

**From Conception to Realisation:
Instrumentation and Recording Quality
in Creative Music Making for the Jazz Multi-instrumentalist**

by

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Included with this submission:

CD 1 – Recording of Recital 1 (*Tatopani*)

CD 2 – Recording of Recital 2 (*The Hiroko Takada Quartet*)

CD 3 – Comparative Examples (*Pieces/excerpts from recitals and commercial CDs*)

Abstract

This submission investigates the creative music-making process from its conception as an idea or musical image to its realisation in the form of a CD of the musical performance. The discussion is based on two recitals by the author in association with two different ensembles. The first recital was with the contemporary world music group Tatopani on November 24th 2005 at Sweet Basil in Tokyo, Japan. The second was with the Hiroko Takada Quartet on March 9th 2006 at the Elder Music Unit in the The University of Adelaide.

It discusses the processes that led to the two recitals from three perspectives: first from the musical perspective of the group; second, from the author's perspective as an individual performer, with emphasis on the contrast between multi-instrumentalism and focusing on a single instrument; and, third, from the practical and organizational perspective, with particular emphasis on the recording process itself.

Examples from the author's recitals are used to demonstrate the discussion, and CDs of the complete recitals are integral to the submission.

Statement

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

Andy Bevan

August 20, 2006

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Sources of Illustrations and Pictures

Illustrations of instruments by Takashi Itoh.

From the booklet from Tatopani’s second CD:

Tatopani, 2000. *Themes From Dreams*. CD. Equilibrium EQ 39.

Figure 10: Photo of author playing *didjeridu* (with stand) by Michael Pronko – used with permission.

From the Tatopani recital at Sweet Basil on November 24th 2005.

All hand-written sheet music provided by Hiroko Takada.

1. INTRODUCTION

There are many aspects to the creative music-making process, namely: the initial creative idea or vision; musical issues such as composition, arrangement, instrumentation and choice of musicians; logistical issues related to the performance of the music; and finally, how to record it in a manner in keeping with the musical objectives so that the music is accurately represented in its finished form (usually CD). Often this process is approached in a non-holistic way – separated into different parts, usually controlled by people not directly connected with the initial creative idea.

This research follows this creative process from conception to realisation with discussion of the challenges and issues encountered in two recitals. It discusses the processes that led to the two recitals from three perspectives: first from the musical perspective of the group; second, from the perspective of the author as an individual performer, with emphasis on the contrast between multi-instrumentalism and focusing on a single instrument; and, third, from the practical and organizational perspective, with particular emphasis on the recording process itself.

The initial creative idea for the music discussed in this submission came from the contemporary world music group Tatopani, of which the author is a member. The cross-cultural influences on Tatopani's music and their original approach to improvising, arranging and composing were the basis for a first research paper (Bevan 2004a). The first of the two recitals served as a natural progression and culmination of this paper. The exegesis will now focus on the unique and creative aspects of the group's music making in relation to the three issues mentioned above. The author has a multi-instrumental role in Tatopani, playing soprano sax, flutes, *didjeridu*, *kalimba*, *harmonic flutes*, keyboard and *overtone singing*. The

format of the second recital, with the Hiroko Takada Quartet, was chosen to highlight contrasting aspects of instrumentation of the first recital. Here the author plays the soprano saxophone exclusively, in the conventional jazz combo setting of piano, bass and drums. The issues and challenges associated with being a multi-instrumentalist in contrast to focusing on a single instrument are discussed with respect to the individual challenges for the player as well as the musical challenges for the group as a whole.

The combination of culturally diverse instrumental and stylistic elements into a holistic approach is not unprecedented in the world of improvised music. Groups such as Oregon and The Paul Winter Consort are excellent examples of this creative blending to form a unique and identifiable sound. Oregon¹, in fact, formed from members of The Paul Winter Consort and pioneered this approach to music making. Interestingly, both groups have recorded with record companies dedicated to a specific sound concept. Oregon with the German label ECM² (amongst others), and The Paul Winter Consort with the leaders own label, Living Music.³ Little, however, has been documented in writing on the creative music-making process. Saxophonist David Liebman is one musician dedicated to the expression and transmission of these ideas and his book, *Lookout Farm: A Case Study of Improvisation for Small Jazz Group* (Liebman 1977), was a groundbreaking work in this field.⁴ Another cultural aspect worthy of mention is the fact that both groups are based in Japan and are part of the diverse music scene there, particularly in regard to its enthusiastic and open-minded adoption of jazz and its offshoots.⁵ It is the open-minded approach to thinking about music that is reflected in the music-making process discussed here.

With the focus of this research on the process of conception to realisation in the form of a finished CD, the issue of recording was integral to the process and of any discussion of the actual performances themselves.⁶ It is therefore included here.

2. MUSICAL ISSUES

The first broad area of discussion looks at the musical issues from a group perspective. Each recital presented very different and specific musical challenges, which can be divided into two main areas of discussion – instrumentation and repertoire.

2.1) Instrumentation

Tatopani started out as a trio in 1993 (refer Appendix A for group profiles). The group's music has been shaped by the variety of instruments played by each of its members. Oregon's reedman Paul McCandless expressed this idea in reference to that group's musical influences.

... the instruments marked our group very distinctly.... even if we were playing traditional jazz, [we] would have still sounded very different, because the instrumentation was so unusual. It also gave the listener a lot of information about exoticism. We had a lot of references just in the instrumentation (McCandless 2001).

In Tatopani's case the music was also shaped by the unique challenges faced when trying to create a sound normally beyond the means of a trio – by the addition of keyboard synthesizers, triggered drum synthesizers and triggered samples.⁷ It is significant here because, for the Tatopani recital, a fourth member was added, namely American composer/arranger/pianist Bruce Stark. This changed the group dynamic completely.

The addition of piano, although providing many exciting new possibilities and directions for the group, introduced some issues previously not encountered in the trio. The first concerned harmony. Tatopani's music has been predominantly modal-based – meaning music played in one mode (scale), usually over a single drone note, with few (if any) chord changes. The introduction of piano into this setting was problematic because the piano is a harmonic instrument. Particularly when adding chordal accompaniment, issues of whether this was

appropriate for the piano became important. A good example is “*Leap of Faith Part 2 – Joy*” (refer CD 1 – track 6). The piece is in 7-beat cycle *cha char*, played over an A drone. The only chordal movement is from an A major triad to a G major triad, but all over the A drone, which creates a modal sound based on the Indian *Khamaj That* or the western *mixolydian* (or dominant) scale (see Figure 1).

NOTE: The sheet music is included on page 4 of the print copy of the thesis held in the University of Adelaide Library.

Figure 1 - Part of the sheet music for “Leap of Faith Part 2 – Joy”

The inclusion of piano into this predominantly Indian musical setting was something that required a great deal of thought and a lot of trial-and-error to make it work. The difficulties

were discussed at length during rehearsals and are summed up by Bruce Stark (pers. com. 2006) as follows:

.... during the first several months of rehearsals and performances I began to understand many things about my musical role in the context of this unique quartet. Tatopani's sound covers a broad spectrum, but central to much of their music is a strong rhythmic groove and relatively static modal harmony. Initially it was this lack of harmonic motion in some of the pieces that posed the greatest challenge, as the piano is an instrument rich in harmonic possibilities. Coming from a classical and jazz background (both of which are very harmony-intense traditions), this was quite frustrating for me at first! However, after playing together for a while, I began to find ways to contribute to the ensemble, which we all found more satisfying.

To summarize, depending on the piece there are three ways in which my piano playing has developed: 1) thinking rhythmically, using syncopation and polyrhythms to enrich the overall groove, like a percussion instrument; 2) thinking texturally, creating a separate layer which floats over the groove, adding another dimension to the overall sound; 3) departing from strict modal usage, exploring more harmonic territory over the "anchor" of a more static bass line or low drum support.

