Stuart Greenbaum: Symphony No.2 *'Double Planet'*
An article by the composer

Overview
This symphony is scored for a chamber orchestra of 20 players, cast in 4 movements:

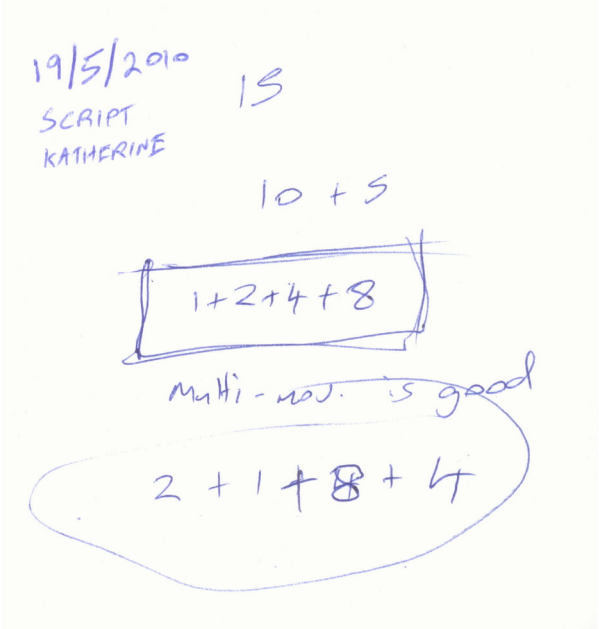
i) *Preview #1*	2'
ii) *Double Planet*	8'
iii) *Preview #2*	1'
iv) *Day and Night*	4'

The work is concerned with miniaturisation, self-similarity and transformation. The shorter preview movements are 'fast-forward' representations of the two longer movements which themselves respond to pictures by the Dutch graphic artist, M.C. Escher whose work in general addresses these issues.

Beginnings: the numbers game
The first ideas for this piece concerned the duration of the proposed new work – 15 minutes. This in turn suggested the possibility of multiple movements. 15 minutes can be divided up in many ways – perhaps most typically into two or three movements of relatively equal duration. From the outset, however, I had something different in mind. In recent years I have taken a more radical approach to the proportion to multi-movement works (including *Chamber Concerto*, *Falling by Degrees*, *Mondrian Interiors* and *The Year Without a Summer*). I have become interested in challenging ideas of balance in regard to both the duration and order of movements.

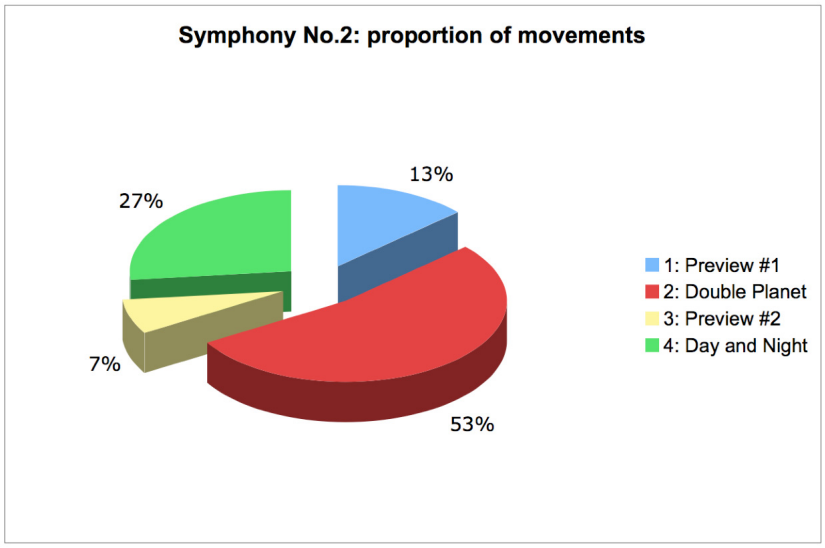
For this new work then (and before I had either written a single note or had any programmatic ideas) I had the following simple premise:

Ex.1



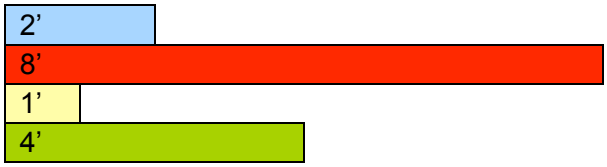
This impromptu sketch was made during a meeting with Katherine Kereszi (Melbourne Symphony Orchestra) in May 2010 at a café in Southbank. After briefly considering a 10+5 minute structure, the idea of binary multiplication (1+2+4+8) then lead to a re-ordering of this to 2+1+8+4 (and ultimately 2+8+1+4). Shown as a pie-chart, this reveals the 2nd movement as constituting over half the total duration of the piece:

Ex.2



I liked the idea that the difference in length between the shortest and longest movements might be pronounced (1:8). I was also drawn to the idea that they could be juxtaposed in an unpredictable order. Finally, I liked the possibility that the two major movements (8+4) might be preceded by micro–versions of themselves (2+1). Shown as a bar graph (in minutes), the scale of the two preview movements is clear:

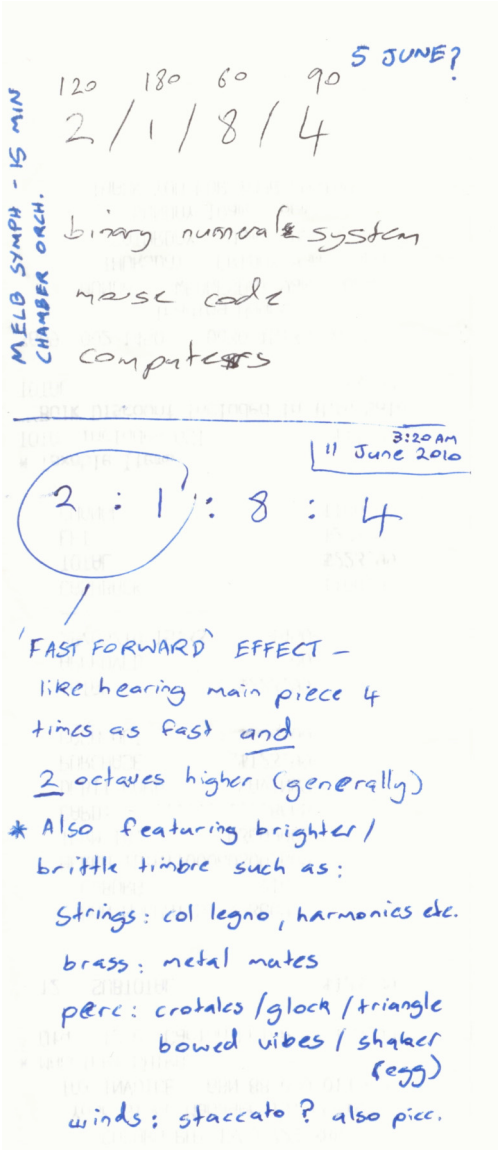
Ex.3



Fast-forward concept

A couple of weeks later, it also occurred to me that the two preview movements might be two octaves higher to reflect the faster speed (1:2:4 represents doubling the speed twice):

Ex.4



Binary multiplication suggested some sort of code or computers (though a little later on the work of Dutch artist M.C. Escher proved the key resonance in regard to multiplication, self-similarity and miniaturisation).

6 days later – the middle of the night to be precise – I was suitably bothered to get out of bed and write down ways of realising the 'fast-forward' effect in orchestration. CD and DVD players have various speeds at which they will allow a rapid scan of the sound and/or vision in order to quickly find a particular location. I find this an interesting experience in its own right. The 'fast-forward' mode is bumpy and 'pixilated' – but it also allows a bird's-eye view of the overall piece and a potentially heightened understanding of the structure.

What do we really hear?

In theory, a rapid-scan preview can influence a listener's reception of the longer movements. Familiarity on conscious and perhaps subconscious levels with the major structural landmarks can result in a deeper, more satisfying engagement with the music. The physical experience of listening to music, however, is *phenomenological* (or experiential) and is also influenced by the listening history of the individual together with their state of mind at the time of listening – so nothing is actually guaranteed. Listening is not an exact science. In practice, I remained sceptical that the preview versions could be possible or successful in a *literal* sense. But I wanted to test out how far I could push that theory without losing sight of the musical reality.

How long is a piece of string?
All four movements were mapped out to the 2, 8, 1 and 4–minute durations to the exact nanosecond. On paper, there is not a quaver more or less than this according to the time signature and tempos. Of course, the interpretation of the score (including fermatas) by living musicians and conducted in a resonant space does not necessarily reflect this. My estimate was that the piece would more likely end up being around 17 minutes long (rather than 15) taking into account phrasing, minor rubato, gaps between movements and such. Even if the tempos are exact, there is often 'phantom space' (motes of time dust between the cracks), which can result in music being around 10% longer in performance than on paper. Knowing this didn't deter me from attempting a pure, exact proportional relationship. The proportion is still relatively true, even if the overall duration is slightly expanded. The recording session ultimately produced a performance duration of just over 16 minutes:

Ex.5

movement	planned duration on paper	duration in performance/recording	% difference
I: *Preview #1*	2'	2' 21"	+ 9 %
II: *Double Planet*	8'	8' 50"	+ 9 %
III: *Preview #2*	1'	1' 10"	+ 9 %
IV: *Day and Night*	4'	3' 47"	- 5 %
TOTAL	**15'**	**16' 20"** (inc. gap between mvts)	**+ 9 %**

The so–called '10% rule' can be clearly seen in the first 3 movements, though the final movement was unexpectedly a little shorter. Here, the shuffle groove eschewed rubato or 'breath' and found a tempo that while only slightly quicker than the metronome marking, allowed for the right feel.

