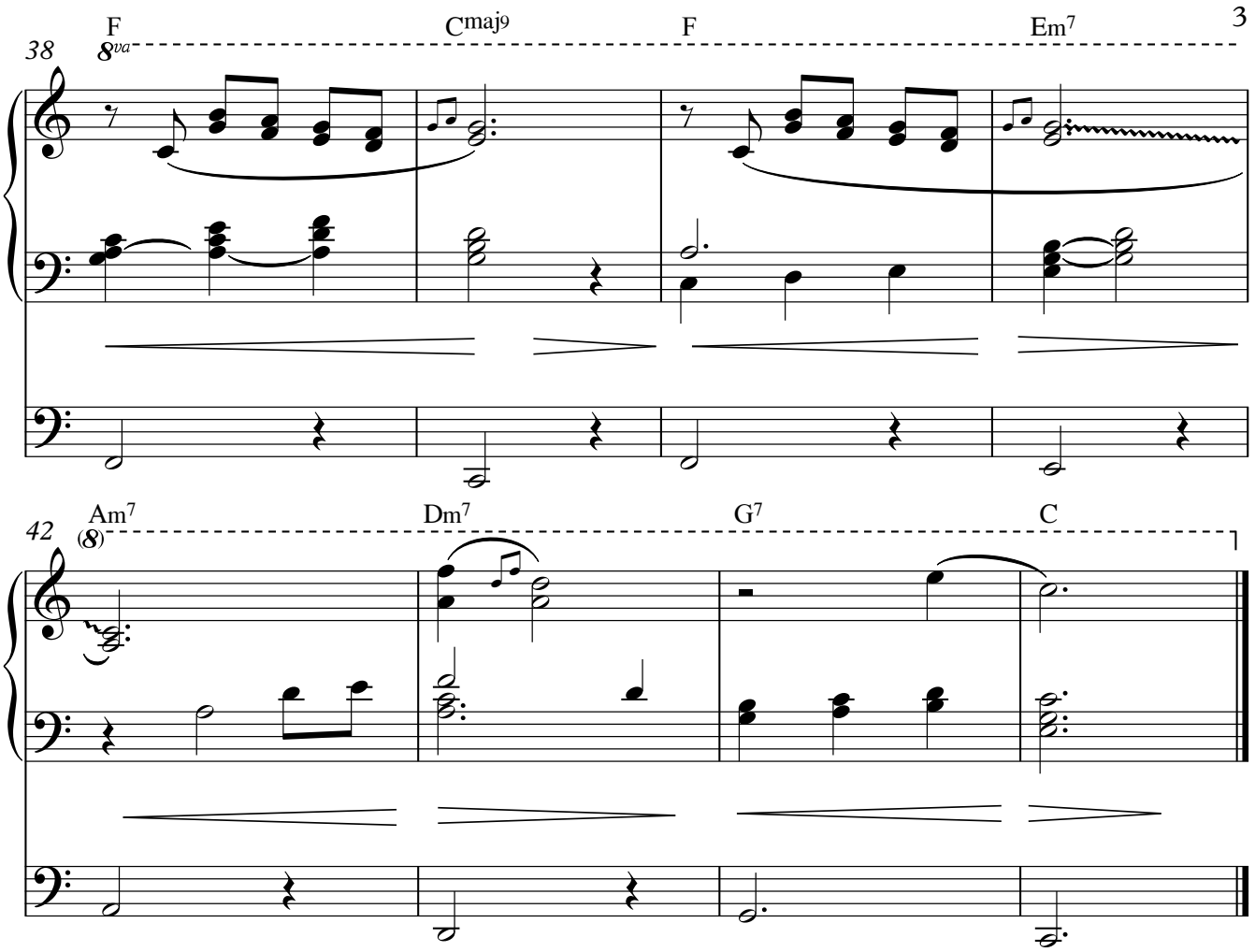
Moon River

Arrangement: Keith Beckingham
As played on *Hi Flying Hammond* (1967)

Henry Mancini
Transcribed by C Stanbury




Second drawbar set
19
Fmaj7
B♭7
Am7
B7/F♯
Em7
A7/E
Dm9
G7
C
(8)
26
Am
F
Cmaj7
F
Cmaj7/E
Bm7(♭5)
32
E7
Am
Am7/G
F♯m7(♭5)
Fm
F
Cmaj7
UK Preset F
UK
LK


F
Cmaj9
F
Em7
38
8va
Am7
Dm7
G7
C
42
(8)

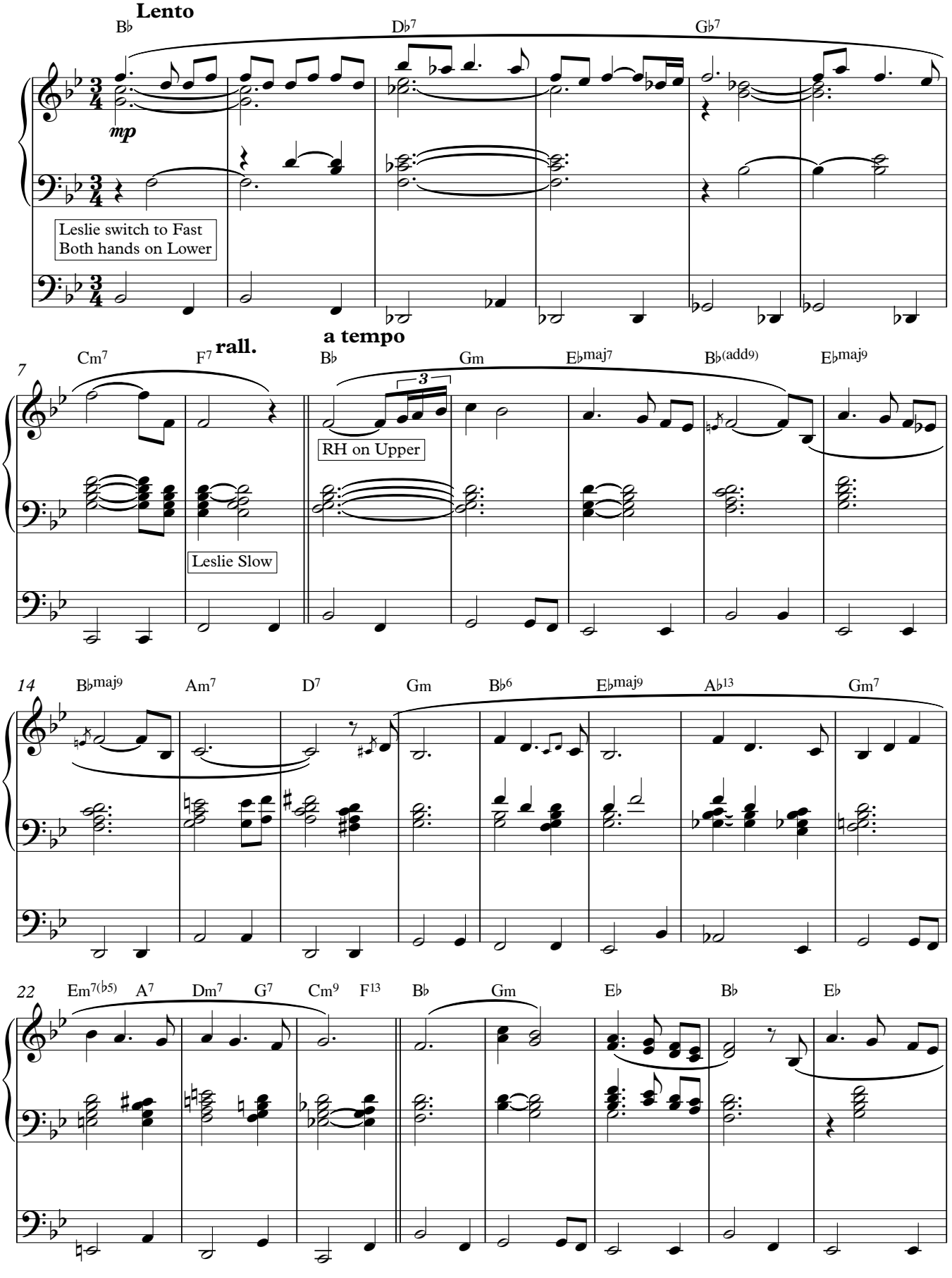
UK: Reed Solo
String 8'
Reed 4' Coupler
LK: Melodion 8'
Accomp Medium
PK: Sustain On
Pedal Soft
String Bass

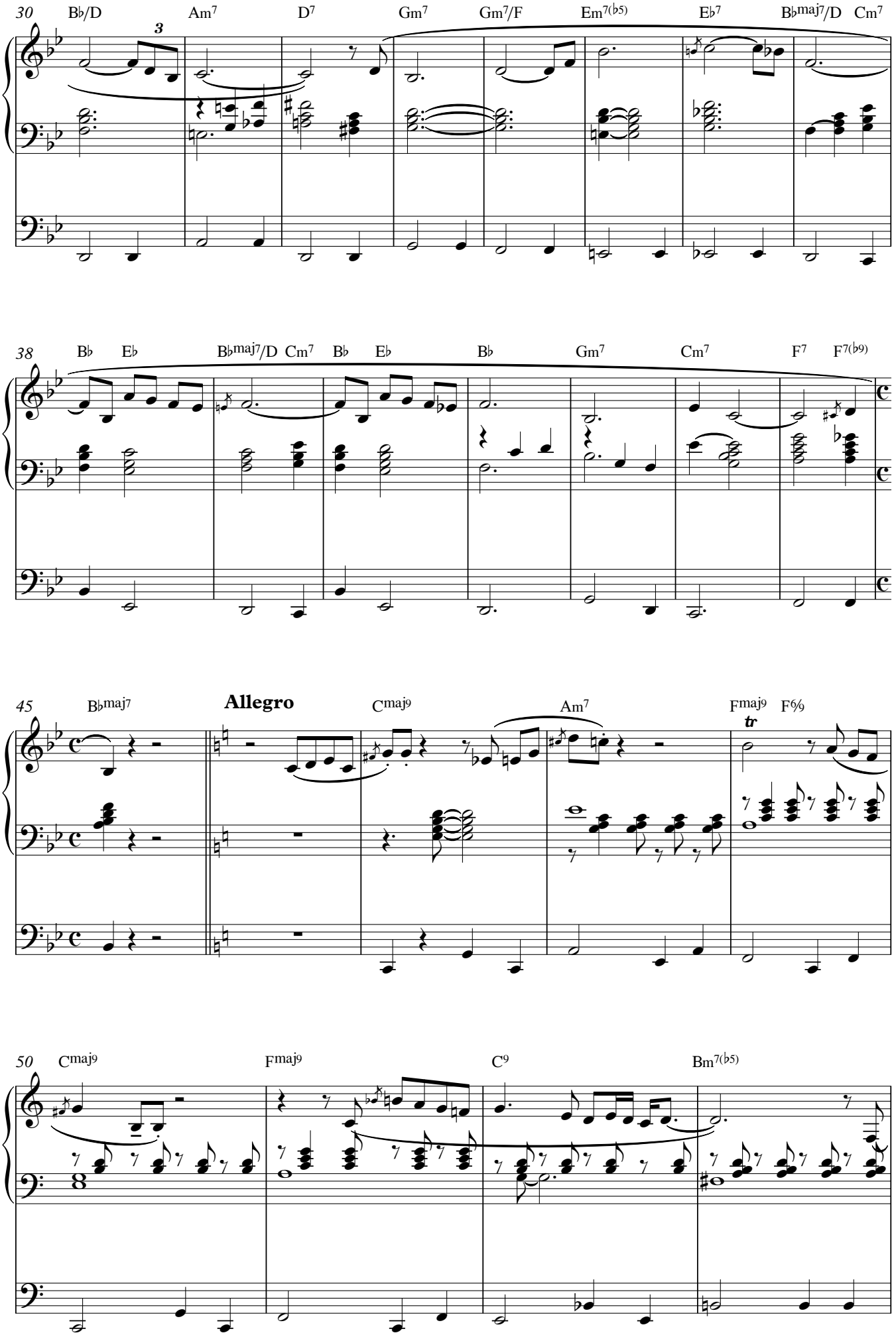
Moon River

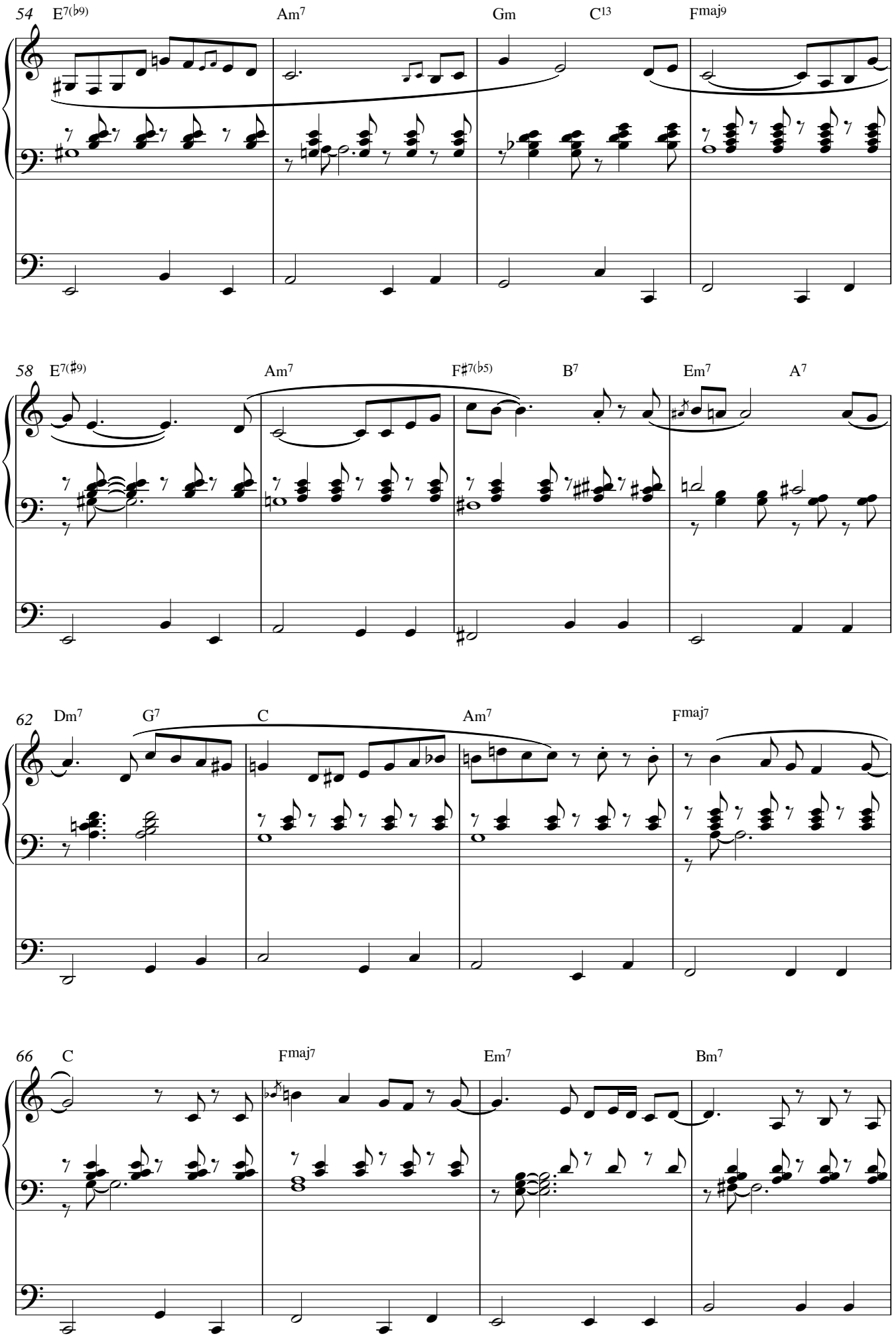
As played by Jerry Allen on
Plays Some of the Oscars (1971)

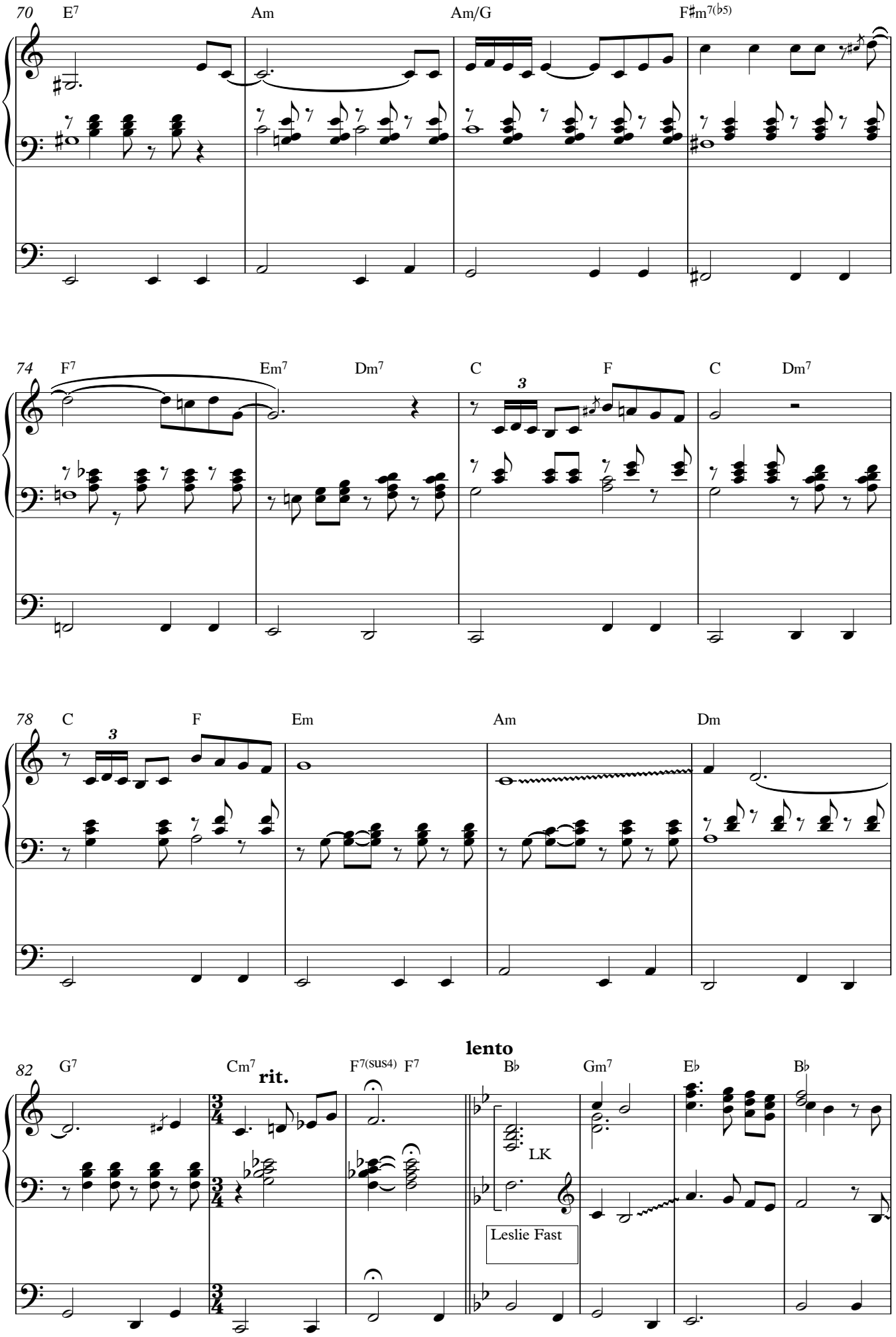
Henry Mancini
Transcribed by C Stanbury

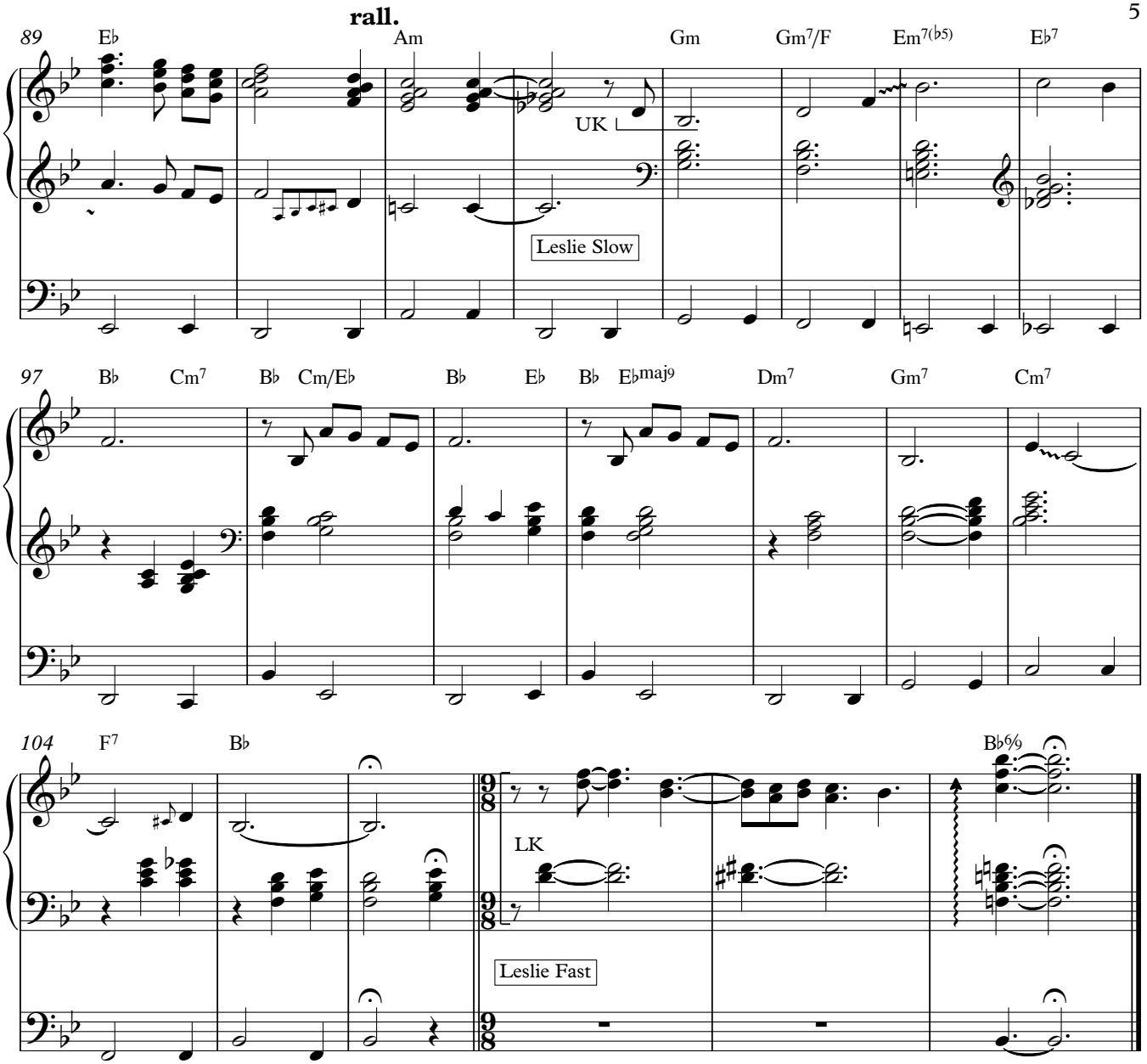
Lento




30
B♭/D
Am7
D7
Gm7
Gm7/F
Em7(♭5)
E♭7
B♭maj7/D
Cm7
38
B♭
E♭
B♭maj7/D
Cm7
B♭
E♭
B♭
Gm7
Cm7
F7
F7(♭9)
45
B♭maj7
Allegro
Cmaj9
Am7
Fmaj9
F6/9
tr
50
Cmaj9
Fmaj9
C9
Bm7(♭5)


