# How *Miraculous* Things Happen

for keyboard sampler and soundfile

by Kyle Gann
1997

# Kyle Gann: *How Miraculous Things Happen*

More than a year before I wrote this piece, my then eleven-year-old son Bernard began to insist repeatedly that I write a piece called *How Miraculous Things Happen*. I don't know where he got the idea. I began my fourth Tuning Study without a title, and finally realized that Bernard's title had an intriguing relationship to what I was writing; enough so to try out the title and see where it led the piece. I was dealing, after all, with the transformation of disappointment into triumph, or - on a more literal level - the gradual transformation of minor into major, along a series of microtonal steps. The piece is dedicated, naturally, to Bernard.

The scale employed contains 24 pitches per octave in an eleven-limit just-intonation system, two of those pitches appearing only in the final measures. Although there are 24 pitches, this is not at all a quarter-tone scale; some pitches are crammed close together, others approximate the regular chromatic scale. The scale (given in Ben Johnston's notation) is as follows:

| **Pitch:** | A | A^- | A# | B- | B | BL- | C7 | C | C^- | C# | C#L | D7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ratio:** | 1/1 | 55/54 | 25/24 | 10/9 | 9/8 | 8/7 | 7/6 | 6/5 | 11/9 | 5/4 | 9/7 | 21/16 |
| **Cents:** | 0 | 32 | 71 | 182 | 204 | 231 | 267 | 316 | 347 | 386 | 435 | 471 |

| D- | D#L | E- | E | F7 | E# | F# | F#L | G- | G# | G#L | A7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/3 | 10/7 | 40/27 | 3/2 | 14/9 | 25/16 | 5/3 | 12/7 | 16/9 | 15/8 | 40/21 | 35/18 |
| 498 | 617 | 680 | 702 | 765 | 773 | 884 | 933 | 996 | 1088 | 1116 | 1151 |

In Johnston's notation, + raises a pitch by 81/80, - lowers it by 80/81, # raises it by 25/24, 7 lowers it by 35/36, L raises it by 35/36, ^ raises it by 33/32, and F-A-C, C-E-G, and G-B-D are all perfectly tuned 4:5:6 major triads. The basic line was a series of ratios leading from B (10/9) to D- (4/3). The tuning results from the pitches from B- up to C#, and from D- down to C#, accompanied by the chords most relevant to the key of A needed to support them and make their harmonic function clear (the root of each chord is given in boldface):

| **Cents:** | 182 | 204 | 231 | 267 | 316 | 347 | 386 | 435 | 471 | 498 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Melody:** | B- | B | **BL-** | C7 | C | C^- | C# | C#L | D7 | **D-** |
| **Hamonies:** | **G-** | G# | A | A | **A** | B- | A | **BL-** | B | A |
| | D- | **E** | F#L | F7 | E | **G-** | **F#** | F#L | G# | F# |
| | | D7 | D#L | **D-** | | D- | | | **E** | |

For instance, the C (C7) that is the seventh of the subdominant chord is different from the C that is the third of the tonic minor, and the B that is the fifth of the dominant chord is different from the B (BL-) that is the tonic of the chord in which A is the seventh; these differences, purely theoretical in most contexts, here become quite audible. The effect, I find, is that the pitches are so well supported by pure harmonies that people often fail to be disturbed by the slight pitch shifts. Some musicians don't even register that I'm using more than 12 pitches to the octave, because the harmonies sound so pure, simple, and familiar.

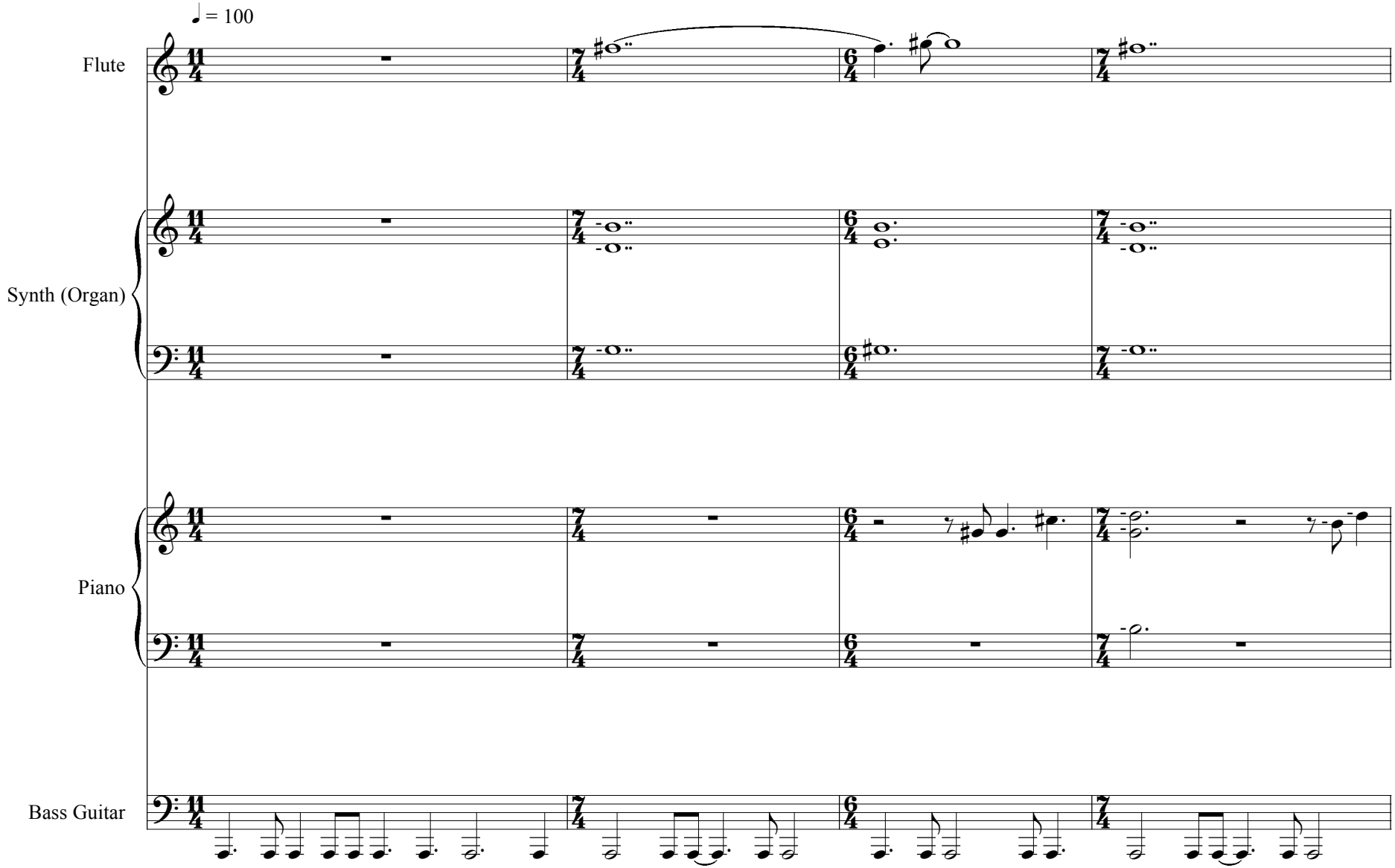
How Miraculous Things Happen opens in A minor and keeps trying to move from B through C up to C# to become A major; but every time it reaches C#, the bass shifts to create F# minor. At the end of the work, A moves up through A^- to A#, for a close in F# major. The piece succeeds in moving to a major key, but not the key it was originally aiming for. That's how, it seemed to me, miraculous things happen.

