



Western Michigan University
ScholarWorks at WMU

Master's Theses

Graduate College

6-1988

Sonic Sculptures for Flute, Cello and Computer Processed Sounds

Randy S. Rowan

Follow this and additional works at: https://scholarworks.wmich.edu/masters_theses



Part of the Music Commons

Recommended Citation

Rowan, Randy S., "Sonic Sculptures for Flute, Cello and Computer Processed Sounds" (1988). *Master's Theses*. 1176.

https://scholarworks.wmich.edu/masters_theses/1176

This Masters Thesis-Open Access is brought to you for free and open access by the Graduate College at ScholarWorks at WMU. It has been accepted for inclusion in Master's Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.



SONIC SCULPTURES FOR FLUTE, CELLO AND
COMPUTER PROCESSED SOUNDS

by

Randy S. Rowan

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Music
Department of Music

Western Michigan University
Kalamazoo, Michigan
June 1988

SONIC SCULPTURES FOR FLUTE, CELLO AND
COMPUTER PROCESSED SOUNDS

Randy S. Rowan, M.M.

Western Michigan University, 1988

Sonic Sculptures is a musical work for flute, cello and computer processed sounds. The processed sounds are different samples taken from the following sources: piano, flute, and cello. The samples consist primarily of special effects created by the three instruments. A description of the processed sounds can be found in the explanation of sounds. All together there is a total of 52 digital samples; 22 samples are taken from the inside of a grand piano, 18 are created by a cello and 12 by the flute.

There are three pieces in Sonic Sculptures. The first consists of a jaunty melodic line presented by the instruments which is supported by long sustaining electronic sounds. In the second piece the electronic sounds present the melodic ideas while the instruments imitate and add color for support. The last piece is a duet between the flute and cello. The two instruments act as a type of mobile structure to which splashes of color are added by the electronic sounds.

ACKNOWLEDGEMENTS

Sonic Sculptures is dedicated to Ramon Zupko and C. Curtis Smith for their support, guidance and innovative inspirations.

Randy S. Rowan

INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.
2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.
3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.
4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.
5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

**University
Microfilms
International**

300 N. Zeeb Road
Ann Arbor, MI 48106

Order Number 1334187

**"Sonic Sculptures" for flute, cello and computer processed
sounds. [Original composition]**

Rowan, Randy S., M.M.

Western Michigan University, 1988

U·M·I

**300 N. Zeeb Rd.
Ann Arbor, MI 48106**

PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ☒.

1. Glossy photographs or pages _____
2. Colored illustrations, paper or print _____
3. Photographs with dark background _____
4. Illustrations are poor copy _____
5. Pages with black marks, not original copy ☒ _____
6. Print shows through as there is text on both sides of page _____
7. Indistinct, broken or small print on several pages _____
8. Print exceeds margin requirements _____
9. Tightly bound copy with print lost in spine _____
10. Computer printout pages with indistinct print _____
11. Page(s) _____ lacking when material received, and not available from school or author.
12. Page(s) _____ seem to be missing in numbering only as text follows.
13. Two pages numbered _____. Text follows.
14. Curling and wrinkled pages _____
15. Dissertation contains pages with print at a slant, filmed as received _____
16. Other _____

U·M·I

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	ii
LIST OF EQUIPMENT	iv
EXPLANATION OF SOUNDS	1
Piano Samples	1
Flute Samples	1
Cello Samples	1
PERFORMANCE NOTES	2
SONIC SCULPTURES	3
Urban Heat	3
Brainstorm	11
Lines	20

LIST OF EQUIPMENT

1. One Mirage Digital Sampling Keyboard
2. One MacIntosh 512 K Personal Computer
3. One Apple midi-interface
4. One J. L. Cooper tape synchronization unit
5. Performer, version 2.2 sequencer software package by Mark of the Unicorn
6. Sound Lab, version 2.0 visual editing software package by Blank Software
7. One Otari half inch eight channel tape machine
8. One MCI one inch eight channel tape machine
9. One spring reverberation unit by Professional Audio Products
10. One eight channel DBX noise reduction unit
11. One Logex eight channel mixing board.

EXPLANATION OF SOUNDS

Piano Samples

There are 16 multi-samples of various effects created from the inside of a grand piano. Examples of some of these effects are: hitting the bass and treble wires with a drum stick and the palm of a hand, plucking the bass and treble wires (single and multiple wires so as to create the intervals of a major second and a minor seventh) with the fingertips, throwing a ring of keys onto the wires while the damper pedal is held down, and also running the thumb nail up the bass wires of the piano. The remaining samples consist of bowed piano wires: four single bass wires and two multiple treble wires forming the intervals of a major second and a minor seventh.

Flute Samples

There are a total of 12 flute samples consisting of special effects such as; flutter tonguing, trills, glissandi and multiphonics creating the intervals of a major second and a minor seventh.

Cello Samples

There are 18 samples of special effects created by the cello. Eight of these are multi-samples of: harmonics, pizzicatos, sul ponticello, tremolos and ordinary bowed effects. The remaining 10 samples are of long tones with the same type of effects implemented.

PERFORMANCE NOTES

The electronic sounds have been scored with traditional note heads however, they do not necessarily indicate the actual pitches. The note heads merely indicate the distribution and arrangement of sounds on the keyboard.

All trills, where not indicated, should be trilled a minor second up.

All harmonics sound as written.

S.P. is an abbreviation for sul ponticello and is used where space is limited.

When the cello player is playing sul ponticello he should play as close to (if not on top of) the bridge as possible.

On page 13, at bar 17, the diamond above the note head is used to signify that a multiphonic of a major second should be played by the flute player.