54
E7(♭9)
Am7
Gm
C13
Fmaj9
58
E7(♯9)
Am7
F♯7(♭5)
B7
Em7
A7
62
Dm7
G7
C
Am7
Fmaj7
66
C
Fmaj7
Em7
Bm7


70
E7
Am
Am/G
F♯m7(♭5)
74
F7
Em7
Dm7
C
F
C
Dm7
3
78
C
F
Em
Am
Dm
3
82
G7
Cm7
rit.
F7(sus4)
F7
lento
B♭
Gm7
E♭
B♭
LK
Leslie Fast


rall.
89
E♭
Am
Gm
Gm7/F
Em7(♭5)
E♭7
UK
Leslie Slow
97
B♭
Cm7
B♭
Cm/E♭
B♭
E♭
B♭
E♭maj9
Dm7
Gm7
Cm7
104
F7
B♭
B♭6/9
LK
Leslie Fast

Upper: Trombone 16'
Trumpet 16'

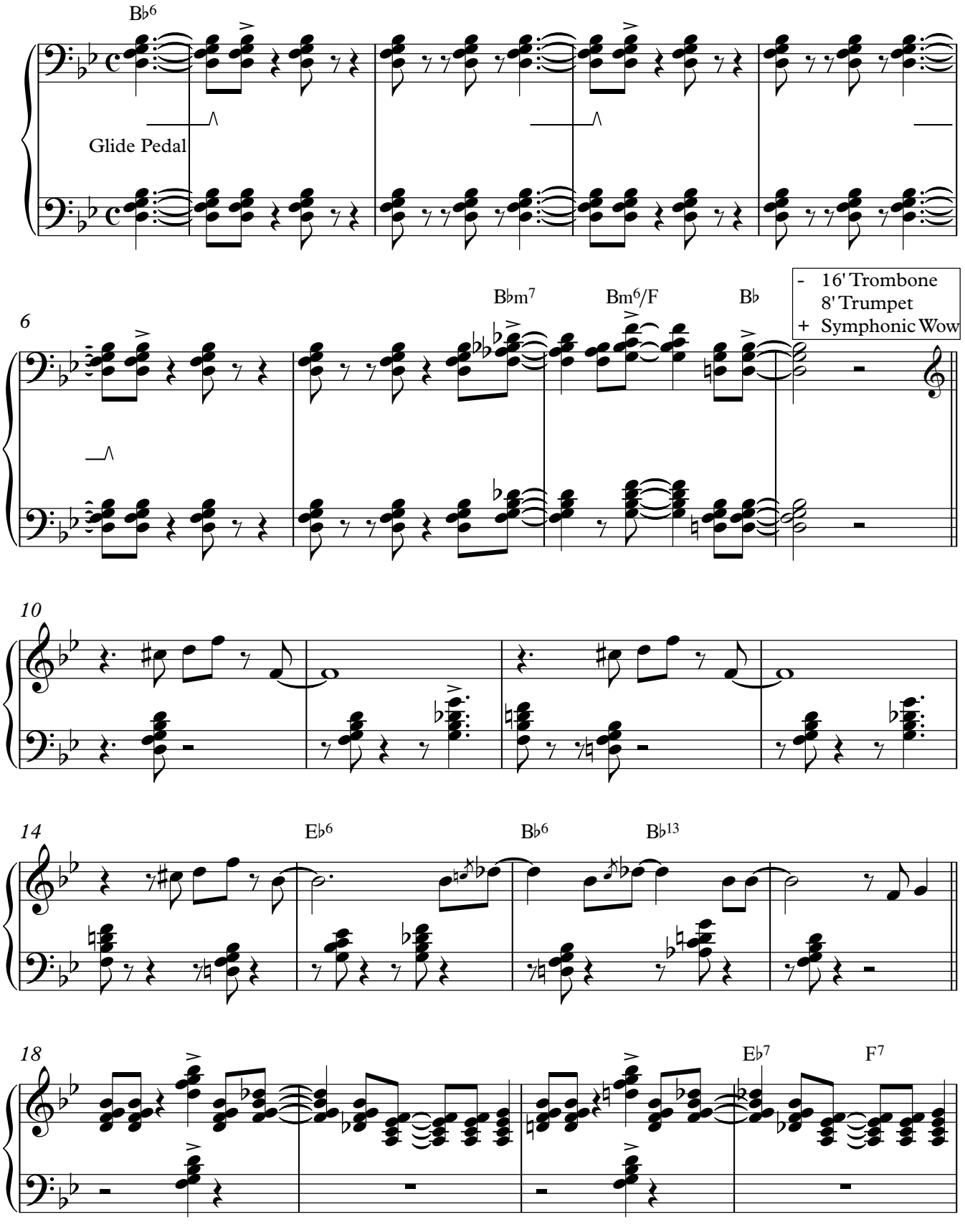
Lower: Melodia 8'
Horn 8'

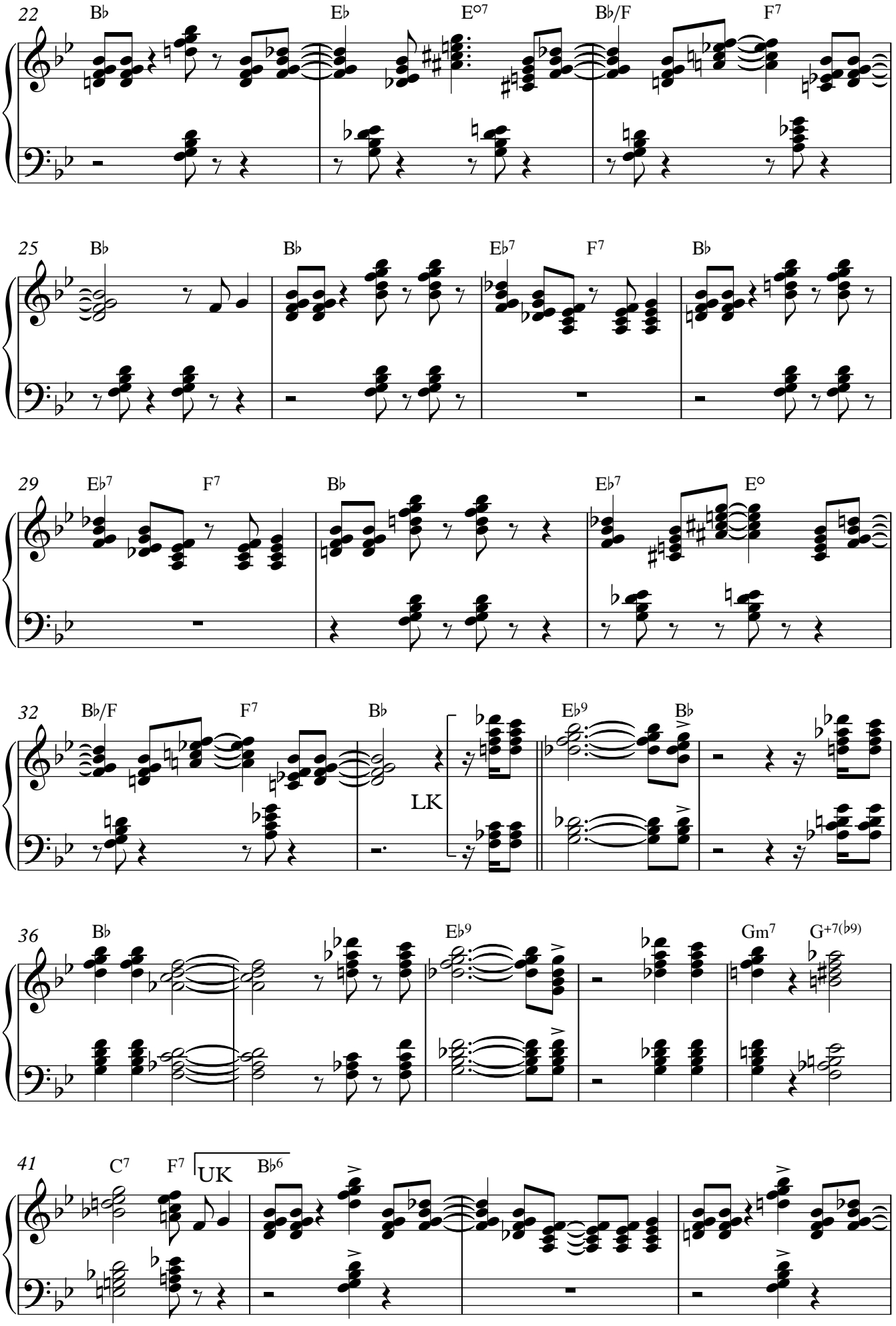
Tuxedo Junction

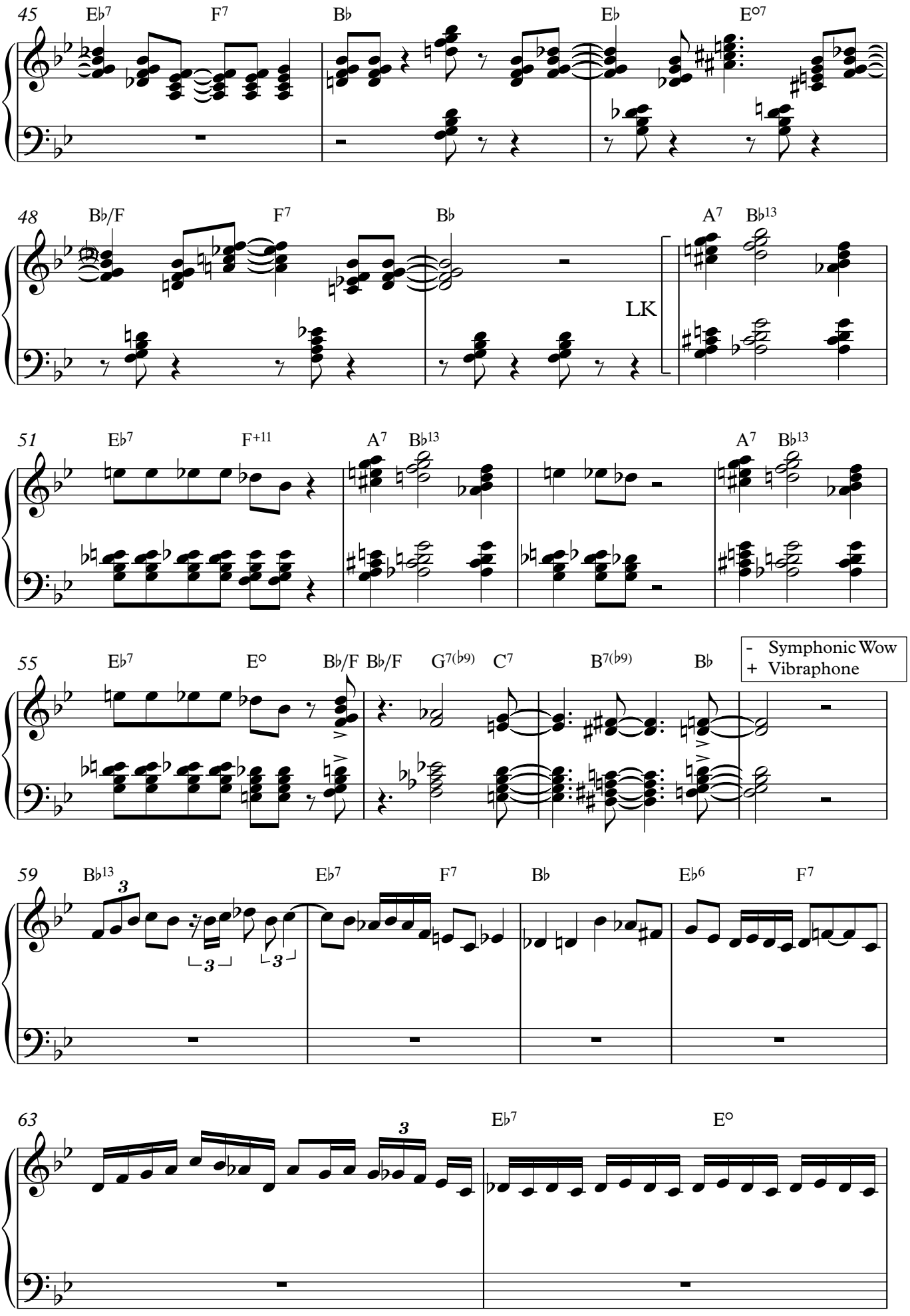
As played by Harry Stoneham
on *This is Harry Stoneham* (1976)

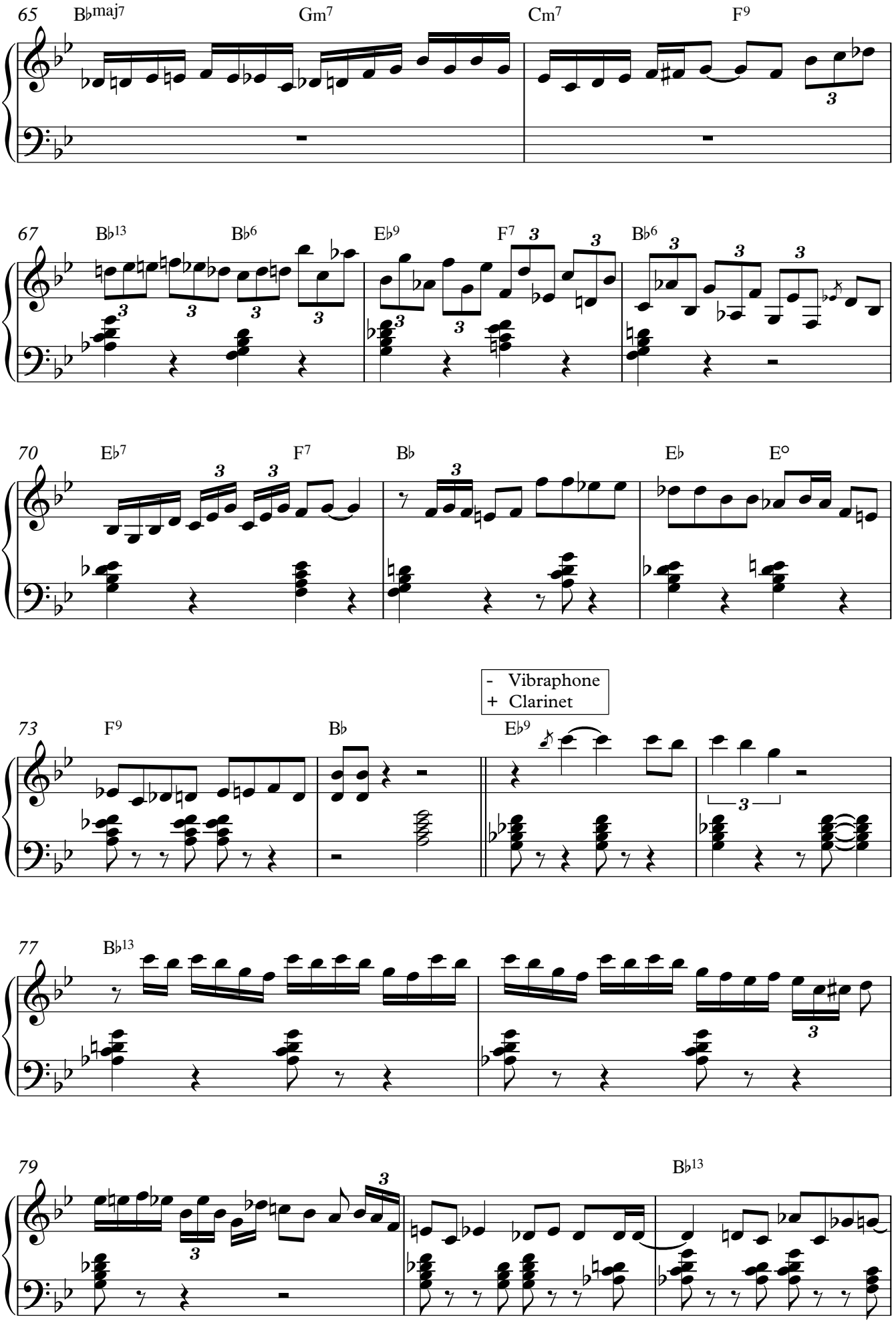
Hawkins & Johnson
Transcibed by C Stanbury

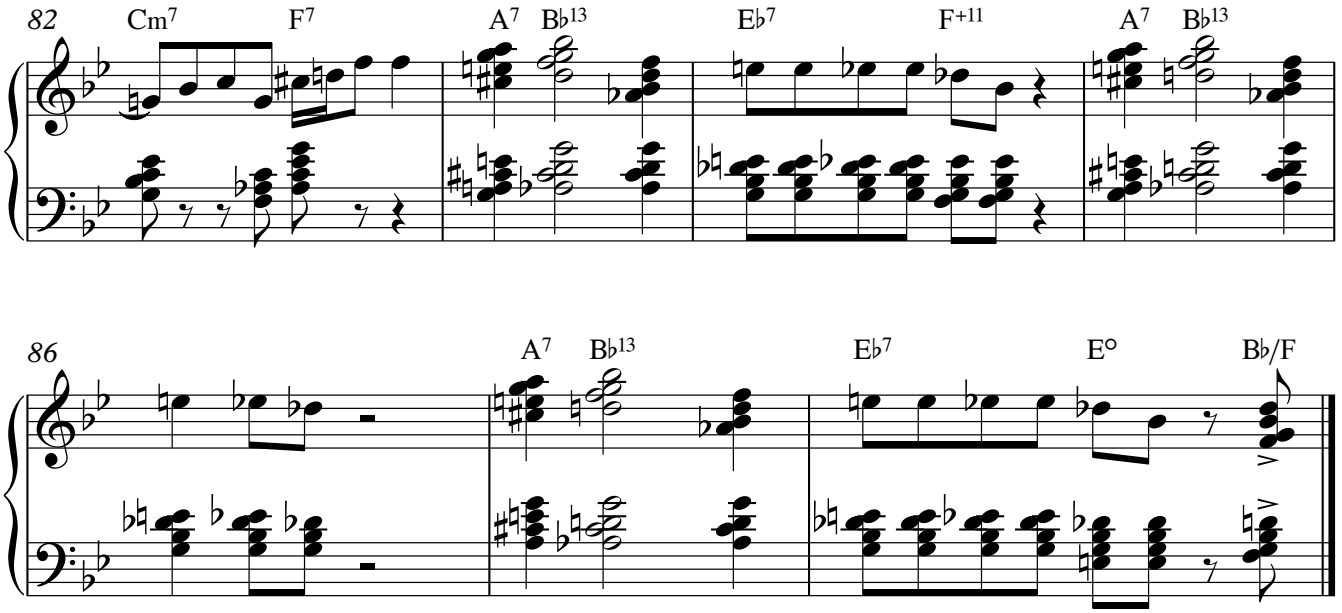
Swing




22
B♭
E♭
E°7
B♭/F
F7
25
B♭
B♭
E♭7
F7
B♭
29
E♭7
F7
B♭
E♭7
E°
32
B♭/F
F7
B♭
LK
E♭9
B♭
36
B♭
E♭9
Gm7
G+7(♭9)
41
C7
F7
UK
B♭6


45
E♭7
F7
B♭
E♭
E°7
48
B♭/F
F7
B♭
A7
B♭13
LK
51
E♭7
F+11
A7
B♭13
A7
B♭13
55
E♭7
E°
B♭/F
B♭/F
G7(♭9)
C7
B7(♭9)
B♭
- Symphonic Wow
+ Vibraphone
59
B♭13
3
3
3
E♭7
F7
B♭
E♭6
F7
63
3
E♭7
E°


65
B♭maj7
Gm7
Cm7
F9
67
B♭13
B♭6
E♭9
F7
B♭6
70
E♭7
F7
B♭
E♭
E°
- Vibraphone
+ Clarinet
73
F9
B♭
E♭9
77
B♭13
79
B♭13



....cont.

