Nicholas Shaheed

Pulse

For Solo Flute, Computer, and Heart-Rate Monitor

2015

Preface and Information

About ***Pulse***

With electronic music that involves live performers, it is typical for the electronics to consist mostly or entirely of prerecorded audio, and for the performer to play to that recording. This approach is, by necessity, a static one. Due to the unchanging nature of a recording, the music loses a key feature of performance that is so important to live music. ***Pulse*** seeks to add back a level of dynamicism to the performance of the electronics. To achieve this, the electronics are controlled by the performer's physiological reaction to the performance by measuring their heart rate in real time.

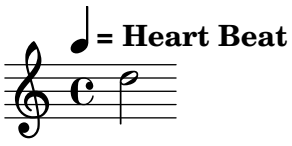
The tempo and a majority of the effects in the piece are somehow shaped by the player's heart rate. Some effects (such as the tempo) simply read the present heart rate, while others are effected by the what the performer's heart rate has been (by calculating averages, peaks, valleys, etc.). Through this, the heart rate becomes the driver of the intensity, frequency, pitch, tempo, and texture of the electronics. It become a dynamic, ever changing performer that is intimately linked to the flutist.

Interludes

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

Tempo & Notation

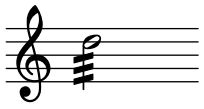
Tempo



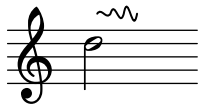
The tempo of all three movements of ***Pulse*** are determined by the performer's heart rate, where the BPM of the heart beat determines the BPM of the quarter note. As the performer's pulse rises and falls, so does the tempo of the music. This constantly shifting tempo requires careful attention from 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).

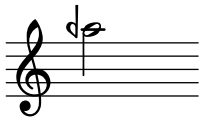
Notation

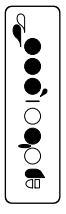


The tremolo indicates flutter tonguing.



This figure is used to indicate increasing intensity of vibrato





Fingering diagrams are given when non-standard notes, effects, intonation, or polyphonics are to be played. Taken from Robert Dick's ***The Other Flute***

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)

For additional information, open the patch's help file (see Using the Electronics).

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 is one brand of cream).

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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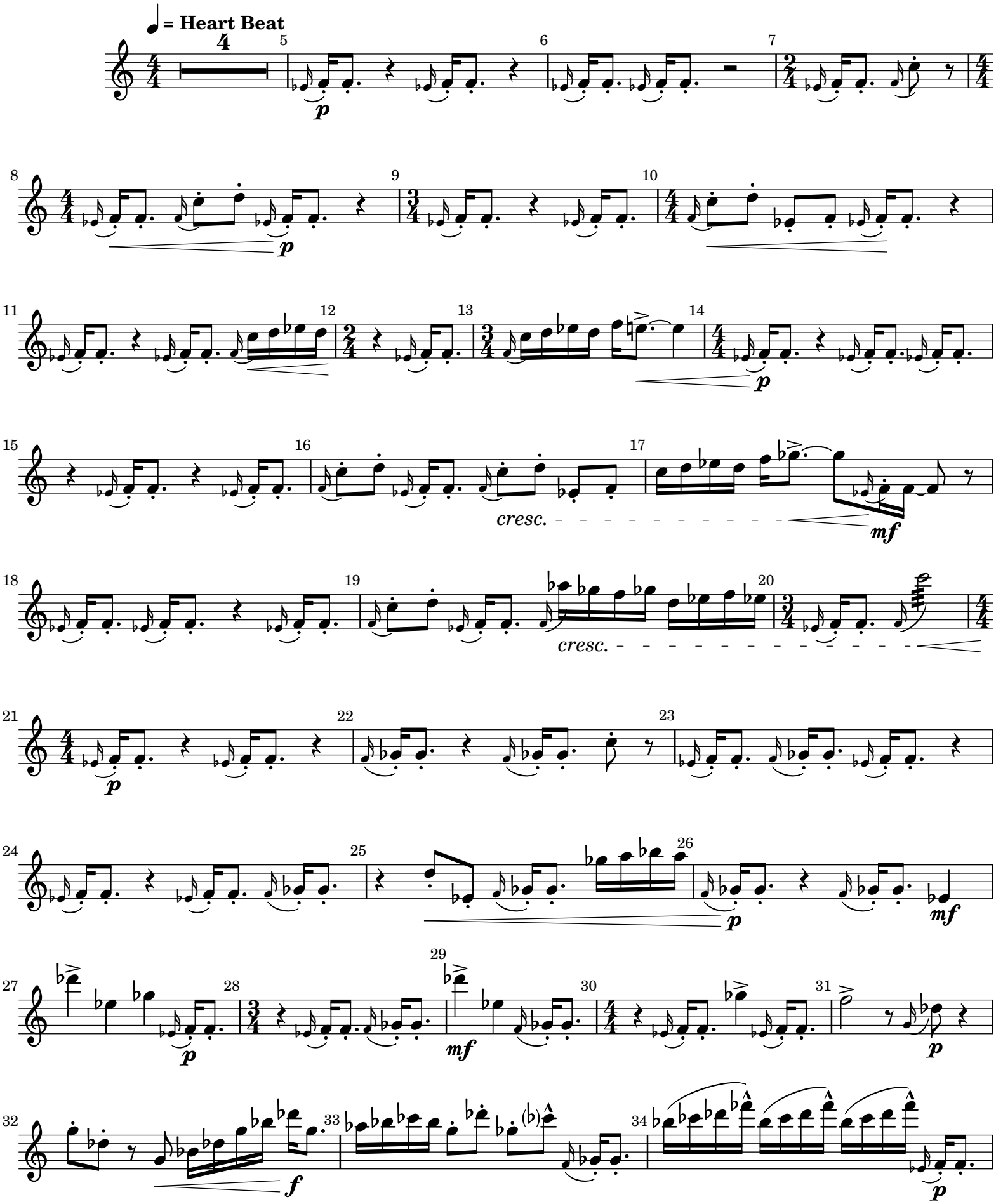
Movement I



