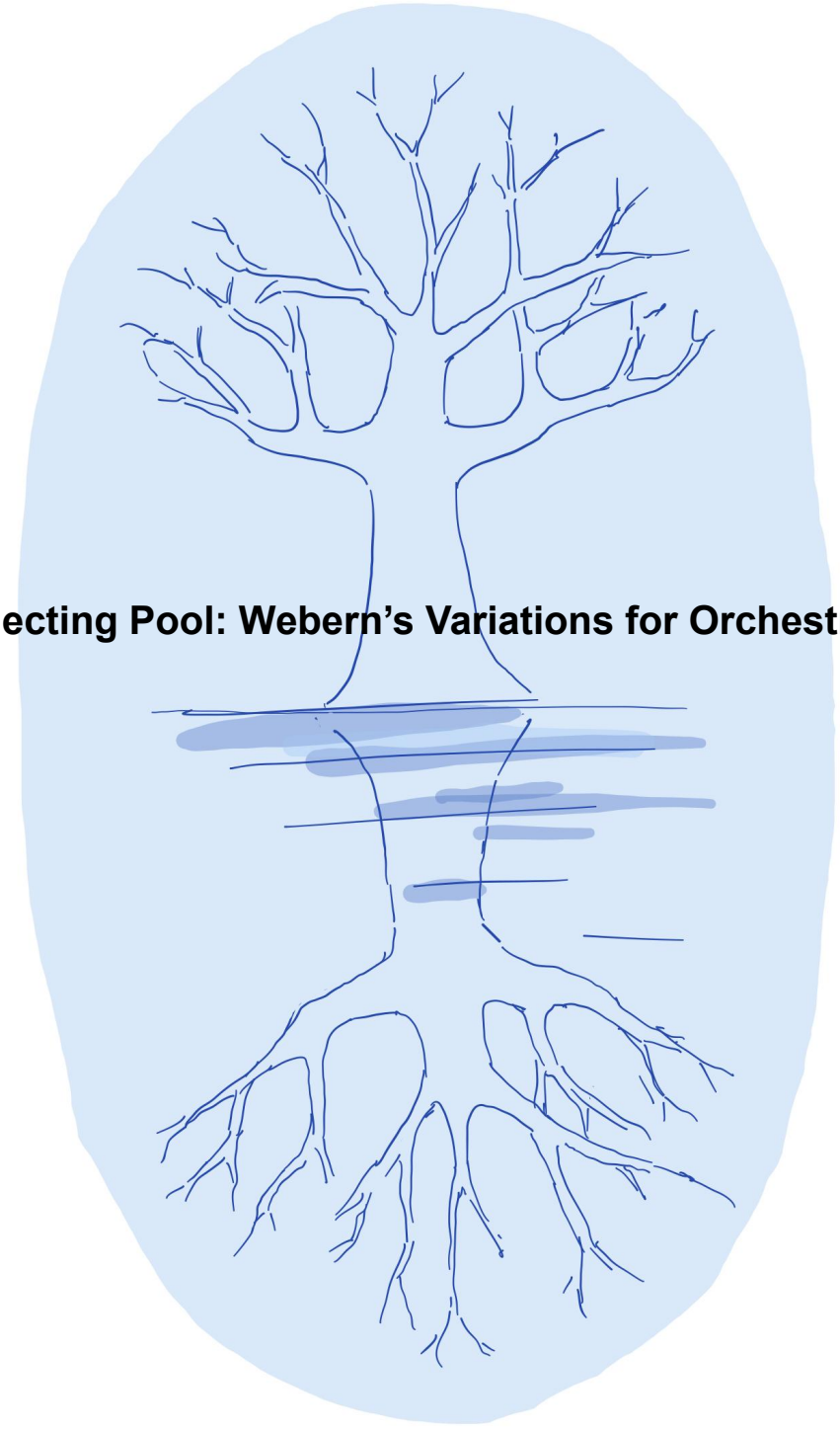
Lucy Song
MUTH 5370



The Reflecting Pool: Webern's Variations for Orchestra, Op. 30

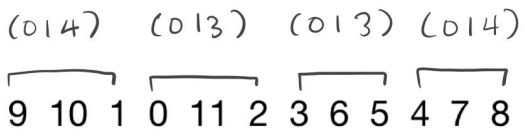
Introduction

Anton Webern's concise collection of published works was known for its rigorous use of twelve-tone technique, economy and brevity, unity on every structural level, and fascination with symmetry and mirror images. The Variations for Orchestra Op. 30, Webern's penultimate work, is no exception; in a mere eight minutes, Webern introduces a particularly special twelve-tone row and explores its expressive capabilities from every angle and possibility. In this paper, I will show how Webern exploits the natural symmetry in this row to create unity and balance, first by analyzing the trichord, tetrachord, and hexachord segments alongside other properties of the original row, and then by exploring how Webern uses these characteristics throughout the diverse textures of the Theme, Variation 2, and Variation 3. These three sections in particular showcase the precision, creativity, and variety of techniques that Webern uses to create this piece. In particular, his use of patterns, orchestration, and rhythm helps replicate symmetry on multiple levels, and makes the work reminiscent of symmetrical patterns in nature. For the purpose of this analysis, Variations for Orchestra Op. 30 will be identified by the seven sections separated by double bar lines: Theme (m.1 - 20), Variation 1 (m. 21 - 55), Variation 2 (m. 56 - 73), Variation 3 (m. 74 - 109), Variation 4 (m. 110 - 134), Variation 5 (m. 135 - 145), and Variation 6 (m. 146 - 180).

Unique Characteristics of the Row and Matrix

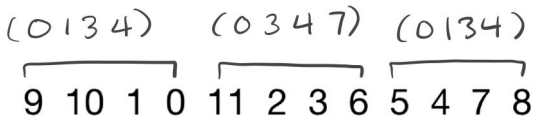
The twelve-tone row that forms the foundation of this work is <9 t 1 0 11 2 3 6 5 4 7 8>. This row can be segmented in multiple ways, each yielding an interesting pattern. In trichords, the prime forms are (014) (013) (013) (014); see Example 1:

Example 1: Prime forms of the original row in trichords



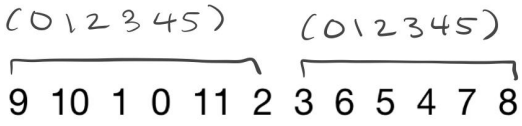
Upon first glance, it seems that the most sensible way to divide this row is into trichords, given the symmetry of (014) segments on the outer ends and two (013) segments in between. However, in this work the row is most often motivically separated into three tetrachords, yielding an equally interesting pattern. See Example 2:

Example 2: Prime forms of the original row in tetrachords



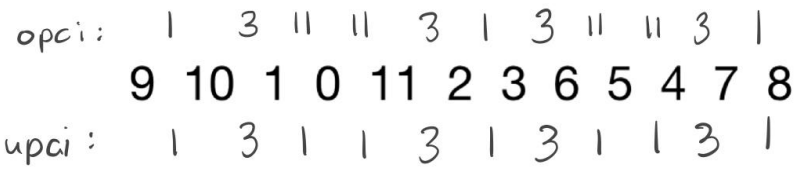
This segmentation of the row is extremely interesting because it contains four “mirrors”. Each of the three segments maps onto itself with a mirror point in the middle, and the prime form (0134) starts and ends the row - the inverse mirror point of the whole row being between the 6th and 7th order numbers. Additionally, just as the middle of (0134) has the most space in between, the middle tetrachord has the most expansive range. Segmenting the row into hexachords yields another interesting observation; the prime form of each hexachord is (012345), so that each half forms its own chromatic scale; See Example 3:

Example 3: Prime forms of the original row in hexachords



The symmetry within the various ways to divide this row stem from the inherent symmetry of the row’s pitch class intervals, which contain only 1 and 3 and form a large palindrome. See Example 4:

Example 4: Ordered and unordered pitch class intervals of the original row



Due to these characteristics, each permutation's retrograde is identical to its inversion, therefore limiting the possible permutations to 24 instead of 48. This row's matrix also exhibits prime combinatoriality (P9/P3), inversional combinatoriality (P9/I8), and retrograde inversional combinatoriality (P9/RI2); see Example 5:

Example 5: Twelve tone matrix showing combinatorial structure

	I_9	I_{10}	I_1	I_0	I_{11}	I_2	I_3	I_6	I_5	I_4	I_7	I_8	
P_9	9	10	1	0	11	2	3	6	5	4	7	8	R_9
P_8	8	9	0	11	10	1	2	5	4	3	6	7	R_8
P_5	5	6	9	8	7	10	11	2	1	0	3	4	R_5
P_6	6	7	10	9	8	11	0	3	2	1	4	5	R_6
P_7	7	8	11	10	9	0	1	4	3	2	5	6	R_7
P_4	4	5	8	7	6	9	10	1	0	11	2	3	R_4
P_3	3	4	7	6	5	8	9	0	11	10	1	2	R_3
P_0	0	1	4	3	2	5	6	9	8	7	10	11	R_0
P_1	1	2	5	4	3	6	7	10	9	8	11	0	R_1
P_2	2	3	6	5	4	7	8	11	10	9	0	1	R_2
P_{11}	11	0	3	2	1	4	5	8	7	6	9	10	R_{11}
P_{10}	10	11	2	1	0	3	4	7	6	5	8	9	R_{10}
	RI_9	RI_{10}	RI_1	RI_0	RI_{11}	RI_2	RI_3	RI_6	RI_5	RI_4	RI_7	RI_8	

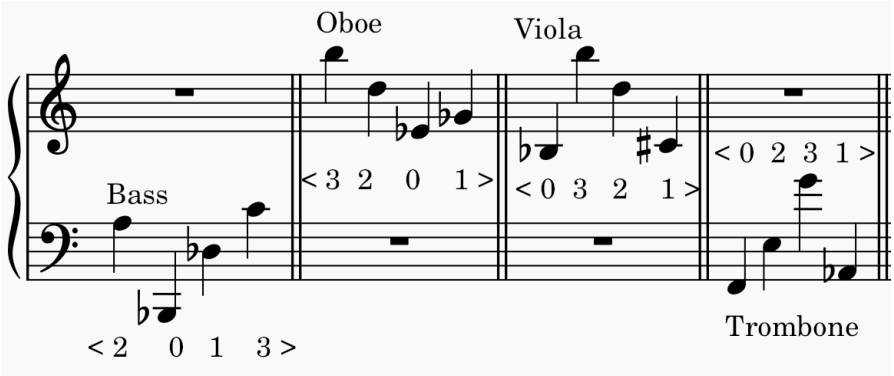
Because the pitch class content remains the same whilst switching hexachord places in these combinatorial relationships, this opens many possibilities of overlap between permutations, which Webern uses extensively throughout the work. Having discussed the

special properties of this row, I now turn to how Webern introduces the row and makes these properties clear to the listener.

Theme: Introducing the Foundational Elements

The opening of Variations for Orchestra immediately emphasizes that the audience should hear the row in motives of four notes. Each gesture is exactly four consecutive order numbers of a particular permutation, usually in the same instrument and surrounded by silence. Occasionally a group of four notes is split among two instruments of similar tessitura, but with rhythm that makes the unity of the four note motive clear.

Example 6: Contour segments of opening four note motives in measures 1-4 (without rhythms)



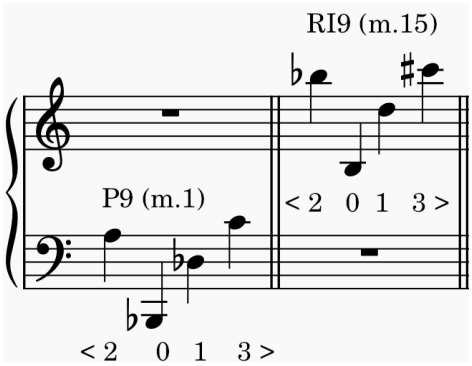
The first four gestures, in addition to clarifying the tetrachordal organization, also introduces the four common CSEGs throughout this section which further creates unity; each gesture has an arched shape, which appears in many forms throughout the piece.

From a more general perspective, this introduction from m.1-20 plants the seed that is the basis for the entire work. There are four permutations used which introduce the qualities of the row: P9, RI9, I9, and R9. These permutations create a synchronic structure over the course of the Theme with R9 in the middle, similar to the outwardly expanding concentric circles when a pebble is dropped in a pond; see Example 7:

Example 7: Diagram of the synchronic structure of the permutations used in the Theme

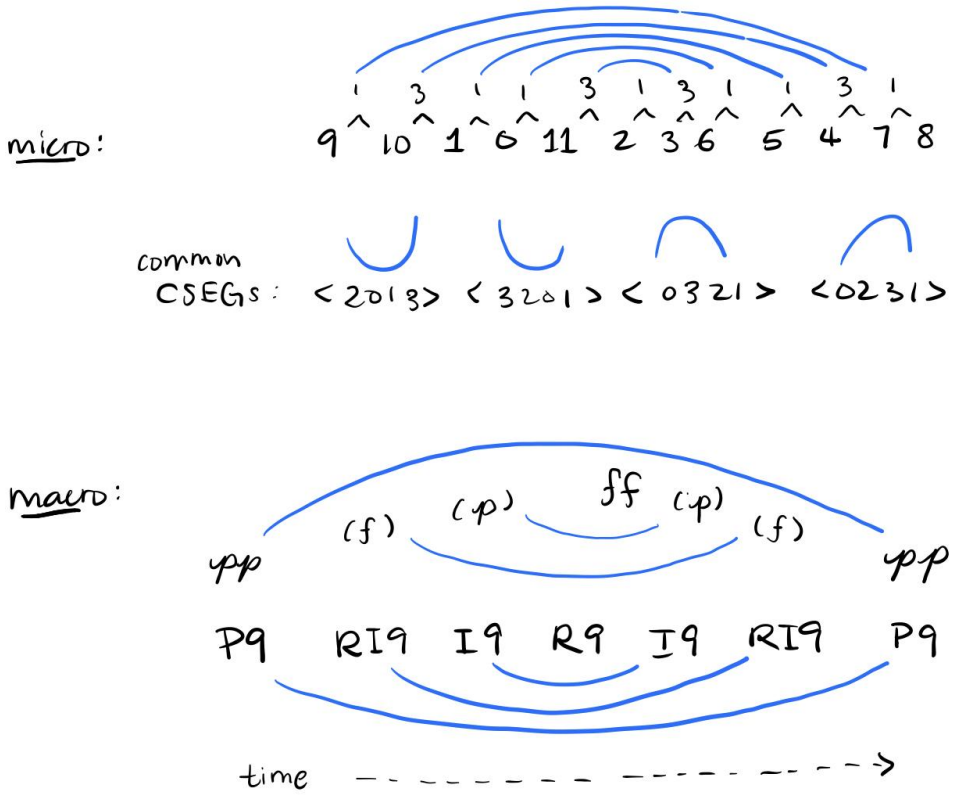
In the same way that the row itself has mirror symmetry, the large scale structure of this section has symmetry: P9 - RI9 - I9 - R9 - I9 - RI9 - P9. In measure 15 after a silence, P9 and RI9 appear for the second time, as if recapitulating the opening. Curiously, the CSEG of m.15 (the gesture that starts the “recap”) is the same as the CSEG of the opening in m.1, as if recalling that gesture to bring the Theme full circle; see Example 8:

Example 8: Similarly in the CSEG of measures 1 and 15



In addition to the contours illuminating the structure of the Theme, Webern’s choice of orchestration helps bring the ear to understand the organization. Noting that the texture is usually sparse, the tripling of loud dynamic voices in m.11-12 seems to point to a climax at that point. Between these two measures, both I9 and R9 (which are at the midpoint of the Theme) turn around at their own midpoints from their first hexachord to second hexachord. This orchestration adds to the arched shape of the Theme, adding to the dynamic intensity in the middle and contrasting with when it becomes quieter winding down; see Example 9:

Example 9: Synchronic and concentric ripple aspects of the Theme on micro and macro levels



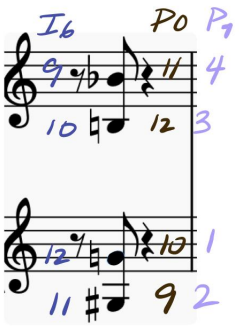
The above diagram summarizes and illustrates the prevalence of these arching or concentric ripple shapes in this section, both on a microscopic and macroscopic level, in the twelve-tone row, motivic contours, dynamics, and permutation pattern. Having established the symmetrical and synchronic characteristics of the theme, this logically leads to a discussion on how Webern exploits these characteristics in variations of the theme.

Variation 2: In Vertical Fashion

This variation is particularly interesting to analyze because Webern perfectly combines the overlapping pitch class content of different permutations with a rigorous pattern. At first glance in the score, it is apparent spatially that each group of four vertical notes belong together, unlike the horizontal contours of the Theme. Each of these groups of notes contains either order

numbers 1-4, 5-8, or 9-12 of a particular permutation. The instrumentation for a single permutation varies from tetrachord to tetrachord; for example where I6 starts in measure 60, order numbers 1-4 are in flute, oboe, clarinet and bass clarinet, order numbers 5-8 are in harp, and order numbers 9-12 are in the violins. As this variation progresses, many tetrachords serve functions in multiple overlapping permutations. This creates the effect of these vertical tetrachords acting beautifully as pivot chords between various permutations; see Example 10:

Example 10: Measure 63 violins, tetrachord serving as a pivot chord for three permutations



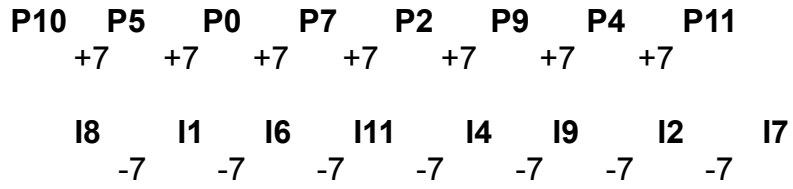
The overlapping pitch class content and the pivot chord function that Webern is able to create from this characteristic is further complicated by the pattern of permutations used. When written horizontally in order of appearance, a pattern emerges of alternating prime and inverted rows:

Example 11: Permutations in order of appearance for Variation 2

P10 - I8 - P5 - I1 - P0 - I6 - P7 - I11 - P2 - I4 - P9 - I9 - P4 - I2 - P11 - I7

When observing where each of these permutations occur in time, each pair of prime and inversion occur concurrently; for example, P10 and I8 happen in the same aural space. This creates another instance of the concentric ripples expanding outward, as prime and inversion permutations move in opposite directions. By looking at the prime permutations and inversion permutations separately in order, another pattern becomes clear:

Example 12: Separate temporal diagrams of prime and inverted permutations



Just as the prime and inverted rows move in opposite directions, the pattern of transposition is moving in opposite directions between the prime and inverted patterns. Each successive P row is transposed by +7 in pitch class, and each successive I row is transposed by -7 in pitch class. This is reminiscent of a circle of fifths sequence in tonal music. In Variation 2, there are outwardly expanding ripples on multiple levels, creating balance, logic, and beauty. It is also interesting to note that the pitch classes that begin the variation (order number 1 in P10 and I8, therefore pitch classes 10 and 8 respectively) are the same pitch classes that end the variation, adding another symmetrical circular element. Ending on pitch classes 10 and 8, along with the approach to those final notes by contrary motion from two pitch class 9 notes in unison, seems to imply or reference a cadential-like function. Having discussed Variation 2, I now briefly turn to Variation 3, in which Webern uses contrasting strategies to create balance in the form, therefore throwing both variations into relief.

Variation 3: A Horizontal Landscape

Variation 3 contrasts with Variation 2 in both texture and structure, and aids in illuminating the different ways in which Webern exploits the characteristics of this twelve-tone row. Instead of vertical construction, the permutations are laid out horizontally, fragmented and almost pointillistically across spans of silence. The sparse rhythms are unsure - almost searching. In complete contrast to the previous variation, no two order numbers from the same permutation occur simultaneously. The series of permutations unfolds in the following manner:

Example 13: Permutations in order of appearance, grouped by concurrent sounding

(I0 - P6) - I4 - P2 - P5 - P3 - P4 - (I3 - P3) - (I2 - P2)
+3 -2 +1

In contrast to the circular, synchronic nature of the theme and previous variation, this variation proceeds more in a diachronic fashion. Instead of a journey from point A back to point A, I see a journey from a distant point B back to point A. In Example 13, rows that sound concurrently are grouped by parentheses to illustrate pairings. The variation starts with two permutations that are distant in many ways, inverted and separated by a tritone (I0 and P6). The next permutation to appear is I4, and is followed by four permutations in prime form, each which gets successively closer to the same starting pitch class as I4 - almost as if the P rows are trying to find the partner to I4. The variation ends with I3 and P3, and then lastly I2 and P2. Though the journey is different in this variation, there is still an element of moving away outward from a central point, just as in the Theme. The concluding pairs of rows both start on a central pitch class and radiate outwards, connecting this variation thematically to the original material.

Conclusion

Even in a brief and incomplete study of Webern's Variations for Orchestra Op. 30, there is much to be seen of Webern's efficiency, creativity, and penchant for symmetry and unified musical ideas. By reproducing a structural idea on multiple levels, one tetrachord (0134) becomes the seed for an entire work. This level of motivitic and formal unity, which is common in Webern's work, gives the impression that the music, from one cell, creates itself, just as one pebble can generate ever-growing concentric waves outwards from itself. In seeing the symmetry and organic growth of this music through replicating simple structures on multiple levels, I am reminded of a tree placed in front of a reflecting pool: symmetry reflected on every level, and a simple idea branching out again and again to create a complex entity.

