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**KLANGSPIEGEL** (2002)  
für Trompete in C und 4-Kanal-Tonband

## KLANGSPIEGEL

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Trompete und Tonband

Mit der freundlichen Unterstützung der Stiftung für Wissenschaft und Technologie des Portugiesischen Ministeriums für Wissenschaft und Forschung (*Fundação para a Ciência e a Tecnologia, Ministério da Ciência e do Ensino Superior*).

Philipp Kolb gewidmet

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Dedicated to Philipp Kolb

## Klangspiegel

The idea that gave birth to Klangspiegel (Sound Mirror) is precisely the sound reflection of certain acoustic characteristics of the trumpet on the tape. The microscopic look of the internal life of a sound, through which we are possessed by a certain reality of the object, allows their projection throughout the perceptible domain. Fourier analysis (FFT) is the tool that we have to go through this passage from the microscopic time to the musical time. The amplitude/frequency pairs resulting from the five trumpet sounds of the FFT analysis are transformed by means of a set of algorithms (amplitude and frequency filters). The former instrumental re-synthesis inverts the role of object and reflected image.

Apart from the analysis of purely spectral data, there is also the observation of the time evolution of the 13 first partials of the trumpet, from which it is extracted a certain order, the "Gestalt". Applying this shape to a set of pitches and extracting the quartertones in their specific time relation to the rest, results in a particular rhythmic proportion. Therefore, the obtained rhythm is a consequence of the melodic shape that was achieved with the "Gestalt" and the set of pitches. The out coming rhythm is used as an archetype with various tone-combinations.

With the development of the compositional work, the idea of reflection has expanded to other aspects. The idea took the form of a temporal mirror, meaning, the reflection at the time axis of an entire section, emerging in the form of a summary. This can happen during long-lasting periods of time, or in the note-to-note domain; it can reflect the part immediately after or already passed sections, or it can be a summary of a parameter only - as for instance the rhythm - or of several parameters simultaneously

## Hinweise zur Ausführung und zur Notation

Seite 2: Vorzeichen sind für einen **Takt** gültig.

Seite 4-8: Vorzeichen sind nur für einen **Ton** gültig.

Seite 9-10: Vorzeichen sind für einen **Takt** gültig.

-> Viertelton tiefer

-> Viertelton höher

-> Viertelton tiefer

-> Viertelton höher

Lautstärke:

1) con sordina (Harmon)

2) senza sordina

pp p mp mf f ff

Luftgeräusche

Luftgeräusche gemischt mit Tonhöhe

Normaler Ton

"p"- "mf" Lautstärke abhängig vom Rhythmus der Ein- und Ausatmung

Ein Tamtam wird als Resonanzkörper benutzt, mit einem Kontakt-Mikrophon abgenommen und durch alle vier Lautsprecher wiedergegeben. Auch die Trompete kann verstärkt werden.

Am Anfang des Stückes sollte der Konzertsaal komplett dunkel sein. Das Tamtam wird mit einem Spot leicht beleuchtet. Bei 4'50" wird ein Spot von oben die Trompete allmählich leicht beleuchten, aber nicht den Körper des Spielers.

## Über die Darstellung der Elektronischen Musik

Seite 1: Auf der X-Achse wird die Zeit [s] dargestellt und auf der Y-Achse die Frequenz [Hz]. Jeder einzelne Gestalt (<>) repräsentiert die Hüllkurve eines Frequenzbereichs. Aus der Ausdehnung der Hüllkurve auf der Y-Achse kann man die Grenzfrequenzen der Bandpaß Filter entnehmen.

Seite 3: Auf der Y-Achse sind die Midicent-Töne dargestellt. Die Nummer 6000 entspricht den Ton c, die 6100 den cis und die 6050 den c#. Das Dreieck das innerhalb der Gestalt sich befindet, stellt den Ablauf der Bandbreite des Filters dar:

von Midicent zu 20 000Hz;

von 20 000Hz zu Midicent

Dauer: ca. 23'

## Performance and Notation Explanations

Page2: Accidentals are valid for one **bar**.

Page 4-8: Accidentals are valid for only one **note**.

