

PIECE FOR COMPUTER AND 4 TROMBONI

(DEATH ON THE BORDER)

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Fulfillment of the Requirements
for the Degree of

MASTER OF MUSIC

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Also special thanks to Arthur Corra and John Rehm and ISU music department, Betty Plummer and ISU's International Studies Office.

The piece is dedicated to my MIDI class teacher Charles Stokes.

A.R.S.

PIECE FOR COMPUTER AND 4 TROMBONI

(DEATH ON THE BORDER)

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Death on the Border is a piece for computer generated tape music and 4 tromboni. It is composed of 7 movements: The Prologue, The Moment, The Yearning, The Ritual, The Oblation, The Lamentation.

The tape part is generated at CCRMA (Center for Computer Research in Music and Acoustics) of Stanford University, California, on a NEXT workstation with a DSP card and the COMMON MUSIC package written in LISP computer language by Heinrich Taube.

Computer graphics techniques such as rosette, infinite regressions, tiling, tweening are used in the composition of the trombone parts.

The Prologue and the Epilogue are for tape only and all the other movements are for tape and tromboni. The durations are as follows : The Prolog 36 sec, The Moment 20 sec, The Yearning 1 min 50 sec, The Ritual 2 min 50 sec, The Oblation 2 min 5 sec, The Lamentation 2 min 30 sec, The Epilogue 40 sec. The total duration is approx. 10 min 50 sec.

The Prologue is an isorhythm based on a 12 tone series. The Moment is a single section emphasizing e as a so called tonal center. The Yearning is in AB form using the modal qualities of the 12 tone series of the first movement, with e as the modal center. The Ritual emphasizes the relations between specific notes of the 12 tone series and causes a modal effect. It has an ABA form from the point of the use of the composition algorithm. It uses isorhythmic structures and slightly alters them through the movement. The Lamentation is an AB form. B is the reverse of A in the trombone part.

The tape part loses the meter in the second section.
The Epilogue is an isorhythm based on 3 chords, built by
grouping the notes of the 12 tone series in 4 voice
chords.

The piece is composed as an abstraction of an East
German escaping to the West.

APPROVED:

Date Arthur E. Corra, Chair

Date John T. Rehm

Date Joaquin A. Villa

PIECE FOR COMPUTER AND 4 TROMBONI
(DEATH ON THE BORDER)

for tape and 4 tromboni ①

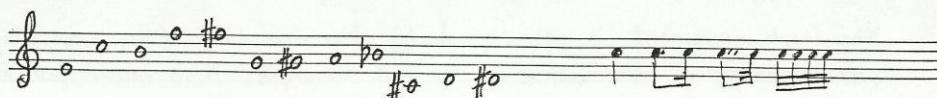
Dedicated to my MIDI class
teacher, Charles Stokes.

Ali Rıza SARAL

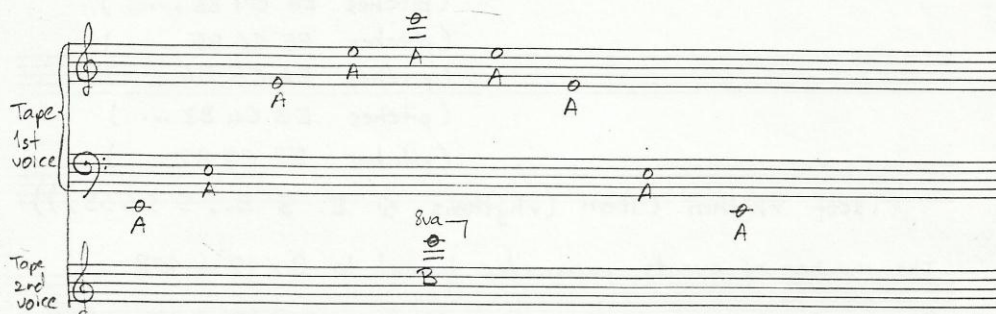
I.
PROLOGUE ②
(for tape only)

COLOR

TALEA



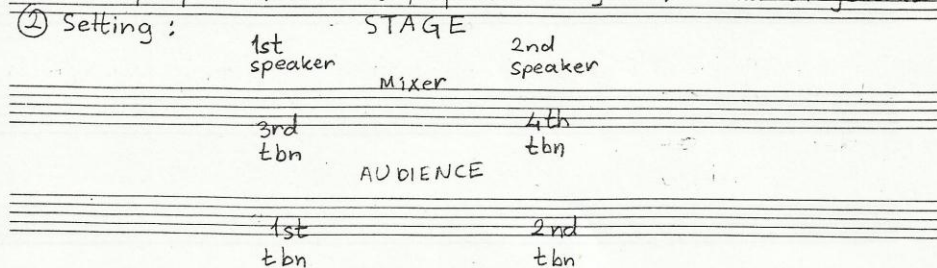
This isorhythm structure is called A, symbolizing both the color and the talea. The color is played according to the talea by the computer, A is played from different octaves. Also, an other voice plays A in a very fast tempo from a very high frequency. This is called B. The music can be symbolized as seen below:



Duration = 36" July 30, San Hose

① The tape parts have to be performed using a mixer and echo generator.

