Nicholas Shaheed

Pulse

For Solo Flute, Computer, and Heart-Rate Monitor

2015

Preface and Information

About ***Pulse***

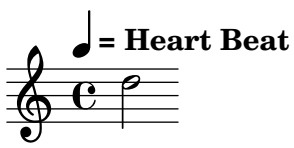
The archetypical work of electronic music involving a live, acoustic instrument consists of prerecorded audio that the performer then plays to. This approach is, by necessity, static. The electronics are unchanging and, as a result, are missing the characteristics that make a live performance live. ***Pulse*** seeks to add an element of dynamicism to the electronics that is derived from the performer's physiological reaction to the performance at hand, through the measurement of the performer's heart rate.

The tempo and a majority of the effects in the piece are somehow shaped by the players heart rate. Some effects (such as the tempo) simply read the present heart rate, while others are effected by the what the performer's heart rate has been. The heart rate is then the driver of the intensity, frequency, pitch, tempo, and texture of the electronics.

Between the movements of ***Pulse***, there are short interludes where the performer does not play. These serve as transitions between the movements.

Tempo & Notation

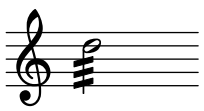
Tempo



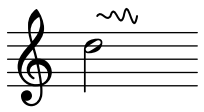
The tempo of all three movements of ***Pulse*** are determined by the performer's heart rate, where the BPM of the heart beat determines the BPM of the quarter note. As the performer's pulse rises and falls, so does the tempo of the music. The constantly shifting tempo in this music requires careful attention from the performer, as movements ***i*** and ***ii*** contain elements in the electronics that are tightly synced to specific measures and beats.

The heart beat is measured using a heart rate monitor (see Hardware).

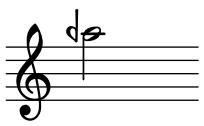
Notation

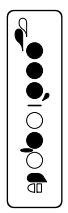


The tremolo indicates flutter tonguing.



This figure is used to indicate the increasing intensity of vibrato





Fingering diagrams are given when certain notes, effects, intonation, or polyphonics are to be played.

Hardware

The following pieces of equipment are needed:

— Stereo PA system

— A computer

1. That can run Max/MSP 7
2. That has at least 1 USB port

— Polar T31 Heart Rate Monitor (contact composer to get)

— Polar Heart Rate Monitor Interface (contact composer)

— An audio interface with...

1. 2 outputs (required)
2. Or one with 4 outputs (recommended)

— Headphones (recommended)

— A mixer (recommended if performing with two people, see Recommendations)

Using the Electronics

The electronics consist of a Max/MSP 7 patch. Contact the composer for downloading and operating instructions. When the patch is up and running, hit the "Help" button to open the help file for the electronics.

Using the Heart Rate Monitor

To attach the Polar T31 Heart Rate Monitor:

1. Fasten one end of the heart rate sensor to the elastic strap.
2. Moisten the two grooved areas on the back.
3. Clip the heart rate sensor around your chest and adjust the strap to fit snugly.
4. Check that the wet grooved areas are firmly against your skin, and that the text on the heart rate sensor is in an upright position and at the center of your chest.

Taken from polar.com, see site for additional illustrations.

Additionally, it is recommended that a heart rate monitor electrode cream be used to ensure a more consistent connection between the skin and the sensor (Buh-Bump cream for example).

Recommendations

It is recommended that a second performer control the levels of the electronics via a mixer. This will allow for more fine grained control of the dynamics in the electronics.

A click track is provided for the performer (and because of the constantly changing tempo, it is highly recommended that it be used). The click track outputs to channels 3 and 4, which the headphones should be plugged into.