Stark's comments suggest that a certain amount of adjustment and experimentation was required on his part. The same can be said for the melody instrument and soloist, but for different reasons. The introduction of clearly-defined harmonic structures can have the double-edged effect of, on one hand, restricting the soloist to play within the harmonic boundaries (as compared to the harmonic freedom within the trio's predominantly modal setting) while on the other hand, enriching and supporting the harmonic elements that are implied by a monotone instrument. Stark was able to adapt to each given musical setting in a very appropriate way (e.g. by playing sparsely and using open voicings in the modal pieces, and by providing strong harmonic and rhythmic support in the pieces with clear chordal movement), which meant any restrictive elements were not felt at all.

Tatopani's instrumentation varies dramatically from song to song and can be clearly shown by comparing two pieces, "*Eleven*" (refer CD 1 – track 7) and "*Bantarang*" (refer CD 1 – track 8), from the recital programme (see Table 1).

	<i>Eleven</i>	<i>Bantarang</i>
Andy Bevan	soprano sax, overtone singing, keyboard	bansuri flute (bamboo flute – India)
Robert Belgrade	bass clarinet	tabla tarang (set of three tuned tabla drums – India)
Christopher Hardy	electronic and acoustic percussion, drums	bendir (frame drum – Middle East)
Bruce Stark	piano, keyboard	piano

Table 1: *The different instruments used by each of the members in “Eleven” and “Bantarang”.*

In “*Eleven*” the instrumentation is complex and broad in its timbral range, creating a sound that is rich and dense. A combination of acoustic and electronic instruments is used. There are two keyboards – one of these is further split into two separate sounds (an acoustic bass sound and a pad sound for the chords), played by Stark behind the melody, and another, as a cushion for the piano to play over, is played by Bevan when Stark shifts to acoustic piano. Hardy is using the full range of his extensive percussion set – from the simple *caxixi* shakers of the opening to the full compliment of *djembe*, *cajon*, snare drum, cymbals and gongs, and two electronic drums that trigger sampled sounds when hit. Over all of this, the melody is played in unison (sometimes shifting to a harmony) by the soprano sax and bass clarinet and, as an extra textural colour, an overtone singing technique (discussed in detail later) is introduced by Bevan in certain sections. This is in stark contrast to “*Bantarang*”, in which each of the musicians is focused on a single instrument. In terms of the overall group-sound created, the contrast between the two pieces is obvious and striking.

In terms of recording, this kind of setup can cause many logistical problems. The setup, for both the live performance and the recording, is complicated, time-consuming and requires an extensive amount of equipment. The number of channels used for Hardy’s percussion set alone was eighteen – and the total channel-count for the group for the Sweet Basil concert was thirty-seven! For a group with the instrumental diversity of Tatopani this means a far

greater amount of time and energy must be spent on the setup and sound check, compared to a more conventional group – at least a group with little change in the basic instrumentation – such as the Hiroko Takada Quartet. For Tatopani, in a concert programme of, for example, ten pieces, this could be the equivalent of mixing a concert in which ten different groups are performing. The same can be said of the live recording process.

In marked contrast to this, the instrumentation for the Hiroko Takada Quartet recital did not cause major concerns. With the standard jazz combo format, the setup for both the recording and the live performance were comparatively simple. The concert itself was performed almost acoustically – a very simple sound system was used to enhance the soprano sax and piano only – and once the microphones were setup for the recording no adjustments were necessary from song to song.

2.2) Repertoire

The programme for the Tatopani recital was chosen from their recently-released CD *Azure* (Tatopani 2005a). Most of the pieces have piano in a key role as accompanist and/or soloist, with the exception of “*Out of the Blue*” (refer CD 1 – track 9), which is a non-chordal piece featuring the Aboriginal *didjeridu* and the Brazilian *berimbau* and *pandeiro* (see Appendix B for the concert programme and a full list of the instruments played by each member on each piece).

The programme can be divided into two broad categories – pieces with a modal foundation, and those with moving harmony, although there is some overlap between the two. “*Azure Part 1 and 2*”, “*Nepali Bicycle Song*”, “*Leap of Faith Part 1*”, “*Eleven*” and “*Delgado Part 1 and 2*” (refer CD 1 – tracks 1, 2, 3, 5, 7, 10, 11 respectively) all fit into the latter category, even though some pieces have only simple harmonic movement. “*Eleven*” has a C minor

harmony throughout (although with rich variation of the keyboard voicings) over a repetitive bass line. Only in the bridge section do the chords move, and then only subtly – four different chords over the repeating melodic phrase, Cm11 – DMaj – AbMaj7 – Gdim (see Figure 2).

NOTE: The sheet music is included on page 8 of the print copy of the thesis held in the University of Adelaide Library.

Figure 2 - The simple chord movement in the bridge of “Eleven”, over the repeating melody and bass line.

The other pieces, “*El Jinete*”, “*Leap of Faith Part 2*” and “*Bantarang*”, come under the modal heading (refer CD 1 – tracks 4, 6, 8 respectively). As discussed above, “*Leap of Faith Part 2*” has movement between two chords, but over a constant drone, and, in terms of approach, is played in one mode. “*El Jinete*” is also somewhat ambiguous in this regard, having some harmonic variation (from the piano in particular). The intrinsic harmonic colour of the piece, however, is determined by the *kalimba* – or thumb piano (see Figure 3), which is tuned to the key of E minor – the E Aeolian mode (see Figure 4). “*El Jinete*” is a popular Mexican song written by José Alfredo Jiménez (the only non-original piece in the recital programme). The original sheet music for this piece shows simple harmonic movement following the melody (I – IV – V – I etc). In Tatopani’s version there is similar harmonic movement from the piano (Em / Am / B7 or F7alt), but over the constant E minor tonality of the *kalimba*.

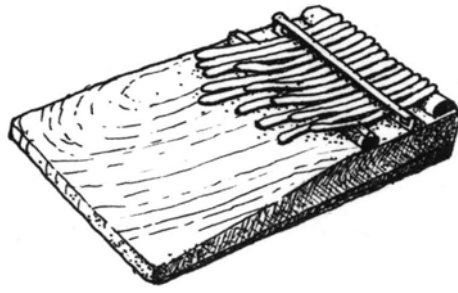


Figure 3: *The kalimba, or thumb piano, used in “El Jinete”.*



Figure 4: *The E minor (Aeolian) scale used as the basic tonality in “El Jinete”.*

This aspect of basing a piece on the key or mode of the participating instruments is prevalent in Tatopani’s music. The group’s musical approach is firmly based in the jazz tradition of improvisation and began from ongoing experimental sessions in which few compositions, either original or otherwise, were played. Free improvisation was the basis and this helped set the trend for the group’s approach to composition and arrangement. A lot of their repertoire is either pure improvisation or based on ideas that came from improvisations. An example of the former is “*Bantarang*” which is a free improvisation with no pre-determined structure or melody. It is based on a scale known in India as *Kalyan That* which corresponds to the western Lydian scale (see Figure 5). The tonal centre was predetermined by the tuning of the *bansuri* flute – a side-blown bamboo flute from India (see Figure 6).

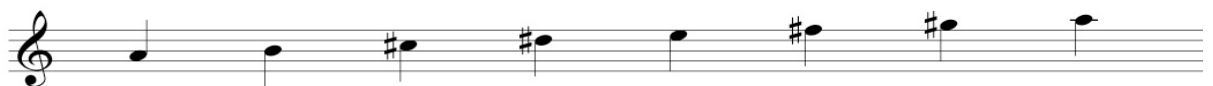


Figure 5: *Kalyan That or Lydian scale.*

The drums are also tuned, adding even more emphasis to the Lydian-based sound. The *tabla tarang*⁸, in this case, consists of three drums that are tuned to the first, second and third

degrees of the scale (A, B and C#). The low-pitched hand drum, the *tar*, is tuned to the fifth degree (E) (see Figure 6).