SONIC SCULPTURES

Urban Heat

Handwritten musical score for "Urban Heat". The score is written on six staves, labeled Track 1, Track 2, Track 3, Track 4, Flute, and Cello. Tracks 1 through 4 each begin with a treble clef, a key signature of one flat (B-flat), and a tempo marking of $\text{♩} = 42$. Each of these tracks contains a single, sustained note marked with a "4", indicating a four-measure rest. The Flute staff begins with a treble clef, a key signature of one flat, and a tempo marking of $\text{♩} = 42$. It contains a complex melodic line with various notes, rests, and articulations, including a section marked "3" and "sfz". The Cello staff begins with a bass clef, a key signature of one flat, and a tempo marking of $\text{♩} = 42$. It contains a melodic line with notes, rests, and articulations, including a section marked "P" and "sfz".

Handwritten musical score for two systems of four tracks (TK 1-4) and two staves (F1, VC). The score includes various musical notations such as notes, rests, and dynamic markings like 'f', 'sf', 'mp', and 'p'. The first system is marked with a '4' and the second with a '2'. The notation is dense and appears to be a sketch or a working draft.

Handwritten musical score for two systems of six staves each. The first system includes Trk 1, Trk 2, Trk 3, Trk 4, Flt, and VC. The second system includes Trk 1, Trk 2, Trk 3, Trk 4, Flt, and VC. The score features complex rhythmic patterns, triplets, and various performance markings such as 'stop', 'mf', 'f', and 'sul ponticello'.

System 1:

- Trk 1: Complex rhythmic pattern with triplets and sixteenth notes.
- Trk 2: Similar to Trk 1, with triplets and sixteenth notes.
- Trk 3: Complex rhythmic pattern with triplets and sixteenth notes.
- Trk 4: Complex rhythmic pattern with triplets and sixteenth notes.
- Flt: Complex rhythmic pattern with triplets and sixteenth notes.
- VC: Complex rhythmic pattern with triplets and sixteenth notes.

System 2:

- Trk 1: Complex rhythmic pattern with triplets and sixteenth notes.
- Trk 2: Similar to Trk 1, with triplets and sixteenth notes.
- Trk 3: Complex rhythmic pattern with triplets and sixteenth notes.
- Trk 4: Complex rhythmic pattern with triplets and sixteenth notes.
- Flt: Complex rhythmic pattern with triplets and sixteenth notes.
- VC: Complex rhythmic pattern with triplets and sixteenth notes.

Performance markings include 'stop', 'mf', 'f', and 'sul ponticello'.

Handwritten musical score for two systems of six staves each. The first system includes parts for TrK1, TrK2, TrK3, TrK4, Flt, and VC. The second system includes parts for TrK1, TrK2, TrK3, TrK4, Flt, and VC. The score is written in a single system with various musical notations, including notes, rests, and dynamic markings.

First System:

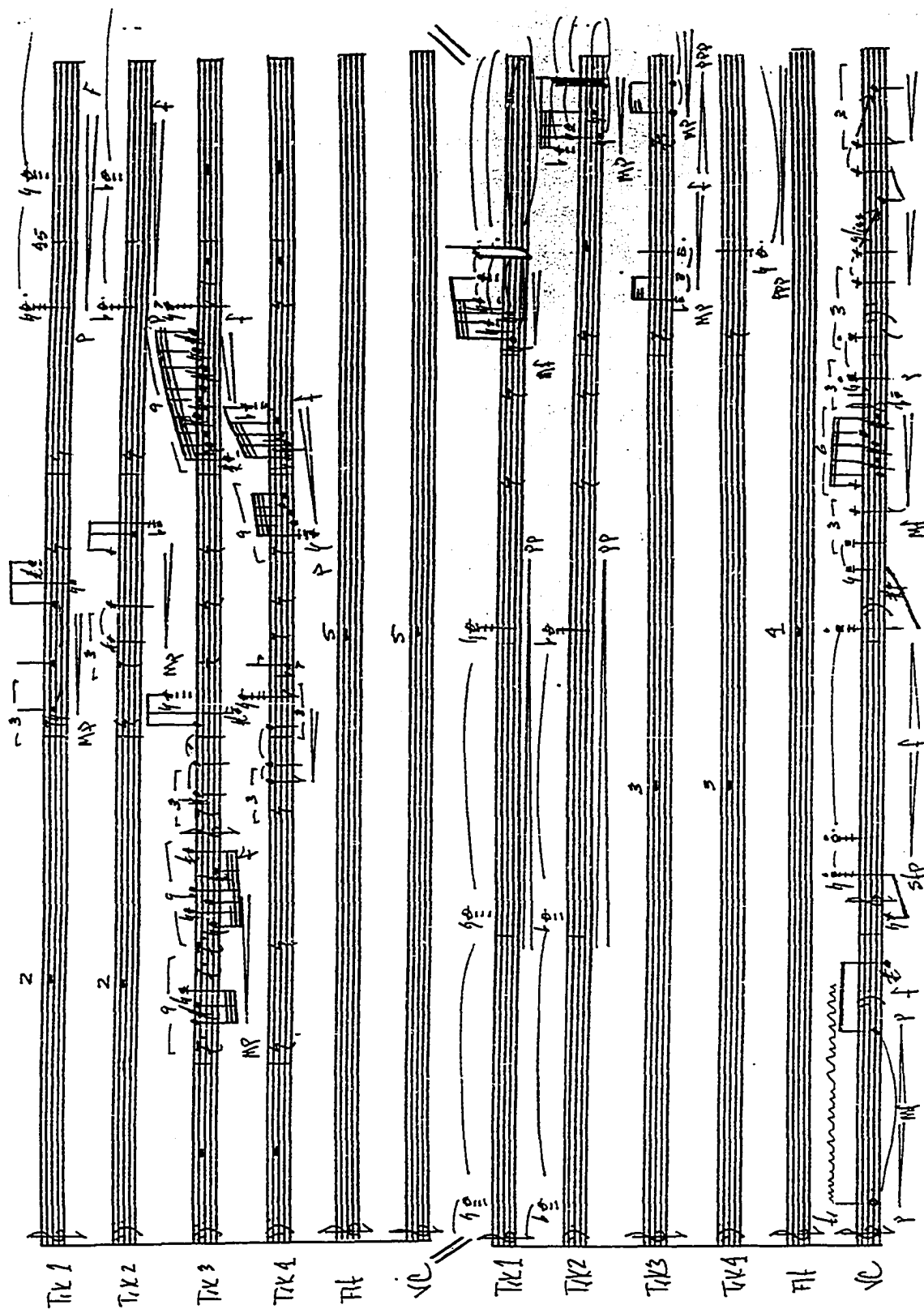
- TrK1:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- TrK2:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- TrK3:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- TrK4:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- Flt:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- VC:** Bass clef, key signature of one flat. Features a melodic line with triplets and slurs.