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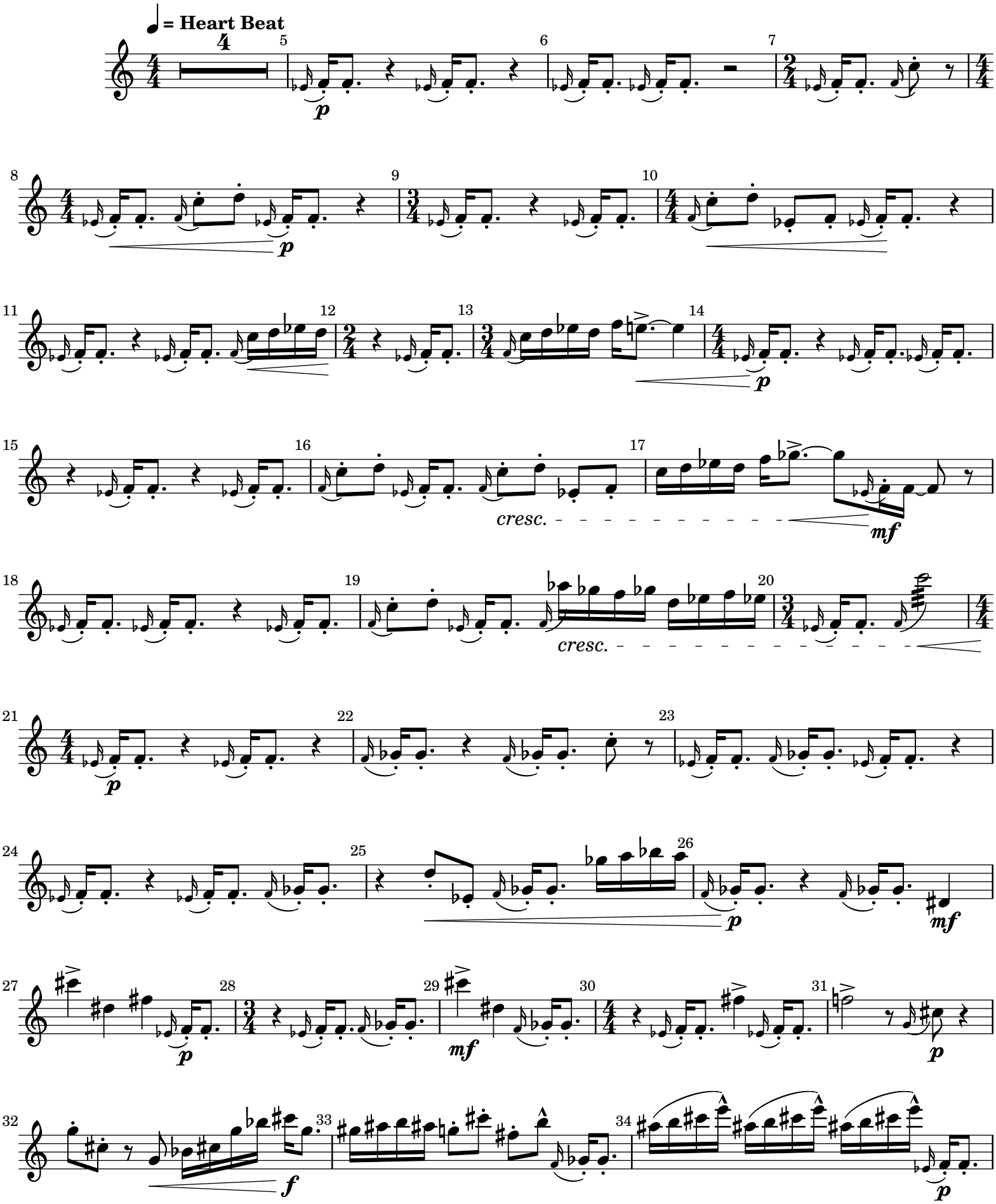
Movement I



