5-2024

Life beyond the Port of Beirut, album & drum triggering system.

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LIFE BEYOND THE PORT OF BEIRUT
ALBUM & DRUM TRIGGERING SYSTEM

By

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B.M., Capital University, 2020

A Thesis
Submitted to the Faculty of the
School of Music of the University of Louisville
In Partial Fulfillment of the Requirements
For the Degree of

Master of Music
in Music/Electronic Music

School of Music
University of Louisville
Louisville, KY

May 2024

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A Thesis Approved on

April 10, 2024

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ACKNOWLEDGEMENTS

To my family, friends, and country for being my life's first port - the port of love, nurture, and emergence to life.

To my professors and mentors for being my life's second port – the port of knowledge, achievement, and excellence.

ABSTRACT

LIFE BEYOND THE PORT OF BEIRUT
ALBUM & DRUM TRIGGERING SYSTEM

Ayman Abi Kheir

March 31, 2024

Life Beyond the Port of Beirut is a project of two parts: an album of 8 instrumental tracks and a drum triggering system. The title is in dedication to my country, Lebanon, and specifically to its main historical seaport in the capital, Beirut. This port is the historical starting point of the Lebanese diaspora who have spread their culture across the globe and contributed to the world culture.

The drum triggering system is a “do-it-yourself” system that enables drummers to trigger samples and virtual instruments through acoustic drum set and percussion. It was designed in Max for Live and Ableton Suite 11.

The album shares my life experiences “beyond the port of Beirut” as a student in the U.S. Six of the tracks are composed for drum set, bass, keys, guitar, and saxophone, with violin on one track. One track is fully computer-generated as MIDI; the last is ‘Musique Concrète’.

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INTRODUCTION

Art is expression. This project is an expression of my experiences and desires; experiences that have created inspiration, lessons, and emotion, and desires of innovation, expression, and growth. It is an expression of love and hope: love for life and country and hope for a better future.

Since its earliest history, Beirut has been a hub of culture on the Eastern coast of the Mediterranean. Many ancient civilizations have passed through its port and its natives have spread their inventions, products, and culture anywhere their ships have landed.

"Life Beyond the Port of Beirut" pays homage to this historical city and its port. It shares my life experiences abroad, "beyond this port", and it intends to give hope to all the Lebanese and remind them that there is life after the death caused by the Port of Beirut explosion. My life abroad is temporary, and I will return home one day, along with many other young Lebanese like me who were forced to leave the country due to the deteriorating economic, social, and political situation. We will all unite and join hands to help bring the life back to Beirut, its port, our country, and the whole world.

Through this project, I aim to contribute to the world of drum performance by finding ways of interpolating my degrees in jazz performance and electronic music composition. I therefore created a drum triggering system that will offer drummers another option to trigger samples and virtual instruments through their drum sets. In addition, I composed, recorded, and produced the album "Life Beyond the Port of Beirut"

with music that recounts my life experiences abroad and merges my musical influences from back home, my jazz studies degree, and my master's in electronic music composition.

DRUM TRIGGERING SYSTEM

Inspiration

What are some practical ways through which drummers can trigger electronic samples during their live performances? Drum sample pads[1] and electronic drum sets have been the used option since their invention. Drum sample pads are usually the more popular option since many drummers prefer still having the touch of an acoustic drum set while having an extra electric pad to trigger samples. However, is there a way to trigger electronic samples live through an acoustic drum set? Drum triggers[2] are used for that task and are becoming more popular. Drum triggers exist in two forms: single-zone triggers in which the signal is captured from one zone of the drum (the head of the drum) or dual-zone triggers in which the signal is captured from two zones, the head and rim of the drum. Usually, drum triggers are connected to drum sample pads or drum modules[3] that trigger built-in sounds or transfer the signal coming from the triggers to MIDI[4] information that can be sent to an audio interface and then trigger virtual instruments or samples inside a DAW (Digital Audio Workstation)[5]. However, commercial drum

[1] Electric Drum Pads that trigger pre-recorded sounds.
[2] Electronic transducer that is attached to a drum and allows it to control other drum modules.
[3] Electric devices that typically serve as the central processing unit of an electric drum set
[4] Musical Instrument Digital Interface: A digital communication protocol used to communicate musical information such as pitch, velocity, and duration.
[5] Software Program for recording, editing, mixing, and producing music.

triggers, sample pads, and modules can get pricey. Is there a cheaper way to trigger virtual instruments and samples from an acoustic drum set?

All these questions and thoughts were my inspiration behind creating my own drum triggering system. I saw some videos online of people attaching piezo pickup microphones[6] to their percussion instruments, connecting those microphones to an audio interface, and then transferring the audio signal coming from the piezo to MIDI information using a free plug-in[7] called KT-drum trigger. This was a cheaper option of achieving drum triggering without the use of a drum module. However, I tried searching online to find this plugin (KT-Drum Trigger) and discovered that it is an older plugin that is no longer available for download. I therefore decided to rely on my knowledge of Max for Live to create my own drum triggering system. Max for Live is a visual programming language that helps you create your own plug-ins in Ableton Live[8].

In the following sections of this chapter, I will go through an in-depth explanation of my drum triggering system: the gear I used, my Max for Live patch, and my Ableton Live session.

Gear

The following gear is needed for building the drum triggering system: piezo pickup microphones (I used the Pintech Percussion RS-5 Acoustic Head Triggers); gaffer tape to attach the triggers to the drums; quarter inch cables (to connect the triggers to the

[6] Similar to drum triggers - transducers that transfer the vibration of musical instruments into electric signals.
[7] Computer software that adds features to a host software
[8] Digital Audio Workstation for music creation and live performance.

audio interface); audio interface[9] with enough inputs for the amount of drums needed to be triggered (I used the Focusrite Scarlett 18i8 3rd gen audio interface); laptop with Ableton Live Suite which includes Max for Live (I used Ableton Live Suite 11).

Max for Live Patch

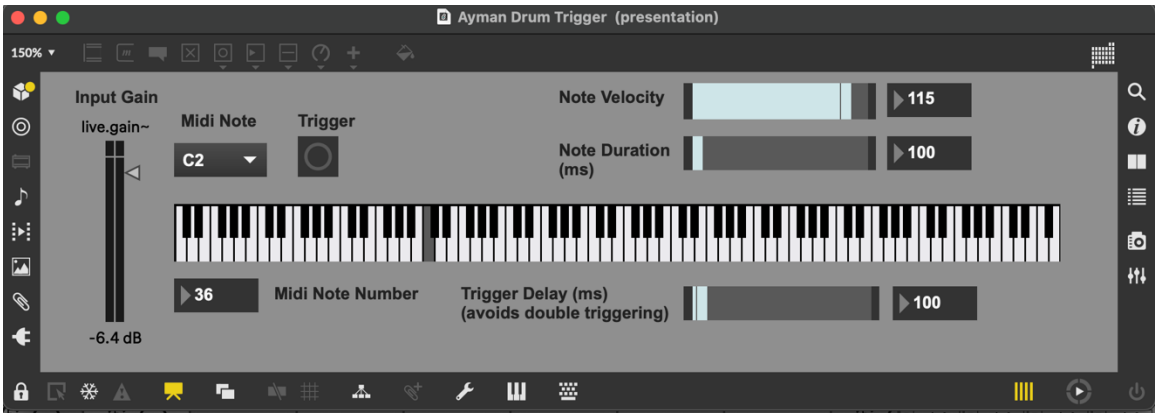


Figure 1. Max for Live Presentation Mode

Figure 1 shows the drum triggering Max for Live patch in presentation mode. In other words, when the user loads the drum triggering plug-in into an audio track in Ableton Live, this is how the plug-in will look.

The **Input Gain** slider sets the gain of the audio signal coming in from the piezo pickup microphone. This determines how sensitive the piezo is to vibration. The higher the gain level, the easier it is for the piezo to pick up softer drum strokes or vibrations. The lower the gain level, the harder it is for the piezo to pick up softer drum strokes or vibrations. One must be careful that if the gain level is too high, the piezo microphone can easily pick up signal from other drums being hit and can therefore cause unwanted

[9] Electric devices that convert the input of microphones or electric musical instruments into digital computing language.

triggering. It should be noted that the gain can also be adjusted on the input of the audio interface being used which will also adjust the sensitivity of signal pickup.

The **Midi Note, Midi Note Number,** and the **Keyboard** will all select the MIDI note that the user wants to trigger by the respective pickup microphone. The **Trigger** button will light whenever the system is triggering. This button can also be used to audition the sounds or virtual instruments being triggered by simply clicking on it. The **Note Velocity** slider and its number box will both set the volume of the triggered/outputted sound. They both have a range between 0 and 127; 0 is no sound and 127 is maximum volume. To adjust any of sliders in the patch simply drag it left or right. To adjust the value of any of the number boxes, you can either drag on the number box up or down or select it and type in the desired value and click return on Mac or enter on PC to set the value. The **Note Duration** slider and number box set the note length or duration of the output sound after each trigger. Both the duration slider and number box have a range between 0ms (millisecond) for shortest sound and 100,000ms (1.66 minutes) for longest sound. The range of any of the sliders or number boxes can be changed if the user accesses the patcher mode[10] of this Max for Live patch. The **Trigger Delay** slider and number box set the time after which the sound can be triggered again after each trigger. They have a range between 0ms for instantaneous trigger after each trigger and 2540ms (2.54 seconds) of maximum time interval after which the sound can be triggered another time. The **Trigger Delay** solves double triggering which is when a sound is triggered multiple times from only one trigger. If a user is experiencing double triggering, all they have to do is increase the trigger delay time to prevent multiple

[10] This mode is the mode used to code the system that appears in presentation mode and will be discussed under figure 2.

triggers. However, one needs to note that with a maximum trigger delay of 2540ms for example, they need to wait 2.54 seconds before they can hit the drums again to trigger a sound. It is therefore recommended to keep the trigger delay low unless a situation requires otherwise.

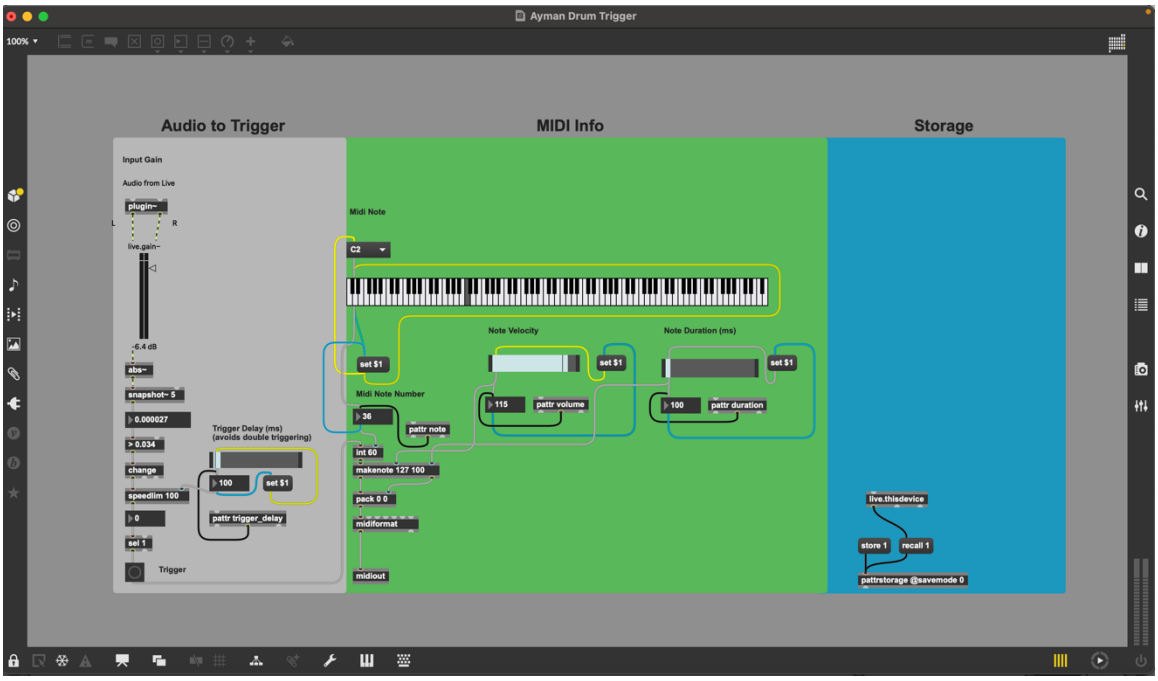


Figure 2. Max for Live Patcher Mode

Figure 2 shows the drum triggering Max for Live patch in patcher mode. This mode shows the behind-the-scenes code used to design the patch. The grey panel on the left, **Audio to Trigger,** is where the amplitude value of the digital audio signal coming from the drum triggers is broken down into discrete numbers that can be used to manipulate other parameters (in this case, those parameters are MIDI information). This concept is called "Envelope Following". As written in the "Envelope Following" tutorial of Max for Live, the technique of envelope following is when you "derive control values from amplitude parameters of an audio signal which can be used to control parameters

elsewhere in the signal chain".[11] This **Audio to Trigger** section starts with the [plugin~][12] object of Max for Live that receives audio from its respective audio track in Ableton Live. This stereo[13] audio signal that comes from two channels, the left and the right (thus the L and R), passes through the [live.gain~][14] object before it reaches the [abs~] object. [abs~] "takes any given signal and outputs only the absolute (non-negative) translation of that signal (i.e. a rectified waveform)"[15]. Since the amplitude of an audio signal alternates between negative and positive values, it is important to use the [abs~] object to ignore the difference between negative and positive sample values and only concentrate on their distance from 0. This will convert the signal to a rectified wave that will facilitate the process of deriving values from the amplitude of an audio signal[16]. The difference between how a sinusoidal signal will look like with and without the [abs~] object is shown below in figure 3.

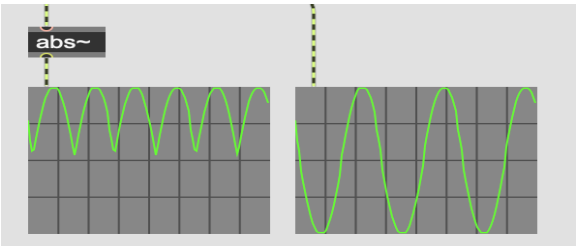


Figure 3. Absolute value of a signal (left) vs normal signal (right)[17].

After the [abs~] object, the signal passes through the [snapshot~] object that converts a signal value into a float[18] message. In this Max for Live patch, you see the

[11] Cycling '74, MSP Dynamic Tutorial 1: Envelope Following, March 22, 2024.
[12] All objects native to MAX/MSP will be presented inside [].
[13] Sound that is directed through two or more speakers so that it seems to surround the listener.
[14] The same **Input Gain** slider that appears in the presentation mode of this patch and is discussed earlier in this section.
[15] Cycling '74, abs~.maxhelp, March 23, 2024.
[16] Cycling '74, MSP Dynamic Tutorial 1: Envelope Following, March 23, 2024.
[17] Cycling '74, abs~.maxhelp, March 23, 2024.
[18] Decimal or fractional number.

argument “5” written in the [snapshot~] object. This argument tells [snapshot~] to output its value every 5 milliseconds. This value will appear in the number box object that is right under the [snapshot~] object. At the instant when the Figure 2 screenshot was taken, the number box showed a value of 0.000027. Due to the alternating nature of digital audio signal, the value inside this number box is constantly changing even when the [plugin~] object is not receiving any sound[19]. Since this patch uses the [abs~] object, this value only alternates between positive values in the range of zero and one[20] and ignores any negative values. When a drum is hit, a large amplitude is detected, and the number box shows a value that is closer to 1. The louder the stroke and/or the higher the gain of [live.gain~], the closer the amplitude will be to 1. To avoid any triggering or passage of messages to the rest of the system with every soft touch of the drum or before the drum is hit, the [>] (greater than) object is used. This object “compares two values to see if one value is greater than a second value. Outputs a 1 if the number is greater than the comparison-number or 0 if it is less than or equal to it”[21]. In this case, the comparison-number of [>] is 0.034[22]. So, when the amplitude of the incoming audio signal exceeds 0.034, a message of 1 is sent to the next object which is the [change] object. [change] “filters out repetitions of a number. It outputs a number only if it is different from the stored number” - (the stored number defaults to 0 if no initial argument was given) - “and will reset the stored number to that differing input number. Alternate

[19] Due to vibrations or soft sounds in the environment around the microphone and the constant static of electricity present inside the audio cables and interface, small inaudible amplitudes are always present in the signal chain.
[20] Audio signal amplitudes in Max for Live objects alternate in the range of -1 and 1.
[21] Cycling ’74, greaterthan.maxhelp, March 23, 2024.
[22] This is an estimated value that is chosen through trial and error.

modes of operation also identify greater-than or less-than conditions".[23] Therefore, the purpose of [change] in this patch is to filter out the consecutive multiple occurrences of 0 or 1 received by [>0.034] and keep updating those successive changes. Next comes the [speedlim] object. This object is the one responsible for avoiding double triggering[24] through the **Trigger Delay** slider and number box in the presentation mode of the patch. The left inlet[25] of [speedlim] receives the message that needs to be sent out of it and the right inlet sets the time interval after which that message output is delayed in milliseconds. The argument written inside [speedlim] initializes that delay time (100ms in this case) but is replaced by any number received by the right inlet. In this patch, the right inlet value is updated by the slider and number box connected to it which have a range between 0ms and 2540ms. "A message received in the left inlet is sent out the outlet,[26] provided the specified minimum amount of time has elapsed since the previous output. Otherwise, [speedlim] waits until that amount of time has passed, then sends out the last message it has received since the previous output"[27]. That is why when [speedlim] receives a 1 or a 0 from [change], it directly sends that message out. However, if during the specified delay time interval after the first output, it receives multiple 1's and 0's, it will wait until the end of the time interval to output the last 1 or 0 it had received[28]. The number box after [speedlim] views and outputs the 0's or 1's it receives. Then, the [sel 1] object only selects 1 from the number box to trigger the button

[23] Cycling '74, change.maxhelp, March 23, 2024.
[24] Refer to page 6.
[25] Inlet is the name given to the input of a max object where it receives messages and is located on the top of the object.
[26] Outlet is the name given to the output of a max object where it sends out messages and is located at the bottom of the object.
[27] Cycling '74, Documentation: speedlim Reference output, March 24, 2024.
[28] Refer to page 6 for more details on how this feature should be used in the system.

after it. The button won't be triggered if the value of the number box before [sel 1] outputs 0. Therefore, the whole function of the grey panel **Audio to Trigger** is to send a trigger to the green panel **MIDI Info**. That trigger is only sent when the piezo pickup microphone detects an amplitude that is above the threshold set by [live.gain~].

In the green **MIDI Info** panel, a MIDI note can be selected through the 'MIDI Note' box menu, the keyboard, or the 'MIDI Note Number' number box. Those three objects send the selected MIDI note/number/pitch to the [int][29] object. That message is then sent to the left most inlet of [makenote]. [make note] "outputs a MIDI note-on message paired with a velocity value followed by a note-off message after a specified amount of time. This allows for generative MIDI output without having to manage note-off generation".[30] The left inlet of [makenote] receives the MIDI note number, the middle inlet receives the MIDI note velocity (volume), and the right inlet receives the MIDI note duration. Notice the **Note Velocity** slider and number box and the **Note Duration** slider and number box that are sending messages to the middle and right inlet of [makenote] respectively.[31] The outputted values of those sliders and number boxes replace the initial 127 argument for velocity and the 100ms argument for duration. When triggered, the left outlet of [makenote] will send the pitch output to the left inlet of [pack] and the right outlet of [makenote] will send the velocity output to the right inlet of [pack]. The duration will be automatically sent as built-in hidden message from [makenote]. [pack] creates a list by "combining items into an output list. The arguments determine the list format and types of the list elements. The number of inlets is based on the

[29] [int] stores and outputs any integer value it receives.
[30] Cycling '74, makenote.maxhelp, March 24, 2024.

[31] Refer to pages 5 and 6 for the ranges of those sliders and number boxes.

number of arguments".[32] In this case, the "0 0" arguments in [pack] will gather the pitch and velocity integer numbers that [pack receives] and outputs them as a list to the left inlet of [midiformat]. "Numbers received in the inlets of [midiformat] are used as data for MIDI messages. The data is formatted into complete MIDI messages (with the status byte determined by the inlet) and sent out the outlet as individual bytes".[33] In this patch, we only need to use the left inlet of [midiformat] which receives a list of pitch and velocity (note-on or note-off) from the [pack] object (duration is also received automatically as a hidden message inside the object). [midiformat] will then send all this MIDI information from its left outlet into [midiout]. [midiout] "transmits raw MIDI data to a specified port".[34] If there is no argument for port,[35] [midiout] transmits MIDI information out of port a. In this system, [midiout] will send all the MIDI information to the Ableton Live audio track on which this drum triggering Max for Live patch is placed.

Notice all the blue and yellow cables that connect the number boxes and sliders to a [set$1] message box. A set message in Max for Live will set a value that it receives or that is written in it as an argument in the object it is connected to. The $1 argument is the argument that receives variables (any number) from the objects connected to it. The goal of this [set $1] message in this patch is to connect the number boxes and sliders together by making the value on one set the value in the other. This will allow the user to see the value they change in a number box appear on the respective slider and the value they change on the slider appear on the respective number box. The same applies to the

[32] Cycling '74, pack.maxhelp, March 24, 2024.
[33] Cycling '74, midiformat.maxhelp, March 30, 2024.
[34] Cycling '74, midiout.maxhelp, March 29, 2024.
[35] A MIDI port is a connection that is specific to each MIDI device being used.

keyboard, the **MIDI NOTE** menu, and **MIDI NOTE NUMBER** box which are all connected to a [set $1] message box.

