

MTO 20.1 Examples: Bugallo, Harmonic and Non-Harmonic Temporal Structures

(Note: audio, video, and other interactive examples are only available online)

<http://www.mtosmt.org/issues/mto.14.20.1/mto.14.20.1.bugallo.php>

Figure 1. Reading of a Player-Piano Roll

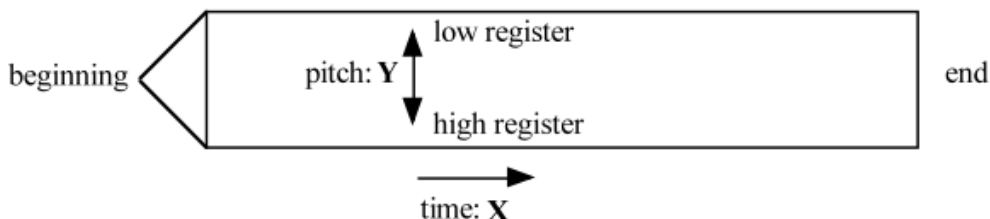


Figure 2. Template “Transposition” at the Octave

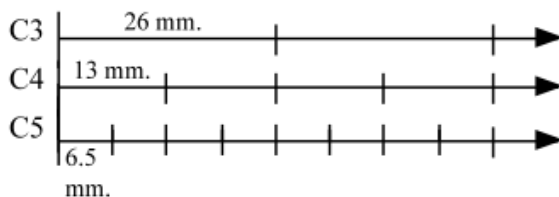


Figure 3. Proportions for the Justly-Tuned Chromatic Scale Given by Cowell

<i>Ratios from C</i>	<i>Tones of Chromatic Scale</i>	<i>Equivalent M.M. Numbers</i>
	C =	60
14:15	C# =	64 2/7
8:9	D =	67 1/2
5:6	Eb =	72
4:5	E =	75
3:4	F =	80
5:7	Gb =	84
2:3	G =	90
5:8	Ab =	96
3:5	A =	100
4:7	Bb =	105
8:15	B =	112 1/2
1:2	C =	120

Table 1. Approximate Dimensions for the Units of the f 15 Templates

Unit #	f 15-templates units measured in millimeters							
	(a-)	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	4.5	8.5	19.5	25	37.7	48.5	75.5	98
2	4.5	8	18.5	24.5	36	49.5	72	97.5
3	3	5.8	12.2	18	25	35	49	70
4	2.8	5.5	11.5	17	21.8	33	44	66
5	3	6	13	17.5	27	35	54	70
6	1.8	3.5	7	9.5	13	18	26	56.5
7	5.2	10.5	23	31.2	46.5	63	92	12.6
8	1.8	3.5	6	9	12.2	19	25	38
9	4.5	8.5	16	24.5	32	49	64.5	98
10	4	8	18.5	24.5	36	49	72	98
11	1.8	3	4	7	9	14.5	18	27.5
12	2.5	4.5	9	14	18	28	36	56
13	4.5	9	19	28	38	56	77.2	112
14	2.5	6	11	16	22	33.5	44	68
15	5.8	11	22.5	33	44	65	68	130
TOTAL in cm.	5.22	10.13	21.07	29.87	41.83	59.6	81.72	109.8

Figure 4. Concordance Between the Templates Bb3 and f 15(a)

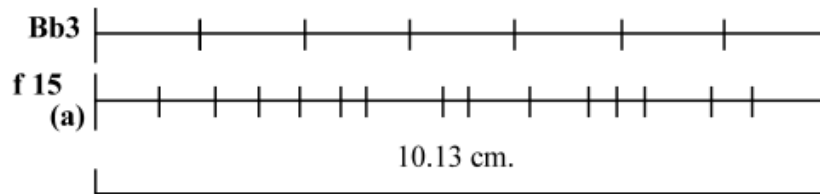


Figure 5. Approximate Proportions Between the Different Sizes of the Template f 15