fff

p

sfz

p

sfz

p

pp

p

mf

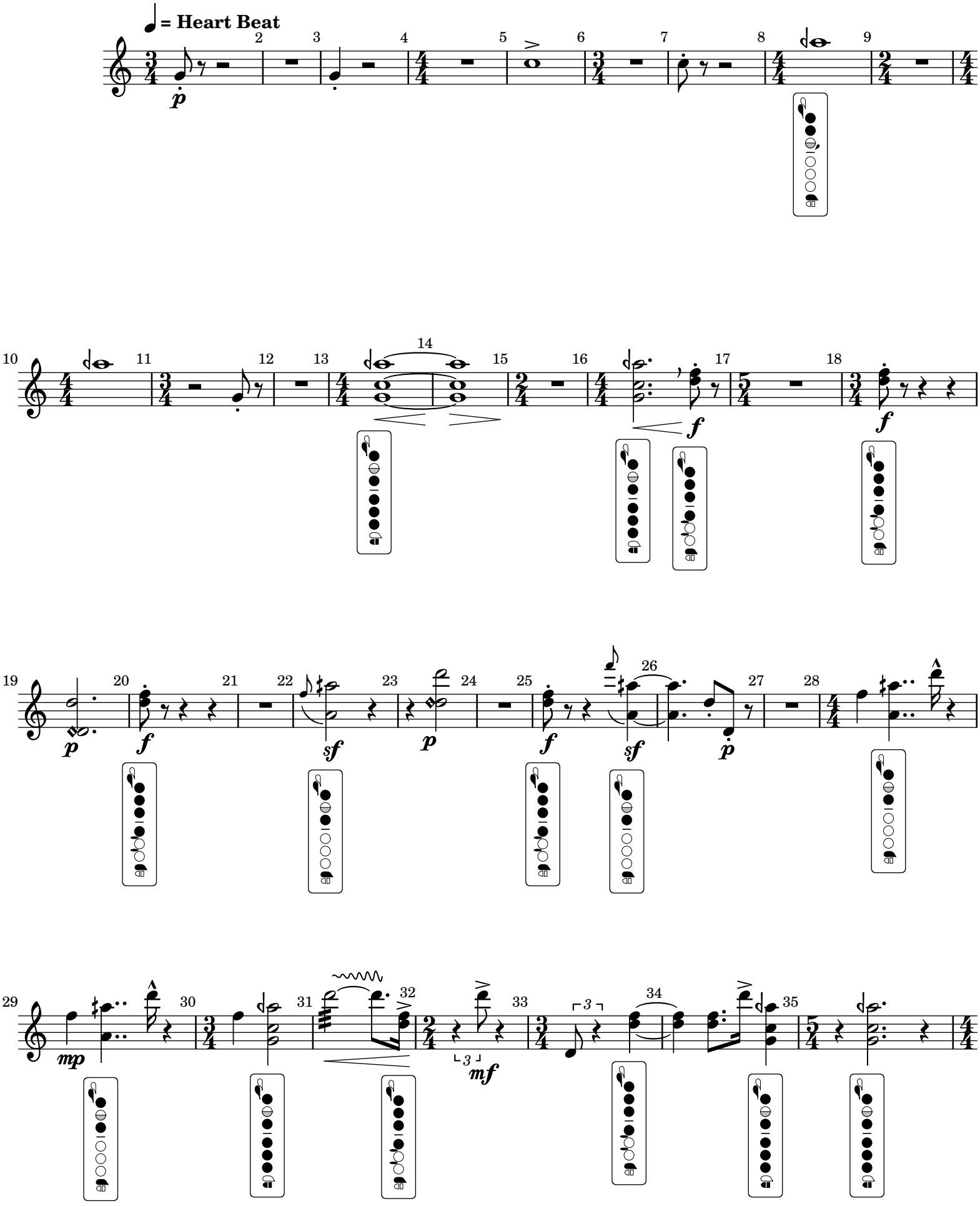
pp

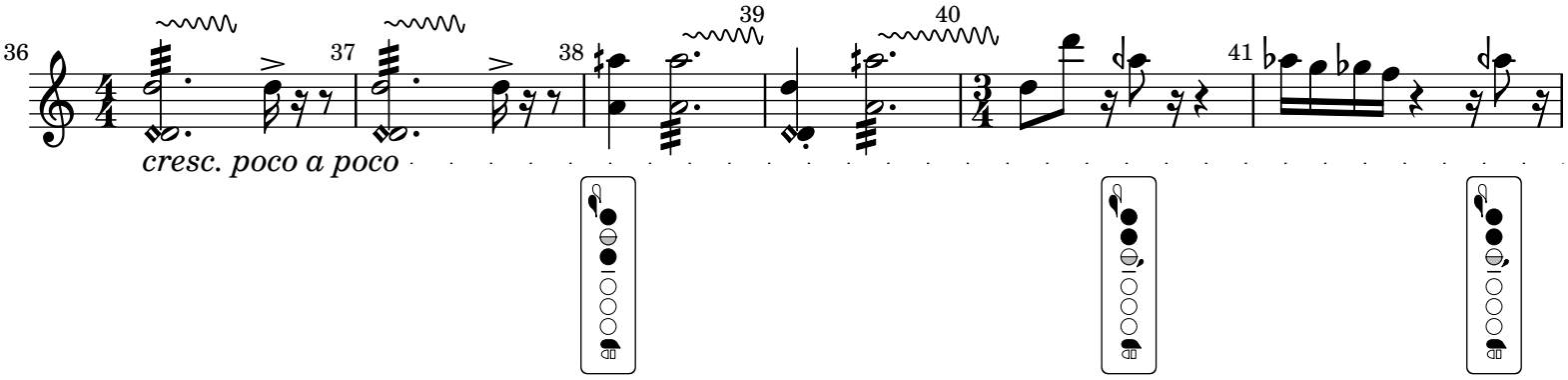
p

Interlude

3

Movement II

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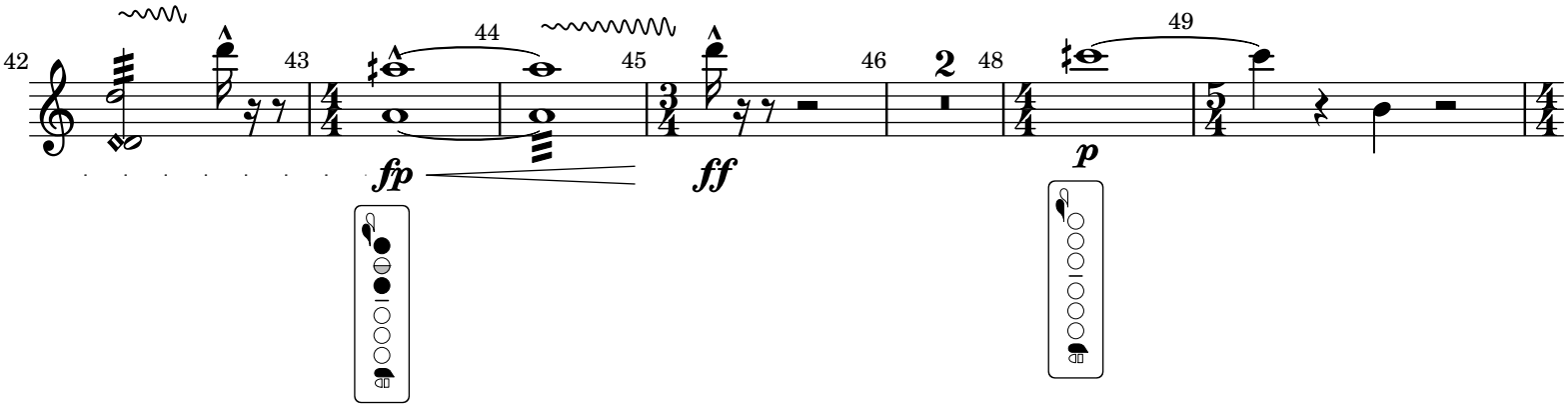