Appendix 1: Twelve-tone matrix for Webern Variations for Orchestra Op. 30

	I_9	I_{10}	I_1	I_0	I_{11}	I_2	I_3	I_6	I_5	I_4	I_7	I_8	
P_9	9	10	1	0	11	2	3	6	5	4	7	8	R_9
P_8	8	9	0	11	10	1	2	5	4	3	6	7	R_8
P_5	5	6	9	8	7	10	11	2	1	0	3	4	R_5
P_6	6	7	10	9	8	11	0	3	2	1	4	5	R_6
P_7	7	8	11	10	9	0	1	4	3	2	5	6	R_7
P_4	4	5	8	7	6	9	10	1	0	11	2	3	R_4
P_3	3	4	7	6	5	8	9	0	11	10	1	2	R_3
P_0	0	1	4	3	2	5	6	9	8	7	10	11	R_0
P_1	1	2	5	4	3	6	7	10	9	8	11	0	R_1
P_2	2	3	6	5	4	7	8	11	10	9	0	1	R_2
P_{11}	11	0	3	2	1	4	5	8	7	6	9	10	R_{11}
P_{10}	10	11	2	1	0	3	4	7	6	5	8	9	R_{10}
	RI_9	RI_{10}	RI_1	RI_0	RI_{11}	RI_2	RI_3	RI_6	RI_5	RI_4	RI_7	RI_8	

Appendix 2: Annotated score of the Theme, Variation 2, and Variation 3

An Werner Reinhart

VARIATIONEN

für Orchester

ANTON WEBERN, op. 30

Theme / Intro

Lebhaft ♪ = ca 160 *langsamer* ♪ = ca 112 *wieder lebhaft* ♪ = ca 160

Flöte
Oboe
Klarinette
Bass-Klarinette
Horn
Trompete
Posaune
Bass-Tuba
Celesta
Harfe

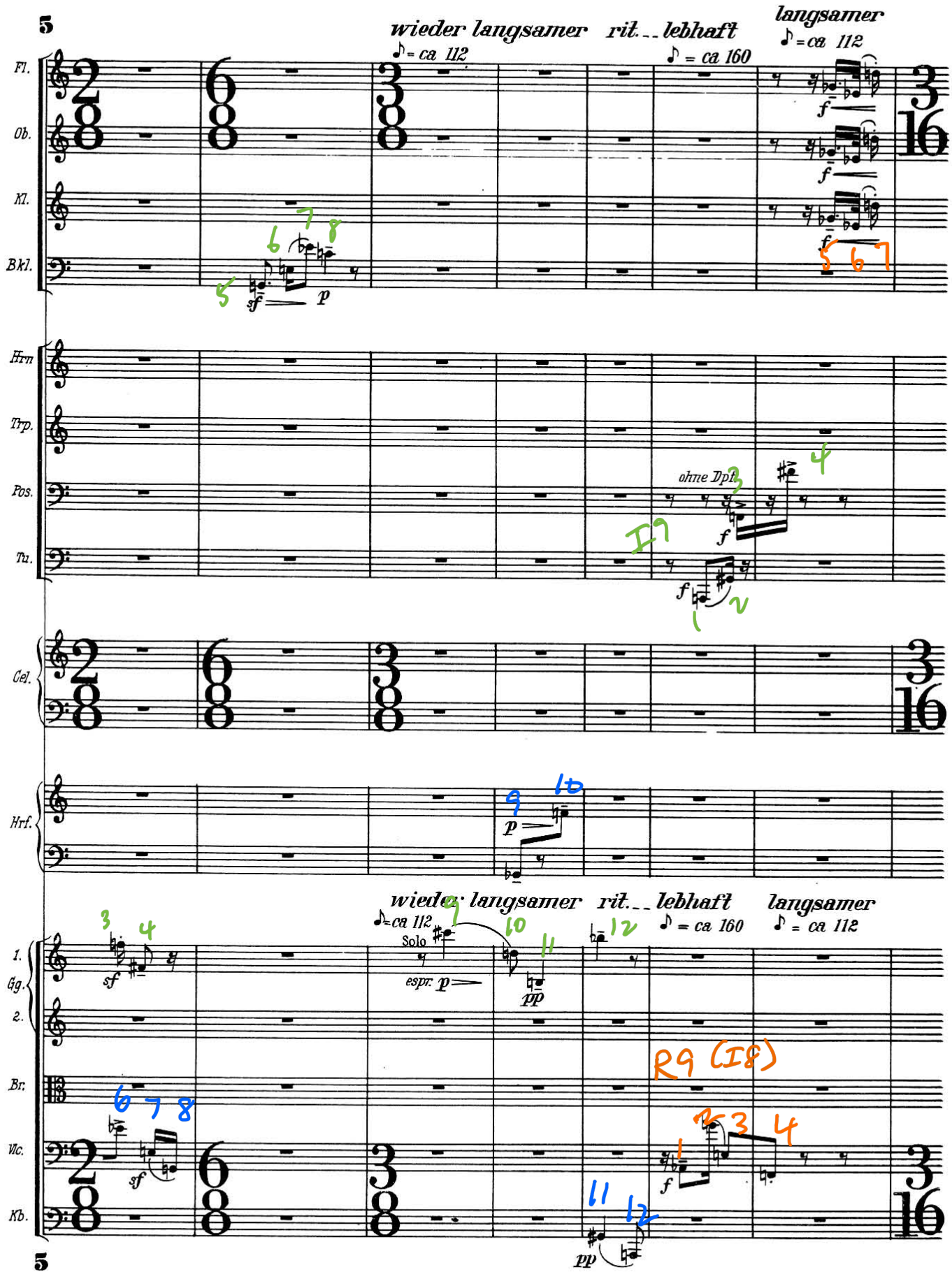
mit Dämpfer *Dämpfer ab*

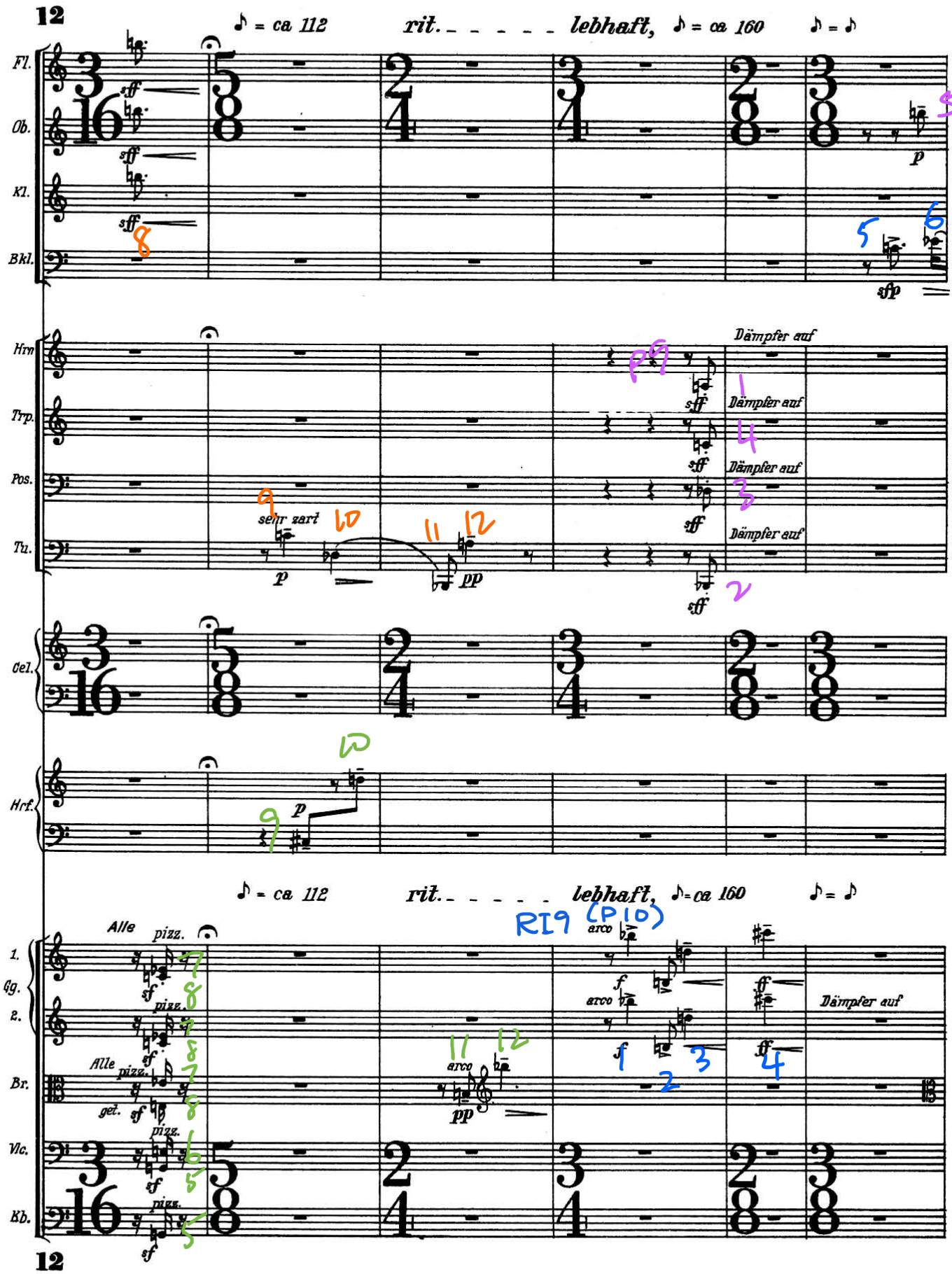
Lebhaft ♪ = ca 160 *langsamer* ♪ = ca 112 *wieder lebhaft* ♪ = ca 160