Figure 6: *The main instruments used in “Bantarang” besides the piano – bansuri flute (left), tabla tarang (centre), tar (right).*

“*Bantarang*” was originally conceived, performed and recorded in a trio setting (with no piano). It is interesting to listen to the original version from *Themes From Dreams* (Tatopani 2000) (refer CD 3 – track 1) and to then compare it with the version from the recital (refer CD 3 – track 2). Both are based on the tonal criteria discussed above; however, with the complex harmonic possibilities offered by the piano⁹ and the simple fact that they are free improvisations (inherently unique), the musical outcomes are radically different. This piece particularly exemplifies the creative aspect of Tatopani’s music making and balances the more ‘composed’ sections of the other recital material.

Having discussed the repertoire of Tatopani, it is appropriate to consider that of the Hiroko Takada Quartet. The decision to perform with this group for the second recital came about initially from the author’s familiarity with both her playing and the group’s repertoire (which is dominated by her original compositions). The juxtaposition of the contrasting nature of the two recitals – in terms of instrumentation and repertoire – was a particular point of interest. On one level the differences are clear and obvious, as presented above, but on further investigation there are also a number of areas of similarity. As with Tatopani’s music, Hiroko Takada’s compositions and arrangements make extensive use of odd metres. In “*Round and*

Round” (refer CD 2 – track 1) there is a constantly shifting metre from 9/8 – with variation of the subdivision within that metre (2–2–2–3 and 3–3–3) – to 5/4, 11/8, 4/4 and eventually the solo section in a long 3/4 metre (see Figure 7).

NOTE: The sheet music is included on page 11 of the print copy of the thesis held in the University of Adelaide Library.

Figure 7 - The first page of the sheet music for “Round and Round” in which the metre changes from 9/8 – 5/4 – 11/8.

Another example of an odd metre composition is “*Sultan Yegah*” (refer CD 2 – track 7). This piece shares similarities with another aspect of Tatopani’s music in that it is an arrangement of a traditional Turkish melody in which the first melody is played over a slow 10/4 rhythm cycle called *Semai*, with a fixed subdivision of 3–2–2–3. This leads to a brighter 6/8 rhythm over which the musicians solo, eventually returning to the slow 10/4 cycle (see Figure 8).

NOTE: The sheet music is included on page 12 of the print copy of the thesis held in the University of Adelaide Library.

Figure 8 - The sheet music for “Sultan Yegah: in a 10/4 metre, shifting to 6/8 at D. The bass melody begins at section C – the quartertone appears in the second bar, denoted here by a slash through the “b” of the Ab quaver on the second half of beat six.

Tatopani have also played a number of similar pieces in *Semai*, making this familiar territory. This version differs from the studio recording of the same piece in that an open introduction over a D pedal was added for the recital. This is an approach taken directly from Tatopani's arrangements of such pieces, creating an atmosphere and mood not often heard in a jazz quartet setting.

The issue of using piano in a non-western musical setting, discussed above in reference to Tatopani's instrumentation, was also encountered in this piece (although this is the only piece in the quartet's programme with this issue). Middle Eastern music uses quartertones – notes that lie in between the usual semitone of western music. For most western instruments quartertones are difficult to produce because they are designed to produce semitones – for the piano it is impossible. In playing this kind of piece with piano, compromises must be made – in this case matching the melodic notes to the piano's tempered tuning. The introduction is an exception to this. With only a deep drone note (no chordal movement), there is much more freedom for the saxophone to explore some of these non-western tunings and inflections. There is also one point in the arrangement where the bass plays the melody and is required to play a quartertone (see Figure 8 – second bar of section C, second quaver of beat six).

From the above discussion we can see how Tatopani's instrumentation directly influences the overall sound and nature of their music and, thus, their repertoire as well, creating a broad spectrum of material within the one group. In contrast, the Hiroko Takada Quartet has a more unified sound throughout its repertoire due to the unchanging instrumentation. The similarities observed stem mostly from non-western cultural influences, but can also be attributed to some degree to the author's individual stylistic and improvisational approaches. This will be discussed further in the following section.

3. INDIVIDUAL CHALLENGES AS A PLAYER

The second main area of discussion focuses on the contrast between the two recitals in regard to the individual challenges faced by the author as a player. These can be looked at from two perspectives. Firstly, the contrast between being a multi-instrumentalist with Tatopani and that of playing only soprano saxophone with the Hiroko Takada Quartet. Secondly, the different improvisational approaches employed for each group.

3.1) Multi-Instrumental Issues

Although the issues discussed here are related to the author's specific situation, they highlight common issues for all musicians confronted with the challenges of playing more than one instrument. The most immediate challenge as a multi-instrumentalist is physical. The woodwind instruments all require different fingering, blowing techniques and embouchures. Renowned jazz multi-instrumentalist David Liebman (soprano/tenor saxes, flutes, bamboo flutes) expressed this dilemma when discussing his reasons for deciding to focus on the soprano saxophone.

It finally became apparent to me that switching between instruments meant severe changes of embouchure, concepts and even how my body actually felt. Also, in an evening's program, I was only playing each horn in real time for only a few minutes. How could I become one with all of these horns and make the kind of creative breakthroughs that occur when an instrument begins to feel increasingly like an extension of the body? (Liebman 1996a).

The fingering of the western flute and the *bansuri* flute are significantly different. For the western flute the soft part of the fingertips is used on the keys. In contrast, on the *bansuri* the fleshy part of the finger (between the first and second joints) is used to cover the holes. Rolling the fingers can control how much of the hole is covered, allowing minute variations in pitch and tone, and portamento, not possible on the western flute (see Figure 9). The

bansuri is used on “*Bantarang*” (refer CD 1 – track 8) and the western flute on “*Leap of Faith Part 2*” (refer CD 1 – track 6).

The *harmonic flutes* use a mouthpiece much like a recorder, only bigger. There are no finger holes but varying the air pressure produces the different notes. Here two *harmonic flutes* are played simultaneously which requires a lot of physical stamina, both holding the instruments and positioning the two flutes in the mouth (each flute is approx. 1.5m in length and made of copper pipe), as well as keeping a continuous air stream going while varying the pressure to each flute to control the pitch (see Figure 9). *Harmonic flutes* are featured on “*Nepali Bicycle Song*” (refer CD 1 – track 2).



Figure 9: *Harmonic flutes (left) and bansuri flute (right)*

One of the biggest challenges is changing from one instrument to another within one piece of music. Each combination presents its own challenges and problems for the player, but as there are too many to discuss here two examples are given.

The most extreme example is changing from *didjeridu* to flute. The *didjeridu* requires a unique blowing technique in which the lips are vibrated to create the basic drone sound. Other sounds are made by varying the shape of the mouth cavity, using the tongue, and using the voice. Furthermore, it is usually blown continuously using a technique known as ‘circular breathing’.¹⁰ After blowing the *didjeridu* for any length of time, the lips tend to go slightly

numb and desensitized. In contrast, the flute requires a very sensitive embouchure, with subtle changes in lip pressure and position. Consequently, playing flute immediately after the *didjeridu* is very demanding, particularly making a quick and seamless adjustment back to a normal flute embouchure. An example of this is “*Leap of Faith*” (refer CD 1 – tracks 5 and 6). *Part 1* has *didjeridu* throughout; it then segues into *Part 2*, in which the melody is played on the western flute. The live version required more time to make the change than the studio version, in which both parts were recorded separately and spliced together later – allowing time to focus on each instrument. (Refer CD 3 for a comparison of the changeover times; track 3 (studio version – 6 seconds from the end of the *didjeridu* to the flute entry, 00:36 – 00:42); and track 4 (live version – 23 seconds, 00:35 – 00:58)).

This piece also incorporates another less-common aspect of multi-instrumentalism – that of playing more than one instrument simultaneously. In *Part 1*, while playing the *didjeridu*, the author is also playing the chordal backing on keyboard. To accommodate this, a personalized *didjeridu* stand had to be invented – fashioned from a cymbal stand and two guitar stands (see Figure 10).



Figure 10: *The didjeridu stand in action – freeing up the hands to play other instruments. In this case, the author is playing clapping sticks together with the didjeridu on “Out of the Blue”.*

Securing the *didjeridu* to the stand frees up both hands to play the keyboard.¹¹ Even though the keyboard part is relatively simple, a degree of independence is required – much like a drummer playing one part with one hand (or foot) and another part with the other.