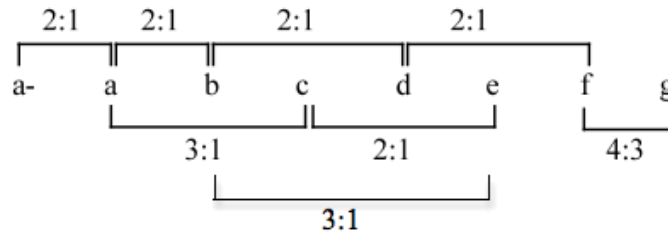


Table 2. Tempo Templates in Studies No. 45 (a, b, and c), No. 45d, No. 46, and No. 47

Definitve Title Study No.	Original Title (<i>Betty Freeman Suite</i>) Study No.	Harmonic templates	Non-harmonic templates
45a	45c	Bb 3	f 15 ^(a)
45b	45b	Bb5 - G3/C4/E4	----
45c		G2/C3/E3 (implied)	f 15 ^{(a), (b), (a-), (d), (c)}
	45d	G2/C3/E3 – Bb5	f 15 ^{(d), (e), (g), (f), (c)}
46	45a	G3/C4/E4 – Bb5 - C6	f 15 ^(b)
47	45e	G3/C4/E4 - Bb5 D#6/G#6/C7 C7/F7/A7 C8	f 15 ^{(b), (c)} accel. rit.

Figure 6. Punching Score of *Study No. 47*, page 1

The image shows a handwritten musical score for a piece titled "Study No. 47, page 1". The score is written on a system of five staves. At the top left, the number "45e" is written. In the center, there is a large, stylized number "1" with some scribbles. At the top right, "45e" is written again, followed by a circled "1" and a large "X" mark. The score consists of five staves. The first staff has six measures, with notes numbered 1 through 6. The second staff has six measures, with notes numbered 1 through 6. The third staff has six measures, with notes numbered 1 through 6. The fourth staff has six measures, with notes numbered 1 through 6. The fifth staff has six measures, with notes numbered 1 through 6. The notes are written in a shorthand notation, often with stems and flags. There are several annotations, including "TBL" written below some notes, and a large "X" at the end of the system. The handwriting is somewhat messy and appears to be a working draft or a "punching score".

Table 3. Dynamic Levels in Nancarrow's Rolls

Dynamic level #	Roll commands (tracks activated)	Suggested Dynamics
1	none or -7-	<i>pp</i>
2	-2-	<i>p</i>
3	-4-	<i>mp</i>
4	-6- (same as 4-2)	<i>mf</i>
5	6-2	<i>f</i>
6	6-4	<i>ff</i>
7	6-4-2	<i>fff</i>

Table 4. Dynamic Indications in Different Documents of Study No. 47

Sections	<i>Punching Score</i>	<i>Roll</i>	<i>Score</i>
Section 1	----	6-4	<i>ff</i>
Section 2	----	6-4	<i>ff</i>
Section 3	----	6-4	<i>ff</i>
Section 4	<i>pp</i>	-7- and <i>una corda</i>	<i>pp</i>
Section 5a	<i>p</i>	-6- (B) + -7- (T)	<i>mf</i> (B) + <i>pp</i> (T)
Section 5b	<i>mf</i>	-6-	<i>mf</i>
Section 5c	<i>ff</i>	6-2 (B) + -6- (T)	<i>f</i> (B) + <i>mf</i> (T)
Final arpeggio	<i>ff</i>	6-2	<i>f</i>
Section 6	missing	6-4	<i>ff</i>
Section 7	missing	6-4-2	<i>fff</i>
Section 8	----	6-4-2	<i>fff</i>