81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

fff

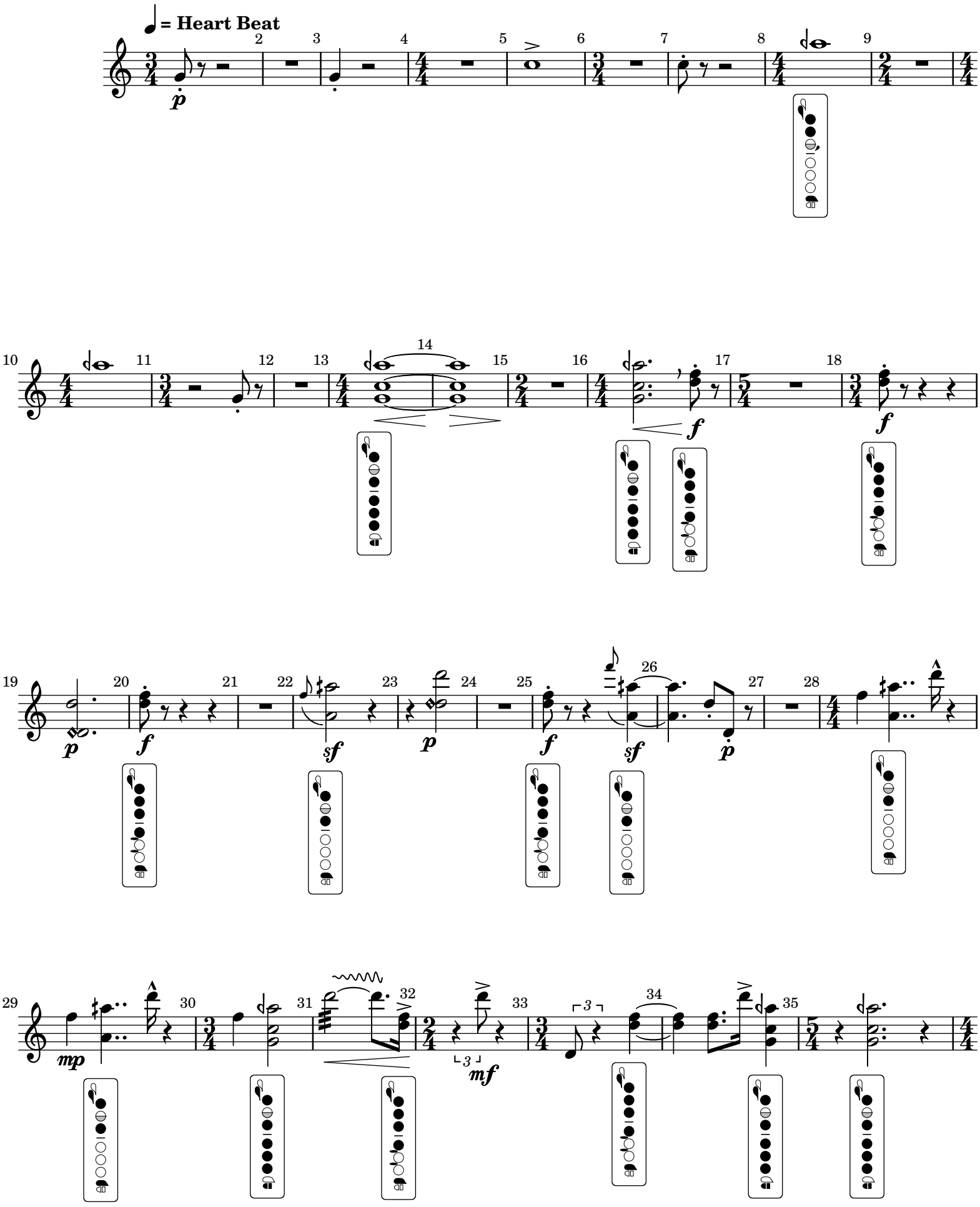
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130

