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PERFORMING AUSTRALIAN ELECTROACOUSTIC WORKS FOR THE PAETZOLD CONTRABASS RECORDER

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Abstract: A striking instrumental design innovation in recent years has been the development of the Paetzold 'square bass' bass recorders, sparking interest among performers and composers to develop a new approach to contemporary performance practice and electroacoustic composition. This article examines two works by Australian composers that have been performed by the author. Both pieces are written for the Paetzold contrabass recorder in F, applying its unique sound palette within different compositional approaches and structures. The electroacoustic works surveyed also use a fixed media soundscape drawing on varying levels of gesture and improvisation from the live performer(s). The works present different relationships between the pre-recorded soundscape and the contrabass recorder and provide an opportunity for the performer to experiment with the large range of sounds possible. This article also serves as a summary of tools, sounds and techniques for composers interested in writing for the instrument.

Introduction

'Rediscovered' in the early twentieth century, the recorder has been part of the early music revival to renew medieval, Renaissance and Baroque repertoire. However, beyond this revival of old music, composers in the mid-twentieth century worked closely with virtuosic performers to explore and apply different techniques and timbres in new compositions with the aim of reconceptualising the recorder as a new, twentieth-century instrument. These artists worked mostly with traditional, Baroque-style recorders; however, over the past 70 years instrument makers have been experimenting with the design of the recorder, including the 1953 radical 'square basses' by Joachim Paetzold. Nicknamed Paetzold basses, these instruments were further developed and patented by Joachim's nephew Herbert Paetzold in 1975.[1] Unlike larger Baroque-style recorders, the Paetzold design incorporates a fully keyed system, and a restructured bore with properties closer to a square organ pipe than the traditional cylindrical shape (see Figure 1). Because the Paetzold design is based on the principle of a cranked wooden organ pipe, the unique range of timbre, attack, and other

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[1] Nicholas S. Lander, 'Innovations: Square Bore Profile Recorders', Recorder Home Page, 2022, www.recorderhomepage.net/history/innovations-in-recorder-design (accessed 7 July 2022).

Figure 1:

Paetzold contrabass in F: www.
kunath.com/en/Paetzold-by-
Kunath/ (accessed 9 August 2022).

sound effects have provided performers with a new spectrum of contem-
porary expression.[2]

There is little written about compositions that include these larger
instruments or the range of sounds that can be applied to modern
musical works. The Paetzold Recorder Investigation for Music with
Electronics (PRIME), based at the Conservatoire de Lausanne,
began exploration into the acoustic properties and performance
approaches of these instruments in the mid-2000s. The team compiled
a sound catalogue and a list of repertoire that includes one or more
Paetzold recorders, many of them commissioned and performed by

[2] 'Paetzold by Kunath', Kunath, 2020, www.kunath.com/en/Paetzold-by-Kunath/ (accessed
9 August 2022).

the Italian composer and recorder player Antonio Politano.[3] In addition to this online catalogue, they produced a research article in 2015 which explored 'new paradigms for the interaction between Paetzold recorder players and machines in live electronic music'.[4] I want to extend this research by presenting two works by Australian composers that have embraced the distinctive sound quality of the Paetzold contrabass recorder in F, each incorporating it within a framework of different compositional methods. I will discuss these works through the lens of the performer, offering a unique perspective on the execution of the gestural and improvisational elements of each piece.

Both works presented in this article demonstrate the application of a contemporary instrument design and newly developed performance techniques to a historical instrument. This acknowledgement of the active heritage of recorder playing within current contexts draws on Benjamin Tassie's notion of post-HIP, a movement focused on 'new music written for, and performed on, historical instruments'.[5] Since the rediscovery of the recorder, composers in the twentieth and twenty-first centuries have been working in this space, composing and developing new performance techniques and approaches for the instrument. The use of electronic manipulation of sound (either pre-recorded or live) common in contemporary recorder repertoire adds to the stylistic plurality described in Tassie's definition of post-HIP. Each piece discussed here features elements of improvisation, incorporating both musical and physical gestures through different compositional approaches to fixed media. These features, in addition to the survey of extended techniques available on the instrument, provide an overview of possibilities for composers considering writing for the Paetzold basses.