Page 9-10: Accidentals are valid for one **bar**.

-> Quartertone lower

-> Quartertone higher

-> Quartertone lower

-> Quartertone higher

Dynamic:

1) con sordina (Harmon)

2) senza sordina

pp p mp mf f ff

Breath noise

Breath noise mixed with tone

Normal tone

"p"- "mf" Dynamic dependent of the rhythm of the in and out breath

A Tam-Tam will be used as a resonant body amplified with a contact microphone. The Trumpet can as well be amplified with a microphone, so that a better fusion between tape and instrument is achieved

At the beginning of the piece the concert hall should be completely dark. One projector will light the Tam-Tam. At about 4'50" the trumpet will be lighted with a projector, but only the trumpet, not the performer.

## About the Representation of the Electronic Music

Page 1: The X-Axis represents Time [s] and the Y-Axis the Frequency [Hz]. Each one of these shapes (<>) corresponds to an envelope within a certain frequency range. The numbers at the Y-Axis denote the limit frequencies settings of a Band Pass Filter.

Page 3: The Y-Axe represents Midicents Notes. The number 6000 corresponds to the middle C, the 6100 the C# and the 6050 the C#. The Triangle inside the shape represents the Time-Varying Bandwidth of the Filter.

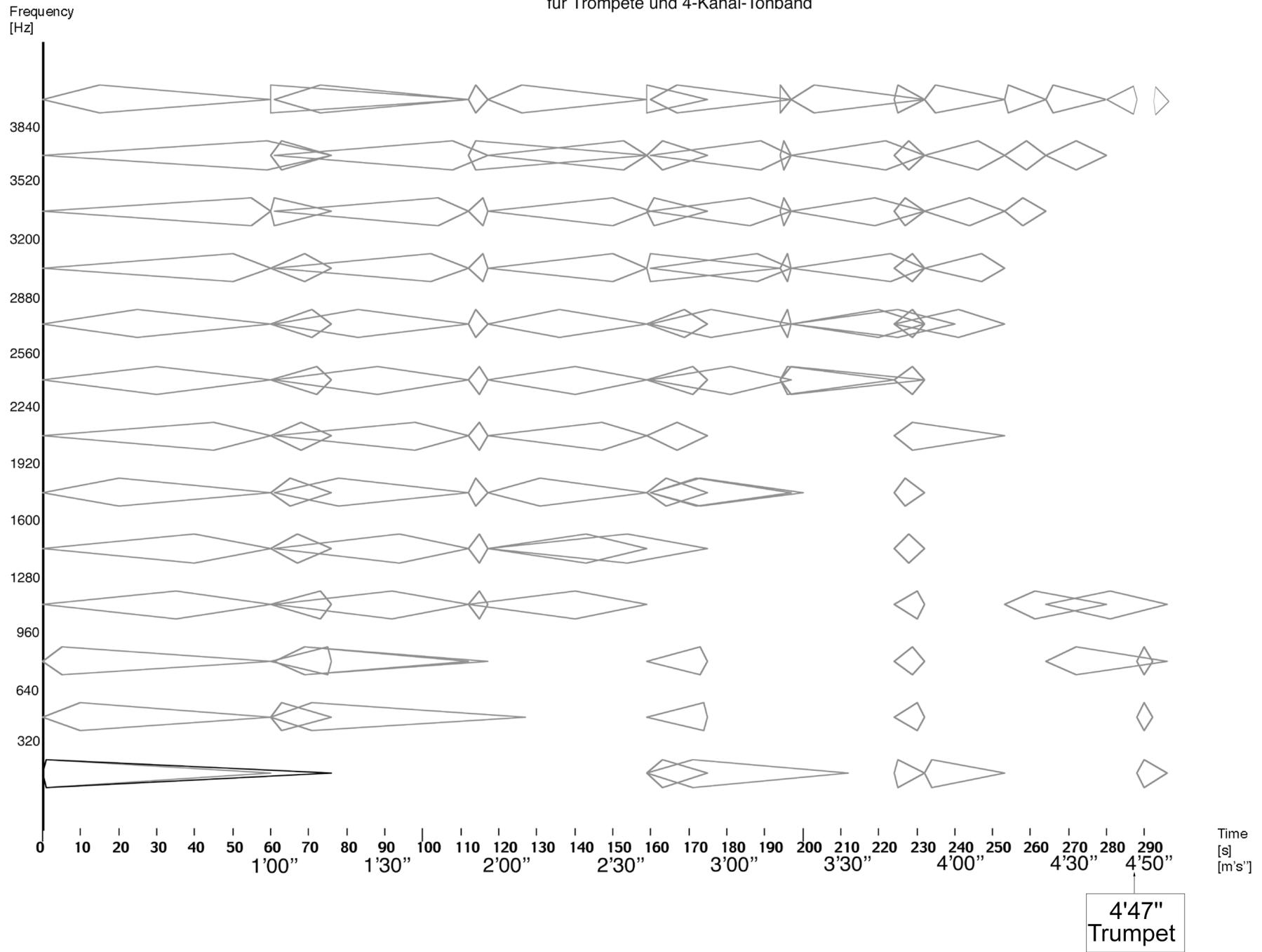
from Midicent to 20 000Hz;