cresc. poco a poco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fp
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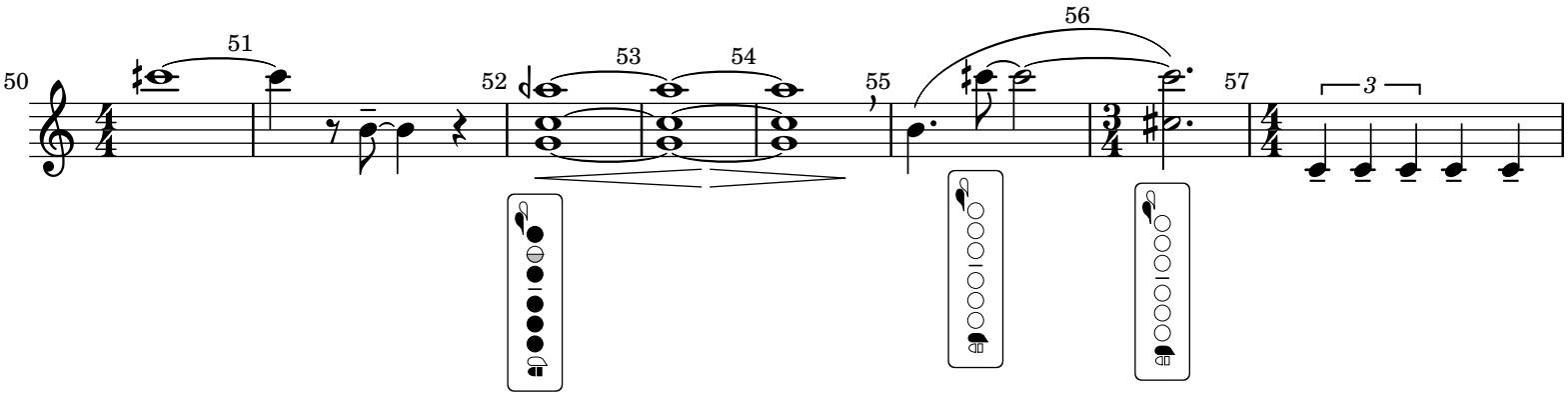