Extended techniques on the Paetzold contrabass recorder

The Paetzold design allows the player to perform several traditional and non-traditional techniques similar to those performed on its Baroque and Renaissance counterparts. A player can reach a full two-octave range, standard for most recorders, while advanced players can extend this range. The shape and mechanism of the flat paddle keys enables players to employ several 'extended' or non-standard/non-traditional techniques that are not possible on Baroque-style recorders. Made from birch, cherry or mahogany woods (some models are now also made from Resona, a synthetic material made from renewable materials), the large surface area of the instrument also makes it possible to attach microphones or sensors to produce electronic sounds via a computer, triggered by physical, visual or audio gestures, extending into the world of live electronics.[6]

Politano's PRIME project analysed different extended techniques possible on Paetzold recorders and categorised them into six groups: dynamics and pressure, articulations, labium actions, microintervals, multiphonics and gesture examples. The techniques contained within

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[3] 'PRIME: Paetzold Recorder Investigation for Music with Electronics', www.primeresearch.ch (accessed 15 June 2022).

[4] Simone Conforti and Angelika Güsewell, 'PRIME Gesture Recognition', *Dissonance/Dissonanz*, 132 (2015), pp. 10–15.

[5] Benjamin Tassie, '"Post-HIP": New Music for Old Instruments in the Twenty-First Century', *TEMPO*, 75, no. 297 (July 2021), pp. 61–70.

[6] Conforti and Güsewell, 'PRIME Gesture Recognition', pp. 10–15.

these groups can be further reduced to three main classifications that are normally assigned to recorder (or woodwind) techniques:[7] air sounds, articulation and pitch.

Here I use these classifications to summarise some of the more common extended techniques available on Paetzold recorders.

Air sounds

Air sounds can be made with and without tone. Options on the Paetzold recorders include inhaling or exhaling (with a closed labium or sound chamber) through the mouthpiece and blowing into the windway. It is also possible to create different air sounds by articulating consonants such as 'sss', 'fff', 'zzz' (without vocalising) or other wind sounds by blowing fully or partially into the mouthpiece. The Paetzold design includes a removable mouthpiece; performing without the small mouthpiece and blowing directly into the instrument can also create a different variety of air sounds. Whistle tones can be created by covering the windway either partially or fully; depending on the amount of air that can escape the windway, this technique also produces a range of dynamics and pitches.

Vibrato also falls within this category. Traditional forms of vibrato – diaphragm, larynx, tongue and labium – are easily achievable on the Paetzold basses. Some vibrati common to recorder players, however, are not possible, such as finger or knee, due to the use of the keyed system and the size of the instrument respectively. Circular breathing can also be performed.

Articulation

Unlike Baroque-style recorders, the removable mouthpiece is a small, open tube and has very little resistance. This means the shape of the mouth and the use of the tongue can produce a range of articulations that vary in attack, timbre, dynamic and pitch. Soft articulations are needed for the lower notes to avoid jumping to the second octave, which can result in very marked and aggressive accents when harder articulations are applied. Single, double and triple tonguing can be used, as well as flutter-tonguing, percussive effects and random finger/tongue play – usually performed as fast as possible. As with most recorders, different syllables produce a variety of articulation strengths, including te, de, ke, ge, le and so on.

An effect unique to the Paetzold is the use of key clicks or key slaps. The large, flat keys of the design can be quite loud, allowing the performer to incorporate percussive sounds from the instrument into their playing.

Pitch

As I mentioned earlier, the range of the Paetzold contrabass is easily two octaves. Like all recorders, the instrument is fully chromatic and there are numerous alternative fingerings to assist with microtones, tuning and timbral and dynamic changes. By raising air pressure, the instrument is capable of multiphonics and high overblown pitches. Multiphonics can be performed by playing more than one note at a time as a chord, or by singing and playing simultaneously. Various trills and tremolos can also be applied. Although the keys prevent

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[7] Susanne Fröhlich, 'The New Potential of a 21st Century Recorder' (Ph.D. dissertation, University of Music and Performing Arts Gratz, 2020), pp. 176–82.

smooth glissandi using the tone holes, pitch can be manipulated by covering the windway.