Registraton

Upper: Trombone 16'
Flute 16',8',4'

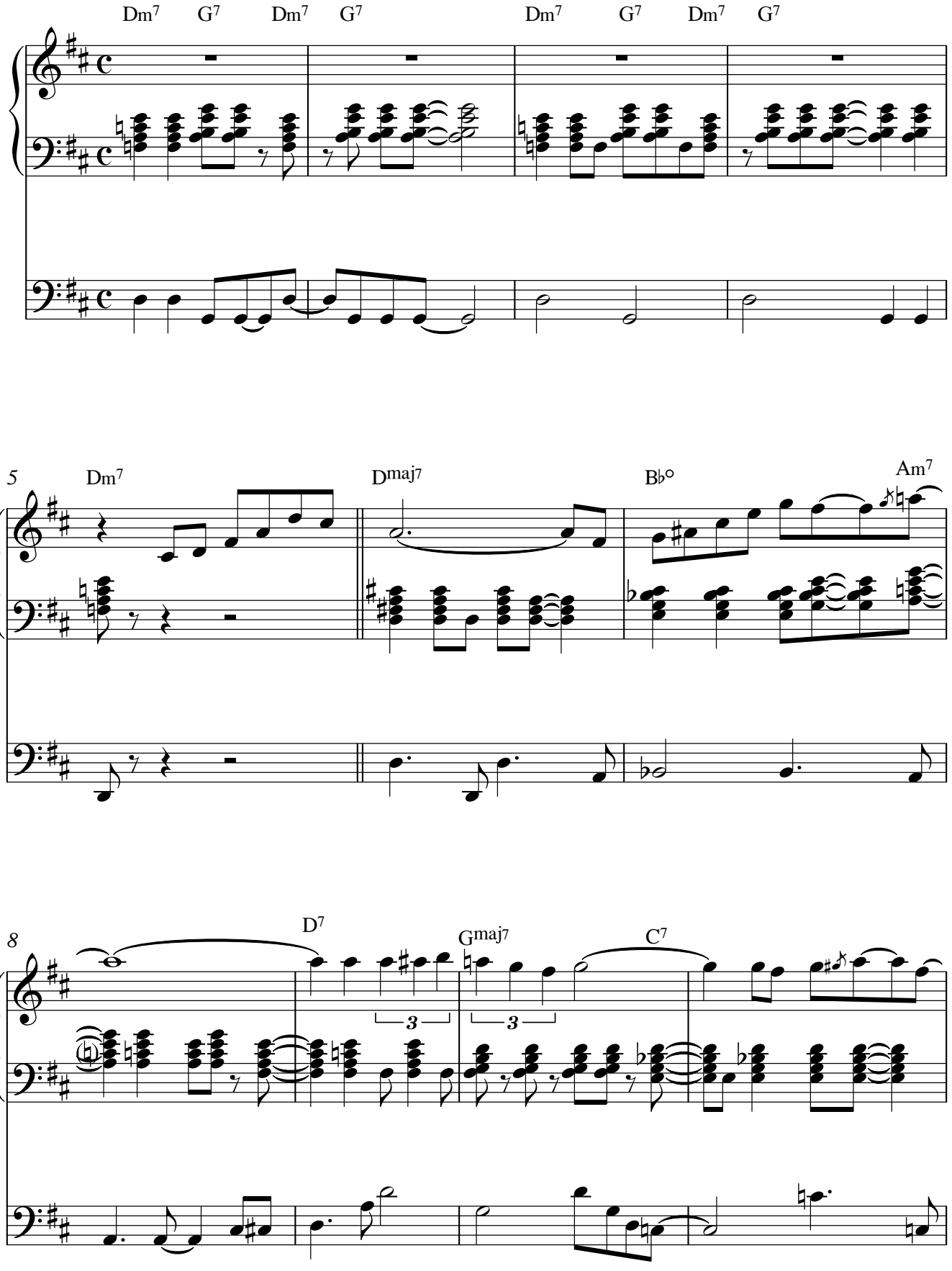
Lower: Flute 8'
Horn 8'

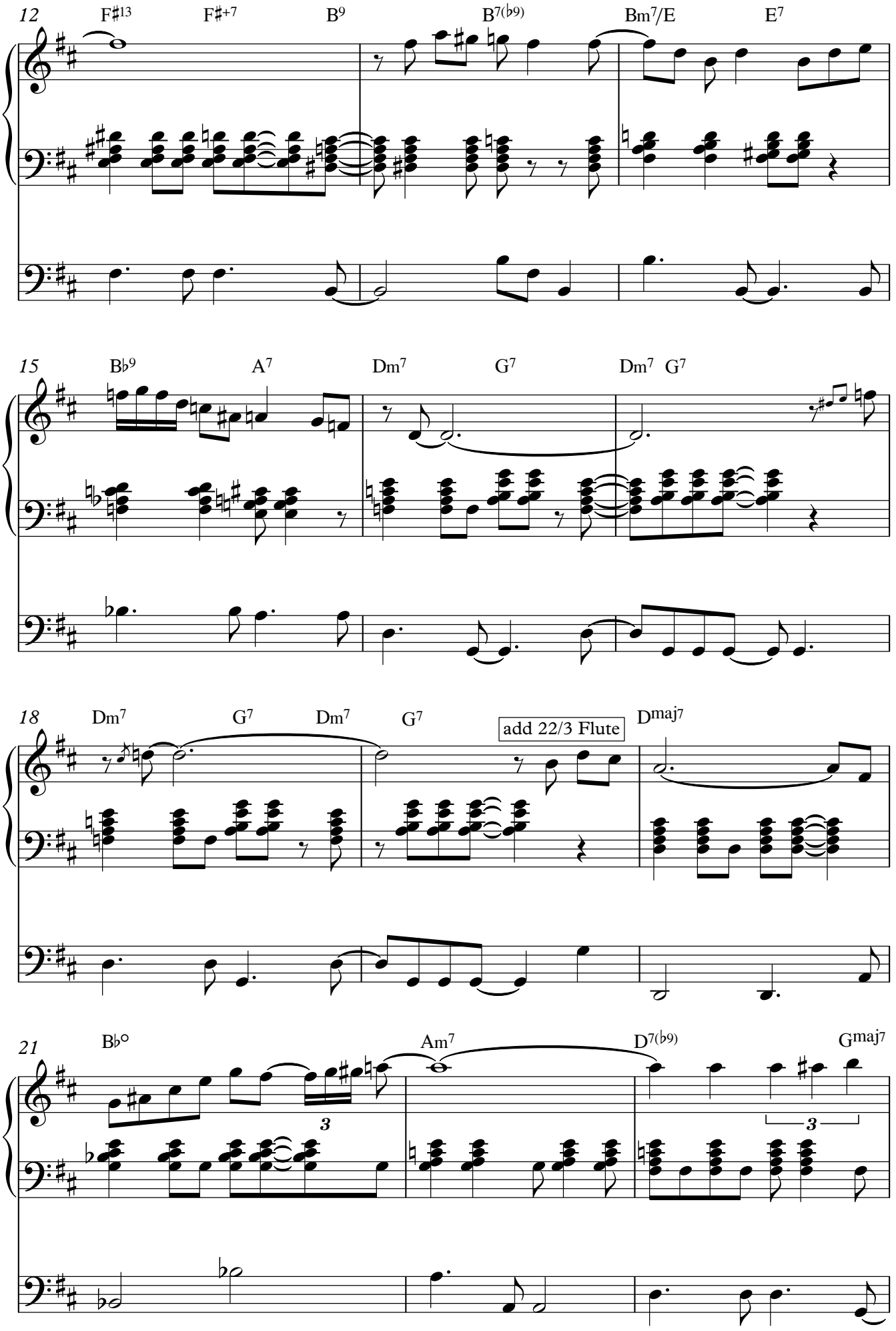
Leslie: Slow

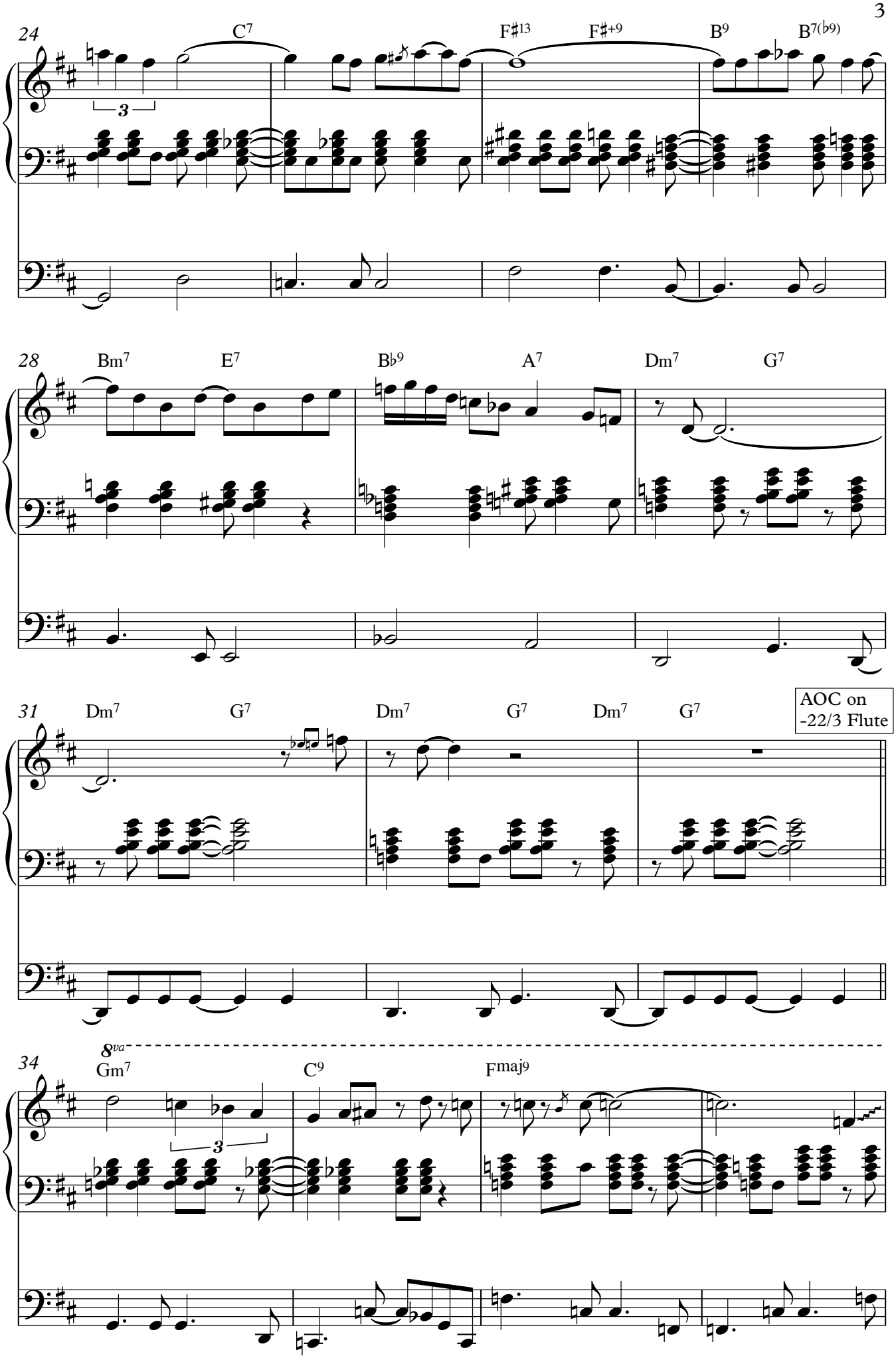
Wave

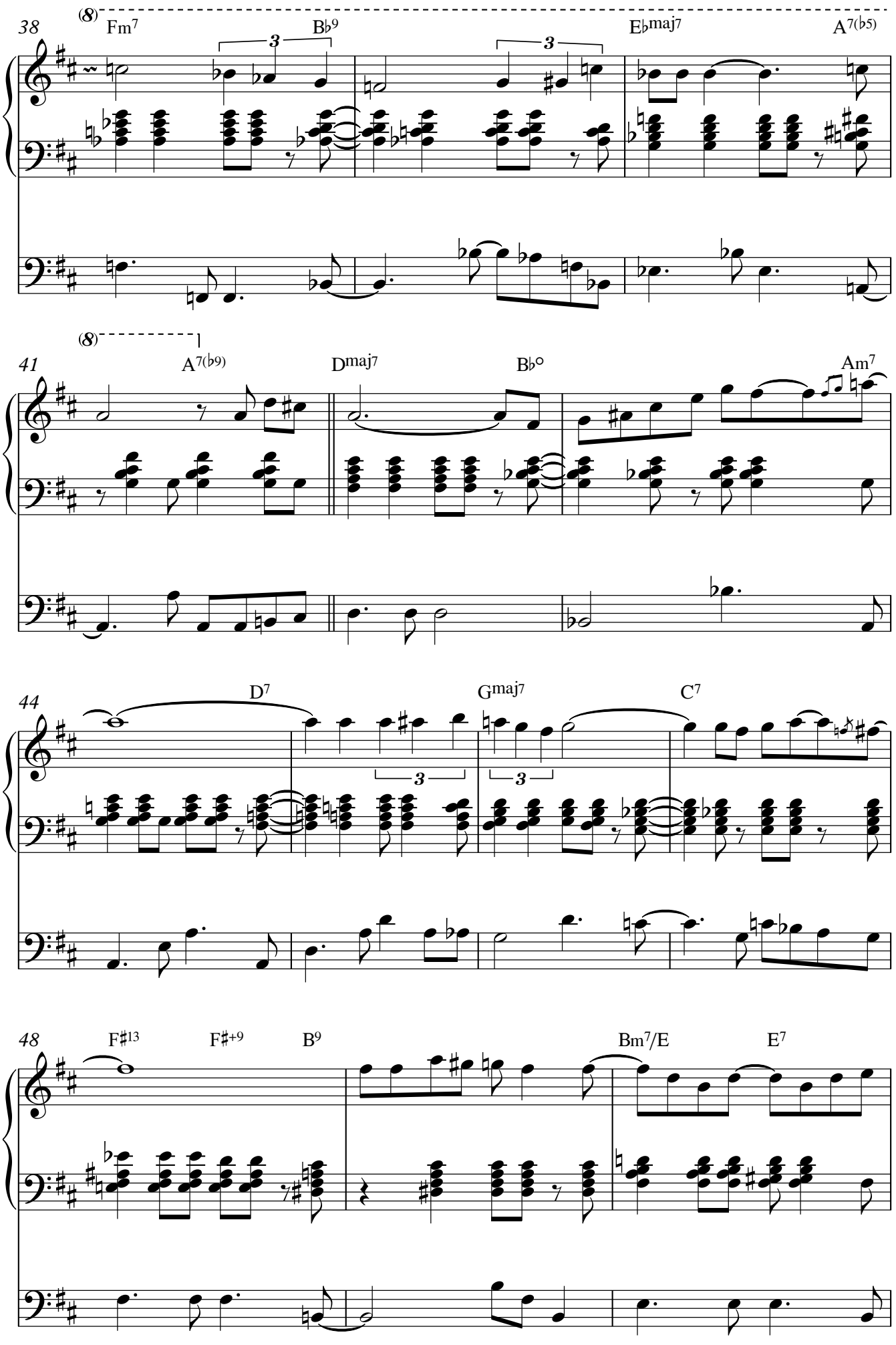
As Played by Harry Stoneham
on *Latin Lowrey (*1976)

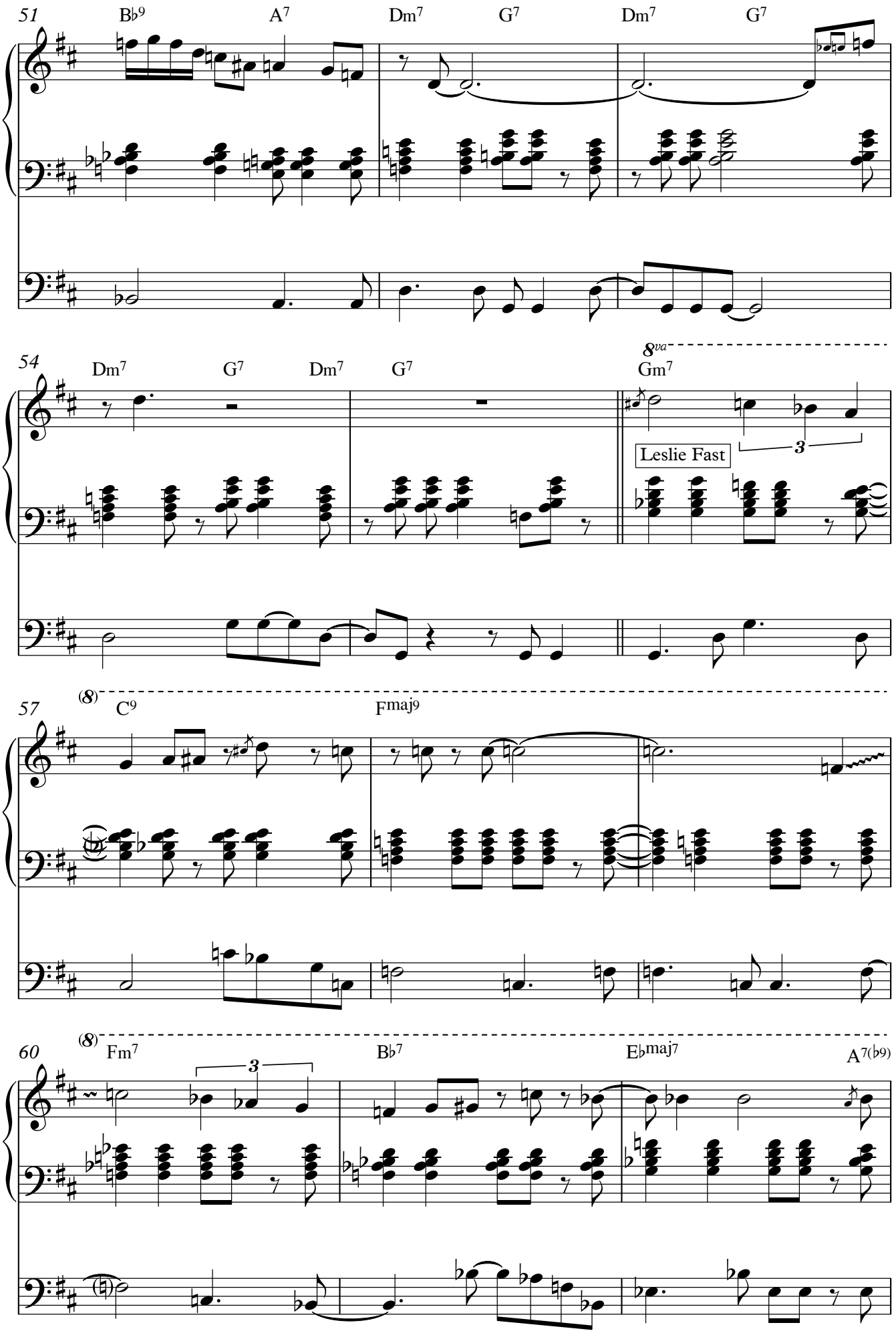
A C Jobim, 1967
Transcribed by C Stanbury

