



Trobador Research Group

# ANALYSIS

composition by Bart Quartier

## *PAPILLON*

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Score of Papillon on [www.bartquartier.be](http://www.bartquartier.be)

Papillon received the Sabam price for Jazz Themes 2002, Belgium

Papillon is recorded on the CD 'Thank You De Werf 058 [www.dewerf.be](http://www.dewerf.be)



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## ANALYSIS

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### *Sources*

In this tune, the multi tonic system is used: one octave divided in two augmented fourths. The amount of sharp and flats are equal between the two tonalities: from C minor (3b) to F# minor (3#). Like in A. Miyoshi's *Diary of the sea - N°3 a Moray's Clock* (from 4b to 4# and back to 4b).

## 1. Melody

### 1. *Sources: approach notes and tonal chromaticism*

The material 'chord studies' – in this case chromatic approach notes – which I was studying, was developed into writing. The melody is constructed with chromatic notes under and diatonic notes above the chord notes.

The image shows three staves of musical notation in treble clef, illustrating chromatic approach notes for different chords. The first staff is in C minor (three flats) and shows four measures: C-7 (notes: Bb, C, Eb, F), Abmaj7 (notes: Ab, Bb, C, Eb), D-7(b5) (notes: Db, Eb, F, Ab), and G7alt (notes: F, Ab, Bb, C). The second staff is also in C minor and shows three measures: C-7 (notes: Bb, C, Eb, F), Ab7 (notes: Ab, Bb, C, Eb), and D-7(b5) (notes: Db, Eb, F, Ab). The third staff is in F# minor (three sharps) and shows three measures: F#-7 (notes: E#, F#, G#, A#), Dmaj7 (notes: D#, E#, F#, G#), and G#-7(b5) (notes: F#, G#, A#, B#).

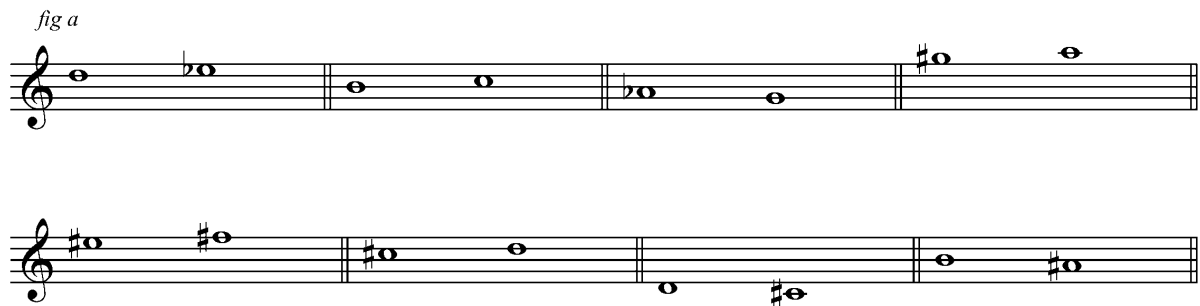
When chromatic notes are hold longer but still get a solution, we could speak about tonal chromaticism.

The image shows a single staff of musical notation in 4/4 time, illustrating tonal chromaticism. It consists of four measures: C-7 (notes: Bb, C, Eb, F), D-7(b5) (notes: Db, Eb, F, Ab), G7alt (notes: F, Ab, Bb, C), and C-7 (notes: Bb, C, Eb, F). The final measure features a triplet of notes: Bb, C, and Eb.

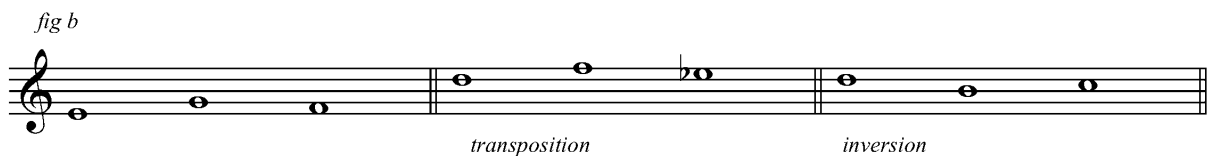
The approach note gets longer from a quarter note (bar 1) to a half note (bar 2), up to a dotted half note (bar 3). In bar 4 the augmentation of the rhythm is given by a triplet of half notes; (between a half note and a dotted half note).