Australian electroacoustic works for recorder

Within contemporary repertoire, recorder players and composers have embraced the use of amplification, fixed media/soundscape and live electronics. Electroacoustic works for recorder date back to the 1960s in Europe with the use of simple amplification.[8] There are two distinct categories of electroacoustic works: those that use pre-recorded media and those with live electronic effects.[9] In the first category, the pre-recorded (or fixed) media can play the role of accompaniment or represent a second voice equal to that of the live performer.[10] There are 15 works listed in the Australian Music Centre catalogue for solo recorder with pre-recorded sound and eight with live electronics (this does not mean there are no other works by Australian composers). Among the earliest Australian electroacoustic works for recorder are Benjamin Thorn's *Newrotika* (1981), for recorder, tape or digital delay, reverb and distortion, tone generator or recorded tone, and Ros Bandt's *Loops* (1983), for improvised recorder player (multiple recorders), voice and quadrophonic tape.[11] In today's terms Thorn's piece would be classified as using live electronics, while Bandt's *Loops* uses pre-recorded playback in eight channels.

There are few electroacoustic works for Paetzold instruments by Australian composers and only a small number of pieces are currently registered with the Australian Music Centre. This article introduces two composers who have worked with me to compose new electroacoustic works featuring the Paetzold contrabass recorder. Each work is based on its composer's interests while responding to the performer's or performers' expressions, contemporary recorder techniques and the instrument's historical background and influences, acknowledging the history of the recorder while firmly establishing it as a solo instrument in the twenty-first century. They draw on very different performance practices but both use fixed media as the accompanying backdrop to the live performer(s). *Tic*, by Anthony Leigh Dunstan, explores physical and musical gesture, an embodied performance experience by which the performer, instrument and audience explore numerous theatrical elements. Eve Klein's *Between the Palms of the Hands* is for two recorder players, using a graphic score and fixed media soundscape as stimuli for free improvisation. Within a pre-recorded site-specific soundworld, the performers interpret the visual and sonic material, communicating ideas between each other using multiple instruments and voice. Both pieces use the Paetzold contrabass recorder in F as a tool for sonic exploration, featuring extended techniques either as written scored elements or within the performer's improvisatory palette.

Theatrics and gesture in performance: *Tic*, by Anthony Leigh Dunstan

During the 1960s composers and performers challenged the notion that the recorder was a simple melodic instrument. They investigated new

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[8] Eve O'Kelly, *The Recorder Today* (Cambridge: Cambridge University Press, 1990), p. 77.
[9] Peter McNamara, 'Contrasting Approaches: The Continued Relevance of Pre-Recorded Live Electronics in Australian Music', *Musicology Australia*, 38, no. 1 (2016), pp. 46–64.
[10] Simon Emmerson, 'Acoustic/Electroacoustic: The Relationship with Instruments', *Journal of New Music Research*, 27, nos 1–2 (1998), pp. 146–64.
[11] Australian Music Centre, 2022, www.australianmusiccentre.com (accessed 13 May 2022).

playing techniques to move the recorder beyond its conventional style of playing and re-establish it as a virtuosic solo performance instrument. One such compositional element which has continued into twenty-first-century performance practice is the addition of visual or dramatic features to make music performances more theatrical. These features can be carried out by the performer through gesture, speech, singing and movement, and extended to the use of technology to include innovative use of staging and/or lighting, video projection or electroacoustic performances. Pieces such as Jan Rokus van Roosendaal's *Rotations* (1988), Stockhausen's 1984 version of *In Freundschaft* (1977), for recorder, and Ryohei Hirose's *Meditation* (1975) rely on physical movement or vocalisations by the performer for dramatic effect. The introduction of the larger, square basses as solo instruments has presented composers with another resource for theatrical display: their (sometimes) cumbersome size and shape. Players are required to use bigger gestures, specifically arm and chest movements to produce sounds, while composers have another apparatus on stage suitable for amplification or other electronic modifications.