I
Geigen
II
Bratschen
Violoncelli
Kontra-Bässe

Solo

Universal Edition Nr. 12417


5
wieder langsamer rit.. lebhaft
♪= ca 112
♪ = ca 160
langsamer
♪=ca 112
Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Tu.
ohne Dpt.
Cel.
Hrf.
wieder langsamer rit.. lebhaft
langsamer
♪=ca 112
Solo
espr.
1.
Gg.
2.
Br.
Vlc.
Kb.
R9 (I8)
5


12
♪ = ca 112
rit. - - - - - lebhaft,
♪ = ca 160
♪ = ♪
Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Tu.
Dämpfer auf
sehr zart
Vcl.
Hrf.
Alle pizz.
arco
RI9 (P10)
1. Gg.
2.
Br.
Vlc.
Kb.
12

Var. I

18

molto rit. - - - - - - - - sehr ruhig

♩ = erreichte ♪ (ca 112)

Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Tu.
Cel.
Hrf.
1. Gg. 2.
Br.
Vlc.
Kb.

pp

mit Dämpfer

molto rit. - - - - - - - - sehr ruhig

♩ = erreichte ♪ (ca 112)

Solo

(Solo)

8va

18

Var. II

52

rit. - - - - - - - - wieder lebhaft ♪ = ca 160

Fl.
Ob.
Kl.
Bkl.
pp
sff
4
5
sff

Hrn
Trp.
Pos.
Tu.
mit Dämpfer
pp
P10 m. Dpf.
3
8
m. Dpf.
1
6
m. Dpf.
2
7
sff

Cel.