## 2. *Motif*

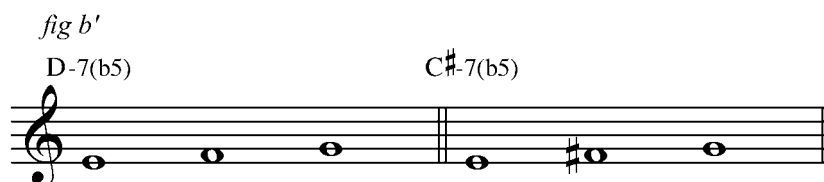
The melody is as fluid as possible, like the flight of a butterfly (papillon). Different techniques like inversion, retrograde, retrograde inversion and transposition are used with following a two-note motif.



In fig b. a motif of three notes is transposed and inversed with some modification.



In fig b' both measures have the notes have the same names but the melody line is different.



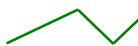



## 3. Approach to strong tonal points:

the thirds appears in the first three bars of each system

#### 4. Balance and mirror in direction of the melody

The arrows give the direction of the melody in each measure separately:

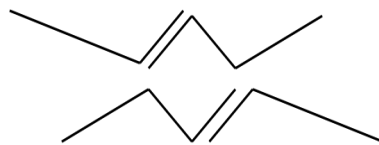
	separately				résumé
System 1	↗	↗	↗↘	↘	
System 2	↗↘	↘↗	↗	↗	
System 3	↗	↗	↗↘	↗↘	
System 4	↘	↘	↗	→	

Balance: the black arrows ↗↘ and → are left over and are in fact the three different possibilities of a direction in a melody. Between the systems we do find also some mirrors in directions. The climax of the melody is situated in the middle of the mirror. ( 5 times ↗)

All 12 tones are used and the last note left (*c#*) is situated in bar 11 (=2/3 of the tune).

We find almost the same situation in retrograde direction: the twelfth note (*e flat*) is situated on the twelfth bar of the piece in retrograde direction (bar 5 = 2/3 of the tune in retrograde direction). Also system 3 is retrograde of system 2. In the résumé, the horizontal mirror lies between System 1 & 4 while a vertical mirror lies between System 2 & 3.

Construction of all the systems together is like a butterfly (papillon):



#### 5. Butterfly and interval vectors\*

(For an explanation of interval vectors, please read at the end of this analysis.)

Intervals used in system 1 are:

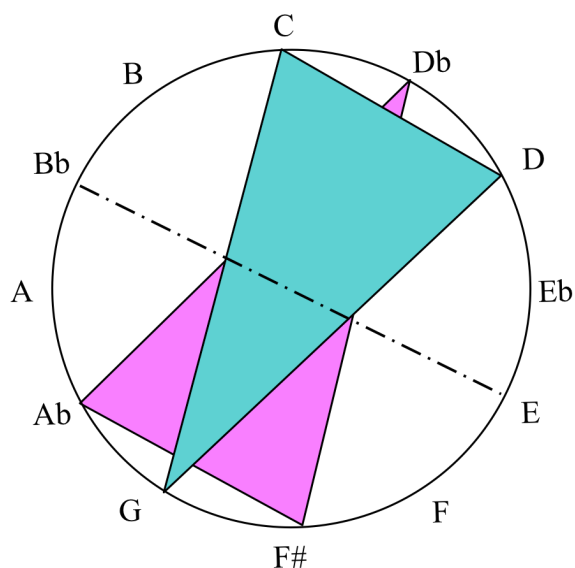
Minor second - major second - minor third - major third - perfect fourth - augmented fourth

1                      1                      1                      1                      0                      0

So here also we remark some horizontal mirrors between the systems:

S1	< 111100 >	S3	< 111110 >
	↕		↕
S2	< 111100 >	S4	< 111110 >

## 2. Harmony



The turquoise triangle is the II-V-I in C min. The purple triangle is the II-V-I in the opposite harmony F# min. Both together give a silhouette of a butterfly (papillon). The dotted line from Bb to E is the axis. The note *b flat* is highest note in the melody in the middle of the tune. The opposite note 'e' appears in the middle of the system 1, 2 and 4. Remark: in this case the climax is not at the usual expected distance of 2/3, however we see in the cycle of fifths that Bb appears at 2/3 in distance between C and F#;