Tic, for Paetzold contrabass recorder in F and fixed media, by Anthony Leigh Dunstan, was composed in 2012 and I gave its Australian premiere that year in the Sydney New Music Network Miniseries. Gesture and theatre play a central role in this work within compositional elements or motifs and the performer's natural and staged physical movements. The composer uses the performer's persona, voice, body and instrument to symbolise a state of nervousness or anxiety. Instrumental techniques include different articulations, windway actions, multiphonics and dynamics, synthesising with the uncovering storyline constructed by the live performer and fixed media. To create a sense of anxiety in the performance, the performer's own 'tics' are to be embraced; as the composer writes, '*Tic* is a unique work that requires a certain depth of theatricality from the performer. The shy, nervous character is integral to the expression of the musical material and piece as a whole.'[12]

In the performance notes Dunstan refers to François Delalande's three levels of functional and symbolic gesture:[13]

- *Geste effecteur* – gestures that are necessary to produce sound (pressing down a key, blowing)
- *Geste accompagnateur* – gestures that relate to body movement associated with effective gestures (movement of arms, chest, etc.)
- *Geste figure* – gestures that are perceived by the audience but without a clear correspondence to a physical movement (a mental image conveyed through sound).[14,15]

The first two levels of gesture are the physical actions by the player: those that are required to play the instrument (inhalation, exhalation and movement over the keys) and the associated body movements that support these (chest, finger and arm movements). *Tic* fuses these first two levels entirely. In addition to effective gestures used

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[12] Anthony Leigh Dunstan, *Tic* [unpublished score], performer's note (2012).
[13] François Delalande, 'Le geste outil d'analyse: quelques enseignements d'une recherche sur la gestique de Glenn Gould' (Paris: Louise Courteau Editrice Inc., 1988), pp. 83–111.
[14] Claude Cadoz and Marcelo M. Wanderley, 'Gesture – Music', in *Trends in Gestural Control of Music*, eds Marcelo M. Wanderley and Marc Battier (Paris: IRCAM, 2000), pp. 77–78.
[15] Alexander Refsum Jensenius, Marcelo M. Wanderley, Rolf Inge Godøy and Marc Leman, 'Musical Gestures: Concepts and Methods in Research', in *Musical Gestures: Sound, Movement, and Meaning*, eds Rolf Inge Godøy and Marc Leman (New York: Routledge, 2010), pp. 12–35.

to play the instrument, accompanying gestures include body movements written into the performance directions, such as heavy breathing and sudden shakes of the head. The contrabass recorder can be played either seated or standing (with the addition of a spike or small rise), and the large size of the instrument can heighten movements, including allowing the performer to partly hide behind it to express perceived shyness or discomfort at performing on stage.

Tic uses several contemporary techniques on the Paetzold contrabass which add to the variety of effective and accompanying gestures. Beginning with effective gestures of blowing, the player performs air sound techniques with the instrument, including blowing without producing a tone and rhythmic or pulsing vibrato. There are also several sounds produced away from the instrument, such as rhythmic breathing (inhaling and exhaling in a rhythm at a particular dynamic), whispered or tonal mutterings (speech), pitched inhalations and gagging or dry heaving. For each of these, accompanying gestures are present, such as movement of the chest, head and face. The more these movements are emphasised, the more uncomfortable the performer and audience feel, increasing the sense of nervousness (Example 1).

A variety of articulations are used to emphasise the erratic and anxious character of the piece. Double and triple tonguing are employed in agitated passages in addition to rapid irregular (as fast as possible) repeated patterns and guttural flutter-tonguing. Multiphonics are delivered by singing and playing simultaneously, while more traditional means of playing include portamento and upper and lower mordents. Articulations vary in the attack and production of a note. One of the most aggressive attacks is produced by the direction 'highest note possible', which can be achieved through overblowing, covering the labium or both. Overblowing includes gestures of deep inhalation with a short, sharp, fast exhalation to overblow the tone chosen. If using the labium, the performer must reach around to the front of the instrument to cover the labium with the palm of their hand (around head height). The large, elaborate movements associated with particular extended techniques on this instrument help to create quite a theatrical effect onstage.

The physical gestures incorporated into the performance which may be associated with accompanying gestures but not with the production of sound include a 'tic' movement and various lengths and depths of breathing and gagging/dry heaving: movements and sounds typical of someone who suffers from music performance anxiety. They occur gradually throughout the piece, sometimes as interjections within tonal material (Example 2). These additional movements

Example 1:
Anthony Leigh Dunstan, *Tic*, p.1.