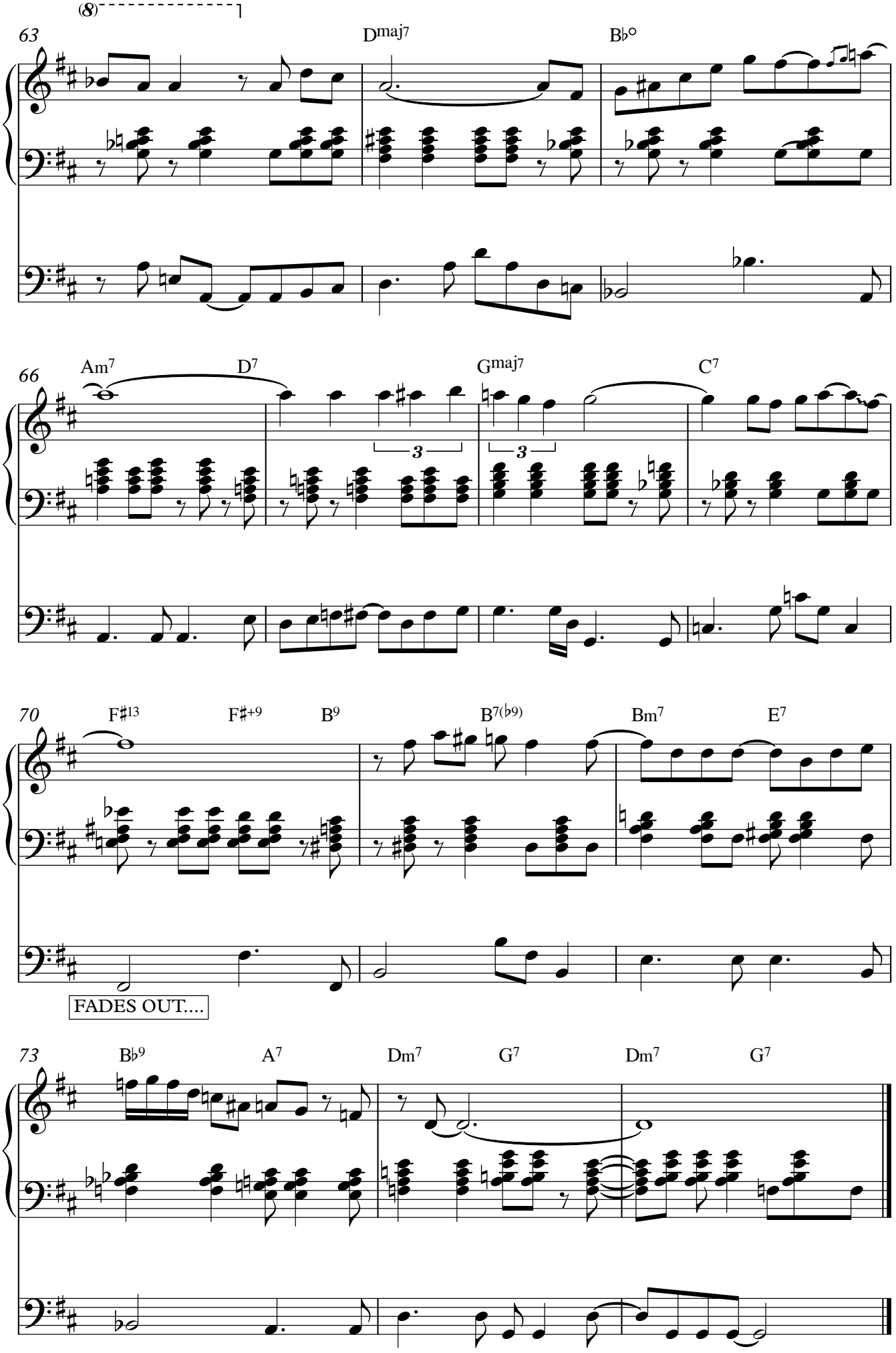



12
F♯13
F♯+7
B9
B7(♭9)
Bm7/E
E7
15
B♭9
A7
Dm7
G7
Dm7
G7
18
Dm7
G7
Dm7
G7
add 22/3 Flute
Dmaj7
21
B♭°
Am7
D7(♭9)
Gmaj7


24
C7
F♯13
F♯+9
B9
B7(♭9)
28
Bm7
E7
B♭9
A7
Dm7
G7
31
Dm7
G7
Dm7
G7
Dm7
G7
AOC on
-22/3 Flute
8va
34
Gm7
C9
Fmaj9


38
Fm7
B♭9
E♭maj7
A7(♭5)
41
A7(♭9)
Dmaj7
B♭°
Am7
44
D7
Gmaj7
C7
48
F♯13
F♯+9
B9
Bm7/E
E7


51
B♭9
A7
Dm7
G7
Dm7
G7
54
Dm7
G7
Dm7
G7
8va
Gm7
3
Leslie Fast
57
(8)
C9
Fmaj9
60
(8)
Fm7
3
B♭7
E♭maj7
A7(♭9)


63
Dmaj7
B♭°
66
Am7
D7
Gmaj7
C7
70
F♯13
F♯+9
B9
B7(♭9)
Bm7
E7
FADES OUT....
73
B♭9
A7
Dm7
G7
Dm7
G7

TEA FOR TWO
二人でお茶を

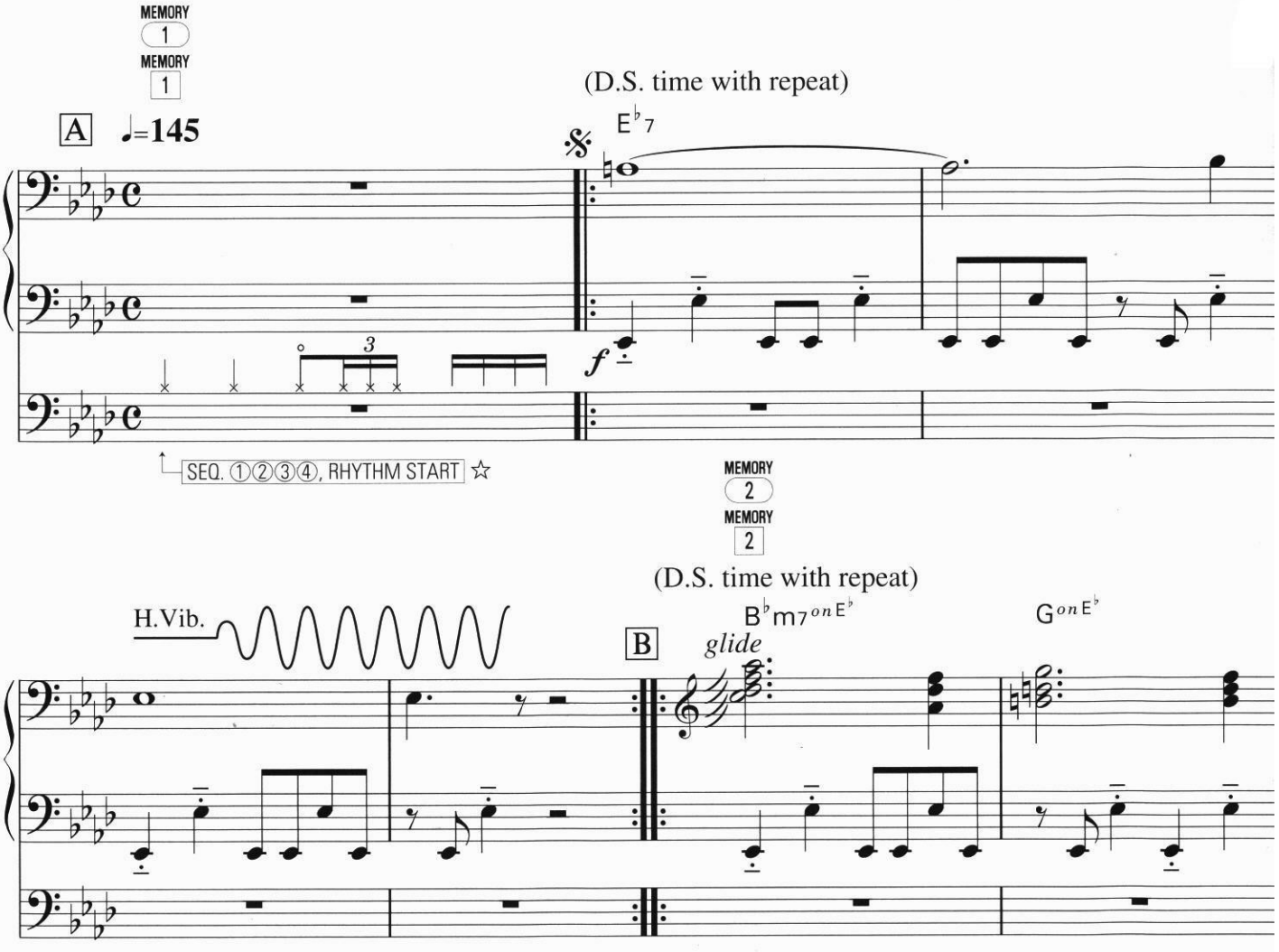
作曲／Irving Caeser　**エレクトーン編曲／松田　昌**
レジストレーション・データ制作／水野義子

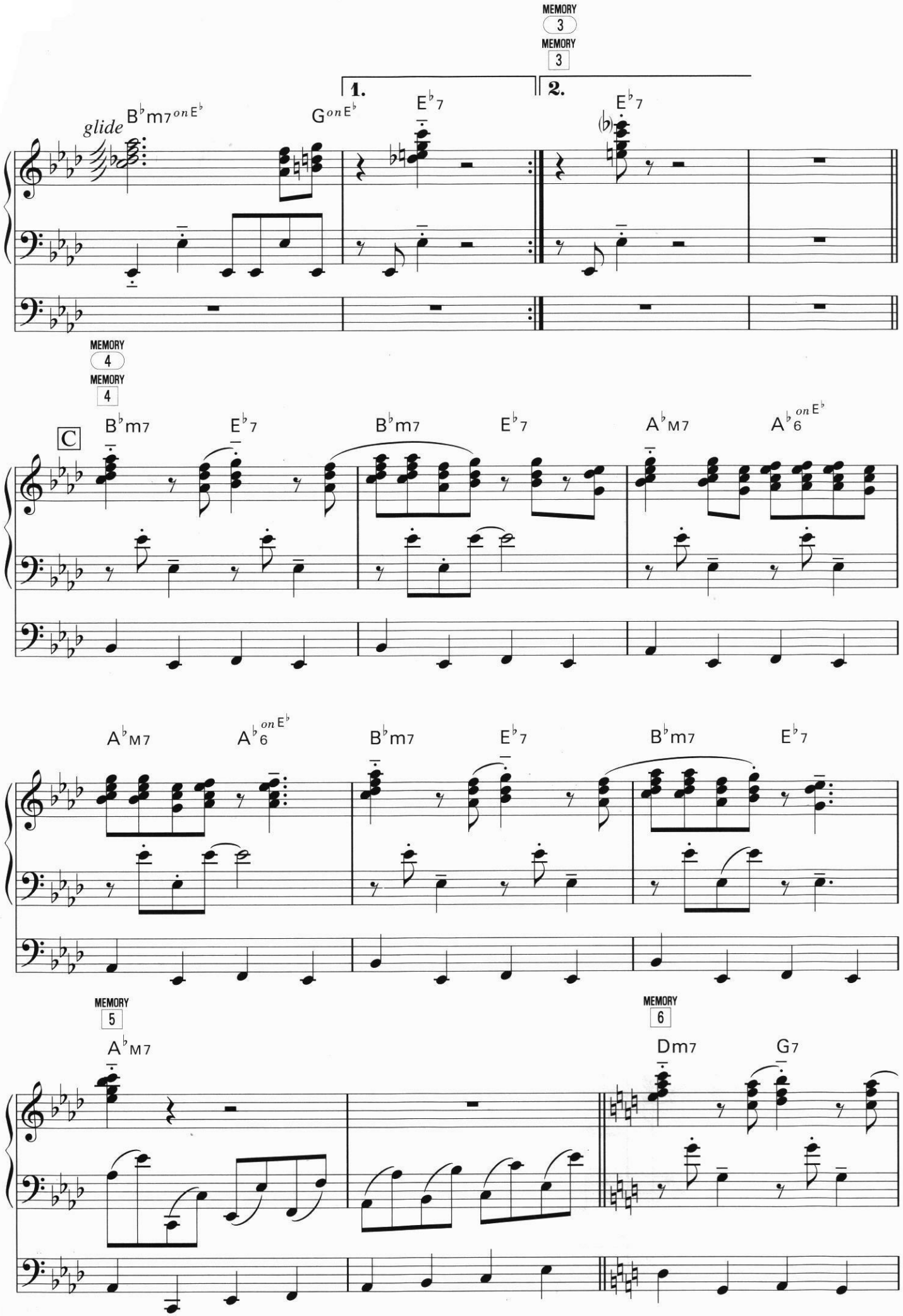
機種	操作手順 … 詳しい操作方法は ➡ 68 頁	使用SONG
(注) EL-900m／900／900B (MEMORY □)	SONG 13 ➡ PLAY	SONG 13・14
(注) EL-700／500／400／200 (MEMORY □)	SONG 15 ➡ PLAY	SONG 15・16
EL-90*／87* (MEMORY ⬭)	SONG 17 ➡ PLAY	SONG 17

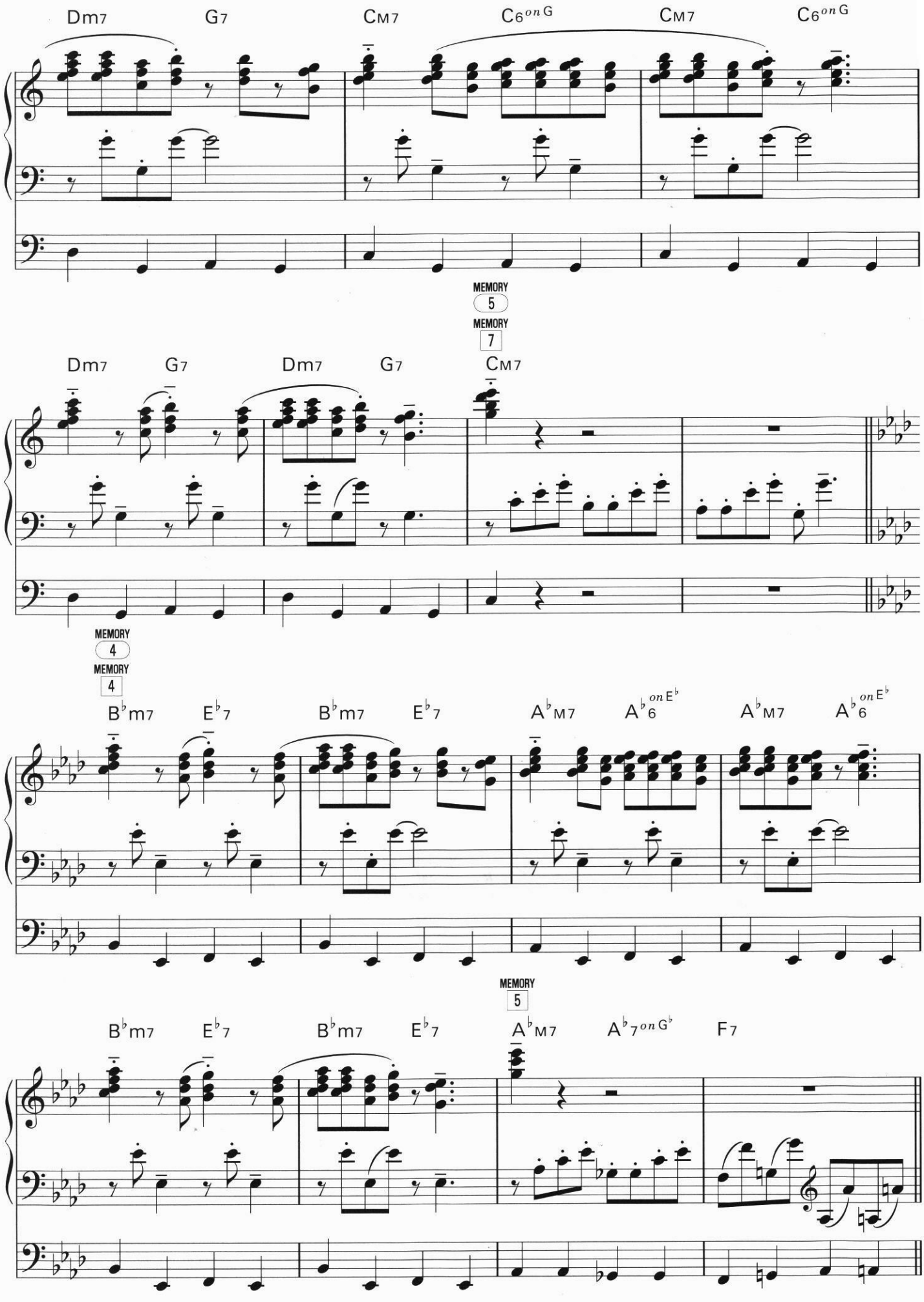
DISK A
FD AUTO
ニーレバー たたむ

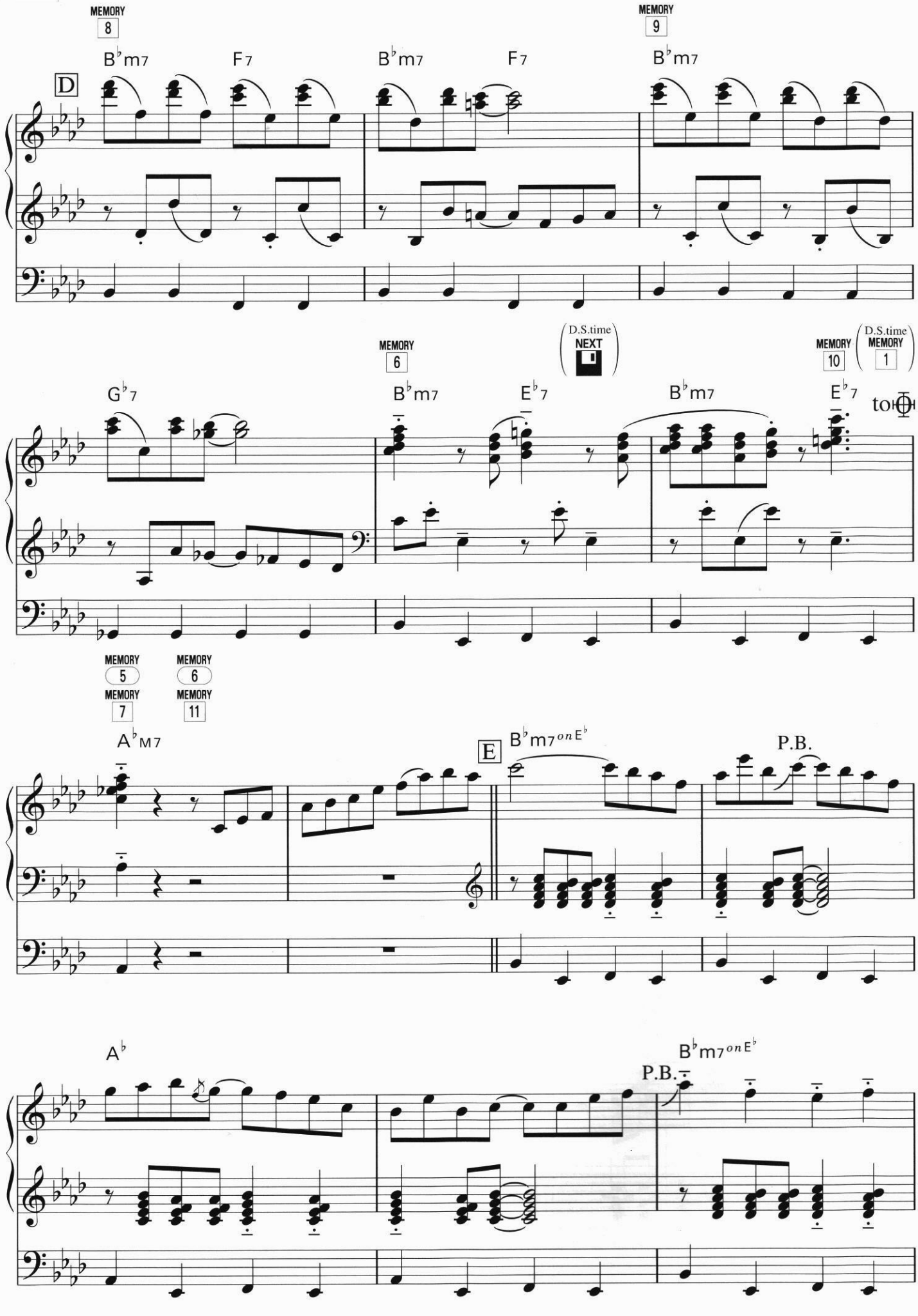
＊必ずエクスプレッションペダルのコントロールを“INT.(インターナル)”に切り替えてください(操作方法は ➡ 69 頁)。
☆楽譜頭の└──は，手動(フットスイッチまたは手押し)で演奏する場合の操作です(詳しい操作方法は ➡ 70 頁)。