Kyle Gann

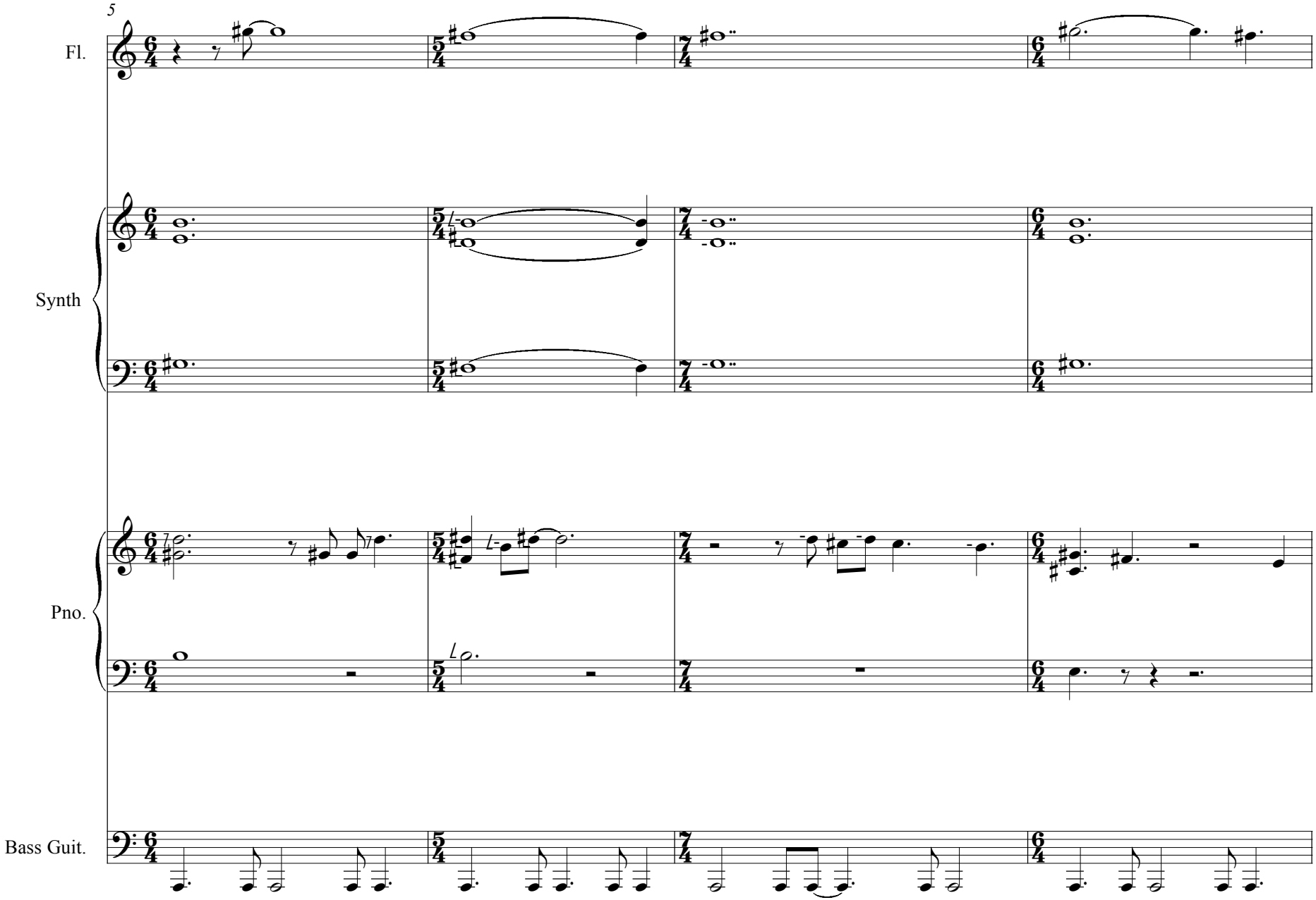
*To Bernard*

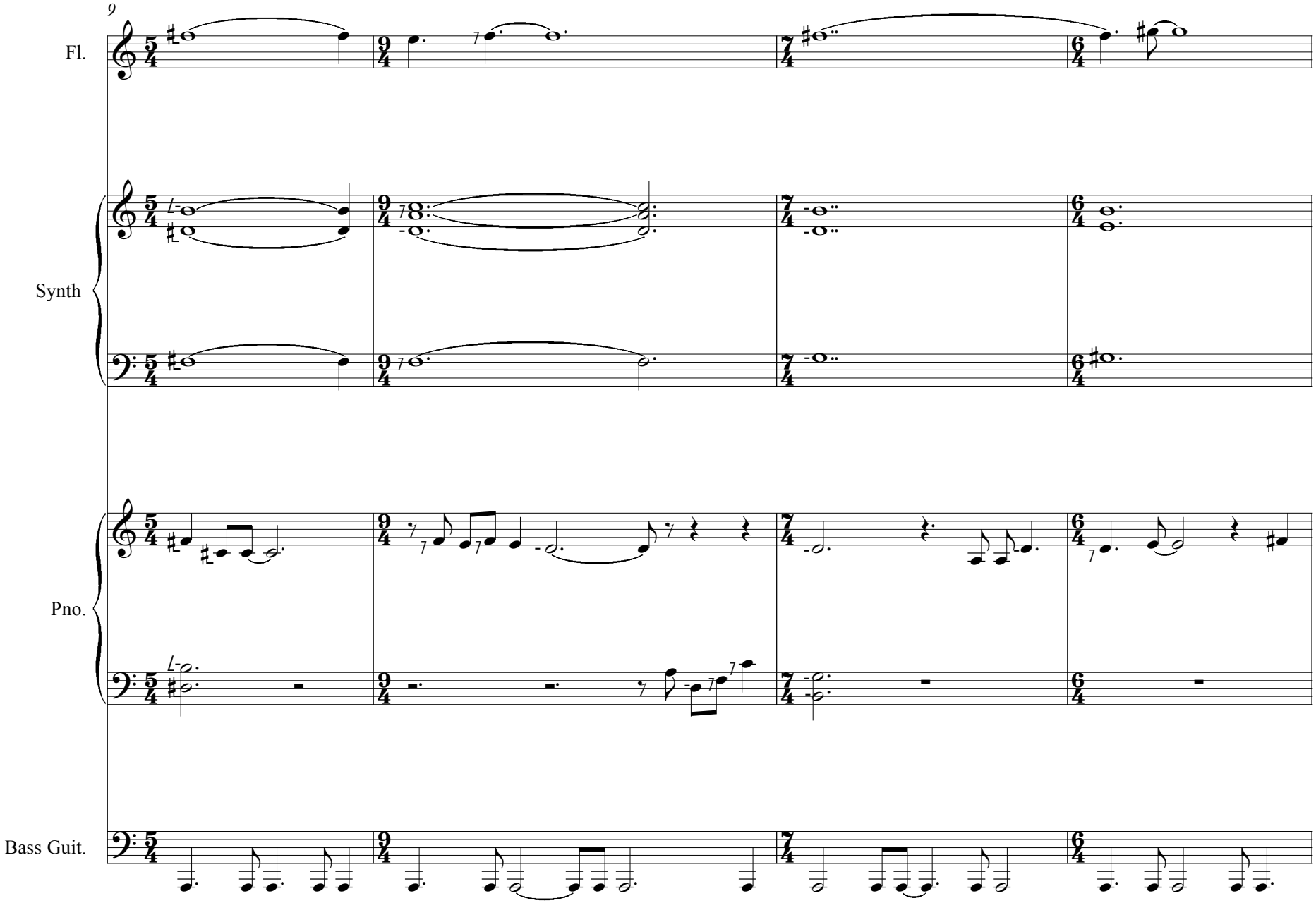
# How Miraculous Things Happen

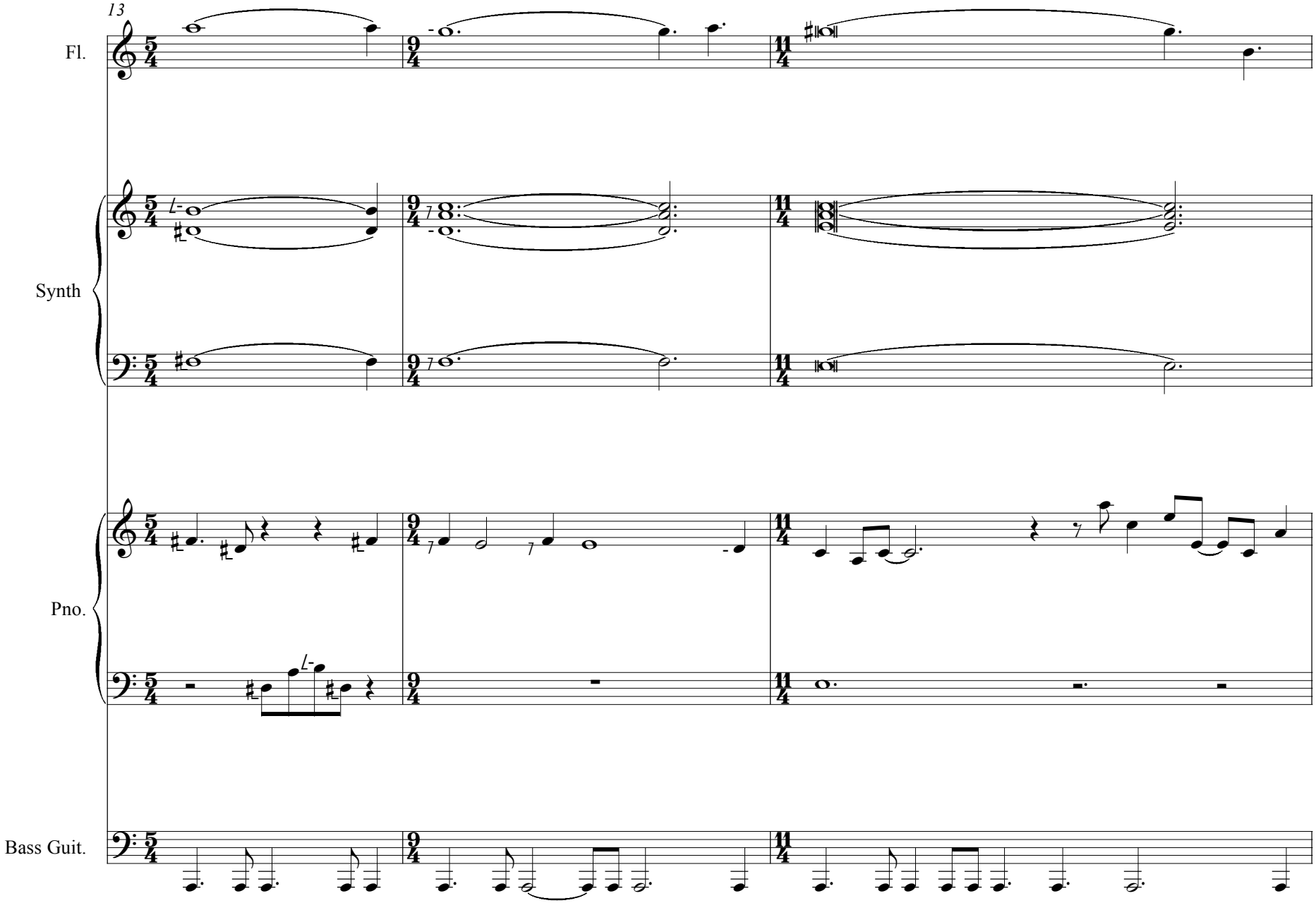
Kyle Gann
1997

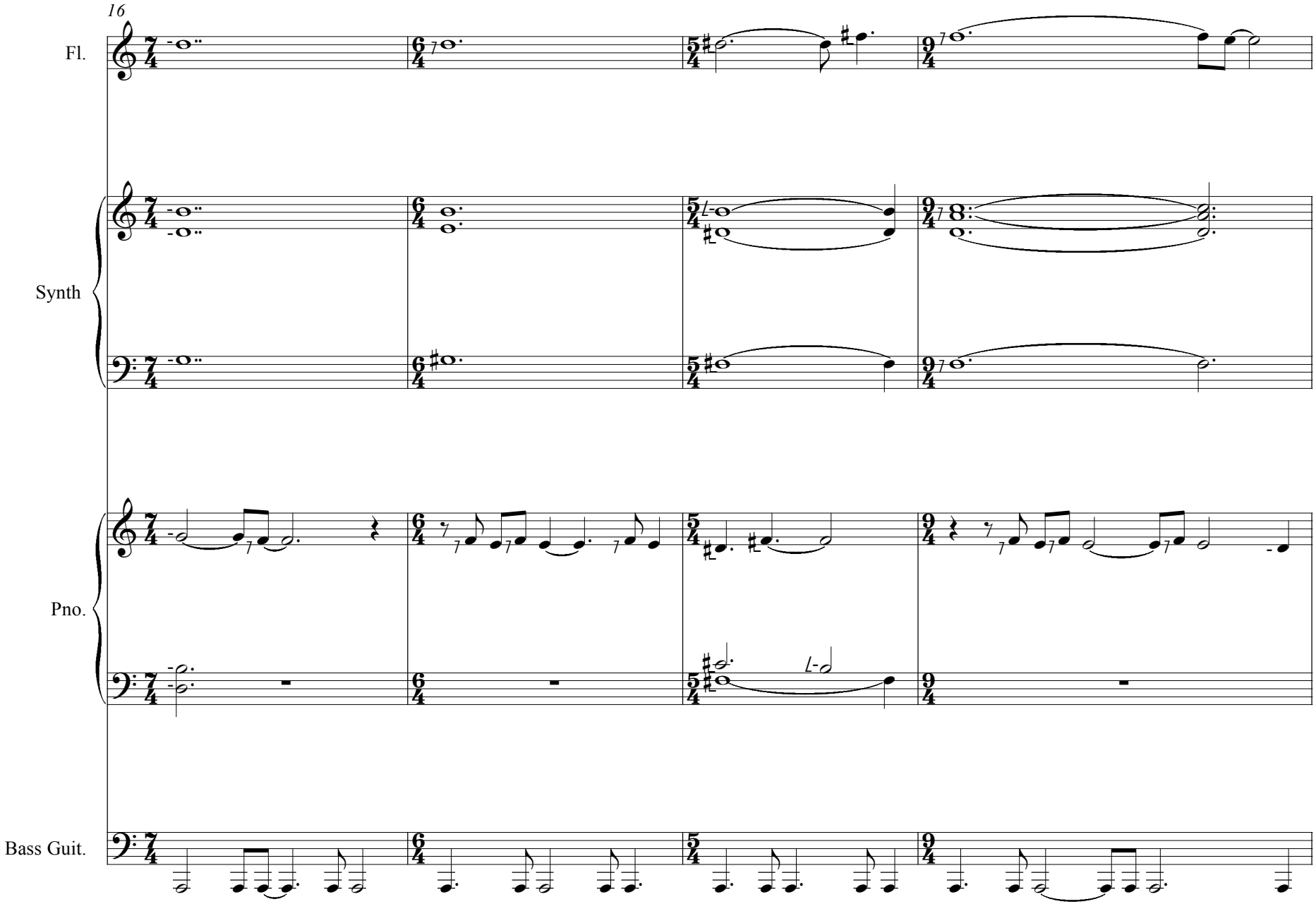


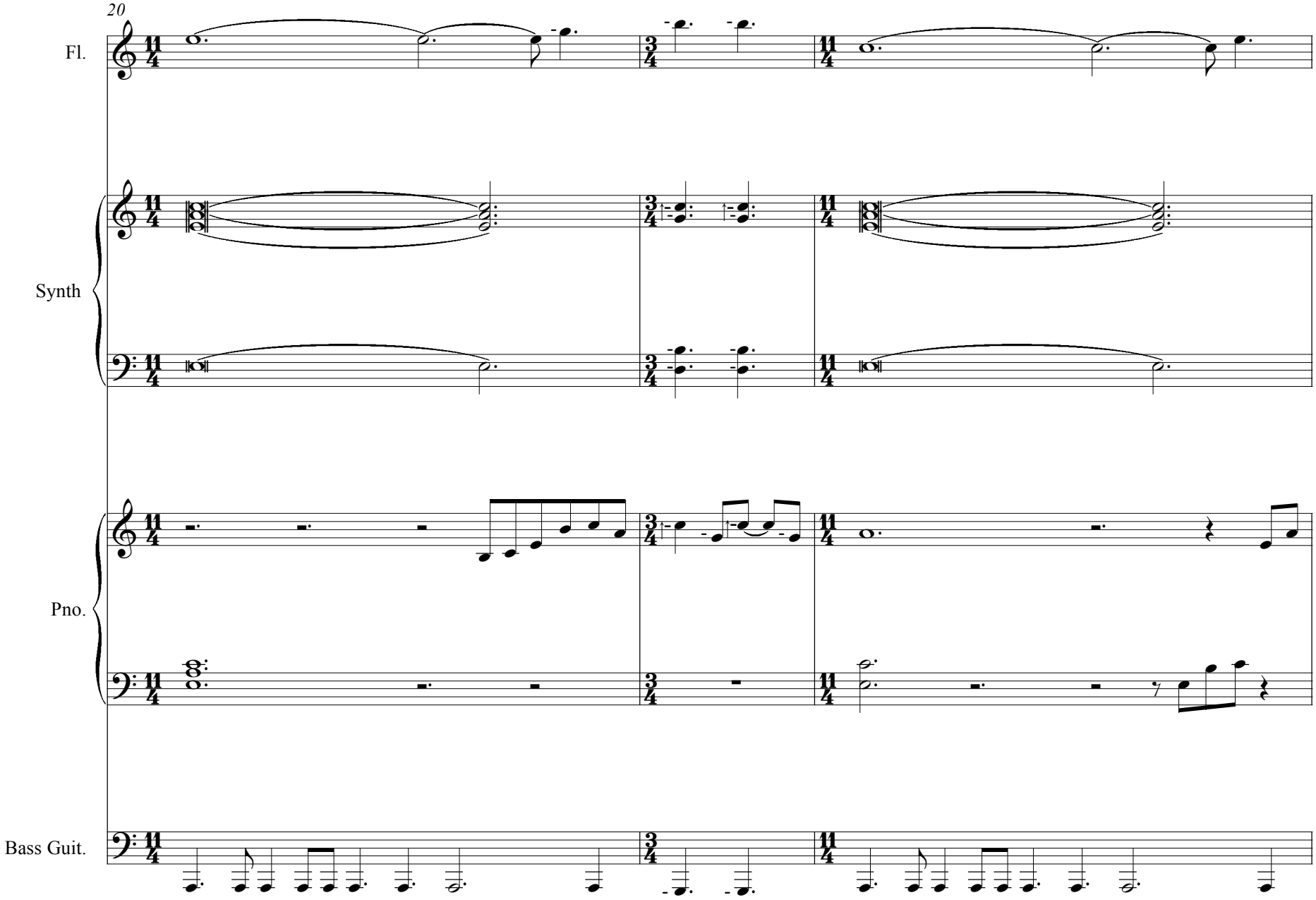