Figure 7. Harmonic Templates Utilized in Study No. 47

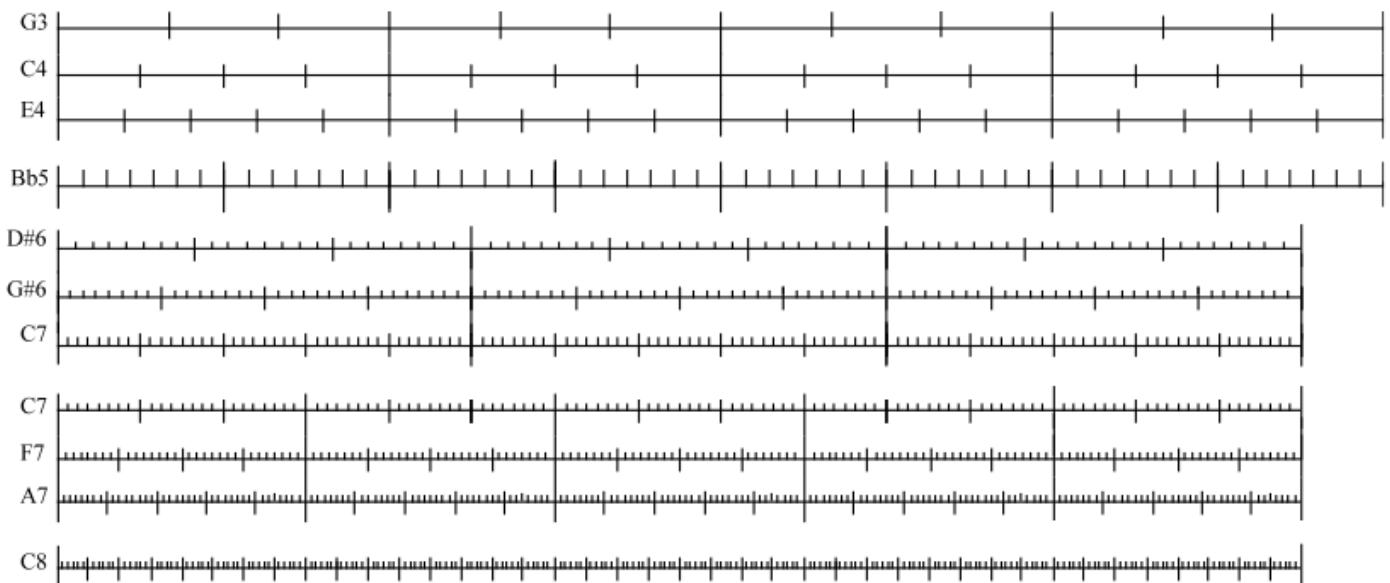


Table 5. Durations in the Accel./Rit. Templates of Study No. 47

Duration #	Values in millimeters	Decrease in millimeters from the previous duration	Decrease percentage from the previous duration	Values for arithmetic acceleration (constant decrease: 14.91 mm.)	Values for geometric acceleration (constant decrease: 15.84%)
13	216	----	----	216	216
12	199	17	8.54%	201.1	186.49
11	174	25	14.37%	186.2	160.99
10	139	35	25.18%	171.2	138.97
9	120	19	15.83%	156.3	119.97
8	102	18	17.65%	141.4	103.56
7	93	9	9.68%	126.5	89.40
6	84	9	10.71%	111.6	77.17
5	73	11	15.07%	96.7	66.62
4	64	9	14.06%	81.8	57.51
3	55	9	16.36%	66.9	49.65
2	45	10	22.22%	51.9	42.86
1	37	8	21.62%	37	37