from 20 000Hz to Midicent

Duration: ca 2

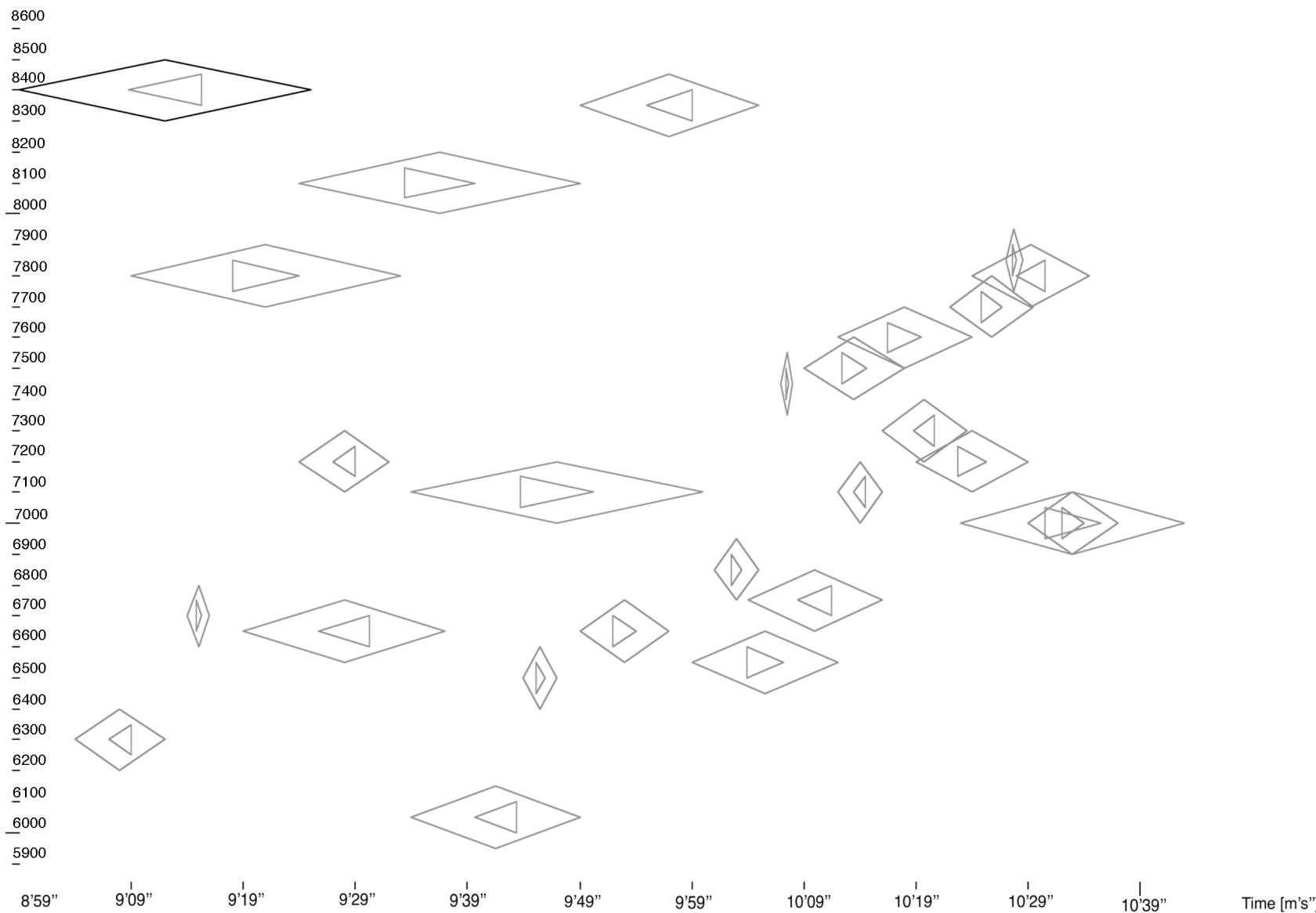
# KLANGSPIEGEL

für Trompete und 4-Kanal-Tonband





Pitch  
[Midicents]



$\text{♩} = 105$

*sffz* T  
13" → L

$f \text{ pp}$  T  
4"  
 $ff$   
8"  
 $pp - mf$  T  
 $f p$  T  
 $f \text{ pp}$  T

6  
 $f$  4"  
gliss  
 $p$  5"  
 $mp$  4"  
 $pp$  8"  
 $pp$  4"

$\text{♩} = 105$   
*p*  
11 rit.  
L 7"  
T L  
12"  
T, L  
9"  
T, L

3  
 $\frac{4}{13}$  70  
4  
 $\frac{4}{4}$   
3  
 $\frac{4}{4}$   
 $\frac{3+3}{8+16}$   
"p"  
"mf"  
accel.  
 $ff$   
18  
 $ff$   
 $ff > > > >$   
 $mf$   
 $sffz$   
 $\text{♩} = 120$   
 $pp$  sempre legatissimo

7  
 $\frac{32}{32}$  60  
21  
(aus)  
(ein)  
simile  
(ein)  
"p" "mf"  
8  
 $\frac{32}{32}$   
7  
 $\frac{32}{32}$

Musical score for a solo instrument, page 5. The score consists of eight staves of music, each with a different time signature and dynamic marking.

- Staff 1:** 16th note = 105. Dynamics: *pp*, *mf*, *f*. Articulation: *semper*. Measure 27: *p* → *mf* → *f*. Measure 28: *mf*. Measure 29: *f*. Measure 30: *70*.
- Staff 2:** 8th note = 105. Dynamics: *mp*, *p*, *sffz*, *f*, *ppp*, *mp*. Measure 31: *pp*. Measure 32: *mp*.