The blue **Storage** panel on the right is where the parameters of the patch are saved. This allows for the same last changed values of [live.gain~], MIDI note, velocity, duration, and trigger delay to be saved and opened up when the Ableton session is opened the next time. This storage system starts with the [live.thisdevice] object that "sends a bang automatically when a Max Device is loaded or to report a device state".[36] Therefore when the Ableton Live session is opened again, [live.thisdevice] will send a bang from its left outlet to the [recall 1] message box. The [store 1] and [recall 1] message boxes are connected to the [pattrstorage] object that has the save mode 0. The [pattrstorage] is an object that saves presets in Max for Live. The [@savemode 0] argument will allow it to save initial presets. To set the initial preset, a [store] message with a number argument (in this case 1) needs to be sent to [pattrstorage] after the preset parameters are changed. To identify the preset parameters that need to be stored, [pattr] objects with given names need to be connected through their middle outlet to the inlet of the object with the parameter that needs to be saved. When the changes are made and the [store] message is pressed, the [pattr] objects will send the set parameters to [pattrstorage] to be saved and loaded as presets when the [recall] message is pressed. The [recall] message will only recall the preset that was saved with the [store] message that shares its number argument.

[36] Cycling '74, live.thisdevice.maxhelp, March 29, 2024.

Ableton Live Session

In this section, I will demonstrate two ways I used to set up the Ableton Live session for drum triggering using this Max for Live patch. These are not the only ways. One can use the Max Patch and set up the Ableton session in any way that suits their needs.

Method 1:

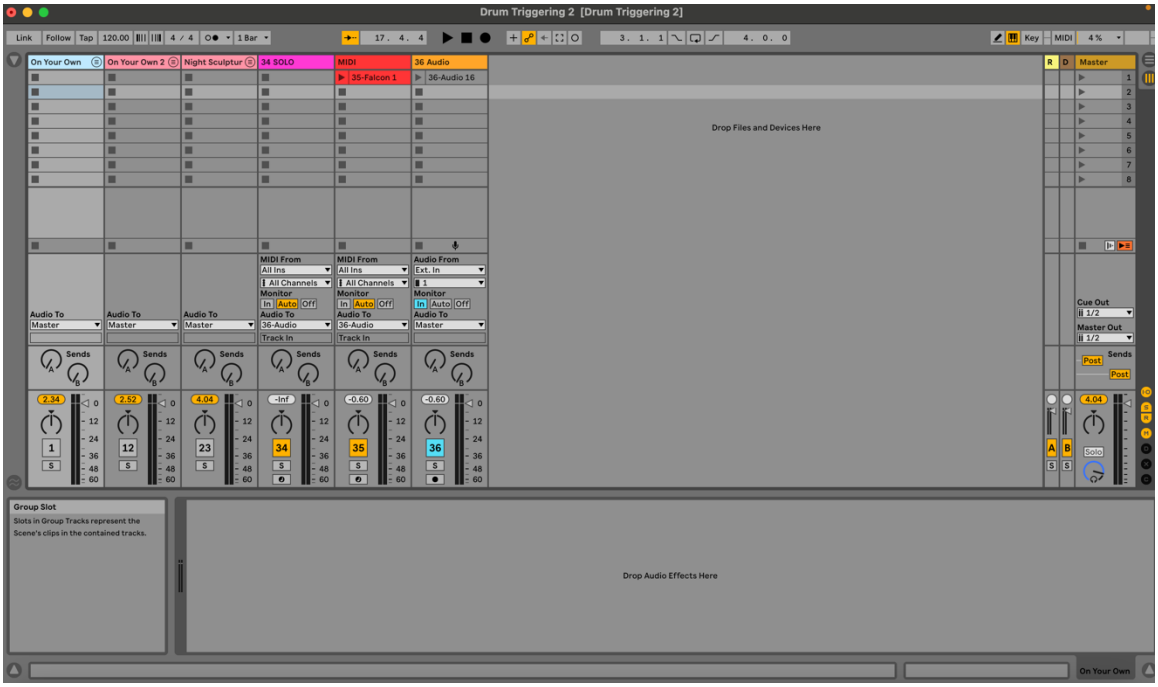


Figure 4. Ableton Live Setup Method 1, Screenshot 1.

Figure 4 shows an Ableton Live session with 6 tracks. The first three tracks on the left are group tracks[37] that contain other tracks within them. These are the tracks used for drum triggering. The other 3 tracks on the right can be ignored because they were just used to record some of the samples. Each of the first three tracks on the left represents a

[37] In this example, those tracks are the ones named "On Your Own", "On Your Own 2", and "Night Sculpture". To open them, one must click the small circle with the three horizontal lines on the right of each of their names.

separate sound library to be triggered by the drum set. To change between the libraries, one must mute or unmute the track activator[38] square buttons at the bottom of each track. For ease of performance, it would be helpful to map those track activators to a MIDI controller or computer keyboard to avoid having to mouse-click them each time one wants to mute or unmute a sound Library.

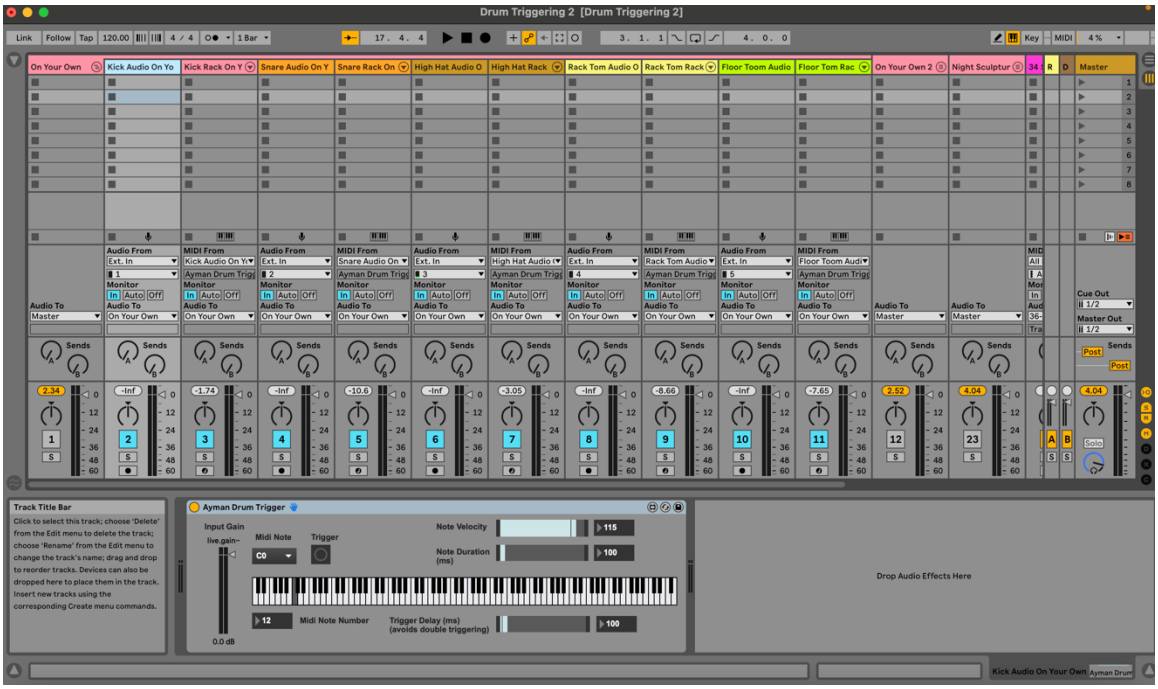


Figure 5. Ableton Live Setup Method 1, Screenshot 2.

Figure 5 shows how the inside of those group tracks might look like. If you notice inside the opened group called "On Your Own", there are 5 pairs of tracks. The first pair is for the kick drum, the second is for the snare drum, the third is for the high hat, the fourth is for the rack tom, and the fifth is for the floor tom. The selected track that is highlight in light blue and is named "Kick Audio On Yo…", is an audio track that receives signal from the piezo pickup microphone attached to the batter head of the kick

[38] Track Activator buttons in Ableton Live will mute or unmute the track. In figure 4, they are the squares numbered 1, 12, 23, 34, 35, and 36.

drum using gaffer tape. The Max for Live drum triggering plug-in is inserted on this audio track and appears at the bottom of figure 5. When the kick drum is played, the piezo microphone will send the signal to the Max for Live patch which sends a MIDI note with the selected information out of the kick audio track. The MIDI track right next to the kick audio track on the right, and that is named "Kick Rack On Y…", will receive this MIDI note. Notice how in the **MIDI From** menu of this track, the kick audio track is selected. This will allow this MIDI track to receive MIDI information from the kick audio track.

Figure 6. Ableton Live Setup Method 1, Screenshot 3.

On the "Kick Rack on Y…" MIDI track, a drum rack is inserted as shown in figure 6. A drum rack is a built-in plug-in of Ableton that allows the user to insert virtual instruments or audio samples on its different square MIDI notes. In this case, a sample is inputted on the MIDI note C-1 on the drum rack. It should be noted that a C0 sent from the Max for Live patch will trigger a C-1 on the drum rack due to unmatching

configuration. The signal chain will thus flow like this: 1) the kick is played, 2) the piezo pickup microphone will send an audio signal to the kick audio track in Ableton, 3) the Max for Live patch on the kick audio track will then trigger a MIDI note with selected information, 4) this MIDI note will be received by the drum rack on the kick midi track and play the sample placed on the matching MIDI note square. This audio and MIDI track pair of the kick, applies to all the other pairs shown in figures 5 and 6.

Method 2:

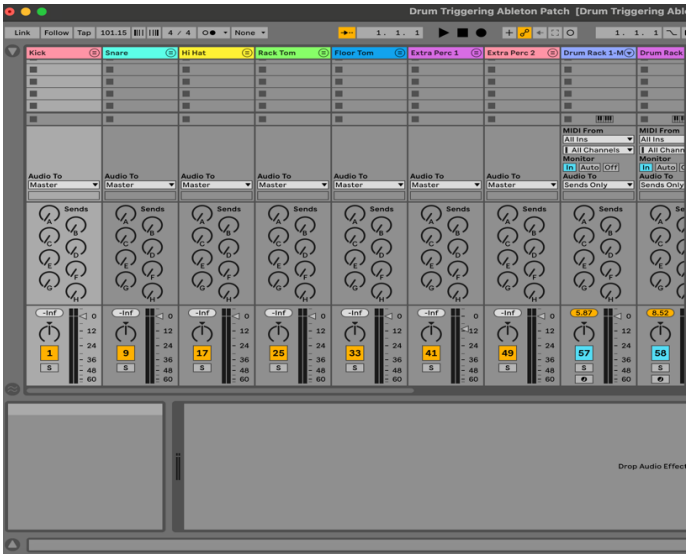


Figure 7. Ableton Live Setup Method 2, screenshot 1

Figure 7 shows the Ableton Live setup for method 2. The first seven tracks named “Kick”, “Snare”, “High Hat”, “Rack Tom”, “Floor Tom”, “Extra Perc 1”, and “Extra Perc 2” are the groups that represent each of the drum set instruments that will trigger sounds inside the Ableton session.

Figure 8. Ableton Live Setup Method 2, screenshot 2.

Figure 8 shows the inside of one of the group tracks, the "Kick" group. The first track in this group is an audio track named "Kick Audio" which receives audio signal from the piezo pickup microphone attached to the kick drum. This signal will then be received by the Max for Live drum triggering plug-in on this audio track. The plug-in will then send the selected MIDI note to each of the other MIDI tracks named "Kick Midi 1-6" in this "Kick" group. Notice how 'Kick Audio' is selected in the **MIDI From** menu of all those MIDI tracks. Each of those MIDI tracks will then send the MIDI information they receive from "Kick Audio" to the respective MIDI tracks that have drum racks. Those drum rack MIDI tracks are selected in the **MIDI To** menu of the "Kick Midi" tracks.

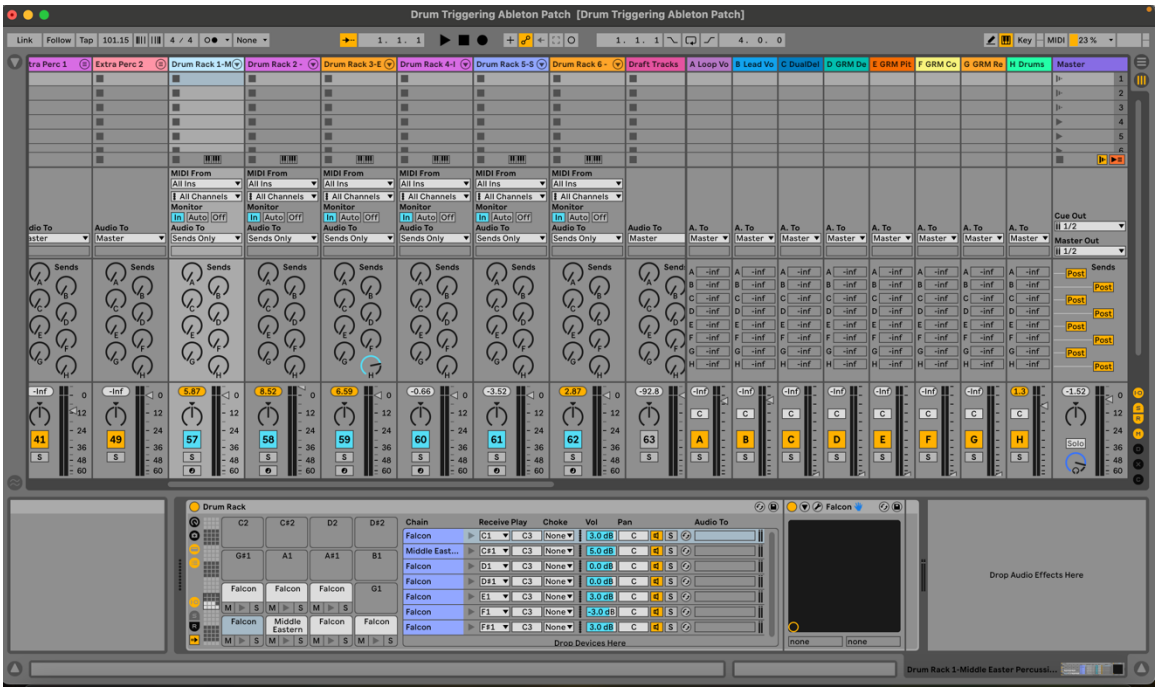


Figure 9. Ableton Live Setup Method 2, screenshot 3.

Figure 9 shows the MIDI tracks that contain the drum racks; there are 6 of them. Each one of them will receive MIDI from its respective MIDI track in the “Kick” group and all the other groups which have the same setup as the “Kick” group. Notice how the drum rack on the selected MIDI track has 7 virtual instruments or samples placed on 7 MIDI note squares that receive their respective MIDI note trigger from each of the 7 drum groups. Similar to Method 1, one can move between the sound libraries of each drum rack track by muting or unmuting the track activator button.

ALBUM

Overview

My background as a gigging drummer has always given me the opportunity to be in the studio to record drums for other musicians' projects or my own. For my first and previous album *Zayzafoon*, I was the composer, drummer, and producer but not the recording, mixing, or mastering engineer. Since the best way to learn is to do, I decided to not only be the composer, drummer, and producer on *Life Beyond the Port of Beirut*, but also the recording, mixing, and mastering engineer. I thought it will be an invaluable experience for me to try this attempt and apply all the knowledge I gained in the master's degree of Electronic Music Composition.

Since the title of the album pays homage to my country, I used a plug-in called "Solo" by Taqsim which enabled me to use Middle Eastern maqams (scales) and virtual instruments. Other virtual instruments I used are UVI's Falcon and Arturia's Analog Lab V. I also used the Glitch2 plug-in by Illformed and the Ina GRM Classic Tools to help me create some ambient, glitchy, and experimental effects. In addition, I used UVI's drum replacer to trigger drum samples with my recorded drum set, Sparkverb for reverb, and Dual Delay X for delay, besides other built-in Ableton Live Suite 11 effects like Eq (equalization) and compression.

The album was recorded in Ableton Live suite 11 using my Focusrite Scarlett 18i8 3rd gen interface. The featured musicians are: Phenex Schwarz-Ward on saxophone, Will

Doty on keys, James Powell on guitar, Christian Mullins on bass, Blakeley Burger on violin, and myself, Ayman Abi Kheir on drums.

The 8 tracks of the album are listed in order below with their respective art, reference notes, and scores when applicable. All art was designed by me using the Canva Visual Suite.

On Your Own

Figure 10. On Your Own Art

Reference Notes:

Tonality: Atonal.

Melody: Motivic Development.

Harmony: Non-Functional Harmony.

Form: Through Composed.

Style: African 12/8.

Description: *On Your Own* is a flow of ideas, thoughts, and emotions that I experienced during the summer of 2020 when the lockdown prevented me from flying home to see my family. I therefore found myself "on my own" trying to handle the responsibility of life.