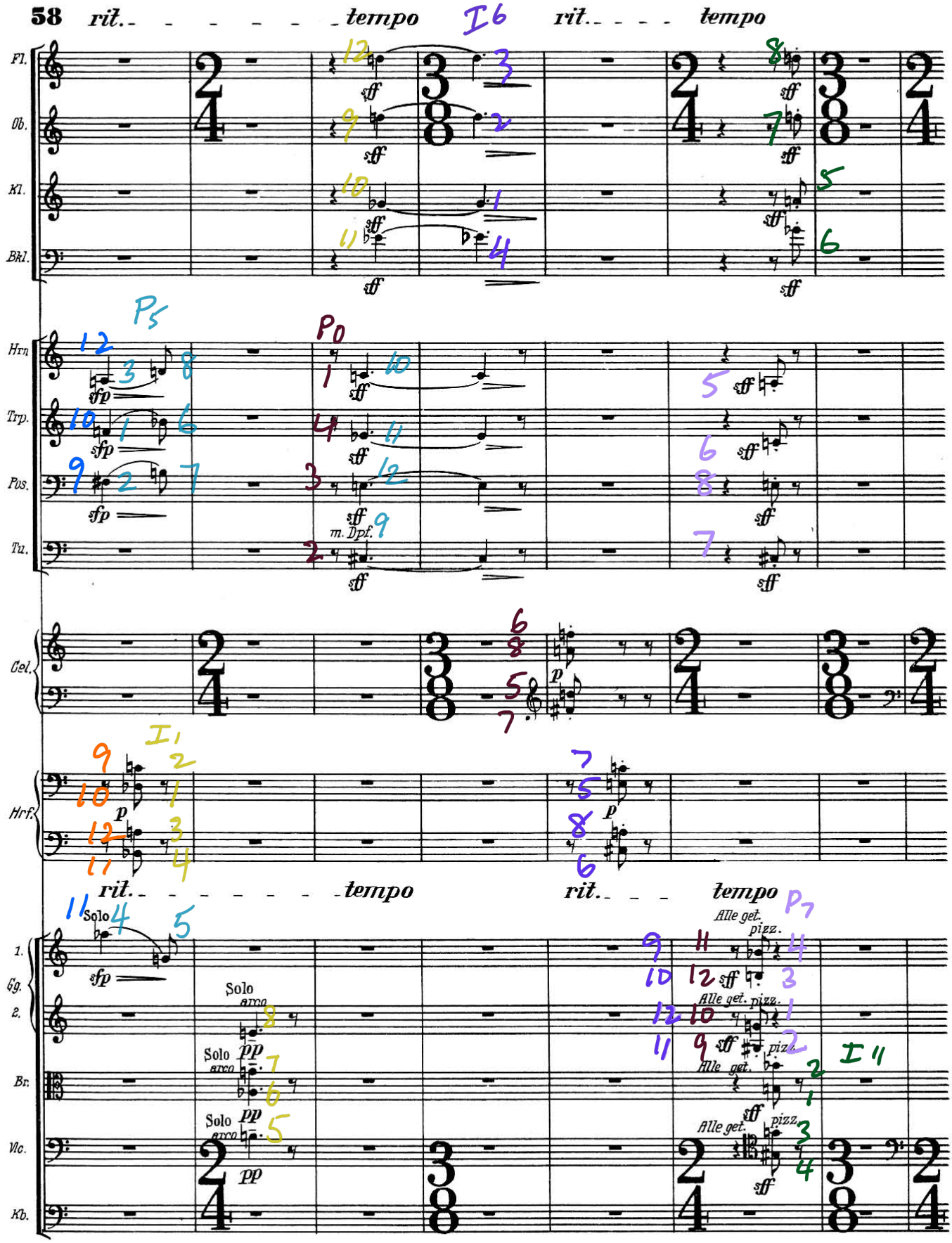
Hrf.
pp

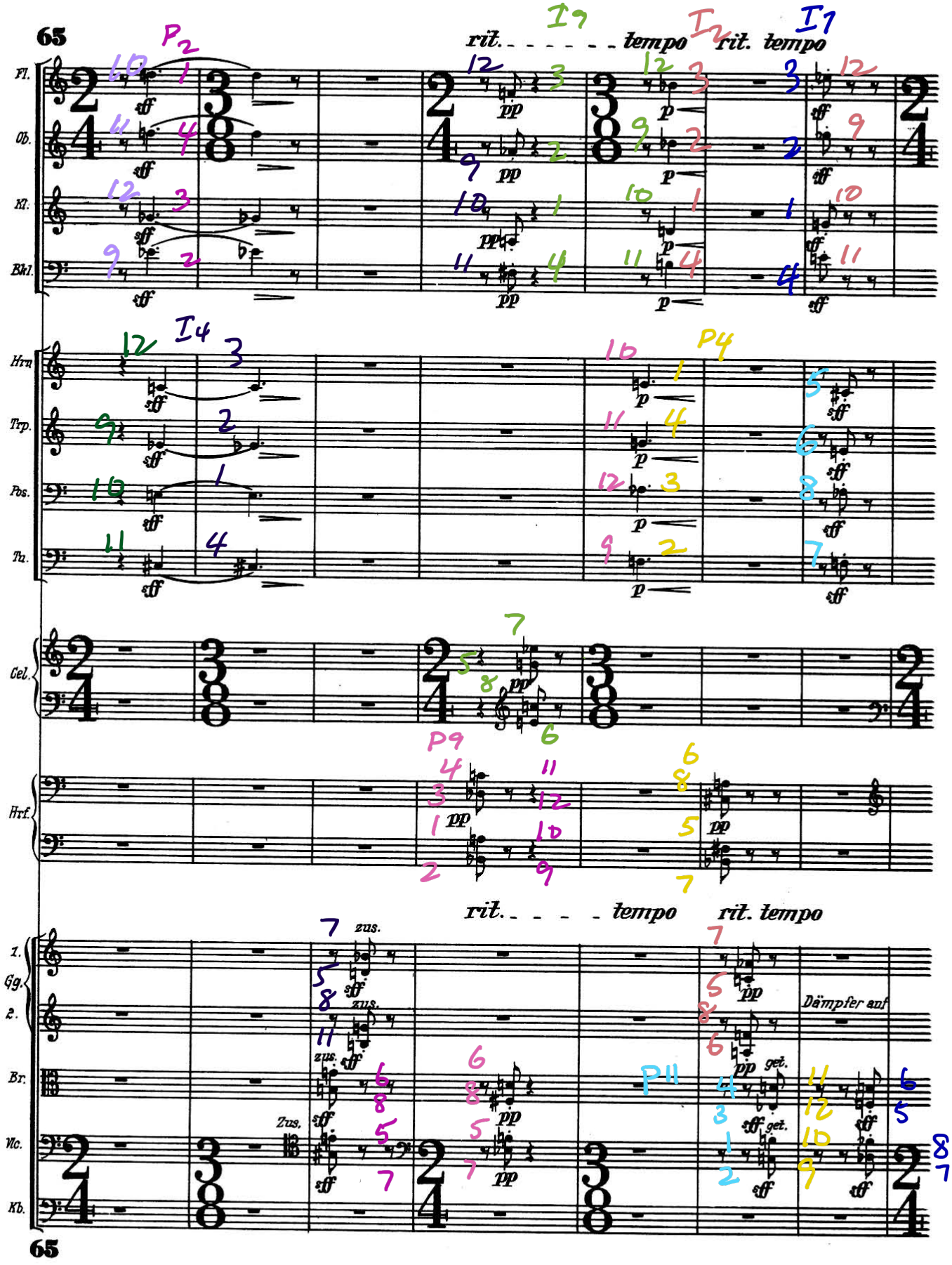
rit. - - - - - - - - wieder lebhaft ♪ = ca 160

1. Gg.
2.
pizz.
pp
I8
pizz.
3
8
Br.
ohne Dpf.
Solo
pp
ohne Dpf.
Alle
pizz.
2
1
7
6
sf
ohne Dpf.
pizz.

Vlc.
Kb.
4
5
sf

52


58
rit.
tempo
rit.
tempo
Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Tu.
Cel.
Hrf.
1.
Gg.
2.
Br.
Vc.
Kb.
Solo
arco
Alle get.
pizz.
m. Dpf.
58


65
rit. tempo
rit. tempo
Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Tu.
Cel.
Hrf.
rit. tempo
rit. tempo
1.
Gg.
2.
Br.
Vc.
Kb.
zus.
Dämpfer auf
65