### 1. Function

C-7	Ab maj7	D-7 (b5)	G7 alt
I min	VIb maj	II min	V7

C-7	Ab7	D-7 (b5)	G7 alt
I min	VIb7	II min	V7 substitute of C#7 = V in F# min

F#-7	D maj7	Ab-7 (b5)	C#7 alt – F#7alt
I min	VI maj	II min	double dominant - V in B min

B-7	G maj7	C#-7 (b5)	F#13alt – B7alt
I min	VI maj	II min	double dominant – VII7 in C min

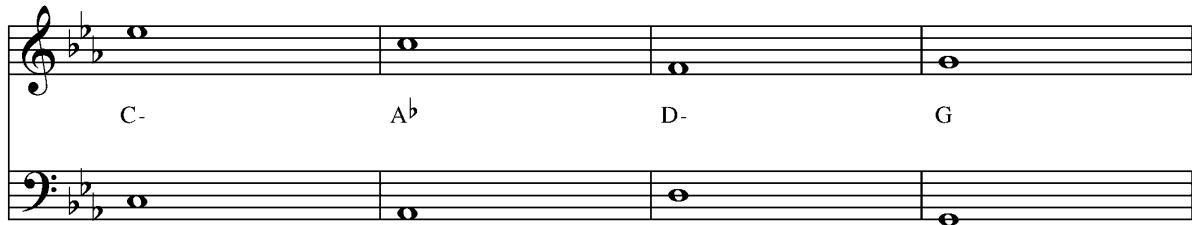
The chord progression (turn around) gives a basic feel.

Because of the mirror construction, the tune could start also on the 9th bar.

There is also a mirror in the bass line: from bar 8 to 9 (middle of the tune), the bass moves  $\frac{1}{2}$  step down while from bar 16 to 1 (end to beginning of the tune), she moves a  $\frac{1}{2}$  step up.

° Scales in relation to harmony

Mostly the harmony is already given by the melody. If you have a nice melody with a good bass, the harmony should become obvious. Let hear the harmony through the melodic lines like improvisers do; they don't need an accompaniment.

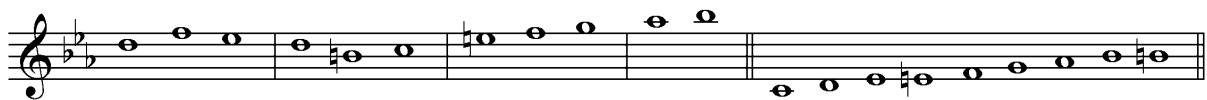


So, this is the basic harmony, later on you can add some alterations, like you wish.

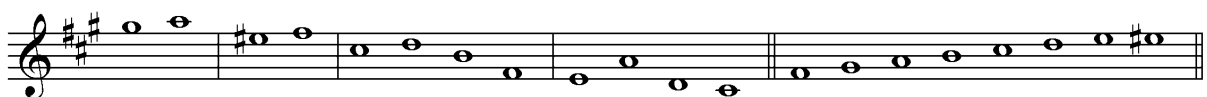
When we put together all the notes of the first system, we have a C min harmonic scale with some 'bebop' chromatic element between III and IV.



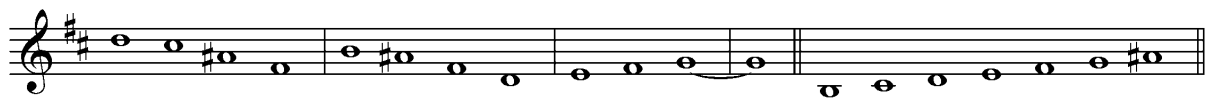
In system 2, another chromatism (besides III and IV) is added between VII and VIII



In system 3, the chromatism is now between VII and VIII:



In system 4, no chromatism is added, it's just the scale of B minor harmonic.



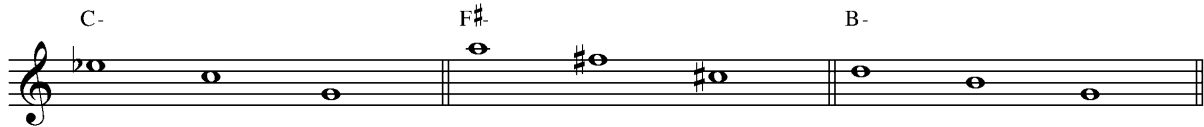
Gmaj7

Remark: we do see the note *a#* in the second bar; this is not directly the 'right' note in a G major mode. The second measure is just a diatonic transposition of the first bar and so it makes more sense. In fact you can play or write any note on any chord as long as it is logic.