Second System:

- TrK1:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- TrK2:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- TrK3:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- TrK4:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- Flt:** Treble clef, key signature of one flat. Features a melodic line with triplets and slurs.
- VC:** Bass clef, key signature of one flat. Features a melodic line with triplets and slurs.

Dynamic markings include *pp*, *mf*, *p*, *mp*, and *f*. There are also slurs, triplets, and other musical notations throughout the score.

Handwritten musical score for two systems of six staves each. The first system includes staves labeled Trk 1, Trk 2, Trk 3, Trk 4, Fil, and VC. The second system includes staves labeled Trk 1, Trk 2, Trk 3, Trk 4, Fil, and VC. The notation is dense with various musical symbols, including notes, rests, and dynamic markings like 'p' and 'pp'.



Handwritten musical score for a 12-track recording. The score is organized into 12 horizontal staves, each labeled on the left with a track identifier: Trk 1, Trk 2, Trk 3, Trk 4, Fl, VC, Trk 1, Trk 2, Trk 3, Trk 4, Fl, and VC. The notation is dense and includes various musical symbols such as notes, rests, and dynamic markings (e.g., *pp*, *mf*, *p*, *sf*, *mp*). There are also performance markings like *mf*, *pp*, *sf*, *mp*, and *sf* scattered throughout the staves. The score appears to be a complex arrangement, possibly for a film or a theatrical production, given the inclusion of multiple tracks and the use of dynamic markings. The handwriting is in black ink on a white background, and the overall layout is vertical, with the staves running from top to bottom.