- Staff 3:** 16th note = 105. Dynamics: *f*, *mf*, *mp*, *f*, *mf*, *mf*, *sffz*. Measure 33: *2*. Measure 34: *32*. Measure 35: *16*. Measure 36: *2*. Measure 37: *8*. Measure 38: *16*. Measure 39: *3*. Measure 40: *8*.
- Staff 4:** 16th note = 105. Dynamics: *mf*, *pp*, *f*, *pp*, *mf*, *pp*, *f*, *pp*. Measure 41: *pp* → *f*. Measure 42: *pp* → *f*. Measure 43: *mf* → *f*. Measure 44: *pp* → *f*. Measure 45: *pp* → *f*.
- Staff 5:** 8th note = 105. Dynamics: *mp*, *pp*, *mf*, *pp*, *f*, *pp*, *f*, *pp*. Measure 46: *pp* → *f*. Measure 47: *pp* → *f*. Measure 48: *mf* → *f*. Measure 49: *pp* → *f*. Measure 50: *pp* → *f*.
- Staff 6:** 8th note = 105. Dynamics: *mf*, *pp*, *mf*, *pp*, *f*, *pp*, *f*, *pp*. Measure 51: *rit.* Measure 52: *a tempo*.
- Staff 7:** 16th note = 105. Dynamics: *mf*, *f*, *mf*, *mf*, *f*, *sffz*. Measure 53: *2*. Measure 54: *8*. Measure 55: *16*. Measure 56: *2*. Measure 57: *8*. Measure 58: *16*.
- Staff 8:** 16th note = 105. Dynamics: *mf*, *f*, *mf*, *mf*, *f*, *sffz*. Measure 59: *2*. Measure 60: *8*. Measure 61: *16*. Measure 62: *2*. Measure 63: *8*. Measure 64: *16*.

