MEDITATIONS 3: THE SEA

A thesis submitted to the

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In partial fulfillment of the
requirements of the degree of

MASTER OF MUSIC

In the Department of Theory and Composition
of the College Conservatory of Music

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by

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Abstract

My Masters Thesis is an electro-acoustic composition whose main focus is interaction between live performer and computer. Although this kind of interaction is still in its infancy primarily due to limitations of artificial intelligence, I have devised ways of circumventing this deterring issue through implementation of controlled and more focused response by the computer. My primary interest was in utilizing the RTcmix music programming language due to fact it has an ability to harness the power of sound processing filters in real-time, while using the microphone as a sound input device. Another focus of the work was to expand capabilities of this language by building a custom front-end application that would ease the interaction between the composer-imposed computer's behavior and a performer. I have also paid a great deal of attention to making the piece resistant to a certain amount of deviation from the original musical material by suggesting and implementing improvisatory passages. Each movement of the work focuses on a particular technique, sound filter, and/or a particular extended technique of playing guitar.

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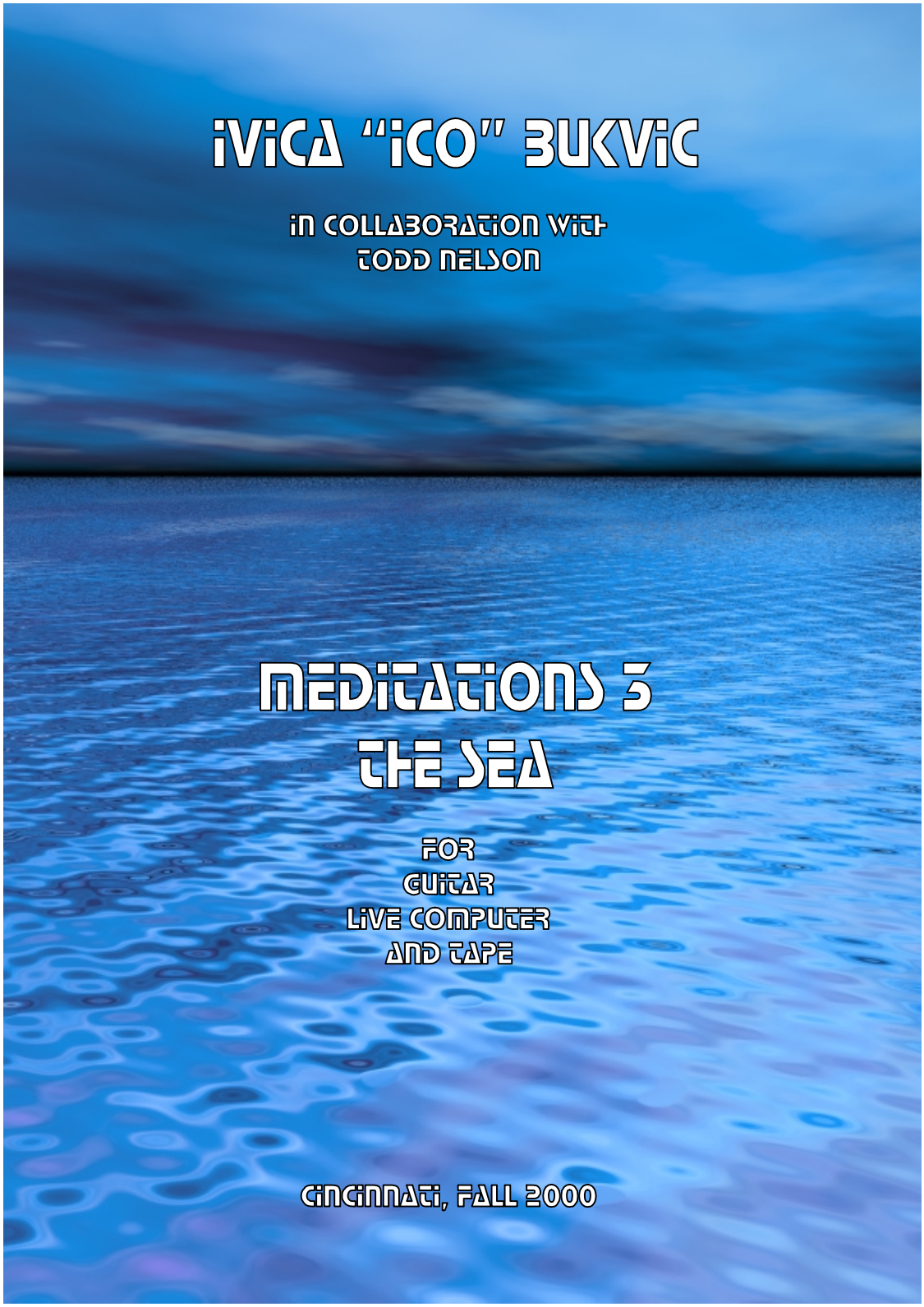


IVICA "ICO" BUKVIC

IN COLLABORATION WITH
TODD NELSON

MEDITATIONS 5
THE SEA

FOR
GUITAR
LIVE COMPUTER
AND TAPE

CINCINNATI, FALL 2000

NOTES

I. About

This piece was originally conceived as an experiment in live interaction between pre-programmed computer and a live performer. Although in today's world we have rather powerful computers, AI (Artificial Intelligence) is still long ways from sophistication that would allow computer to perform even what we consider to be basic tasks, not to mention express human-like musicality. Thus my approach in this work was to create series of filters, which process sound emanating from the performer, in real-time, and feed the resulting sound back to the performer, stimulating response of the player. This symbiotic circle obviously would not work if the performer's music were set strictly, since the last step of this process requires a somewhat aleatoric response from the performer. The computer filters also are set in such fashion that they have an element of "randomness," (I use word randomness in a very careful fashion since even the randomness in the computer world is not as random as we would expect it) which can then clarify the reasoning behind calling this kind of response "live." In this piece "live" really indicates that no two performances of this work are the same, yet the integrity and the overall distribution of musical material due to this flexible construction remains unhindered.