Copyright © Monroe Street Music 2007

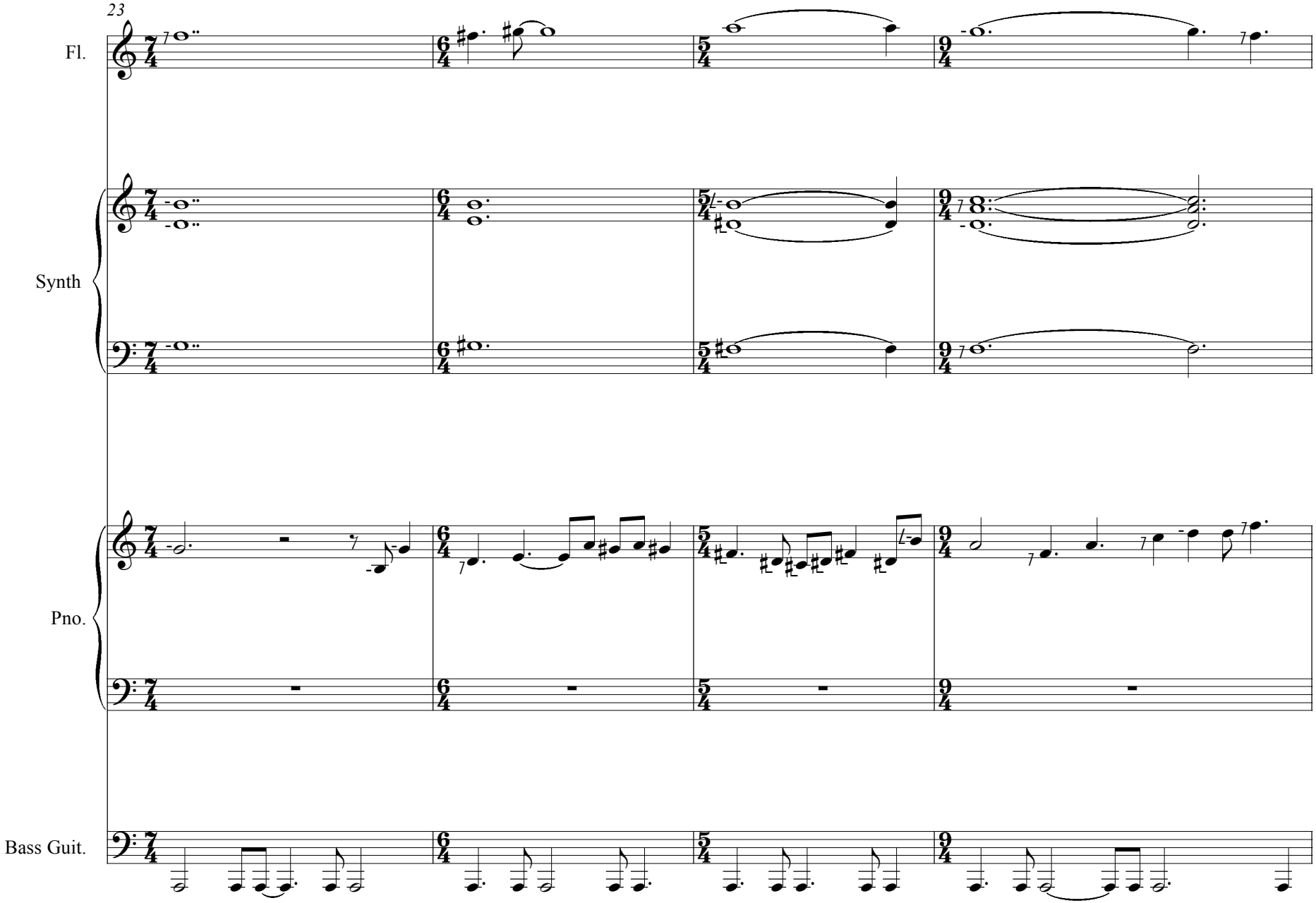

5
Fl.
Synth
Pno.
Bass Guit.

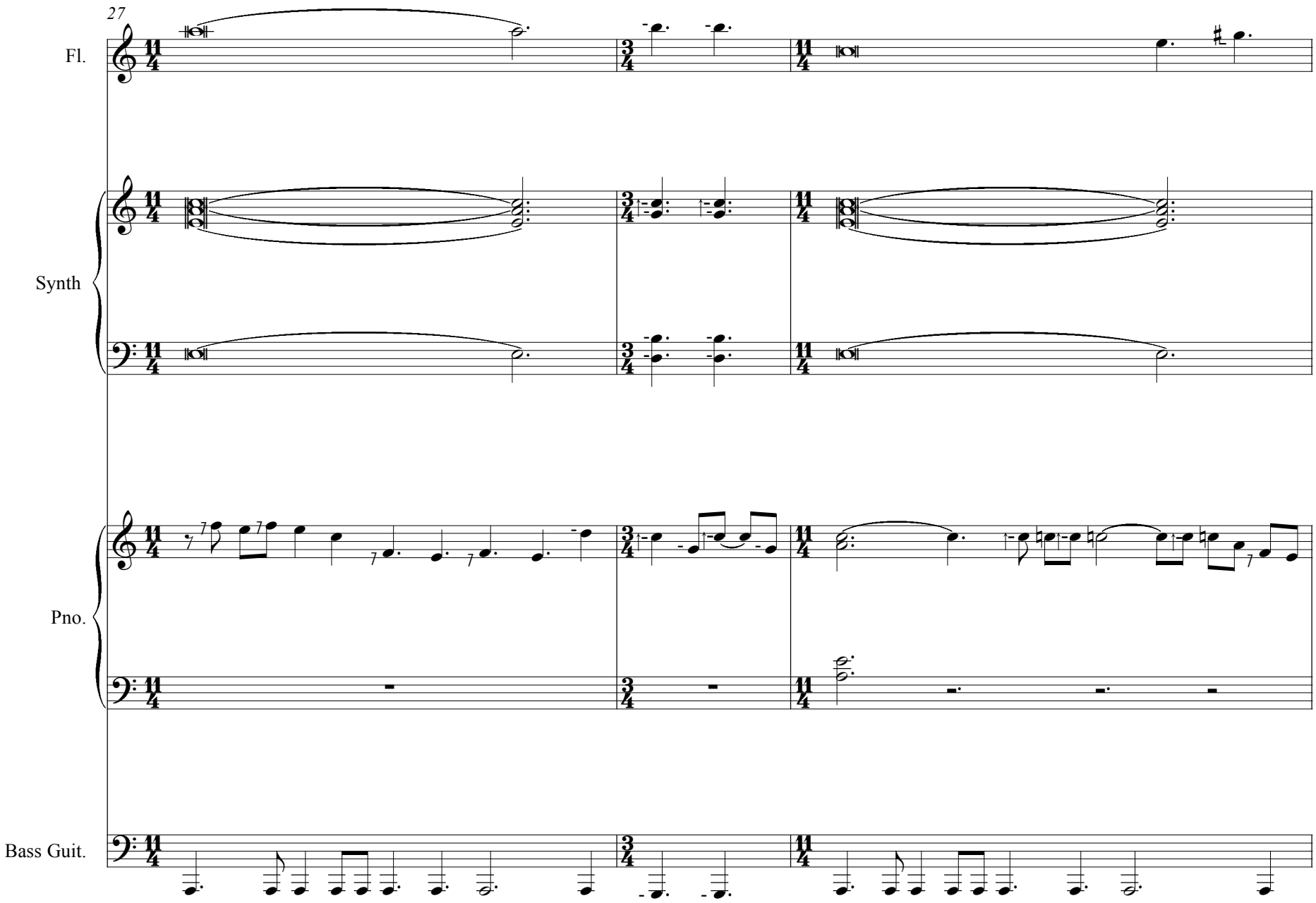

9
Fl.
Synth
Pno.
Bass Guit.

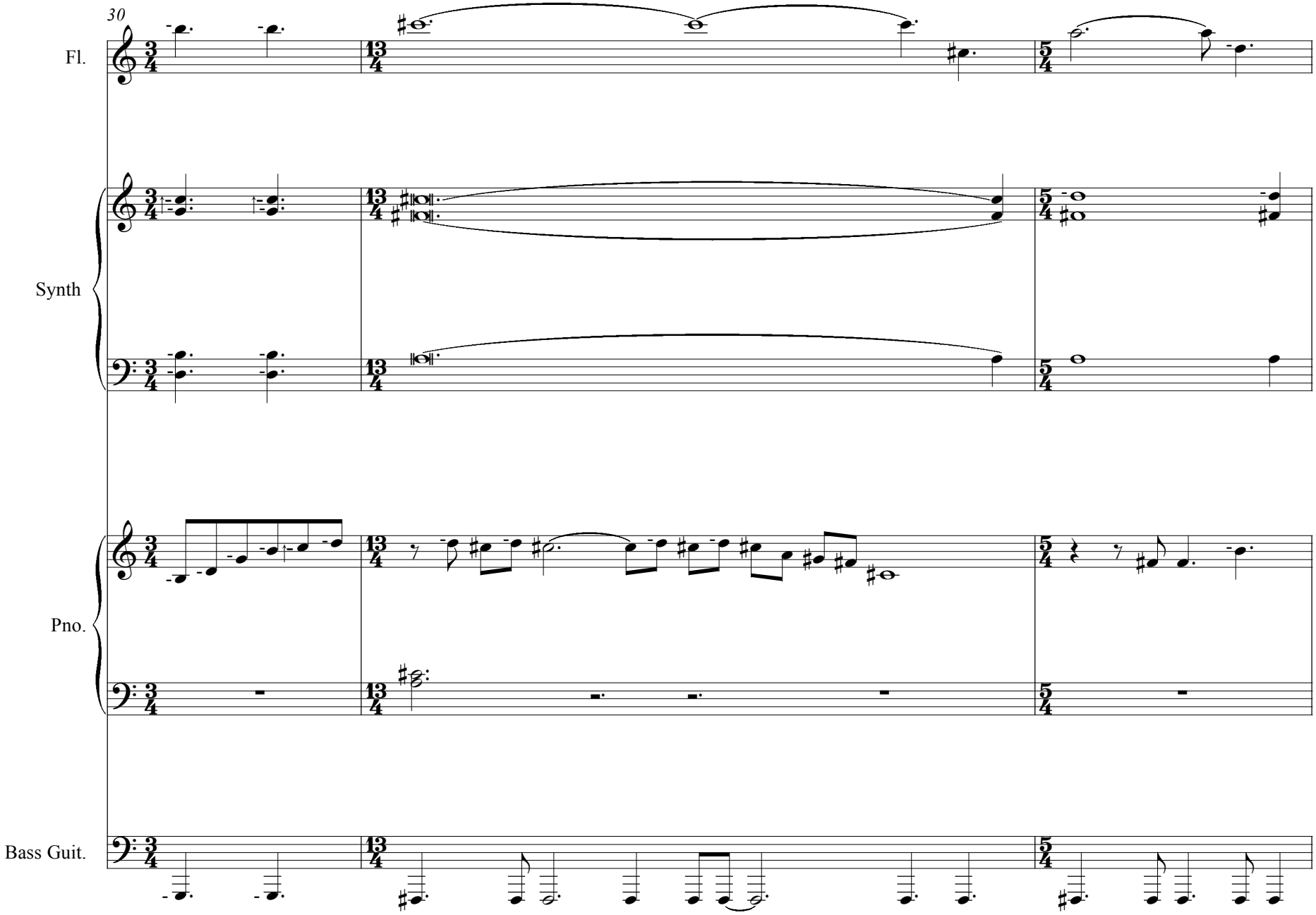

13
Fl.
Synth
Pno.
Bass Guit.

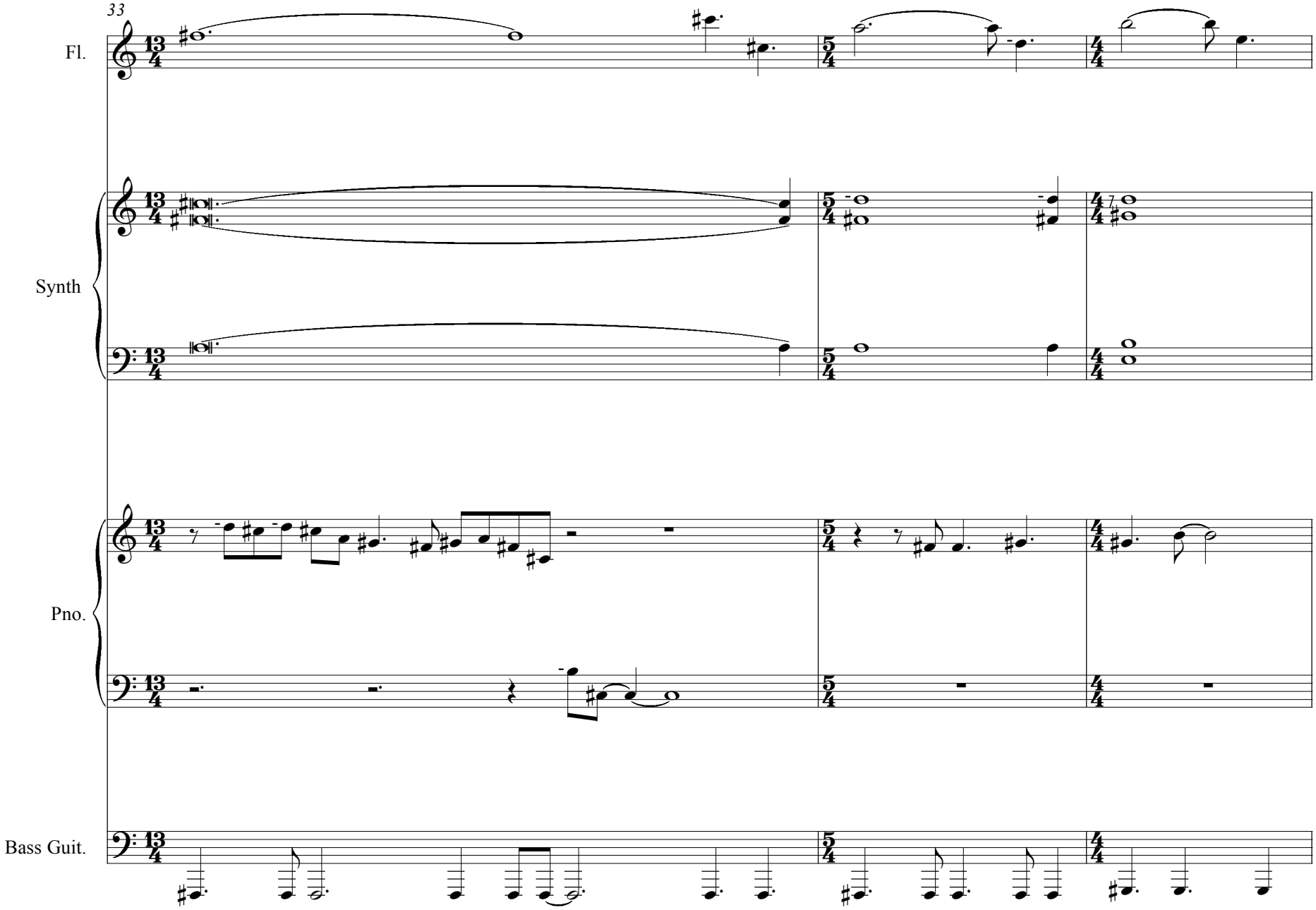