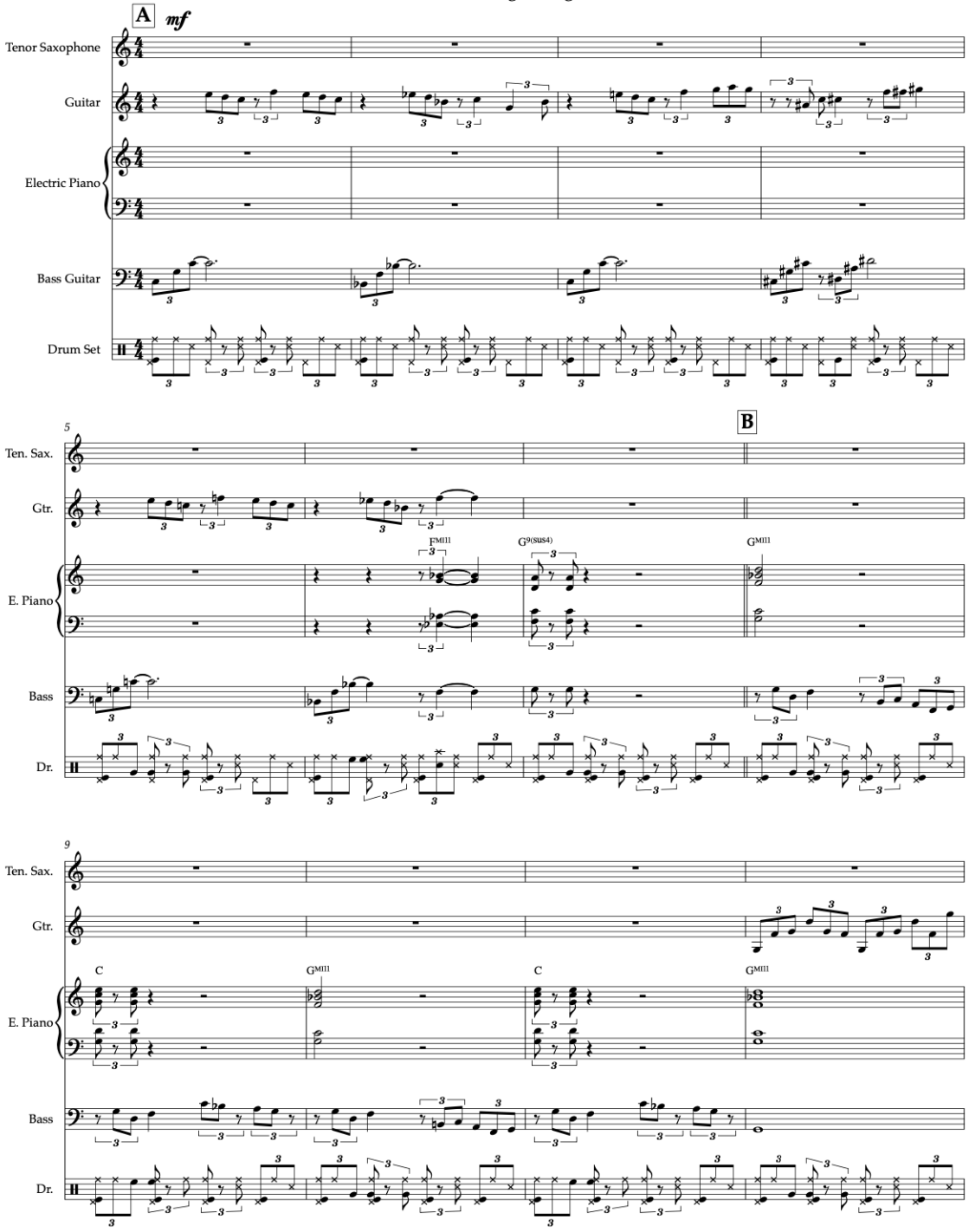
On Your Own

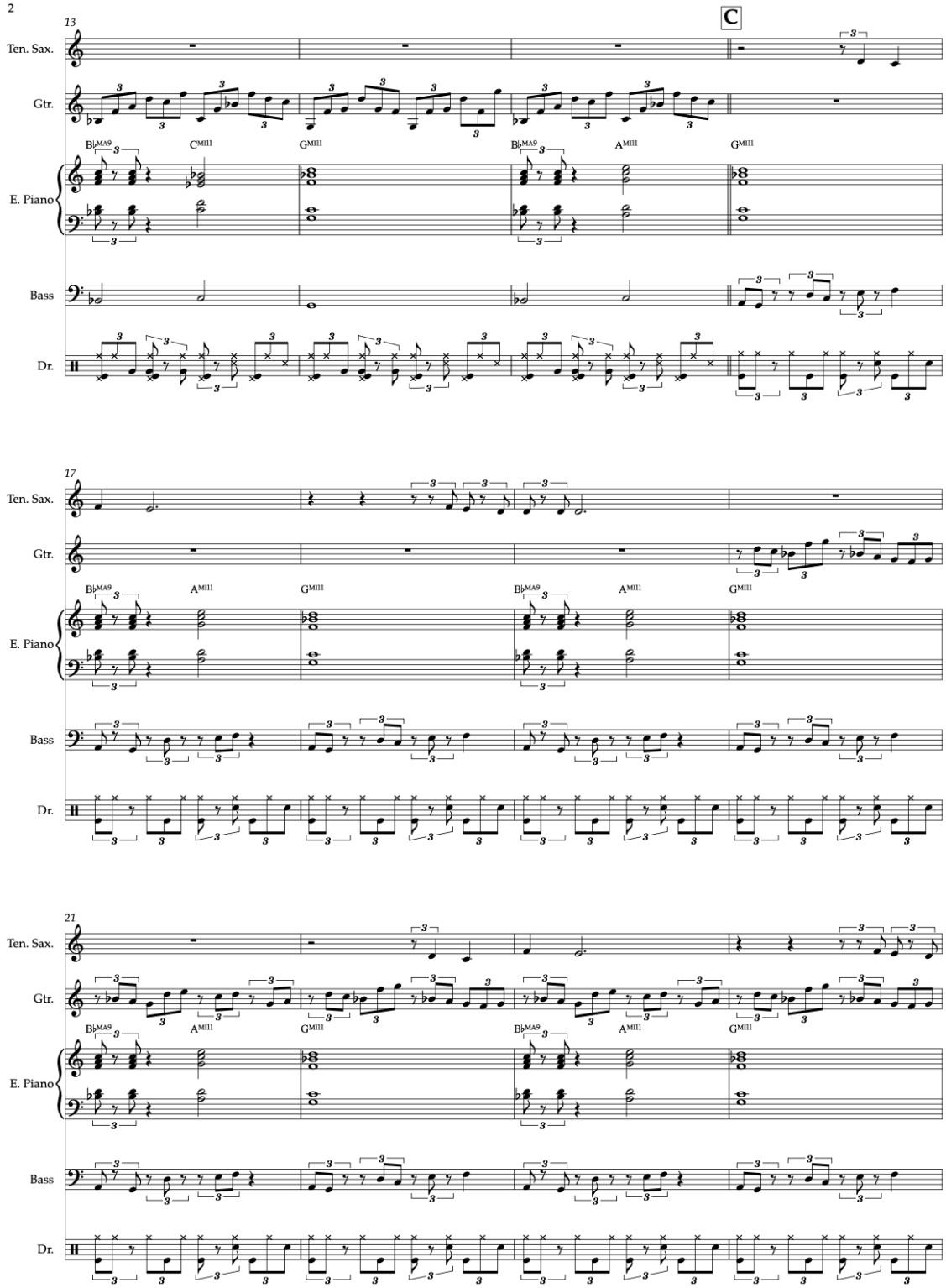
♩ = 100

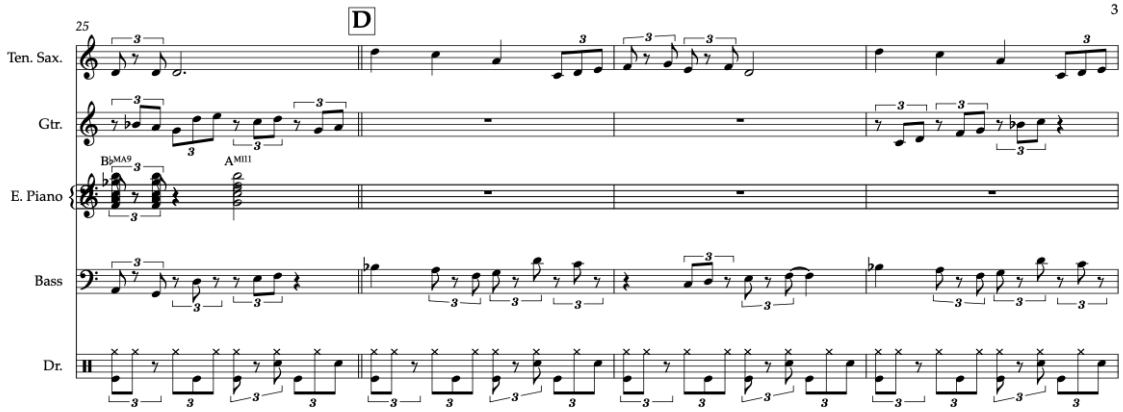
African 12/8

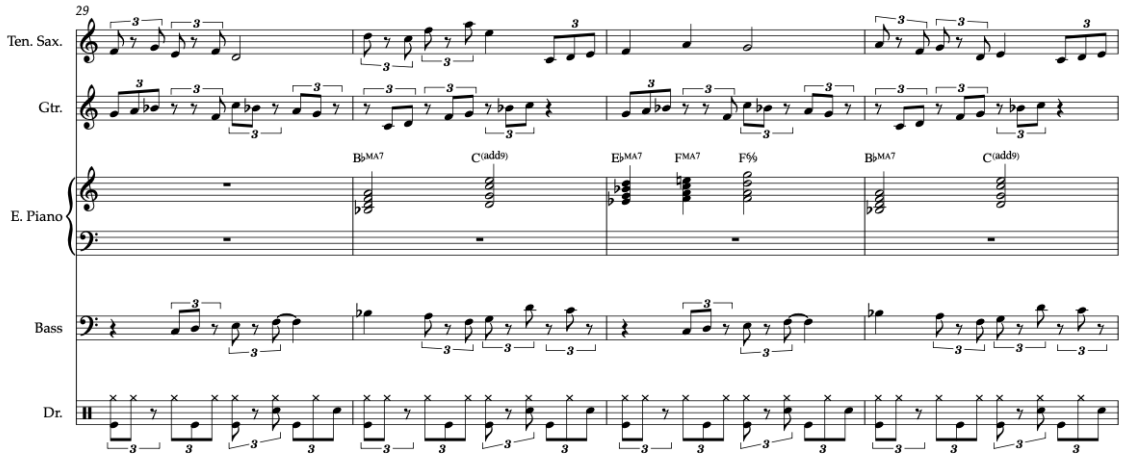
(Drum intro with electronics at the beginning then start on drum cue)

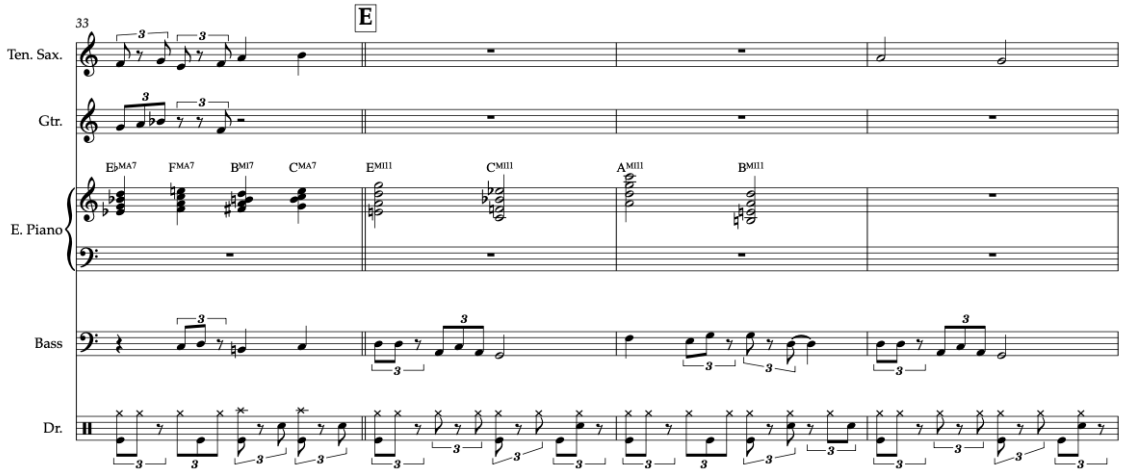
Ayman Abi Kheir 2020

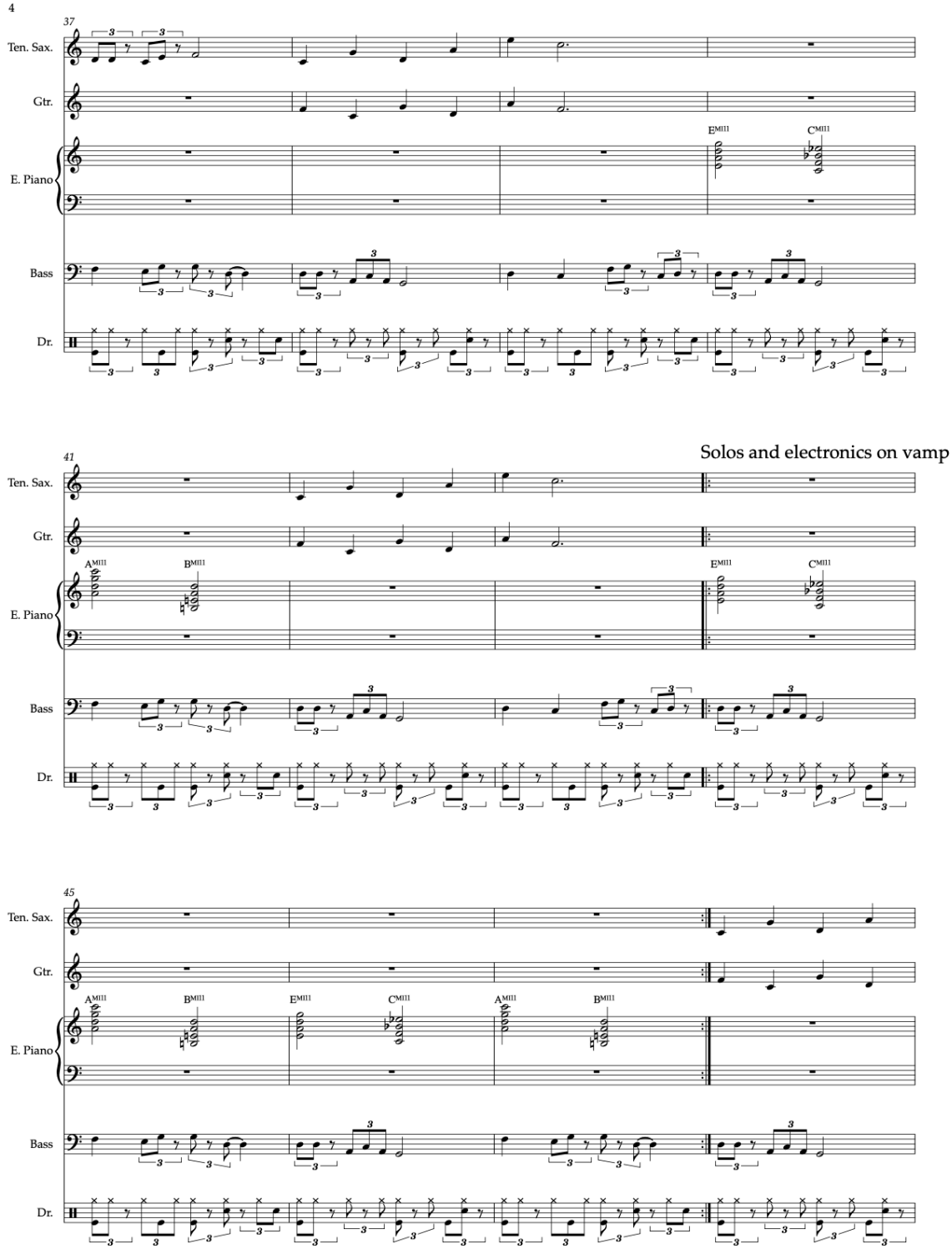



2
13
C
Ten. Sax.
Gtr.
E. Piano
Bass
Dr.
B♭MA9
CMIII
GMIII
B♭MA9
AMIII
GMIII
17
Ten. Sax.
Gtr.
E. Piano
Bass
Dr.
B♭MA9
AMIII
GMIII
B♭MA9
AMIII
GMIII
21
Ten. Sax.
Gtr.
E. Piano
Bass
Dr.
B♭MA9
AMIII
GMIII
B♭MA9
AMIII
GMIII


25
D
Ten. Sax.
Gtr.
B♭MA9
AMI11
E. Piano
Bass
Dr.


29
Ten. Sax.
Gtr.
B♭MA7
C(add9)
E♭MA7
FMA7
F♯ø
B♭MA7
C(add9)
E. Piano
Bass
Dr.


33
E
Ten. Sax.
Gtr.
E♭MA7
FMA7
BMI7
CMA7
EMI11
CMI11
AMI11
BMI11
E. Piano
Bass
Dr.


4
37
Ten. Sax.
Gtr.
E. Piano
Bass
Dr.
EMIII
CMIII
41
Solos and electronics on vamp
AMIII
BMIII
45

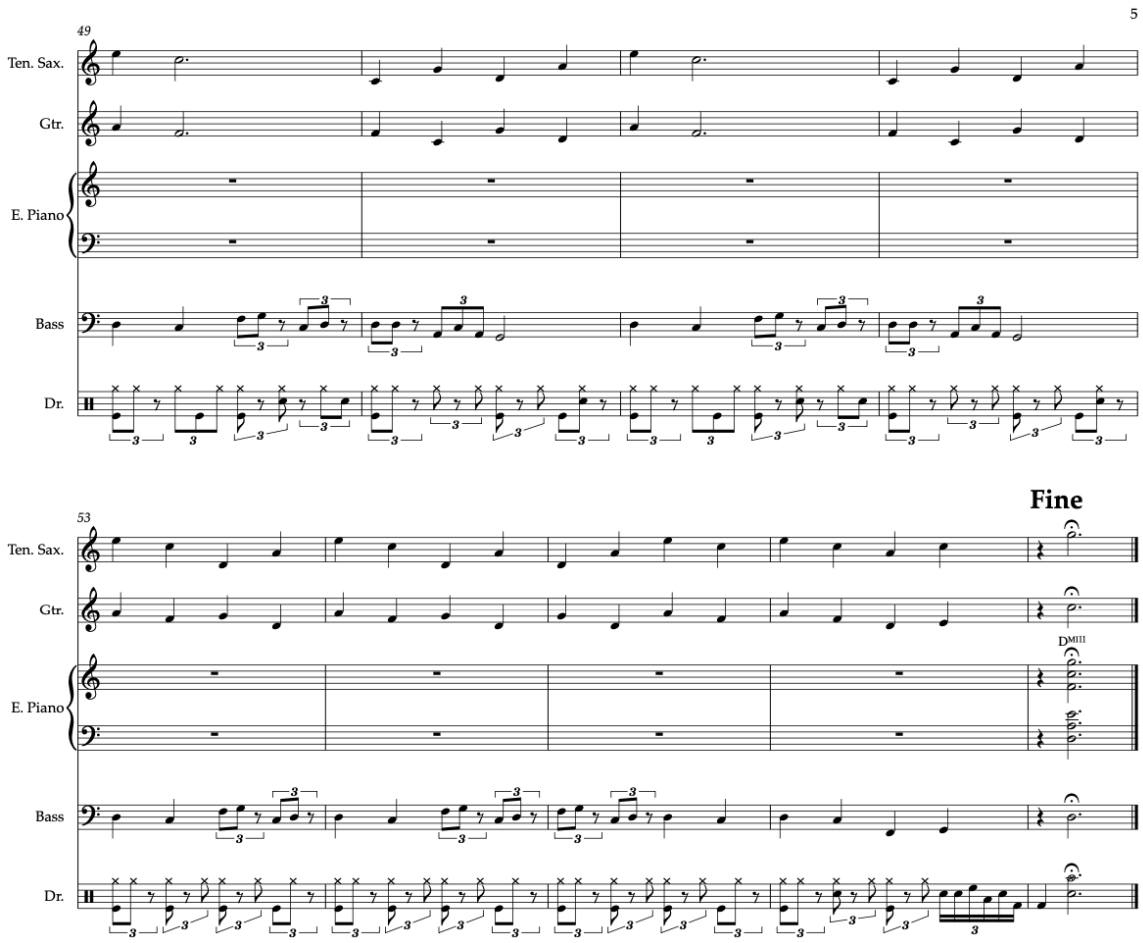


Figure 11. On Your Own Score

Night Sculpture with Dale

Figure 12. Night Sculpture with Dale Art. (Painting of Dale by Jacinto Guevara)

Reference Notes:

Tonality: Modal, Minor**,** Atonal.

Melody: Motivic Development.

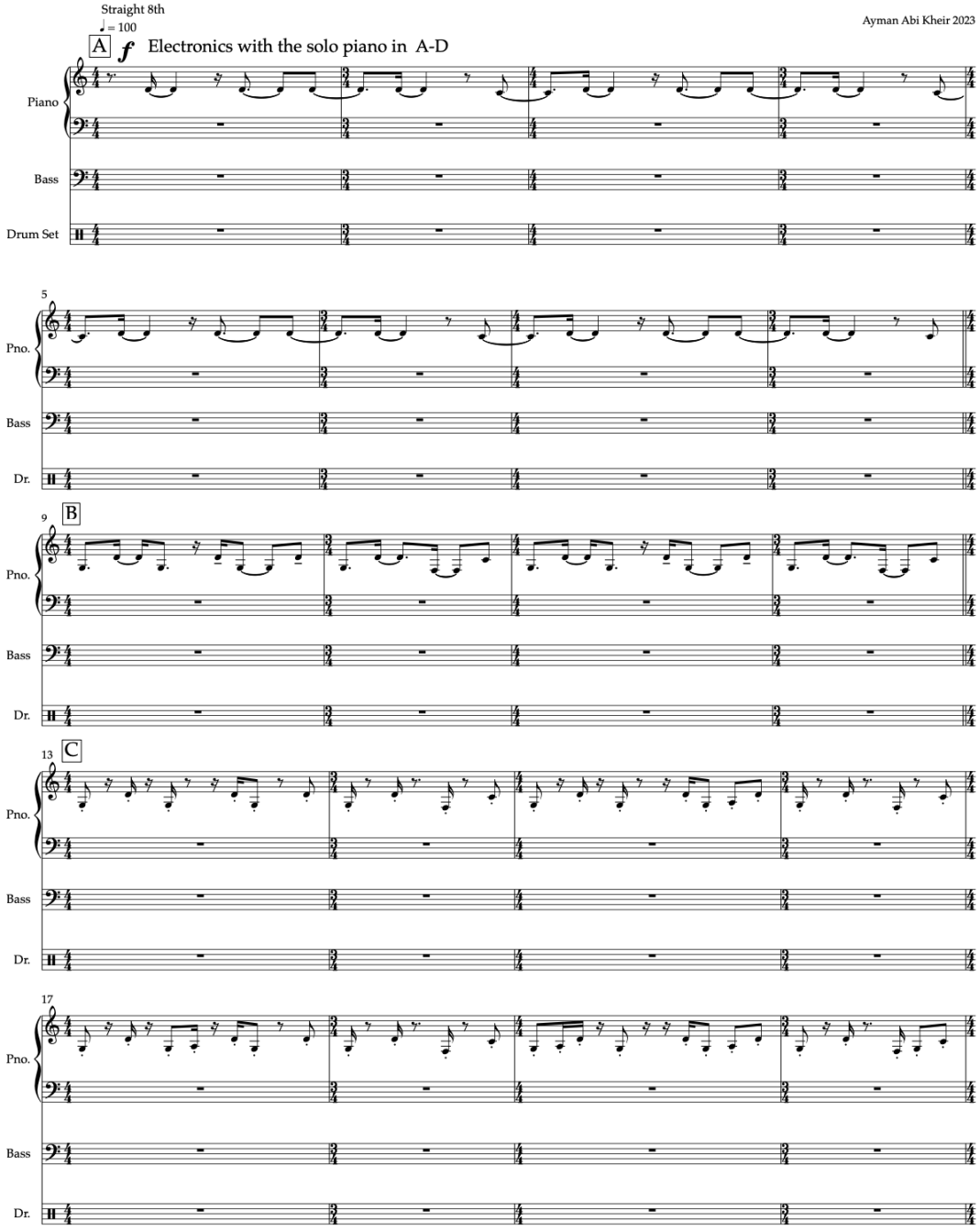
Harmony: Non-Functional Harmony.