II. Technical Requirements

For the performance of this piece it is required to have a computer with an OS (Operating System) that is supported by the music software RTCmix version 3.0.0 or higher (currently the only options are Linux/IRIX OS), a full-duplex sound card, and a relatively fast computer (due to wide variety of CPU's and their varying performance, it is hard to specify exact speed requirements, but anything above Intel Pentium II 333Mhz for IBM compatible machines should be sufficient). The computer should also have a C++ compiler installed as well as a CD-ROM drive, necessary for the installation.

Other requirements are as follows:

- 2 microphones (one for computer input and other for the guitar amplification, computer input microphone should be small enough to fit inside the sound hole of the guitar). As an alternative it is possible to use 1 microphone for both tasks, as long as the OS supports such type of mixing.

- Amplification system and 2 high fidelity speakers
- Mixer (suggested: Mackie 1402 VLZ-Pro, or better)

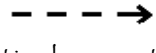
- Sound monitor for performer (preferably headphones in order to minimize feedback)

- Feedback suppressor (optional)

If RTCmix is successfully installed and fully functional, the data contents (including sound files, RTCmix score-files and a custom launch/timer application) should be installed onto the computer (any directory that has enough of available disk space), but the organization of the files within the installed folder should NOT be changed, otherwise the changes could result in program failing to run. After all the files have been transferred onto the computer, it will be necessary to compile the *main.c* file located in the root directory of the installation. There should also be at least 100MB of disk space available for all the "recorded" files that get saved onto the Hard-Drive including the 5th movement, which is prerecorded (playback only). After starting the compiled program, the user/performer will face several options that will allow them to select the preferred movement that they wish to begin.

III. Performance Notes

There are several special notational devices in the score:

-  **A Dotted arrow pointing in one direction** is used when a particular material leads irreversibly to next one without any timing constraints. In another words, performer can take as much time to develop and/or repeat particular idea, and then according to their own tastes move on to the next one.

-  **A Solid arrow pointing in both directions** is used to denote a section which is actually an interaction between two ideas where performer has a choice of going back and forth between them according to their own tastes.

-  **A Solid bold arrow pointing in one direction** is used in similar fashion like a dotted arrow, except that the material that follows is marked with the accurate timer (located above the staff), which means that the preceding material has a limited and exactly allocated time when it should move on to the next idea.

- "Boxes" usually contain information about a particular technique or a sound which is otherwise hard to describe. Sometimes they are used to describe grouping of ideas that are to be played in random order.

IV. Movement-specific Notes

The work is subdivided into five movements. Here's more info about each one:

I. "Wave Dances" is a strictly acoustic movement in which scoring is pretty much self-explanatory. It is important, though, to have the second movement already entered as a next choice in the computer program, so that when the time comes to trigger the beginning of the second movement (which happens before the first one ends due to fact that first and second movements are overlapped), that task is only limited to pressing "Return" on the keyboard.

II. "Endless Blue" is the first movement that involves computer response. It is important that the performer studies score well, and anticipates both cue points, and has a great control over the spacing of the ideas, due to fact that this, as well as other movements, is rather tightly controlled when it comes to overall duration of the piece.

III. "The Eye of a Storm" is tightly controlled movement where guitarist creates layers which are then replayed back, while the performer creates a new layer on top of them. This means that timing in this movement is of the essence, yet the material that is to be played between these strictly timed "checkpoints" is rather flexible.

IV. "Forgotten Shores of the Southern Pacific" is maybe the most improvisatory of all movements. Nonetheless, timing cues are again to be closely observed. This movement in the end merges with the fifth one.

V. "Vox ex altis" is a tape-only closing movement. The performer is to remain calm, with head slightly bowed. If possible, the lights should be gradually dimmed at the beginning of the movement until darkness envelopes the concert space.

V. Additional Issues of Great Importance

- Speakers must be positioned in front of the performer in order to avoid feedback.

- Hair comb or any other plastic rod-like item should be used to create grooves along half of the length. This will be used for the third movement (see images 3.1 and 3.2).

- The paperclip used also in the third movement should be inserted between strings alternating above and below in such a way that the first string goes above the paperclip. After it has been inserted above the sounding hole, it should be slid all the way to the guitar "bridge." For more info see image 3.3.

- The pencil used in the fourth movement should be initially stuck only under the second and over first string in order that It can vibrate. Generally, the longer the free side of the pencil, longer the favorable vibration of the pencil after the initial "pull." See image 4.1 for description of this process.

- In the later part of the fourth movement a pencil is placed under second and fifth strings, thus creating a kind of a "prepared" sound. To see the exact desired position, please refer to the image 4.2.