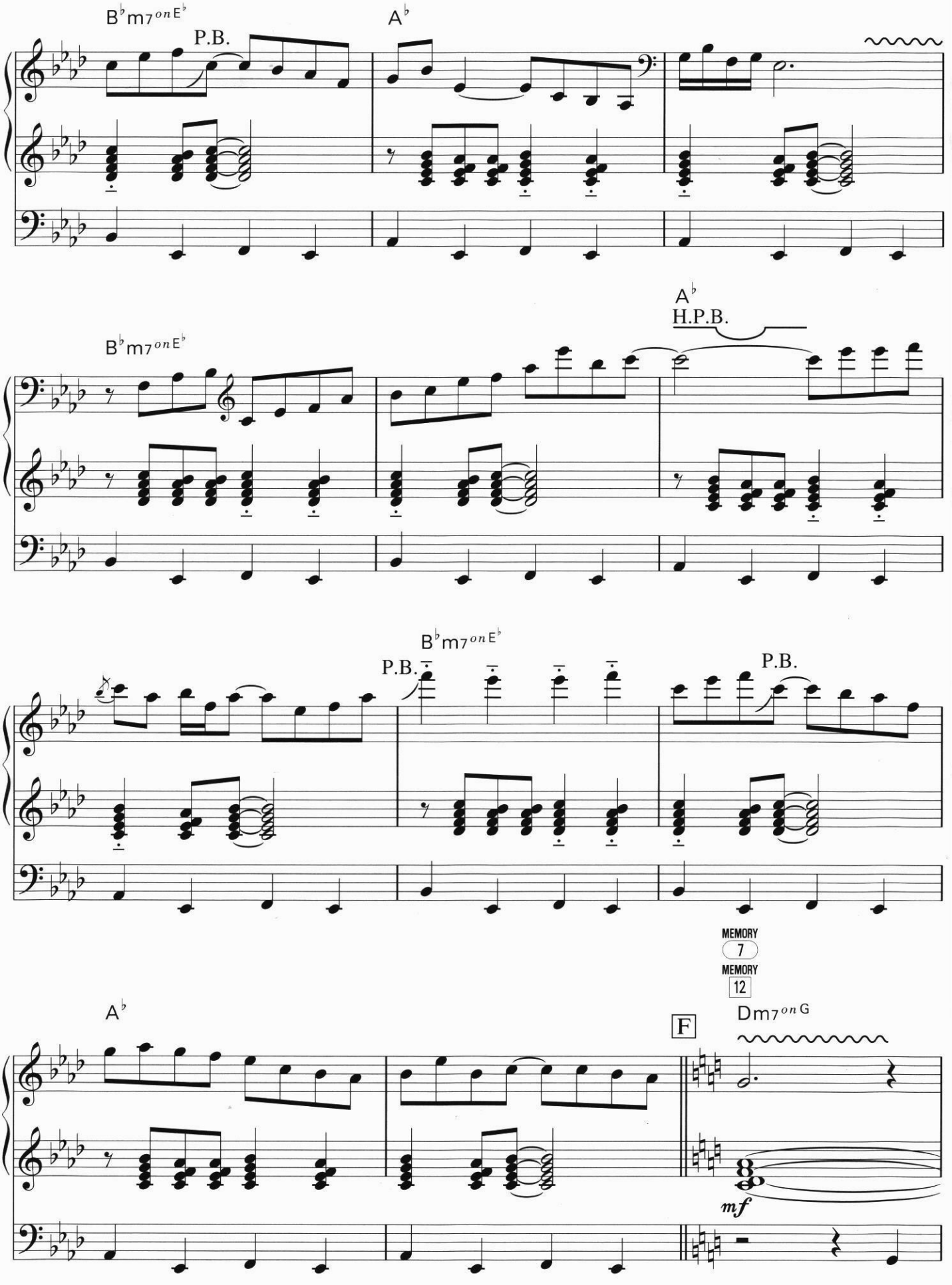
(注) EL-900m～200の場合，この曲ではSONGを2つ使用します。楽譜中のNEXTのタイミングで，自動的に次のSONGのレジストレーション・データがエレクトーン本体にセットされます。

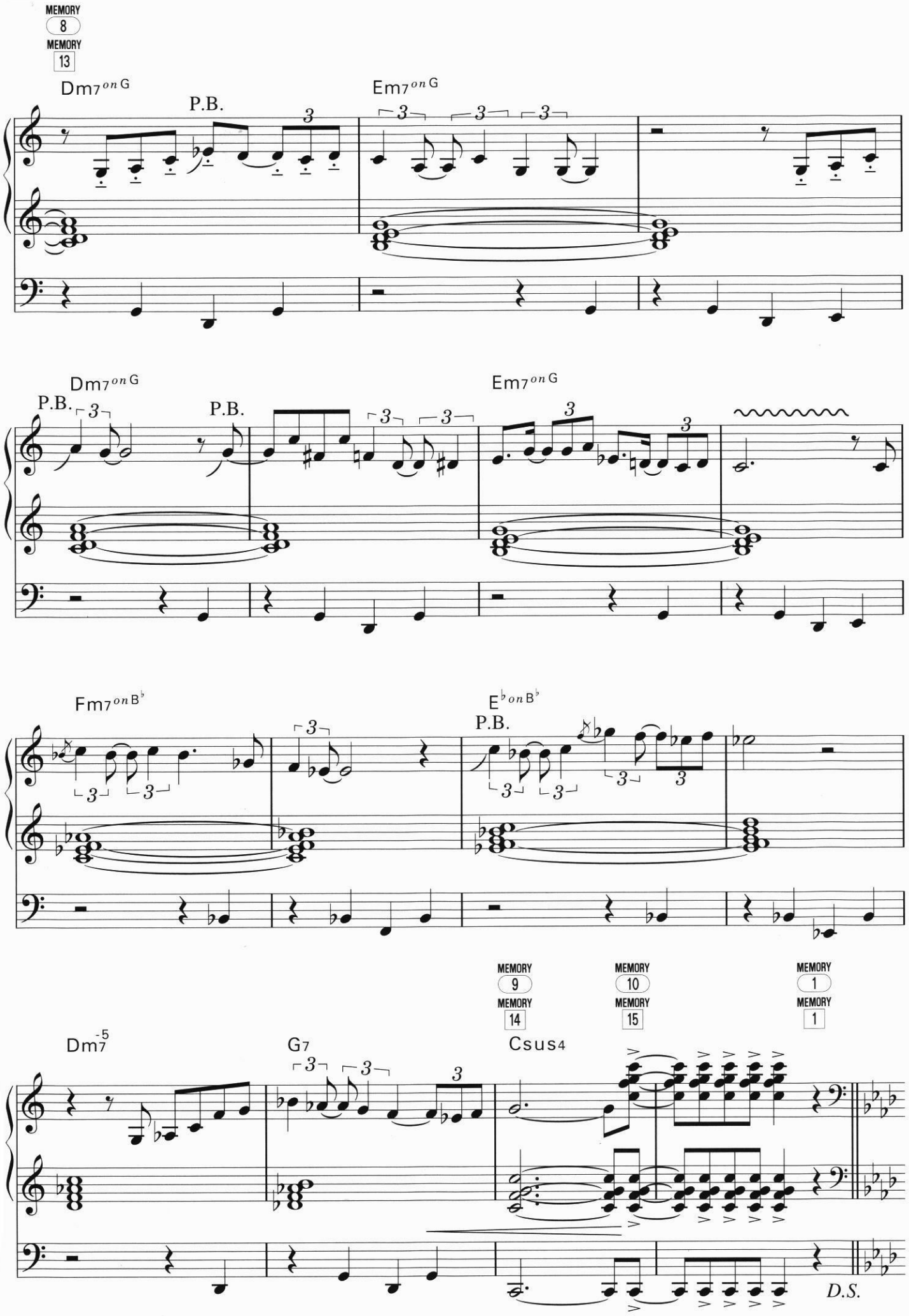


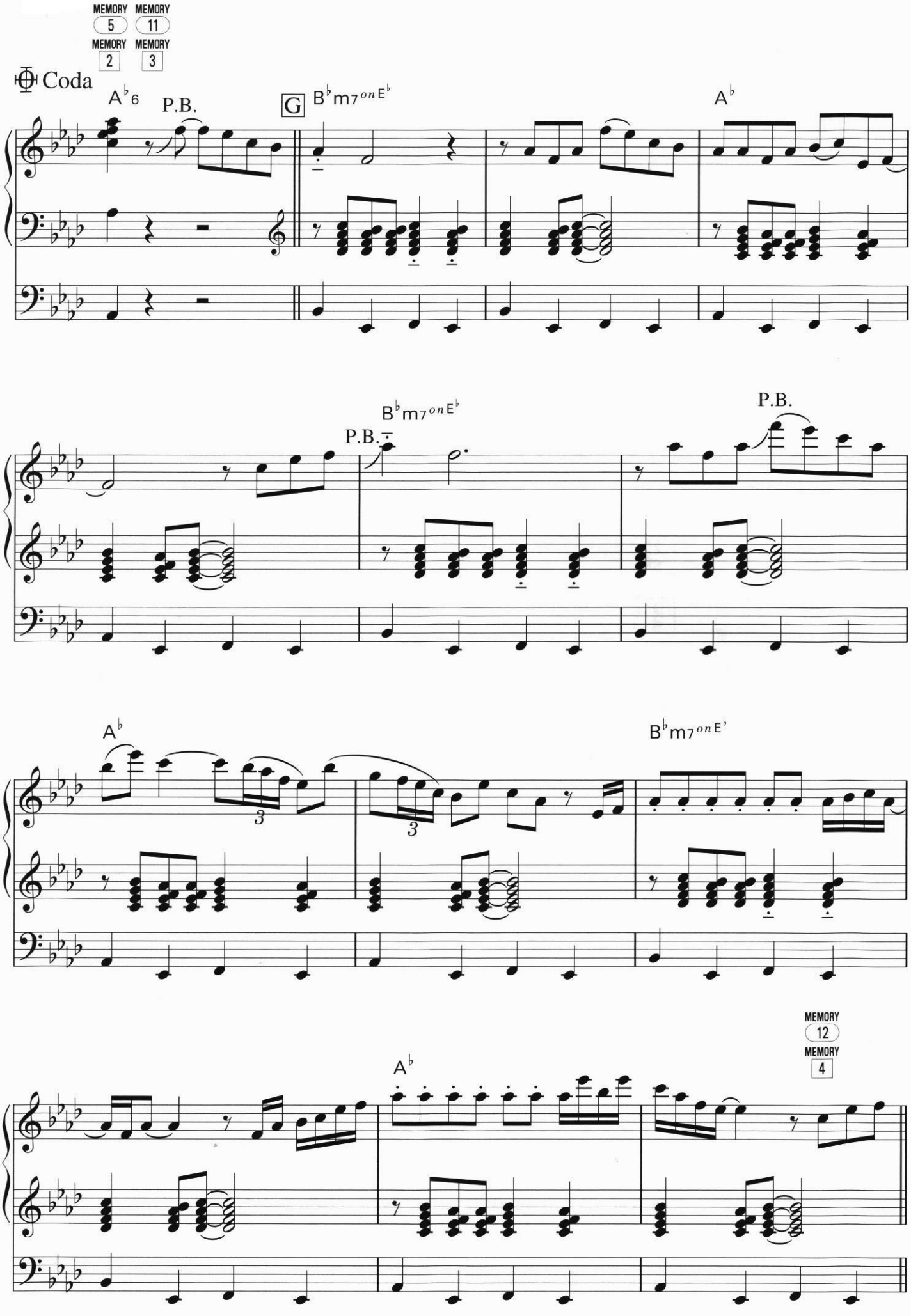

MEMORY 3
MEMORY 3
1.
2.
glide
B♭m7 on E♭
G on E♭
E♭7
E♭7
MEMORY 4
MEMORY 4
C
B♭m7
E♭7
B♭m7
E♭7
A♭M7
A♭6 on E♭
A♭M7
A♭6 on E♭
B♭m7
E♭7
B♭m7
E♭7
MEMORY 5
MEMORY 6
A♭M7
Dm7
G7

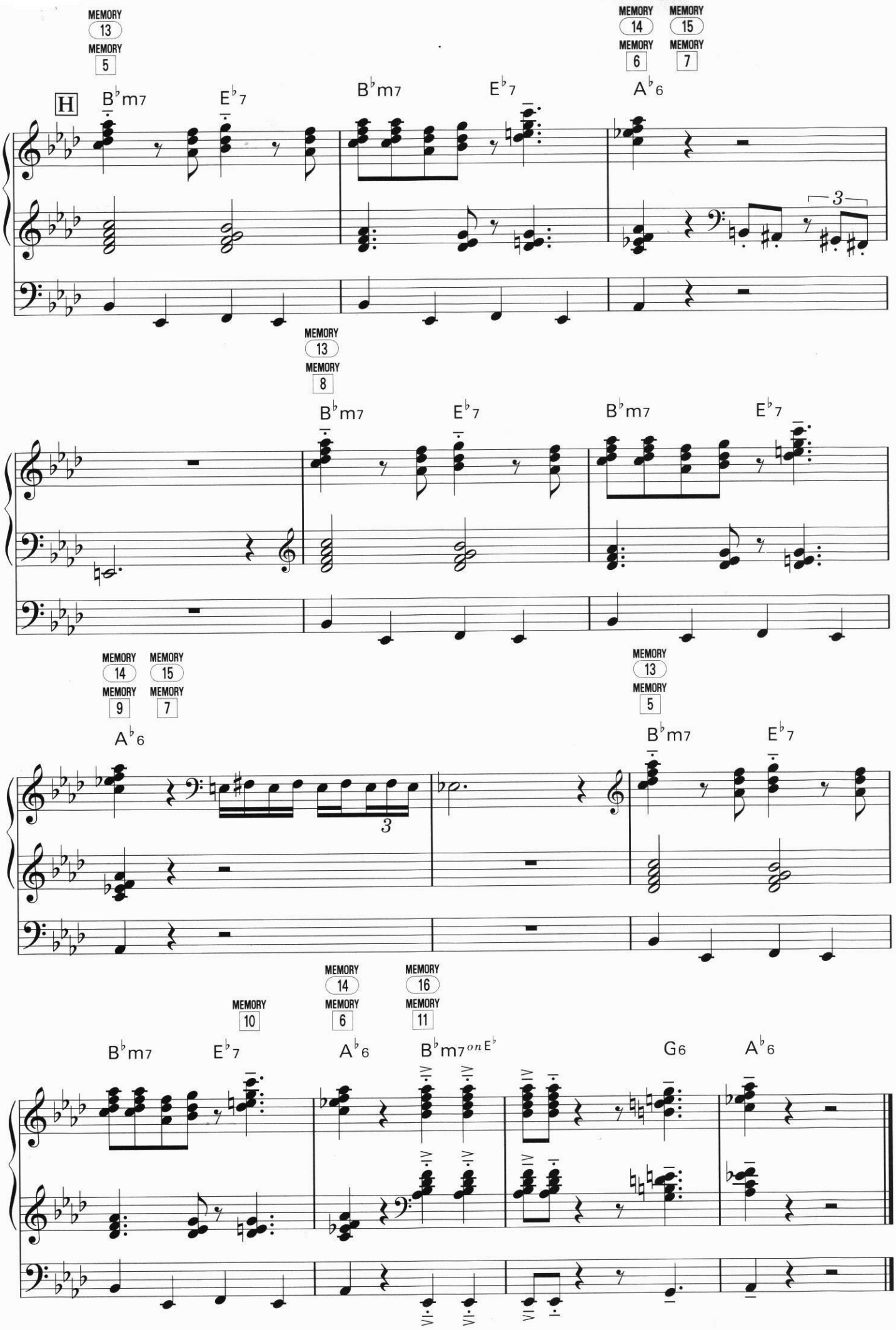

Dm7 G7 CM7 C6onG CM7 C6onG
MEMORY 5
MEMORY 7
Dm7 G7 Dm7 G7 CM7
MEMORY 4
MEMORY 4
B♭m7 E♭7 B♭m7 E♭7 A♭M7 A♭6onE♭ A♭M7 A♭6onE♭
MEMORY 5
B♭m7 E♭7 B♭m7 E♭7 A♭M7 A♭7onG♭ F7


MEMORY 8
MEMORY 9
D
B♭m7
F7
B♭m7
F7
B♭m7
MEMORY 6
D.S.time NEXT
MEMORY 10
D.S.time MEMORY 1
G♭7
B♭m7
E♭7
B♭m7
E♭7
MEMORY 5
MEMORY 6
MEMORY 7
MEMORY 11
A♭M7
E
B♭m7 on E♭
P.B.
A♭
B♭m7 on E♭
P.B.


B♭m7onE♭
P.B.
A♭
A♭
H.P.B.
B♭m7onE♭
B♭m7onE♭
P.B.
P.B.
MEMORY 7
MEMORY 12
A♭
F
Dm7onG
mf


MEMORY 8
MEMORY 13
Dm7 on G
P.B.
Em7 on G
Dm7 on G
P.B.
P.B.
Em7 on G
Fm7 on B♭
E♭ on B♭
P.B.
MEMORY 9
MEMORY 14
MEMORY 10
MEMORY 15
MEMORY 1
MEMORY 1
Dm7 -5
G7
Csus4
D.S.


MEMORY 5
MEMORY 11
MEMORY 2
MEMORY 3
Coda
A♭6
P.B.
G
B♭m7 on E♭
A♭
B♭m7 on E♭
P.B.
P.B.
A♭
3
3
B♭m7 on E♭
MEMORY 12
MEMORY 4
A♭


MEMORY 13
MEMORY 5
MEMORY 14
MEMORY 15
MEMORY 6
MEMORY 7
H
B♭m7
E♭7
B♭m7
E♭7
A♭6
3
MEMORY 13
MEMORY 8
B♭m7
E♭7
B♭m7
E♭7
MEMORY 14
MEMORY 15
MEMORY 9
MEMORY 7
MEMORY 13
MEMORY 5
A♭6
3
B♭m7
E♭7
MEMORY 14
MEMORY 16
MEMORY 10
MEMORY 6
MEMORY 11
B♭m7
E♭7
A♭6
B♭m7 on E♭
G6
A♭6