16
Fl.
Synth
Pno.
Bass Guit.

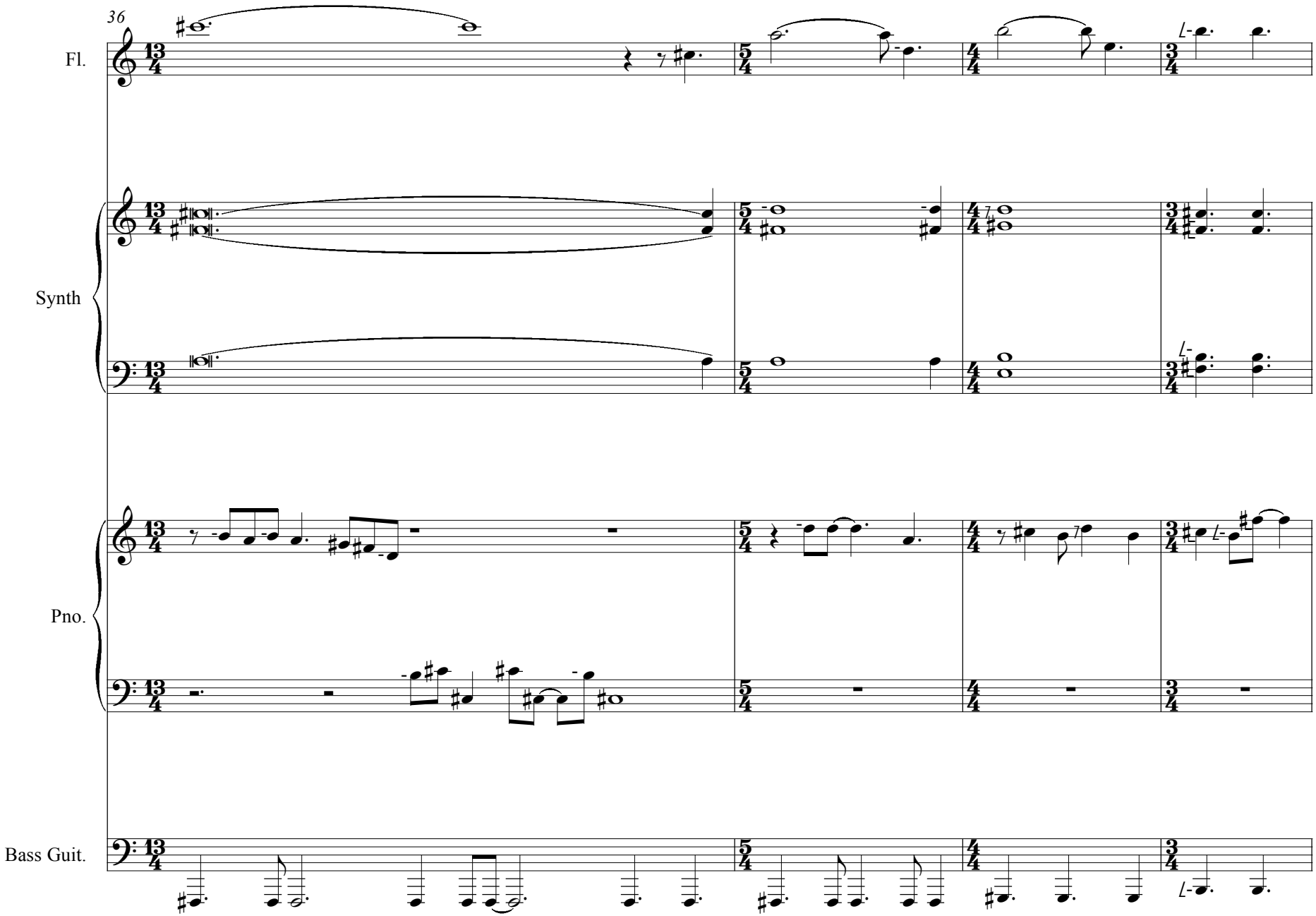

20
Fl.
Synth
Pno.
Bass Guit.

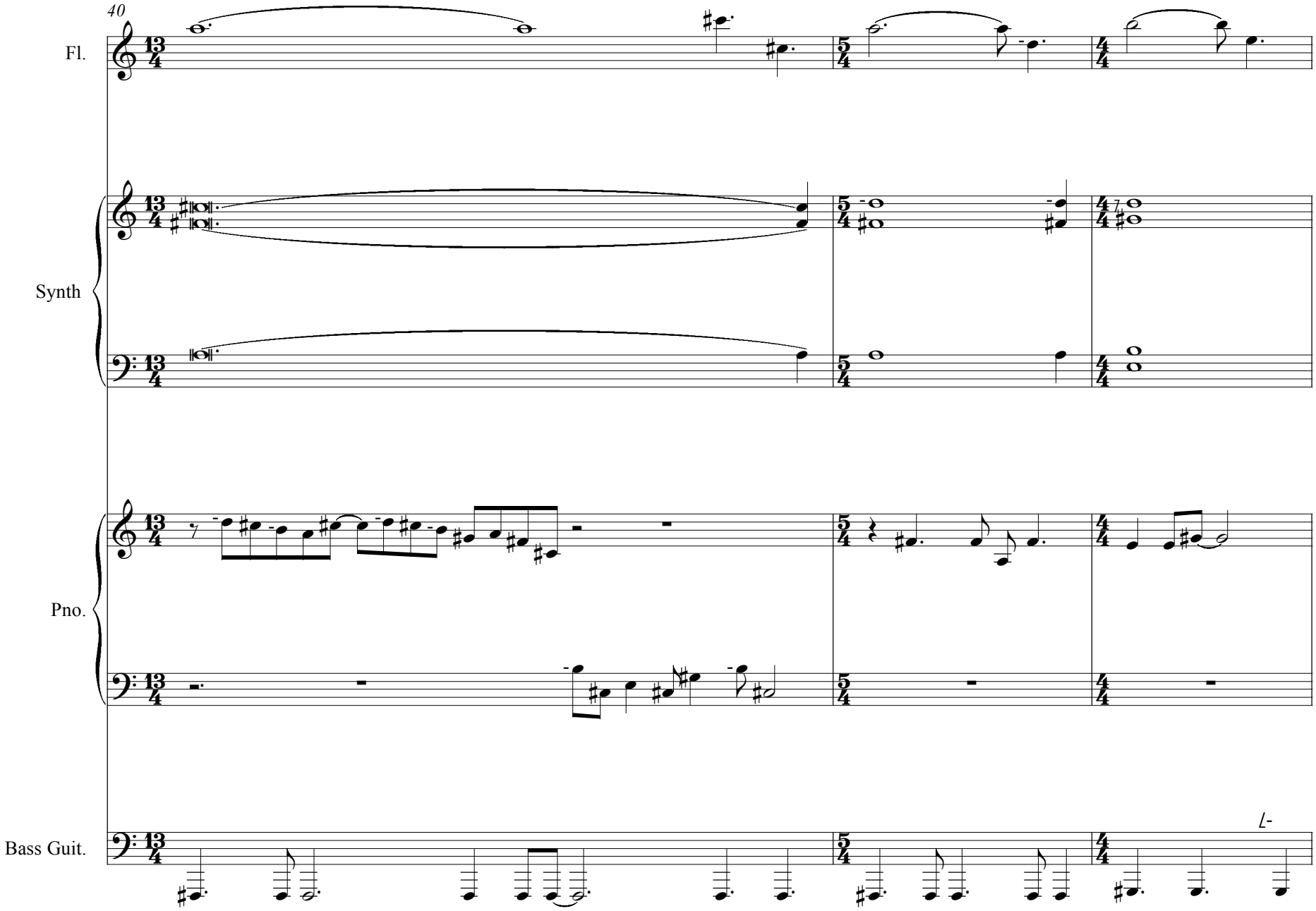

23
Fl.
Synth
Pno.
Bass Guit.


27
Fl.
Synth
Pno.
Bass Guit.

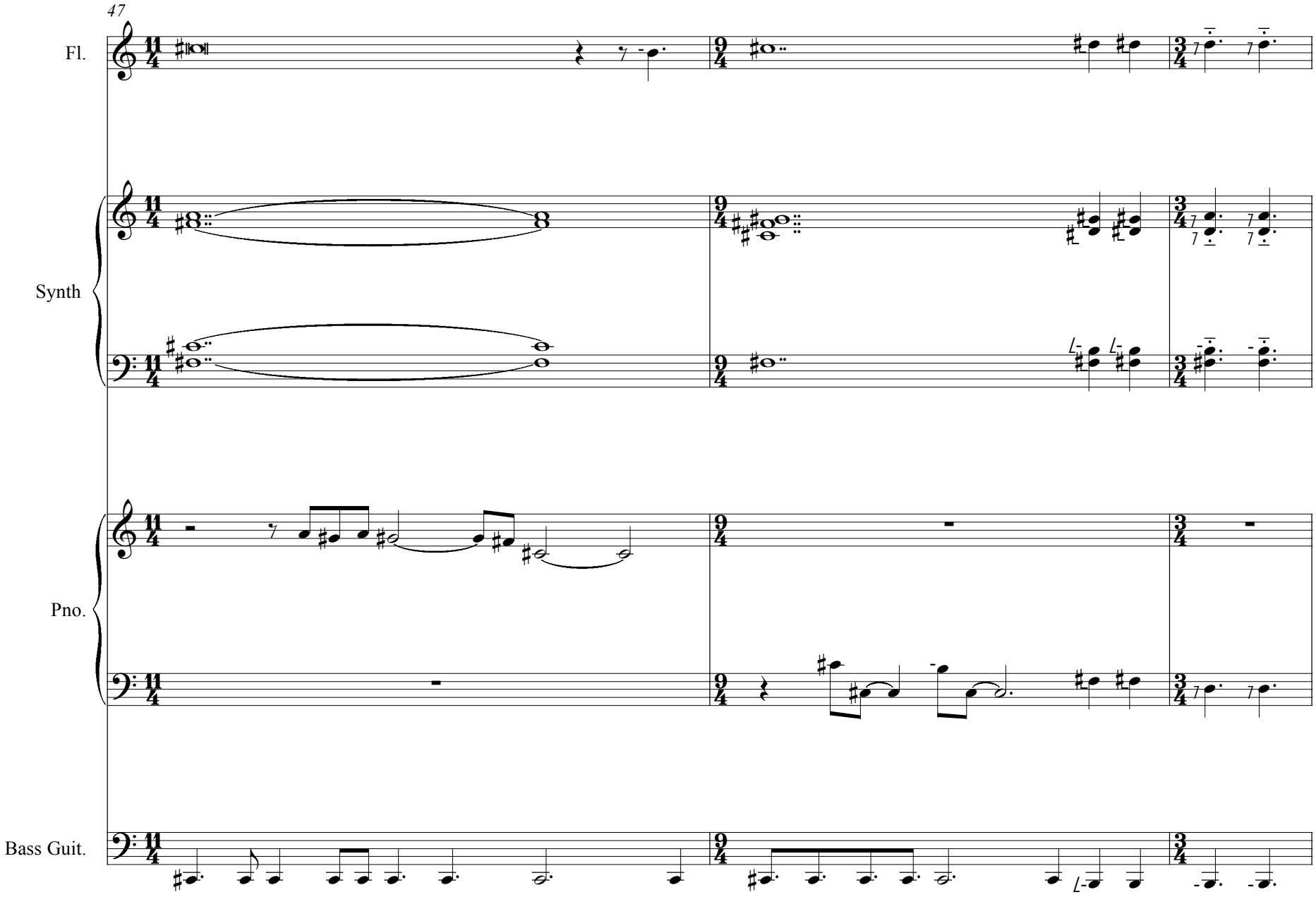

30
Fl.
Synth
Pno.
Bass Guit.