VI. Images

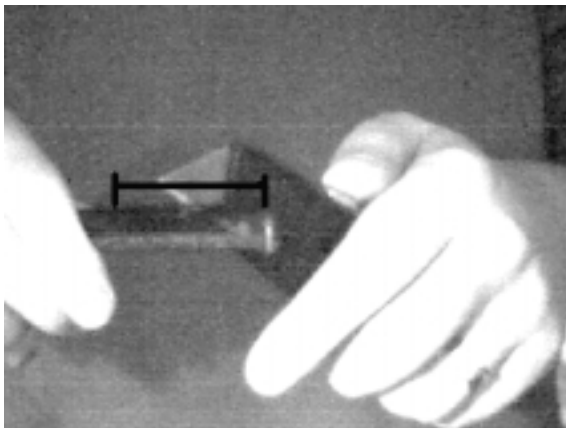


Image 3.1: Preparing hair comb with a scalpel

Image 3.2: Using hair comb on top two strings

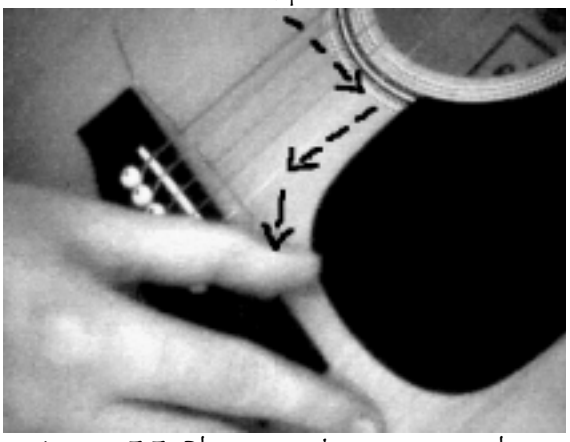