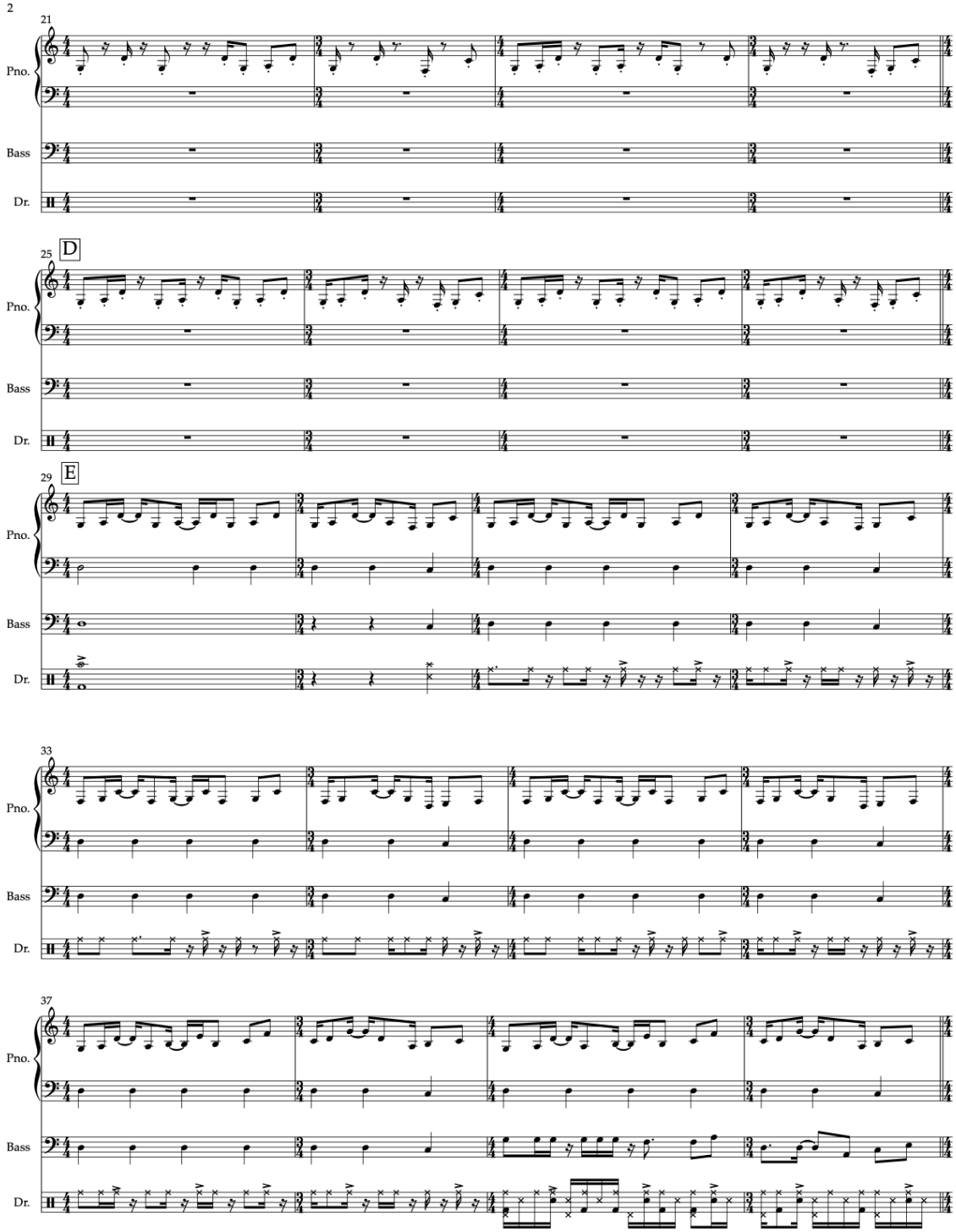
Form: Through Composed.

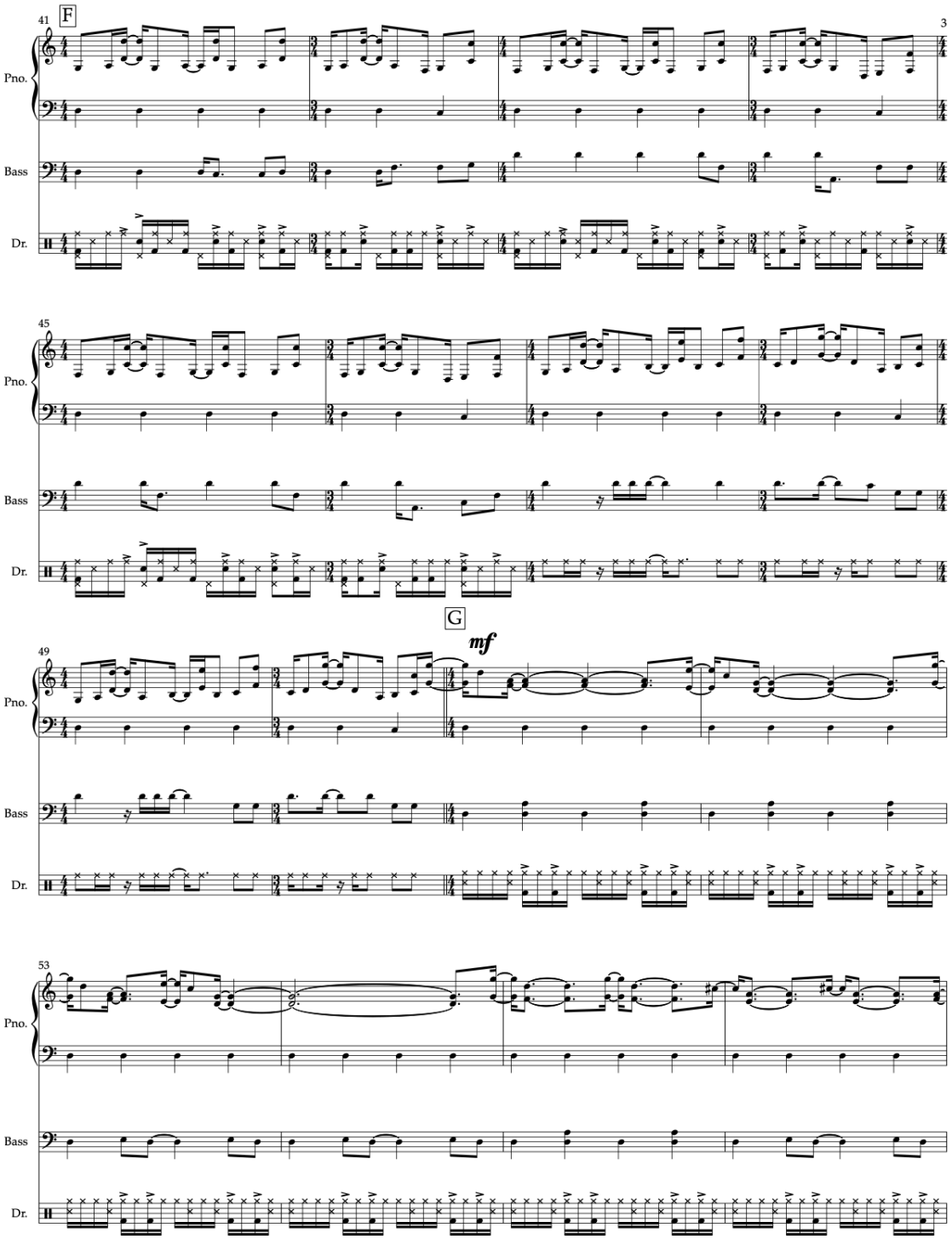
Style: Straight 8th.

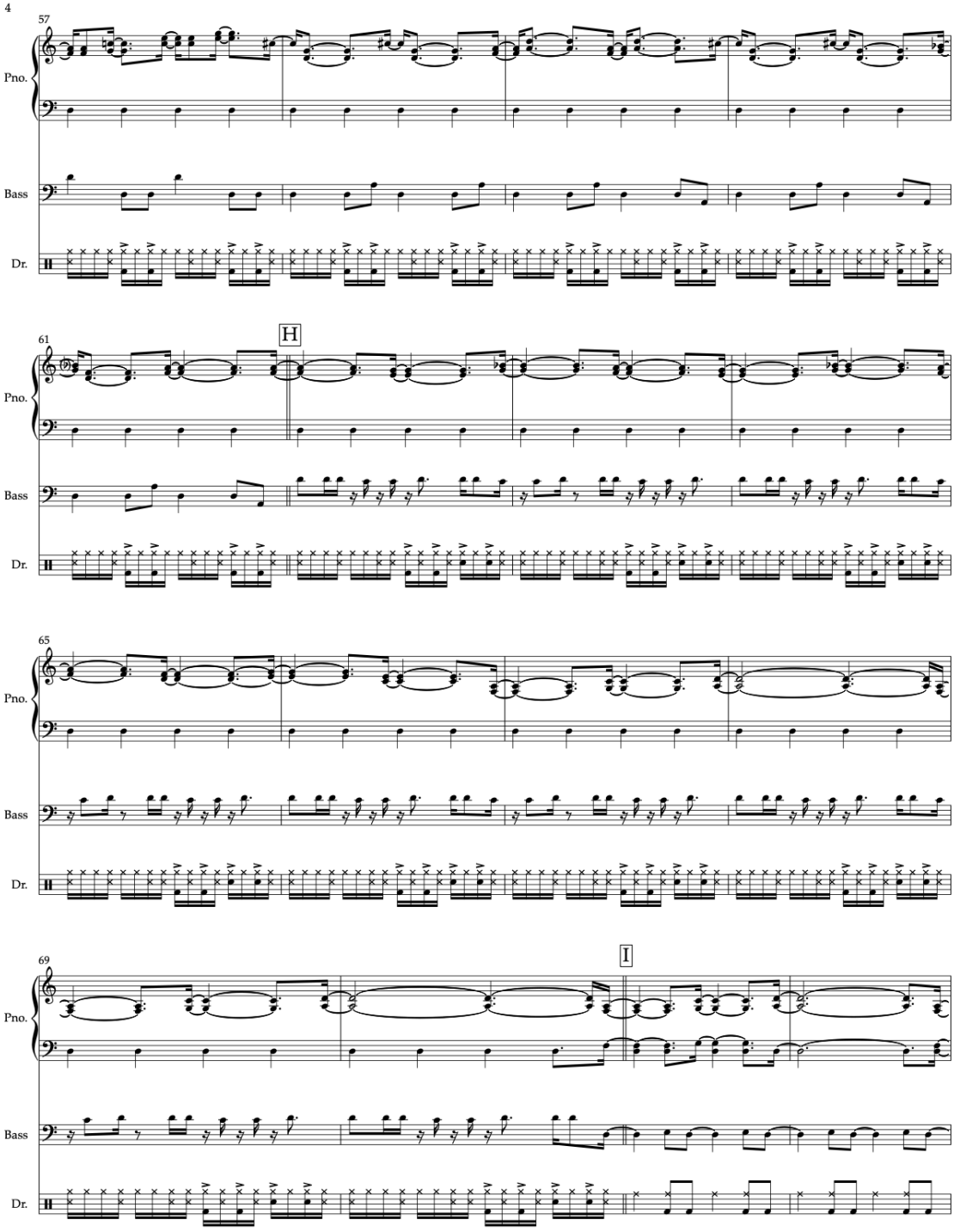
Description: It was a mystical night when I finished one of my many inspiring phone calls with Dale and sat down to play my piano. Just like the sculpture I was helping him with, I sculpted the introductory part of this piece. Dale is an exceptional sculptor who lives near Columbus, Ohio and whom I briefly worked with in 2021. It was an unforgettable experience getting to spend time with him and learn about his craft.

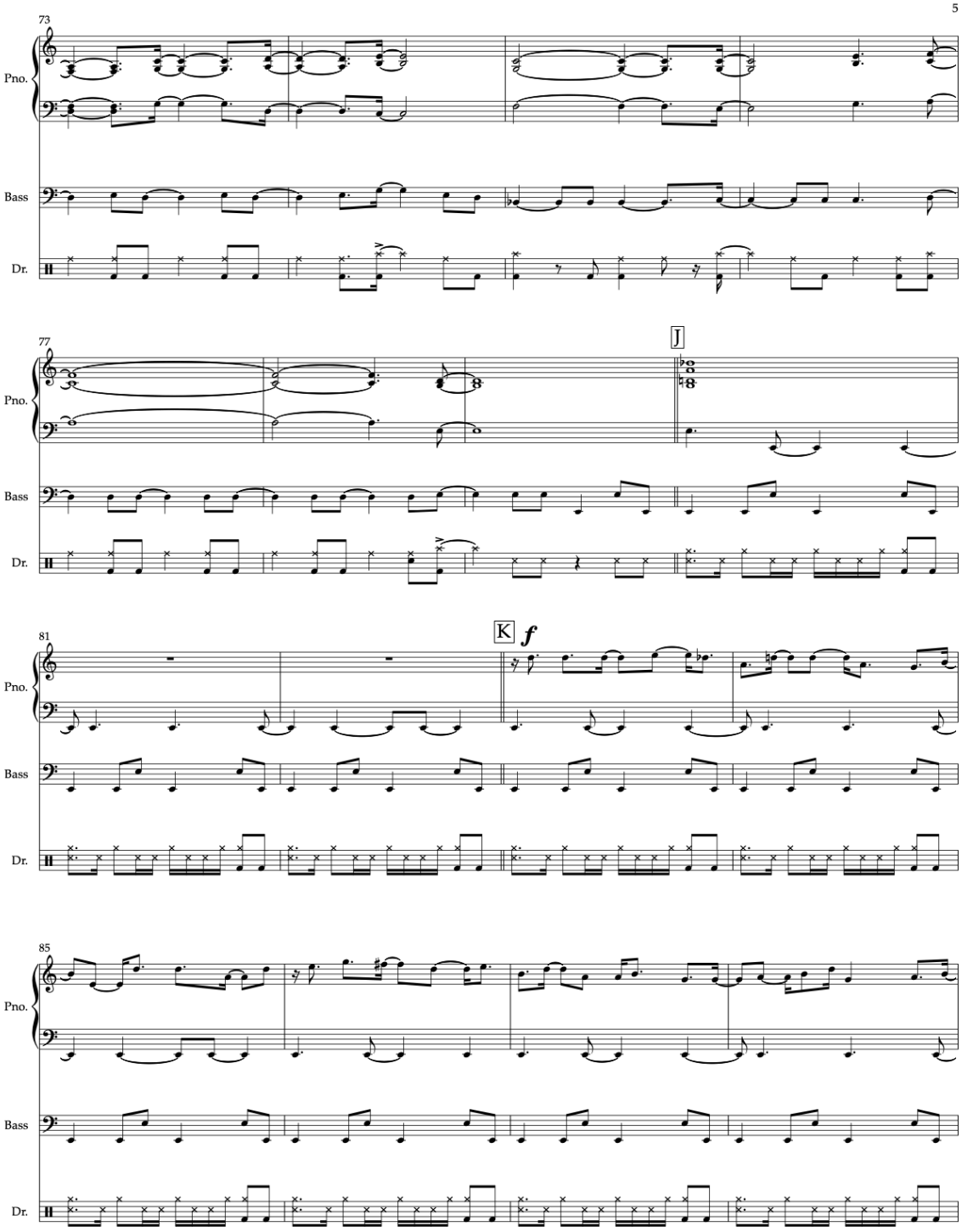
Night Sculpture With Dale

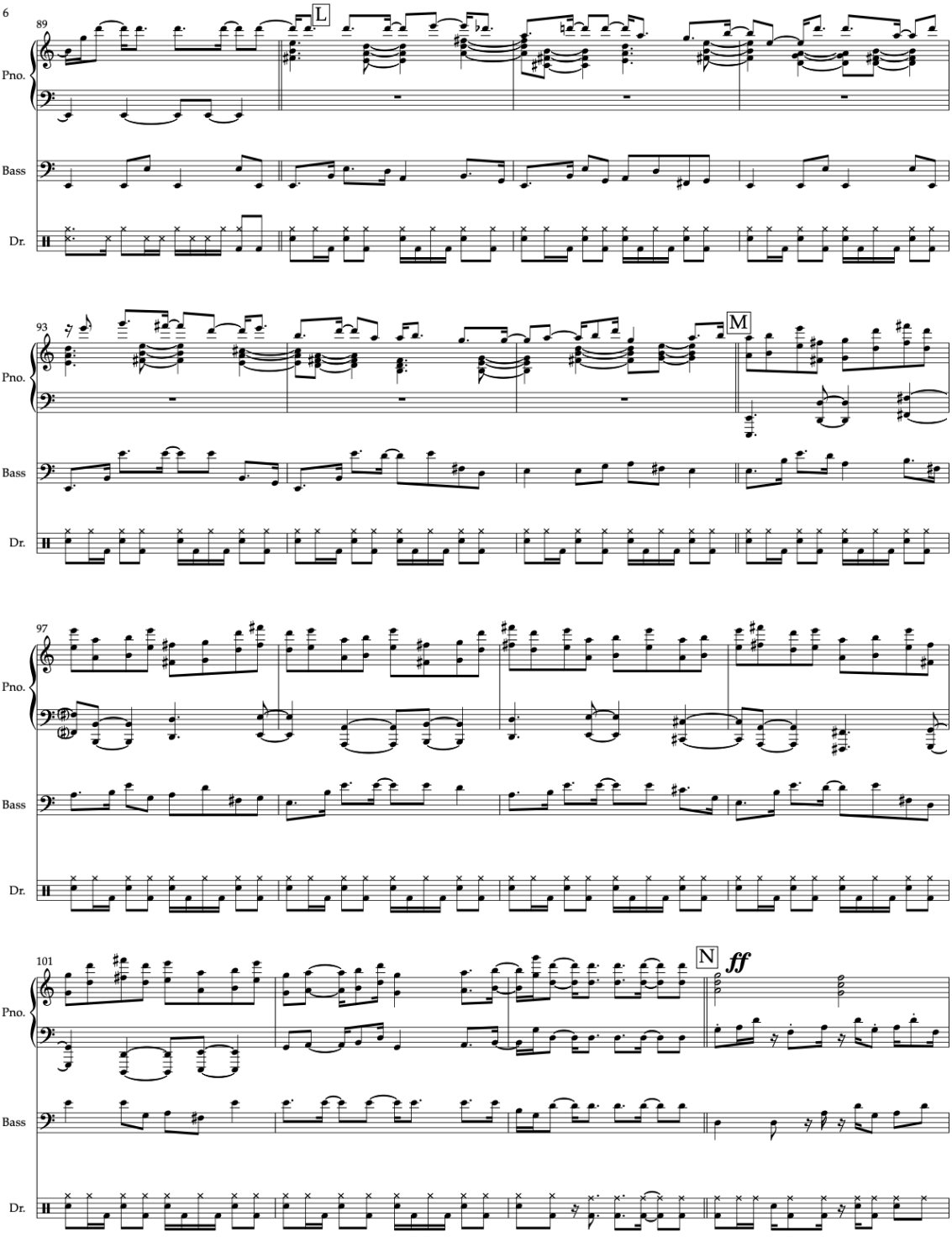


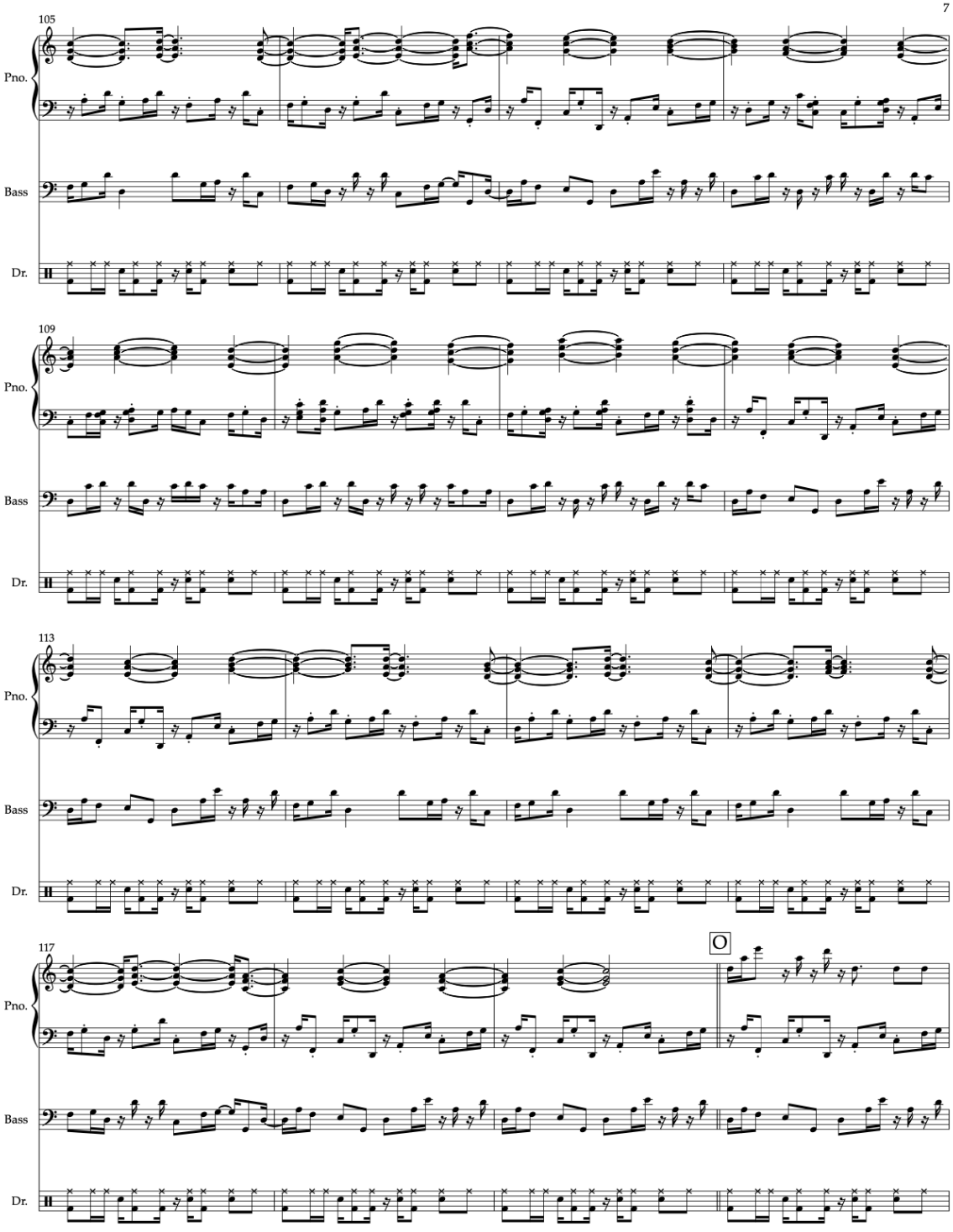

2
21
Pno.
Bass
Dr.
25
D
Pno.
Bass
Dr.
29
E
Pno.
Bass
Dr.
33
Pno.
Bass
Dr.
37
Pno.
Bass
Dr.