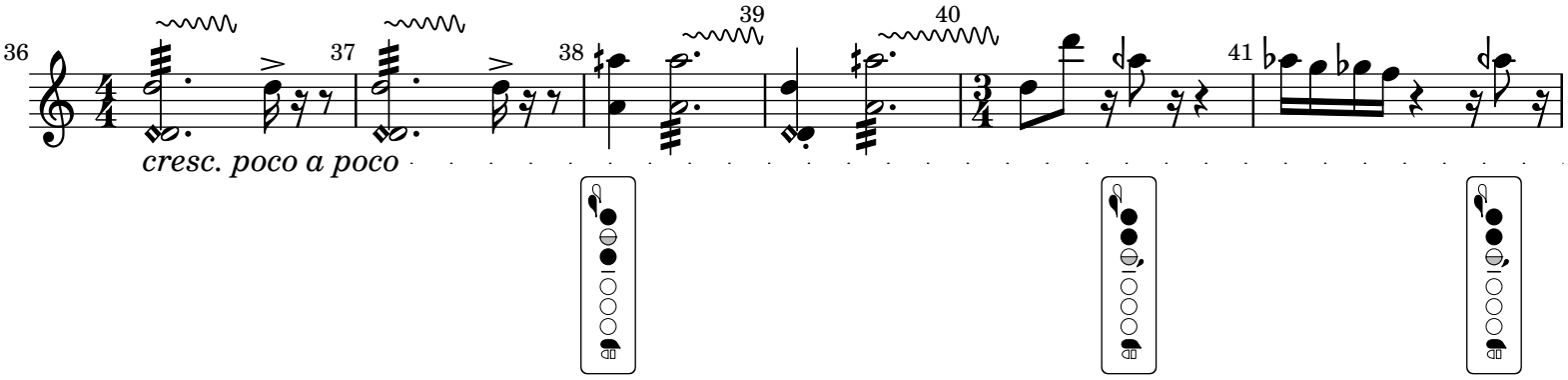
p *sfz* *p* *sfz* *p* *pp* *p* *mf* *pp* *p*