Image 3.3: Placing and using paperclip

Image 4.1: Placing and using pencil for a strum-like sound

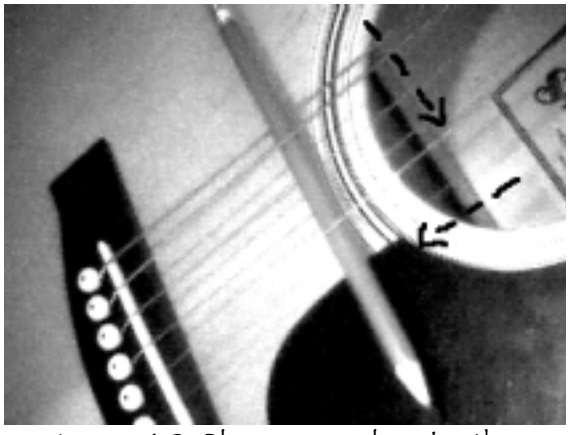
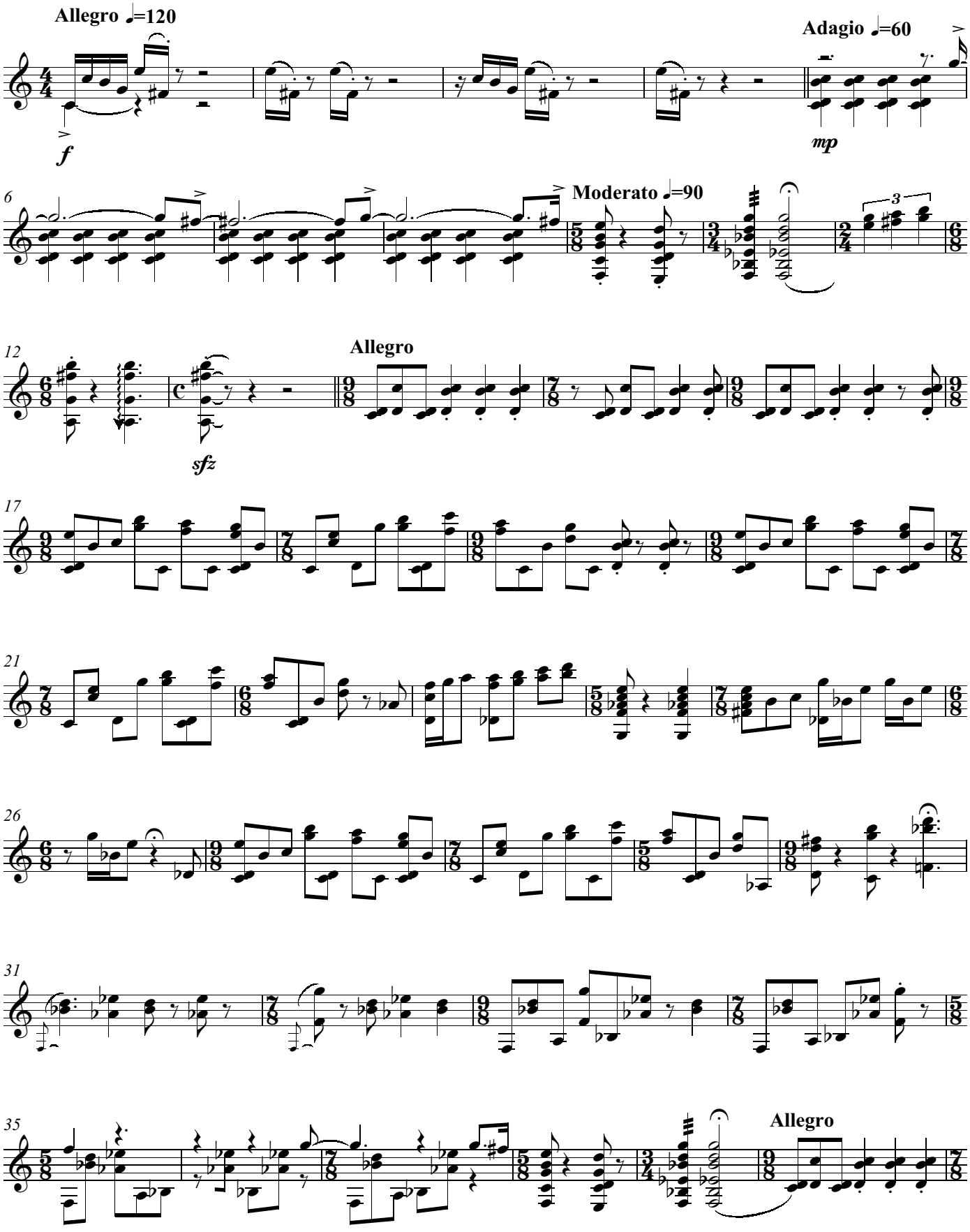
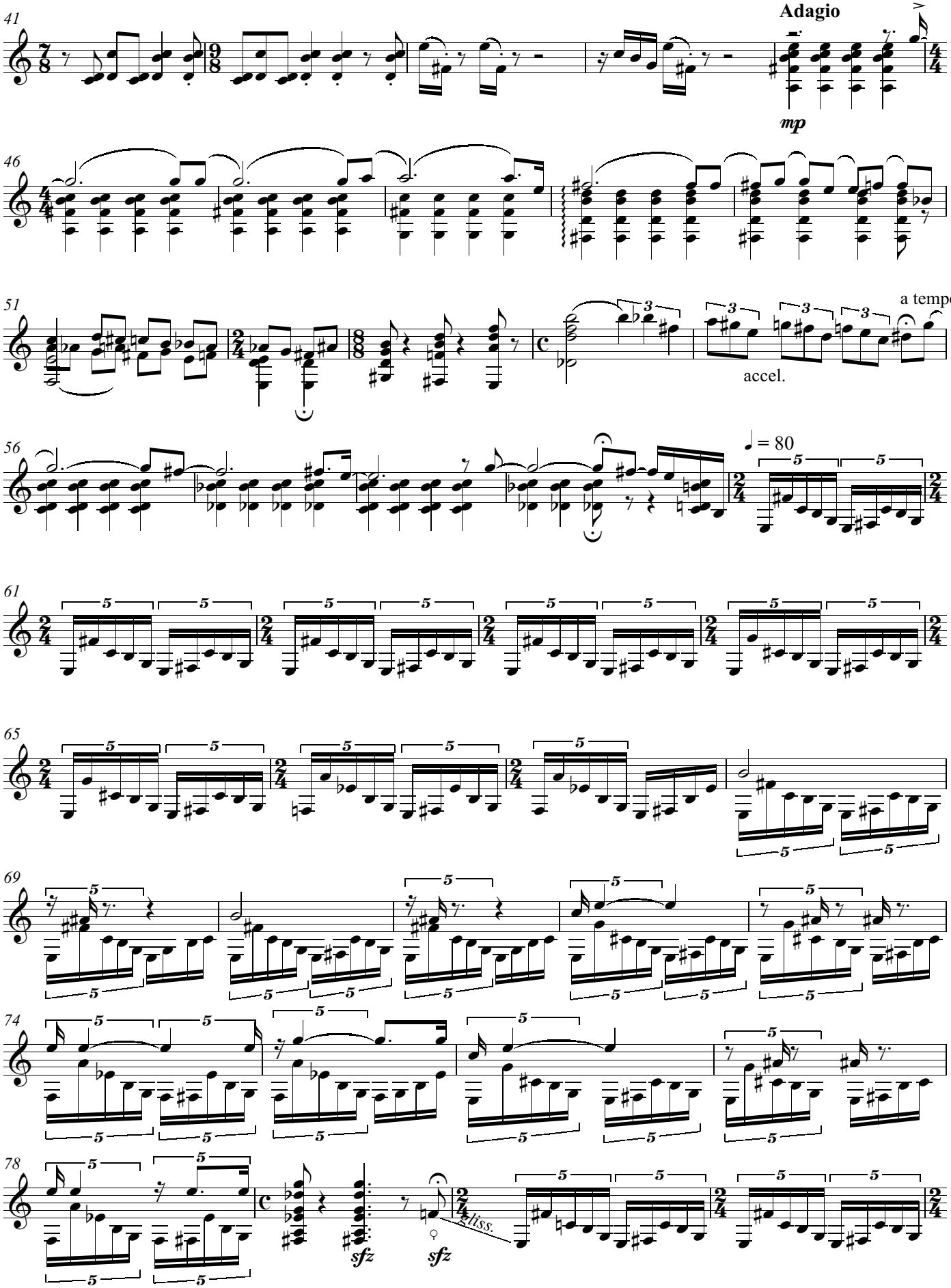