② Setting :



The tone meister is supposed to direct the performance if needed.

②

COMMON MUSIC (LISP) NOTATION:

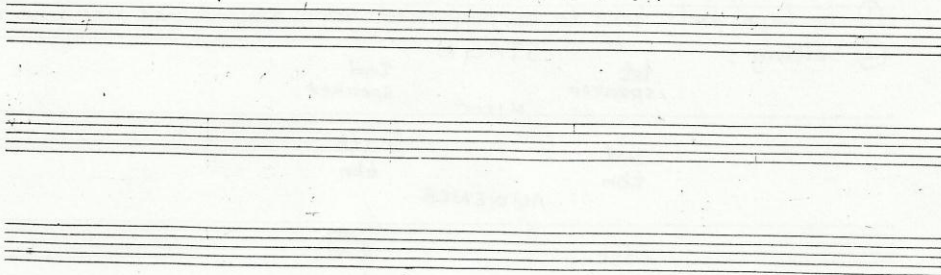
CCRMA 1990 Summer Course example files are created by David A. Jaffe using COMMON MUSIC package. COMMON MUSIC package is composed of a group of Common Lisp functions. They can be found in the Common Music Manual (Preliminary Draft) by Heinrich Taube. David A. Jaffe and Heinrich Taube are both musicians doing research work at CCRMA (Center for Computer Research in Music and Acoustics), Stanford University, California.

The first movement is composed by changing the freq and rhythm parameters of the Wave1_1.lisp example. Also other parameters such as duration, waveforms have been changed.

```
(self freq (item (pitches (pitches E2 C3 B2 ... )
                          (pitches E3 C4 B3 ... )
                          (pitches E4 C5 B4 ... )
                          (pitches E5 C6 B5 ... )
                          (pitches E6 C7 B6 ... )
                          (pitches E5 C6 B5 ... )
                          (pitches E4 C5 B4 ... )
                          (pitches E3 C4 B3 ... )
                          (pitches E2 C3 B2 ... )
                          )
              )
      (setf rhythm (item (rhythms Q E. S E. S SSSS)))
```

The number of events parameter is set to $9 \times 12 = 108$.

The performance was done on a Next workstation with a DSP card.



II. THE MOMENT

①

Prestissimo

0"

I. NOTES RHYTHM NOTES RHY. NOTES RHY. NOTES RHY.
pp IN RANDOM IN RANDOM IN CYCLE mp IN RANDOM IN RANDOM mp cresc. IN RANDOM

II. NOTES RHYTHM NOTES RHY. NOTES RHY. NOTES
pp IN RANDOM IN RANDOM IN CYCLE mp IN RANDOM IN RANDOM mp cresc. IN RANDOM

III. NOTES RHYTHM
pp IN RANDOM IN RANDOM

IV. NOTES RHYTHM
p IN RANDOM IN RANDOM

Tape 1st voice { (notes C1... to B7 in cycle)
(rhythm 64)
2nd voice { same as 1st voice

5"

I. NOTES RHY. NOTES RHY. NOTES RHY.
gliss. IN CYCLE mf IN CYCLE mf cresc. NOTES RHY. IN RANDOM

II. RHYTHM NOTES RHY. NOTES RHY. NOTES RHY.
IN RANDOM IN CYCLE mf IN CYCLE mf cresc. NOTES RHY. IN RANDOM

III. NOTES RHYTHM NOTES RHY. NOTES RHY. NOTES RHY.
IN RANDOM IN RANDOM IN CYCLE mf IN CYCLE mf cresc. NOTES RHY. IN RANDOM

IV. NOTES RHYTHM NOTES RHY. NOTES RHY. NOTES RHY.
IN RANDOM IN RANDOM IN CYCLE mf IN CYCLE mf cresc. NOTES RHY. IN RANDOM

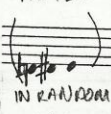
Tape 2nd voice { same as 1st voice
4th voice { same as 1st voice

ONER M. L. K. EVI
Veznedler, büyük Reşit Paşa Cad. 30A
Büyüktürk
Tel. 522 18 36

Handwritten musical score for three staves, measures 10-11. The notation includes notes, rests, and dynamic markings like 'f' and 'ff'. Annotations include 'NOTES', 'RHY.', 'IN RANDOM', 'IN CYCLE', and 'IN RANDOM'.

Handwritten musical score for three staves, measures 12-13. The notation includes notes, rests, and dynamic markings like 'f' and 'mf'. Annotations include 'NOTES', 'RHY.', 'IN RANDOM', and 'IN CYCLE'.