「フィガロの結婚」序曲

Overture from The Marriage Of Figaro K.492

作曲／W. A. Mozart

エレクトーン編曲／内海源太

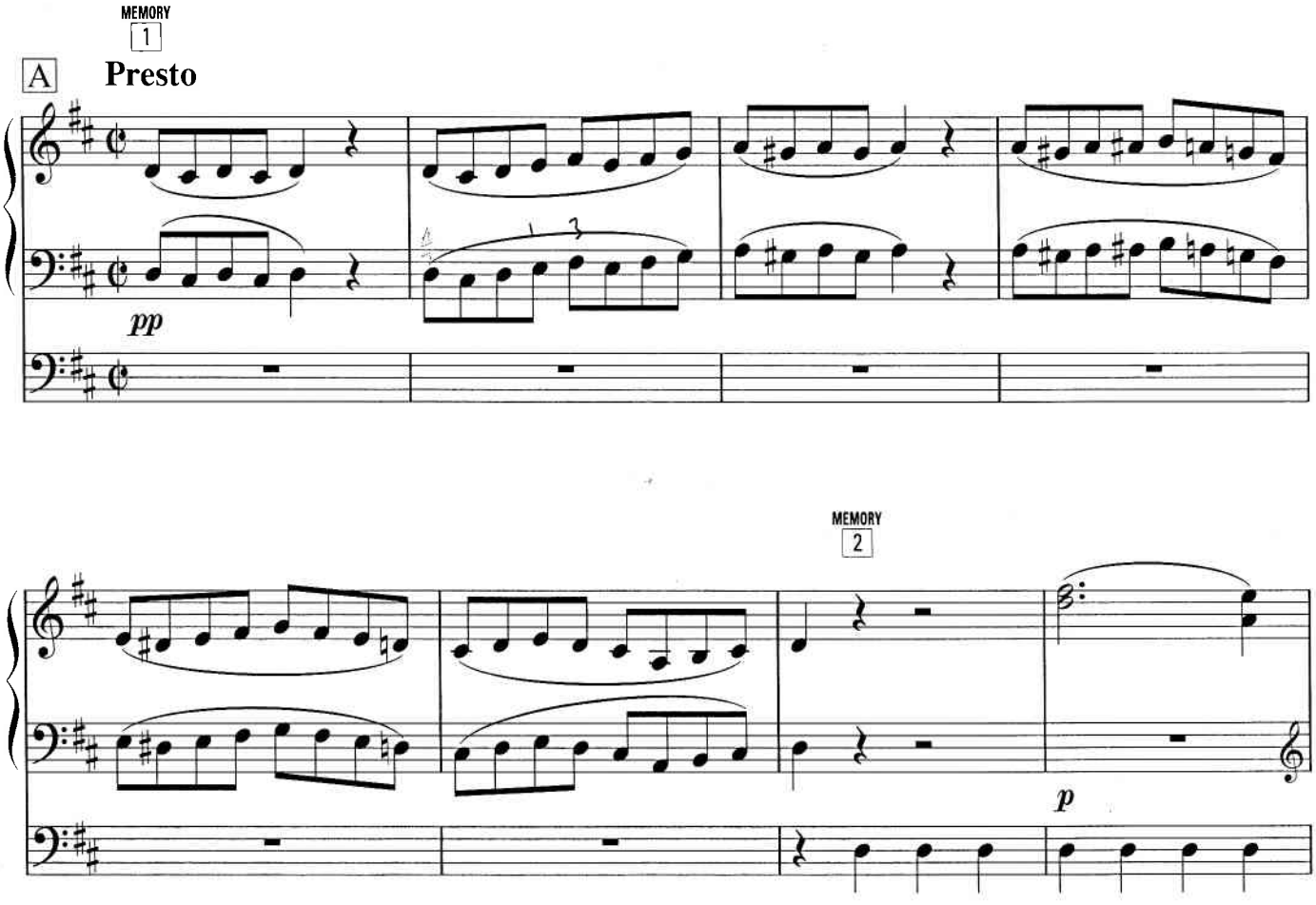
ニーレバー たたむ

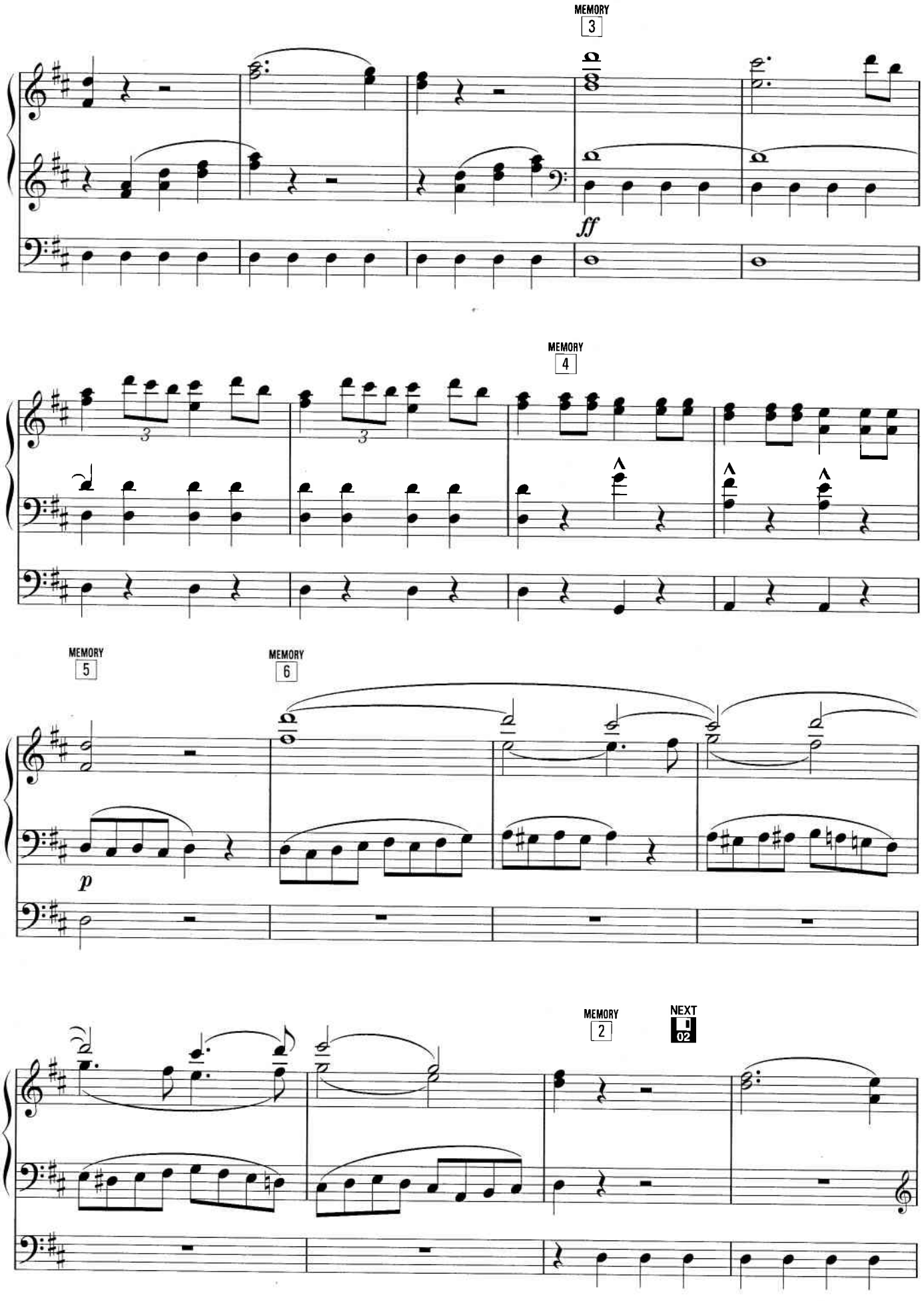
使用データ		内 容	操作手順（詳しい操作方法は➡68頁）	メモリーチェンジ	レジスト個数
☆ELS-01C・ELS-01	P（レジスト）	自分で演奏	01C Pフィガロの結婚 ➡ ▶（MDR PLAY） ➡ MEMORY 1	レジストシフト	8個

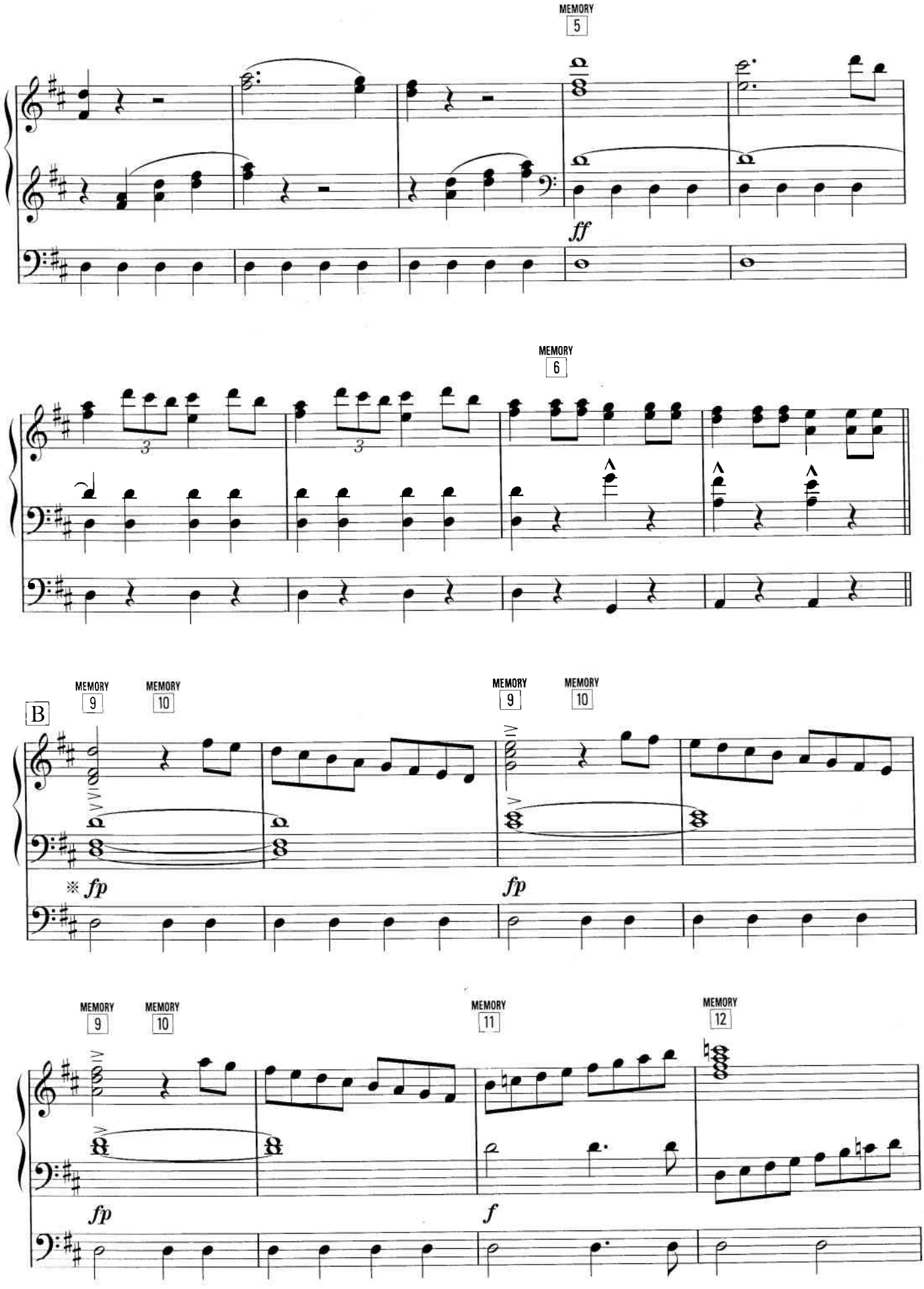
☆「ELS-01C（カスタム・モデル）データと「ELS-01（スタンダード・モデル）」データの2種類があります。操作手順は両機種「共通」です。

❶この曲ではレジストレーション・データを8つ使用します。
楽譜中のNEXTのタイミングで右フットスイッチを押して、次のレジストレーション・データをエレクトーン本体にセットしてください。