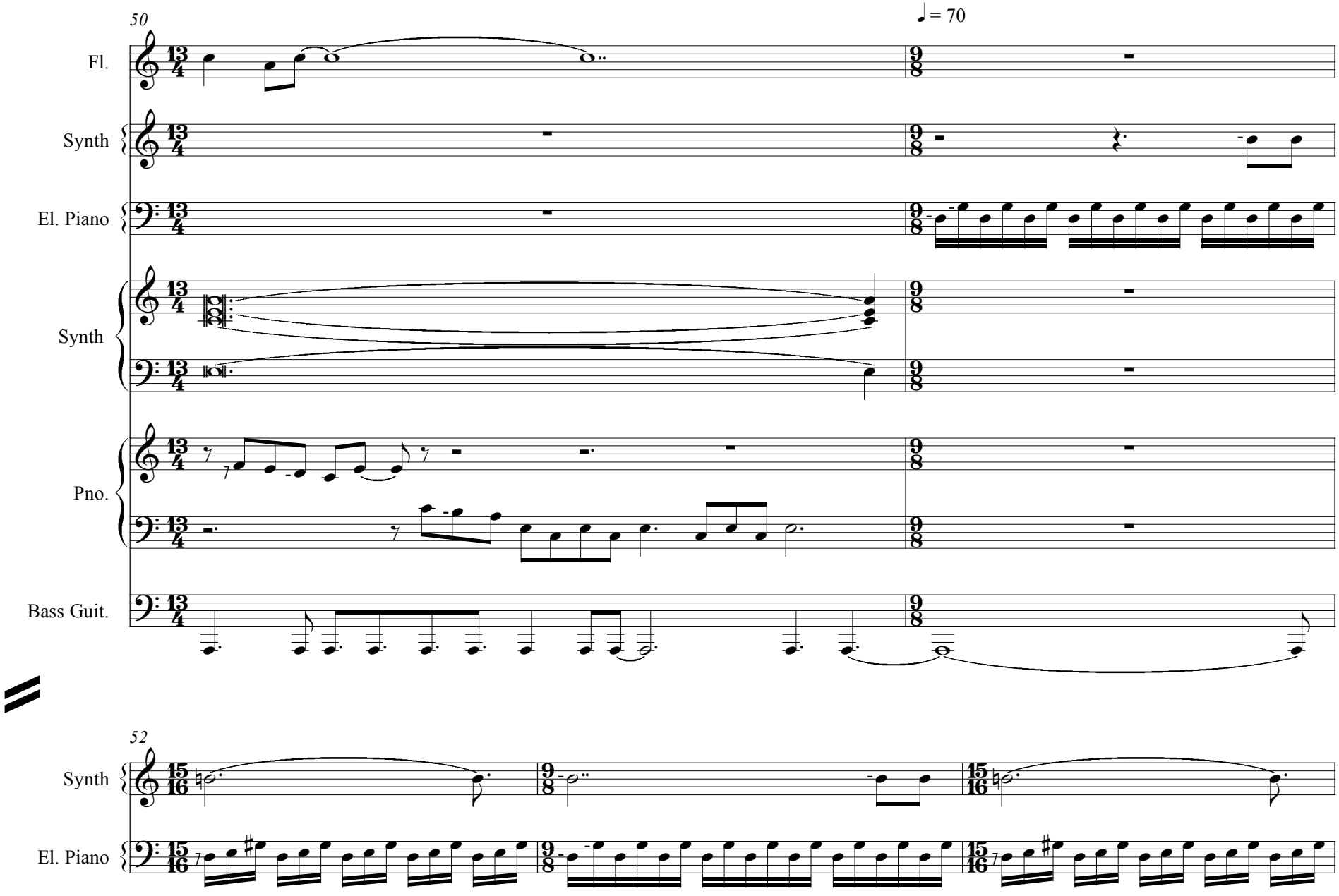

33
Fl.
Synth
Pno.
Bass Guit.

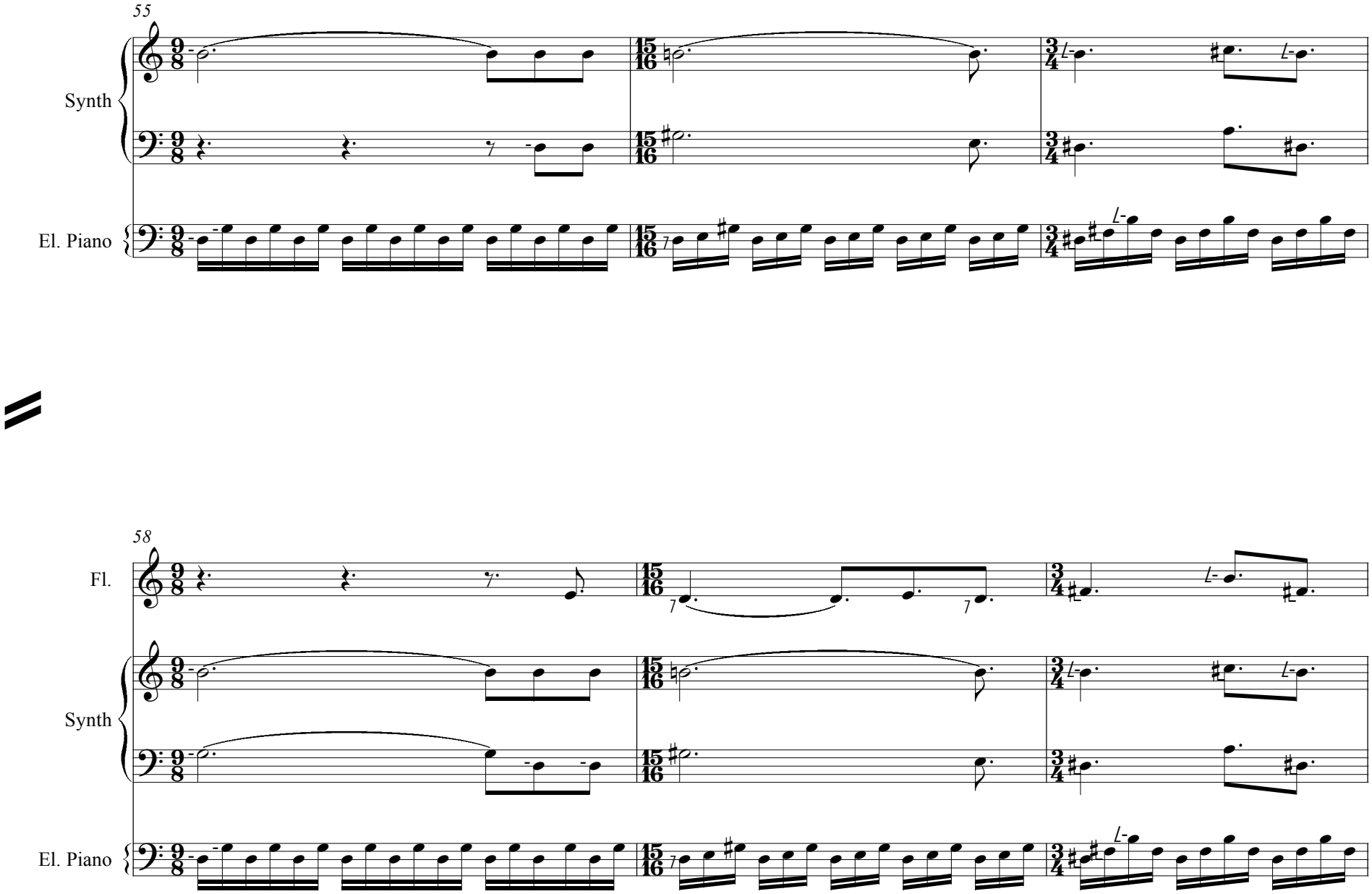

36
Fl.
Synth
Pno.
Bass Guit.

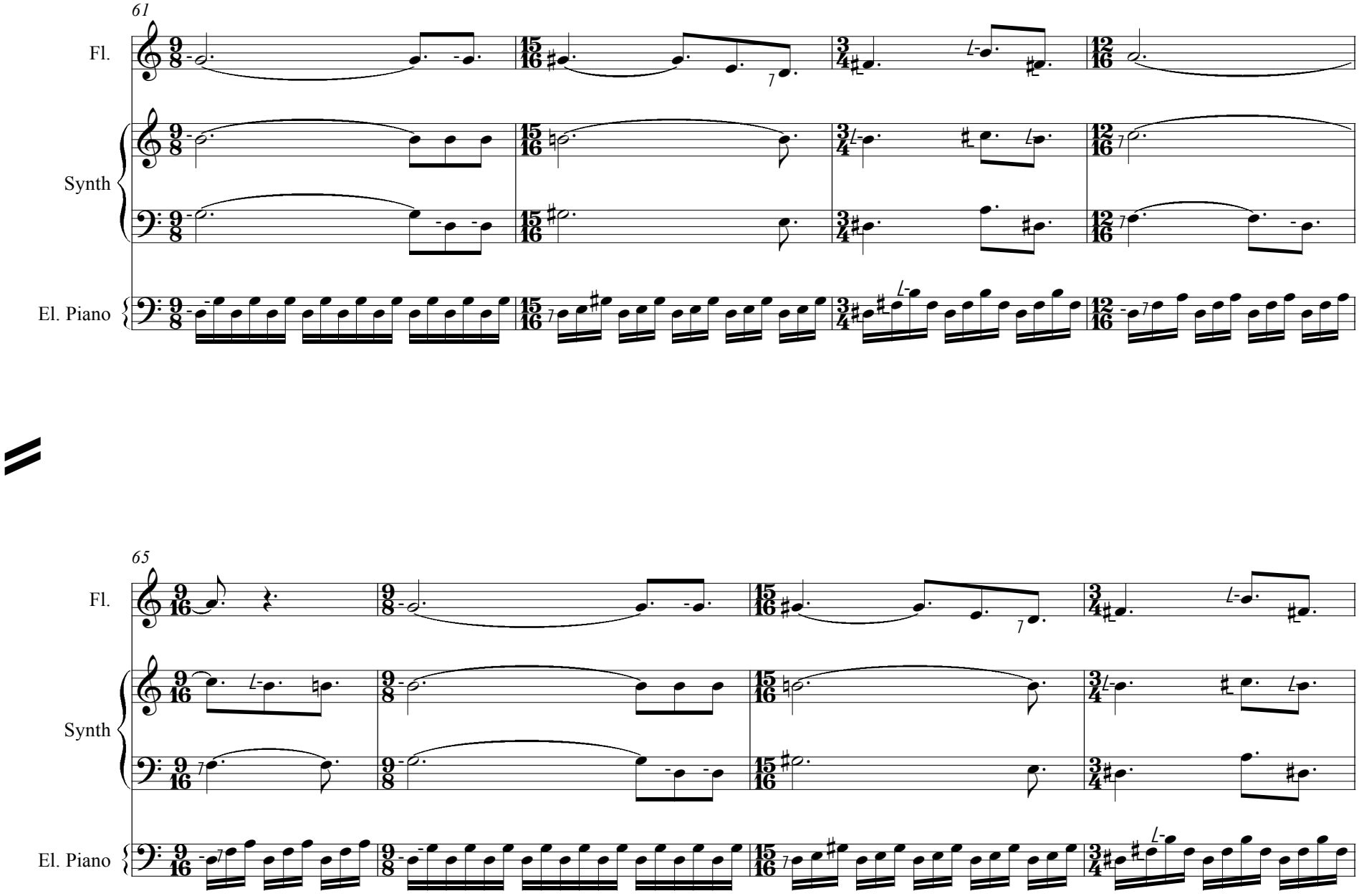

40
Fl.
Synth
Pno.
Bass Guit.

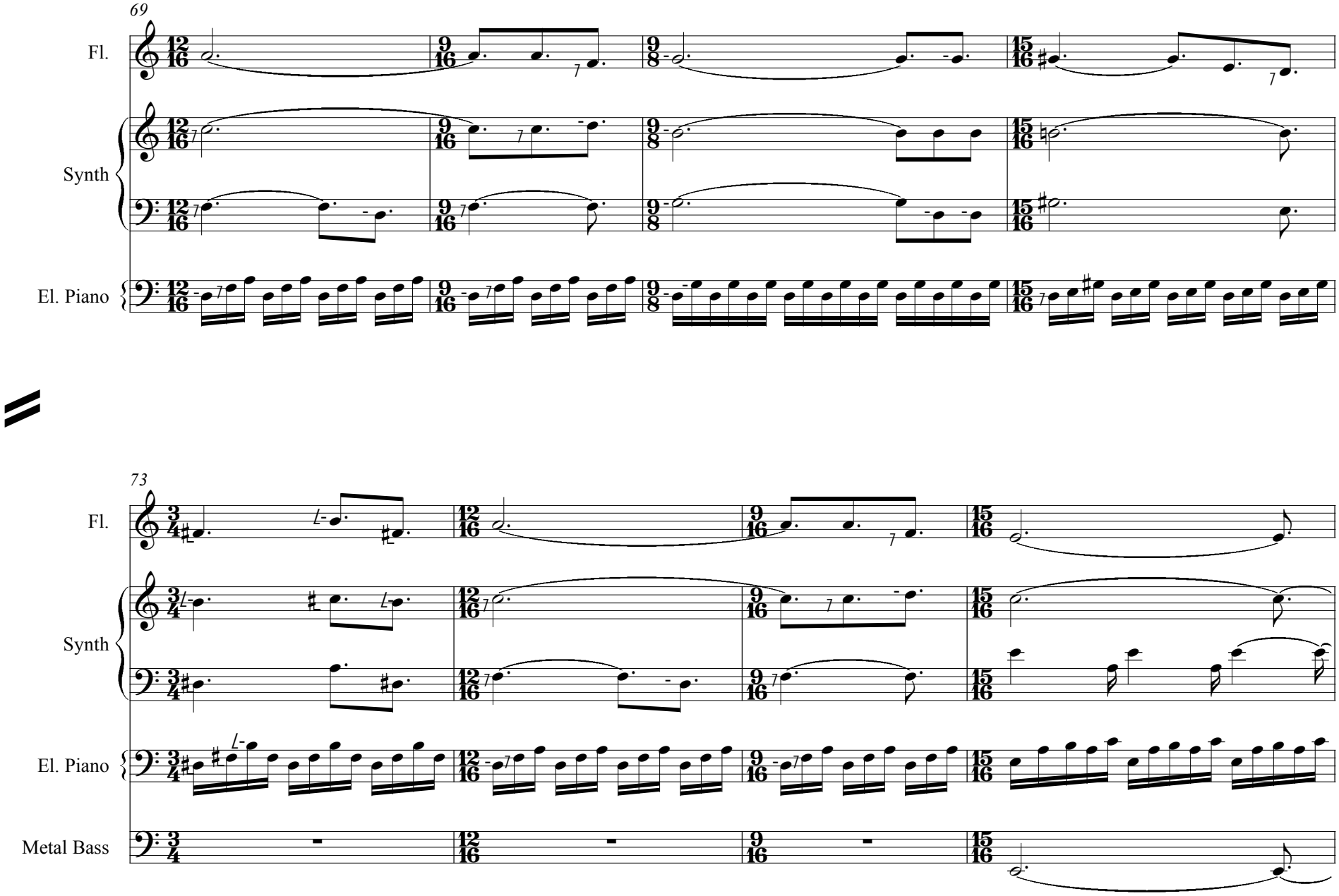
43
Fl.
Synth
Pno.
Bass Guit.