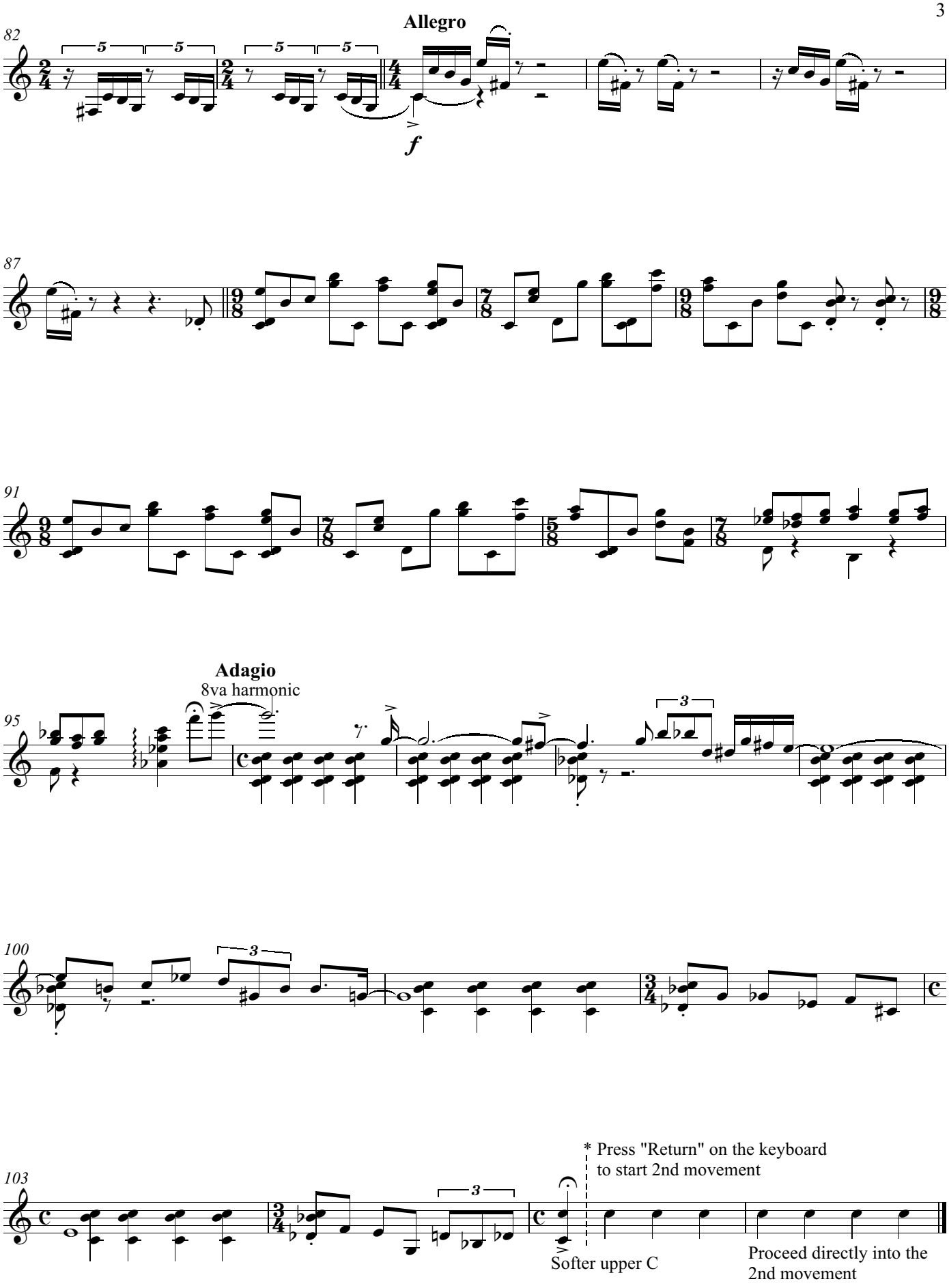
Image 4.2: Placing pencil under the sounding hole and under second and fifth strings