Figure 8. Template Continuity and Musical Elision Between Sections 1 and 2



Figure 9. Roll Templates in Section 3

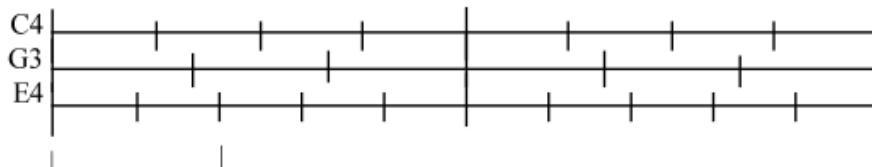


Figure 10. Rhythm of Upper Voices in Section 5a

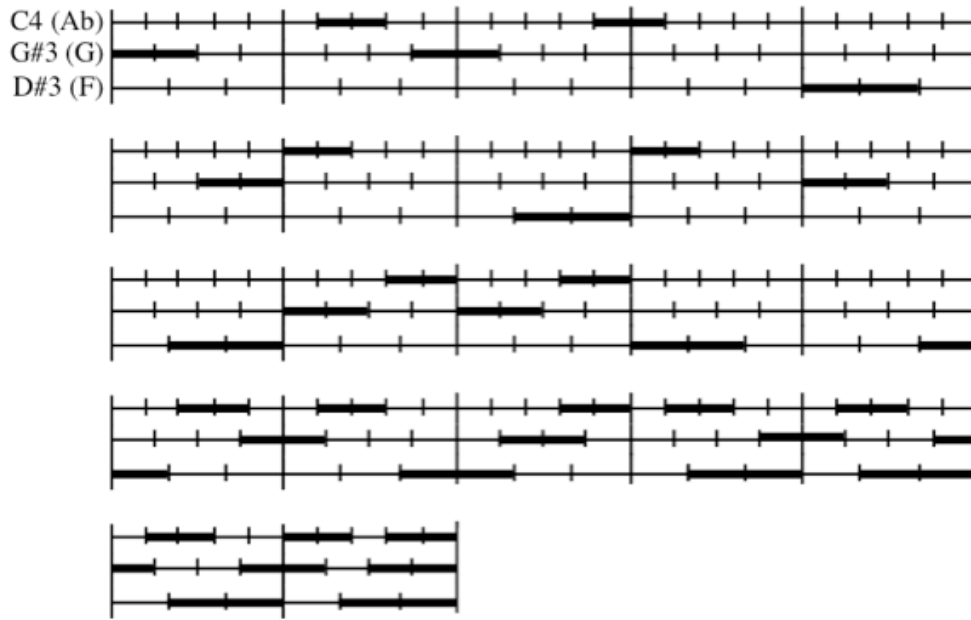
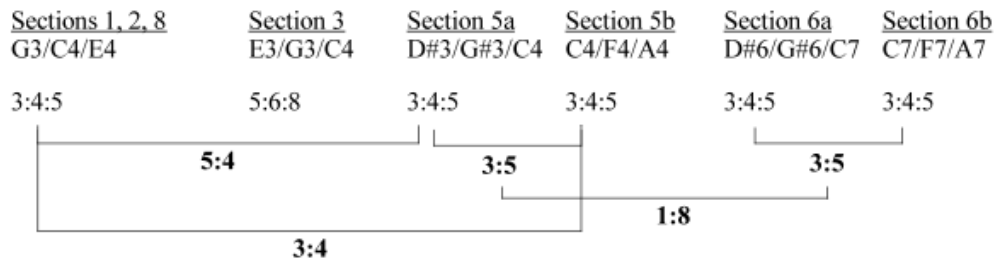


Figure 11. Relationship Between the Templates Bb5 and C8



Figure 12. Triadic Template Combinations and their Temporal Proportions

a)



b)

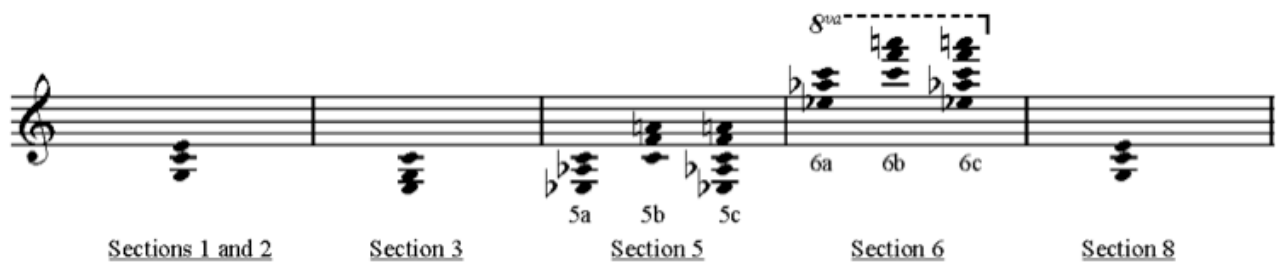


Figure 13. Groupings of Template Units and Metronome Markings