In this regard, preparation for the Tatopani recital was quite intense. Of course, this is an ongoing process that requires continuous attention and practice. Extra attention, however, had to be given to factors such as song order – to try and make the instrument changes as smooth and impact-free as possible (with the least negative affect on the embouchure); rehearsal of the actual changes themselves, separate from musical issues – allowing enough time to make the changes, and having the instruments for a given piece in the appropriate place to make the change.

3.2) Improvisational Concepts

Although improvisation is an integral part of the music of both groups, the concepts and approaches applied to each situation were somewhat different. As discussed above, this is not a clearly-delineated difference – the Hiroko Takada Quartet’s repertoire is based on chord changes, but there are also some modal elements; Tatopani’s music is predominantly modal, but some pieces have distinct chords changes. Other factors are cultural influences such as those mentioned above – Indian and Middle Eastern. One of the issues for the modern jazz player is to assimilate these wide-ranging (and evermore ubiquitous) improvisational influences with the established jazz foundations, into a cohesive and meaningful approach. The ideal being to synthesize them into an individual and distinctive voice.

The author’s approach to the music based on chord changes stems from the bebop tradition, which is dominated by ‘standard’ chord progressions (V–I, IV–I, II–V–I, III–VI–II–V–I etc.). It is based on the use of arpeggios and approach notes – notes that lead to a chord tone from

below or above, e.g. B – C, or D# – E, or F# – G over a C major chord (see Figure 11a) with emphasis on the upper extensions of the chord (see Figure 11b).



Figure 11a: *The use of approach notes in an improvised line over a C major and C minor chord. The chord tones are indicated by brackets.*

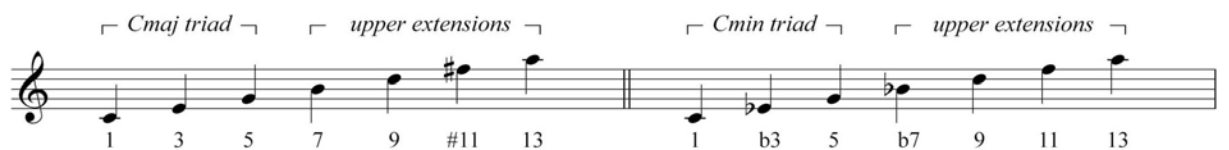


Figure 11b: *The chord tones and upper extensions of a C major and C minor chord.*

In the repertoire of both groups, however, the chordal movement often follows less conventional movement. In many cases the chords move in unexpected ways with less emphasis on the traditional resolution of a particular chord sequence. Examples of this can be heard on “*Ame No Nioi*”, “*Boys on the Wind*” (refer CD 2 – tracks 2 and 3) and “*Nepali Bicycle Song*” – second half of sax solo (refer CD 1 – track 2, 5:20 – 6:07).

The approach used over the modal¹² pieces is somewhat different. The melodic and harmonic possibilities within the mode are explored, while also trying to diverge from the tonality (often referred to as playing ‘outside’) by the use of chromatics and intervallic patterns (such a 4ths and 5ths). Examples of this approach can be heard on Tatopani’s “*Azure Part 2 – Blue Funk*”, in which the soprano solo is played over an E minor tonality (refer CD 1 – track 2, 2:50 – 4:20) and “*The Wind from the West*” from the Hiroko Takada Quartet. Here the solo section is played over a D drone, with no set harmonic base (refer CD 2 – track 5, 1:13 – 5:05).

The overall connecting element between these two broad approaches is melody. In both recitals melody tends to take precedence over harmony, even though the harmony is never totally ignored. David Liebman expressed this point eloquently:

In the end, chords are only moving colors that help to specify the available notes for melodic invention, but do not preclude unrelated tones. Harmony is not an intellectual tool with no other purpose than to cause the music to be pedantic; it serves the element of melody (Liebman 1996b).

This element of melody is a fundamental part of the author's approach to improvisation and is apparent throughout the two recitals.

4. RECORDING

The third main area of discussion relates to the recording of the recitals. The recording of any musical performance is inherently weighted with issues that can affect the quality and ultimate reception of the finished product. Recording improvised music is further complicated by the quandary of capturing, and therefore making repeatable, something that is musically unrepeatable. Mark Katz in his book *Capturing Sound: How Technology Has Changed Music* states:

While hardly independent of models or rules, improvised music assumes its exact shape and sound only when executed. An improvised solo or work is, by definition, unique, belonging to a specific time and place. A recorded improvisation is therefore a paradox: it is music of the moment made timeless, the one-of-a-kind rendered reproducible, the spontaneous turned inevitable (Katz 2004).

It is beyond the means of this submission to discuss the philosophical aspects of recording improvised music, so the discussion is limited here to the technical issues of sound production.

Broadly speaking, recording can be divided into two main types: live recording and studio recording. Both have positive and negative aspects. Live recording has the positive aspect of being able to potentially capture the true nature and energy of a performance in front of an audience, but can also be hindered by logistical problems of trying to reproduce on tape (or whatever medium is being used) the best possible sound of each instrument/voice, while still paying due heed to the live sound and the position and miking of those instruments. On the contrary, studio recording (depending on the studio) offers more control and flexibility in regard to the sound quality of the instruments, but can often lack the energy, atmosphere and ambience unique to a live performance situation. These issues are discussed here, with reference to the specific problems faced in recording the two recitals and the different approaches applied for each concert.

4.1) Tatopani Recital

The Tatopani recital was held at one of the foremost jazz venues in Tokyo, Sweet Basil – a large club, seating around 250-270 people with very good stage, sound and lighting facilities as well as talented and experienced staff.

A stereo signal (two channel – left/right) was taken directly from the mixing desk and recorded to DAT (digital audio tape).¹³ One of the common problems with this kind of recording is that the sound is being mixed for the live performance in the club, *not* for the recording. Some instruments have a louder acoustic sound than others, and electronic instruments have no acoustic sound at all, which means the levels these instruments are set at, to achieve a balanced sound in the club, could be quite different than the levels for a balanced recording. In the recording of the Sweet Basil concert, these balance problems can be heard throughout.¹⁴

Another aspect of this recording style is the use of *effects*.¹⁵ In a studio, one can achieve separation of the instruments by placing each player in a sound booth.¹⁶ This allows for much greater control over how each instrument is miked and what effects can be added to that instrument. In contrast, in a live recording situation, each microphone will pick up all the other instruments being played on stage – to some degree.¹⁷ If, for example, a reverberation effect (to simulate the natural reverberation of a concert hall or large room) is desired on the saxophone, this effect will be felt on all the other instruments that the saxophone microphone is picking up. A very obvious example of this can be heard on “*Azure Part 1 – The River Deep*” and “*Azure Part 2 – Blue Funk*” (refer CD 1 – tracks 1 and 2).

In *Part 1*, the vocal technique known as overtone singing is used.¹⁸ The overtones, or harmonics, resonate much more clearly in a room with very *wet* acoustics (a lot of reverberation). In both studio- and live-recording situations, this must be added. In the studio recording of this piece from Tatopani’s third CD *Azure* (Tatopani 2005b), the overtone singing was recorded in a separate booth, which allowed for a rich reverberation to be added without affecting the other instruments. On the concert recording, however, the reverb applied to the voice can be heard (felt) on the overall sound throughout *Part 1*. This is clearly evident where *Part 1* segues into *Part 2*. Here the music goes into a very energetic percussion interlude that leads into the opening double-saxophone *riff* of the second piece. It was conveyed to the sound staff that the rich reverb on the voice microphone would not be needed in the second part of the piece, but a clear point at which to cut the reverb was not given. Consequently, the end result on the live recording is that *Part 1* was a little more ‘washed out’ than desired and this crossed over into *Part 2* for two or three bars before the engineer cut the reverb on the voice microphone (refer CD 1 – track 2, 0:06). This example clearly shows the difficulty of using strong effects on a live recording, but also touches on another issue – that of recording directly to stereo as opposed to multi-track recording, which was the recording method used for the second recital.