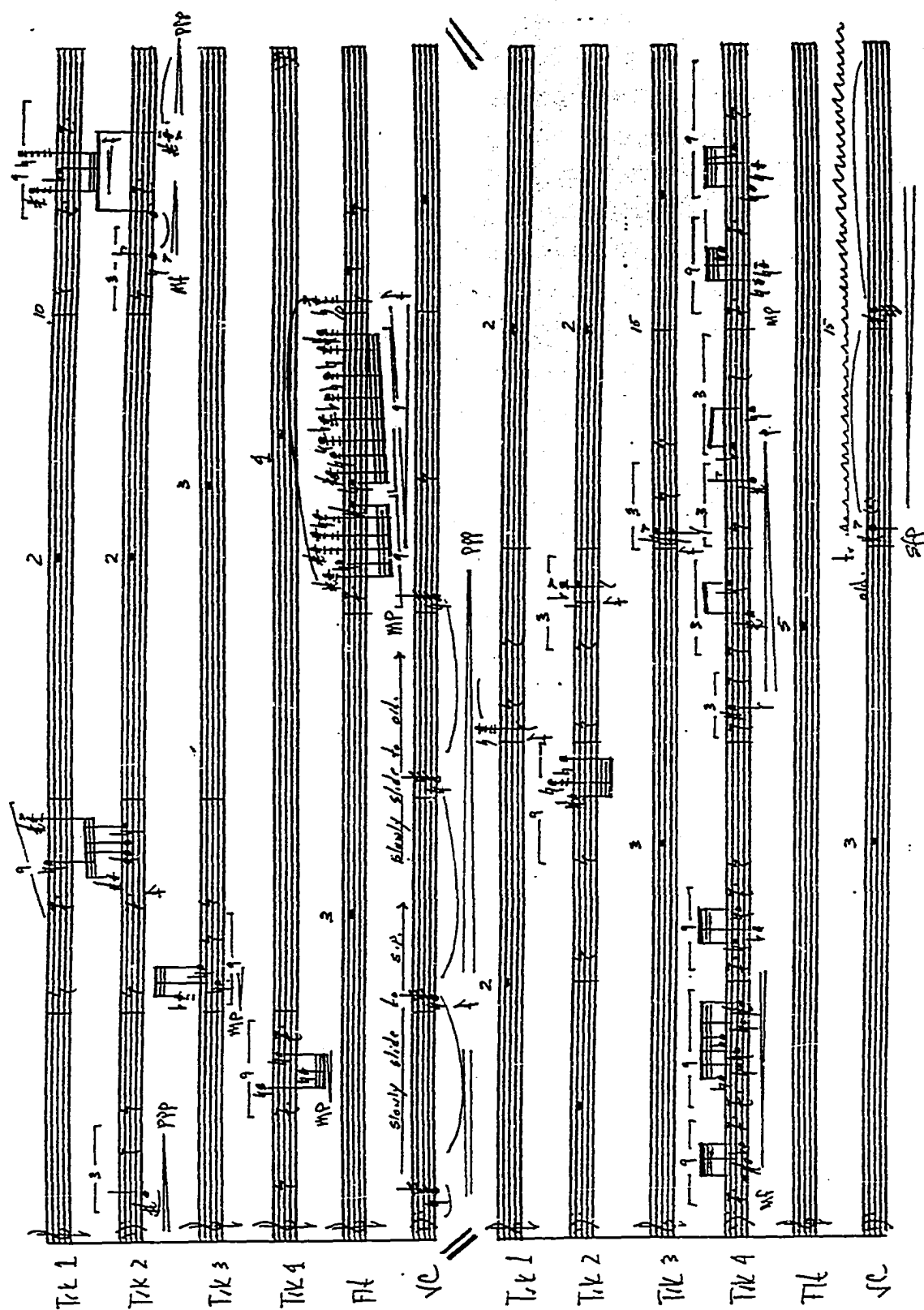


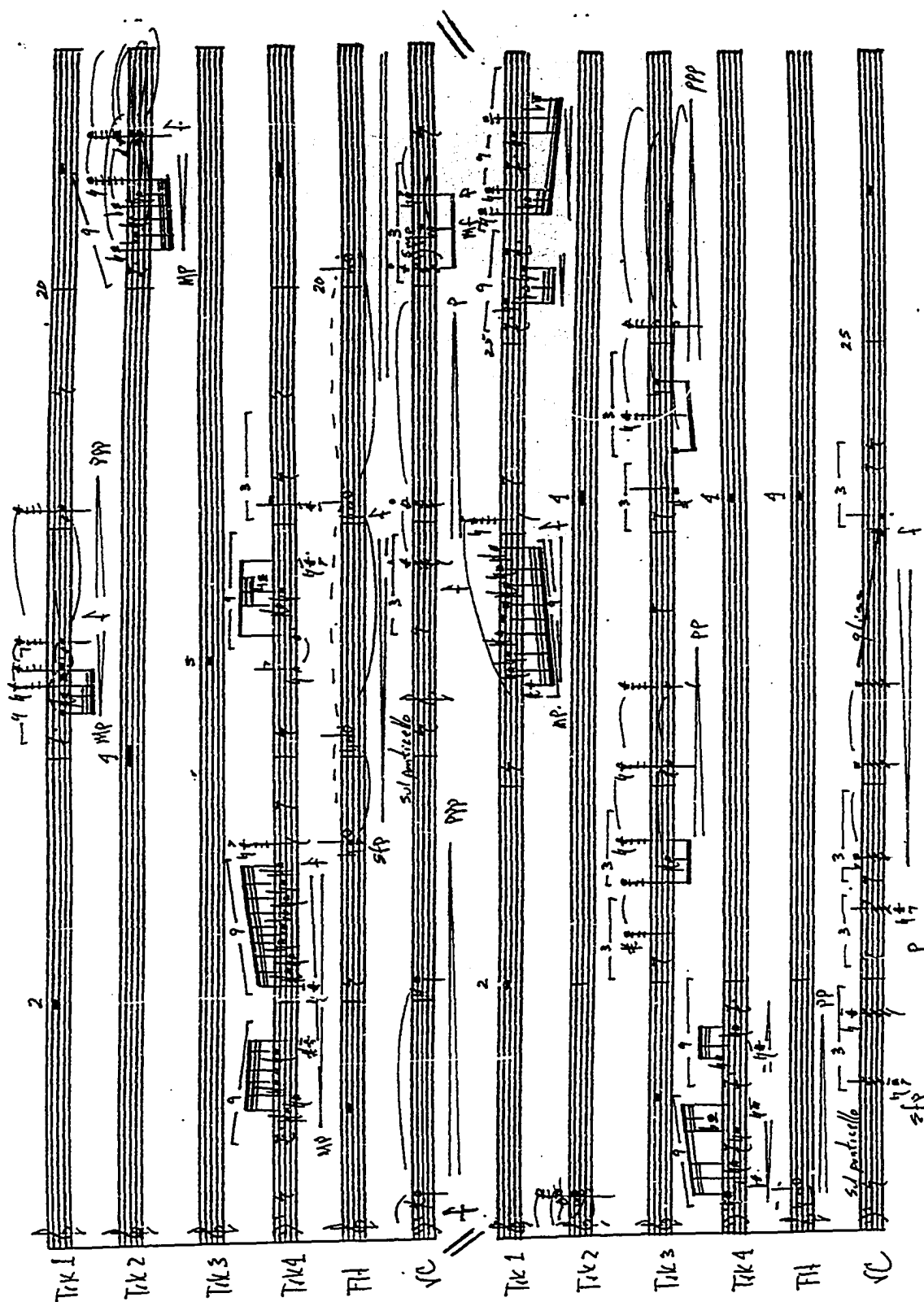
Brainstorm

Handwritten musical score for the piece "Brainstorm". The score is written on six staves, labeled Track 1 through Track 6. The tempo is marked as $\text{♩} = 72$ at the beginning of Track 1 and Track 4. The score includes various musical notations such as notes, rests, and dynamic markings like *MP* (Mezzo Piano) and *f* (forte). The notation is handwritten and appears to be a sketch or a working draft. The staves are labeled as follows:

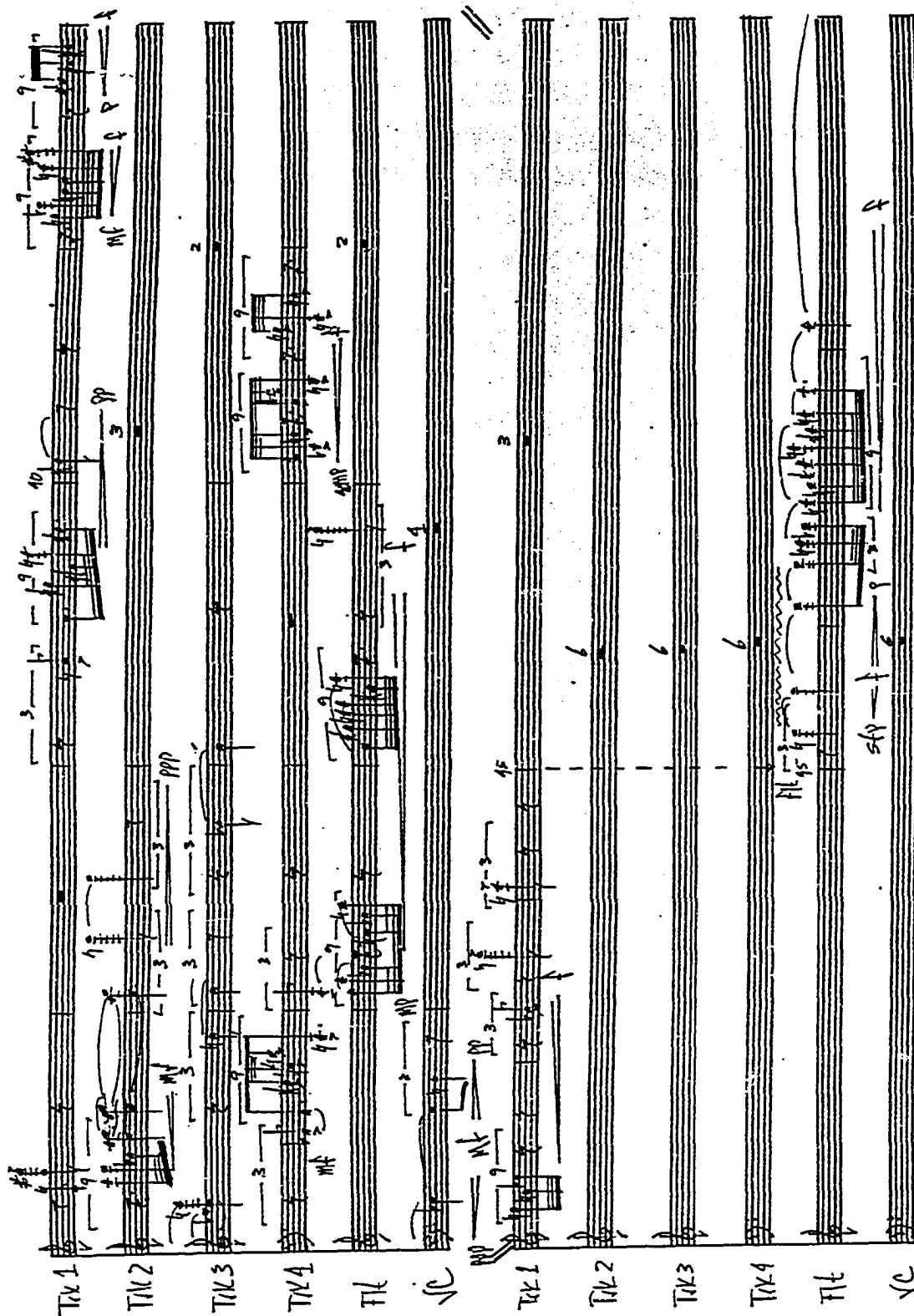
- Track 1
- Track 2
- Track 3
- Track 4
- Flute
- Cello

The score is written on a single page, and the page number 11 is visible in the top right corner.