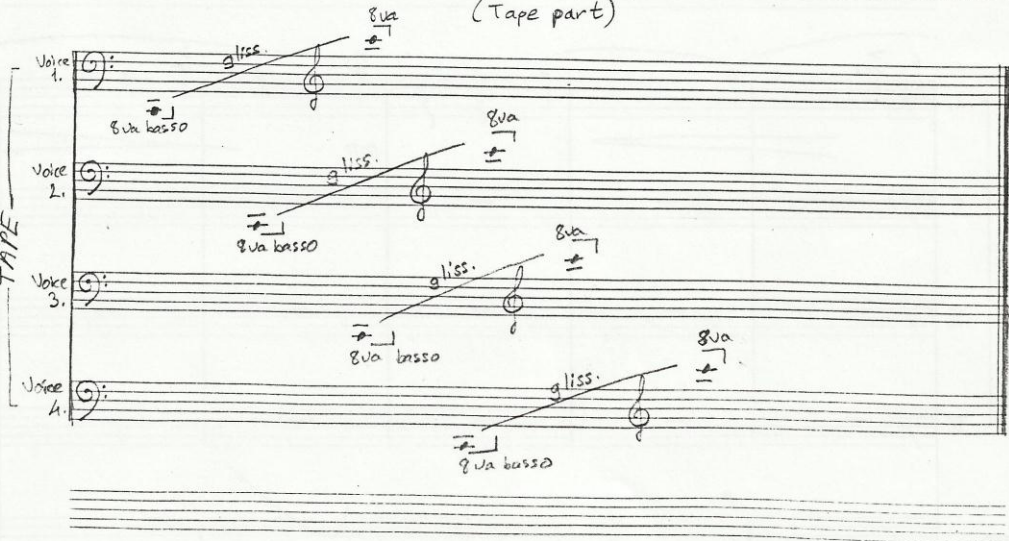
duration = 20"
July 80 - Feb 82
San Hese, Istanbul

- ① **NOTES** indicates that those notes have to be played randomly according to the rhythm pattern that is given next to it.

- ② **RHYTHM** indicates that the notes that are indicated before should be with either eight or sixteenth values which are chosen randomly.

- ③ Unless indicated (by rests) the players have to continue playing the given structure until the next one.
- ④ The density of the texture is left to the choice of the performers' taste and physical ability. This movement is supposed to have a blasting effect.
- ⑤ The bar lines indicate the absolute time in seconds.
- ⑥ The notation of the trombone parts are adopted from the COMMON MUSIC notation of Heinrich Taube of CCRMA.

II.
THE MOMENT
(Tape part)

TAPE



III. THE YEARNING

Moderato cantabile ♩ = 108

Tromboni

I. *pp* *espressivo* *p*

II. *pp* *espressivo* *p*

III. *pp* *espressivo* *p*

IV. *pp* *espressivo* *p*

Tape

High *mf* *ff* *f*

Medium *mp* *mf* *ff* *f*

Low *mp* *mf* *ff* *f*

Tbn.

I. *mp*

II. *mp*

III. *mp*

IV. *mp*

Tape

10" *f* 15"

Handwritten musical score for Tbn. (I, II, III, IV) and Tape. The score is in bass clef with a key signature of one sharp (F#). The Tbn. parts are marked with dynamics: *mf*, *mp*, *pp*, and *mf*. The Tape part features a series of wavy lines representing sound, with dynamics *ff*, *f*, *f*, and *mf*. The Tape part also includes markings for *10"* and *25"* and the word *espressivo*.

Handwritten musical score for Tbn. (I, II, III, IV) and Tape. The score is in bass clef with a key signature of one sharp (F#). The Tbn. parts are marked with dynamics: *mf*, *f*, *mp*, and *mp*. The Tape part features a series of wavy lines representing sound, with dynamics *mp* and *mf*. The Tape part also includes a marking for *30"*.

Handwritten musical score for four tubas (I, II, III, IV) and a tape. The score is in bass clef with a key signature of one sharp (F#). The tuba parts feature various notes, rests, and dynamic markings. The tape part includes a 35" section with a tremolo pattern and a 40" section with a series of notes and dynamic markings.

Tuba I: 21 $\text{F}\sharp$, $\text{B}\flat$ $\text{F}\sharp$, $\text{F}\sharp$, $\text{B}\flat$. Dynamics: *mf*, *mf*.

Tuba II: $\text{B}\flat$, $\text{B}\flat$, $\text{B}\flat$, $\text{F}\sharp$, $\text{B}\flat$. Dynamics: *p*.

Tuba III: $\text{B}\flat$, $\text{B}\flat$, $\text{F}\sharp$, $\text{B}\flat$. Dynamics: *p*.