4.2) The Hiroko Takada Quartet Recital

Multi-track recording is “a term applied to sound-recording techniques in which separate tracks are recorded simultaneously or successively and then combined in the studio” (Mumma 2006). For live recording, the main difference between a direct-to-stereo recording and a multi-track recording is that, with the latter, many elements of the mix – the sound or tone quality of each instrument, relative levels, use of effects, etc. – can be adjusted after the fact. With direct-to-stereo, they cannot be changed afterwards. The sound can be changed to some degree, but any changes will affect the whole sound and cannot be applied to separate instruments.

The issue of sound being picked up by other microphones (*bleeding*) as discussed above, is still relevant with multi-track recording; however, there is a far greater degree of flexibility in making choices about the mix, and the huge advantage of being able to listen over and over in order to achieve the most appropriate sound for a given piece. Multi-track recording was chosen for the second recital for these reasons.

In this case, the Elder Music Unit (hereafter EMU) in The University of Adelaide was an excellent venue because it is set up with a comprehensive Pro Tools system.¹⁹ This meant that, even though it was recorded in one room in a concert setting, each instrument could be recorded separately, with the microphones dedicated to the recording, not the live sound.²⁰ A total of seventeen separate channels were used (see Figure 12 and Table 2). These channels were recorded to hard disk as individual sound files and were then mixed using the Pro Tools computer-based mixing software.

CLIENT:		SONG:		OFFSET:		TEMPO:		DATE: 8/3/04
1 Kik AKG.	2 Sn Top. SM-57	3 Sn Bot * lowest face. Beta 57	4 Q1. Yamaha	5 Floor Yamaha	6 Hats. Neumann K84	7 OH Left. Rode NTS.	8 Oh Right Rode NTS.	
9 Bass DI. out of amp.	10 Bass U87.	11 Piano U87. Omni keep centre.	12 Piano U87 Figure 8 Pan L.	13 Piano U87 Figure 8 copy Figure 8 Pan R.	14 Sax 1 NT2 top.	15 Sax 2 AKG. Bot.	16 Room L. NT 2	
17 Room R.	18.	19.	20.	21.	22.	23.	24.	

Figure 12: The track list from the second recital at the EMU space, showing the microphone and the instrument on which it was used.

Track	Instrument	Microphone	Track	Instrument	Microphone
1	Bass Drum	AKG	10	Bass	Neumann U87
2	Snare – Top	Shure SM 57	11	Piano Panned Centre	Neumann U87 (omni)
3	Snare – Bottom	Shure Beta 57	12	Piano Panned Left	Neumann U87 (Figure 8)
4	Hi Tom Tom	Yamaha	13	Piano Panned Right	Neumann U87 (Figure 8)
5	Low Tom Tom	Yamaha	14	Soprano Sax Top	Rode NT-2
6	Hi-Hats	Neumann K84	15	Soprano Sax Bottom	AKG
7	Overhead Left	Rode NT-5	16	Room Microphone Left	Rode NT-2
8	Overhead Right	Rode NT-5	17	Room Microphone Right	Rode NT-2
9	Bass – Direct Line from Amp.	DI Box			

Table 2: The microphones used for each instrument – in list form.

It may be of interest to add that the Hiroko Takada Quartet has recorded two CDs (Takada 1998, 2003), both of which used this recording method, i.e. a single-room recording with no separation booths. The main difference is that, because these CDs were not concerts, a lot more freedom was achieved in instrument placement (e.g. placing the drums as far away as

possible to limit bleeding), and the use of baffles wherever possible (particularly with the bass and drums). The crucial point, however, is the ability to mix after the actual recording. This enables many issues brought about by the limits of the recording situation to be dealt with after extensive deliberation and experimentation (for a more detailed discussion of the multi-track mixing process refer to Appendix C). In this regard, even though the EMU recording was of a live performance in front of an audience, it is the author's opinion that the sound quality holds up against those two CDs that were released commercially.²¹

CONCLUSION

Each creative music-making project will, by definition, have its own unique process from conception to realisation. It is clear, though, that when approached in a holistic way, the key elements that make up these processes – instrumentation, repertoire, individual challenges as a player, approaches to improvisation, and recording – are intrinsically linked and bound in such a way as to give that particular musical outcome a certain stamp of individuality. This is evident in the different processes involved for each of the recitals discussed here and in the resultant end-product of each performance in the form of a CD. It also corroborates observations made of other groups that have made similar music-making explorations, such as Oregon, The Paul Winter Consort and David Liebman's Lookout Farm.

A constant theme throughout was the idea of contrast and juxtaposition between the two recitals. This has been highlighted in the three main areas of discussion – personal challenges as a player, musical challenges as a group and logistical challenges in the recording process. These contrasts are clear and significant in terms of the actual music produced and the

processes leading up to the performances. Within this overall theme of contrast, however, many elements of correlation and similarity between the two recitals were also observed.

From a multi-instrumental perspective this suggests that, even though multi-instrumentalism allows for a divergent range of musical possibilities for the player, there will always be a common thread stemming from the player's background and location, musical influences, approaches to improvisation and sound concept, no matter what instruments are played. The discussion, of course, focused on the specific challenges faced by the author, but the observations made can be applied to other creative music-making projects in which instrumentation plays a role. In many genres multi-instrumentalism is often perceived from a generic "instrument" perspective whereby the specific characteristics of the instrument (tone, colour and even style) are given higher priority than the artistic or creative aspects of the performer. To quote Liebman one final time, "Fortunately, the musicians with whom I work do not play alongside an instrument, but with a human being who happens to express himself through one or another vehicle" (Liebman 1996d). Such observations shed light from the artist's creative standpoint, on the role of the multi-instrumentalist and its associated issues and how that role can vary in different musical settings.

The fact that recording issues were an integral part of the research provided extra focus for this discussion beyond the purely musical aspects. Preparation of the music involved going one step beyond the usual performance-related challenges to seeing the music documented in the best way possible. The recording situations discussed here were by no means ideal (which is the reality for the majority of musicians), and when looked at holistically, they clearly show that there are strong and important correlations between recording and the musical process – the creative musical seed, instrumentation, composition, arrangements and performance space. This is an area of the music-making process that would benefit greatly from future consideration and research.

The idea of music from conception to realisation has been a central element of work done on this submission. In that sense, it is the author's belief that the final products are a good representation of the music as it was conceived, processed, and finally performed – although being based on improvised music, they are just one outcome, captured forever, out of many other potential outcomes.



Endnotes:

¹ Its original members, Paul McCandless (oboe, english horn, bass clarinet), Glen Moore (double bass, violin, piano, flute), Ralph Towner (acoustic guitar, piano, french horn, trumpet, flugelhorn), and Collin Walcott (*tablā*, *sitar*, clarinet, percussion), all played in the Paul Winter Consort before forming their own group in 1970. The sensitive interaction of the players in performance allows them to improvise collectively without assuming rigidly defined roles. Their recordings include pieces based upon complex harmonies and others based on a drone or totally free improvisation. The fact that the musicians play 60 to 80 different instruments gives the group a wide palette of sounds.

See further: Larson, Steve and Kernfeld, Barry. 2006. "Oregon." *Grove Online Music* ed. L. Macy. (Accessed June 13, 2006) <http://www.grovemusic.com>

² German record company. It was founded in Cologne in 1969. By 1971 it was recognized for its excellent recordings of free jazz. ECM has a readily identifiable house style, uniting two previously disparate genres, jazz-rock and free jazz.

See further: Kernfeld, Barry. "ECM." *Grove Online Music* ed. L. Macy. (Accessed June 13, 2006) <http://www.grovemusic.com>

³ Representative albums are The Paul Winter Consort (*Icarus* 1973), and Oregon (*Oregon* 1983).