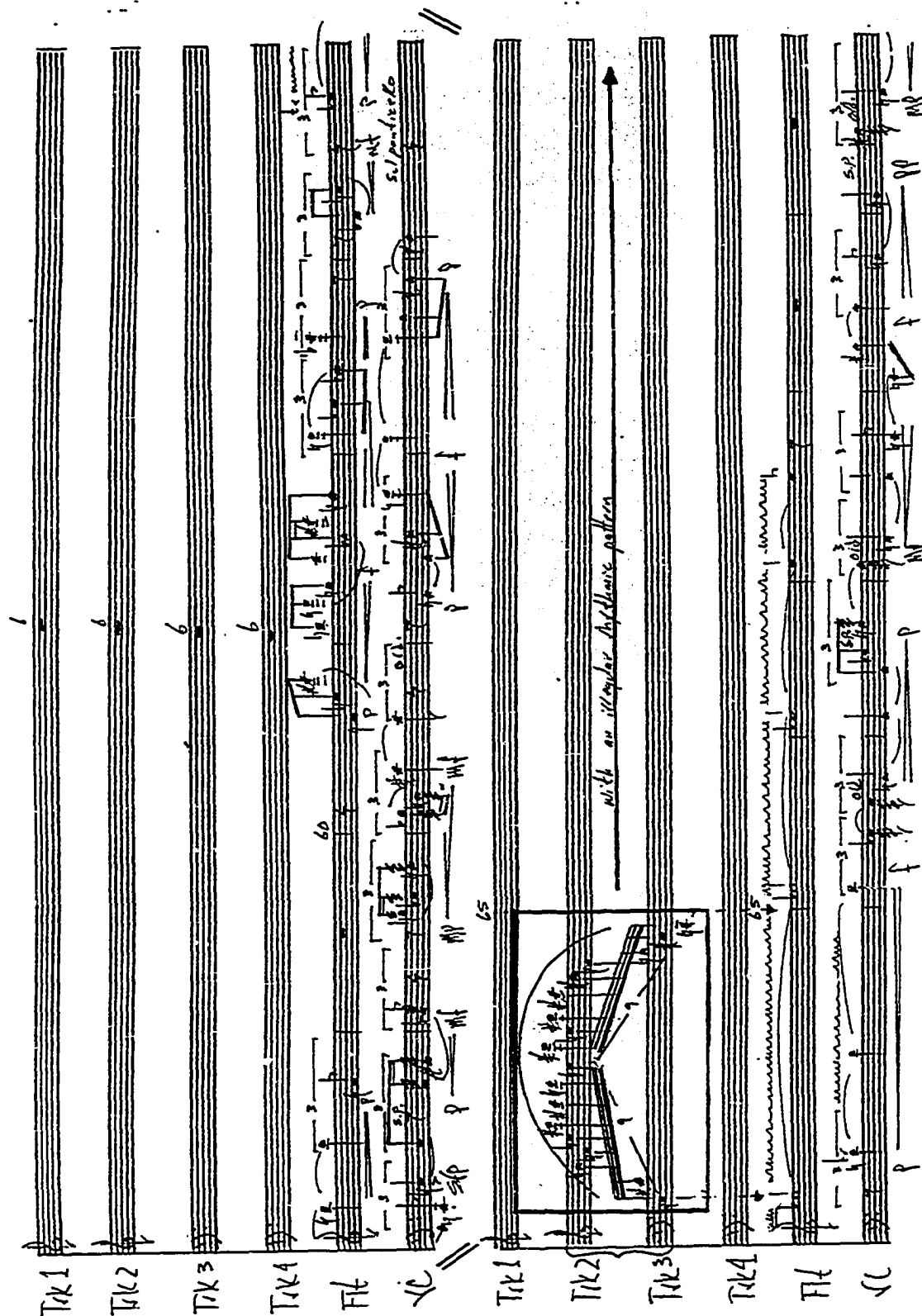




The image shows a handwritten musical score for two systems of six staves each. The staves are labeled T1K1, T1K2, T1K3, T1K4, Flt, and VC. The notation includes various musical symbols such as notes, rests, and dynamic markings like 'pp', 'mf', and 'p'. There are also some handwritten annotations and a double bar line between the two systems.



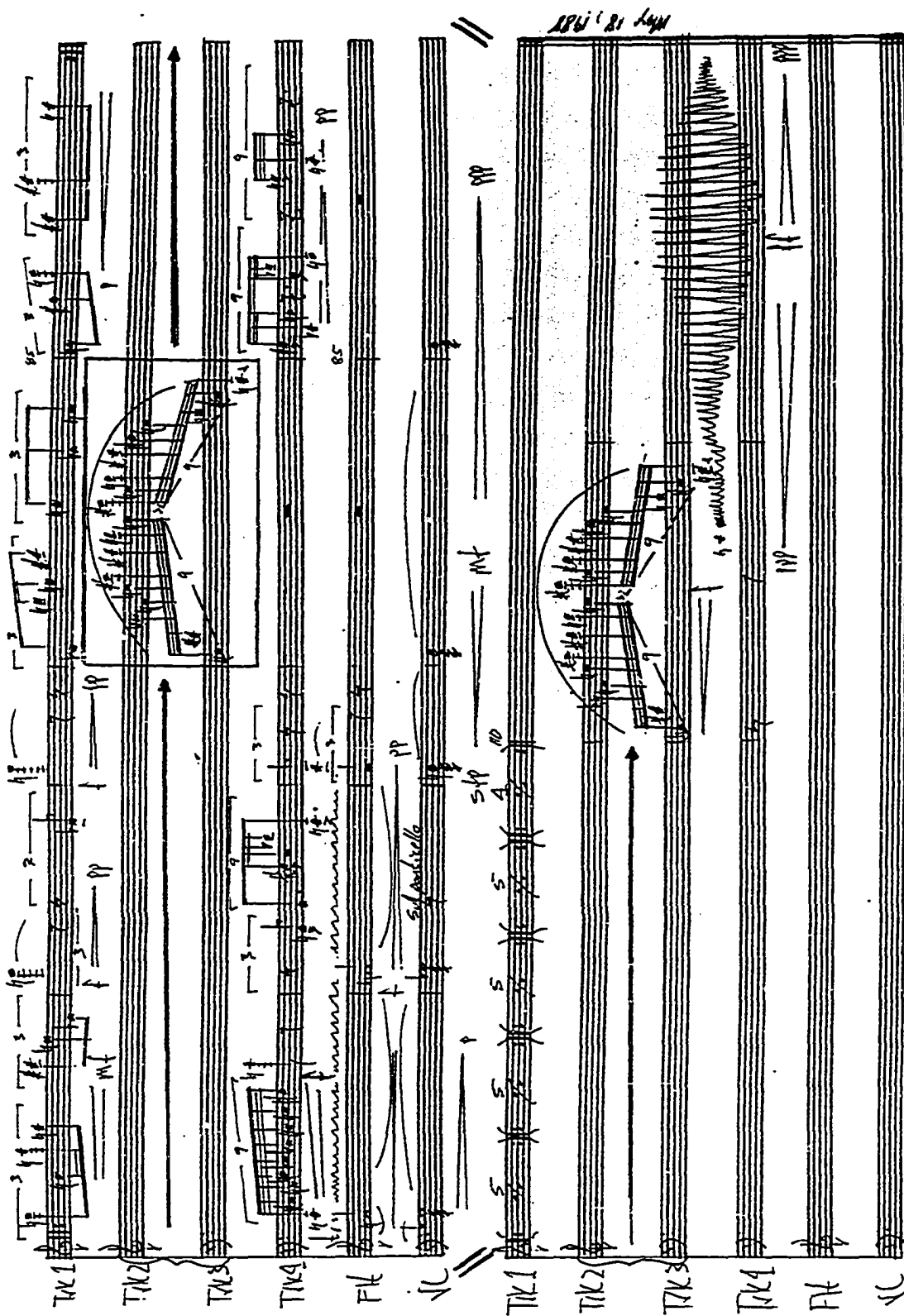
The image displays two systems of handwritten musical notation on staves. Each system consists of four staves labeled T1K1, T1K2, T1K3, and T1K4, followed by two staves labeled FH and SC. The notation includes various musical symbols such as notes, rests, and dynamic markings like *pp* (pianissimo), *mp* (mezzo-piano), and *mf* (mezzo-forte). There are also numerical markings (1, 2, 3, 4, 5, 6) and other annotations like *od.* and *gliss*. The handwriting is in black ink on a white background.