Example 2:
Anthony Leigh Dunstan, *Tic*, p. 2.

continue the tradition of 'musical theatrics' that has formed a large part of contemporary recorder repertoire alongside a history of successful pieces such as Maki Ishii's *Black Intention* (1975), which takes inspiration from Japanese nō theatre with its terrifying roar or scream.

The pre-recorded soundscape is a sparse series of seemingly random vocal and soprano recorder sounds. The soundscape is also sporadic in terms of dynamics, sound material and instrumental and vocal articulations. The live performer moves in and out of this soundscape, with a focus on the edgy live performance. Jensenius et al refer to figurative gesture as 'a mental image that is not directly related to any physical movement, but which may be conveyed through sound'.[16] Therefore, the use of soundscape as an accompaniment to evoke meaning suggests an employment of the third level of Delalande's gestures: figurative gesture. This level is perceived by the audience without a corresponding physical gesture from the performer. The sound elements in the fixed media surround the audience, enhancing the message the performer is trying to convey, yet the physical gestures of sound production are not visible. The disjunct soundscape enhances the performance, but it is not related to specific movements.[17,18] Figurative gestures are more complex and individualised: they may not be related to a physical movement and are images or thoughts created through the sound. Hidden 'tics' and the fixed media – not associated with any clear physical movement – reinforce these figurative gestures.

Body movement in musical performance is used as a tool to evoke meaning. Dunstan has emphasised this in *Tic* by deliberately directing the performer to accentuate gestures, including all three of Delalande's forms of gesture, to convey the feeling of shyness and nervousness of the performer. This is transferred on to the audience, who can see, hear and feel the apprehensive performance. Often, music does not have to be observed, but by incorporating physical movement

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[16] Ibid., p. 19.
[17] Marcelo M. Wanderley, 'Performer–Instrument Interaction: Applications to Gestural Control of Sound Synthesis' (Ph.D. dissertation, Université Pierre et Marie Curie, Paris VI, 2001).
[18] Rolf Inge Godøy and Marc Leman (eds), *Musical Gestures: Sound, Movement, and Meaning* (New York: Routledge, 2010).

and gesture into a performance, these theatrical compositions are transported into the realm of performance art. The contrabass becomes a prop, and in *Tic* it can be used to the performer's advantage.

Graphic notation and improvisation: *Between the Palms of the Hands*, by Eve Klein

The modern recorder player is not unfamiliar with the concept of graphic notation. Composers sought freedom from the constraints of the instrument's traditional method of playing in the mid twentieth century, and repertoire for the recorder in the 1960s comprised most styles of composition, including avant-garde and experimental approaches to notation. Early examples of graphic notation include Michael Vetter's composition *Rezitative* (1967) and his collaboration with Sylvano Bussotti on the composition of *RARA* (1966). Both pieces use only imagery to create the score. During the 1960s, graphic notation provided an opportunity for extremely virtuosic players to explore new sounds and techniques that had not yet been notated within contemporary compositions and free-form structures. Although not notated graphically, some Australian composers have produced aleatoric works that use sound objects as stimuli for performers to construct form. These include Katrina Dowling and Thomas Reiner's *Sweet flute* (2007) and Benjamin Thorn's mobile piece *Awake with the Birds 2* (2018). These works incorporate the performer's own realisation of the piece, within some structural parameters. There are very few Australian works for the recorder that are notated purely graphically.

Between the Palms of the Hands for two recorder players and fixed media was written entirely as a graphic score. Using images as stimuli for improvisation, the performers form a sonic relationship between shapes, colours and textures, in addition to fixed sound media. The work was written by Eve Klein for the Australian Recorder Project (Alana Blackburn and Joanne Arnott) and was premiered at the Sydney Vivid Festival in 2015. The piece is one of three in the folio titled *Codextant: Medieval Immersions in New England*, funded by an Australian Council for the Arts New Work Grant. Like many contemporary works, it required close composer–performer collaboration.[19] Crucial to this collaboration was composer–performer experimentation and discussion about the various sizes, shapes and timbres of different recorders owned by the two players. Hence, the uniqueness of the work is housed both within the performers' personalised vocabulary of playing techniques and expression and the arsenal of instruments they possess, the only request from the performers being that the piece reflect the heritage of the instrument through a contemporary lens.