⁴ Liebman describes the book as follows: "[It] was written cooperatively by the members of that group [Lookout Farm]. In it we discussed five original compositions from the standpoint of how they were conceived and evolved during the course of performance. The ideas reflected our individual and collective insights into the creative process (Liebman 1996c)."

⁵ This subject is discussed in detail in E. Taylor Atkins' book *Blue Nippon: Authenticating Jazz in Japan* (2001).

⁶ This continued the research theme from the author's second research paper, which looked at issues associated with the recording of acoustic instruments – with the Japanese *shakuhachi* used as the focus of three case studies, "Technical Issues For Acoustic Recordings (*Shakuhachi as a Case Study*)" (Bevan 2004b).

⁷ This aspect of the group's music was discussed in detail in the paper, "A Study Of The Cross-Cultural Influences On The Music Of Tatopani" (Bevan 2004).

⁸ The Indian *tabla* consists of two drums – a high-pitched, tuneable drum called a *tabla* and a low pitched one called a *baya*. The *tabla tarang* is any number of the higher drums tuned to different pitches.

⁹ Pianist Bruce Stark (pers. com. 2006) offered this view of his approach within the modal framework of the *bansuri*, *tabla tarang* and *tar*: "That was primarily arpeggio textures within the mode, with slow, broad bass movement suggesting a chord progression of extended major or minor harmonies. Also, use of the extreme registers."

¹⁰ A technique used principally by wind players to enable them to produce a continuous stream of notes without breaking to draw breath. The player inhales through the nose, filling the lungs with air; simultaneously, using the diaphragm, he replenishes the reservoir of air in the mouth cavity, while continuing to expel air from the mouth into the instrument.

See further: Kernfeld, Barry. "Circular breathing." *Grove Online Music* ed. L. Macy. (Accessed July 3, 2006) <http://www.grovemusic.com>

¹¹ Keyboard is not the only instrument played together with the *didjeridu*. In “*Out of the Blue*” the *didjeridu* is played together with a set of wooden clapping sticks (refer to CD 1 – track 9)

¹² The defining characteristic of modal improvisation is that it explores the melodic and harmonic possibilities of a collection of pitches, often corresponding to one of the ecclesiastical modes or to a non-diatonic scale from traditional or ethnic music. The mode is expressed harmonically through drones or through two or more chords that oscillate beneath melodic lines using the same pitches.
See further: Kernfeld, Barry. “Modal Improvisation.” *Grove Online Music* ed. L. Macy. (Accessed June 3, 2006) <http://www.grovemusic.com>

¹³ For the Tatopani recital the DAT recording was transferred to hard disk. The stereo files were then enhanced using the Pro Tools computer-based mixing software. As stated above, it was not possible to change relative levels of individual tracks or the sound of each separate instrument. Changes were made to the overall group sound only.

¹⁴ Some examples of this can be heard on track 1 of CD 1, “*Azure Part 1 – The River Deep*”, in which the soprano sax melody is a little softer than it should be and somewhat distant, and on track 2 of CD 1, “*Nepali Bicycle Song*”, in which the bass clarinet is sometimes louder than its backing role requires.

¹⁵ Effects are colorations added to enhance or change the quality of a given sound (or instrument). The most common effects are: reverb, delay, echo, chorus, phasing etc.

¹⁶ Even in studios without complete separation (sound booths), some separation can be achieved by using baffles. These are large partitions (usually made of some kind of sound-absorbing material) that are placed in front of, or around, the player to prevent their sound going directly into other microphones. These cannot be used in concert situations for obvious aesthetic reasons.

¹⁷ The degree to which the sound of the other instruments is picked up would depend on the type of microphone used (directional or omni) and the level at which it is set.

¹⁸ A vocal style in which a single performer produces more than one clearly audible note simultaneously. In melodic overtone-singing styles, a drone is produced on the first harmonic or fundamental and a flute-like melody created from a series of upper harmonics or overtones. Pegg, Carole. “Overtone-singing.” *Grove Online Music* ed. L. Macy. (Accessed June 17, 2006) <http://www.grovemusic.com>

¹⁹ Pro Tools is the industry-standard, computer-based, digital multi-track recording software – used in the majority of professional studios the world over.

²⁰ The concert itself was performed almost acoustically – a very simple PA system was used to enhance the soprano sax and piano only.

²¹ Refer to tracks 5 and 6 of the accompanying CD 3 to compare the sound of the commercially released CD version of “*The Wind From The West*” and the same piece from the recital.

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Appendix A - Musician Profiles

Profiles of the musicians in each recital ensemble.

1) Tatopani

Andy Bevan was born in Perth and raised in Adelaide, South Australia. After initial studies on flute and piano, he pursued a performance degree on the tenor sax. Along with playing a wide range of woodwinds, his association with Australian aboriginal musicians inspired him to play the *didjeridu* which he immediately incorporated into his musical activities. Following several years working as a professional musician in Australia, he traveled for a year and a half in South East Asia absorbing the various cultures and musical traditions. He presently resides in Japan, performing a variety of music including jazz, Brazilian, fusion and world music. His distinctive sound and the array of colors he brings to any group have put him in great demand in both studio and performance situations.

Robert Belgrade was born in San Francisco, California. He began his studies in Western Classical music on the piano and flute, followed by studies on saxophone and improvisation with John Handy. He studied vocal music under Ali Akbar Khan and *tabla* under Zakir Hussain, Alla Rakha and Swapan Chaudhuri at the Ali Akbar College of Music. He currently resides in Japan, performing in a wide range of musical contexts, including R&B, jazz, Latin and Indian music. His individual sound and playing style derive from his background in both Eastern and Western music. He has more recently extended his multi-instrumental talents to incorporate the bass clarinet, the Brazilian *pandeiro* and Afro-Cuban percussion.

Christopher Hardy, an American based in Tokyo since 1989, is a highly-praised percussionist, composer, educator and recording artist. Hardy has a background in Western percussion from the University of Michigan and is a hand-drum specialist whose primary focus is on Middle Eastern and North African percussion. He also performs and records in Renaissance, jazz, world music and other creative musical settings, and has synthesized this variety of influences to create a unique and individual voice. His solo CD *Touch*, released on the Victor label, was voted “Best Popular Album of 2002” in Japan and has been released on DVD as well.

Born in San Diego, California, **Bruce Stark** completed his master’s degree in composition at the Juilliard School. His music, which draws from both jazz and classical traditions, has been performed, recorded on numerous CDs, and broadcast worldwide. He has also been featured as pianist/arranger on over a dozen other albums, performing his arrangements of a wide range of material from Bach to jazz standards to traditional Japanese melodies. The recipient of numerous awards, Stark has the ability to focus eclectic elements into an organic and compelling musical voice.

2) The Hiroko Takada Quartet

Hiroko Takada started playing piano when she was five. She began leading her own groups while studying at the Osaka University of the Arts. In 1981 she moved to Tokyo where she studied jazz theory and composition. For the past decade she has led her own quartet as well as performing freelance with a variety of musicians and instruments. She has toured extensively in Europe with groups from Japan as well as collaborating with European

musicians. Her first CD of original compositions, *A Song for Someone*, was widely acclaimed in both Japan and Europe, where it was released in 1998. This was followed by her second CD *Elma* in 2003.

As the quartet is based in Japan the bass and drum positions had to be filled by local musicians in Adelaide. With limited rehearsal time (one full rehearsal and a sound check/rehearsal on the day of the recital), drummer Craig Lauritsen and bassist Lyndon Gray performed creatively, professionally and with great enthusiasm.

Lyndon Gray, a graduate of the Elder Conservatorium of Music jazz programme, has a string of achievements: runner up at the 2003 Barossa Jazz Festival Awards, appearances at the Glenelg Jazz Festival and the Edinburgh Festival of Arts. He is comfortable in a diverse range of musical genres and has performed extensively both in Australia and abroad with a number of popular groups, including alternate country and pop group, The Audreys, which have done well on the international festival circuit.