Meditations III: The Sea

1. Wave Dances

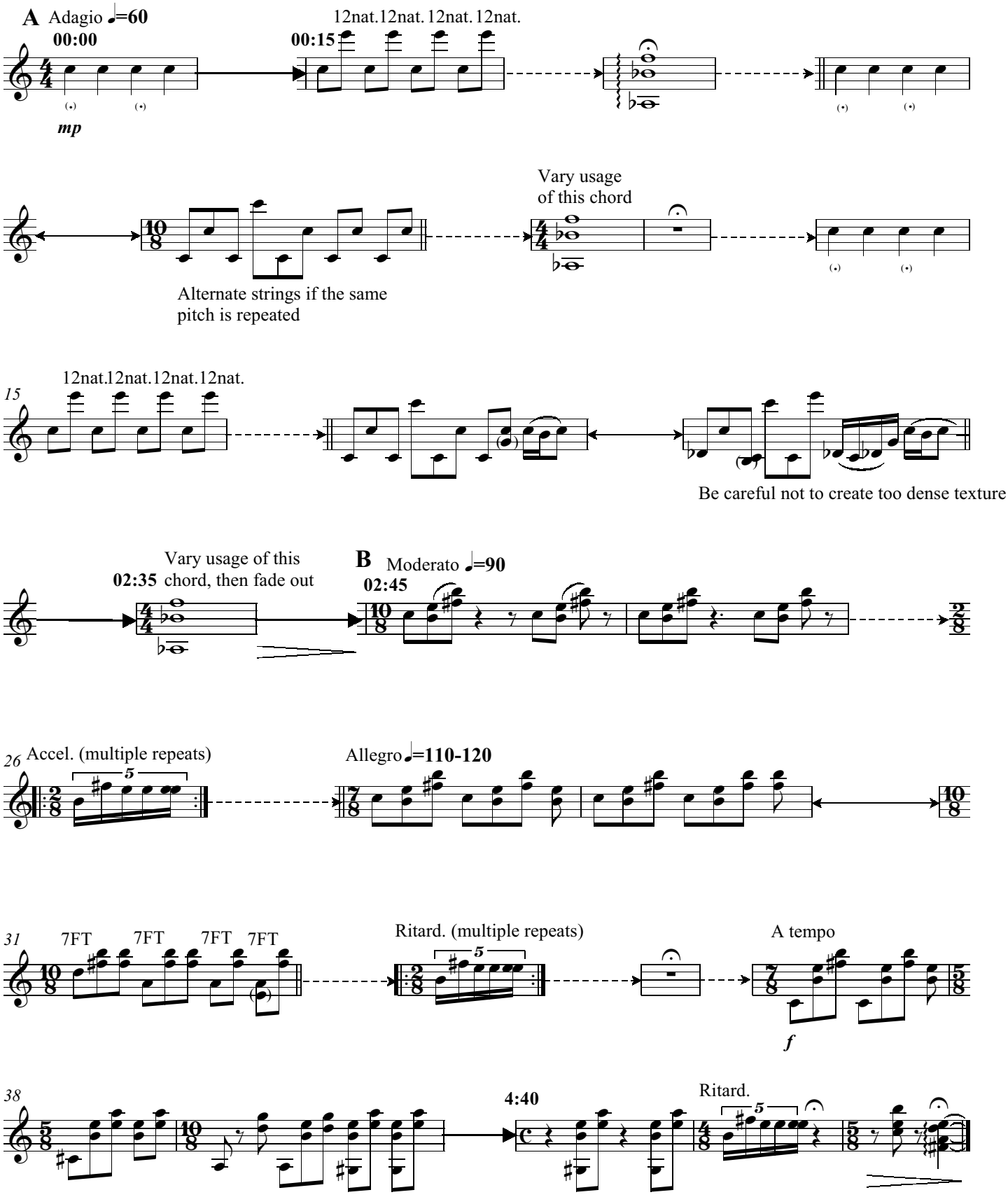



41
Adagio
mp
46
51
a tempo
accel.
56
♩ = 80
61
65
69
74
78
sfz
sfz
liss.


Allegro
f
Adagio
8va harmonic
* Press "Return" on the keyboard
to start 2nd movement
Softer upper C
Proceed directly into the
2nd movement

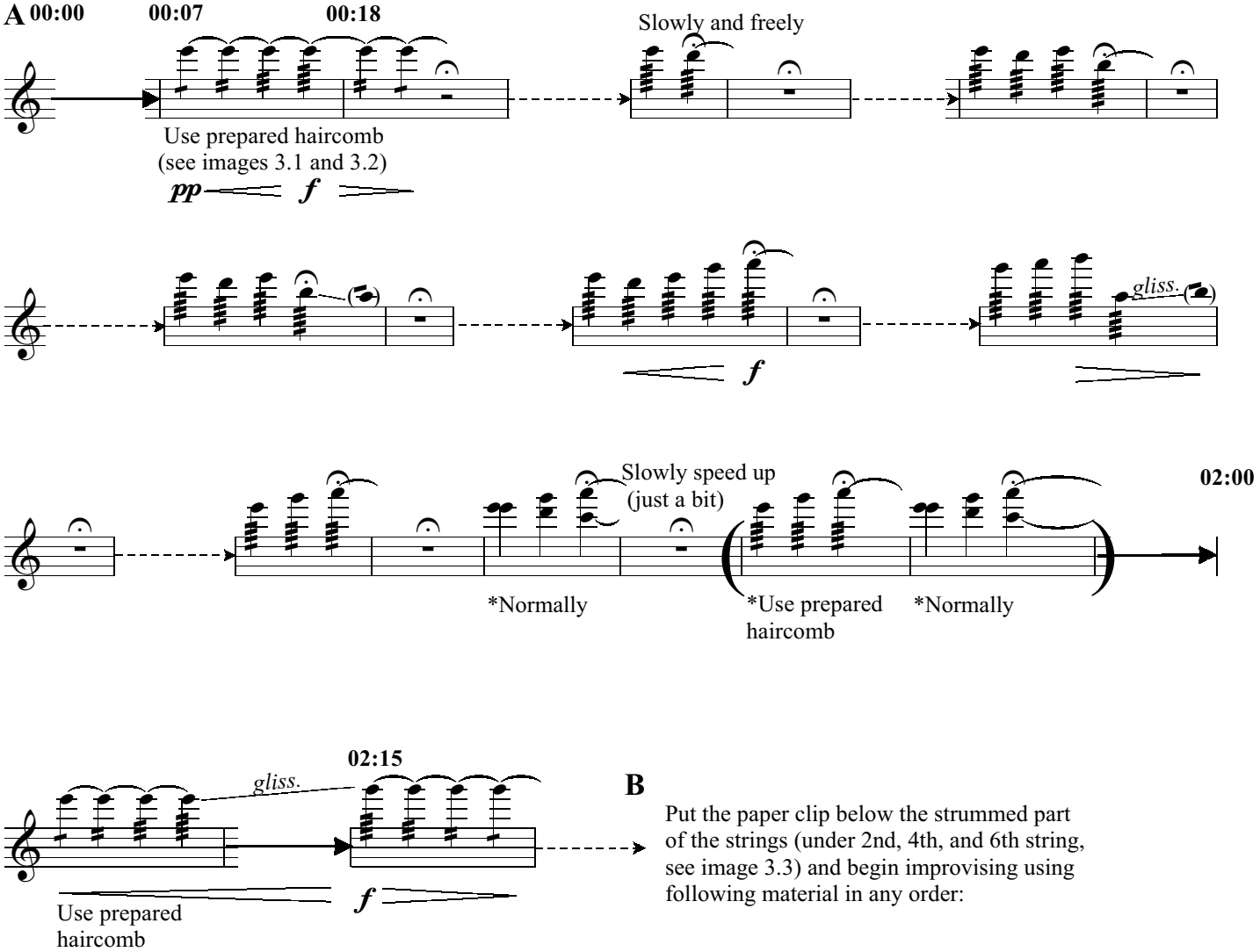
Meditations III: The Sea

2. Endless Blue



Meditations III: The Sea

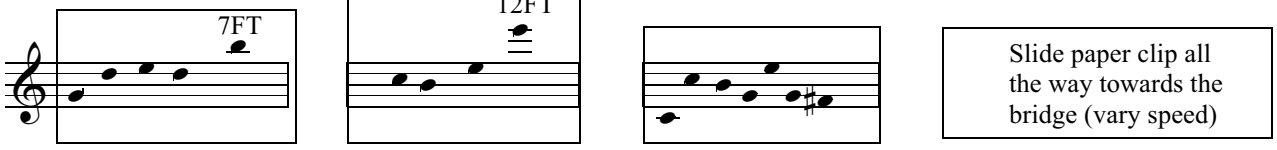
3. The Eye of a Storm



B

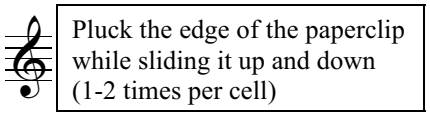
Put the paper clip below the strummed part of the strings (under 2nd, 4th, and 6th string, see image 3.3) and begin improvising using following material in any order:

Overall tempo is faster, although it may be varied depending on a cell and interpretation

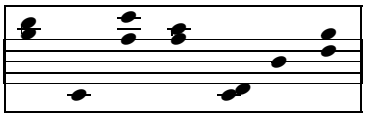


Slide paper clip all the way towards the bridge (vary speed)

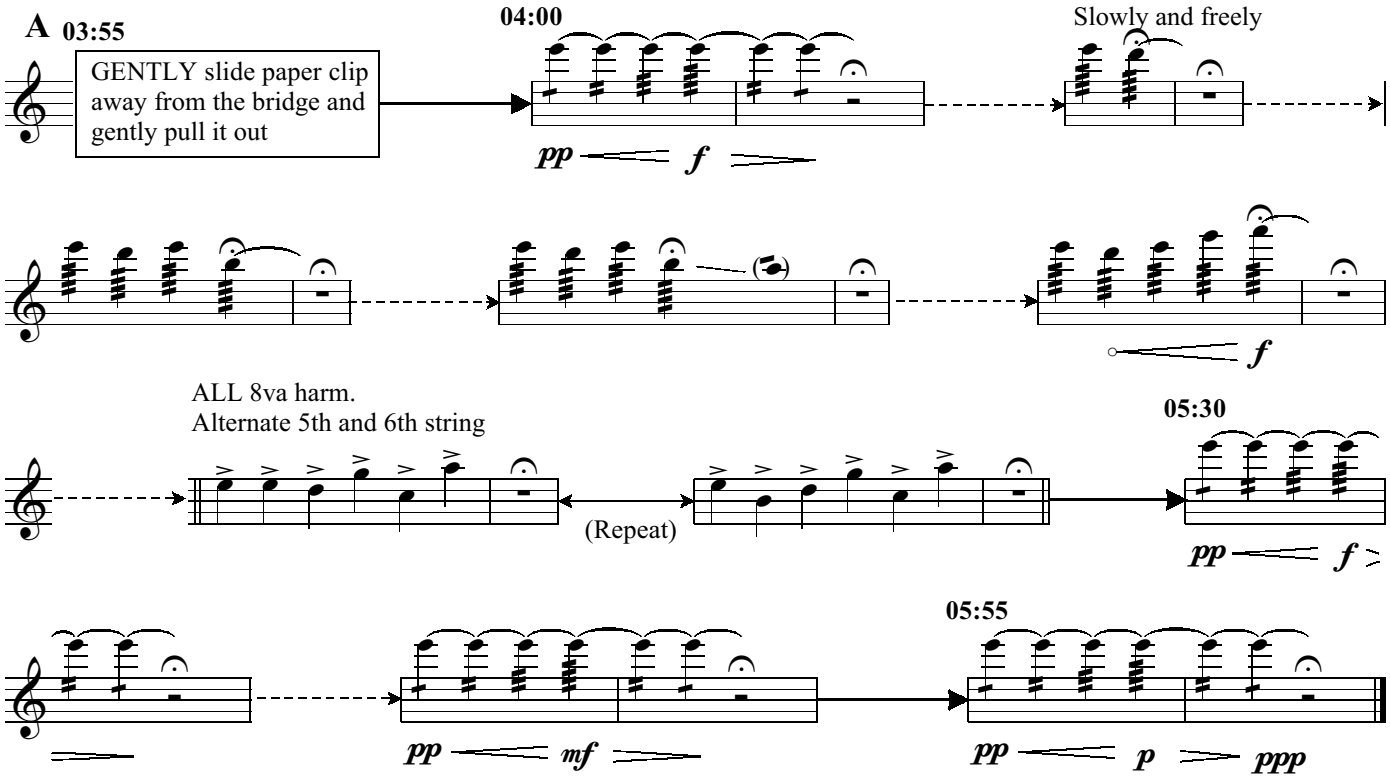
There MUST be separation between cells in a form of silence!



Pluck the edge of the paperclip while sliding it up and down (1-2 times per cell)