20 musicians playing 32 instruments
Orchestral commissions typically specify the type and number of instruments that will be available to the composer. This particular brief was for a chamber orchestra of around 20 musicians. Aaron Copland's *Appalachian Spring* was mentioned as a reference point, and from this, I adopted the same string section (4 violins, 2 violas, 2 cellos and 1 double bass). The double string quartet nature of this octet (plus bass) is essentially a chamber music combination (as opposed to a full orchestral string section), but it does invite complete divisi and is laid out in the score accordingly on 9 staves – one staff per instrument (as are the wind, brass and percussion sections).

The Copland work also has single winds (flute, clarinet and bassoon) to which I added an oboe. Three of the four wind players double, with the low instruments employed for the main movements (especially cor anglais and contra bassoon) and higher instruments for the preview movements (notably piccolo and oboe).

For a brass section I chose the slightly unusual combination of flugel horn and 2 trombones. The glissando capability of the trombones was attractive and the mellow flugel horn doubles on a brighter trumpet in C for the preview movements.

Unlike the Copland, piano was not recommended (to allow touring to venues without an instrument) but harp was included along with 3 percussionists playing a variety of tuned instruments (timpani, vibraphone, glockenspiel and crotales) along with instruments of indefinite pitch (cymbals, wind chimes, triangle, tom toms and orchestral bass drum).

The chamber orchestra therefore features 4 wind, 3 brass, 3 percussion, harp and 9 strings. The most attractive aspect of this combination was the ability to feature solo instruments in unique combinations.

M.C. Escher (1898 – 1972)
A couple of months after devising initial thoughts about proportion and structure, my thoughts then turned to the nature of the music that would fill these spaces. I found myself leafing through my collected edition of Escher prints and identifying with his ideas about proportional self-similarity. Works such as his woodcut *Circle Limit III* (1959) embody the concept: interlocking fish are large in the centre but gradually get smaller towards the outer circumference without losing their proportion. In essence, this is the musical relationship between the preview movements and the main movements (at a factor of 4 to 1).

More specifically, the 2nd movement is based around the wood engraving, *Double Planet* (1949) and the 4th movement is based around the woodcut *Day and Night* (1938). My interest in the work of Escher is longstanding and can be found in some of my earlier works (including *New Roads, Old Destinations*, *Mobius Strip* from *Five of One, Half a Dozen of the Other…?* and *Spirals* from *Four Thoughts*).

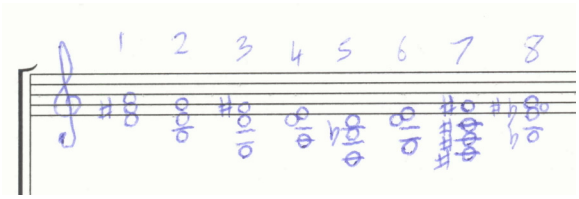
Starting from the end
All movements were initially mapped out in short score – sometimes on a grand staff, sometimes in 4 or more staves depending on the musical requirements. These short scores provided a structural scaffolding showing the bars, time signature, tempo and some level of motivic or harmonic 'flow'. Melodic material and more complex polyphony and textural development were mostly composed later on, straight to full score.

Additionally, the four movements were composed in reverse order, starting with the 4th movement. The preview movements were always going to be composed last as representations of the main movements. The following analysis, therefore, starts with the final movement and works backwards.

IV: *Day and Night*
Escher's *Day and Night* is symmetrical in design. A flock of birds that fly over the rural city and farmlands magically transform in direction (backwards & forwards), colour (black & white) and time (day and night).

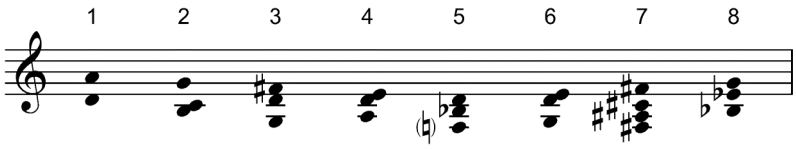
This final movement is based around a sequence of 8 chords written on 16 July 2010:

Ex.6



These were the first actual notes put to paper. Once explored more fully, however, the opening triads seemed too overt and some notes were removed or altered before settling on the final version:

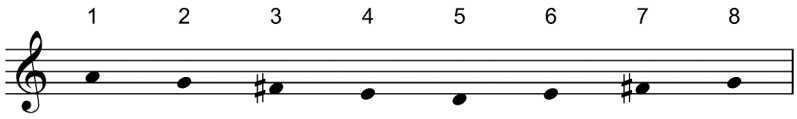
Ex.7



The first 4 chords are relatively consonant to the central note of 'D' whereas the last 4 are more dissonant. The only standard major triads occur in the second half of the sequence (Bb, F# and Eb major) and are all 'outside' or dissonant in relation to the *nominal* centre of D major. The note 'D' is found in 6 of the 8 chords but D major is not revealed until the very end of the movement. Despite the presence of tonal materials (scales and triads) the piece is not functionally tonal in any traditional sense.

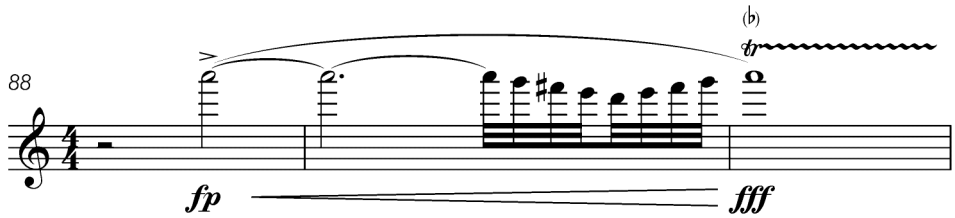
Also notable is the voicing of the chords whose top notes outline the first 5 notes of the D major scale descending and then ascending:

Ex.8



As a subtle nod to this scale pattern, the flute plays it complete in a little flourish over the final chord:

Ex.9



Minimalist architecture

The main structural concept for the final movement was to morph gradually from consonance to dissonance in a similar way to Escher's *Day and Night*, which morphs according to its title. The 8 chords transform in minimalist fashion as follows:

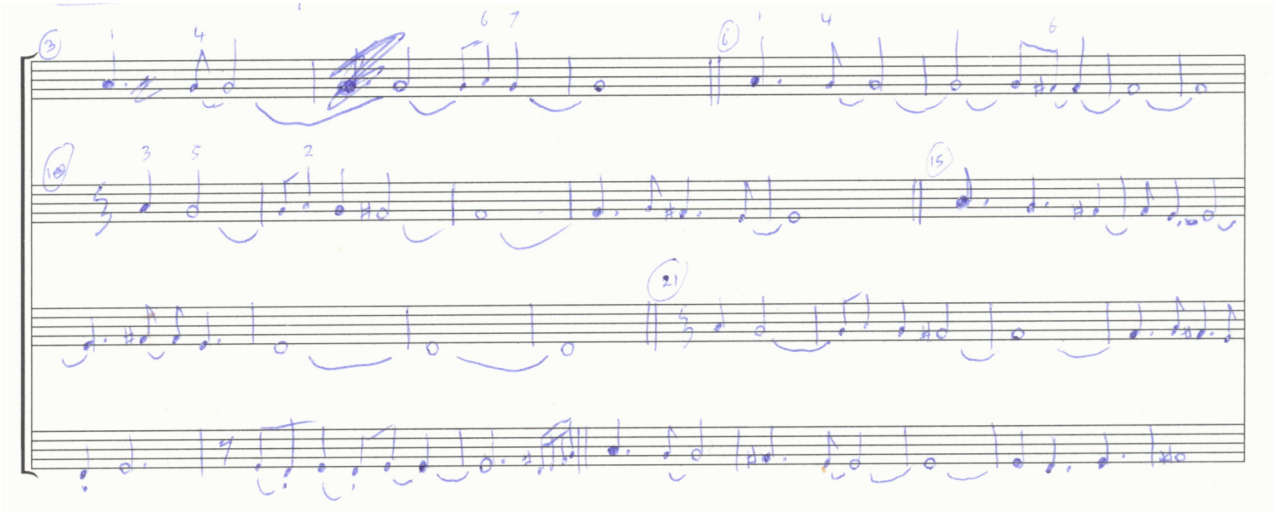
Ex.10

1							
1	2						
1	2	3					
1	2	3	4				
1	2	3	4	5			
1	2	3	4	5	6		
1	2	3	4	5	6	7	
1	2	3	4	5	6	7	8
	2	3	4	5	6	7	8
		3	4	5	6	7	8
			4	5	6	7	8
				5	6	7	8
					6	7	8
						7	8
							8

The pattern starts with the first chord and gradually adds the next one in (one at a time) until the full sequence of 8 chords is heard consecutively. The reverse process then happens except that it gradually omits the first chord, then the second and so on until only the 8th chord is left.