41
F
3
Pno.
Bass
Dr.
45
Pno.
Bass
Dr.
G
mf
49
Pno.
Bass
Dr.
53
Pno.
Bass
Dr.


4
57
Pno.
Bass
Dr.
61
H
Pno.
Bass
Dr.
65
Pno.
Bass
Dr.
69
I
Pno.
Bass
Dr.


73
Pno.
Bass
Dr.
77
J
Pno.
Bass
Dr.
81
K
f
Pno.
Bass
Dr.
85
Pno.
Bass
Dr.


6
89
L
Pno.
Bass
Dr.
93
M
97
101
N
ff


105
Pno.
Bass
Dr.
109
Pno.
Bass
Dr.
113
Pno.
Bass
Dr.
117
O
Pno.
Bass
Dr.

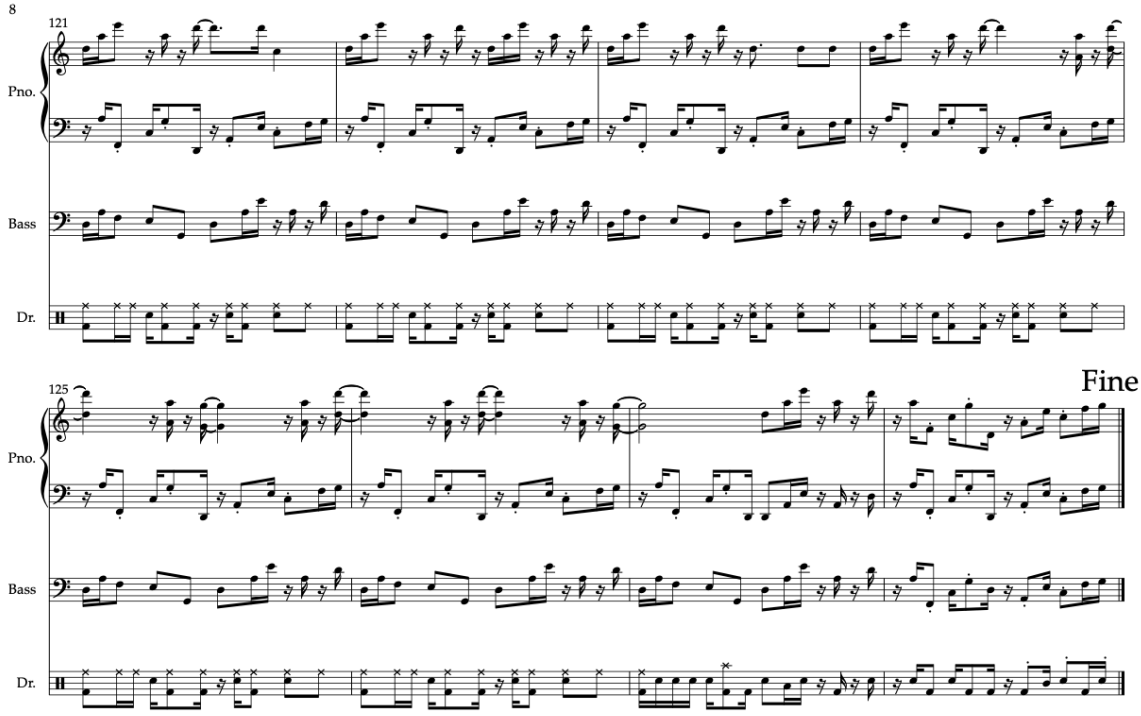


Figure 13. Night Sculpture with Dale Score

Life Beyond the Port of Beirut

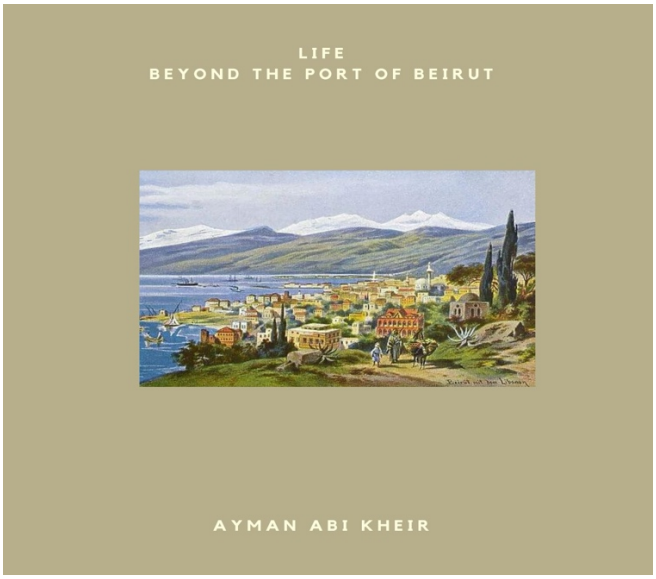


Figure 14. Life Beyond the Port of Beirut Art

Reference Notes:

Tonality: Modal, Atonal.

Melody: Motivic Development.

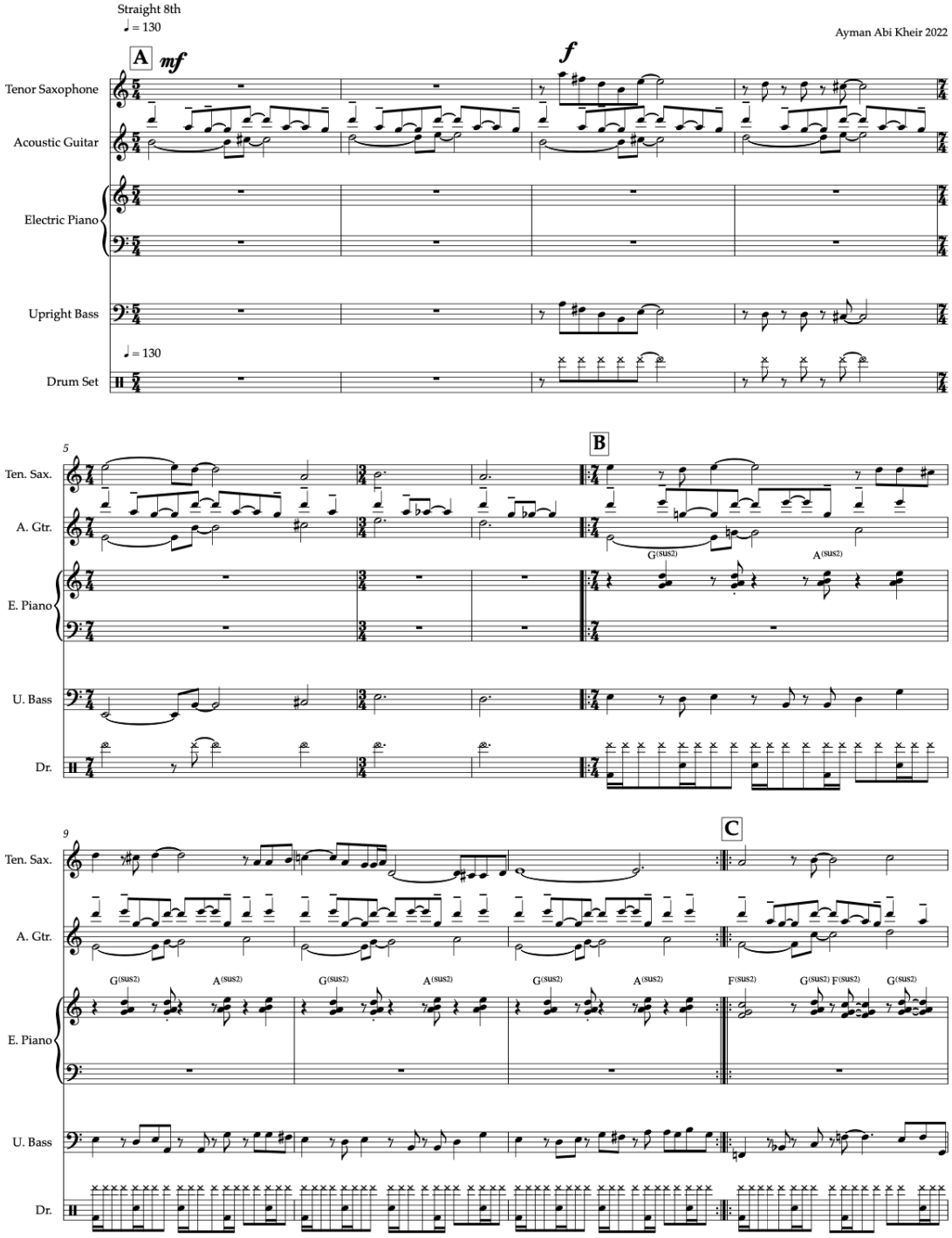
Harmony: Modal Harmony**,** Non-Functional Harmony.

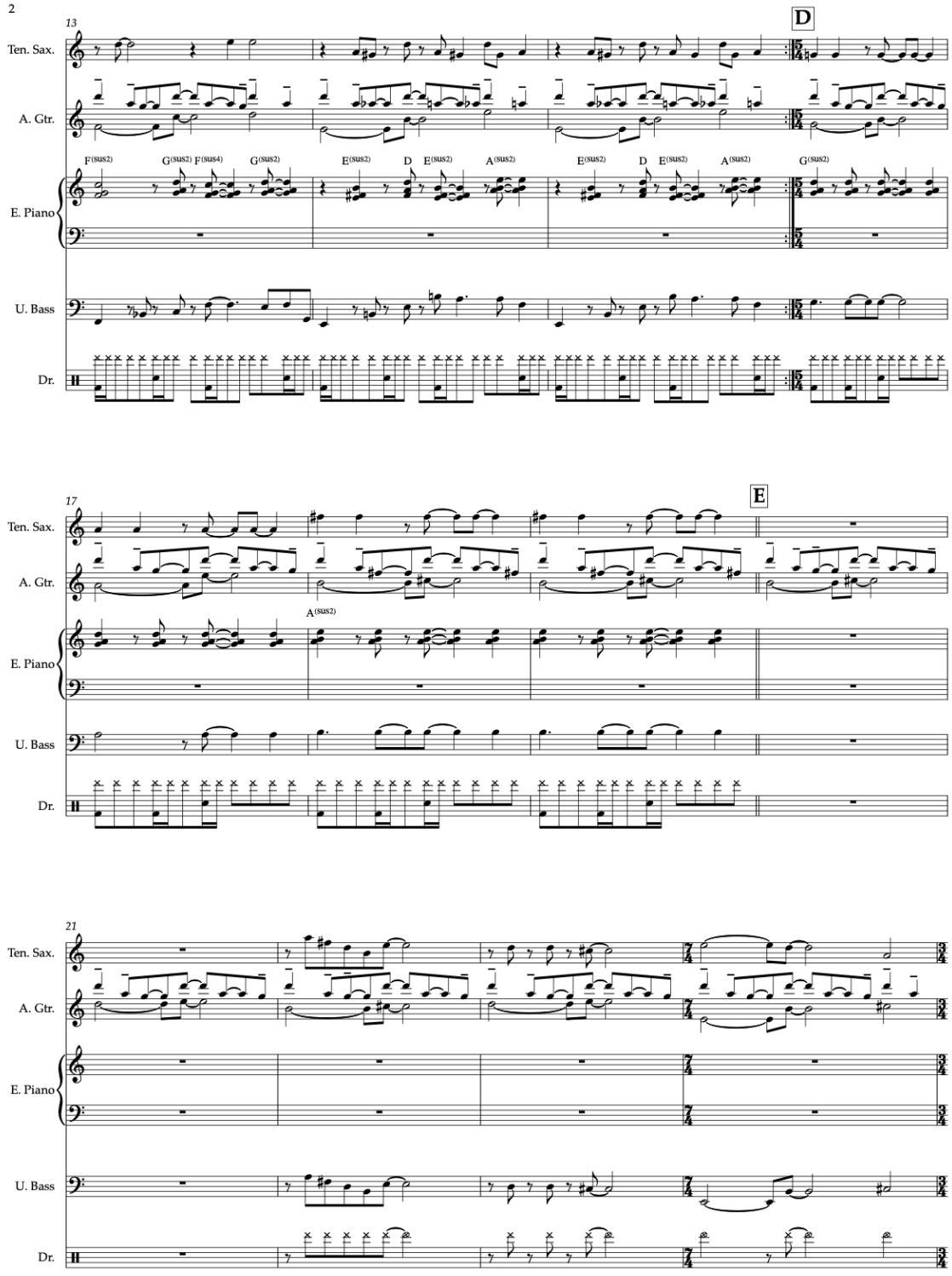
Form: Through Composed.

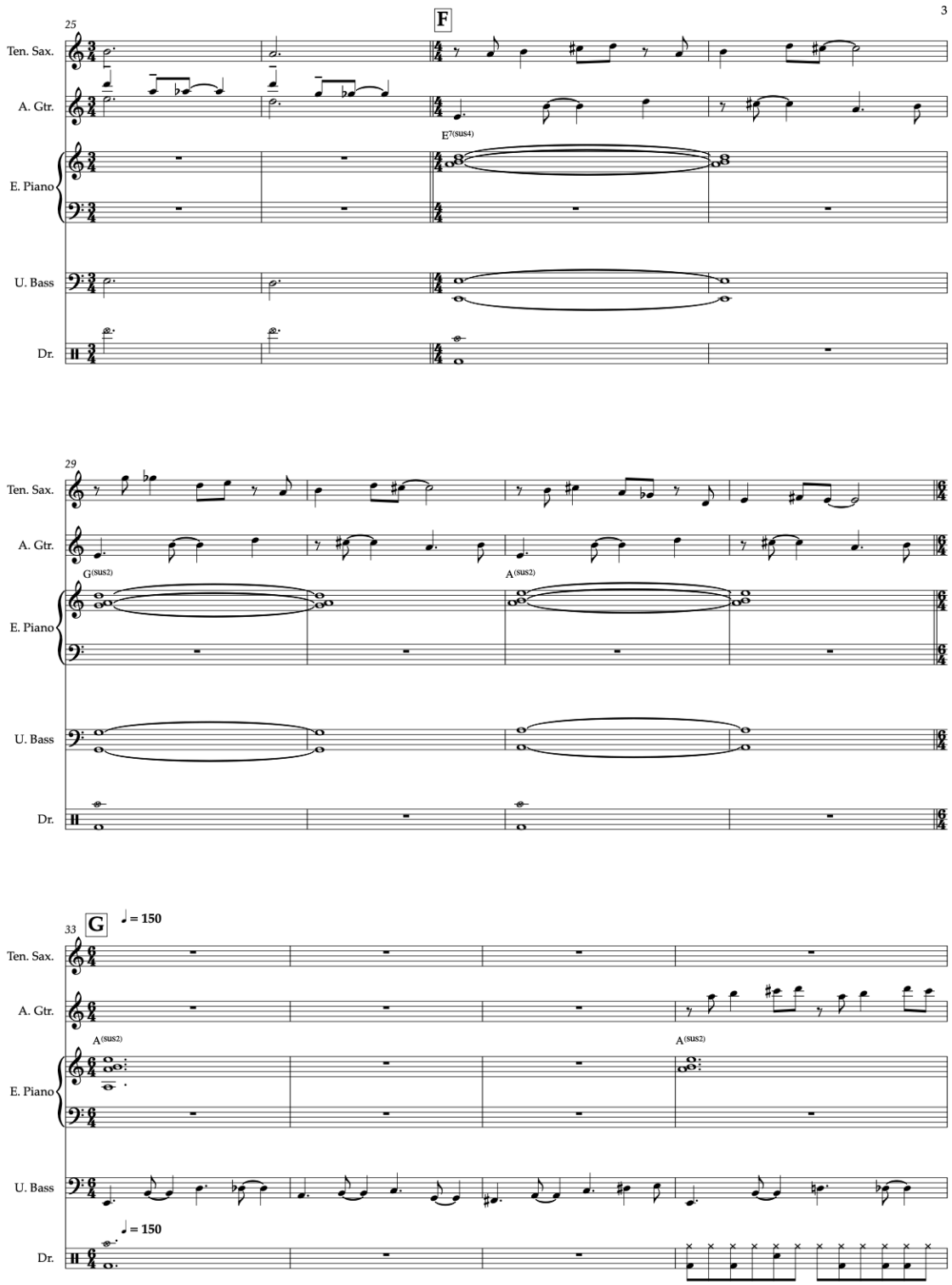
Style: Straight 8th.

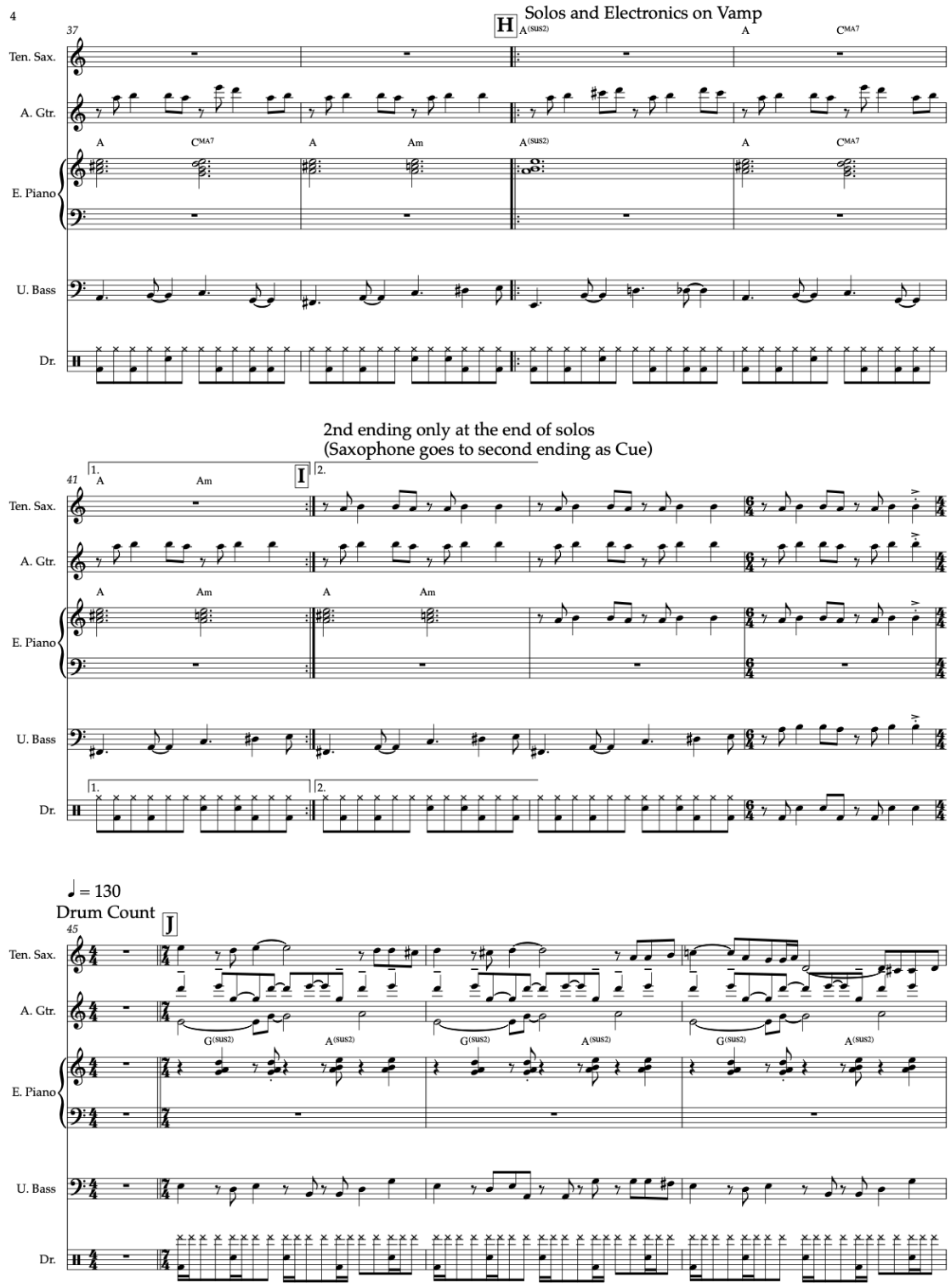
Description: The historical and lively Port of Beirut is not at the same glorious state it was at throughout history. A catastrophic explosion destroyed it on August 4, 2020. Devastated by the news, I returned to my apartment in Columbus, Ohio, and played my guitar. I was experimenting with the David Crosby guitar tuning of EBDGAD. The guitar part for *Life Beyond the Port of Beirut* thus emerged as source of hope, perseverance, and life after death.