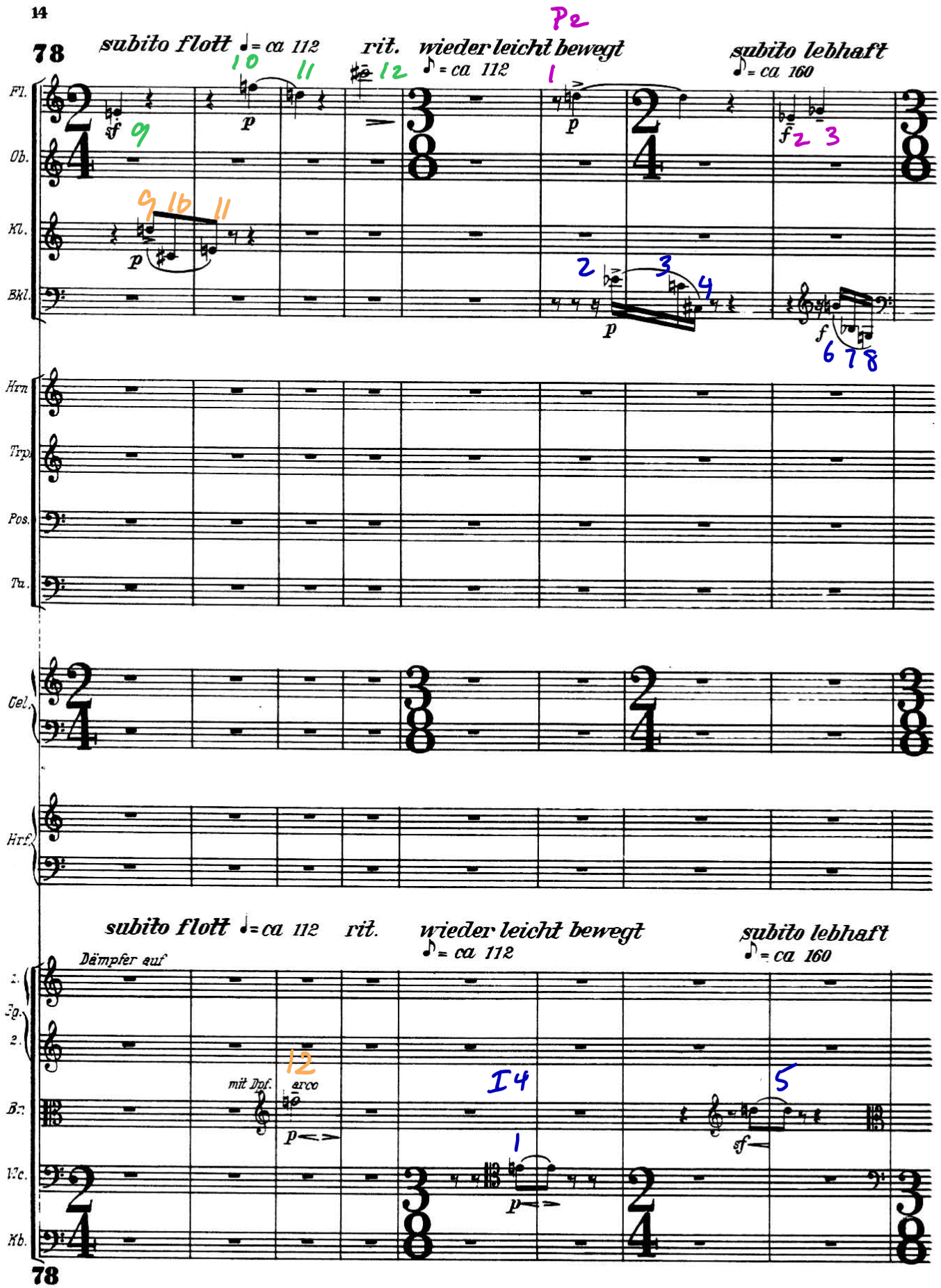
Var. III

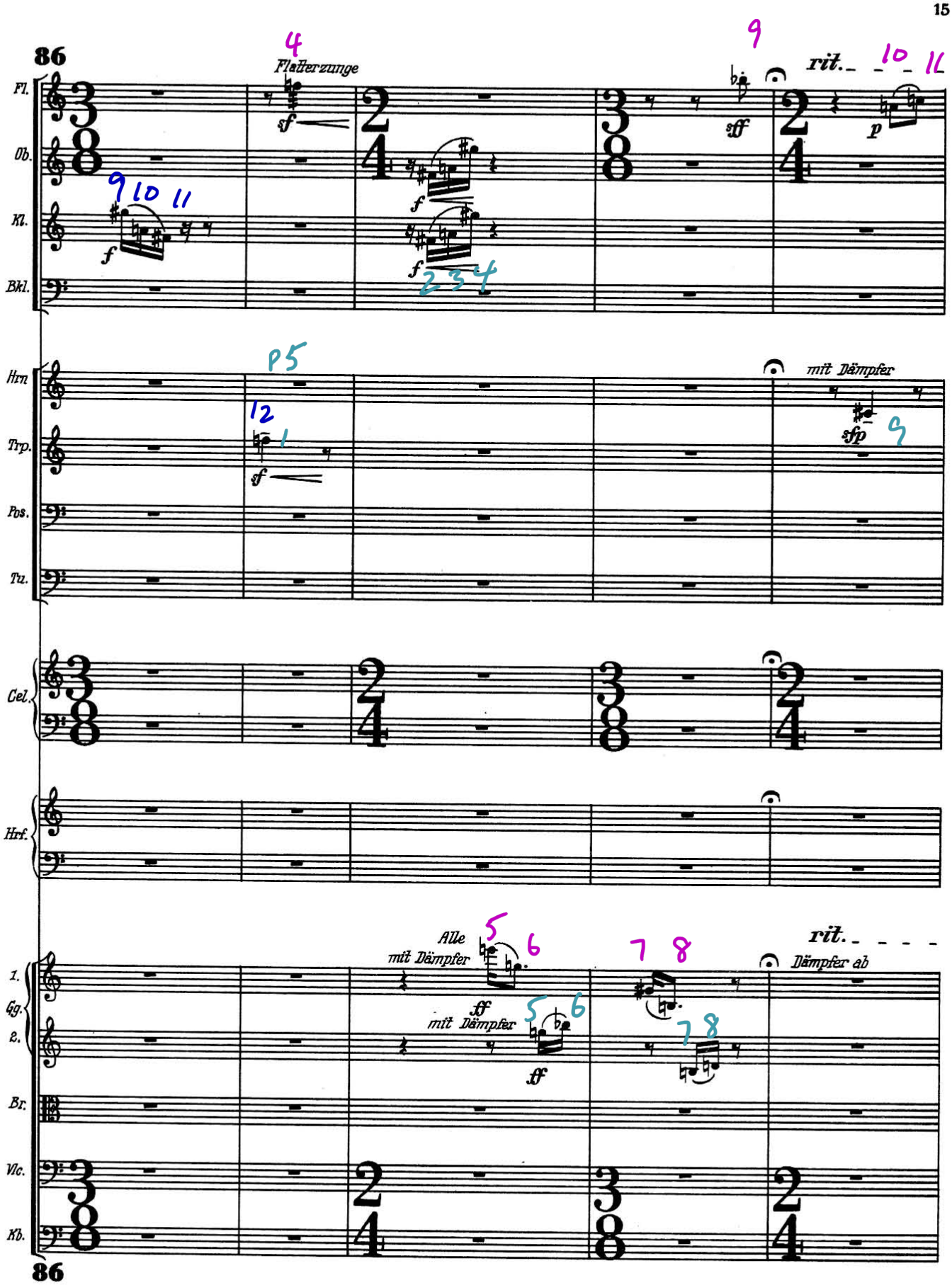
72

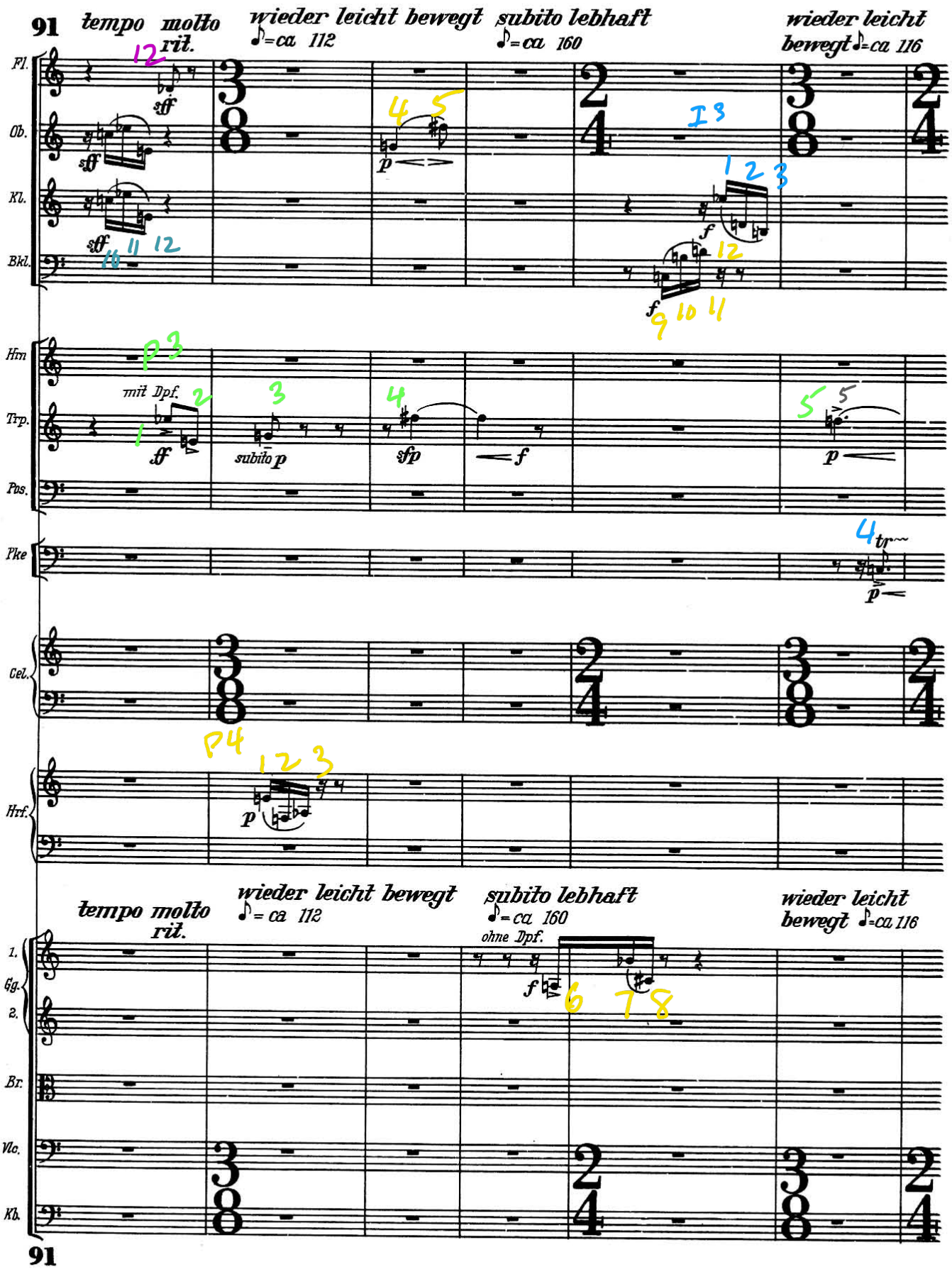
etwas bedächtig ♪=♪ (ca 160) leicht bewegt ♪= 112