> [T]he work juxtaposes text from Kafka's *Blue Octavo* Notebooks with the iconic medieval manuscript and contemporary recorder performance techniques. In this context Kafka's text highlights the competition between players hands, a metaphorical struggle for dominance, which parallels the recorder's discombobulating relationship between contemporary and historical repertoires, techniques and tonalities.[20]

[19] Louise Devenish and Stuart James, 'Composer–Performer Collaboration in the Development of Kinabuhi Kamatayon for Percussion and Electronics', *Sound Scripts*, 6, no. 1 (2019), pp. 1–12.

[20] Eve Klein, *Codextant: Medieval Immersions in New England*, performers' note, 2015, www.eveklein.com/codextant (accessed 3 July 2022).
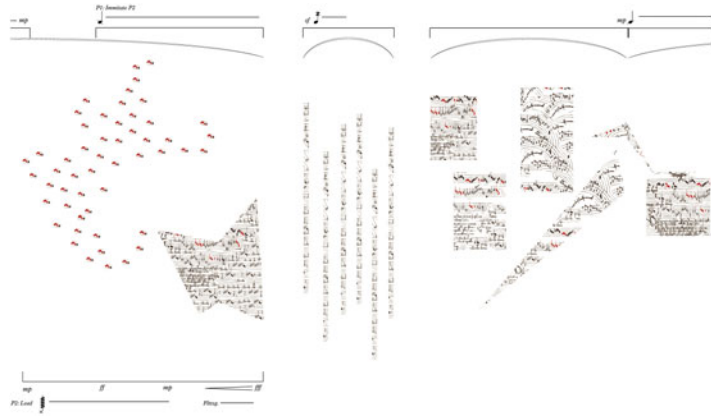
Example 3:
Eve Klein, *Between the Palms of the Hands*, p. 4.

Between the Palms of the Hands requires each performer to not only interpret their own score but also produce a musical construct together. The images in the score are fragments from the *Chantilly Codex* (c. 1350–1400), which Klein pasted together in an intricate and visually alluring score, producing several levels on which the performers can interpret the graphics (see Example 3). In addition, the score is performed to a fixed soundscape to which the performers can also respond with their own sound material. Using segments of the *Chantilly Codex* as musical material, the composer's choice of graphic material and instruments clearly reflects a post-HIP approach, blurring the 'boundary between interpretation and composition, imposing twentieth- and twenty-first-century performance (and listening) practice on to historical repertoire both as a means of revivification of the historical, and as generative'.[21] This acts as a service to cultural heritage and sustainability through reinvention and reinterpretation.[22]

Klein does not explain what any shape represents; however, at times some instrumental techniques are specified – varying amounts of breath sound with and without tone, different amounts of labium coverage, singing and dynamics – as a timbral guide. The piece only specifies the Paetzold contrabass recorder for the second player; the first player can choose three recorders of any size or style. The directions 'high instrument' or 'low instrument' are provided to indicate the performer should choose from the different registers of the recorder family. For the 2015 world premiere, the first player chose a seventeenth-century-style soprano by Philippe Bolton, based on models of Richard Haka (1645/6–1705), a wide-bore Renaissance 'Ganassi' in G by Monika Musch (a twentieth-century invention based on a sixteenth-century model)[23] and a modern Yamaha basset. These instruments provided the largest pitch and tonal range available to the player, as well as for the exploration of techniques and timbres unique to each. The massive 4.5 m graphic score was loaded on to

[21] Tassie, '"Post-HIP"', p. 62.
[22] Dawn Bennett, Anna Reid and Peter Petocz, 'Creative Workers' Views on Cultural Heritage and Sustainability', *Journal of Aesthetics & Culture*, 6, no. 1 (2014), pp. 1–12.
[23] The 'Ganassi' instrument was designed by Fred Morgan as a modification of a Renaissance recorder examined by Morgan while researching Sylvestro Ganassi's *Opera intitulata Fontegara* (Venice, 1535). Fred Morgan, 'Making Recorders Based on Historical Models', in *Recorders Based on Historical Models: Fred Morgan Writings and Memories*, ed. Gisela Rothe (Fulda, Germany: Mollenhauer Verlag, 2007), pp. 64–67.

iPads and scrolled across the screen in real time using Decibel's ScorePlayer app.[24] The piece is fully improvised with only four instances of written notation, which can also be performed at the players' discretion.