Life Beyond the Port




13
D
Ten. Sax.
A. Gtr.
E. Piano
F(sus2) G(sus2) F(sus4) G(sus2) E(sus2) D E(sus2) A(sus2) E(sus2) D E(sus2) A(sus2) G(sus2)
U. Bass
Dr.
17
E
A(sus2)
21


25
F
Ten. Sax.
A. Gtr.
E7(sus4)
E. Piano
U. Bass
Dr.
29
Ten. Sax.
A. Gtr.
G(sus2)
A(sus2)
E. Piano
U. Bass
Dr.
33
G
♩ = 150
Ten. Sax.
A. Gtr.
A(sus2)
A(sus2)
E. Piano
U. Bass
♩ = 150
Dr.


4
37
H
Solos and Electronics on Vamp
A(SUS2)
A
CMA7
Ten. Sax.
A. Gtr.
E. Piano
U. Bass
Dr.
A
CMA7
A
Am
A(SUS2)
A
CMA7
2nd ending only at the end of solos
(Saxophone goes to second ending as Cue)
41
1.
2.
I
A
Am
A
Am
♩ = 130
Drum Count
45
J
G(SUS2)
A(SUS2)
G(SUS2)
A(SUS2)
G(SUS2)
A(SUS2)

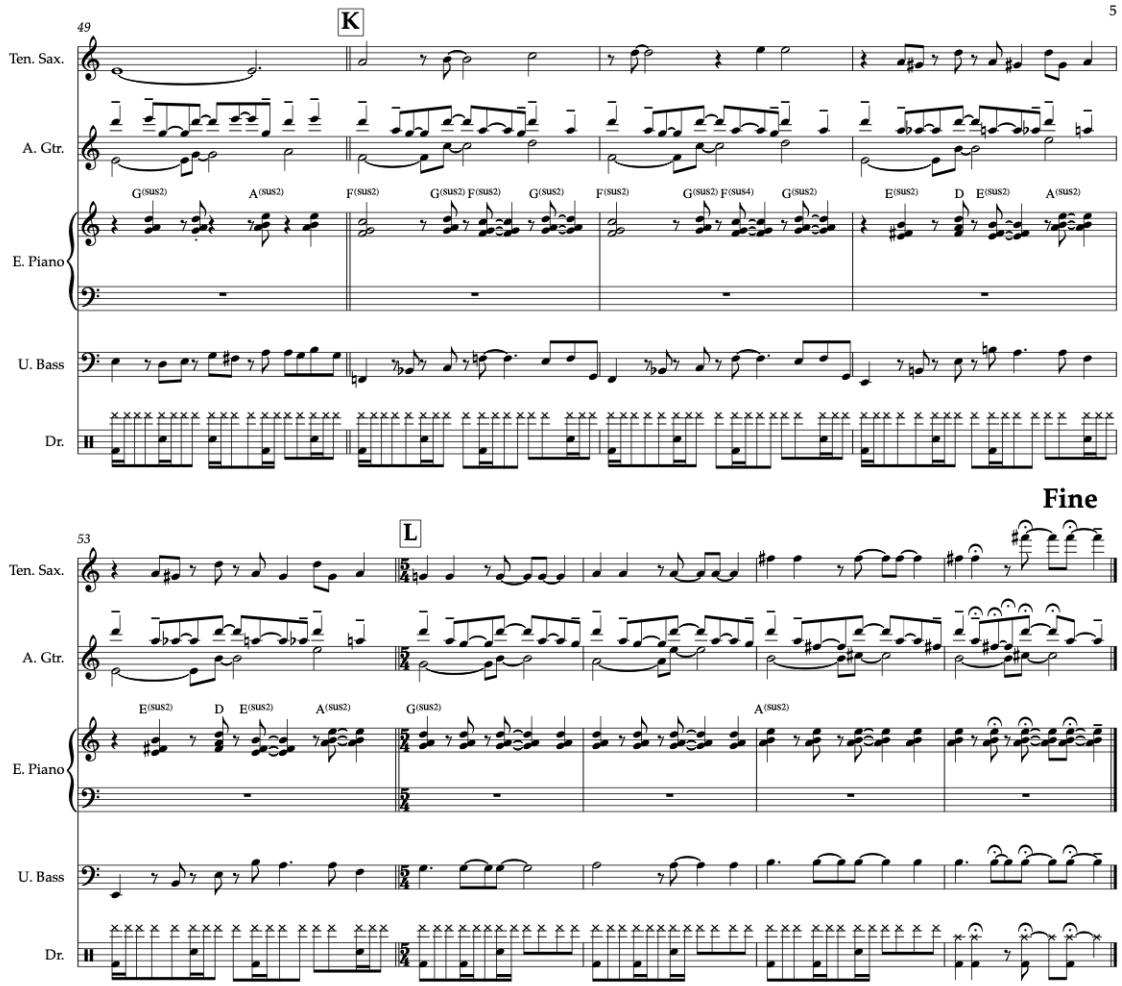


Figure 15. Life Beyond the Port of Beirut Score

Frog Fog

Figure 16. Frog Fog Art

Reference Notes:

Tonality: Modal, Atonal.

Melody: Motivic Development.

Harmony: Modal Harmony**,** Non-Functional Harmony.

Form: Through Composed.

Style: Electronic/EDM.

Description: *Frog Fog* is a computer-generated piece that uses midi and virtual instruments. It was created in 2023. What would frogs sound like if they synchronize their ribbits? The Illformed Glitch2 plug-in was inserted to some tracks with virtual instruments in Ableton Live to answer that question. It's a foggy weather and, in a foggy state, the frogs ribbit their music!

مسافر (Traveler)

Figure 17. مسافر (Traveler) Art

Reference Notes:

Tonality: Modal, Minor.

Melody: Riff.

Harmony: Modal Harmony.

Form: Through Composed.

Style: Swung Funk**,** African 6/8.

Description: مسافر is the Arabic word for 'Traveler'. It is a reflection on the period surrounding my flight from Beirut, Lebanon to Columbus, Ohio in the summer of 2019 coming back to resume my college education in the U.S. The musical ideas to this piece were all inspired by my experiences around that time. I felt my soul being stretched to a new land while its roots were still attached back home.

مسافر

Swung Funk

♩ = 75

Ayman Abi Kheir 2019

Intro *f*

Tenor Saxophone

Electric Guitar — C♯ dorian

Electric Bass

Drum Set — Drum Fill

5

A

Ten. Sax. — C♯ dorian — A^maj9/E — A6/9 (no3rd) — A^7(sus4)/D — Am^9/F

Dr. — 4

9

Ten. Sax. — C♯ dorian — A^maj9/E — A6/9 (no3rd) — A^7(sus4)/D

Dr.

13

B

Ten. Sax. — F△ — G△ — F♯△ — G♯△ — C♯ dorian

Dr. — 4

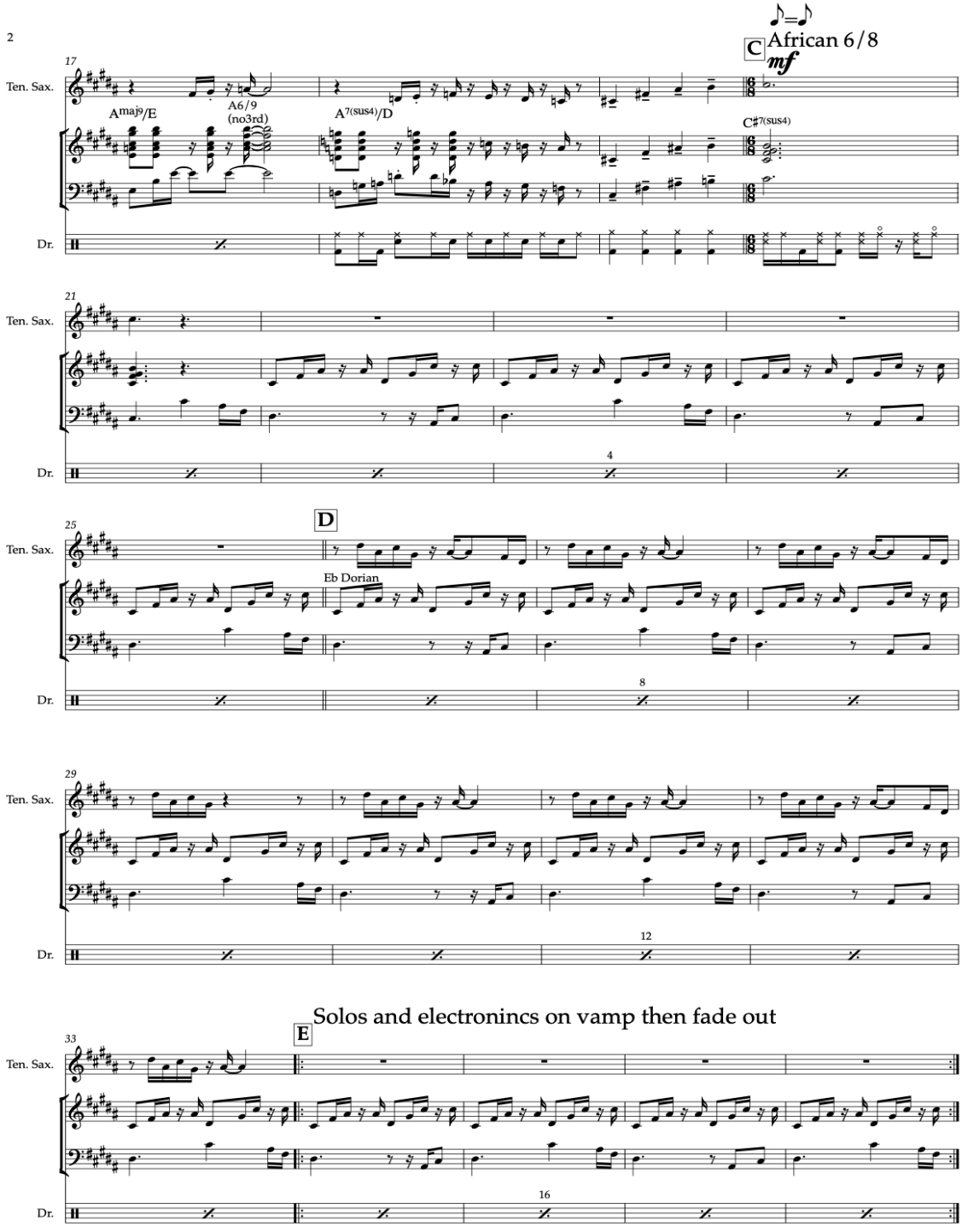


Figure 18. مسافر (Traveler) Score

When the Old Woman Knits

Figure 19. When the Old Woman Knits Art

Reference Notes:

Tonality: Atonal.

Melody: Motivic Development, Counterpoint.

Harmony: Non-Functional Harmony.

Form: Through Composed.

Style: Swung Funk**,** African 6/8.

Description: This music is intended to represent the pride, authenticity, and compassion of a grandmother knitting wool clothes to keep her loved ones warm during winter. The different sections of the piece represent the different segments of the knitted wool.