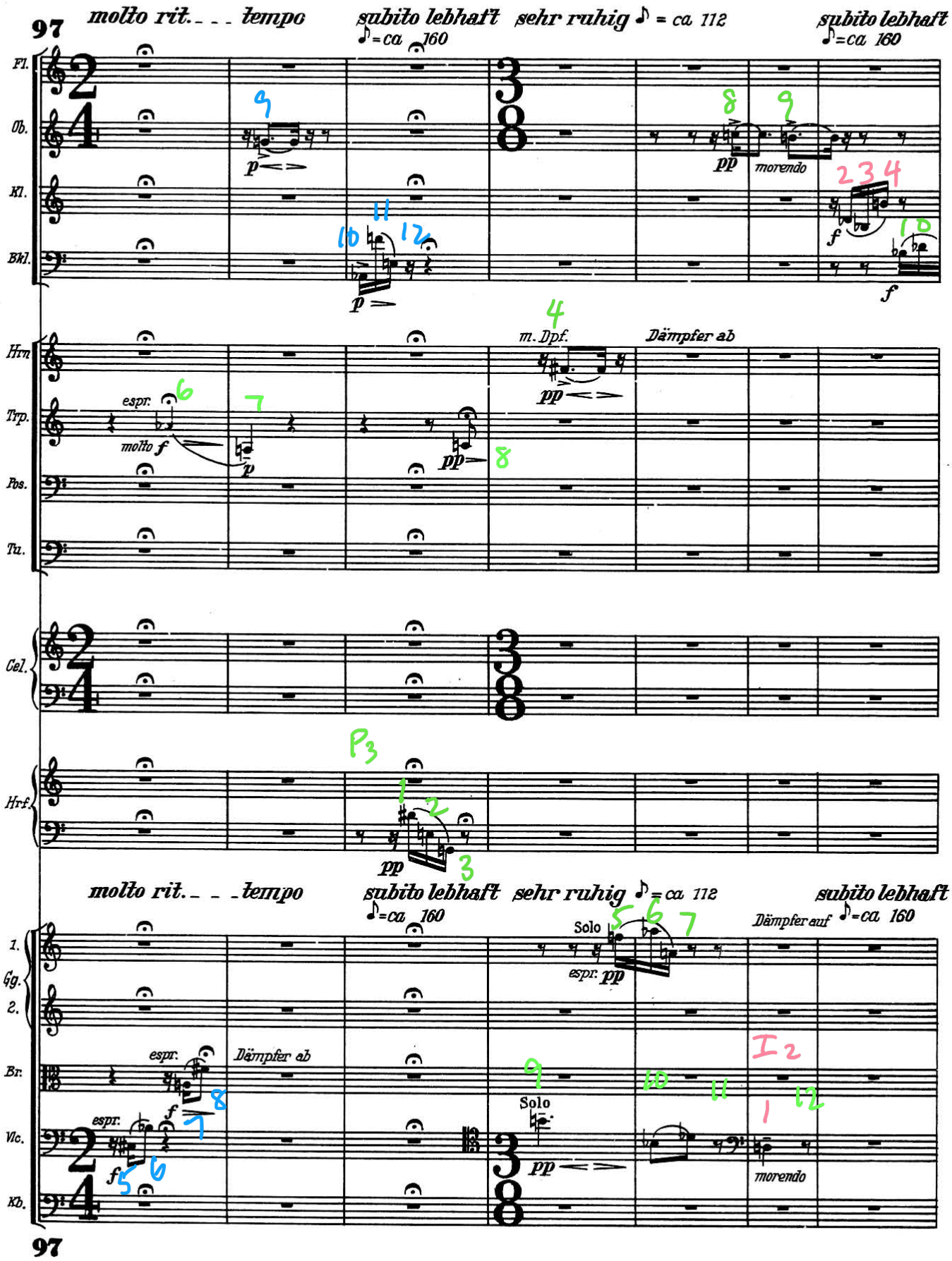
Fl.
Ob.
Kl.
Ekl.
Hrn
Trp.
Pos.
Tu.
Dämpfer ab
Cel.
Hrf.
etwas bedächtig ♪=♪ (ca 160) leicht bewegt ♪= 112
Solo pizz.
arco
zart
Solo
1. Gg.
2.
Dämpfer auf
Br.
Dämpfer auf
mit Dpf.
arco
zart
Vc.
Kb.

72


78
subito flott ♩= ca 112
rit.
wieder leicht bewegt
♪= ca 112
subito lebhaft
♪= ca 160
Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Tu.
Cel.
Hrf.
Dämpfer auf
mit Dpf.
arco
Vc.
Kb.
78


86
Fl.
Flatterzunge
sf
rit.
Ob.
ff
p
Kl.
f
Bkl.
Hrn
mit Dämpfer
Trp.
sfp
Pos.
Tu.
Cel.
Hrf.
Alle
mit Dämpfer
ff
rit.
Dämpfer ab
1.
Gg.
2.
Br.
Vlc.
Kb.
86


91
tempo molto rit.
wieder leicht bewegt ♪=ca 112
subito lebhaft ♪=ca 160
wieder leicht bewegt ♪=ca 116
Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Pke
Cel.
Hrf.
1. Gg.
2.
Br.
Vlc.
Kb.
mit Dpf.
subito p
ohne Dpf.
91


97
molto rit. - - - tempo
subito lebhaft
sehr ruhig
= ca. 112
= ca. 160
Fl.
Ob.
Kl.
Bkl.
Hrn
Trp.
Pos.
Tu.
Cel.
Hrf.
Gg.
Br.
Vc.
Kb.
espr.
molto f
m. Dpf.
Dämpfer ab
Dämpfer auf
morendo
Solo
pp
f
p
97

Var IV

104

flott ♩ = ca. 112

subito lebhaft beschleunigend ♪ = ca. 160

ruhig fließend erreichte ♩ = ca. 112

Fl.
Ob.
Kl.
Bkl.

f
flüchtig
pp

P2

Hrn
Trp.
Pos.
Tu.

mit Dämpfer
ff
m. Dpf.
sfp

Cel.
Hrf.

sf
pp

flott ♩ = ca. 112

subito lebhaft beschleunigend ♪ = ca. 160

ruhig fließend erreichte ♩ = ca. 112

1. Gg.
2.
Br.
Vc.
Kb.

ohne Dämpfer
ff
pizz.
sf
Dämpfer auf
mit Dpf.
pp

104