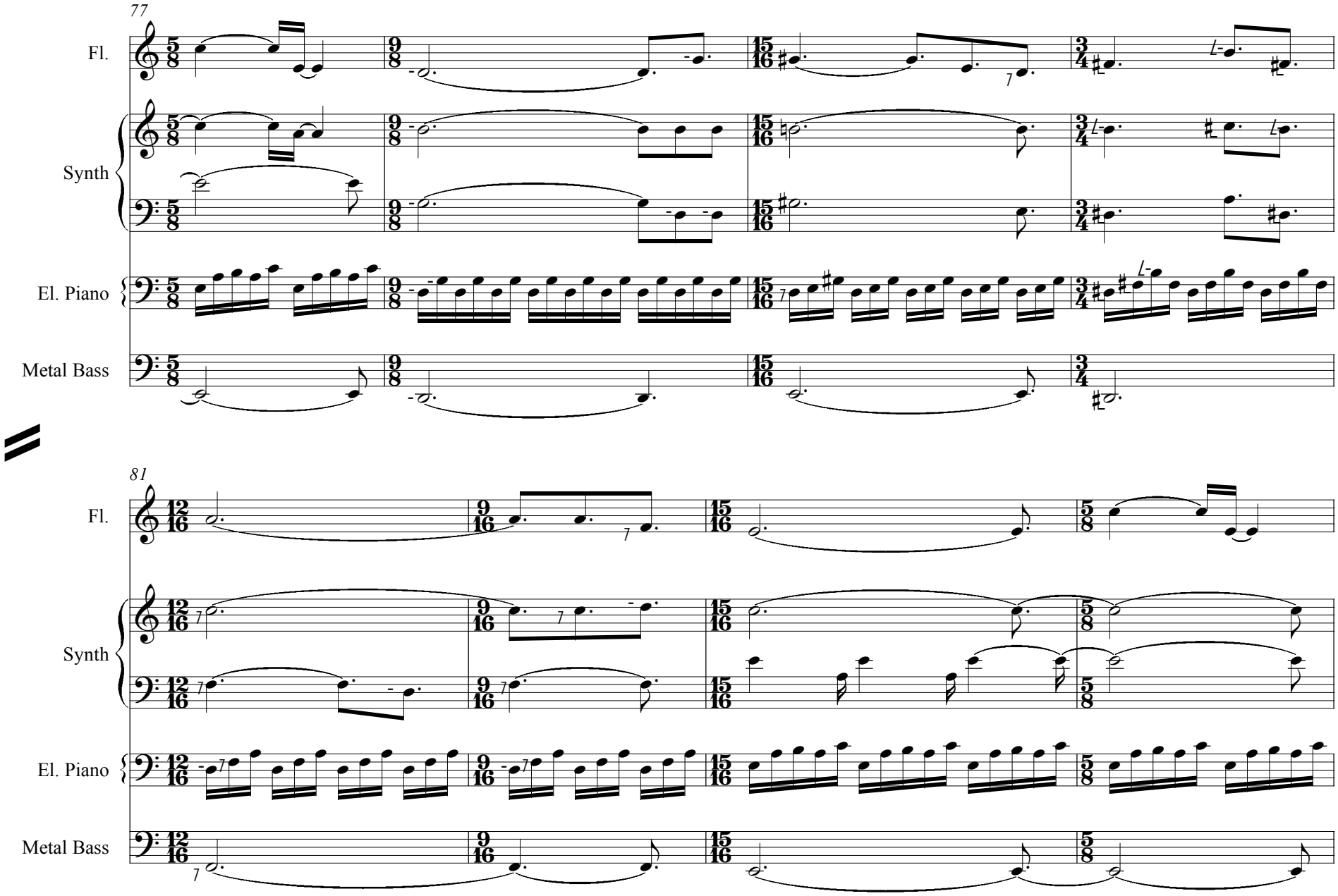

47
Fl.
Synth
Pno.
Bass Guit.

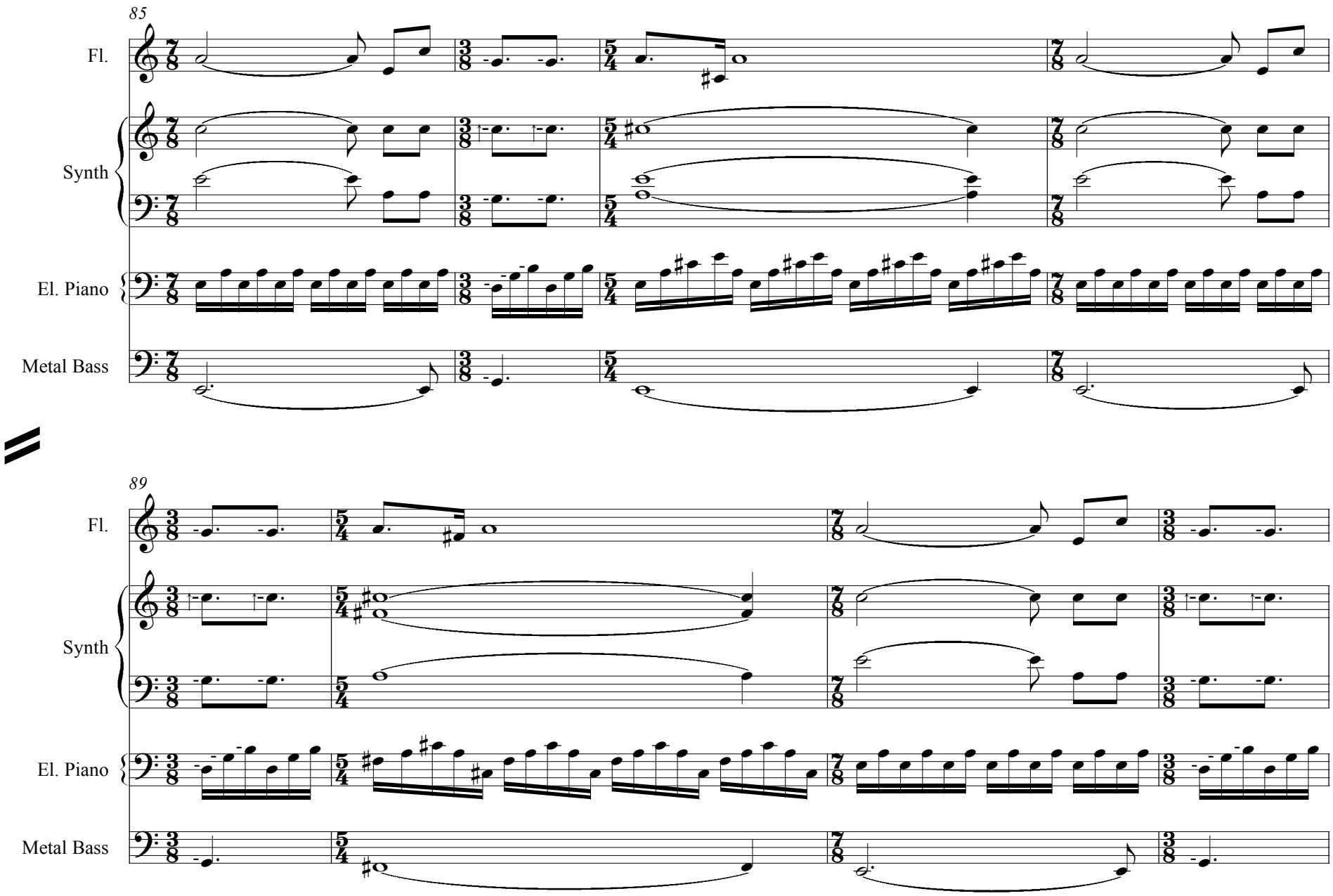

50
♩ = 70
Fl.
Synth
El. Piano
Synth
Pno.
Bass Guit.
52
Synth
El. Piano

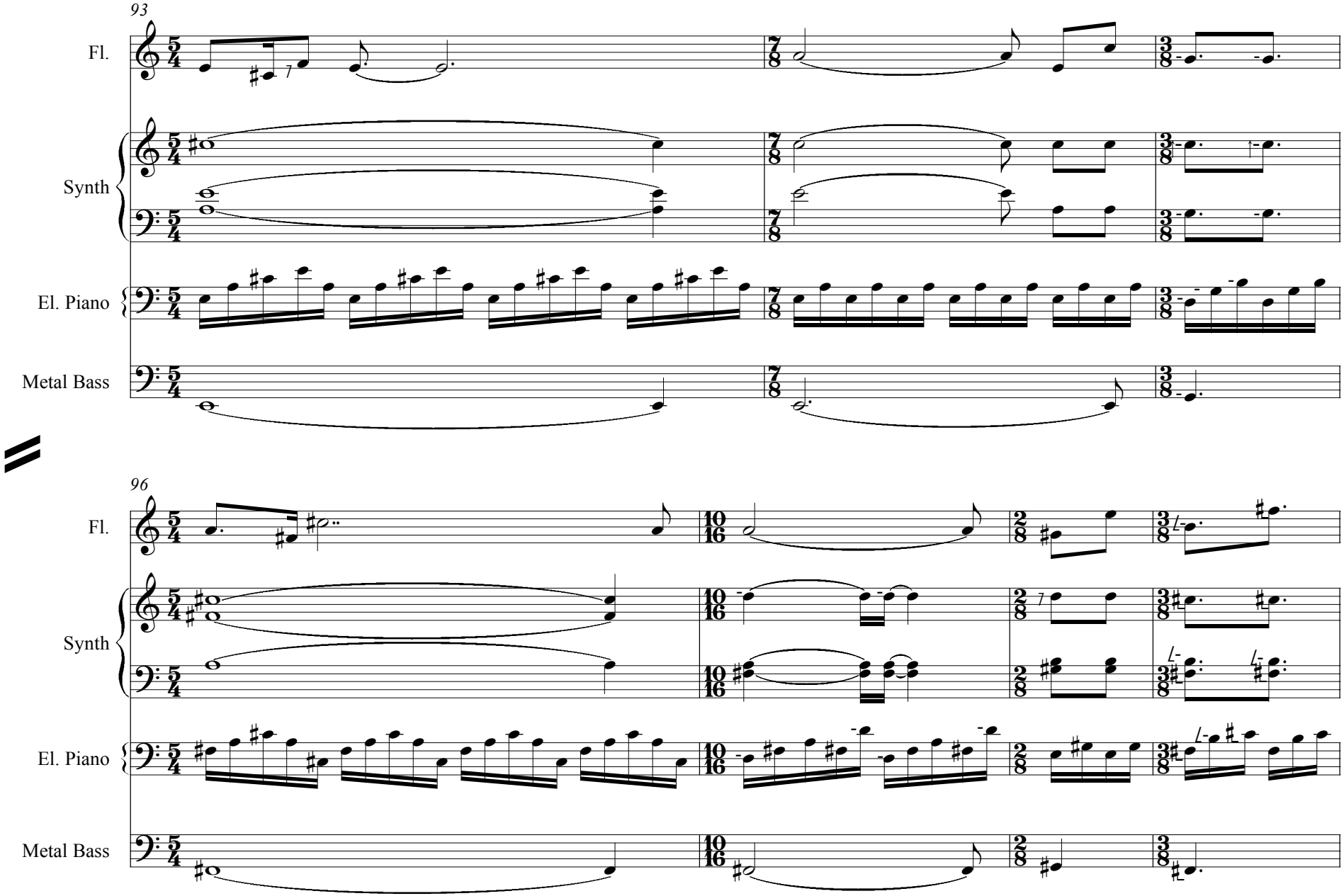

55
Synth
El. Piano
58
Fl.
Synth
El. Piano

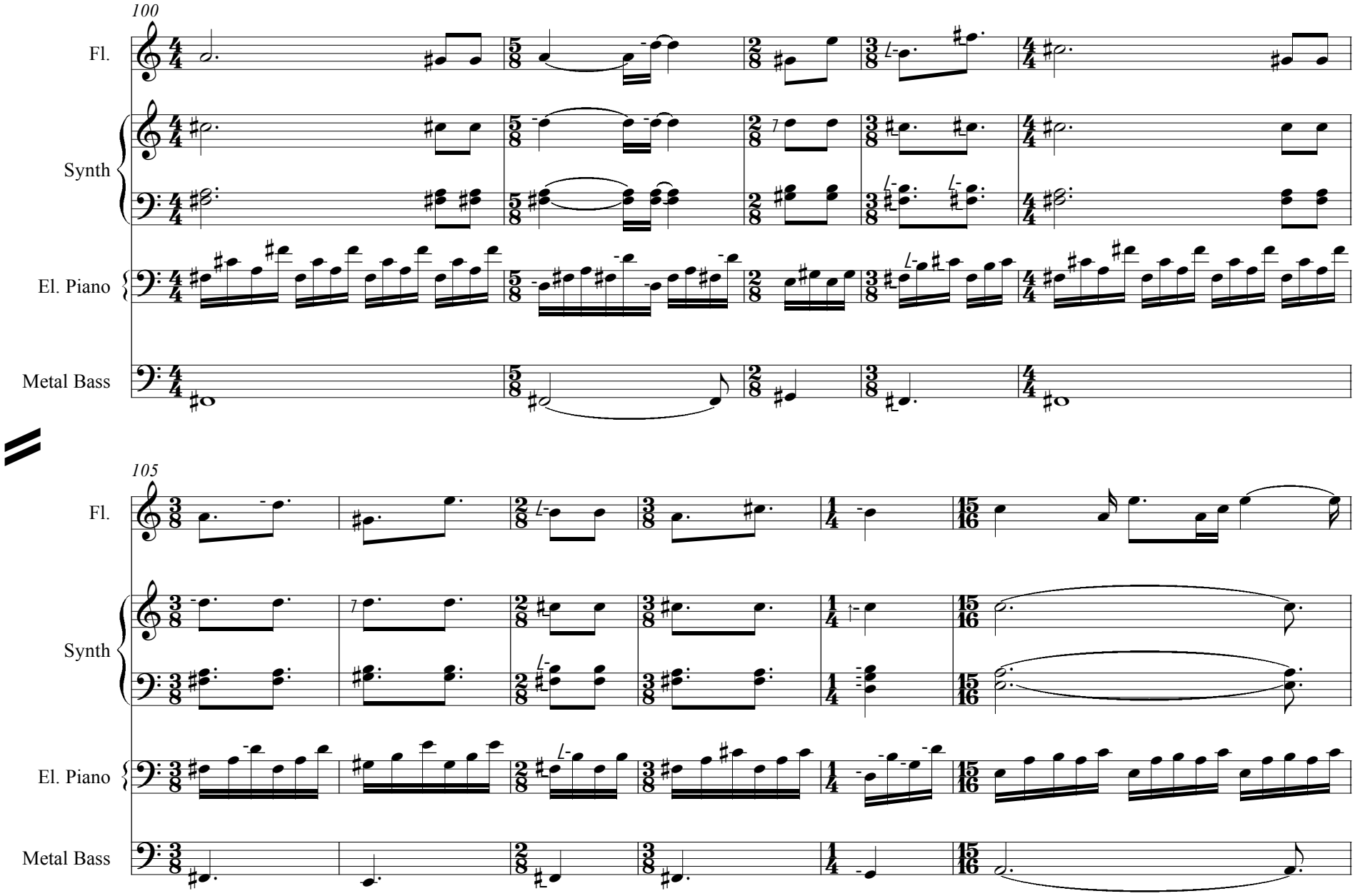

61
Fl.
Synth
El. Piano
65
Fl.
Synth
El. Piano

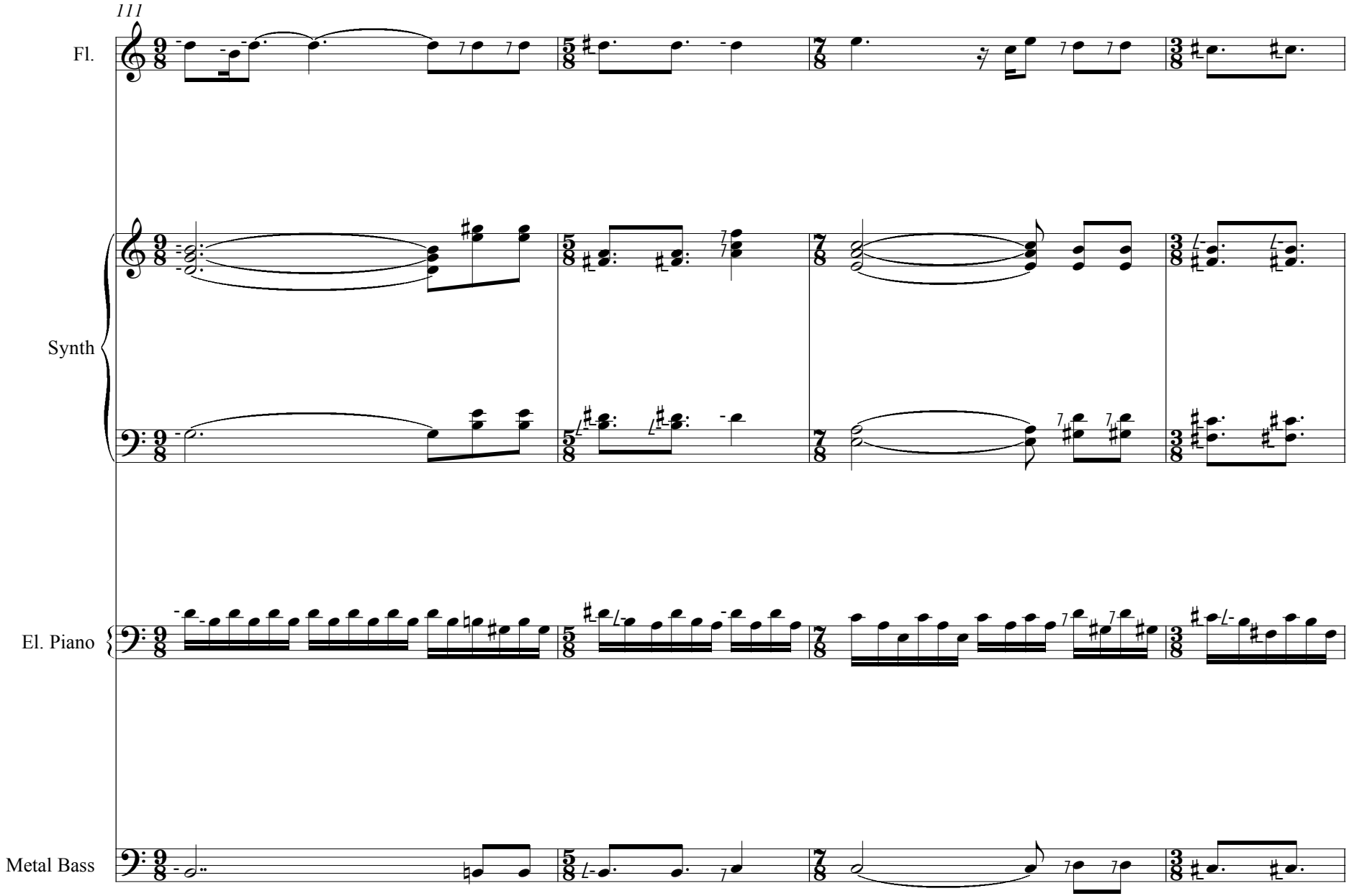