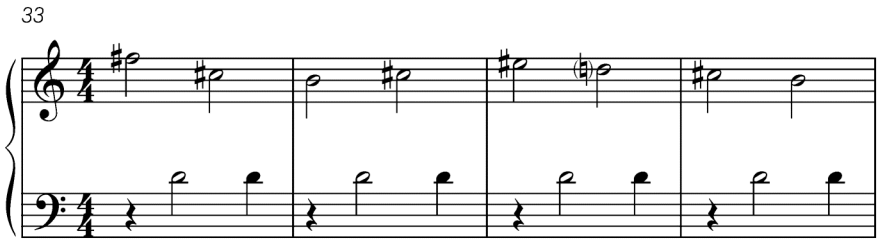
While this is strictly ordered, the smaller note–to–note detail is relatively free and through-composed to the halfway point. Additionally, oscillation between adjacent chords is freely allowed and was worked out by sketching the top note of the chord in a manner that would provide phrase variation (shown in part by numbers referring to what quaver beat the new notes fall on: 1, 4, 6, 7, 1, 4, 6, 3, 5, 2 etc.):

Ex.11



A small secondary motive appears four times, the first time before letter E and then lengthened in its next appearance at bar 33:

Ex.12

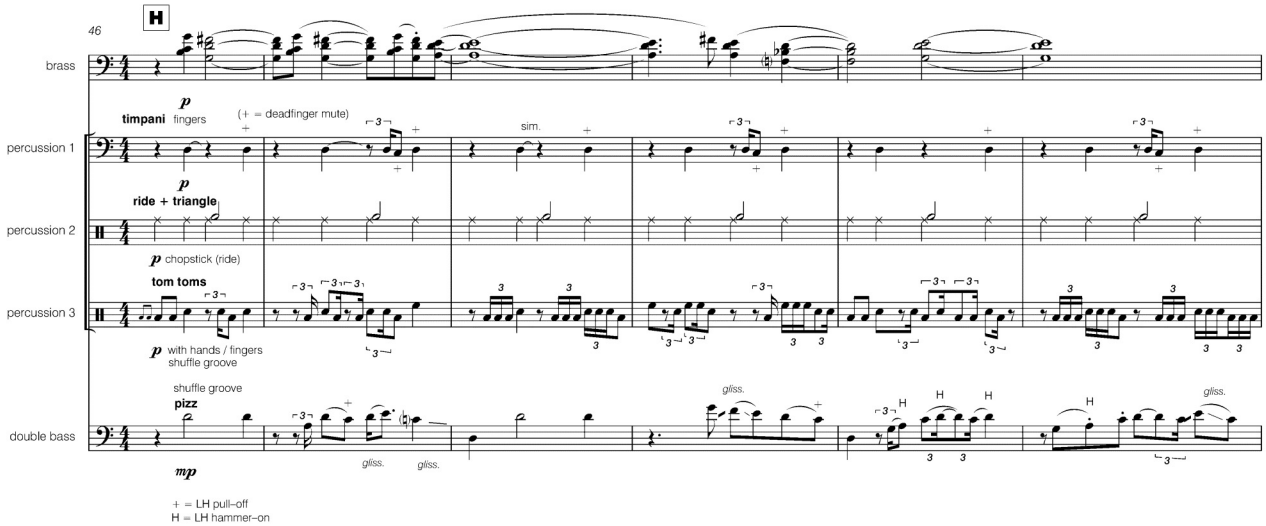


This simple motive typically features harp, pizzicato strings and glockenspiel. The four appearances are easily found leading to new sections and correspond in mirrored arch form to each other in the overall structure of the 4th movement.

Shuffle Mode

The final movement opens with percussion, winds and pizzicato strings, transforming gradually into a full arco string section. The brass are deliberately withheld until halfway through the movement and when they come in at letter H, they are accompanied by ride, triangle and tom toms (played by hand in a shuffle groove) with pizz bass:

Ex.13



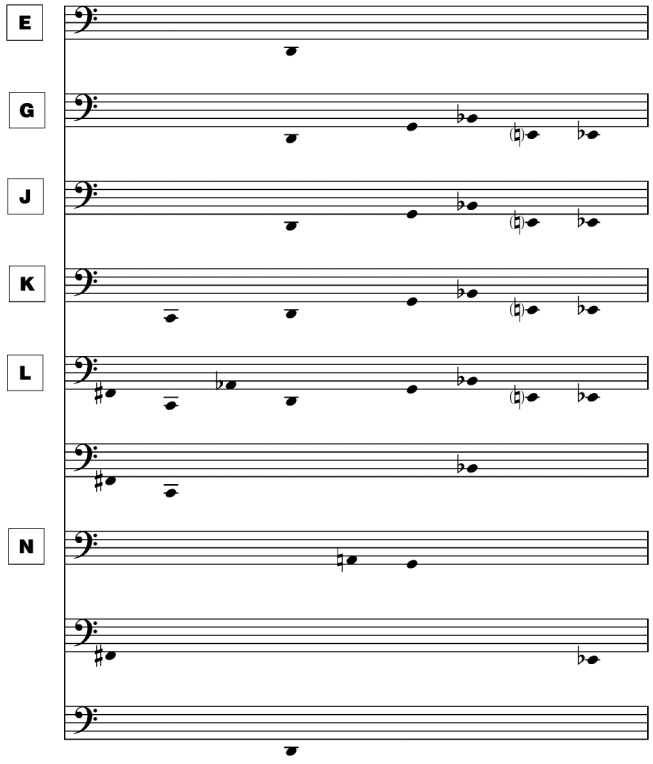
This is virtually a ‘new band’, designed to morph from a ‘classical’ sound into a more overt jazz idiom. In terms of rhythm, feel and colour, it is almost like pressing a button on the remote control and changing channels. In reality, the harmonic structure is still midway through a gradual minimalist process.

The shuffle feel that is established at letter H was in part influenced by two particular pop songs: *Rosanna* (1982) by Toto – crotchet = 84; and *Let There Be Love* (1991) by Simple Minds – crotchet = 88. I didn’t listen to these songs at the time of writing but my memory of them was influential. Referring back to them now, I can see that the triple shuffle feel is slightly slower in these songs (than the 4th movement tempo of crotchet = 90), and the tom tom figuration is more through-composed than a standard shuffle pattern, but there is a connection, nonetheless.

It is additionally interesting to note that Toto’s drummer, Jeff Porcaro, states that the *Rosanna* shuffle beat was influenced by similar beats by Steely Dan (with whom he had played), Led Zeppelin’s Jon Bonham and Blues Rock musician, Bo Diddley. He put together elements from those artists into his own beat. Sadly, Jeff Porcaro died at the age of 38. Yet almost 20 years after his death he can still be seen on the internet demonstrating these shuffle elements at the drum kit. This is turn demonstrates the mercurial nature of influence in modern music. It is almost impossible to track exact influence due to the amount of different styles composers and musicians are exposed to and in what ways they put this back together.

Chromatic bass lines
The final movement is overtly centred around the note ‘D’, but halfway through letter G, a progressive moving bass line develops, initially adding notes G, Bb, E and Eb, and then later on more notes still. The technique of tritone bass motion is featured in Debussy-esque fashion – a technique I first noticed as a 17–year–old studying *La Mer* (1905) and later also found in Steve Reich’s *The Desert Music* (1984). This paradigmatic chart reads like a book (left to right / top to bottom) and shows how the bass line develops:

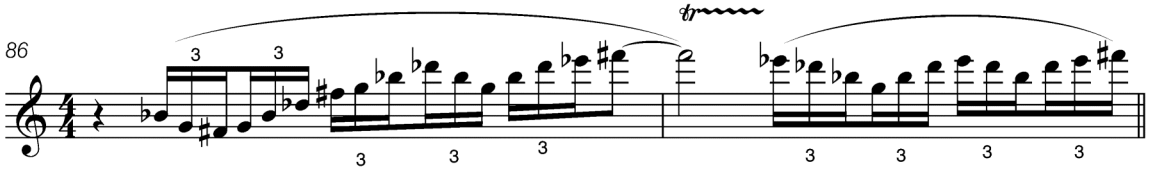
Ex.14



After letter L, the central note ‘D’ is withheld for 11 different notes building tension until it finally returns at the end.

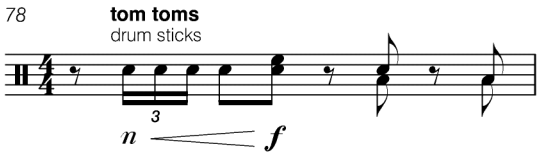
Building Density
In the second half, the phrase order is reversed (though not an exact palindrome) while the harmonic pattern continues its transformation. Further licence was taken in orchestration but the pattern is still noticeably apparent. For instance, the arpeggios toward the end of the movement are all taken from a scale formed out of chords 7 and 8 (noting enharmonic changes in accidentals):

Ex.15



These arpeggios proliferate polyphonically through the orchestra from letter L onwards, supported by harp glissandi and tom toms, now played with drum sticks:

Ex.16



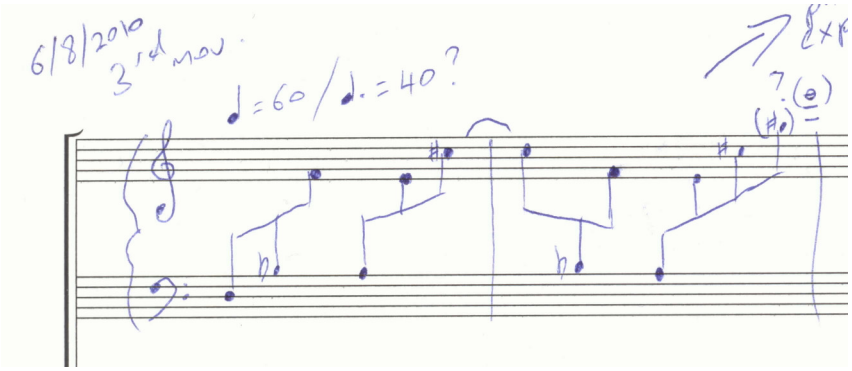
The tom toms pattern leads into and maintains offbeat quaver syncopation as a propulsive device. It is specifically influenced by Steve Ferrone's majestic drumming toward the end of the piece, *Cathedral in a Suitcase*, found on the Pat Metheny CD, *Secret Story* (1992).