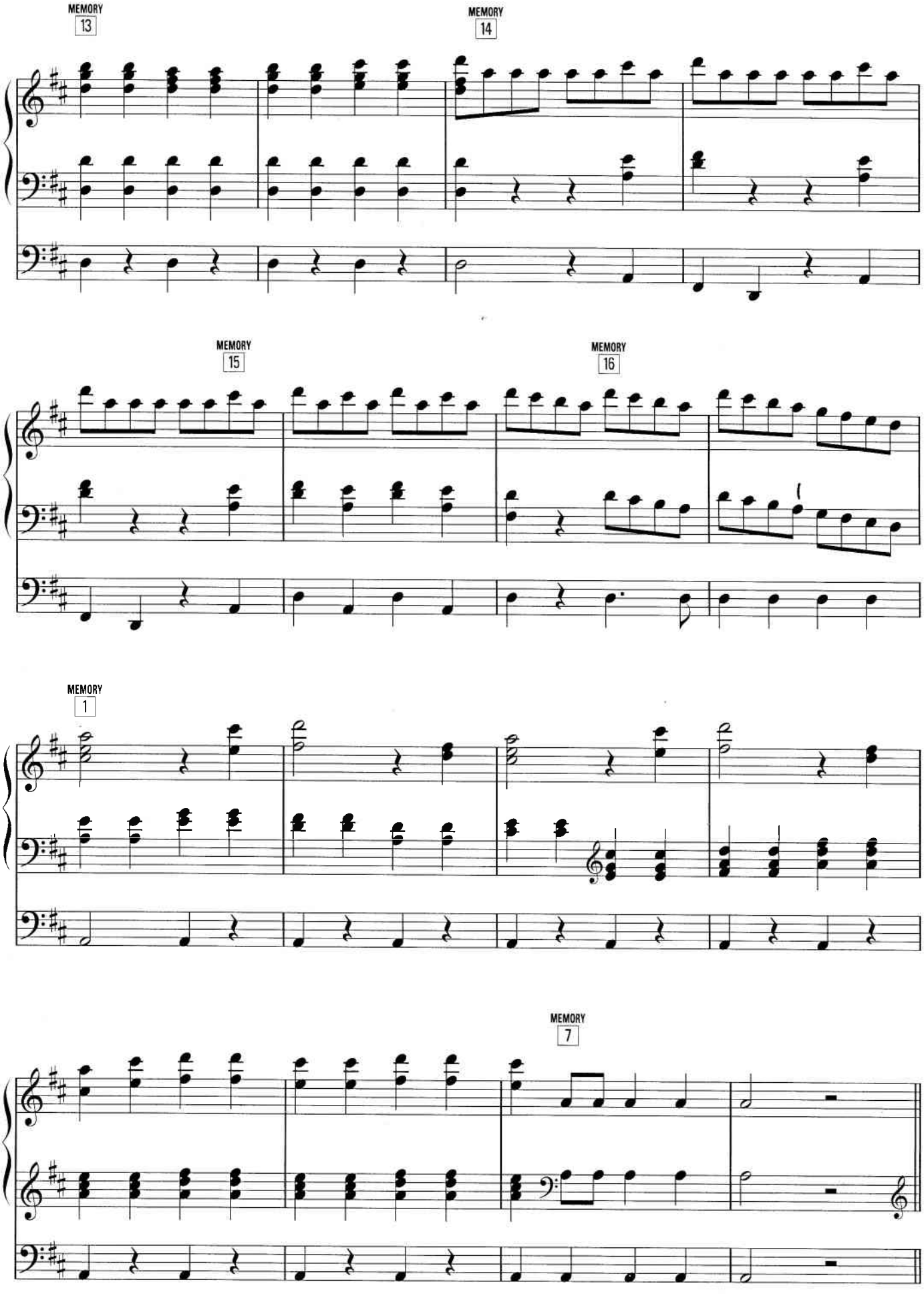
●この曲では、リズムは使用しません。

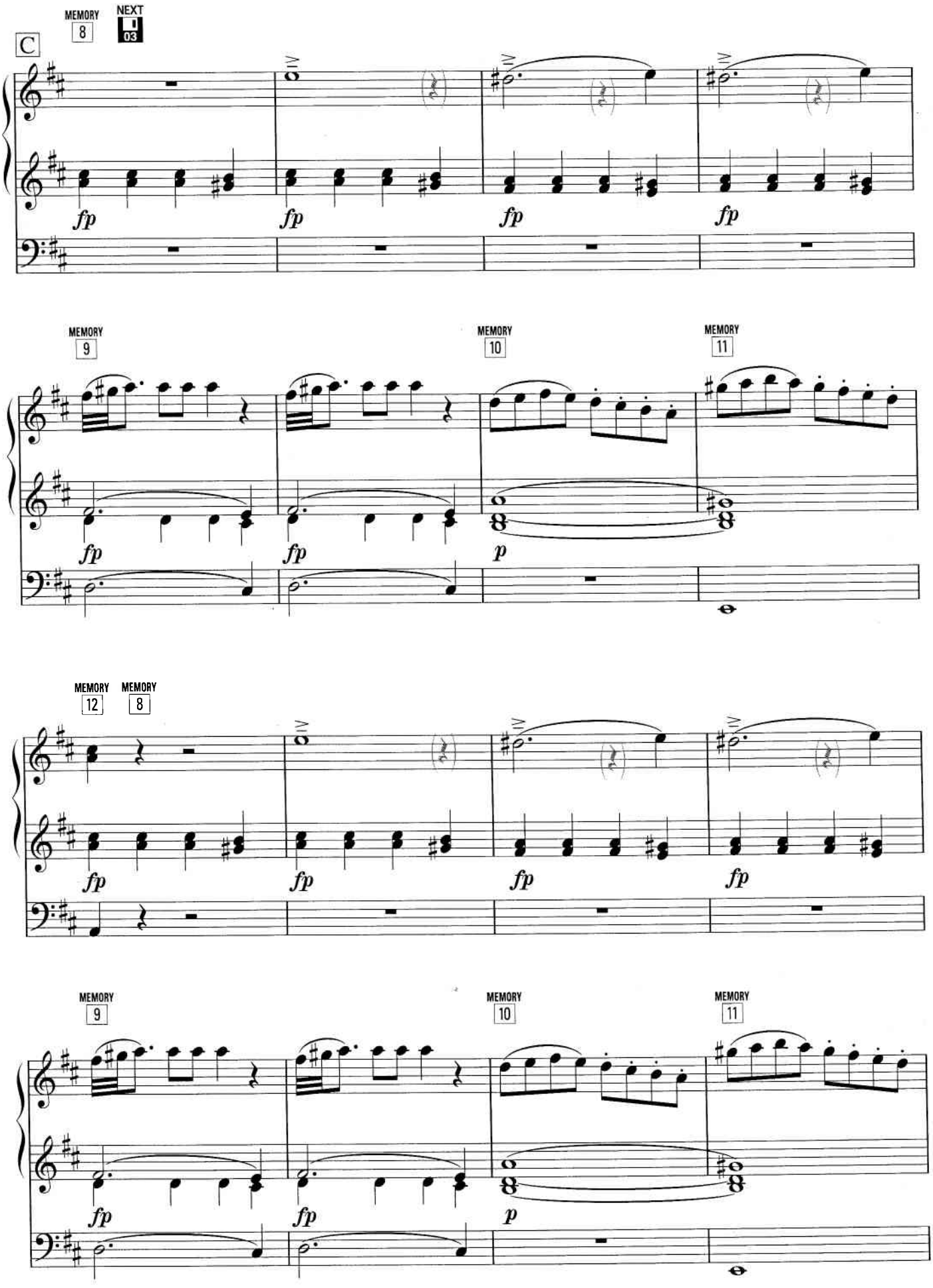


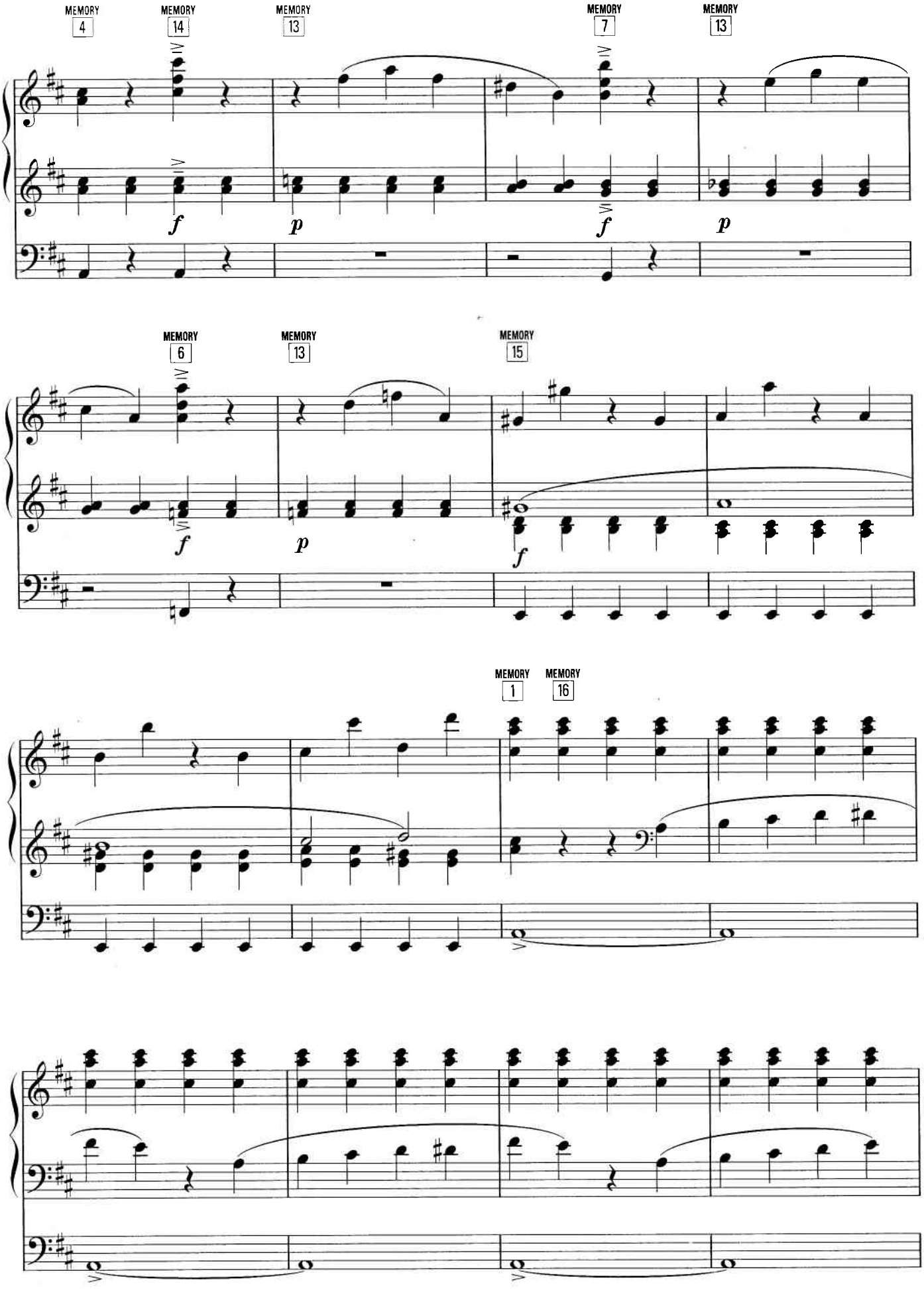

MEMORY
3
ff
MEMORY
4
MEMORY
5
MEMORY
6
p
MEMORY
2
NEXT
02

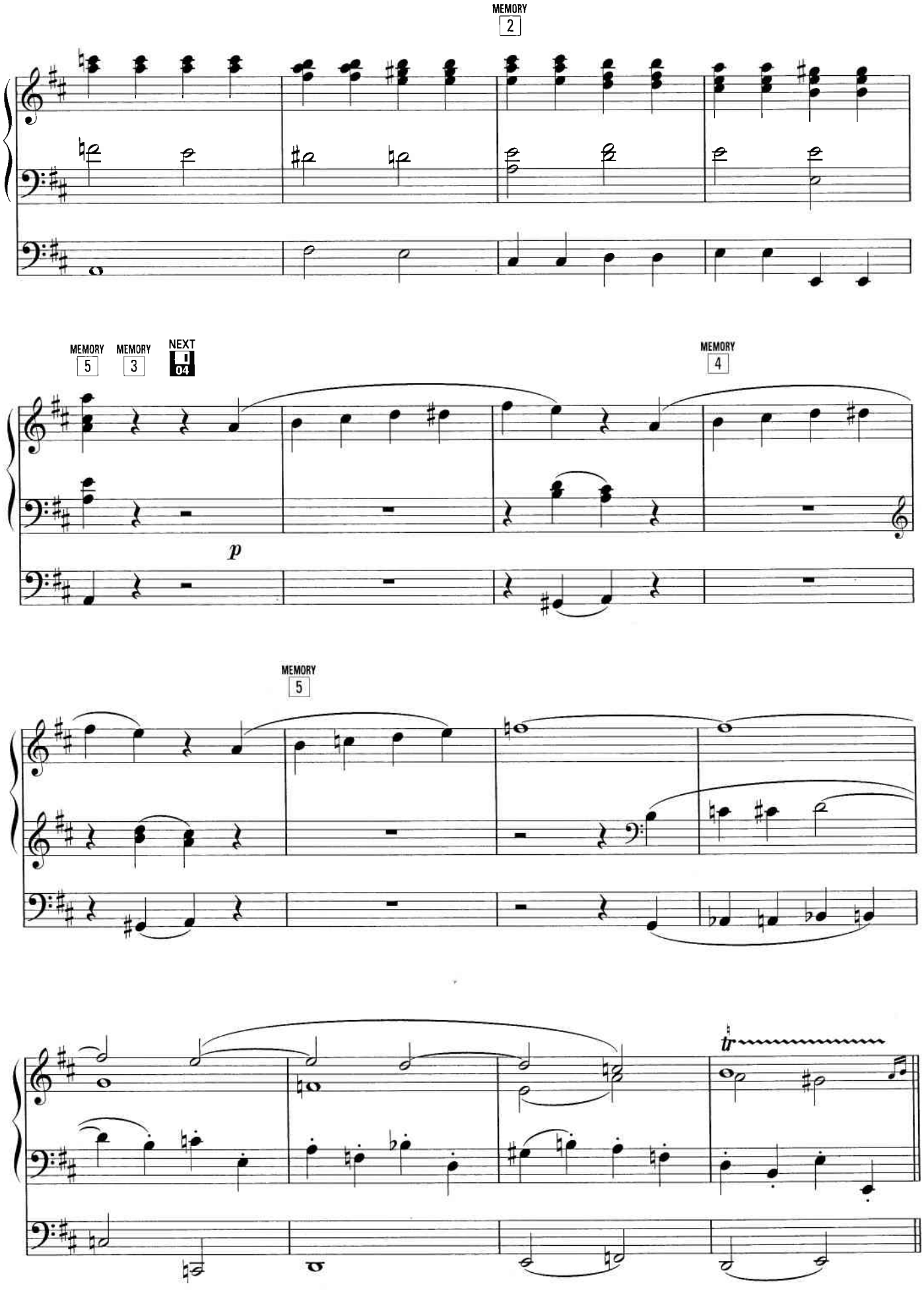


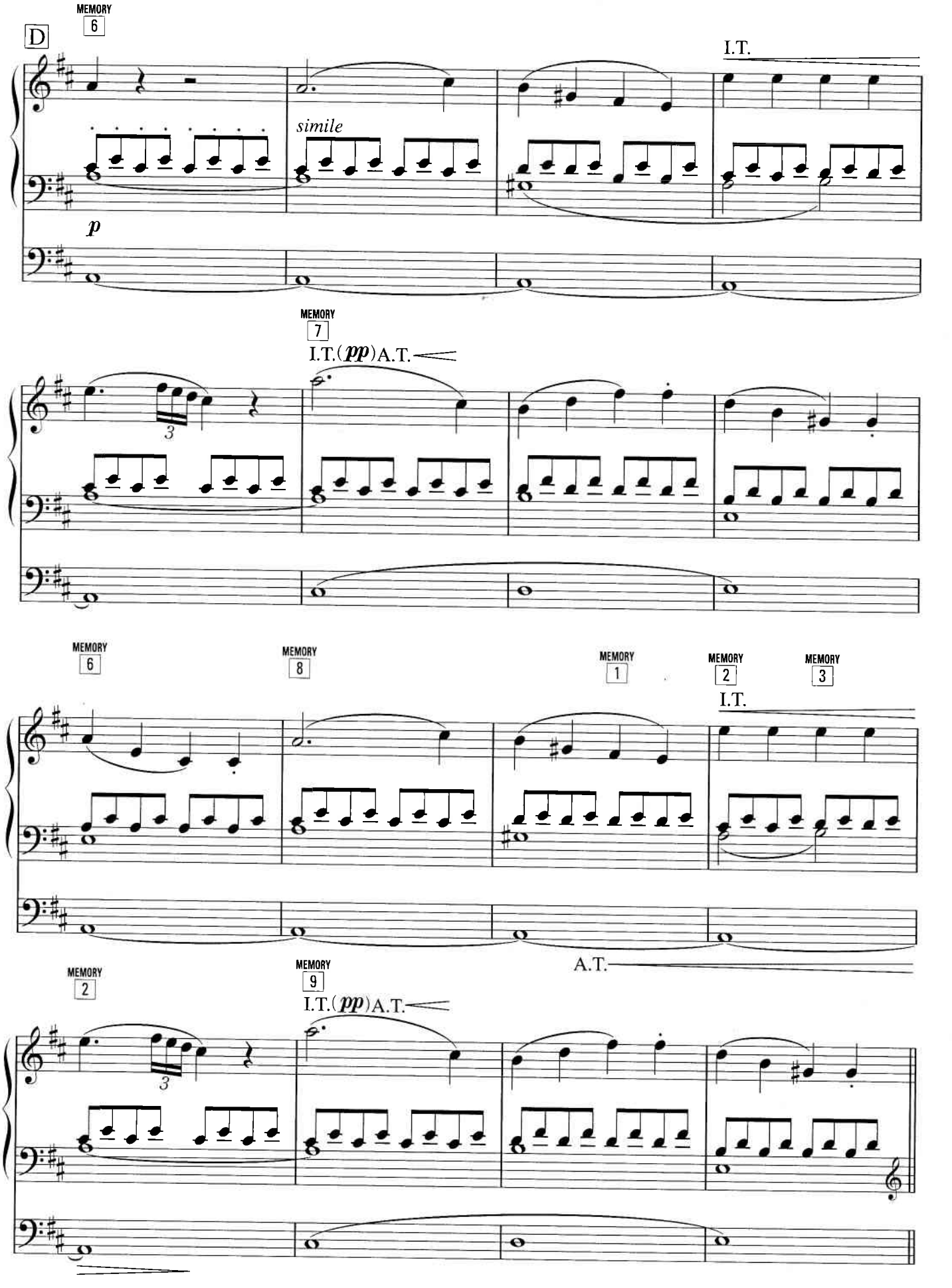
※同様、*fp*をエクスプレッションペダルであまりつけすぎないように気をつけてください。

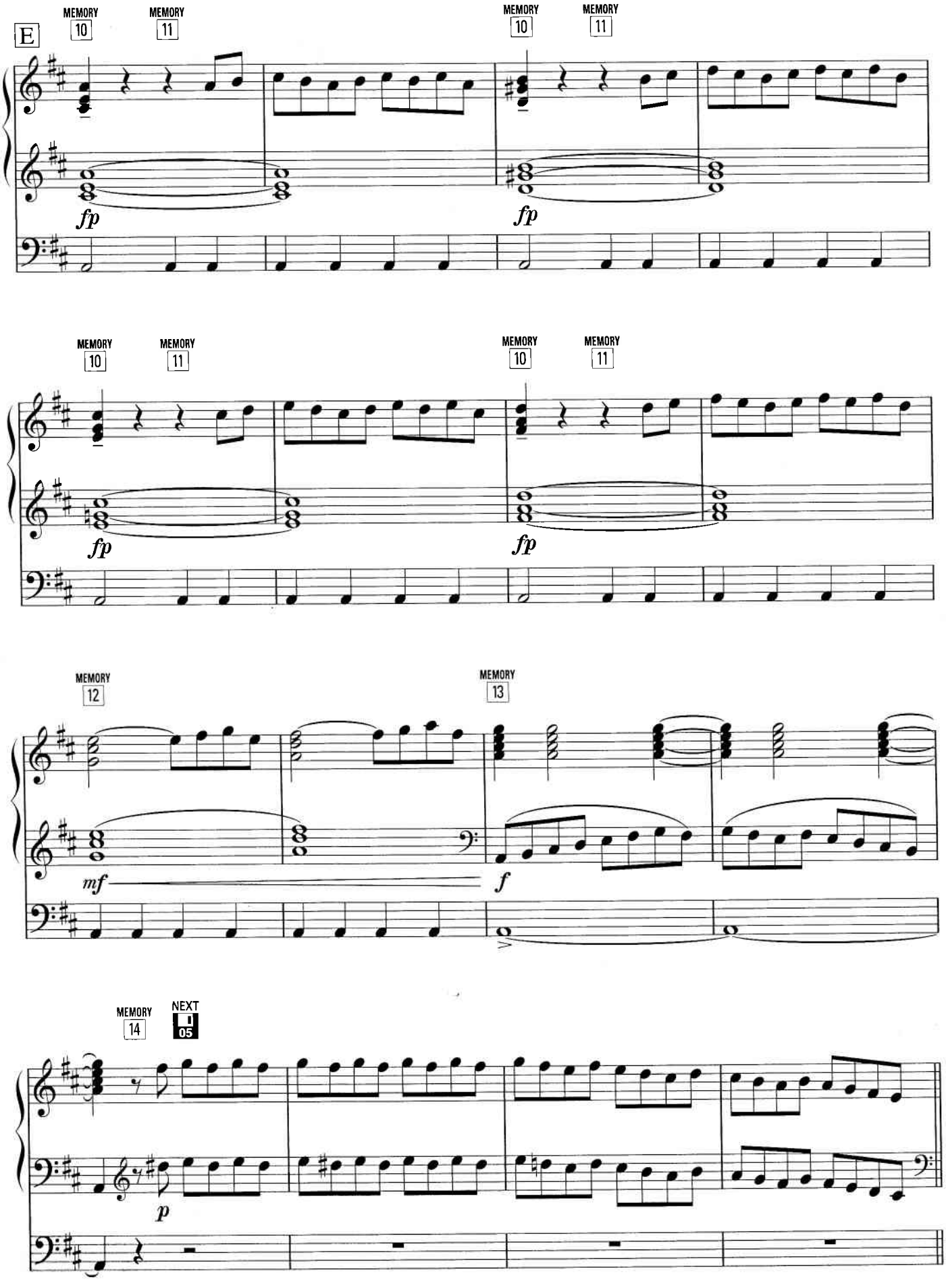

MEMORY 13
MEMORY 14
MEMORY 15
MEMORY 16
MEMORY 1
MEMORY 7


MEMORY 8
NEXT 03
C
fp
MEMORY 9
MEMORY 10
MEMORY 11
p
MEMORY 12
MEMORY 8


MEMORY 4
MEMORY 14
MEMORY 13
MEMORY 7
MEMORY 13
f
p
f
p
MEMORY 6
MEMORY 13
MEMORY 15
f
p
f
MEMORY 1
MEMORY 16


MEMORY 2
MEMORY 5
MEMORY 3
NEXT 04
MEMORY 4
p
MEMORY 5
tr


MEMORY 6
D
I.T.
simile
p
MEMORY 7
I.T.(pp)A.T.
MEMORY 6
MEMORY 8
MEMORY 1
MEMORY 2
MEMORY 3
I.T.
A.T.
MEMORY 2
MEMORY 9
I.T.(pp)A.T.


E
MEMORY 10
MEMORY 11
MEMORY 10
MEMORY 11
fp
fp
MEMORY 10
MEMORY 11
MEMORY 10
MEMORY 11
fp
fp
MEMORY 12
MEMORY 13
mf
f
MEMORY 14
NEXT 05
p

continues..

Appendix B (Transcriptions of Organist Interviews)

1. Andrew Gilbert, (Gilbert, 2014).
2. Janet Dowsett, (Dowsett, 2015).
3. Tony Pegler, (Pegler, 2015).
4. Keith Beckingham, (Beckingham, 2015).
5. James Sargeant, (Sargeant, 2015).
6. Paul Carmen, (Carman, 2015).
7. Peter Holt, (Holt, 2011).
8. Glyn Madden, (Madden, 2011).

Interview with Andrew Gilbert (AG), conducted by Christopher Stanbury (CS) on the 24 June 2014.

CS: OK, any ideas on this one? You're going to hear the same tune but different arrangements.

AG. Yep.

CS. [Plays Keith Beckingham, *Moon River* (Beckingham, 1967)].

AG: I'm going to say Keith Beckingham.

CS: Yes! Spot on.

AG: Just listen to the left hand chords!

CS: What's special about the left hand chords?

AG: Ah. If you watch Keith, he's got this lovely, where there's always one finger that's always glued down. And he's got this lovely counter melody sort of sitting behind all his chords. And, that's a Hammond and 122, which is his distinctive sound. Which, if you hear him play Concorde or something like that on later LPs, it's not the same. It's very distinctive. It's not his sound though. Don't tell him I told you! He would probably admit that Eddie Layton, from the States…

CS: Right.

AG: Ah. A lot of the sounds that Keith did, Eddie Layton had done. And Eddie Layton was the Hammond demonstrator that came across when Keith was starting and, obviously, you can't help but be influenced, but then Keith broadened the whole thing and put his stamp on it. But, a lot of the sounds, if you hear an Eddie Layton recording, like 'Stormy Weather' by Eddie Layton and then, Keith Beckingham playing 'Stormy

Weather', there wasn't much difference. Keith had this lovely easy listening style. And, a lot of my Hammond stylings, drawbar stylings, still comes from Keith.

CS: Ok. So this one…

[Plays Jerry Allen – *Moon River*, (Allen, 1971)].

AG: Different tone. Totally different, yeah. Who's playing? Lowrey?

CS: Yes.

AG: Now, which of the guys would it be? Jerry?

CS: Yes, spot on! [Laughter].

AG: It's only got to be Jerry, or one of the Americans, but yeah.

CS: A different sound?

AG: Yeah. It's a totally different sound. I mean, the Hammond had this lovely sort of very clear, sort of, with the percussive sound, but this is more laid back.

CS: And, that top line? Strings? Or some sort of clarinet, reed type thing?

AG: Yeah. Depending on the era. The Lowrey had a totally different sound. The Hammond had this lovely clear, percussive sound but that is more laid back. You'd deliberately not play it like a Hammond, you'd put Strings and Clarinet through it, whack it through the Leslie and it would fizz. Just put everything through the Leslie. Then, after that, they started getting clever, you had flutes going through the Leslie and you couldn't put reeds and

strings through the Leslie. But, an old Lowrey, you could make it fizz.

CS: OK. Change of song. Now, this one, you might not get.

[Plays Dick Delany, *Satin Doll (*Delany, 1964)].

AG: Hmmm. Well, it's a Hammond C3 or B3, definitely. American.

CS: Dick Delany. I spoke to him on the internet, because one of the things that I've noticed with the early stuff, not with Keith or Jerry, but those sorts of studio recordings: the bass, he doesn't play.

AG: Hmmm.

CS: And I realise, of course, a C3 doesn't have bass sustain. And, he also said that they put an acoustic bass in because the pedals wouldn't record well at the time. Is that something that you found? That the C3 bass was always a little…

AG: Well, when I did my early Hammond stuff for the BBC in 1973, that they recorded, I always used to tell them where to position the microphones. It was very important to pick up the right sound: "Can I move the mics?", "Ok". We used a different microphone on the Leslie bass rotor. They didn't know what a bass rotor was. So we have a condenser mic up here for the highs and an AKG202 dynamic mic for the bass rotor for the lows. We were in mono in those days. It was all to do with how you placed the microphones around the Leslie. Sustain? The Hammond didn't have that facility and they grunted. Ah! You could kick the Hammond to death because it didn't have sustain and you can't do

this lovely sort of fizzy sound. It's got a lot to do with it. It didn't have that facility and it grunted. If you're trying to compete with a Lowrey, which didn't grunt, maybe that's got something to do with it.

CS: Next one. You might know who this is. [Plays Harry Stoneham – *Satin Doll* (Stoneham, 1967)].

AG: Hmmm. Lowrey Heritage or Lincolnwood. As to who's playing it – Harry Stoneham.

CS: Yep. This is from *Two Fellas to Follow*.

AG: Yep.

CS: This is my favourite version. I love it. You can hear him pumping the expression pedal.

AG: Yes, that was very much his style.

CS: The bite that is on the Heritage…

AG: Yes?

CS: How much of that is the Leslie? Could you distort the Leslie?

AG: That sounds like it's using distortion, yes. The Heritage and Lincolnwood were valve anyway. You could turn them up. You could make them distort. If you wound up the gain on the Leslie and floored it you'd get this lovely gritty sound. Harry did it and Alan Haven did it.

CS: Yes. I can hear the Leslie spinning up and down quite a bit.

AG: Yes.

CS: In general, how important would you say having a Leslie on the organ was at that time?

AG: You mean for Lowrey?

CS: Well, both I suppose.

AG: Pretty essential. Yeah. For Hammond, there are a couple of Hammonds that I like “sans Leslie”, the inimitable X66, of course, and the H100, but I'm afraid for me the other models are pretty lacklustre without the added sparkle that the Leslie delivers so well.

CS: And the same for Lowrey?

AG: Yeah. You really needed it.

CS: I’ve noticed that there aren’t a lot of registration changes. Was it quite difficult to do, to change the sound whilst you’re playing?

AG: You’d need to be pretty fast. I’d certainly have to sit down and practise it now. But, I can remember thinking “How the hell did I play that?” Everything over there [gestures] and I think: “OK, well, my hand goes over there and hits that for a split second [gestures]. It was hard work work on those. I mean, that was the point of the spinets, why they were smaller than the Hammond console models, to get them into people’s homes. And, they sold very well because of it.

CS: Here’s another recording of Harry, playing *Wave.* [Plays Harry Stoneham, *Wave* (Stoneham, 1976a)].

AG: [Listens]. I expect the AOC will come on in the middle!

CS: Yeah! I think it is in the middle eight. But what’s interesting about this, I tried to do this, and I can’t get it. You can’t do that, play it live because if you try and do that left hand, the AOC cuts in and out. So, you can’t have sustained notes like you hear there.

AG: Yes! Oh! So, are we into multitracking? We must be into multitracking. You’ve put the accompaniment in and then sit there with a silent sustained chord and later put the AOC over the top, yeah.

CS: And that sort of thing, to listen to it, you think is brilliant. Well, it is brilliant anyway, but you can't do it live.

AG: Because when you take your hand off the keys you lose the chords.

CS: And, it's a later Lowrey. A TGS-1.

AG: Ah! You know, I used to play one of those in a hotel in Brighton. The TGS-1 had the usual flutes and Leslie, plus the Symphonic Strings. I always felt Lowrey went overboard with the phasing of the strings and they were very mushy. Not at all realistic but they blended well with the flutes in a theatrical manner. These sounds only really worked one at a time, adding them together often produced weird effects! It was a bit of a pig to play. To go from organ to solo sounds meant switching off all the flutes and strings and selecting the required solo voice, for example. An awful lot of rocker switch pushing! But the overall sound was very smooth and quite loud, so in a hotel environment or home it was more than enough. I wouldn't have wanted to play a concert on one though.

CS: [Plays Glyn Madden, *Wave* (Madden, 1979)].

CS: This is…

AG: Glyn Madden!

CS: On an E50.

AG: [Listens.] Because now we're getting into better orchestral sounds, but they were mostly solo voices. The E50 had no strings, we didn't get that until the E75, I think. But its definitely getting more orchestral.

More solo stuff, but you've still got the organ sound, which people expected. Which is why the later Yamahas were such a change.

CS: Lastly, this one. [Plays Max Takano, *Tea for Two*, (Takano,1988)].

AG: Hmmm. Different. This is Japanese.

CS: Going back to what you were saying about solo sounds. I suppose its true that the piece uses a lot more orchestral sounds.

AG: Of course, and presets. There is no way you would play something like that without presets or registration memories. The arrangement had to match the instrument. But we now get to a stage where you just cannot play this sort of thing without presets.

Interview with Janet Dowsett (JD), conducted by Christopher Stanbury (CS) on the 30 June 2015.

CS: OK, so, I'm currently looking at Glyn's performance of *Wave* (Madden, 1979) on an E50.

JD: [Laughs]. Right! Gosh, that's going back some!

CS: And I'm now moving on to looking at the HS series and EL series, the late eighties and nineties.

JD: Uh huh.

CS: From what I remember of the HS and EL, from speaking to others about it, they were a huge change.

JD: Mmmm. [Nods].

CS: Can you remember seeing an HS for the first time and thinking "what is this?"

JD: Yes I can, because I was working at Yamaha and I was officially a demonstrator for Yamaha, so we got to see them first. "We" being me, Glyn and Steve Lowdell.

CS: Right.

JD: And, the technology was completely different to what had come before. And, the possibilities of it were incredible. The sounds were quite stunning. We had five models to sell. My first impression of the HS8 was the wheel on the right hand side, which was a visual thing. You turned the knob of the wheel to get all of the different functions. Which was great for registering things in advance, but you couldn't play it on the fly. Whereas with what had come before, with something like a

D85, with a D85 you could register it as you went along and you could do something different every time. But on the HS, and, later the EL, there was no earthly way of making it sound right: the balance, sustain, because everything was so individual. Vibratos, yeah.

CS: The HS was the first one with sixteen buttons between the keys. The registration pistons.

JD: Yes, that's right. And also we had RAM packs and, later, disk drives. It transformed my playing because I could register things intricately for the first time. I found myself capable of long medleys with good, proper registrations. Your registrations started changing, because instead of having a general registration which was OK and very pleasant, you could actually work out an arrangement in advance and say "on bar four, beat three, I am going to have a crash symbol and it's going to be exactly this loud, with exactly this level of sustain." Therefore, the arrangements were suddenly available, which suddenly meant you had to stay away from the usual *Girl From Ipanema* sambas, or bossa novas and things like that, or the *Colonel Bogey March* and anything that actually would have fitted a theatre organ. Because suddenly we were into the theme from *Superman*, which at the time I remember and *Raiders of the Lost Ark* and things like that, which could not have worked without lots of intricate registrations. It also had the kick switch to the right. That was the other revolutionary thing. Because the registration changes could be done with your foot and therefore, again, the intricacy of registrations was suddenly available. It was a totally different way of thinking.

CS: Did everybody at the time welcome this?