69
Fl.
Synth
El. Piano
73
Fl.
Synth
El. Piano
Metal Bass


77
Fl.
Synth
El. Piano
Metal Bass
81
Fl.
Synth
El. Piano
Metal Bass

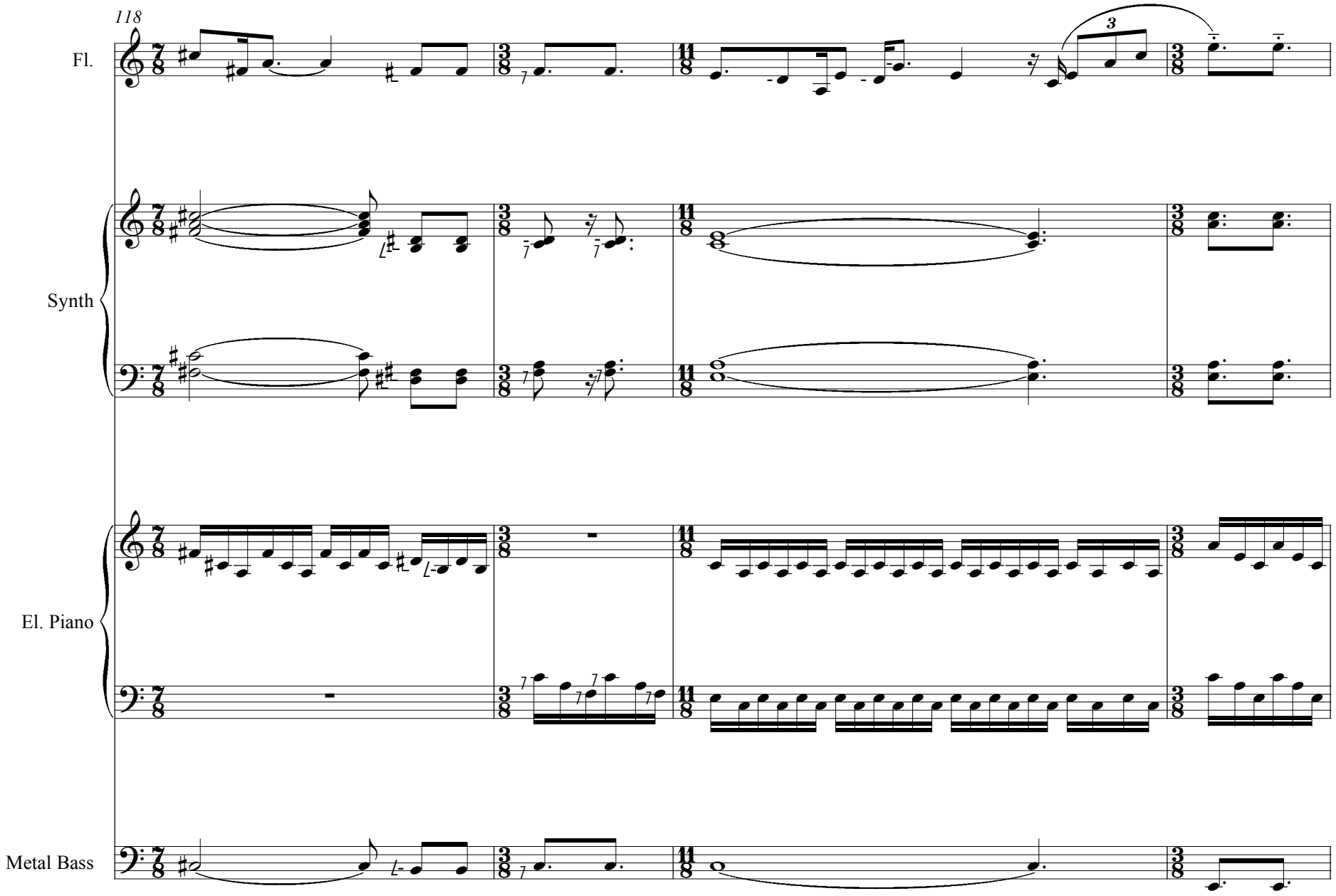

85
Fl.
Synth
El. Piano
Metal Bass
89
Fl.
Synth
El. Piano
Metal Bass

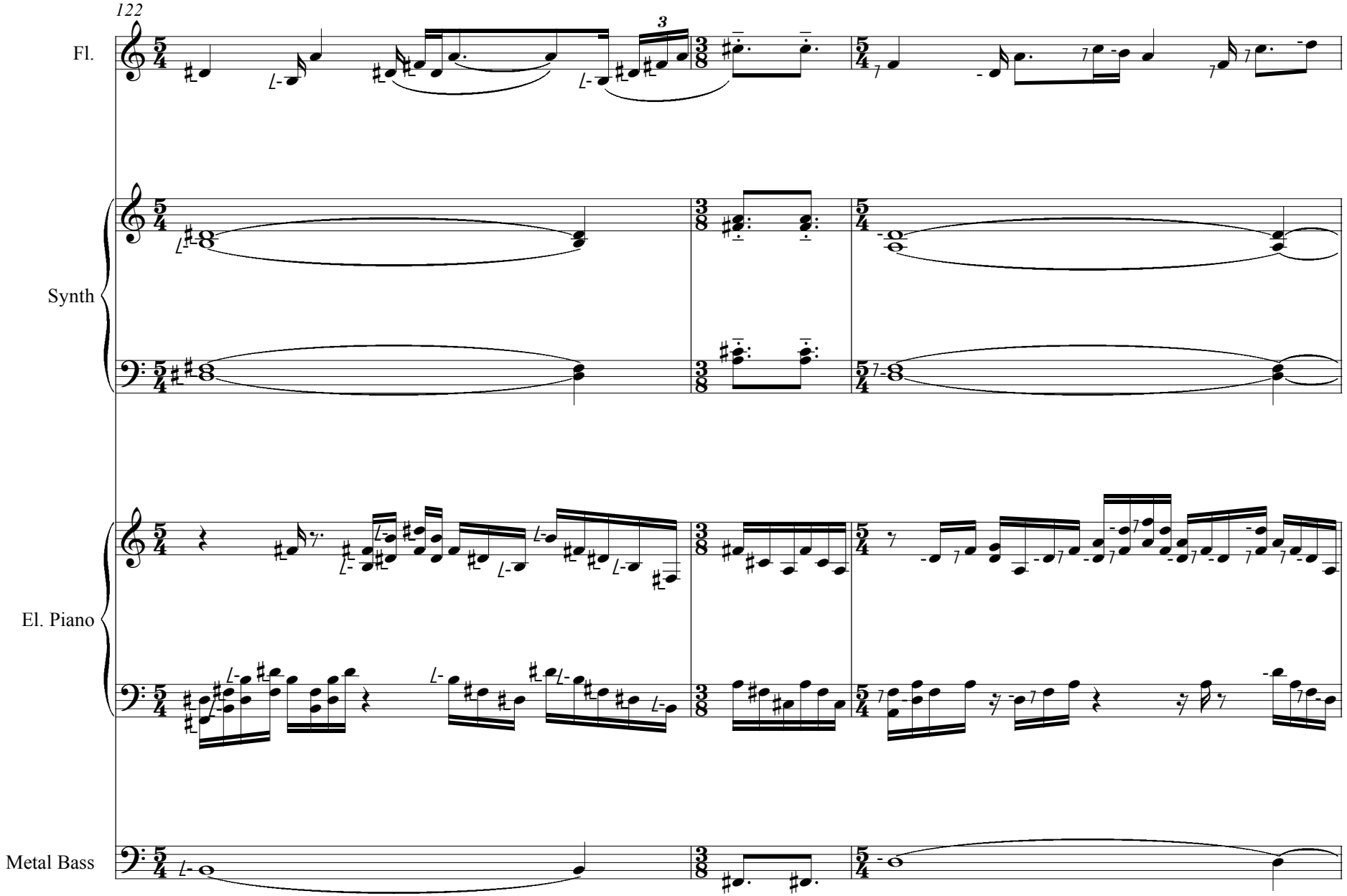

93
Fl.
Synth
El. Piano
Metal Bass
96
Fl.
Synth
El. Piano
Metal Bass

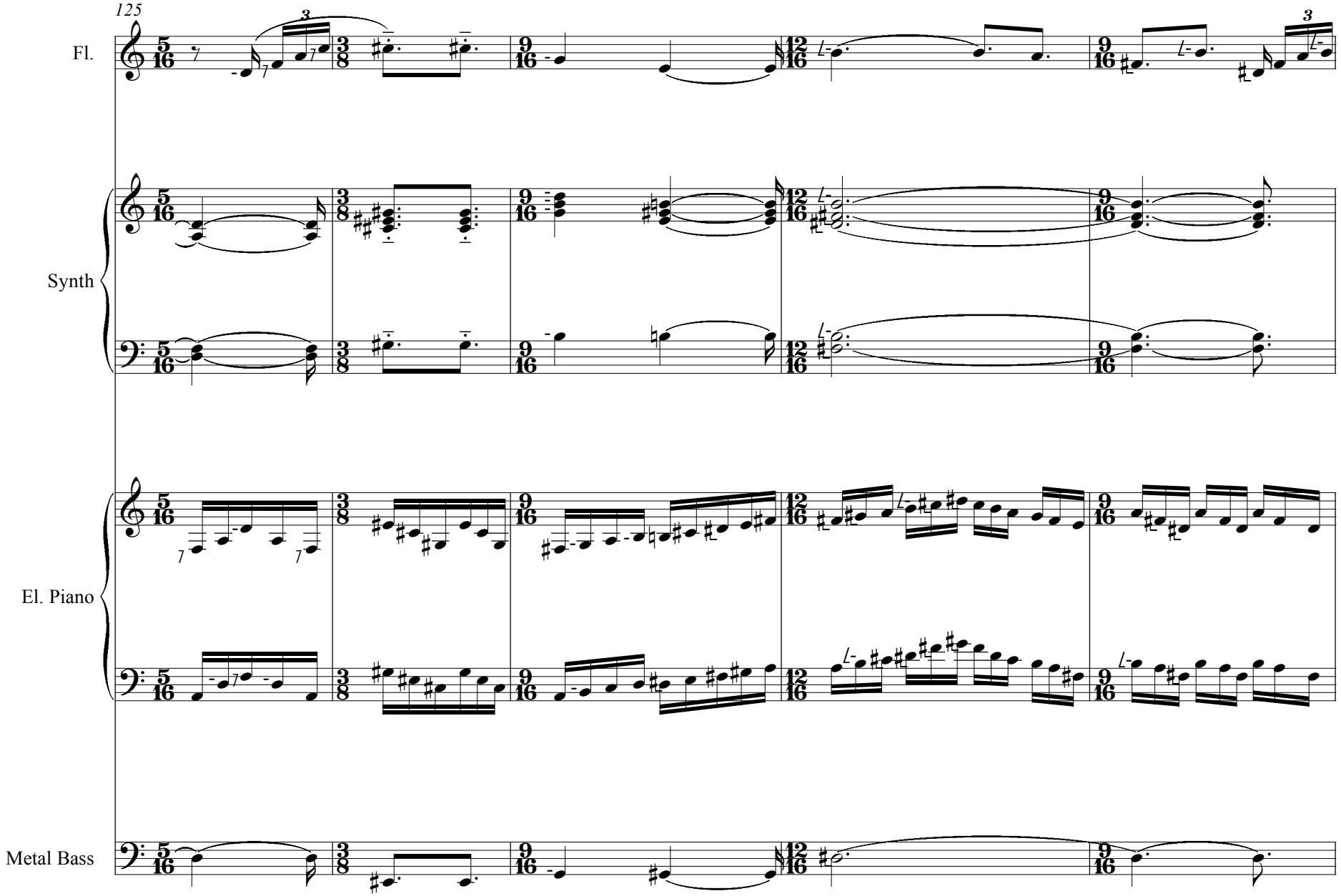