° Target notes and harmony

In the melody, we have some target notes like in improvisation. In this case the target notes are the basic triads of the minor harmony.

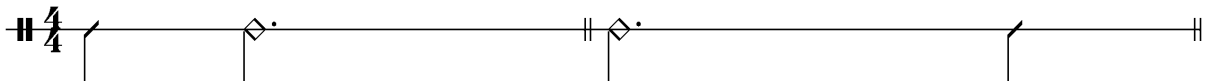
System 1 and 2 is C minor. System 3 is F# minor.



The target notes of System 4 are *g*, *b* and *d* (together G major) although the harmony is B minor. *g* is VI in B and V in C.

### 3. Rhythm

The rhythm is presented in a more simple way in order to have a balance with the complex melody and harmony. In the first two measures of each section (C min and F# min) the rhythm is retrograde.



### 4. Proportions and Numbers

1. Semitones and amount of notes

The most active moment is in System 3 where we have the most notes and therefore also the most semitones, like a butterfly whirling down.

Amount of notes		Semitones		
S1	9	S1	1 4 1 8 3 2 3 1	= 23
S2	11	S2	3 2 1 3 1 4 1 2 1 2	= 20
S3	12	S3	1 4 1 5 1 3 5 2 5 7 1	= 35
S4	11	S4	1 3 4 5 1 4 4 2 2 1	= 27

2. mirror in amount of notes

	bar 1	bar 2	bar 3	bar 4	total	=	≈
S1	2	2	3	2	9	20	8
S2	3	3	3	2	11		
S3	2	2	4	4	12	24	
S4	4	4	3	1	12		
total	11	11	13	9			
=	22		22				
≈	8						

Horizontal mirrors between numbers are found in purple while turquoise represent the vertical mirrors. The number 8 is divisible in 2 and 4 (like the profile of a butterfly).

3. mirror and circle movement in note numbers\*

	bar 1	bar 2	bar 3	bar 4	total	≈	≈	=
S1	2 3	11 0	4 7 5	8 7	47	11	2	8
S2	2 5 3	2 11 0	4 5 7	8 10	57	12	3	
S3	8 9	5 6	1 2 11 6	4 9 2 1	64	10	1	
S4	2 1 10 6	11 10 6 2	4 6 7		65	11	2	

The number 8 appears again in the last column. Also the sum of the tonalities (clockwise: C-C#-D-F#-G-Ab-B) makes 8 (0+1+2+6+7+8+11 = 35 ≈ 8)

ooo

\* interval vectors

explanation of 1 and 0:

1 means that the interval is used; 0 means that the interval is not used

the first number shows a minor second; the second number shows a major second; the third number shows a minor third; the fourth number shows a major third; the fifth number shows a perfect fourth; the sixth number shows a augmented fourth

for ex.:

$$\begin{array}{cccccc}
 1 & 1 & 1 & 0 & 0 & 0 \\
 m2 & M2 & m3 & M3 & P4 & \#4
 \end{array}$$

there is a minor second, a major second, a minor third, no major third, no perfect fourth and no augmented fourth in the melody

110110: there is a minor second, a major second, no minor third, a major third, a perfect fourth, no augmented fourth in the melody. For intervals wider then augmented fourth, we use the inversions of intervals (like minor second becomes major seventh and vice versa)

\* note numbers

c = 0, c# = 1, d = 2 etc...



### *Conclusion*

The climax in Papillon is just in the middle: at the end of the first 8 bars there is the most intense transition just before the most relaxed area when the melody falls down.

Efforts were made to find a balance between a stable form (common progressions) and chromatic connections with substitutes.

In composition we try to find a balance between expectation and surprise: in this tune the expectation is the perfect mirror between C minor and F# minor while B minor is a sort of surprise. Here again a lot of things were discovered after writing the tune. The only starting point was the approach notes together with the octave division.

*'The best tool for a musician is the ear.'* (A. Schönberg).

## *Sources*

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Thank You - Bart Quartier Quintet – CD 058 De Werf, Brugge, Belgium  
[www.bartquartier.be](http://www.bartquartier.be)

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*This analysis was in collaboration with Trobador Research Group Koninklijk Conservatorium Brussel.*