Craig Lauritsen, after finishing a diploma in jazz at the University of Adelaide, continued his studies privately under the tutelage of renowned jazz drummer Bob Moses in Boston and Pandit Debashish Cakraborty in New Delhi. He has extensive experience as a performer, educator and author. He has taught privately and in many music institutions and, since 2004, has been a member of the Vic Firth Worldwide Education Team. He has performed with a long list of Australian and overseas artists and is recognized for his ability to play in a wide range of musical styles.

Appendix B – Recital Programmes

1) Concert Programme for Recital 1 – *The concert programme and instrumentation for the Tatopani recital at Sweet Basil, Tokyo on November 24th, 2005.*

First Set

1. Azure Part 1 – The River Deep (R. Belgrade)

Andy Bevan – keyboard, overtone singing

Robert Belgrade – soprano sax

Christopher Hardy – acoustic and electric drums and percussion

Bruce Stark – piano

2. Azure Part 2 – Blue Funk (R. Belgrade)

Bevan – soprano sax

Belgrade – tenor sax, pandeiro

Hardy – acoustic and electric drums and percussion

Stark – piano

(Extra percussion: Masaru Shimizu)

3. Nepali Bicycle Song (R. Belgrade)

Bevan – harmonic flutes, soprano sax

Belgrade – bass clarinet

Hardy – acoustic percussion

Stark – piano

4. El Jinete (José Alfredo Jiménez)

Bevan – kalimba

Belgrade – soprano sax

Hardy – acoustic and electric drums and percussion

Stark – piano

5. Leap of Faith Part 1 – Psalm (R. Belgrade)

Bevan – keyboard, didjeridu

Belgrade – tenor sax

Hardy – acoustic percussion

Stark – piano

6. Leap of Faith Part 2 – Joy (R. Belgrade)

Bevan – flute

Belgrade – tabla

Hardy – udubu, kanjira

Stark – piano

7. Eleven (A. Bevan / R. Belgrade)

Bevan – soprano sax

Belgrade – bass clarinet

Hardy – acoustic and electric drums and percussion

Stark – keyboard, piano

(Extra percussion: Masaru Shimizu)

Second Set

1. **Bat Dance*** (C. Hardy)

Bevan– soprano sax

Belgrade – tenor sax

Hardy – tar (frame drum)

2. **Funauta*** (Trad. Turkish)

Bevan– soprano sax, didjeridu, clapping sticks

Belgrade – tabla, voice

Hardy – darbukka, riq

3. **Bantarang** (A. Bevan / R. Belgrade / C. Hardy / B. Stark)

Bevan– bansuri flute

Belgrade – tabla tarang

Hardy – bendir (frame drum)

Stark – piano

4. **Out of the Blue** (A. Bevan / R. Belgrade / C. Hardy)

Bevan– didjeridu, clapping sticks

Belgrade – pandeiro

Hardy – berimbau, tar (frame drum)

Stark – shaker

(Extra percussion: Masaru Shimizu)

5. **Tatopani*** (R. Belgrade)

Bevan– soprano sax

Belgrade – tenor sax

Hardy – acoustic and electric drums and percussion

Stark – piano

(Extra percussion: Masaru Shimizu)

6. **Delgado Part 1 – Tiempo Sagrado** (R. Belgrade)

Bevan– soprano sax

Belgrade – bass clarinet

Hardy – darbukka

Stark – piano

7. **Delgado Part 2 – Feria** (R. Belgrade)

Bevan– soprano sax

Belgrade – tenor sax

Hardy – darbukka

Stark – piano

(Extra percussion: Masaru Shimizu)

(*) denotes pieces that were played at the concert but not included in this submission (to conform to required duration).

2) Concert Programme for Recital 2 – *The concert programme and instrumentation for the Hiroko Takada Quartet recital at the Elder Music Unit, Adelaide on March 9th, 2006.*

Andy Bevan – soprano sax

Hiroko Takada – piano

Craig Lauritsen – drums

Lyndon Gray – bass

First Set

1. **Round and Round** *(H. Takada)*
2. **Ame No Nioi** *(H. Takada)*
3. **Boys on the Wind** *(H. Takada)*
4. **Blue in Green** *(Miles Davis/Bill Evans)*
5. **The Wind from the West** *(H. Takada)*

Second Set

1. **Je Ne Sais Quoi*** *(Enrico Pieranunzi)*
2. **Kaori's Song** *(H. Takada)*
3. **Sultan Yegah** *(Hact Aref Bek)*
4. **For a New Day** *(H. Takada)*
5. **Three Triangles*** *(H. Takada)*

(*) denotes pieces that were played at the concert but not included in this submission (to conform to required duration).

3) Track Lists for CDs

CD 1 – Tatopani Recital

1. Azure Part 1 – The River Deep *(4:41)*
2. Azure Part 2 – Blue Funk *(4:33)*
3. Nepali Bicycle Song *(8:33)*
4. El Jinete *(8:55)*
5. Leap of Faith Part 1 – Psalm *(4:10)*
6. Leap of Faith Part 2 – Joy *(7:32)*
7. Eleven *(7:42)*
8. Bantarang *(6:02)*
9. Out of the Blue *(3:51)*
10. Delgado Part 1 – Tiempo Sagrado *(5:10)*
11. Delgado Part 2 – Feria *(5:02)*

CD 2 – The Hiroko Takada Quartet Recital

1. Round and Round *(6:49)*
2. Ame No Nioi *(9:03)*
3. Boys on the Wind *(7:46)*
4. Blue in Green *(5:19)*
5. The Wind from the West *(7:50)*
6. Kaori's Song *(8:42)*
7. Sultan Yegah *(9:59)*
8. For a New Day *(8:28)*

CD 3 – Comparative Examples (*pieces and/or excerpts from the recitals compared to the same pieces from the commercially released CDs*)

1. Bantarang (*from “Themes from Dreams”**) (6:36)
2. Bantarang (*from recital 1*) (6:02)
3. Leap of Faith – excerpt (*segue from Pt. 1 to Pt. 2 – from “Azure”**) (0:54)
4. Leap of Faith – excerpt (*segue from Pt. 1 to Pt. 2 – recital 1*) (1:11)
5. The Wind from the West (*from “Elma”**) (7:06)
6. The Wind from the West (*from recital 2*) (7:50)
7. Sultan Yegah – excerpt (*sax track with no EQ*) (0:38)
8. Sultan Yegah – excerpt (*sax track with EQ*) (0:38)
9. Boys on the wind – excerpt (*piano track with no EQ*) (0:34)
10. Boys on the wind – excerpt (*piano track with EQ*) (0:34)
11. Sultan Yegah – excerpt (*bass track with no EQ*) (0:36)
12. Sultan Yegah – excerpt (*bass track with EQ*) (0:36)

(*) Details of the commercially released CDs are as follows:

Track 1

Tatopani, 2000. “Bantarang.” *Themes From Dreams*. CD. Equilibrium EQ 39. Track 3.

Track 3

Tatopani, 2005. “Azure Part 1 – The River Deep.” / “Azure Part 1 – Blue Funk.” *Azure*. CD. Tatopani Music TM-003. Tracks 1 and 2.

Track 5

Takada, Hiroko. 2003. “The Wind from the West.” *Elma*. CD. Roving Spirits Co. RK CJ-2010. Track 7.

Appendix C – Detailed Discussion of Mixing Techniques

A detailed discussion of specific mixing techniques used to enhance the recorded sound in multi-track recording. Several sound files for each example have been included on the accompanying CD 3. Listening to, and comparing these tracks, in conjunction with the text, will give a clearer understanding of the discussion – a good set of headphones or hi-fi system is recommended.

As discussed in section 4.2, one of the advantages of multi-track recording is the ability to mix after the fact. In this appendix, specific examples from the second recital will be used to highlight the problems of live recording and how they were addressed in the mixing process. The issue of *bleeding* will be analyzed in detail with reference to each instrument.