Handwritten musical score for a string quartet, featuring staves for Violin 1 (TK1), Violin 2 (TK2), Viola (TK3), and Cello (TK4). The score is divided into two systems, each marked with a double bar line and the instruction "with an irregular rhythmic pattern".

The first system includes dynamic markings such as *p*, *ppp*, *mf*, and *pp*. It also features various musical notations including slurs, ties, and fingerings (e.g., 1, 2, 3, 4, 5, 6, 7, 8, 9). A section of the score is marked with a double bar line and the instruction "with an irregular rhythmic pattern".

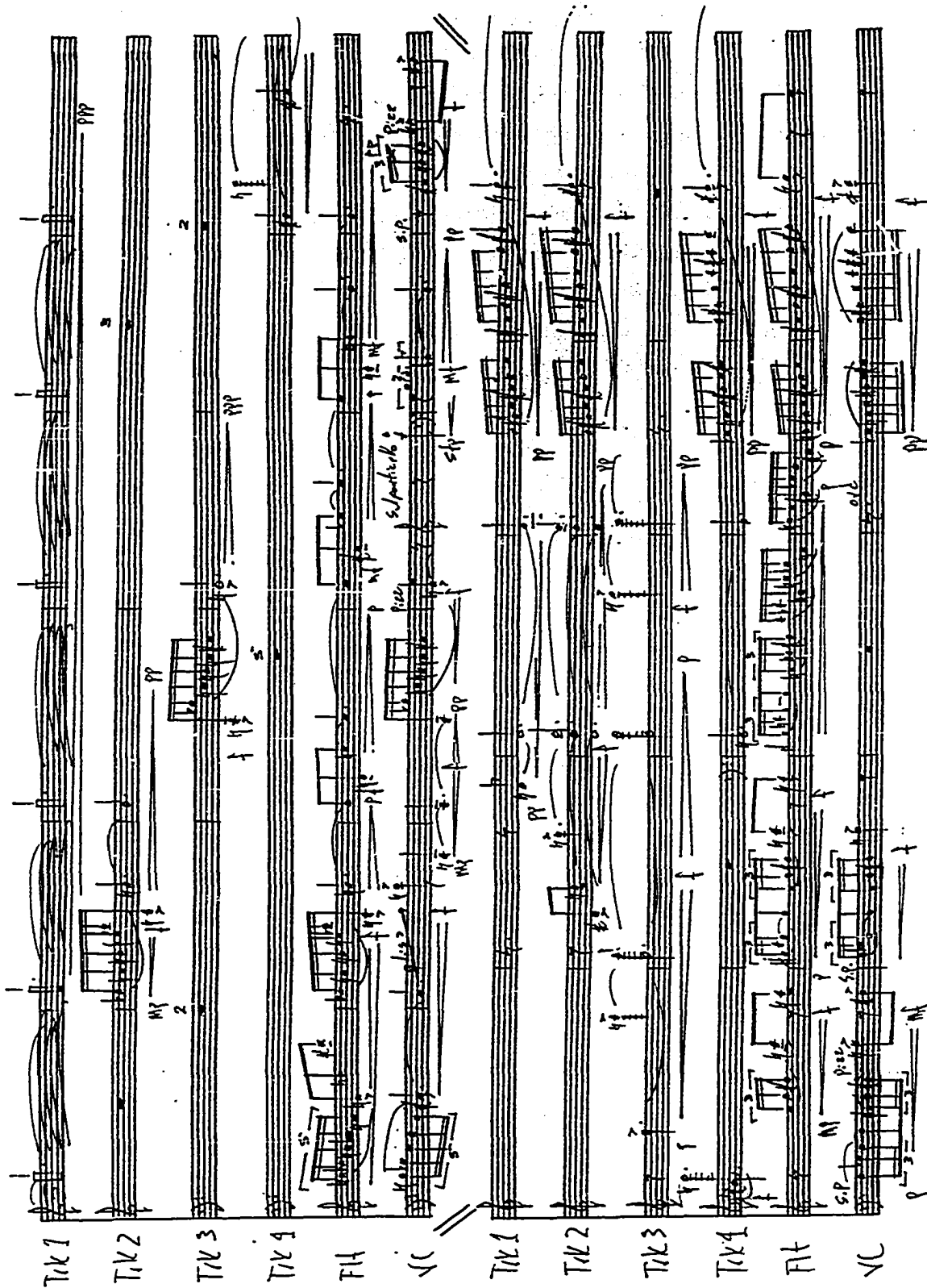
The second system continues the musical notation, including dynamic markings like *mf* and *ppp*, and various musical notations such as slurs, ties, and fingerings. The score concludes with a final measure marked with a double bar line.



Handwritten musical score for a string quartet, measures 10 through 12. The score is written on six staves, labeled TL1, TL2, TL3, TL4, FL, and C. The notation includes various musical symbols such as notes, rests, and dynamic markings (pp, mf, f). Measure 10 is marked with a double bar line and a repeat sign. Measure 11 is marked with a double bar line and a repeat sign. Measure 12 is marked with a double bar line and a repeat sign. The score is written in a cursive, handwritten style.