Interlude

3

Movement II

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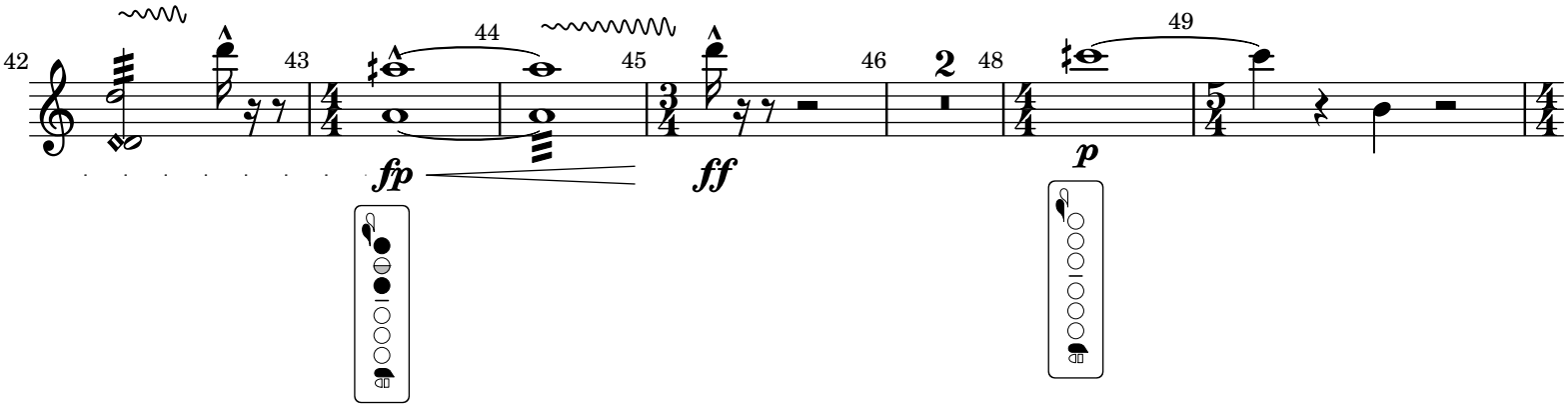
cresc. poco a poco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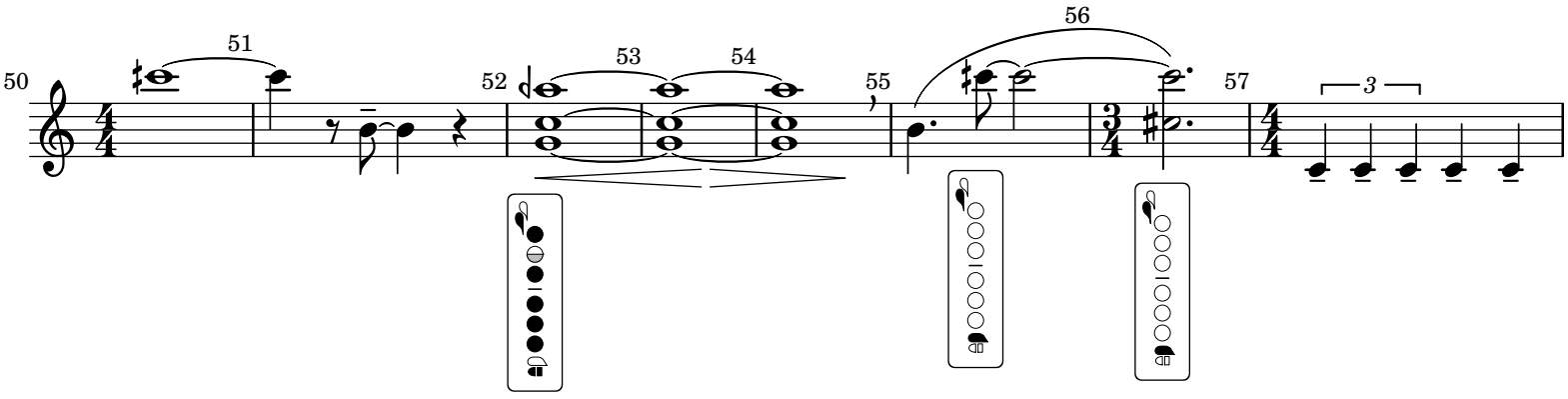
fp
ff
p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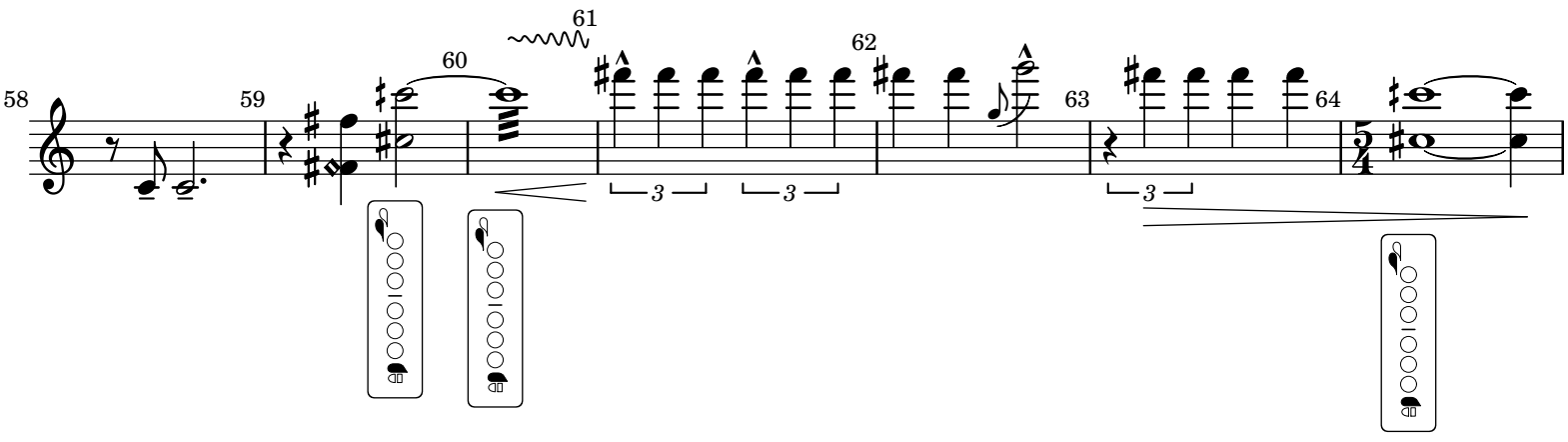