Tuba IV: $\text{B}\flat$, $\text{B}\flat$, $\text{F}\sharp$, $\text{B}\flat$. Dynamics: *p*.

Tape: 35" (tremolo, *mf*), 40" (*mf* > *mf* *f* *mf*).

Handwritten musical score for four tubas (I, II, III, IV) and a tape. The score is in bass clef with a key signature of one sharp (F#). The tuba parts feature various notes, rests, and dynamic markings. The tape part includes a 45" section with a tremolo pattern and a 50" section with a series of notes and dynamic markings.

Tuba I: 26 $\text{F}\sharp$, $\text{B}\flat$ $\text{F}\sharp$, $\text{F}\sharp$, $\text{B}\flat$ $\text{F}\sharp$. Dynamics: *f*.

Tuba II: Rest.

Tuba III: Rest.

Tuba IV: Rest.

Tape: 45" (tremolo, *p*), 50" (tremolo).

Handwritten musical score for the first system, measures 31 to 35. The score is for four tubas (I, II, III, IV) and a tape. The key signature is one sharp (F#). Measure 31 starts with a treble clef and a key signature change to one sharp. The tuba parts are mostly rests, with some notes in measures 32 and 33. The tape part has a wavy line indicating a sound effect, with a 'mf' dynamic marking. A '55'' time signature is present.

31 $\text{F}\sharp$

I. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

II. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

III. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

IV. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

Tbn. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

Tape mf $55''$

Handwritten musical score for the second system, measures 36 to 40. The score is for four tubas (I, II, III, IV) and a tape. The key signature is one sharp (F#). Measure 36 starts with a treble clef and a key signature change to one sharp. The tuba parts are mostly rests, with some notes in measures 37 and 38. The tape part has a wavy line indicating a sound effect, with a 'mf' dynamic marking. A '60'' time signature is present.

36 $\text{F}\sharp$

I. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

II. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

III. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

IV. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

Tbn. $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$ $\text{F}\sharp$

Tape mf $60''$ f fff mf f

Handwritten musical score for four tubas (I, II, III, IV) and a tape. The score is in 4/4 time, marked with a treble clef and a key signature of one sharp (F#). The first measure shows tubas I, II, and III playing a half note F#4, while tuba IV plays a half note F#3. The second measure shows tubas I, II, and III playing a half note G#4, while tuba IV plays a half note G#3. The third measure shows tubas I, II, and III playing a half note A4, while tuba IV plays a half note A3. The fourth measure shows tubas I, II, and III playing a half note B4, while tuba IV plays a half note B3. The fifth measure shows tubas I, II, and III playing a half note C5, while tuba IV plays a half note C4. The sixth measure shows tubas I, II, and III playing a half note D5, while tuba IV plays a half note D4. The seventh measure shows tubas I, II, and III playing a half note E5, while tuba IV plays a half note E4. The eighth measure shows tubas I, II, and III playing a half note F#5, while tuba IV plays a half note F#4. The score includes dynamic markings of mf and f, and a crescendo hairpin. The tape part is marked with a 1' 10" and 1' 15" time signature.

Handwritten musical score for Tbn. (Tuba) and Tape. The score is divided into two systems. The first system is marked with a wavy line and a wavy line, indicating a wavy sound effect. The second system is marked with a wavy line and a wavy line, indicating a wavy sound effect. The score includes dynamics such as *f* (forte), *mf* (mezzo-forte), and *ff* (fortissimo). The notation includes notes, rests, and a wavy line for the Tape part.

51

I. *ff*

II. *ff*

III. *mf* *f* *f*

IV. *mf* *f* *f*

Tbn. *mf* *f* *f*

Tape 1'25" 1'30" *ff* *ff*

56

I. *p* *mp*

II. *p* *mp*

III. *p* *mp*

IV. *p* *mp*

Tbn. *p* *mp*

Tape 1'35" *f* *mf* *ff* 1'40"

Handwritten musical score for Trombone (Tbn.) and Tape. The Tbn. part consists of four staves (I, II, III, IV) with notes and dynamic markings (pp, ppp). The Tape part has a wavy line with dynamic markings (f, ff) and a handwritten '1'45"'.

① indicates vibrato, with its depth and frequency.

② indicates a single sustained pitch.

③ indicates a glissando towards higher pitches.

④ The synchronization of the tape and trombone parts is not important. The tape part is supposed to have a totally random character.

⑤ The tape part is not unique, it changes between different performances. There are 2 tape parts at least for the whole piece.

Handwritten musical score for Trombone (Tbn.) and Tape. The Tbn. part consists of four staves (I, II, III, IV) with notes and dynamic markings (pp, ppp). The Tape part has a wavy line with dynamic markings (f, ff) and a handwritten '1'45"'.

duration = 1'30"
Soprano, Alto, Tenor, Bass
Normal, IL, 16mm