The soundscape is site-specific, encapsulating the natural and man-made sounds of the New England region in New South Wales, Australia. Sounds of local birdsong are used, another interesting reflection of the recorder's historical representation in eighteenth-century Italian and French opera,[25] and in teaching birds to sing.[26] As the techniques used by the live players are not always prescribed by the composer in the score, the idiomatic playing of each performer on different instruments came out in the performance. For the second player, the Paetzold's ability to create percussive sounds and overtones became a feature in the live interpretation of the score. The melodic and percussive options that can be performed on the Paetzold provided a range of attributes that could mimic or contribute to the layered soundworld. To reflect some of the percussive sounds in the accompanying media, techniques such as key tapping, double tonguing, flutter-tonging and accented, explosive articulations were used on the contrabass. These reflected metal horseshoes and wood tapping and occurred during visual clusters of patterns. Closing the labium/windway or blowing across the mouthpiece produced accompanying wind sounds, represented by swirling shapes, and multiphonics were usually played when block shapes were present. The use of overblowing to produce overtones was also incorporated into the improvisation when following long, vertical shapes on the score. Each of these sounds was also considered as a conversation with the other performer.

The dual improvisatory nature of this piece in addition to the electroacoustic soundscape produces a unique dialectic relationship between all three 'players'. Each takes a turn to be leader, and each is led by the others. The instrumentalists become part of the soundscape, sometimes even hidden by complementary musical gestures, while at other times they take the forefront. As a form of communicative gestures, this is heightened by the communicative feedback loop between the players while improvising, and combined with the aural stimulus forms a sense of conflict and coexistence. At times, the performance directions ask each player to imitate the other.

Very few specific techniques are prescribed in this piece; instead, individual players must decide which techniques they will use and when. These will change from player to player as their personal characteristics or idioms are used. This example of free improvisation is described by Kuldkepp as consisting of 'various discrete actions, which embody a personalised vocabulary of playing techniques and musical expressions'. Due to the unpredictable nature of free improvisations, it requires players to have an 'extensive vocabulary to be available at any moment'.[27] Therefore, the techniques applied throughout the piece are familiar to the performers. These sounds are balanced with the pre-recorded soundscape, adding textures and

[24] The Decibel ScorePlayer app can be downloaded from https://decibelnewmusic.com/decibel-scoreplayer/ (accessed 12 June 2022).

[25] Adrienne Simpson, 'The Orchestral Recorder', in *The Cambridge Companion to the Recorder*, eds John Mansfield Thomson and Anthony Rowland-Jones (Cambridge: Cambridge University Press, 1995), pp. 94–100.

[26] Edgar Hunt, *The Recorder and Its Music* (London: Eulenburg Books, 1977), p. 49.

[27] Kristin Kuldkepp, 'Free Improvisation as Experience: A Pragmatic Insight into Improvisational Gesture', *Organised Sound*, 26, no. 1 (2021), pp. 100–109.

sounds that aren't present: both melodic and pitched material, and percussive features. The two live players and electroacoustic sound-scape create an interactive relationship where each player becomes the initiator or imitator either through live response to each other's ideas or as directed in the score by the composer, resulting in a complex web of sound. Although graphic scores are not a new way of composing, the approach to dual improvisation with different forms of stimuli to reflect the instrument's heritage presents a new example of post-HIP through reinvention of ancient written material.

Conclusion

Both of the Australian works discussed here represent a unique approach to contemporary recorder composition, allowing the performer(s) to explore the different techniques and sounds available to the contrabass recorder with varying levels of freedom. Both works significantly contribute to recorder repertoire, particularly when considered within a post-HIP context. The Paetzold design of bass recorders has made these instruments more accessible and available, providing the opportunity for larger recorders to become performance instruments rather than occupying their typical ensemble role. Incorporating them in solo twenty-first-century repertoire including the use of soundscape or live electronics is both post-HIP and an extension of the recorder's ancient past and the avant-garde practices of the 1960s. I hope this article can also help composers to think about incorporating some of the sound qualities of the Paetzold contrabass recorder in contemporary compositions.