The End
The final movement increasingly features the full chamber orchestra leading to 2 beats of general pause before a full tutti arrival chord. The end–sequence dissonance escalating to a general pause followed by a big major chord perhaps finds an analogue in the ending of *A Day in a Life* (1967) by the Beatles. There is a similarity there that is worth comparison, though this was not in mind while writing. There is also an effective variation on this type of ending to be found in the first movement of the *Piano Concerto* (2001) by German composer, Claus Ogermann.

The arrival chord is essentially D major. Despite 'D' being hammered out perpetually throughout the movement, the progression is continually coloured by harmonic ambiguity, modal alternation and bitonality; so this undiluted arrival chord is intended to function somewhat like a 'barge of light, shining in the darkness' (Steve Reich's description of Stravinsky's *The Rake's Progress*). As the chord trills to its height there are a couple of darker tones (minor 6th) in the winds. Perhaps Escher's picture is never fully 'day' or 'night'. My own reaction to the picture is ambiguous – an attempt to hold day and night simultaneously.

II: *Double Planet*
The 2nd movement is easily the longest at 8 minutes on paper. It is constructed out of this 2–bar motive:

Ex.17



This sketch is from August 2010, though I had been playing this on and off for a few weeks before attempting to write it down in a specific way. It refers to the '3rd movement' but *Double Planet* ultimately became the 2nd movement. I was originally playing this in 6/8 but decided on 3/4, in part to accommodate an overall tempo scheme for the 4 movements as follows:

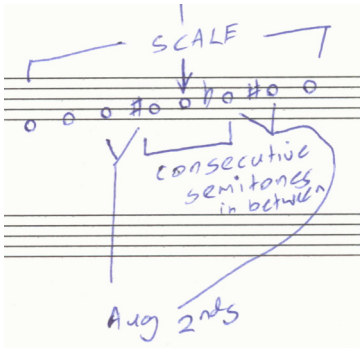
Ex.18

movement	planned tempo	score tempo
I: *Preview #1*	120	dotted crotchet = 160
II: *Double Planet*	60	crotchet = 60
III: *Preview #2*	180	crotchet = 90
IV: *Day and Night*	90	crotchet = 90

The tempos for the preview movements (1+3) were planned to be double those for the main movements (2+4). Given that the preview movements were intended to be 4 times faster, this would additionally require halving of rhythmic values. In the end, the tempo for the opening became dotted crotchet = 160 (4 x dotted crotchet = 40 – as shown in the sketch above). By contrast the 3rd movement (Preview #2) stayed at crotchet = 90 but divided the rhythmic values by 4. While complex to solve in notation (tempos and time signatures) hopefully, the result for the listener is more immediate: the preview movements are 4 times as fast.

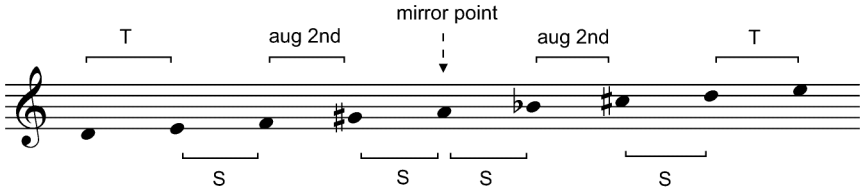
The arpeggio pattern above outlines major triads of Bb and A against a D bass (chords VI and V in D minor). It departs from standard tonal analysis with the introduction of G#. It is marked in brackets because I was still contemplating the ramifications of this 'outside' note. After writing it out as a scale, this became a little clearer:

Ex.19



Algerian Mode
The resultant scale is actually the first octave of the Algerian mode. It contains two augmented 2nds separated by two semitones. In fact, if another E is added on top of the octave, the scale becomes perfectly symmetrical around the central note of A:

Ex.20



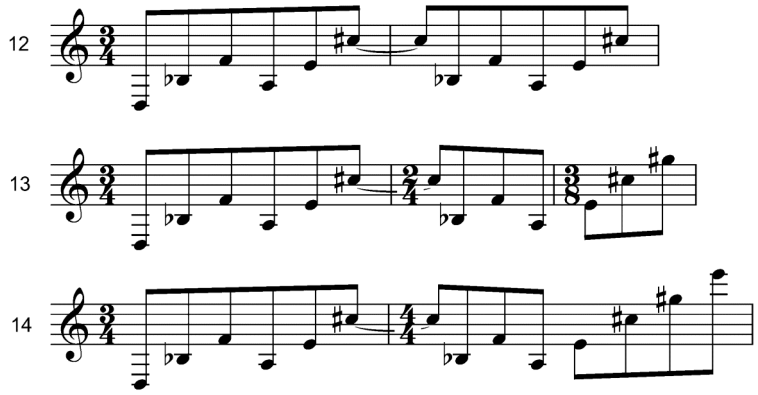
This scale lies at the heart of the 2nd movement (which in turn is the heart of the whole symphony), and it was around this time that my ruminations of Escher's work zeroed in on his 1949 wood engraving, *Double Planet*. The picture shows two regular tetrahedrons intersecting as if they were one world. They are in fact two quite separate worlds: one a jungle with trees, mountains and dinosaurs, and the other a construction of palaces and bridges occupied by humans. It's a strange, uneasy proposition that (over half a century later) might be interpreted as humans being out of touch with the natural environment – creating for themselves an

ivory tower from which they can view the jungle at a safe distance. The Algerian scale, to my ear, also provides a strange, uneasy – yet beguiling, harmonic flavour.

This 'Algerian' motive initially adds up to 12 quavers (before the introduction of the G#), and undergoes expansion (from 13, 14, 15 up to 16 quavers) and reduction across 5 large cycles (called 'Perspectives'). They are labelled as 'Perspectives' because all 5 sections are based on the same motive but increasingly focus in on the subject (as Escher does) and then zoom out again.

The expansion is disguised by changes in time-signature but is actually quite precise:

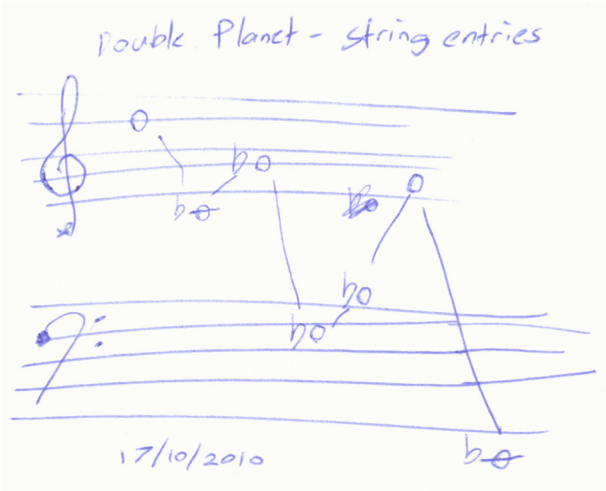
Ex.21



Orchestration of the short score

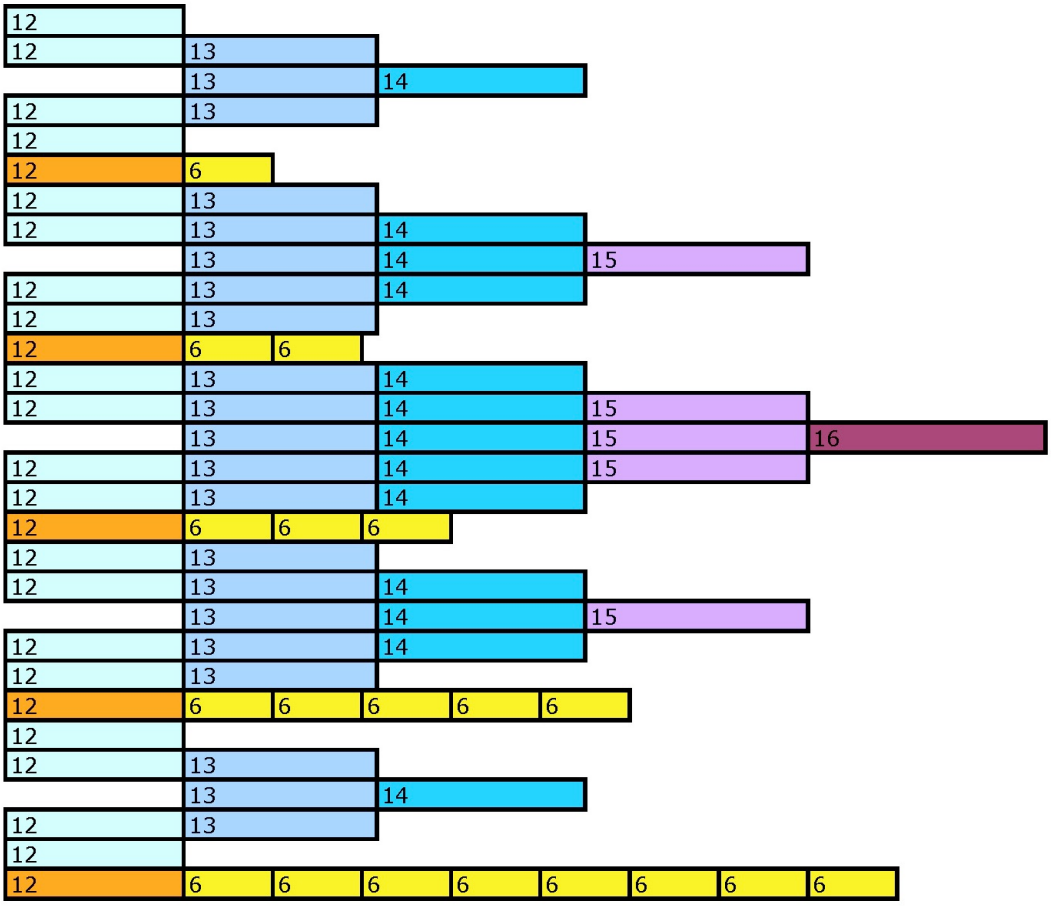
Once this process of motivic expansion was completed in short score, its subsequent orchestration filtered out the quaver flow in perspectives 1 and 5 (flugel horn solo) and this was reinterpreted as a sustained string chord, gradually forming by fading in the notes of the motive one by one:

Ex.22



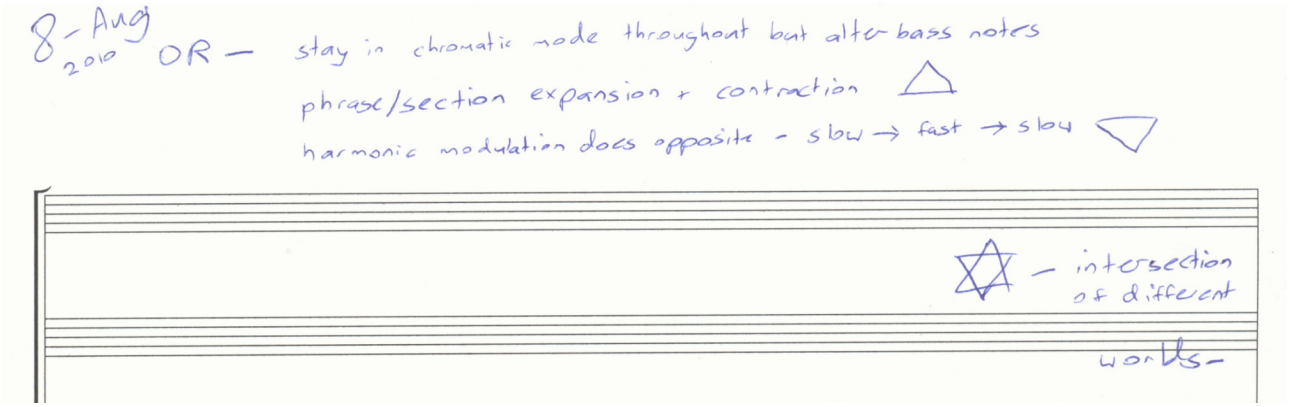
The orchestration of the movement opens with a solo flugel horn and gradually builds to a tutti texture in the middle and then reduces back to a sparse texture again. The expansion process is divided by bridge sections (marked below in orange and yellow), though the 5 main sections (Perspectives) show individual arch forms in between, and an overall arch form as well. This paradigmatic chart reads like a book (left to right / top to bottom) and shows the length of phrases in true proportion:

Ex.23



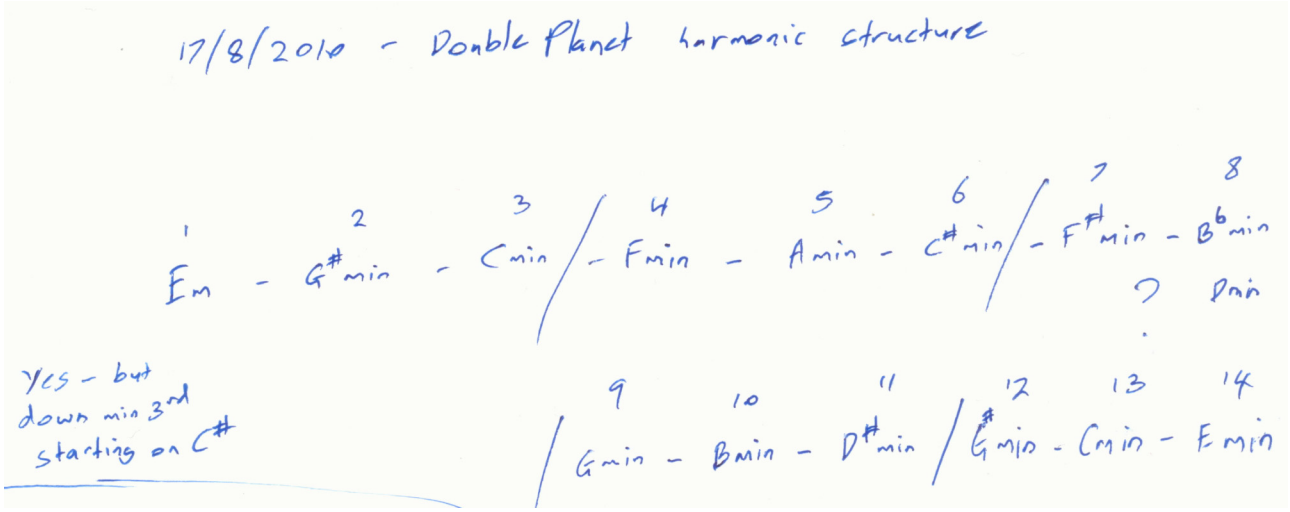
The arch form was created in response to the intersecting tetrahedrons in Escher's *Double Planet*:

Ex.24



This sketch from the 8th of August proposes a metrical structure of expansion (towards the longest phrases) and then contraction (like a pyramid), together with a harmonic structure that does the opposite (an inverted pyramid). This would result in the rate of harmonic change getting quicker toward the middle of the movement and then slower again. Just over a week later the modulation plan was worked out:

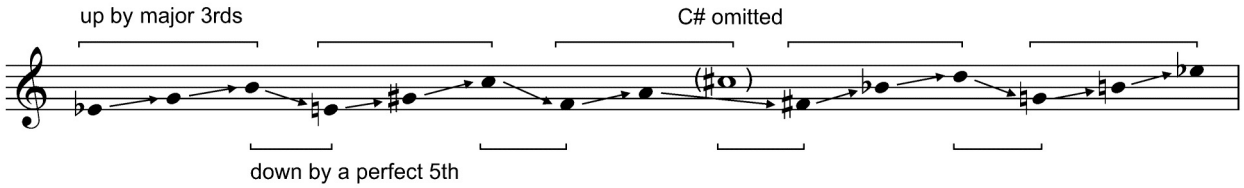
Ex.25



The harmonic plan

The sketch above questions what the starting key will be. A number were tried out and Eb was ultimately chosen to facilitate longer stretches in resonant minor keys for the strings (especially G and B which appear twice):

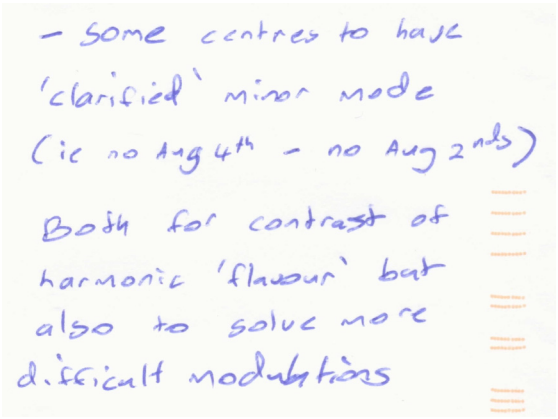
Ex.26



The plan modulates up by major 3rds (twice) and down a perfect 5th (once), repeating this pattern until arriving back at the starting harmonic centre of Eb. In theory, this scheme cycles through all 12 chromatic centres, the exception being C# which was omitted after the central climax to heighten a sense of difference.

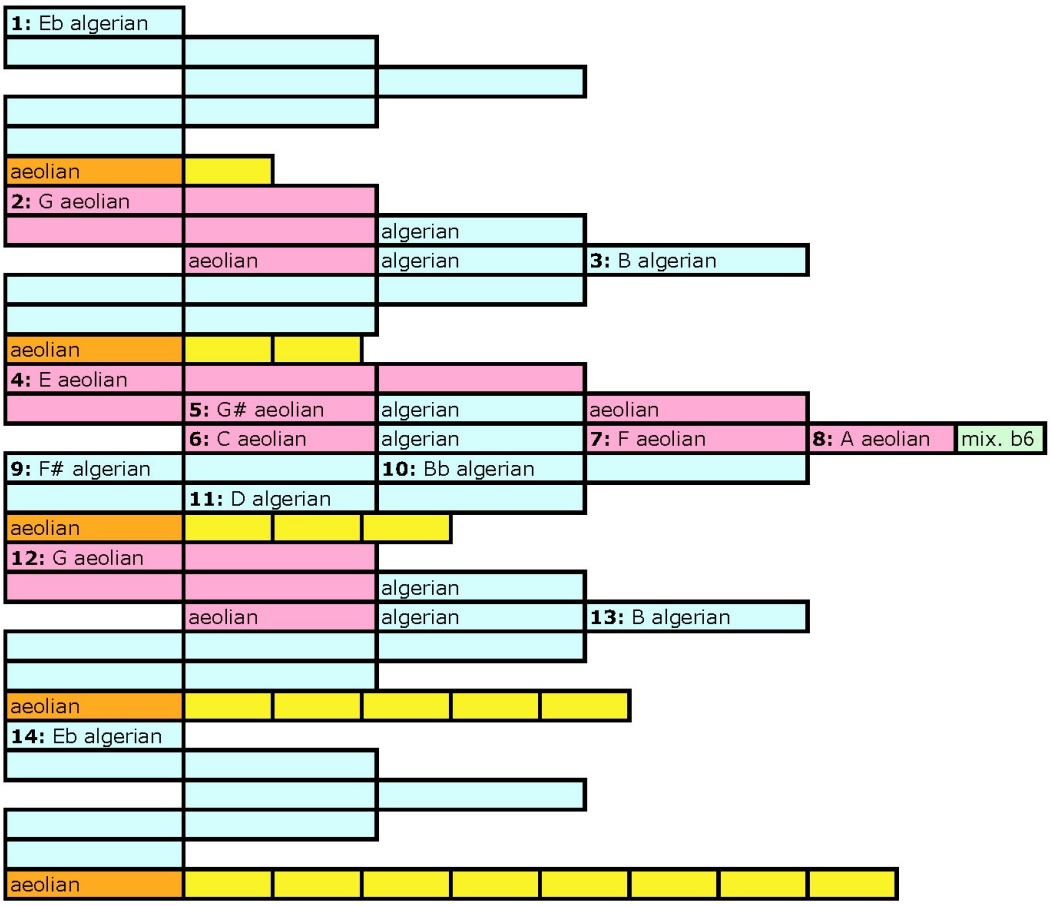
Throughout all this planning, what didn't eventuate was staying in a chromatic (Algerian) mode throughout. By the 18th of August, a different approach seemed more preferable:

Ex.27



The result was that Perspectives 2, 3 & 4 were altered to make partial use of an Aeolian mode (marked in pink) as variation to the Algerian mode (marked in light blue):

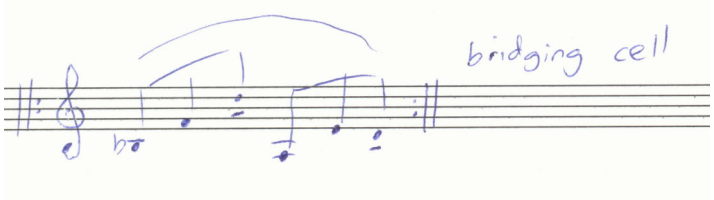
Ex.28



The Algerian mode comprises 56% of the total duration of the movement and the Aeolian mode 44%. There is a slight mixture of both at the mid-point of the arch form. Arvo Pärt's *Te Deum* (1984) features a central point of modal alternation which is most rapid at the point of climax, and having studied this work as part of a PhD, this was certainly a technique that I was drawing on. Pärt's *Te Deum* alternates minor and major modes (Aeolian and Ionian) and is highly noticeable for this. The 2nd movement of this work, *Double Planet* alternates two different modes with minor 3rds (Algerian and Aeolian) and the resultant contrast is more subtle.

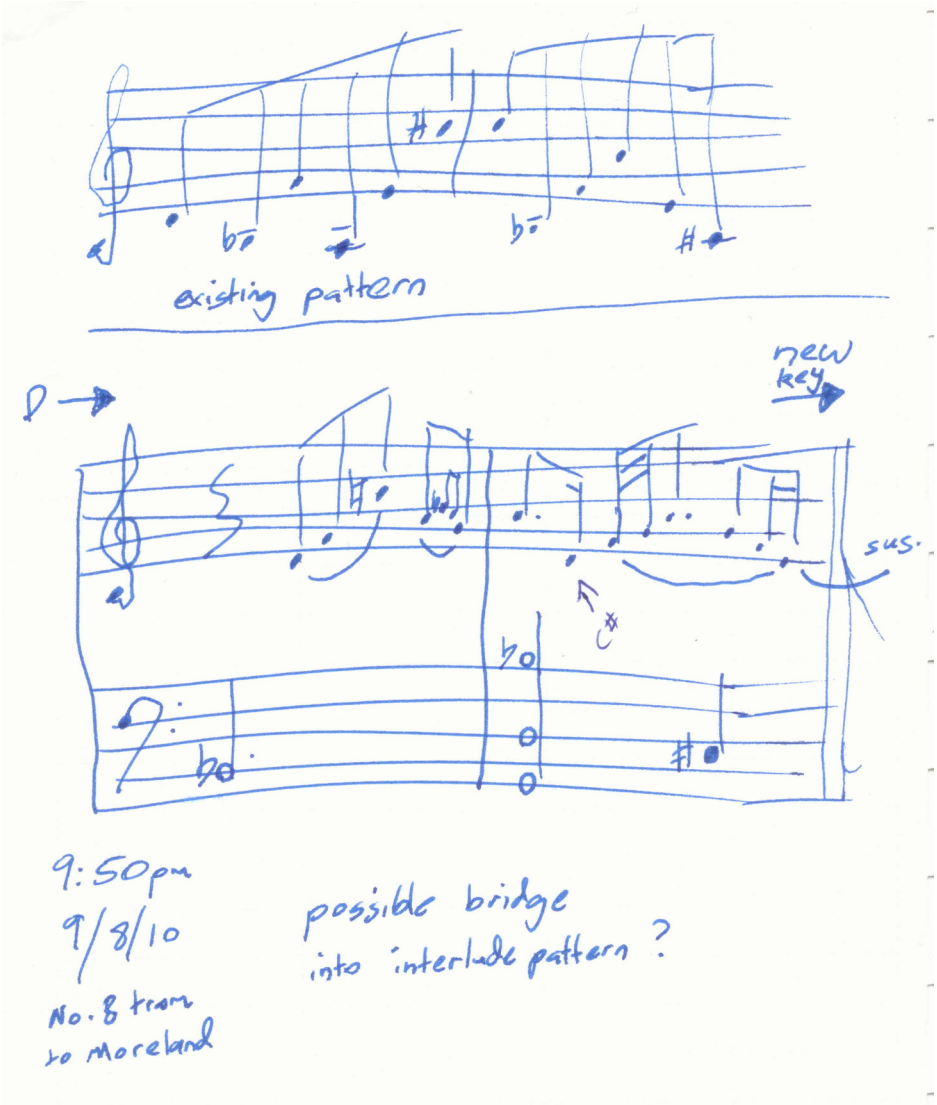
Build a bridge…
Following each of the 5 'Perspectives' are 5 bridge sections, whose melody is always the same, yet whose tail end motive gets longer each time. The tail end (or bridging cell) was composed first:

Ex.29



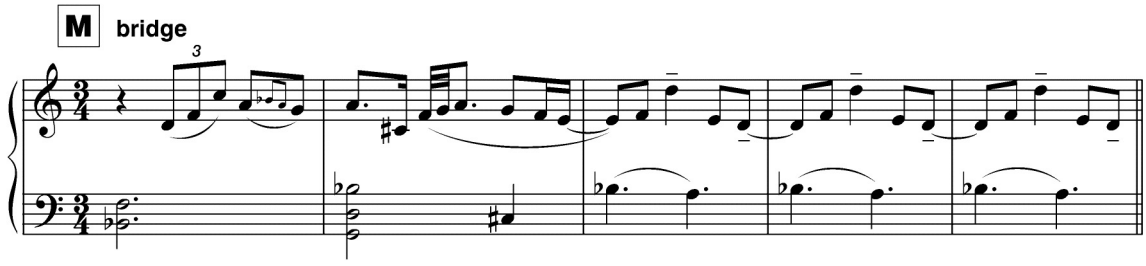
On reflection, the bridge sections felt like they needed a more overtly contrasting gesture and this came a little later one night on the tram home from the city. I didn't have any manuscript paper on me so I roughly drew it up on the back page of an address book:

Ex.30



The new bridge together with the tail end motive fitted together as such:

Ex.31

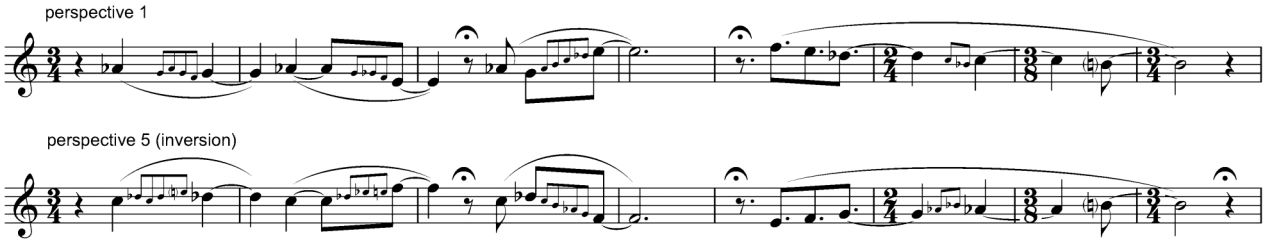


The 5 bridge sections are designed to be familiar, yet the tail ends surreptitiously get a little longer each time according to the Fibonacci series (1, 2, 3, 5, 8).