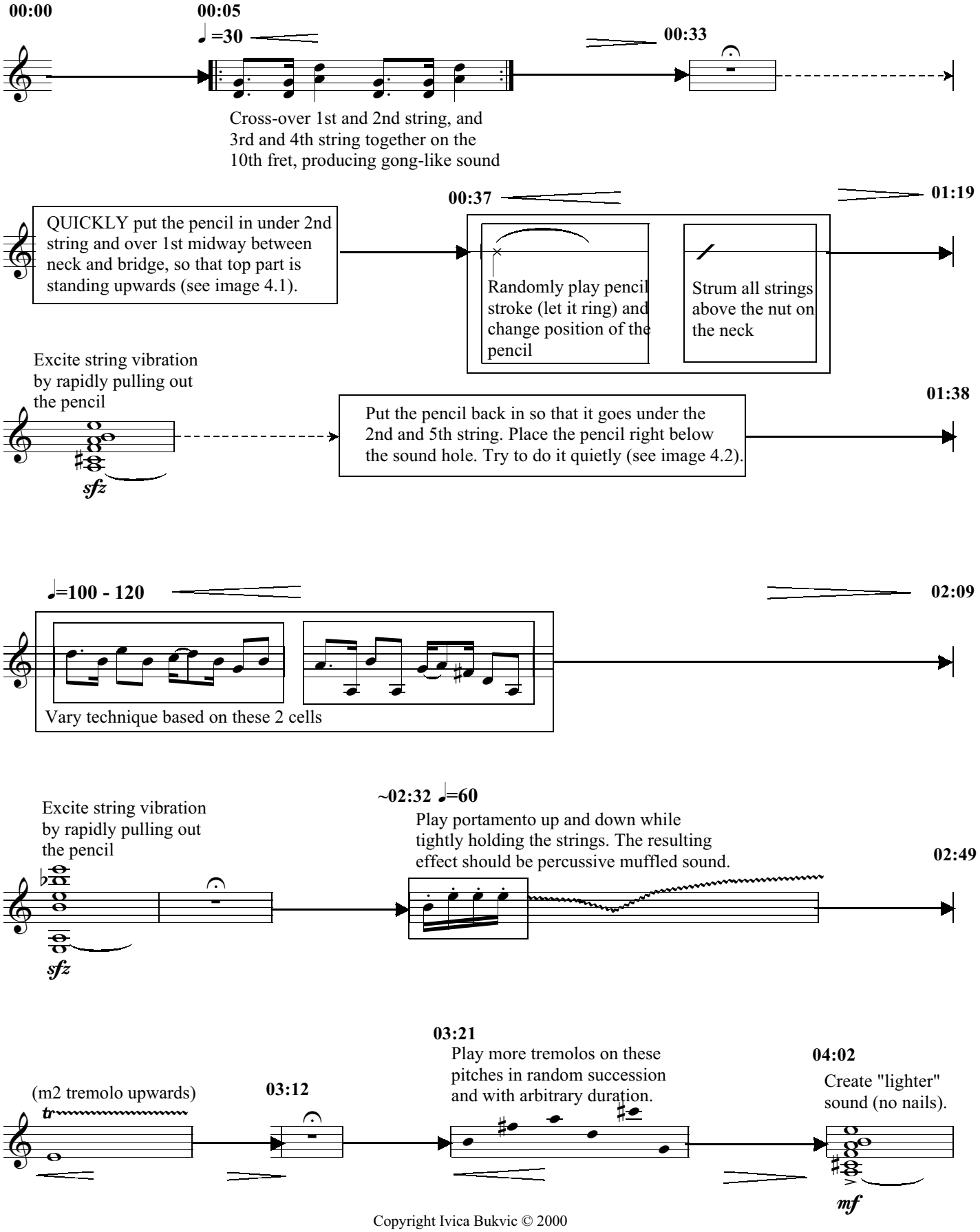


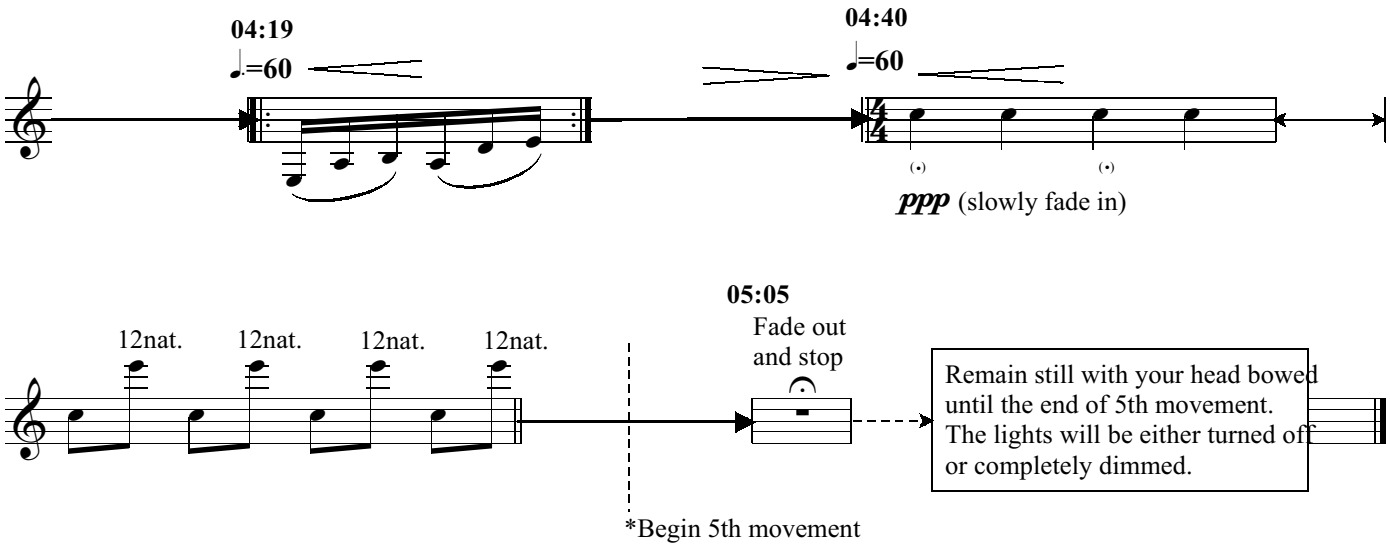
Tap on the body of the guitar with a hand (no nails!), in order to create muffled sound.


A
03:55
GENTLY slide paper clip away from the bridge and gently pull it out
04:00
Slowly and freely
pp
f
f
ALL 8va harm.
Alternate 5th and 6th string
(Repeat)
05:30
pp
f
05:55
pp
mf
pp
p
ppp

Meditations III: The Sea

4. Forgotten Shores




04:19
♩.=60
04:40
♩=60
ppp (slowly fade in)
12nat.
12nat.
12nat.
12nat.
05:05
Fade out
and stop
Remain still with your head bowed until the end of 5th movement. The lights will be either turned off or completely dimmed.
*Begin 5th movement