Drums

Eight separate tracks were used for the drums in order to get as clean a sound as possible for each drum, allowing more control during mixing. Using so many microphones can be problematic, however, as each one picks up the total room sound and this becomes compounded when each channel is left on. One way to counter this is to delete un-needed sections of certain tracks. In the mix window of “*Sultan Yegah*” (see Figure 1) the top eight tracks are the drum tracks. Track 1 is the bass drum, tracks 2 and 3 are the snare drum (top and bottom) and tracks 4 and 5 are the tom-toms. As can be seen, these drums are only hit a few times throughout the first half – and the tom toms are still relatively sparse in the second half. The areas between hits on all five tracks contained a lot of extraneous sound, which tended to the make the mix sound ‘muddy’. These extra microphones also accentuated the particular characteristics of the room sound, which in this case was not a desirable result. Once deleted, the overall sound was noticeably clearer. This technique was used wherever possible to help cut down on superfluous noise.

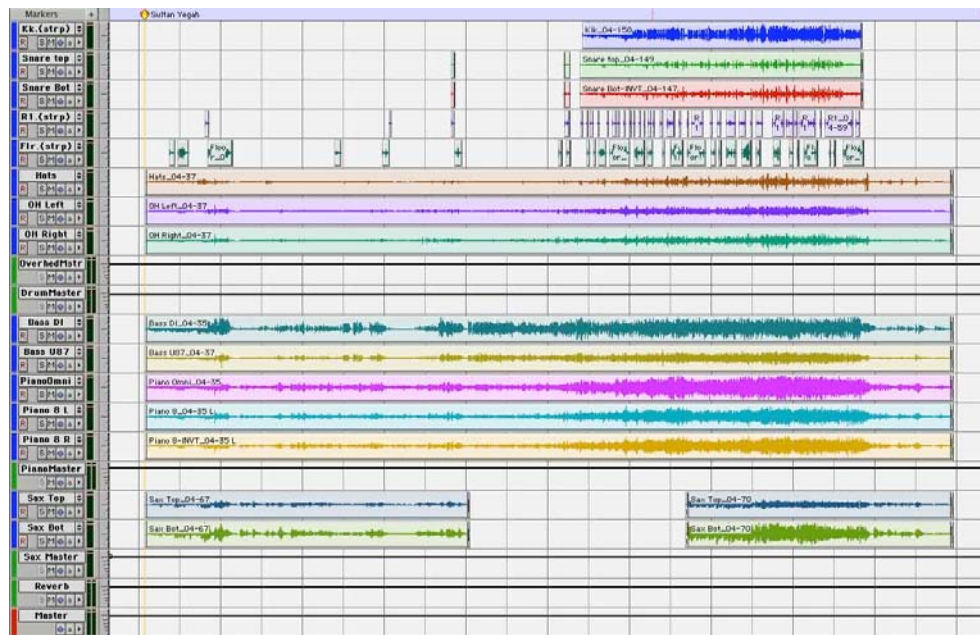


Figure 1: *The Pro Tools mix window from “Sultan Yegah”.*

Saxophone

A big problem was the saxophone microphones picking up other instruments in the room – particularly the drums. This was resolved to some degree by the use of equalization (EQ). EQ was used partially to enhance the tone of the sax, but also as a filter to try and reduce the amount of unwanted sound. By ‘soloing’ the original sax tracks, one can hear how much the other instruments were bleeding into these tracks (refer CD 3 – track 7).

Note that it is not just the level of sound, but the amount of low frequency resonance, particularly from the drums, bass and the low end of the piano, that causes the most problems. By applying an EQ *plug-in*¹ to these tracks and cutting out everything below 121 Hz, a significant improvement in clarity was achieved (see Figure 2) (refer CD 3 – track 8). This is a sensitive procedure, because if not done carefully, it can adversely change the sound of the instrument. The standard frequency range of a kick drum is 30-147 Hz for the fundamental

¹ ‘Plug-in’ is a term used to describe any kind of software signal processor.

(the range of the harmonics is 1-6 kHz), and a soprano sax (similar to an oboe) is 261-1568 Hz (harmonics – 2-12 kHz) (Bartlett 2002). It can be seen then, that filtering out frequencies below 121 Hz will retain all the lowest natural frequencies of the sax while significantly reducing the frequencies of instruments such as the kick drum, tom-toms, bass, and the lower end of the piano (all of which contributed to the low end muddiness heard on the original sax track).



Figure 2: *The EQ plug-in used on the saxophone.*

Piano

The piano was the most problematic instrument. Three high-end condenser microphones were used – Neumann U87s. These large-diaphragm microphones are highly sensitive and can pick up subtle nuances of timbre and sound colour, which was ideal for an instrument with the rich tonal palette of the piano; however, this meant they were also sensitive to any other sounds in the room. Usually in a concert situation the piano is placed so that the sound projects out to the audience. In the EMU recital this would have meant the piano also faced the drums, allowing the direct sound of the drums into the piano microphones. A compromise was made

– placing it the opposite way so that its lid was facing the drums. This had a beneficial effect, but by soloing the piano microphones one can clearly hear how much the other instruments were still picked up, particularly the drums (refer CD 3 – track 9). In fact, the level of the drums on the piano channels is enough that very little extra was needed from the drum channels – they served mostly to give some clarity to each drum sound.

The technique used on the saxophone was not appropriate for the piano because the piano’s frequency range, 28-4196 Hz (harmonics 5-8 kHz), is so broad that cutting certain frequencies completely would have dramatically changed the sound of the piano itself. In this case again a compromise was made. The low-end frequencies were partially cut from around 100 Hz in a way that retained as much of the true nature of the piano in that frequency range as possible, while reducing some of the unwanted drum sounds and general low-frequency resonance (refer CD 3 – track 10). Notice the cut-off curve is less severe for the piano (compared to the sax), allowing some of the frequencies closer to 100 Hz to filter through (see Figure 3).



Figure 3: *The EQ plug-in used on the piano.*

Bass

Similar issues were encountered with the bass. Two channels were used for the bass, one a line signal taken directly from the bass amplifier (a totally clean signal – bass only), and a microphone placed in front of the bass’s bridge. The clean sound source provided by the line signal is very desirable, but unfortunately it tends to make the bass sound unnatural – often like an electric bass and usually harsh and lacking in warmth. The microphone used on the bass was also a Neumann U87. In a studio recording, this microphone would always be preferable to a line signal as it can capture the deep frequencies, the finger and string nuances, and the sense of air movement unique to the contrabass; however, with the acoustic level of the bass being quite low, the microphone had to be set at a high input level to get a good signal, causing major bleeding problems. In this case, the microphone contained so much of the other instruments that the line signal had to be used more than was initially anticipated. The microphone channel was set at a slightly higher level than the line channel and the EQ technique described above was also employed; however, here the high frequencies (above 5 kHz) were cut to remove unwanted sounds from that range (see Figure 4).



Figure 4: *The EQ plug-in used on the bass.*

The frequency range of contrabass is 41-294 Hz (fundamentals) and 1-5 kHz (harmonics). The range for cymbals is 300-587 Hz (fundamentals) and 1-15 kHz (harmonics); snare drum is 100-200 Hz (fundamentals) and 1-20 kHz (harmonics) (Bartlett 2002). The frequency range of the harmonics of the cymbals and snare goes well over 5 kHz, meaning a lot of unwanted high-end resonance beyond the range of the bass. There was a general compounding of low bass frequencies from several tracks (low drums, piano and bass) in the overall recording, so the bass frequencies were also cut from 50 Hz, which are only the deepest sub-bass frequencies.

Conclusion

Other techniques were used to enhance the recorded sound for each recital; however, it is beyond the means of this submission to discuss them all. The above is a detailed example of just one issue, but it illustrates the kind of problems encountered and the nature of the processes involved in dealing with them.



**CDs 1, 2 and 3 are included with the print copy
held in the University of Adelaide Library.**

CD 1 – Recording of Recital 1 (*Tatopani*)

CD 2 – Recording of Recital 2 (*The Hiroko Takada Quartet*)

CD 3 – Comparative Examples (*Pieces/excerpts from recitals
and commercial CDs*)