JD: Everybody at Yamaha did. I was in the Yamaha world where it was all really exciting. And, of course, were influenced by the Japanese. By Max Takano in particular. When we saw what they were doing, what the possibilities were, I seem to remember Glyn being sent to Japan on a course specifically on how to play the instrument.

CS: I would imagine that Yamaha, at the time, were trying to distance themselves from the Hammond organ.

JD: Yes, it was revolutionary. In fact, we forgot how to play organ sounds for ever such a long time. We did. I remember all of us getting accused of not playing organs anymore. In fact, people didn't think they were organs anymore because they became orchestras. And then, Yamaha went through a phase of calling them multi-keyboards, instead of calling them organs. Because they weren't organs as we knew it. We were trying to emulate orchestras. For the first time, it really did give you realistic sounds, we didn't have to pretend anymore. For me, the creation of that instrument changed my playing, for the better. It pushed my technique. For me it was the kick switch, the registration memories and the disk drive and the glorious sounds. Every time a new sound came out we had to exploit it, to sell the instruments. It made our musicianship better. I remember the excitement with some of the voices in particular.

Interview with Tony Pegler (AG), conducted by Christopher Stanbury (CS) on the 11 July 2015.

CS: Ok. So, what I'm going to do is play you some music, and the way it's worked with..

TP: Other suspects [laughter].

CS: It's not a test in any shape or form! I found, so far, that in most cases you will be able to probably tell who's playing.

TP: Hmmm. I didn't really listen to a lot or organ music, after it got a bit silly. So, the whole, ah, this is a bit disrespectful but, the whole Wersi nonsense. I didn't, y'know…

CS: Ok, well, let's start with this. Ready?

TP: Yeah!

CS: [Plays Keith Beckingham, *Moon River* (Beckingham, 1967)]. Oh, that's nicely done. Using a long decay. Second harmonic percussion through the Leslie, so, oh, so it's old drawbar. It's accurate, beautifully played. It's Keith! That's really nice. Lovely playing.

CS: What makes it lovely?

TP: It's very stylish. Do you know what I mean? And he does that lovely glissando. Nice.

CS: What about the left hand?

TP: Erm. Very Eddie Layton. Of course, little counter melodies. Very nice. When Keith was first associated with Hammond, he was the "boy wizard". They made a record for a magazine, it was his first record. I remember it. Beautiful.

CS: So, that's Hammond with reverb?

TP: Yeah.

CS: How important is reverb to the way you play?

TP: I think it…I'm going to be just a little bit nerdy. If you listen to the reverb on that, it's something like a 147 but it's not a 147RV where the reverb went to straight speakers. Here, unless I'm mistaken, the reverb is going through the Leslie and so I think that definitely changes it. I think that's also studio reverb. I think it changes your playing because, I suppose, it's a little bit like a sustain pedal on a piano. You can use that when playing legato and make everything blend just a little more… It would certainly help that style and that is Keith's style. So I think you could say that reverb is actually quite important.

CS: Ok. Next one. Same piece, different player. [Plays Jerry Allen, *Moon River*, (Allen, 1971)].

TP: This is fun! [Listens]. That's Jerry. He knew all the professional's chords. You know? It's a strange registration.

CS: That's a Lowrey?

TP: Yeah. There's the Leslie slowing down. Hmm. Interesting. It was a favourite sound of his, the melodeon sound, he used it. Because, quite a few of those transistor Lowreys, er, had that and he liked it. I think before they had presets, I can't remember what it was, but some of them had a switch that said "Slow Attack". Slow Attack certainly changes the way you play . It's lovely. It's an interesting thing that I don't think other

instrumentalists appreciate... that you can take a guitar sound, and then play the same thing with a flute sound and it almost feels like the keys press differently. It's spikey for guitar and you can almost imagine that there's a pick that you kind of click through. That must affect the way you play. You know, that was the big distinction between the Heritage and the later ones. The Heritage is a very different sound to the transistor flute. The Heritage flute, for me, unless my memory is not so good, had more noise in it than a purer a tone. And I think that, possibly, it was a bit edgier. The Heritage that Harry and Alan Haven had. I find the Heritage much more edgy. Also, the valves were much spitty-er. Their early albums on the Heritage, oh, absolutely iconic. The transistor sound always had a bit of the attack nipped off. But, going back to Jerry. He was doing the real music world. He was doing the Palladium, tours with theatre people and working with all the big names on *Lunchbox*. So was Harold Smart, who did *Music While You Work*, all that kind of stuff. They were working with the real arrangers, so that's why you get the proper chords, proper stuff. You know? Harry is from that world too, there weren't many. They competed with real musicians. I think that had a lot to do with the way the organ went. The older styles weren't always great. Now, things like the swell pedal. You listen to early Alan Haven, and it's fearsome. In *Annie's Room*, it's going up and down like nobody's business. That's adding

percussion, but it's quite bizarre! But, then, Keith with his legato swell pedal was different too.

CS: Ok. Have a listen to this. [Plays Harry Stoneham, *Satin Doll* (Stoneham, 1967)].

TP: Oh, that's Harry. Ah! On Heritage.

CS: AOC on top?

TP: Yeah, he's just turned it off. It didn't work on five and third and two and two thirds anyway. [Listens]. He's using it now, I think. I mean, that's interesting. You listen to that, it's quite spitty.

CS: Yeah.

TP: Can you hear the swell pedal? We were talking about the swell pedal. Yeah! Do you notice also that the bass pedals are going straight?

CS: Yes, that's because he had his own box?

TP: He did, he did indeed.

CS: Is most of that AOC?

TP: You can't tell here, it's quite flicky. AOC only works on 8,4 and 2. What a brilliant idea! So, if you were using something like 16, 8 and 2 with AOC only on the 8 and 2 foot, you get a kind of George Shearing thing. That's lovely, really good.

CS: OK. A different song. [Plays Harry Stoneham, *Wave* (Stoneham, 1976a)].

TP: Ugh!

CS: Is this still a Heritage?

TP: Are you absolutely sure this is a Heritage?

CS: No.

TP: It's not a Heritage. Right. Wind that back a tiny bit. Listen to that. Listen to the two and two thirds and listen to how that is speaking faster than the other sounds. Well, the Heritage never did that. First of all, you wouldn't use a two and two thirds without five and third. When was this done?

CS: Mid seventies.

TP: You'd be hard pushed to find a Heritage working then.

CS: Really?

TP: Yeah. Dave Smith had one at the Lowrey place in Braintree. I think this is something else.

CS: It's got AOC on it. But, his left hand. How's the left hand being played?

TP: Multitracking? Because it couldn't do that. Did you ever see Harry play on Parkinson? There's a YouTube clip somewhere.

CS: It's been removed!

TP: No! Where he points to him. Harry said that was the highlight of his musical career. Being pointed at by Duke Ellington! He wasn't expecting it – they didn't do it in rehearsal.

CS: Yeah, it's gone now.

TP: Harry was such a lovely man.

CS: Ok. Try this [Plays Harry Stoneham, *Tuxedo Junction* (Stoneham, 1976)].

TP: Eugh! What is that!?

CS: Symphonic Holiday.

TP: Is it really? Oh gosh. Can you hear that half of the stuff is going through the Leslie, the other half not?

CS: Yeah.

TP: Is it really? Gosh! It's not a nice noise really. Is this on …

CS: The album is *This Is Harry Stoneham*.

TP: I don't understand that. I don't understand why he would have pushed those buttons, because it is a horrible noise. Do you like it?

CS: No, not really.

TP: No, I don't. I know why its like that, because don't forget we were demonstrators. We had to play what they told us and sometimes we had to exploit stuff that was really horrible. You can tell this is promotional.

CS: It is horrible, but this is starting to try to sound like a big band. Whereas the early stuff wasn't trying to be anything but organ.

TP: That makes sense. Does it not follow, then, that if you've got a button labelled "this", then you're going to try to play like "that"? There were some players that could do that, and some that couldn't. Remember the MX1? It was cutting edge in its day. Don't forget that we were paid to make these instruments sound good, when sometimes they really were tricky to play. I remember Jerry [Allen] demonstrating the Lowrey MX1, which was a huge advance because it had automated computer backings for the first time. It was designed for home players who just held the chords down. But, it only works with the most

basic chords, like a minor seventh and so on. So, all these lovely chords, he couldn't play. It sounded terrible when he tried and he hated it. He wouldn't play it.

Interview with Keith Beckingham (KB), conducted by Christopher Stanbury (CS) on the 6 September 2016.

CS: Keith, thank you very much for agreeing to talk to me about *Moon River.*

KB: It's a pleasure. You have certainly analysed my recording very well and I commend you on your attention to those little details that make all the difference!

CS: Thank you. I'd like to start by asking you about your approach to left hand accompaniment. I notice you have a very distinctive style. In *Moon River*, the accompaniment part on the lower manual plays an important role in this arrangement, specifically in the use of the lovely counter melodies and flowing harmonies. For me, the rich registration on the lower manual adds a sparkle to the three-note chords heard. Four note chords tend to sound a little bit muddy if over used whenever I try to emulate this style at home. Would you say that the general use of thinner chord textures was deliberate in this arrangement?

KB: Well, I modelled my approach to harmony on the style of Eddie Layton who perfected three part harmony. Using two notes with the left hand and a pedal. Two or three note accompaniment chords work much better than four note chords on electronic organs. Big chords appear to clog the speaker!

CS: The Leslie speaker is vital to the sound of the organ, although I would think reverb plays an important part in this arrangement too? Was extra

reverb added by the studio or was this just the standard Hammond reverb with a Leslie 122?

KB: I have always modified Hammonds whereby the reverb signal goes through the treble horn of the Leslie speaker. This gives the spinning reverb effect to which you refer. When I was involved with the design team at Hammond I managed to get them to offer this as an option on certain models such as the B-3000.

CS: I can hear some changes of preset registration on the upper manual. Some of the factory preset keys are used but the Clarinet must be achieved using the drawbars? I particularly notice what I think is the solo second percussion setting used at the beginning of the piece which has an almost piano-like decay. Have I heard this correctly?

KB: The model used on Moon River was a Hammond M-100 which has a Clarinet preset on the upper. The second harmonic percussion is used together with the 16 foot drawbar to create the bell effect that you hear.

CS: My last question relates to your own views on how electronic organ design changed during the nineteen seventies and nineteen eighties, gradually moving towards more advanced orchestral emulation. Were these later instruments as satisfying to play and did they demand a significantly different approach to arrangement than instruments such as the Hammond?

KB: For many years the Americans led the field selling organs to a middle aged market. Then the Japanese took over where their domestic market was much younger and where there was no tradition of theatre organs. This is why Yamaha concentrated on orchestral multi

keyboards, not even calling their products “organs” Fortunately the Hammond retains a unique sound still much heard in the pop and jazz fields. It’s the only sound that I like to play and identify with.

Interview with James Sargeant (JS), conducted by Christopher Stanbury (CS) on the 28 October 2015.

CS: James, many thanks for letting me chat to you about your memories of the organ world, particularly some of the instruments that you worked with over the years. As you know, I've been doing a bit of work on various organs over the last few years and I wanted to talk to you, about what came after the Hammond organ era.

JS: Right, ok.

CS: So, I've been working on Lowrey instruments recently. Amongst others, I have a Lowrey TGS-1 at home. What were your recollections of that instrument?

JS: Well, the TGS-1 was out before I started working in retail, but it is fair to say that I know of it and have played them over the years. At that time, Lowrey were really the market leaders. The TGS-1, that was the one where they started putting orchestral presets in them, particularly strings and it was multi-channel. So, they were the first of the orchestral Lowreys, really. I remember it was very difficult to play actually, because you needed to do lots of switching. You'd need the Leslie on the flutes though, as they weren't particularly strong. They weren't the same as the earlier transistor Lowreys and, as you know, not anything like the Heritage.

CS: One of the pieces that I'm transcribing is recorded on a TGS-1, by Harry Stoneham.

JS: Oh, really? Which album?

CS: It's *This is Harry Stoneham*.

JS: Oh, right. I thought that was on a Cotillion.

CS: I don't think so, it's definitely a TGS-1 on the album cover at least.

JS: Ah ha. Sure.

CS: One thing that I've noticed, on another album, *Latin Lowrey*, experimenting with the AOC effect and other things, is that there are times when you hear things, like AOC being heard in a melody whilst you hear a rhythmic chord underneath. He plays a bossa nova pattern with the left hand, but you can hear AOC in the melody at the same time.

JS: You couldn't do that live. Right.

CS: Yes, so presumably Harry used multitracking.

JS: I would imagine so. Thinking about what they were doing at that time, there were a few things that you can hear on *Latin Lowrey* that, as you've found out, can't actually be done live. Certainly, there was no way to get the AOC to sustain when you're playing a left hand pattern like that.

CS: I also wanted to ask you about the Electone organs, because I know you are very much associated with Yamaha.

JS: Yes. I joined Yamaha as a product specialist in the late nineties, so that was AR100 and EL900 series. I'd actually been working for Hammond before, so it was quite a change.

CS: Do you have any preference for any type of instrument?

JS: I'd have to say, I think the Hammond for me is more a live playing instrument. I've got an SK2 now, which does everything I

need it to do. The only thing you can't do on it is have the bass not go through the Leslie, which I'd like. Keith actually asked me about that too, which I thought was quite amazing. Keith Beckingham asking me about a Hammond! I was talking to Martin recently, and we were all saying that we'd be far happier just buying old organs and playing them, rather than trying to follow the Electone model. I mean, it works in Japan, but it's the insistence on preprograming, I think, that harmed the industry and, whilst it is very clever, it did put a lot of people off. I think, for me, it's about feeling rather trapped in your registrations. I remember Martin saying to me that, if he sat down at an EL900 with his disks and tried to play some of his arrangements from fifteen years ago, he couldn't. Not because he wouldn't remember the music, but because he wouldn't recall how the sequence of registration changes worked within the piece. On the other side of things, I suppose the fact that the Electone is still going in Japan means that, on some level, our tradition is still being kept alive.

Live concert with Paul Carman, recorded by Christopher Stanbury, at the Ascot Organ and Keyboard Club, 25 May 2015.

The following is transcribed from a concert given by Paul Carman on the above date. After finishing a piece, Carman gives his views on the instrument played:

‘So, this is a Böhm organ and, as you can hear, it sounds absolutely wonderful, doesn’t it? I think the nice thing is how realistic some of the sounds are, which means the music sounds so much better. I remember in the old days, when I first started doing this job, it wasn’t always the case that the organs were any good. I mean, you had piano and guitar, but did it really sound like a piano or guitar? You know, it didn’t matter that the trumpet tone on the organ didn’t really sound like a trumpet. It was all in our heads anyway. I think we definitely imagined that they were better than they were, looking back. ‘

Interview with Peter Holt (PH), conducted by Christopher Stanbury (CS) on the 4 July 2011.

CS: Peter, thanks for agreeing to have a quick chat.

PH: No problem.

CS: If I may, I'd like to ask you about your experiences with Hammond organs and, I guess, what makes you want to play them. I know you perform on them and have demonstrated for Hammond.

PH: Sure.

CS: One of the things that I've read quite a lot is that a Hammond feels different to play.

PH: Right.

CS: Could you tell me what your experience has been?

PH: Well, the keys of a Hammond organ are more rounded and of a higher quality than most. That's certainly true. They're much easier to play, which allows for fast glissando and effortless jazz improvisations. It's a very tactile feel. They're very playable.

CS: I know that there are features on the console models such as chorus, vibrato, percussion. How important is that?

PH: Well, it's what makes it really, from a jazz player's point of view. You wouldn't have Jimmy Smith without the chorus and percussion on the B3. That is the sound. And, its also the way that the Hammond does it. Everyone's tried to copy it, but only Hammond, for me, has got it right.

CS: I know what you mean. Of course, we need to talk about the Leslie.

PH: You can't forget the Leslie. Sure.

CS: Why do you think the Leslie speaker is considered integral to Hammond organ playing?

PH: Ah. It's what it does to the sound. You can't have a Hammond without a Leslie. The Leslie speaker transforms the sound of it, from the single tonewheel pitch of each note to a full bodied rich vibrato. It's surround sound, I guess, as the speaker horn moves the sound through the air with the option of those two speeds and the effect created when you toggle between them.

CS: Lastly, tell me why you like the Hammond so much.

PH: Er. Well, where to start? [Laughs]. The attraction to the Hammond organ for me is, that it feels "alive". And, as a musician you can add feeling and soul to your performance in a way that brings your emotions into the music. Ultimately producing a unique and more spontaneous performance each time you play as your approach is dictated by your mood on the day.

Interview with Glyn Madden (GM), conducted by Christopher Stanbury (CS) on the 4 July 2011.

CS: Hi Glyn. Thanks very much for letting me ask you a few questions.

GM: Not at all Chris, it's nice to be asked!

CS: I'd like to start by asking you about your experience of Hammond organs.

GM: Ok.

CS: Do you find the physical feedback from playing a console model Hammond different to any other organ?

GM: Feedback. You mean the way it plays?

CS: Yeah.

GM: Ah, right. Well, Hammond had unique characteristics that made it different to play from any other organ of its time, that's for sure. Looking back, this may have been more of a deciding factor for players in the nineteen seventies than now, because each of the alternative instruments were organ based as opposed to the orchestral organs of later years and each manufacturer had its own distinct characteristics. Each brand was much more unique then than now, that's for sure. What that meant for Hammond, well, in terms of performance, the fast attacking response from the Hammond's keys and swell pedal gave it an edge for many performers, particularly in the jazz and pop culture of the time. The sharp acceleration of the expression pedal was keener than other instruments I recall and this is easily noticeable, particularly when block chords are played, in many recorded performances where the sound of each chord is given an almost explosive attack. My

personal preference was and still is for the spinet models rather than the heavy bassed consoles. Possibly this is because I'm not a jazz player and because I usually played solo rather than as part of a band so the lighter bass sounds of the later spinet instruments appealed to me more. It seems odd that all the demonstrators employed by Hammond during the sixties and seventies played the instrument more in the style of a kind of cross-over theatre organ than the style of jazz heroes of the sixties such as Jimmy Smith. I found that weird, because today it's the jazz scene that's keeping it alive, really. Overall, I think the key feature of the Hammond organ would have to be its drawbars. This was different. And, still the best way of doing it today. What a genius design! Hammond patented it for many years, then when it ran out everybody got it.

CS: And what about the other features on Hammonds, such as percussion, chorus, vibrato, things like that?

GM: Erm. Well, I wouldn't make as much of these as I would the drawbars or, of course, the Leslie. But, these features shaped the tone and have become part of the hallmark Hammond sound, whatever that means! They have probably grown in importance as nostalgia for the Hammond sound itself has grown. Again, they have more importance within the jazz fraternity where the chorus and vibrato stuff was often mixed with the Leslie to produce a denser, grittier, kind of sound. As a youngster, beginning to learn about playing Hammond, people used to say to use one or the other, not both. I don't know, you just play with

what sounds right, don't you?

CS: Right. I was going to ask about the Leslie speaker. How important is that?

GM: Oh, absolutely. I find it difficult to disassociate the two. Hammond and Leslie have always been as one to me and in the seventies, to be honest, I'd sooner have played another brand of organ from the same era, like Lowrey, with a Leslie than play a Hammond without.

CS: As a musician, what attracts you to the Hammond organ?

GM: In the late nineteen seventies and eighties, I grew away from the Hammond as developments in other areas were far more exciting and, with Hammond, there was a kind of "been there and done that" feeling. New voices and effects were being pioneered and organs were changing into something new and exciting. I'd got a job with Yamaha, first on the D85 but then we later had FS, HS and EL, which took things into a different direction. There was a lot of resistance to it, though.

CS: I remember you demonstrating the HS8 at the Stanley Halls in Croydon.

GM: Where?

CS: The Stanley Halls, near Riverside Organ Studios.

GM: Oh, ok. Riverside I remember, yes. Of course, we used to do the big festival at Fairfield every year.

CS: Yes.

GM: They were very exciting times. Different instruments.

CS: Do you remember the E50?

GM: The E50? [Laughs]. Well, they were the step between the D series and F series. D series was still analogue technology really and the F series was digital. So, with the E series there was a bit of digital synth in there to make a few orchestral sounds. But, they were only solo sounds, the strings were still terrible. Actually, I don't know if it had strings.

CS: I'm listening to the album you made on the E50 at the moment.

GM: Oh, crikey [laughs].

CS: And, I've noticed there is organ playing and organ sounds and, what I would call emulative playing in there too.

GM: Emulative? You mean copying different styles?

CS: Yes. With regard to the different instruments and trying to convey their characteristics, I guess.

GM: Oh, I see. Yes, that was deliberate, I suppose, because we were trying to make them sound like other things, believe it or not. So, there were some sounds, like the flute on that recording, that, at the time, sounded like a real flute and I tried to play like one too. It's a funny thing, that, because, when I started it was very easy to register anything, really. If you wanted it to go "oooooh" it was mostly white flute tabs, if you wanted it to go "naaaaa" is was the red ones, and if you had some yellow or black ones they made it sound even nicer, really. But, of course, that was a completely different world to what we ended up with, with the EL series, which was pretty much that you had to have thought about playing something a week in advance before you wanted to play it.

CS: Because it took that long to program.

GM: Well, you know how long these things take to make it sound like we do. And that was the problem, because people wanted to play more than they wanted to sit and program. I feel the organ has changed, now, into something completely different. Maybe it lost it's way somewhat, and with it, its identity. Maybe it was me that changed again.