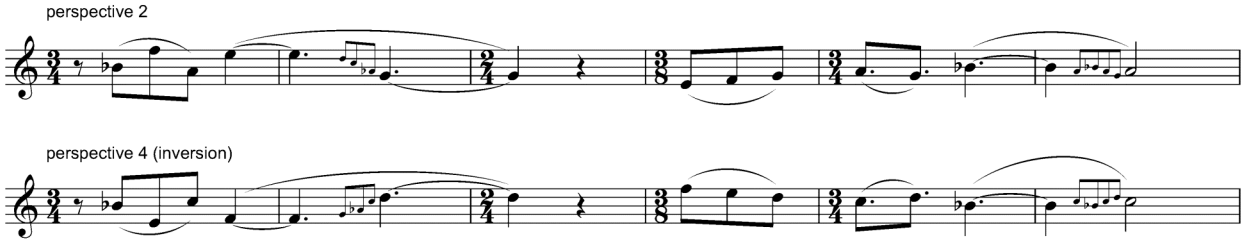
Melodic invention and inversion

Overtly melodic lines were freely composed against the structured motivic flow, mostly within the Aeolian and Algerian scale alternations as outlined by the motivic flow. One of the influences for the approach to melody and texture was Lyle Mays, *Street Dreams* (part 3) which features particularly haunting cor anglais writing against an orchestral soundscape. Perspectives 4 and 5 mirror Perspectives 2 and 1 with the crucial difference that the cor anglais and flugel horn solos are inverted (using the central 'B' line of the staff as the mirror point):

Ex.32
Flugel Horn



Ex.33
Cor Anglais

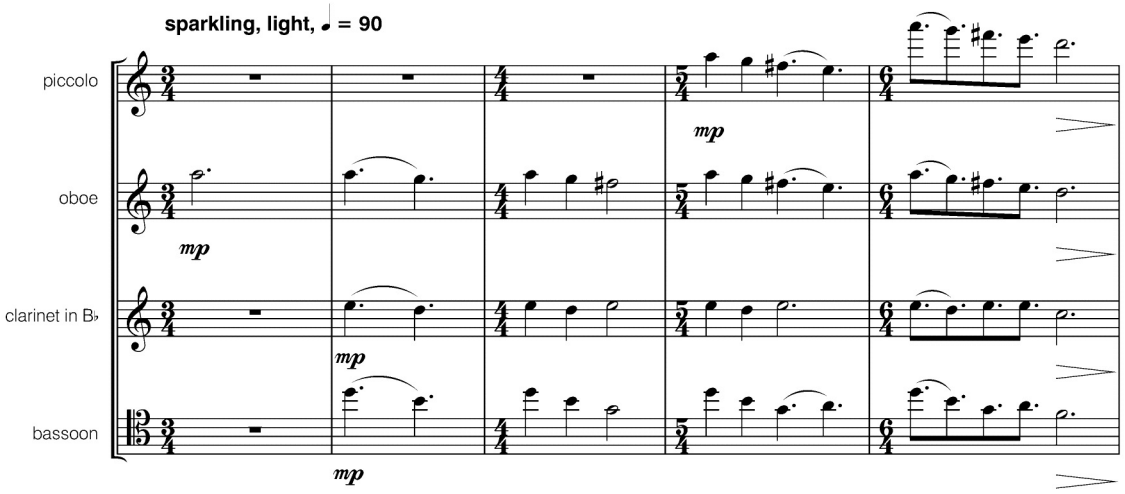


The cor anglais and flugel horn inversions are rhythmically unaltered and the scale type is also true to the original mode. Some other small details outside of the motivic flow are also inverted but the majority of the texture is exactly repeated. This is intended not only to reinforce the structural arch form, but also to create a sense of déjà vu. The material is repeated without being quite the same.

III: *Preview #2*

The 3rd movement, *Preview #2*, makes use of 'quantisation' or approximation. It follows the harmonic plan of 8 chords as found in the final movement, *Day and Night*, almost exactly. Because it also is 4 times faster, however, it dispenses with the ornamental oscillation between chords that the final movement allows. In colloquial terms, it 'cuts to the chase' and represents only the essential chordal transformation:

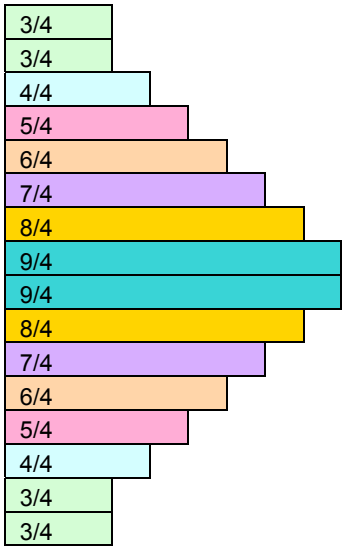
Ex.34



Whereas the 4th movement, *Day and Night* is scored exclusively in 4/4, *Preview #2* converts the number of 4/4 bars into a single time signature that expands from 3/4 up to 9/4 and back to 3/4 again:

Ex.35
chordal progression of 4th movement converted into a metrical structure for *Preview #2*

1							
1	2						
1	2	3					
1	2	3	4				
1	2	3	4	5			
1	2	3	4	5	6		
1	2	3	4	5	6	7	
1	2	3	4	5	6	7	8
	2	3	4	5	6	7	8
		3	4	5	6	7	8
			4	5	6	7	8
				5	6	7	8
					6	7	8
						7	8
							8

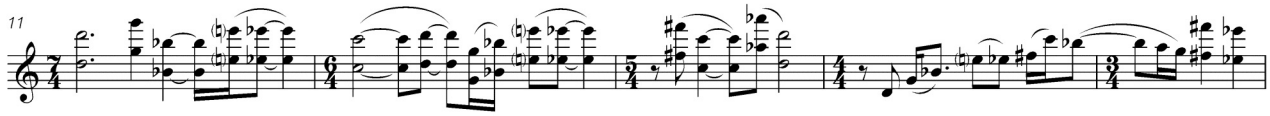


Metrically this is a pure arch form but harmonically the 8 chords are morphing from consonance to dissonance as they do in the final movement (but at 4 times the speed).

The harp and vibraphone dovetail a connected flow of semiquavers (chords as arpeggios) representing the pulsing of rapid–play mode. This second preview is scored almost exclusively above middle C. In theory, music played at 4 times the speed would also be exactly two octaves higher. This is an attractive concept in electro-acoustic terms, but not always practical in acoustic orchestration. Nonetheless, this movement represents an attempt at this ideal through high–register scoring and also through the exploitation of timbral devices such as brass mutes, which help to accentuate higher partials in the harmonic spectrum.

The bass line of the final movement (analysed earlier) is played two or more octaves higher by the 4 violins:

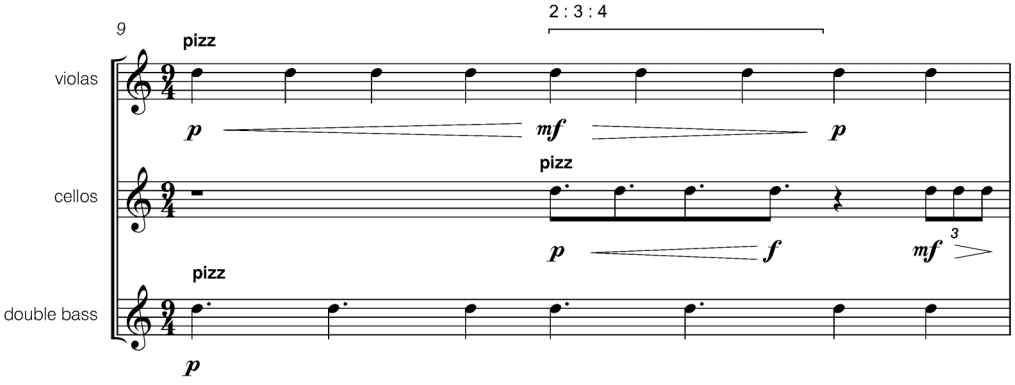
Ex.36



The resultant harmonic function is different, because it no longer defines the inversion of the harmony and its effect is apparently more chromatic. It is unfolding at 4 times the speed of the bass line that will follow in the final movement (refer back to Ex.14), so this compression adds to the heightened sense of dissonance.

The lower strings sometimes engage in playful rhythmic interplay in pizzicato on the central note, D:

Ex.37



The final D major chord at bar 16 is intended to contrast overtly with the preceding chromaticism and points toward the final D major climax at the end of the 4th movement.

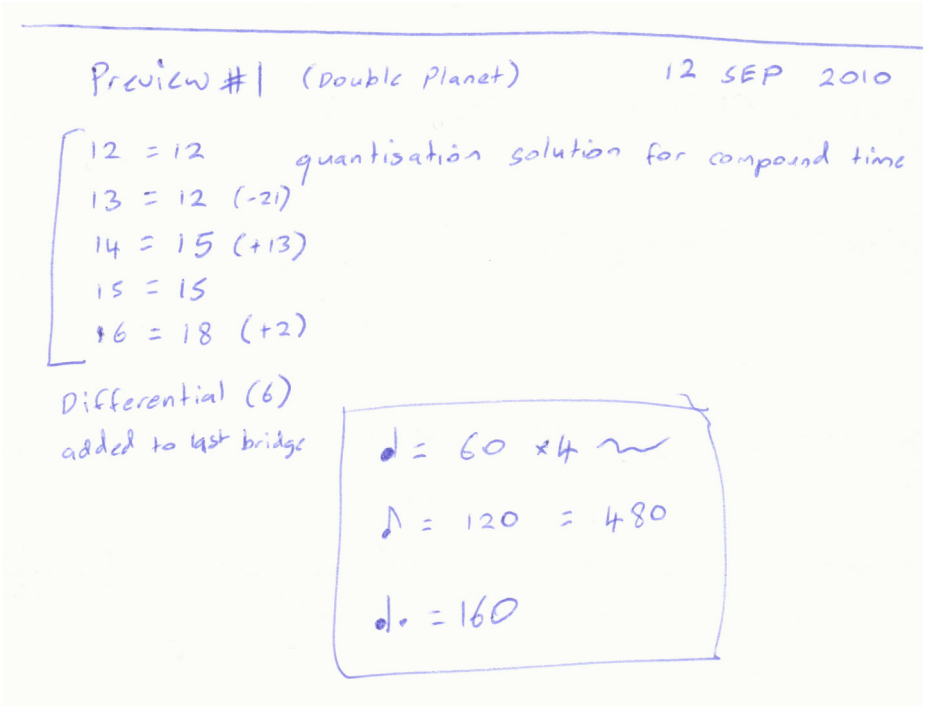
I: *Preview #1*

The slow arpeggios that form that backbone of the 2nd movement, *Double Planet*, showed both promise and difficulty when played back by the computer at 4 times the speed. In general, the fast tempo was very effective and certainly the harmonic rate of change was fascinatingly clear in rapid motion. In general the feel indicated compound time (6/8 or 12/8) due to the basic unit of 12 quavers.