When the Old Woman Knits

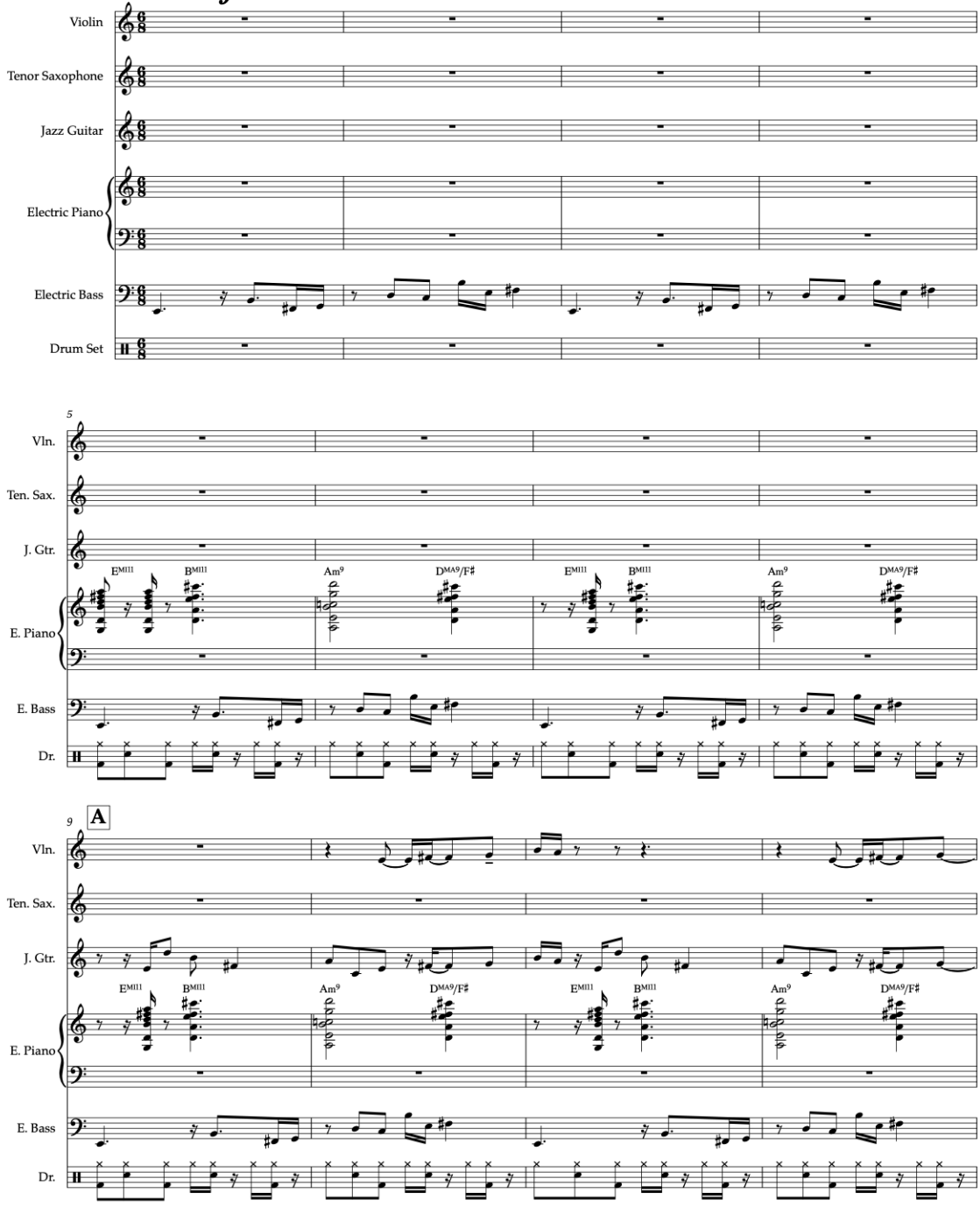
Ayman Abi Kheir 2019

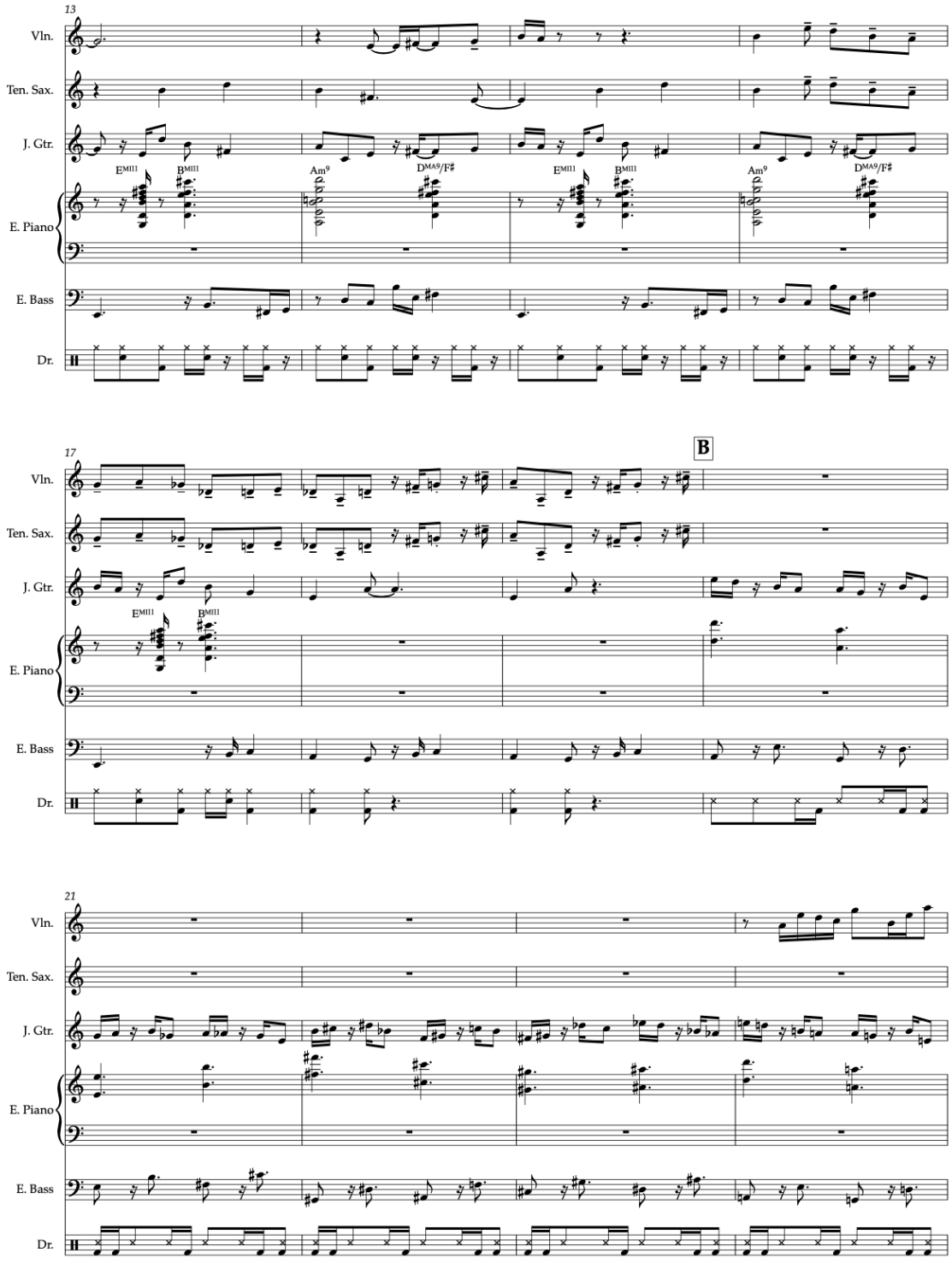
Straight 8th

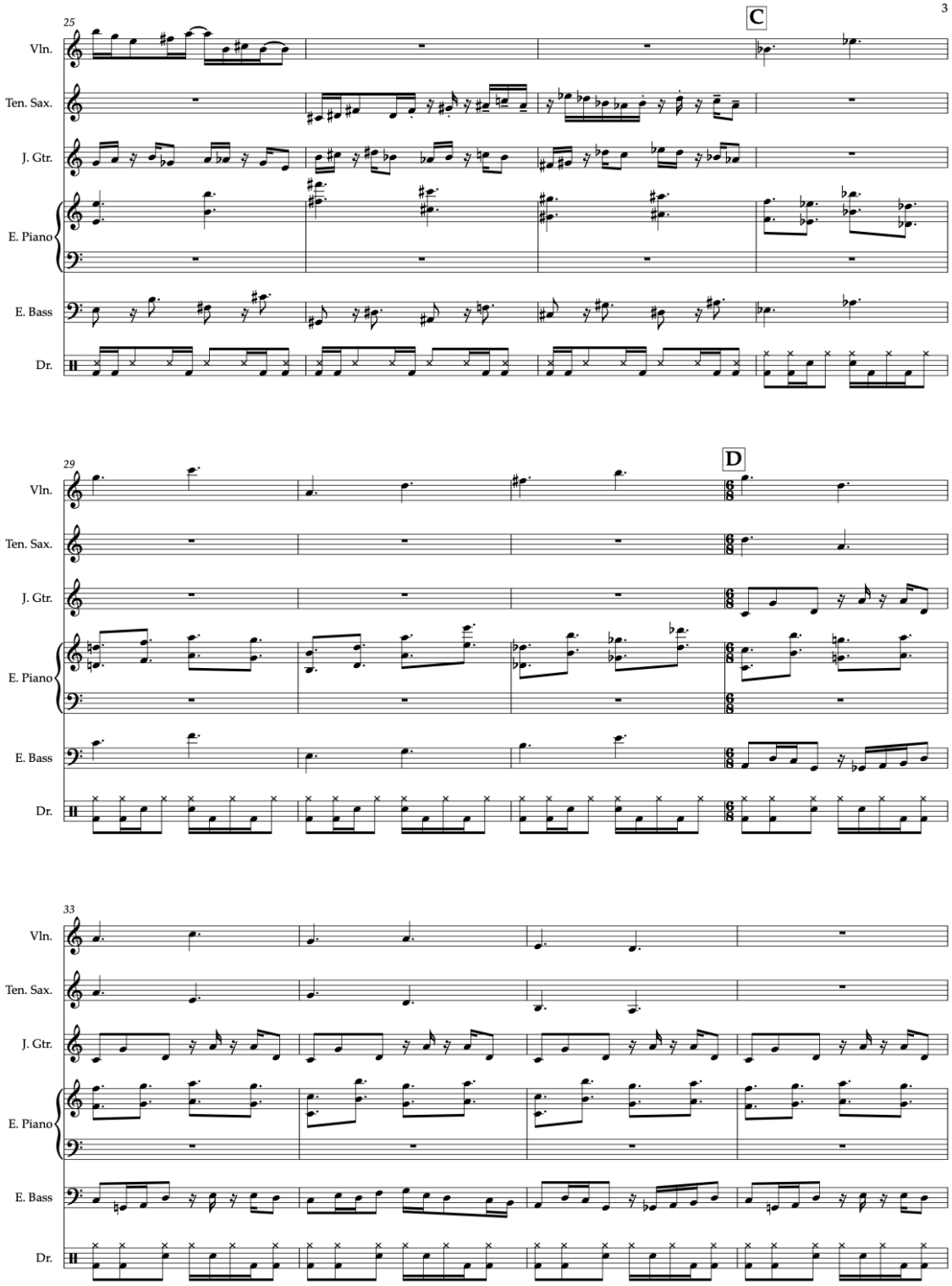
♩ = 70

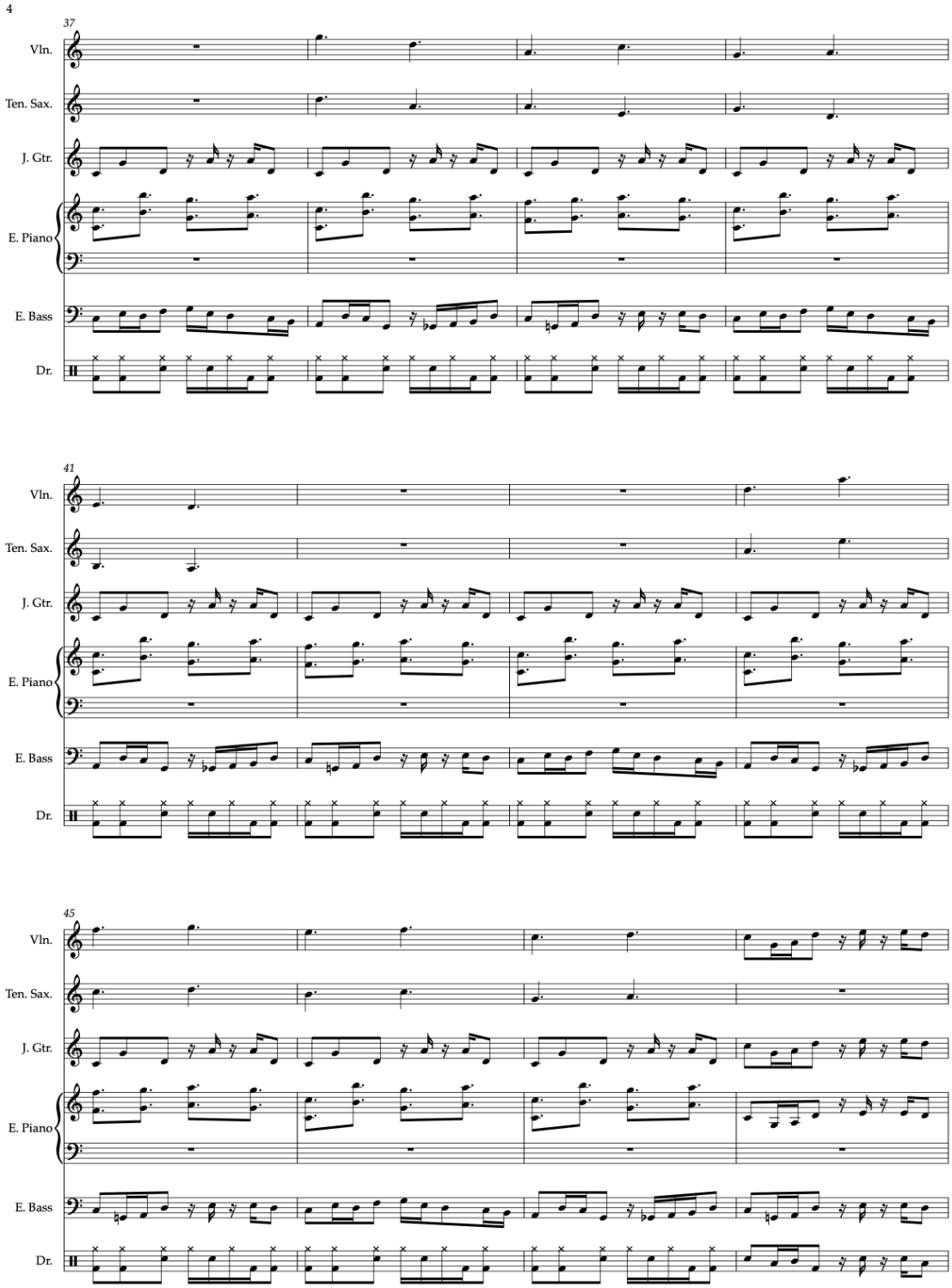
(Free collective improvisation with electronics before tune starts then bass starts the tune alone)

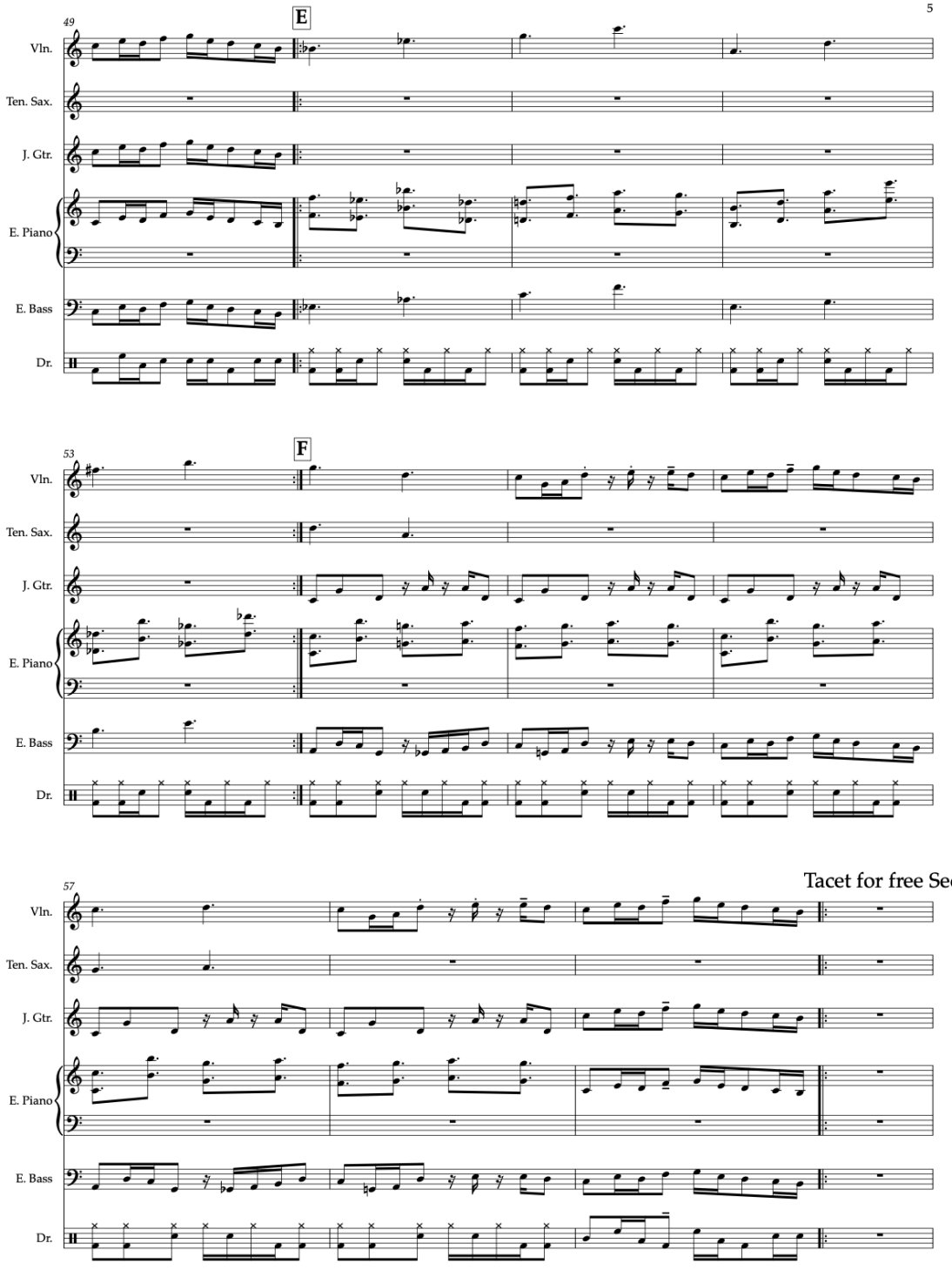
Intro *f*

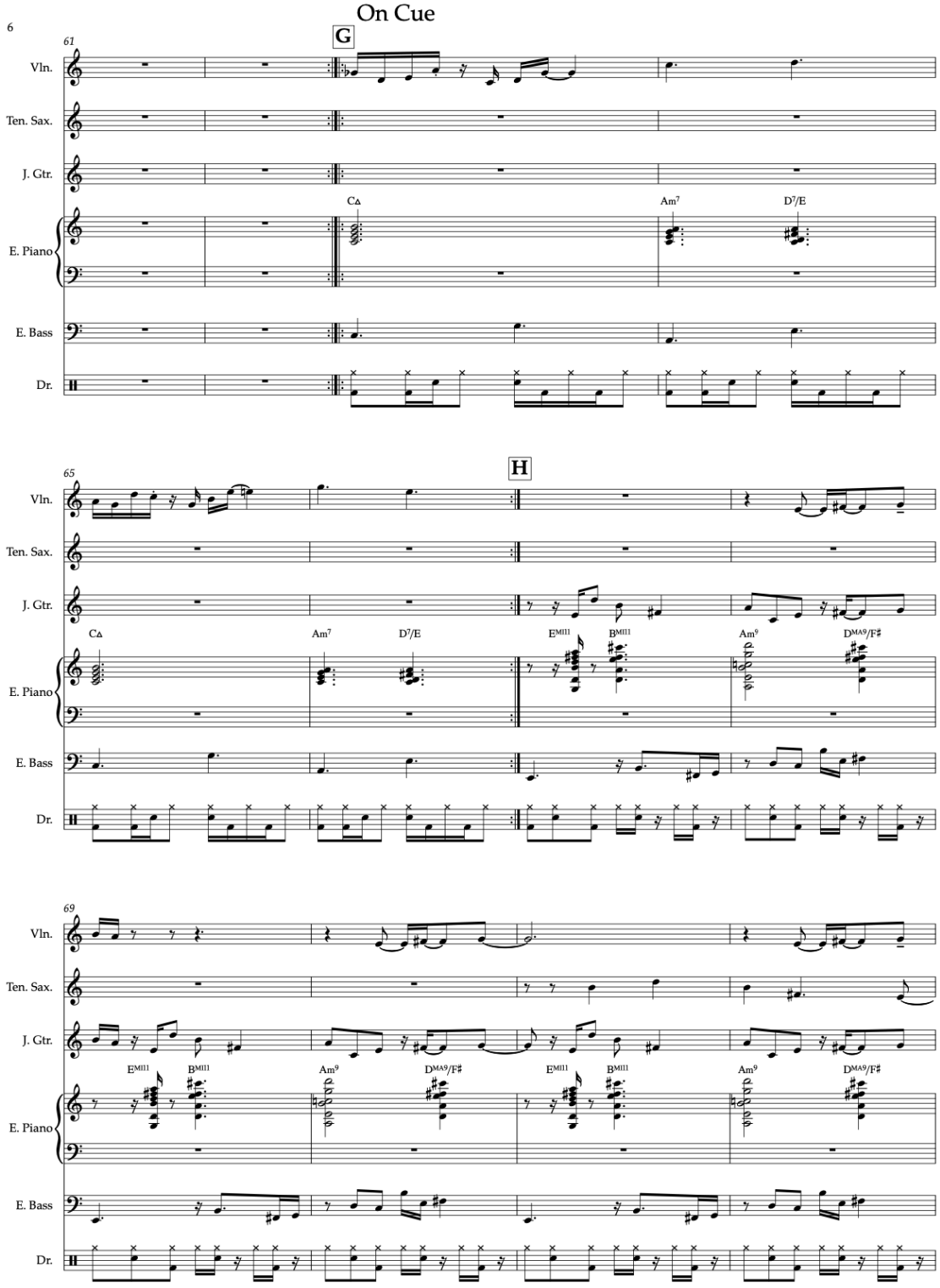



13
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.
EMI11
BMI11
Am9
DMA9/F♯
17
B
21


25
C
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.
29
D
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.
33
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.


4
37
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.
41
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.
45
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.


49
E
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.
53
F
57
Tacet for free Section


On Cue
6
61
G
Vln.
Ten. Sax.
J. Gtr.
E. Piano
E. Bass
Dr.
C△
Am7
D7/E
65
H
EMI11
BMI11
Am9
DMA9/F♯
69

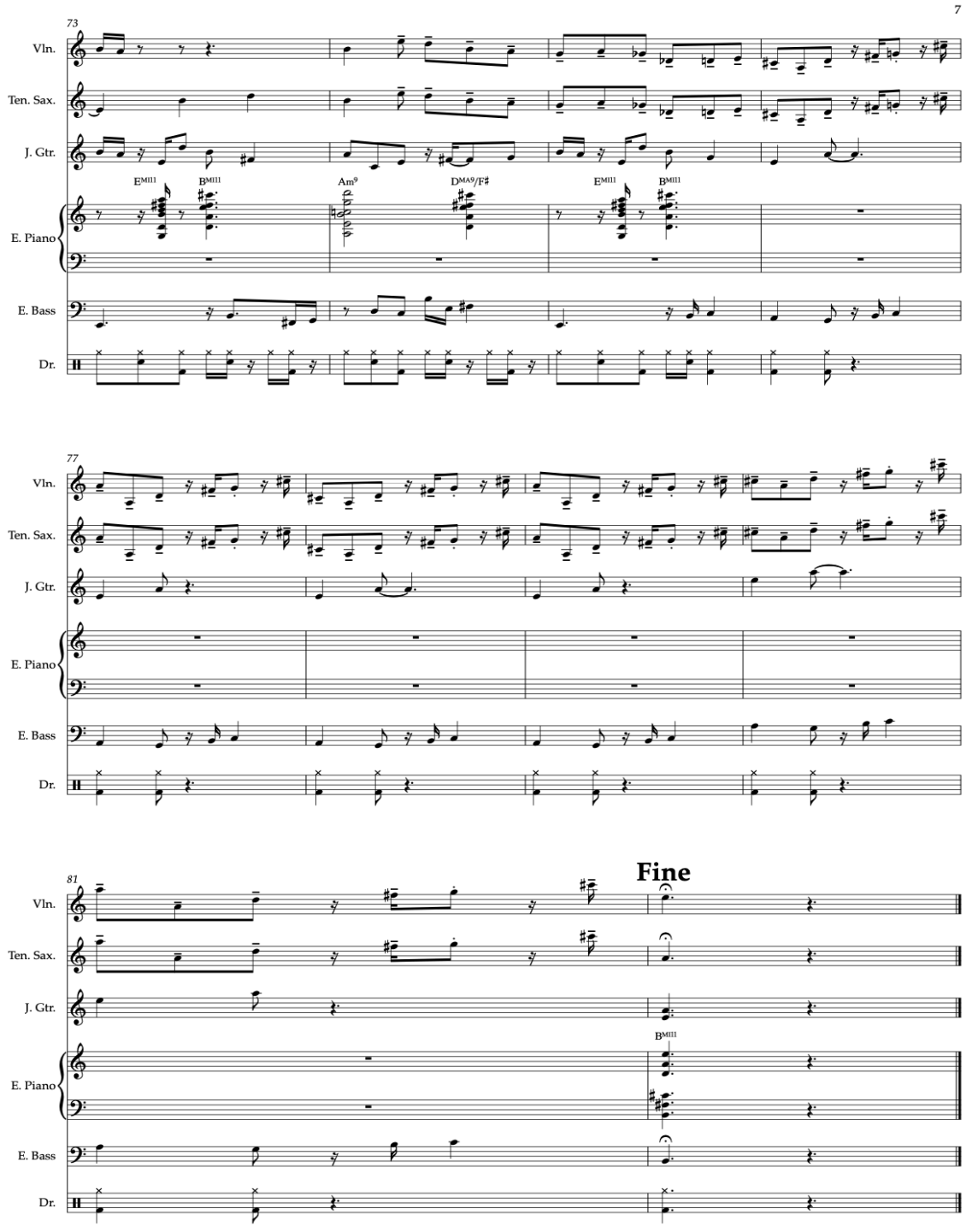


Figure 20. When the Old Woman Knits Score

Zahreddine-Crowley & Life Thereafter

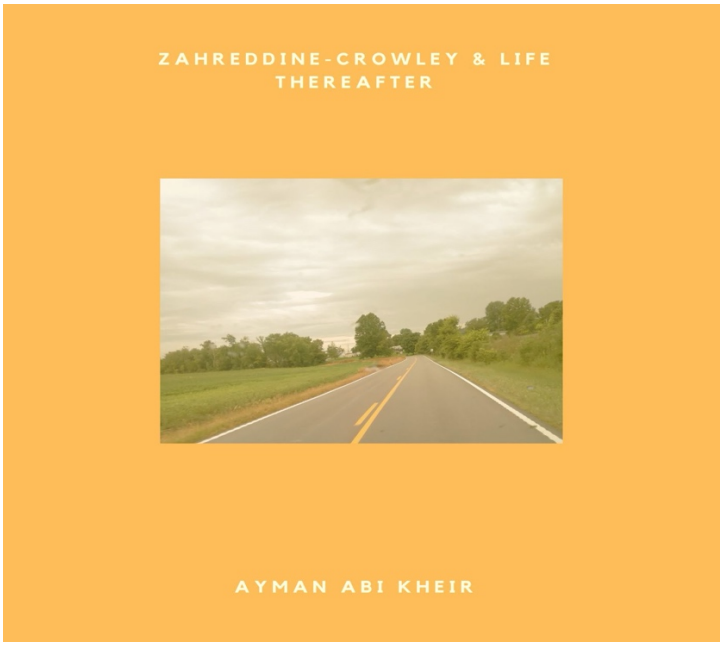


Figure 21. Zahreddine-Crowley & Life Thereafter Art

Reference Notes:

Tonality: Db Major, A Minor**,** Atonal.

Melody: Motivic Development, Counterpoint, Riff.

Harmony: Diatonic Harmony, Modal Harmony**,** Non-Functional Harmony.

Form: Through Composed.

Style: Straight 8th**,** African 6/8.

Description: Finishing my undergrad and getting my work authorization in the U.S during Covid, made it difficult to find a job. A very kind Lebanese lady named Hala Zahreddine and her husband Michael Crowley hosted me and let me stay with them until the situation got better. It was a very special experience living with them and becoming an older brother to their kids Anthony and Andrew. They became like a family to me, and I will forever be grateful. This piece was started when I was staying with them and completed after I left Columbus, Ohio to get my master's at the University of Louisville.