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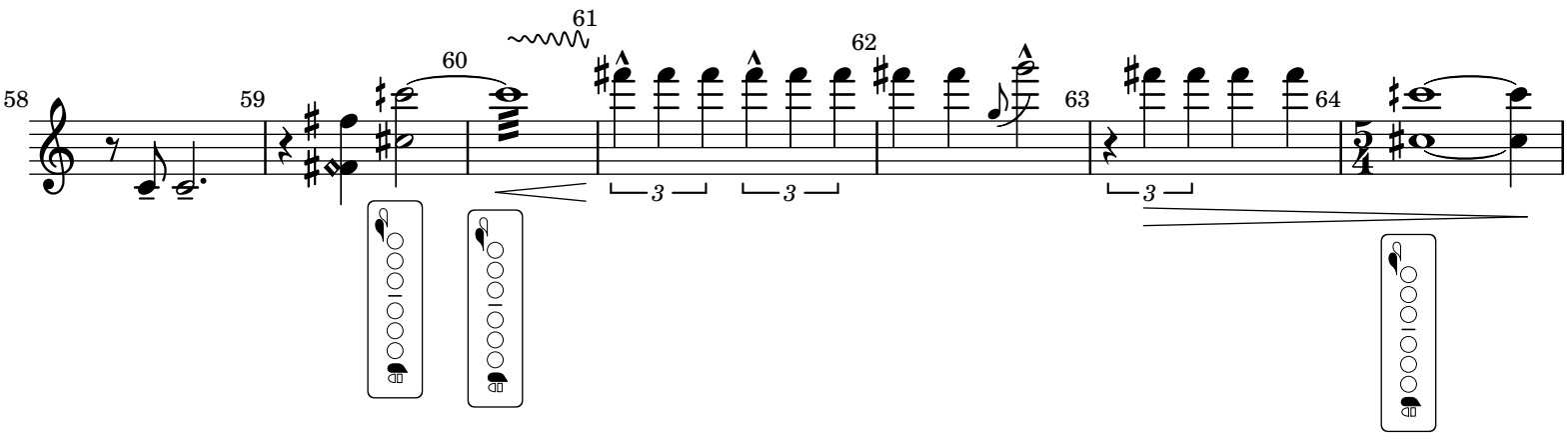
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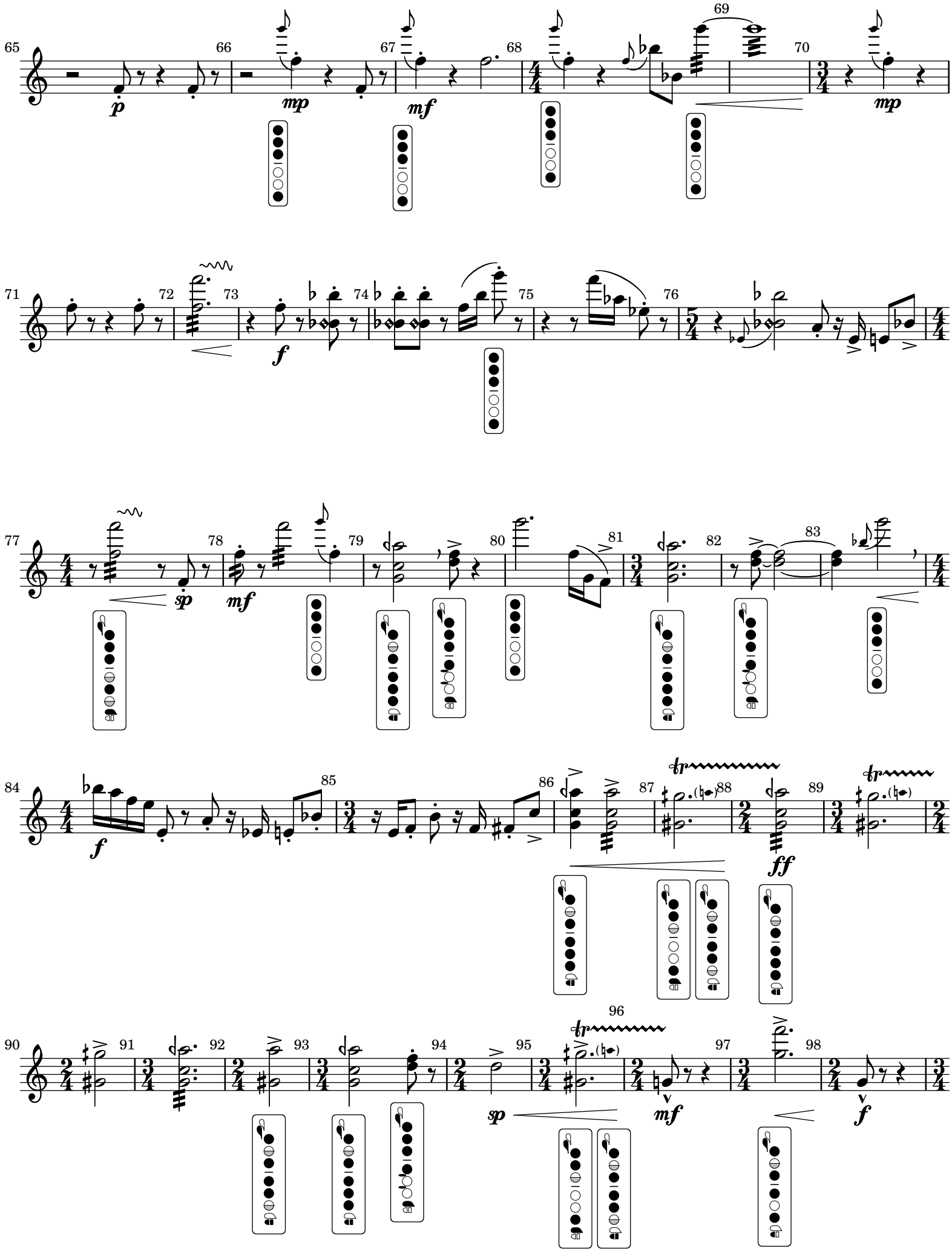
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97
98
p
mp
mf
f
sp
ff
tr

99 100 101 102 103 104 105 106 107 108 109

ff

Interlude

12

Movement III

= Heart Beat

p

7

mp

13

19

mf

24

30

37

43

50

56

molto legato

63

mp

mf

70

f

79

87

molto legato

p

95

102

110