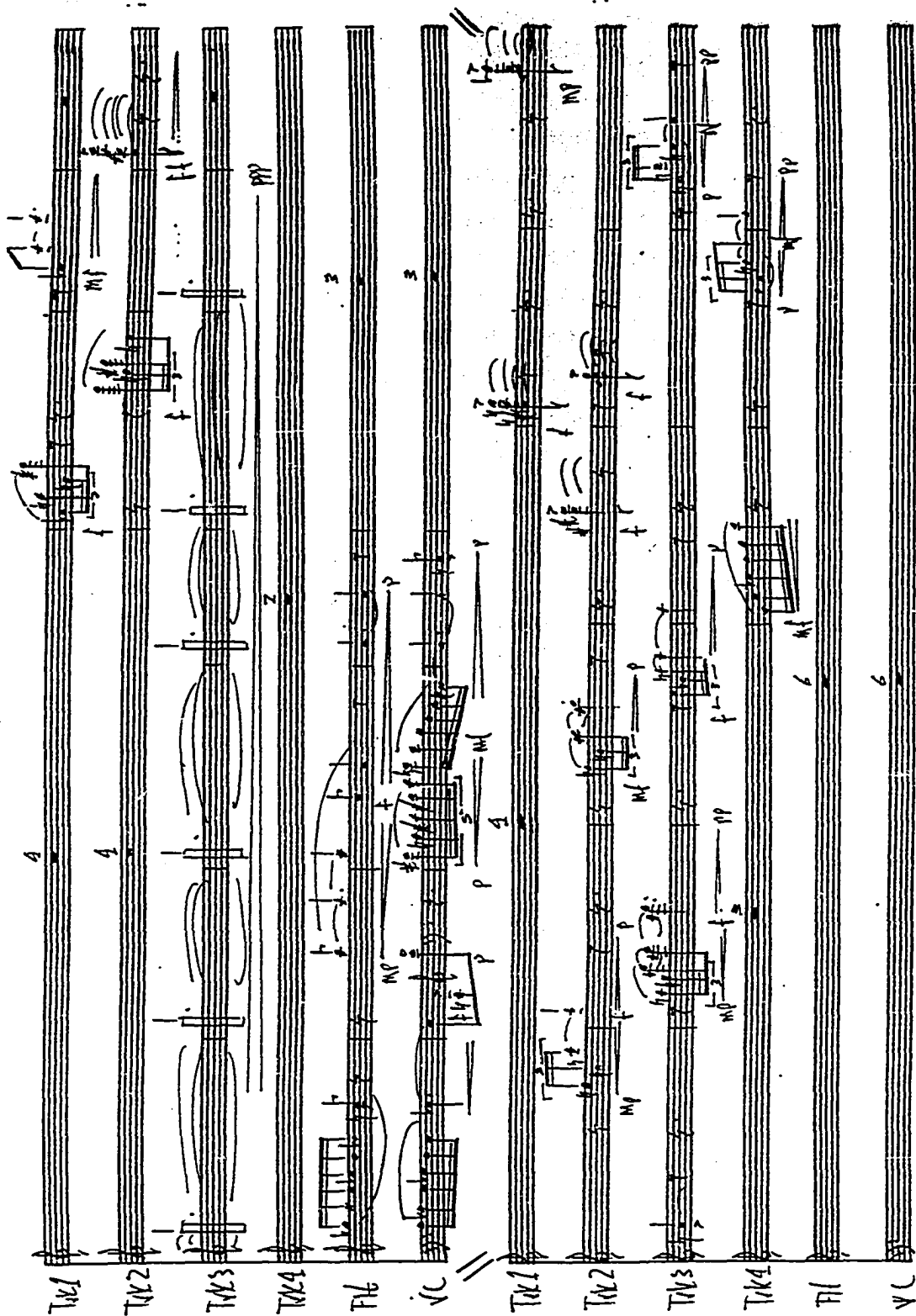
Handwritten musical score for two systems of strings. Each system consists of four staves labeled TK1, TK2, TK3, and TK4, followed by a first horn (FH) and a second horn (SC). The notation includes various dynamics (p, mf, f, ppp, sfz, sf), articulations (accents, slurs), and performance instructions like 'sola' and 'sottocello'. The score is written in a cursive, handwritten style.

Handwritten musical score for two systems of strings. Each system consists of four staves labeled Tck1, Tck2, Tck3, and Tck4, followed by two additional staves labeled Flt and VC. The notation includes various musical symbols such as notes, rests, slurs, and dynamic markings like ppp, mp, and p. The first system shows a complex arrangement of notes and rests, with some staves having multiple measures of music. The second system continues the composition with similar notation, including some staves with multiple measures of music. The overall style is that of a handwritten musical manuscript.



Handwritten musical score for a string quartet and vocal parts, page 25. The score is written on ten staves, labeled TVK1, TVK2, TVK3, TVK4, Flt, VC, TVK1, TVK2, TVK3, TVK4, Flt, and VC. The notation includes various musical symbols such as notes, rests, beams, and dynamic markings like ppp, mf, and p. The score is divided into two systems by a double bar line. The first system covers staves TVK1 to VC, and the second system covers staves TVK1 to VC. The notation is dense and includes many slurs and ties, indicating complex musical passages. The handwriting is in black ink on white paper.

Handwritten musical score for 'The Rose Tree' on ten staves. The notation includes various musical symbols such as notes, rests, and bar lines, along with some handwritten annotations like 'f' and 'p'.



May 20, 1988

The image shows a handwritten musical score on two systems of six staves each. The staves are labeled as follows:

- System 1: Trk 1, Trk 2, Trk 3, Trk 4, Fl, VC
- System 2: Trk 1, Trk 2, Trk 3, Trk 4, Fl, VC

The notation includes various musical symbols such as notes, rests, and dynamic markings like 'pp' and 'mp'. The score is dated 'May 20, 1988' in the top right corner.