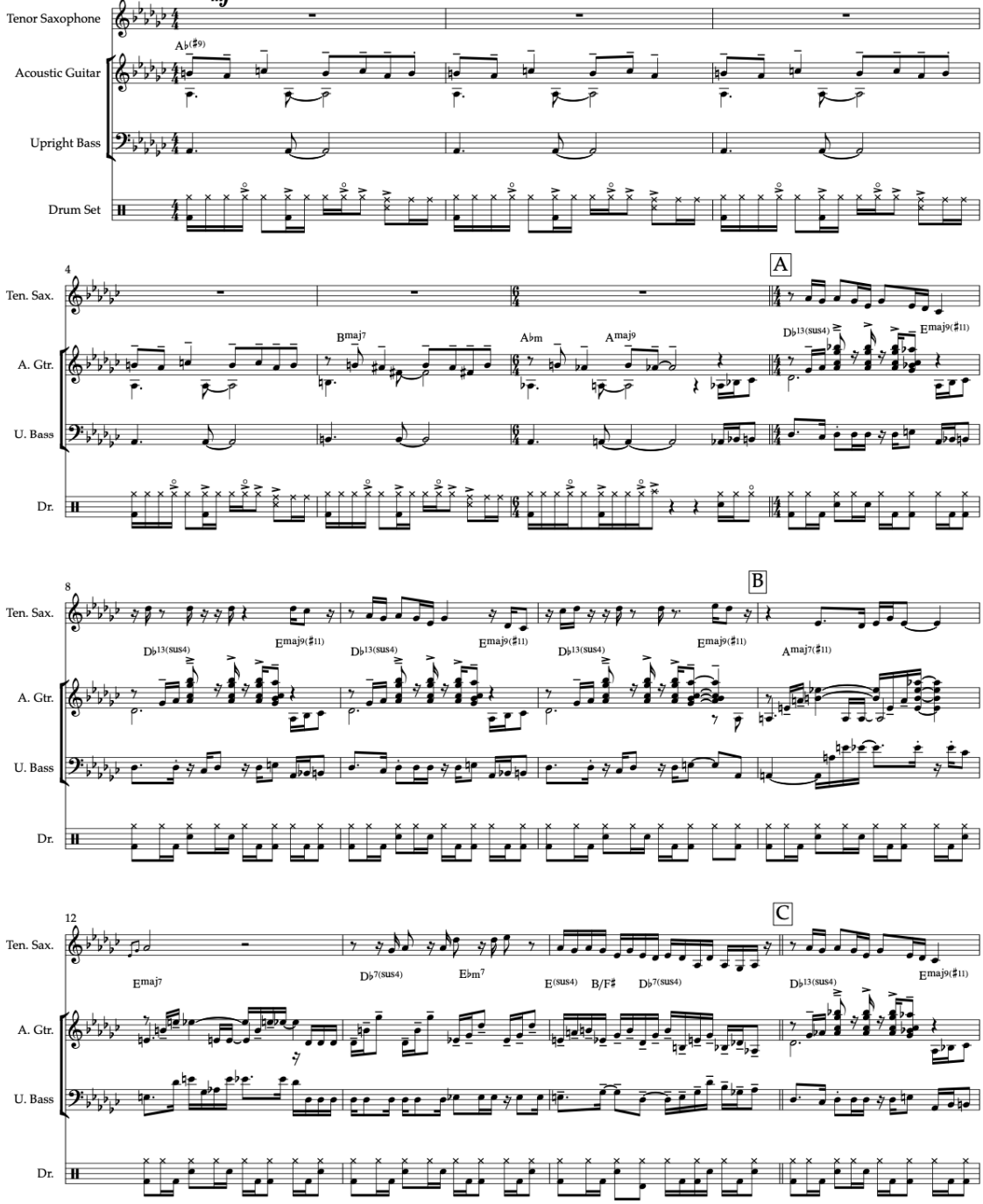
Zahreddine-Crowley & Life Thereafter

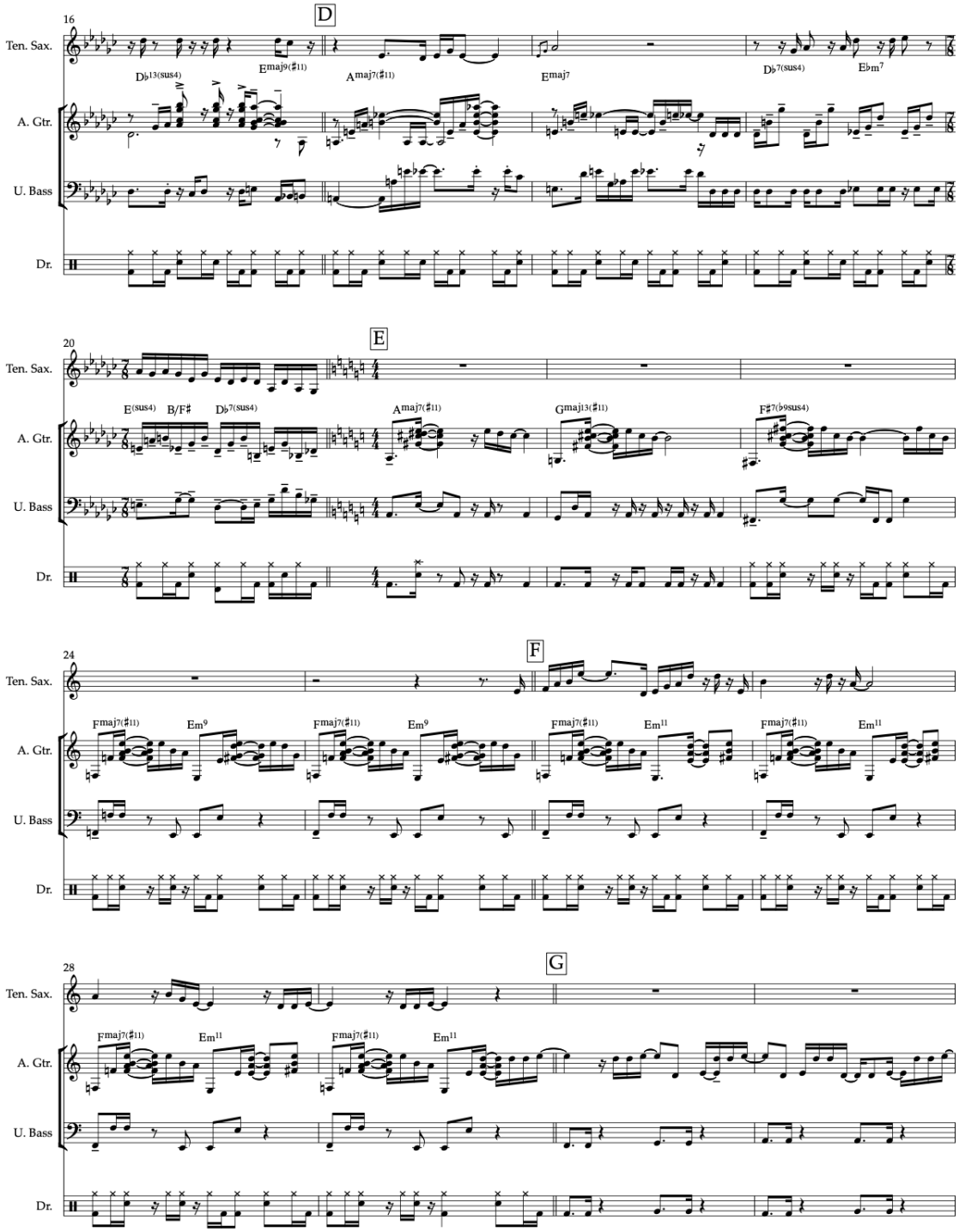
Straight 8th

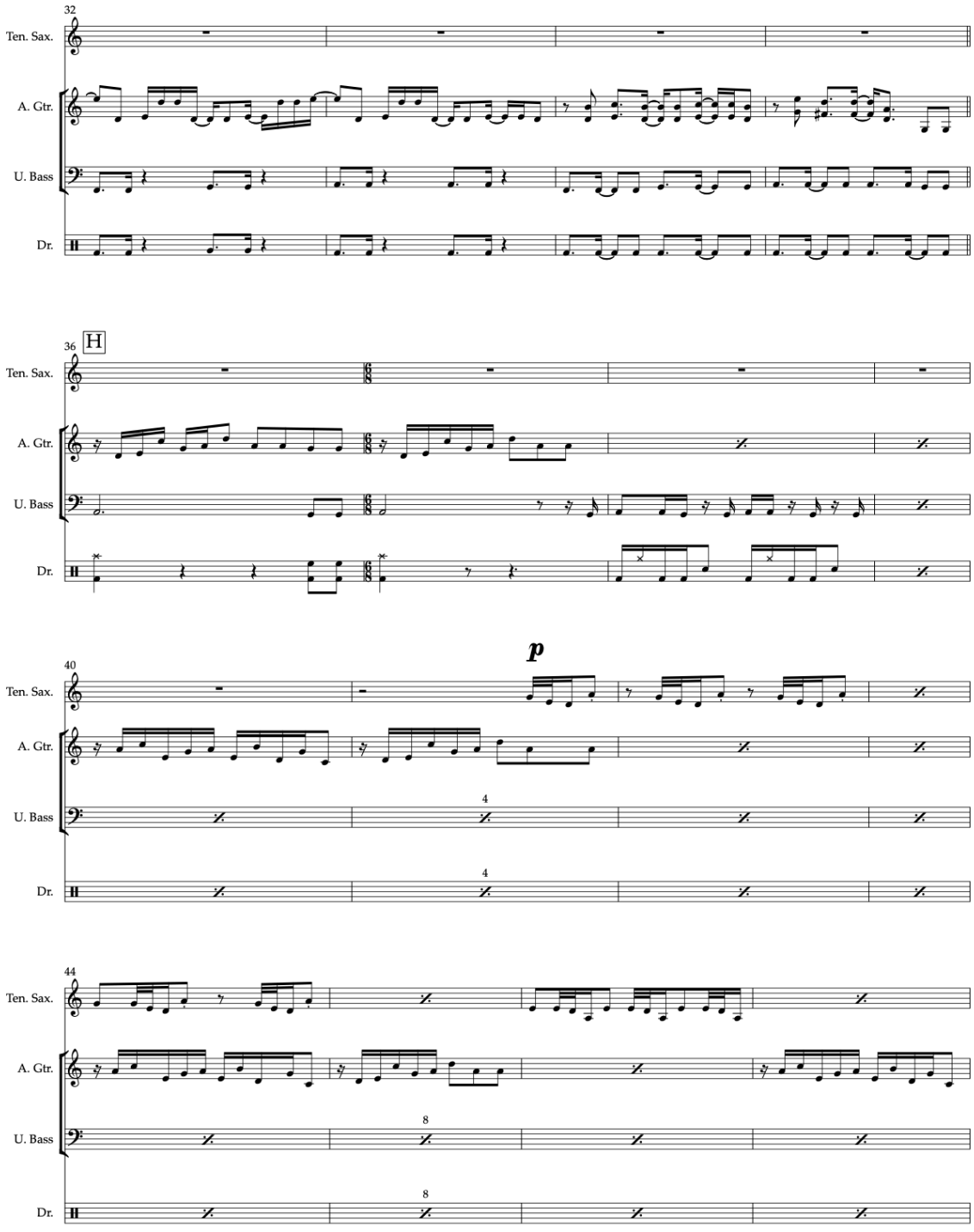
♩ = 60

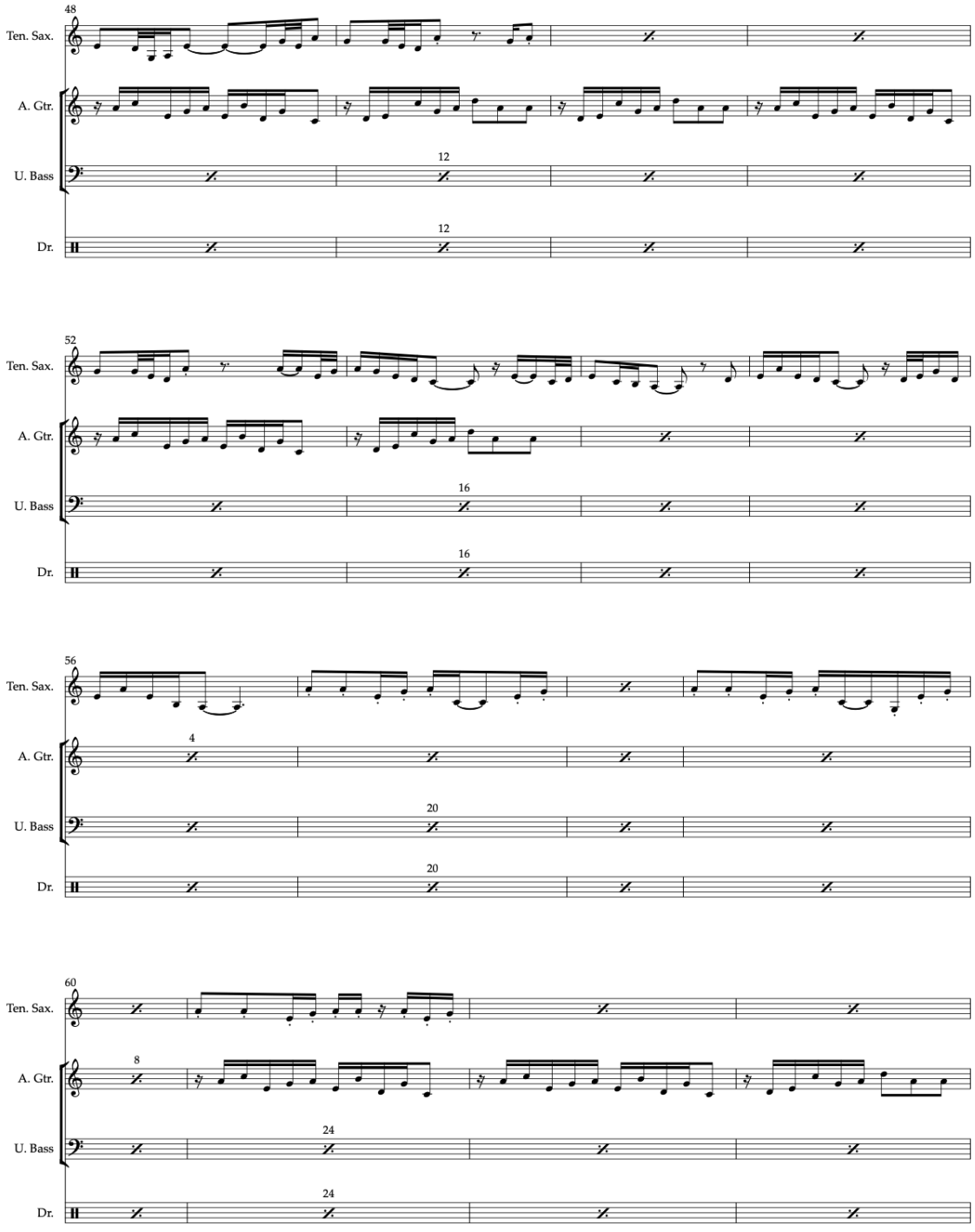
Ayman Abi Kheir 2024

Intro *mf* Electronic vamp on first two bars; intro fades in after electronic vamp




16
D
Ten. Sax.
A. Gtr.
U. Bass
Dr.
D♭13(sus4)
Emaj9(♯11)
Amaj7(♯11)
Emaj7
D♭7(sus4)
E♭m7
20
E
E(sus4)
B/F♯
D♭7(sus4)
Amaj7(♯11)
Gmaj13(♯11)
F♯7(♭9sus4)
24
F
Fmaj7(♯11)
Em9
Em11
28
G


32
Ten. Sax.
A. Gtr.
U. Bass
Dr.
36
H
Ten. Sax.
A. Gtr.
U. Bass
Dr.
p
40
Ten. Sax.
A. Gtr.
U. Bass
4
Dr.
4
44
Ten. Sax.
A. Gtr.
U. Bass
8
Dr.
8


48
Ten. Sax.
A. Gtr.
U. Bass
12
Dr.
12
52
Ten. Sax.
A. Gtr.
U. Bass
16
Dr.
16
56
Ten. Sax.
A. Gtr.
4
U. Bass
20
Dr.
20
60
Ten. Sax.
A. Gtr.
8
U. Bass
24
Dr.
24

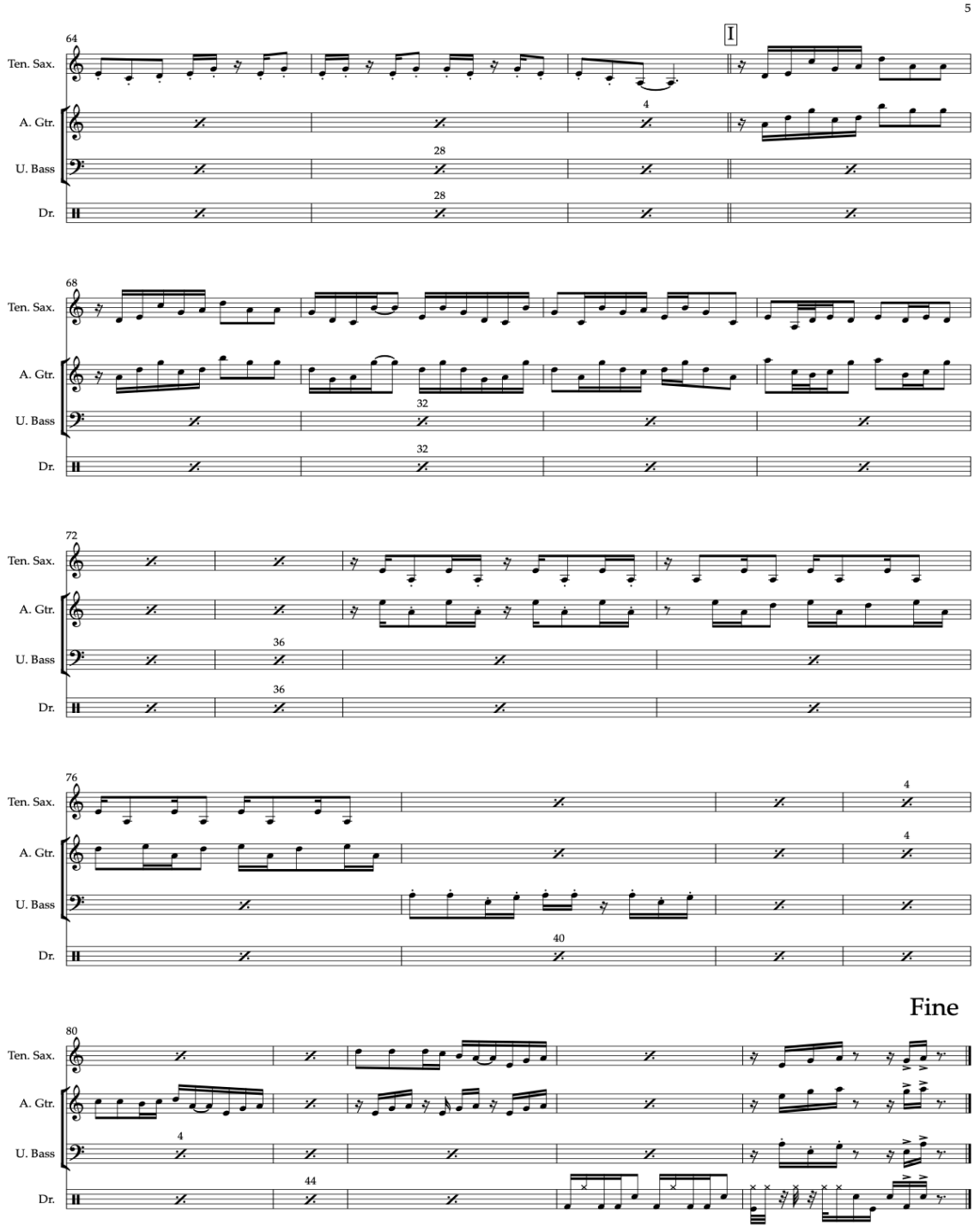


Figure 22. Zahreddine-Crowley and Life Thereafter Score

Subtle Arguments

Figure 23. Subtle Arguments Art

Reference Notes:

Tonality: Atonal.

Melody: Motivic Development.

Harmony: Non-Functional Harmony.

Form: Through Composed.

Style: Ambient Music Concrète.

Description: *Subtle Arguments* is a Musique Concrète piece that uses pre-recorded sounds as its raw materials. The sounds are those of objects. Objects have a voice; expression; something to say... They all state their arguments. Each is important. The result is music. The result is life.

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CURRICULUM VITAE

NAME: Ayman Abi Kheir

PROFESSIONAL SUMMARY: To innovate, preserve, and spread artistic culture through music and creative media.

EDUCATION & TRAINING:

M.M., Electronic Music Composition
University of Louisville, Kentucky
2022-2024

B.M., Jazz Studies, Percussion
Capital University, Columbus, Ohio
2018-2020

Jazz Studies, Percussion
Notre Dame University, Zouk Mosbeh, Lebanon
2016-2018

PROFESSIONAL TEACHING EXPERSIENCE:

Graduate Teaching Assistant: University of Louisville, Electronic Music Composition, Computer Music Studios
Louisville, Kentucky
2022-2024

Private Drum Teacher
2012-Present

Music Instructor: Kentucky Arts Academy
Louisville, Kentucky
2023-2024

Music Instructor: Guitar Center, Lewis Center Music Academy, and Chambers Music Studios
Columbus, Ohio
2021

Drum Teacher: Lebanese International College School
Beirut, Lebanon
2016-2018

MUSIC BIO
& PERFORMANCE: **Composer, drummer, recording engineer, and producer** of the self-authored album *Life Beyond the Port of Beirut*
Louisville, Kentucky
2024

Drummer for U.S. artists and groups: Hype Level Midnight, Adam Elfers, Ashley Huffer, Stan Smith, Phil Maneri, William Strickler
2018-2021

Composer, drummer, and producer of the self-authored album *Zayzafoon*
Columbus, Ohio
2019

Drummer on two albums with the Lebanese bands: Homesick, and Yeti Pop
Beirut, Lebanon
2019

Drummer for the Lebanese bands: Homesick, Iyam El Lira, Jack Haddad's Band, Haifa Wehbe's Band, Yeti Pop, Dhour Shweir Big Band, Lebam Jazz Big Band, Maen Zakariya's Band
2016-2018

Drummer and actor at the Samsung Pay commercial
Beirut, Lebanon
2017

Drummer and actor at the Coca Cola commercial
Beirut, Lebanon
2015

URL: Album: Zayzafoon - Ayman Abi Kheir (Spotify Link)
Music Video:Pine - Music Video (YouTube Link)

Album Release Concert: Zayzafoon - Album Release Concert (YouTube Link)

TECHNICAL SKILLS:

Avid Protools
Avid Sibelius
Ableton Live
Max/MSP
Chuck Music Programming
Python Programming Language
UVI Falcon, Music Digital Synthesizer
Photography
Videography
Adobe Photoshop
Adobe Premiere Pro

VOLUNTEER EXPERIENCE & LEADERSHIP:

Volunteer Mentor at Connecting Champions
(mentoring organization for kids and young adults with cancer)
2024

Chief Assistant for the Cub Scouts
Lebanese Scouts for National Education
2014-2017

Community Service“Claque” Library
Bikfaya, Lebanon
2016

Community Service at “Baytuna”
(elderly care institution)
Dhour El Shweir, Lebanon
2015

Founder and Leader of Saint Joseph School’s Percussion Group
Cornet Chehwan, Lebanon
2014

Participant in planting campaigns by “Shweir Evergreen”
2012-2013