Musical score for a solo instrument, likely woodwind or brass, featuring six staves of music. The score is in common time and includes various dynamics such as *f* (fortissimo), *ff* (fortississimo), and *sfs* (soft forte). The notation uses a mix of standard note heads and vertical bar patterns. Measure numbers 72 through 97 are visible above the staves. A dynamic instruction "rit." (ritardando) appears in measure 83, and "a tempo" appears in measure 84.

72 *p* *pp* *f* *mp* *f* *mf* *f* *sfs*

78 *sfs* *mp* *mp* *f* *32* *f* *32*

83 *f* *sfs* (quasi gliss) *mf* *mp* *rit.* *f* *a tempo*

89 *mf* *f* *mf* *sfs* *f* *f*

94 *f* *mf* *mf* *mp* *f* *pp* *f*

97 *mf* *mf* *mp* *f* *ff* *mf*

A musical score consisting of six staves of music for a solo instrument, likely a woodwind. The score is numbered 101 through 120. The instrumentation includes a single melodic line with slurs, grace notes, and dynamic markings such as *mf*, *f*, *sfz*, *mp*, *ff*, and *mf*. The time signature varies frequently, including 3/8, 2/8, 3/16, 4/8, and 4/4. Measure 101 starts with *mf* and transitions to *f*. Measures 102-103 show *sfz* and *f* dynamics. Measures 104-105 feature *mp*, *mf*, *f*, and *sfz*. Measures 106-107 show *mf*, *f*, *ff*, and *mf*. Measures 108-109 show *mp*, *f*, *mf*, *mp*, *f*, and *mf*. Measures 110-111 show *mf*, *f*, *ff*, and *mf*. Measures 112-113 show *mp*, *f*, *mf*, and *mp*. Measures 114-115 show *mf*, *f*, *ff*, and *mf*. Measures 116-117 show *mp*, *f*, *mf*, and *mp*. Measures 118-120 show *f*, *mf*, *f*, and *f*.

124

*f*

*sfz*

*pp* — *mf* *pp*

— 32

128

*mp*

*mf*

*mf*

*pp* *sempre legato*

131

*f*

*ff*

*ff*

134

*d=60*

*ff*

*mf*

*f*

126

*f*

*mp* < *mf*

*f*

139

*mf*

*mp*

*ff*

*pp*

[START TAPE at 11'15]  $\text{♩} = 45$

$\text{♩} = 158 > \text{pp}$   $\text{♩} = 45$

$\text{ff}$   $\text{p}$  sempre staccato

repeat repeat

**IV**

$\text{28}''$   $\text{♩} = 60$

$\text{1'26}''$

$\text{X3}$

$\text{f}$   $\text{p}$   $\text{rit.}$

$\text{accel.}$

$\text{III. Ventil}$   $\times \times \times$

$\text{"f"}$

$\text{"p"}$

$\text{2'11}''$

10

$\text{♩} = 45$

*p*  $\text{pp}$

39 aus ein "f"

$\text{♩} = 46$

*p*  $\text{pp}$

46 3'02"  $\text{♩} = 105$

*p*  $\text{pp}$

53 "f"

$\text{♩} = 45$

*ppp*  $\text{p}$   $\text{pp}$

$\text{♩} = 80$

$\text{♩} = 40$

$\text{♩} = 80$

$\text{♩} = 60$

$\text{♩} = 45$

*"p"*  $\text{p}$

$\text{♩} = 60$

$\text{♩} = 80$

$\text{♩} = 40$

$\text{♩} = 80$

$\text{♩} = 40$

$\text{♩} = 38$

$\text{♩} = 38$  (non accel/rit.)

$\text{♩} = 105$

$\text{♩} = 38$

TAPE SOLO

32

32