The difficulty lay in the expansion to 13 and 14 quavers since these numbers are not divisible by 3. In the slower 2nd movement the extra quavers add ambiguity to the grouping without disturbing the general flow of the music. But at 4 times the speed, these extra beats cause a loss of pulse that would be both impractical in performance and hard to meaningfully discern even through the precision of computer playback.

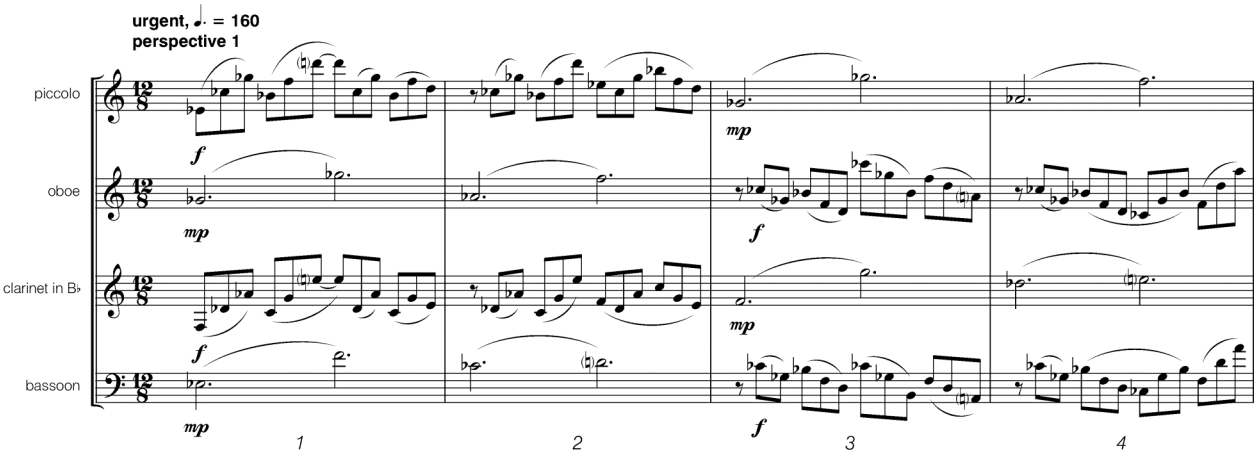
The solution to this problem lay in quantisation: the 13's would lose a beat to become 12's and the 14's would add a beat to become 15's. 12 and 15 are both divisible by 3 and able to carry the dotted crotchet pulse effectively. This slight readjustment allowed the music to 'speak' effectively at the faster tempo without losing the essential proportional relationship with the 2nd movement:

Ex.38



The preview version still features ambiguity through hemiola (as also found in the 2nd movement) though the melodic layers are stripped away giving this 1st Preview the feel of a pure scherzo, driven initially through fast quaver patterns in the woodwinds which exactly mirror the harmonic design of the 2nd movement:

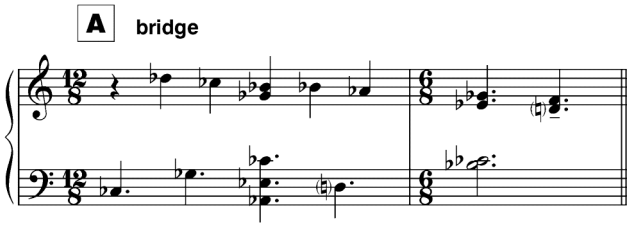
Ex.39



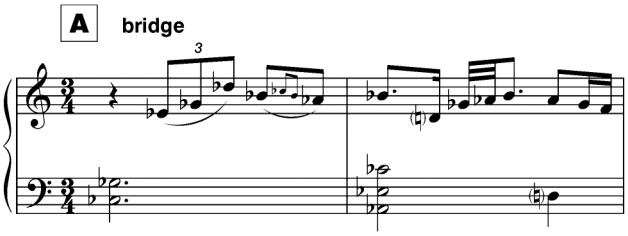
Bridging the divide

The bridge section acts as a metrical gear change out of the quaver flow and into a hemiola feel of crotchets against dotted crotchets. The first 12/8 bar (Ex.40) equates to two bars of 3/4 from the 3rd movement (Ex.41):

Ex.40

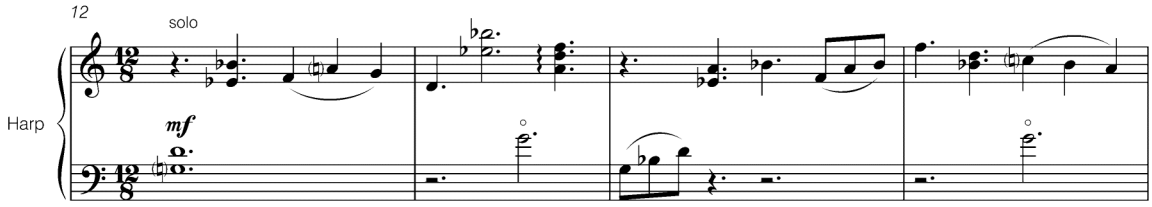


Ex.41



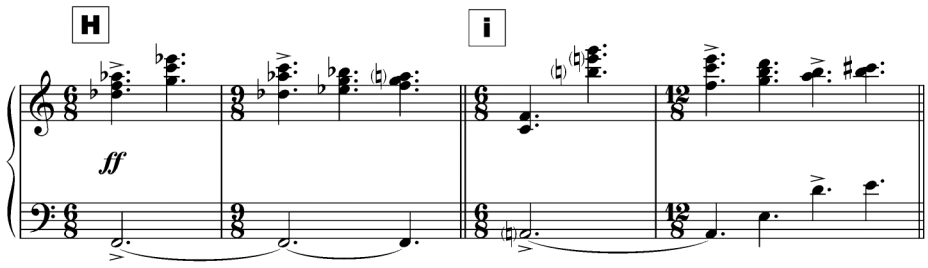
Subsequent textural variations (such as the harp solo at letter B) mix up quavers with crotchets (virtual triplets) and the regular pulse of dotted crotchets:

Ex.42



The first time this appears it is accompanied by a high cello solo, but when it returns at letter N it is heard by itself exclusively. Once the preview's central climax arrives, the whole orchestra plays (as in the 2nd movement) but here in tutti dotted crotchets:

Ex.43



It is interesting to note that while this is the least filled-in section in regard to subdivision, it is nonetheless the most pungently driving part of the movement, accented with crash cymbals on every beat. The corresponding rehearsal letters in the 2nd movement are also climactic employing the full orchestral tutti – but lasting 4 times as long.

Afterthoughts

One of the most discussed issues with other composers in regard to the concept for this work was the order of movements. What would happen if the shorter movements were last? Or the preview movements paired with their extended versions? In all, there are 24 different possible orders in which the 4 movements could appear. I am interested in all of them and it was an interesting experiment to listen to the 4 movements in different orders. The largest movement, *Double Planet*, was originally designed as the 3rd movement. On reflection, however I swapped the 2nd and 3rd movements in order to hear the 'slowed down' impression of the main movements directly after their preview or 'fast forward' versions.

While the duration of this symphony is relatively brief in comparison to the history of symphonic music and written for relatively small orchestral forces, the interconnected nature of the movements (on a number of levels) is why I came to consider it to be a symphony and titled it accordingly. The work is dedicated to my mother, Elizabeth Scarlett – herself a pianist and scholar with a PhD in Poulenc and a constant source of musical inspiration and heritage to me.

Terms for further study
Algerian mode
Aeolian mode
Bitonality
Fibonacci Series
Harmonic Spectrum
Hemiola
Inversion
Ionian Mode
Minimalism
Modal alternation
Nanosecond
Paradigmatic analysis
Phenomenology
Quantisation
Shuffle

Works by the composer for reference
Chamber Concerto
Falling By Degrees
Mondrian Interiors
The Year Without a Summer
New Roads Old Destinations
Five of One, Half a Dozen of the Other…?
Four Thoughts

Works by other composers for reference
Aaron Copland, *Appalachian Spring*
Claude Debussy, *La Mer*
Lyle Mays, *Street Dreams*
Pat Metheny, *Cathedral in a Suitcase*
Claus Ogermann, *Piano Concerto No.1*
Arvo Pärt, *Te Deum*
Steve Reich, *The Desert Music*
Simple Minds, *Let There Be Love*
Igor Stravinsky, *The Rake's Progress*
The Beatles, *A Day in a Life*
Toto, *Rosanna*

Works by Escher for reference
Ascending and Descending
Circle Limit III
Day and Night
Double Planet
Mobius Strip
Spirals

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