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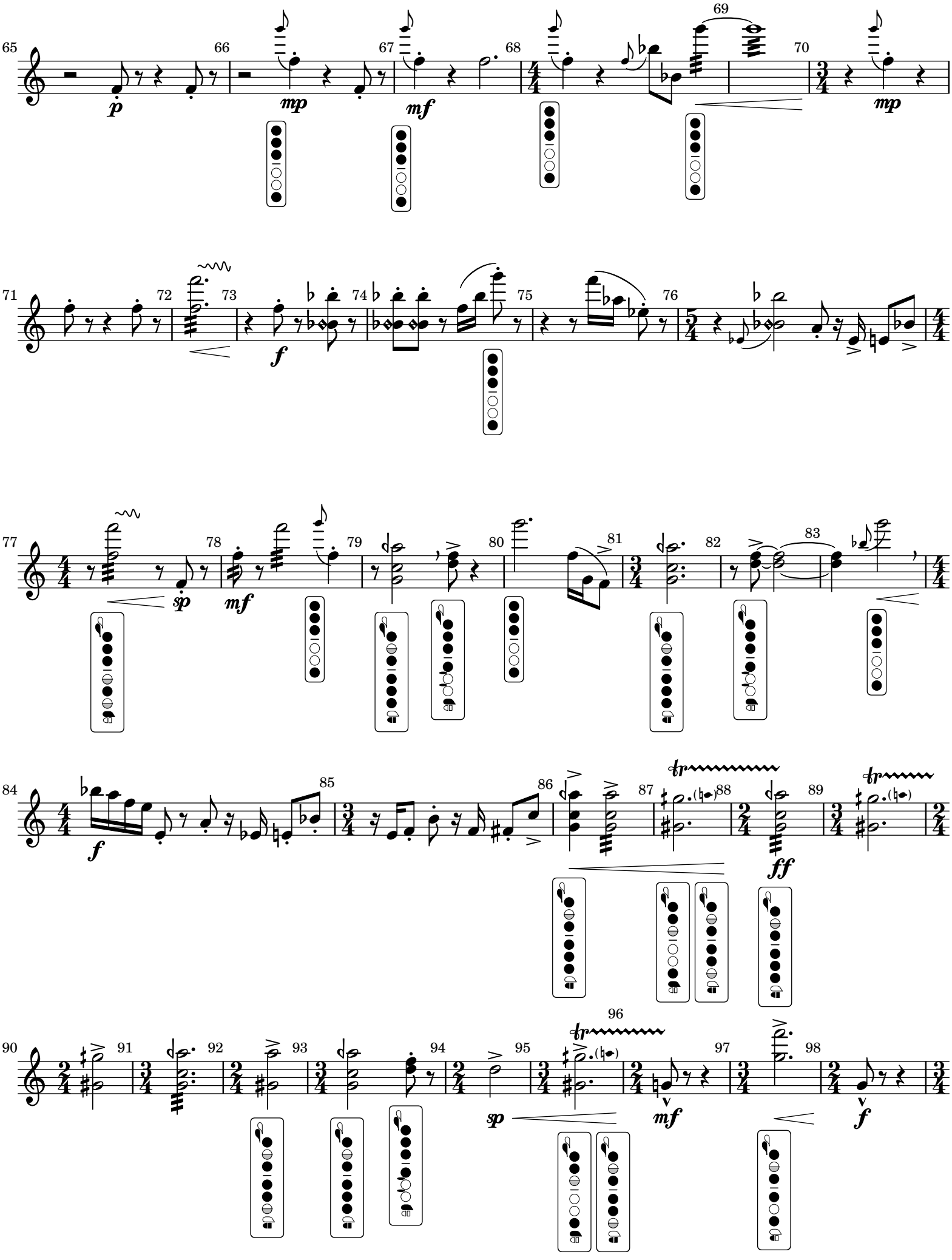
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93
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95
96
97
98
p
mp
mf
f
sp
ff
tr

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