100
Fl.
Synth
El. Piano
Metal Bass
105
Fl.
Synth
El. Piano
Metal Bass

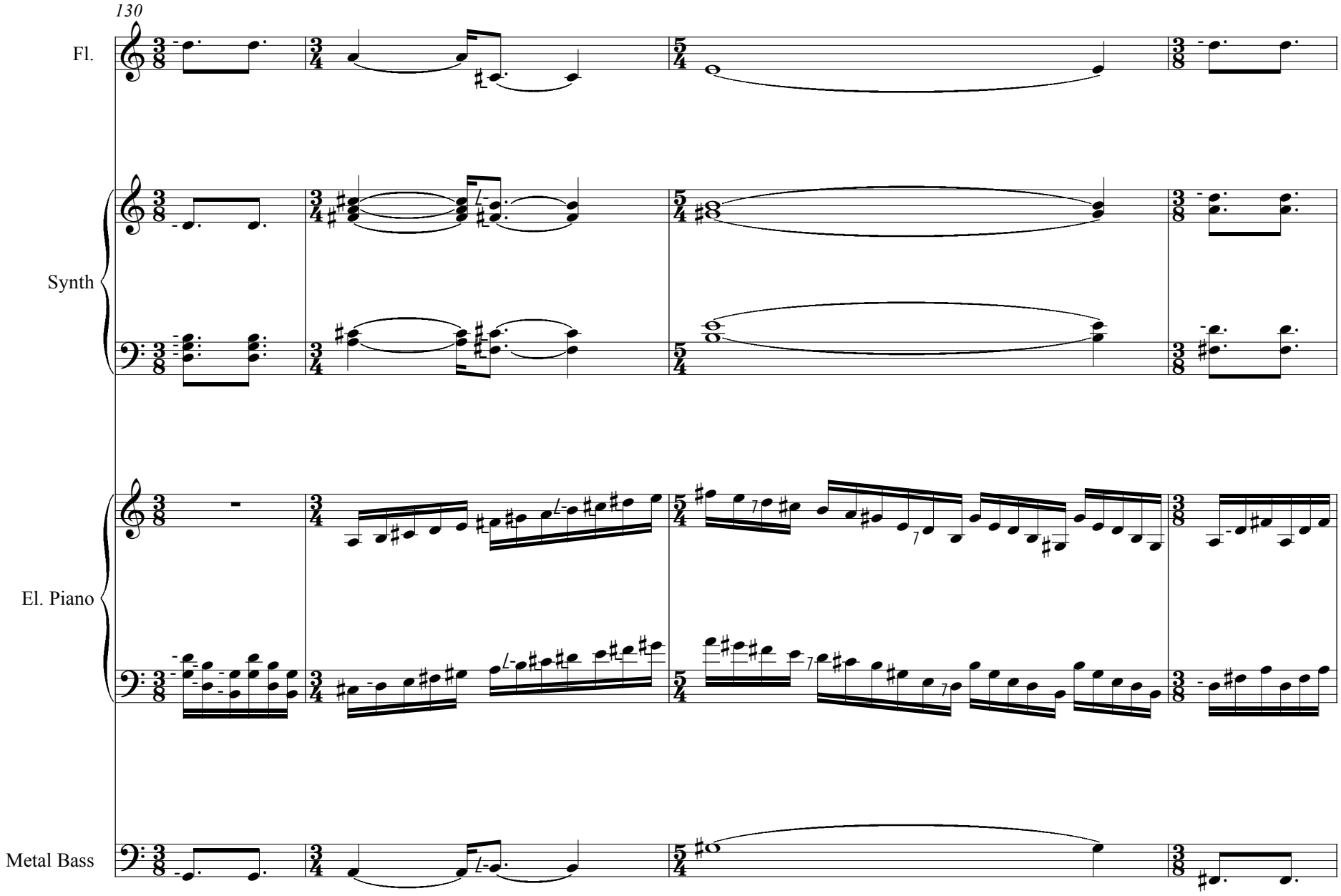

111
Fl.
Synth
El. Piano
Metal Bass

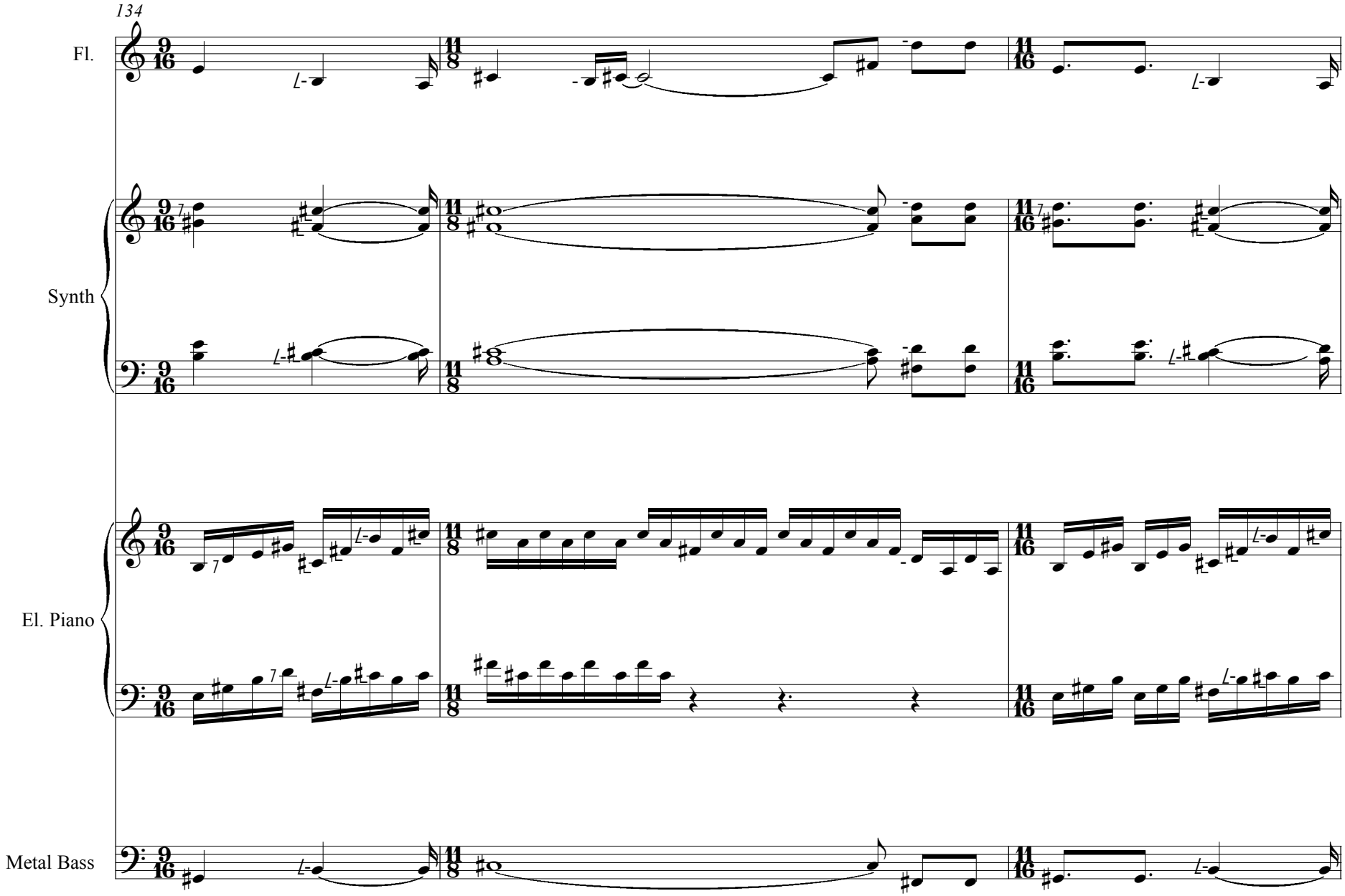
115
Fl.
Synth
El. Piano
Metal Bass

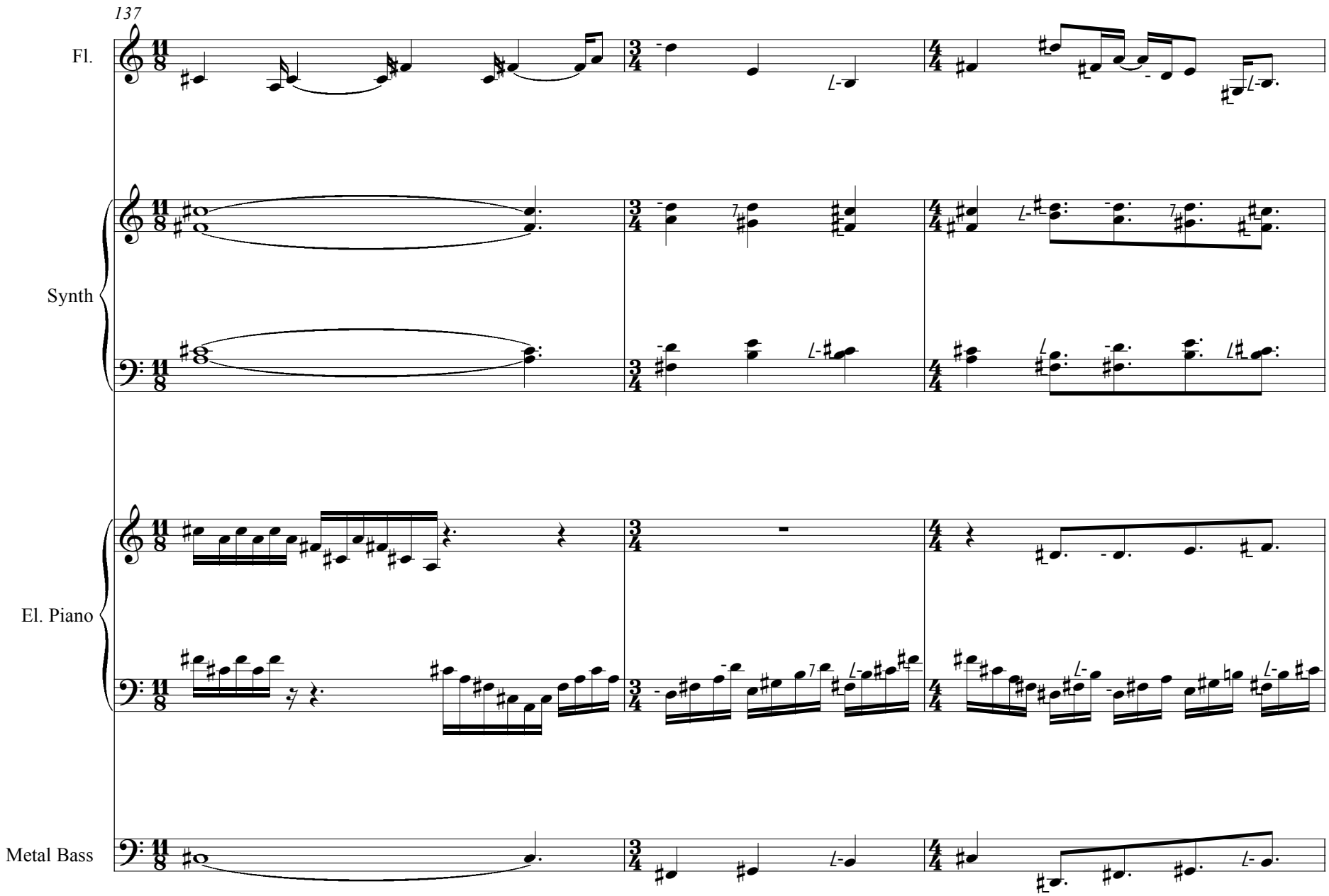

118
Fl.
Synth
El. Piano
Metal Bass

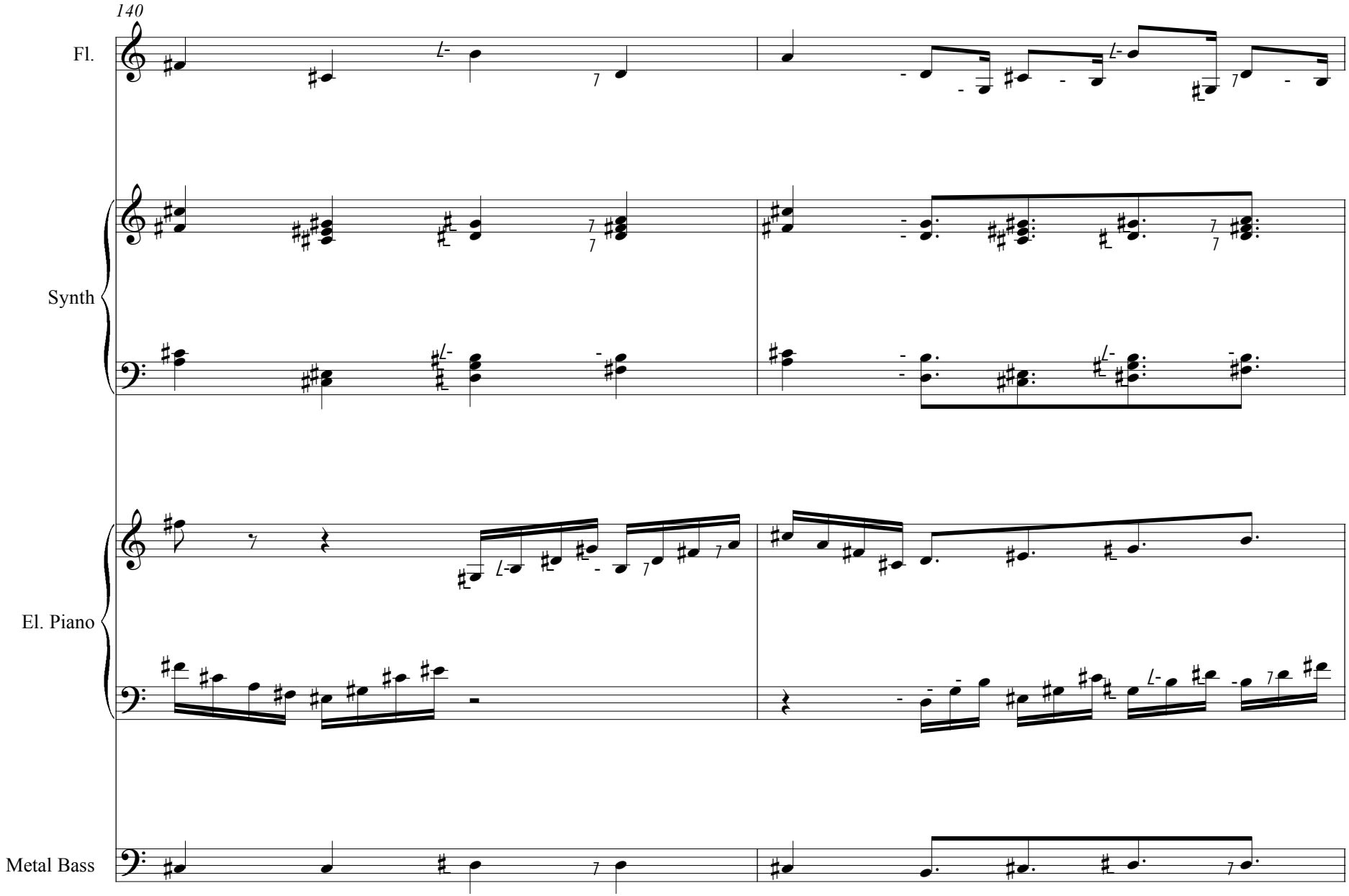

122
Fl.
Synth
El. Piano
Metal Bass

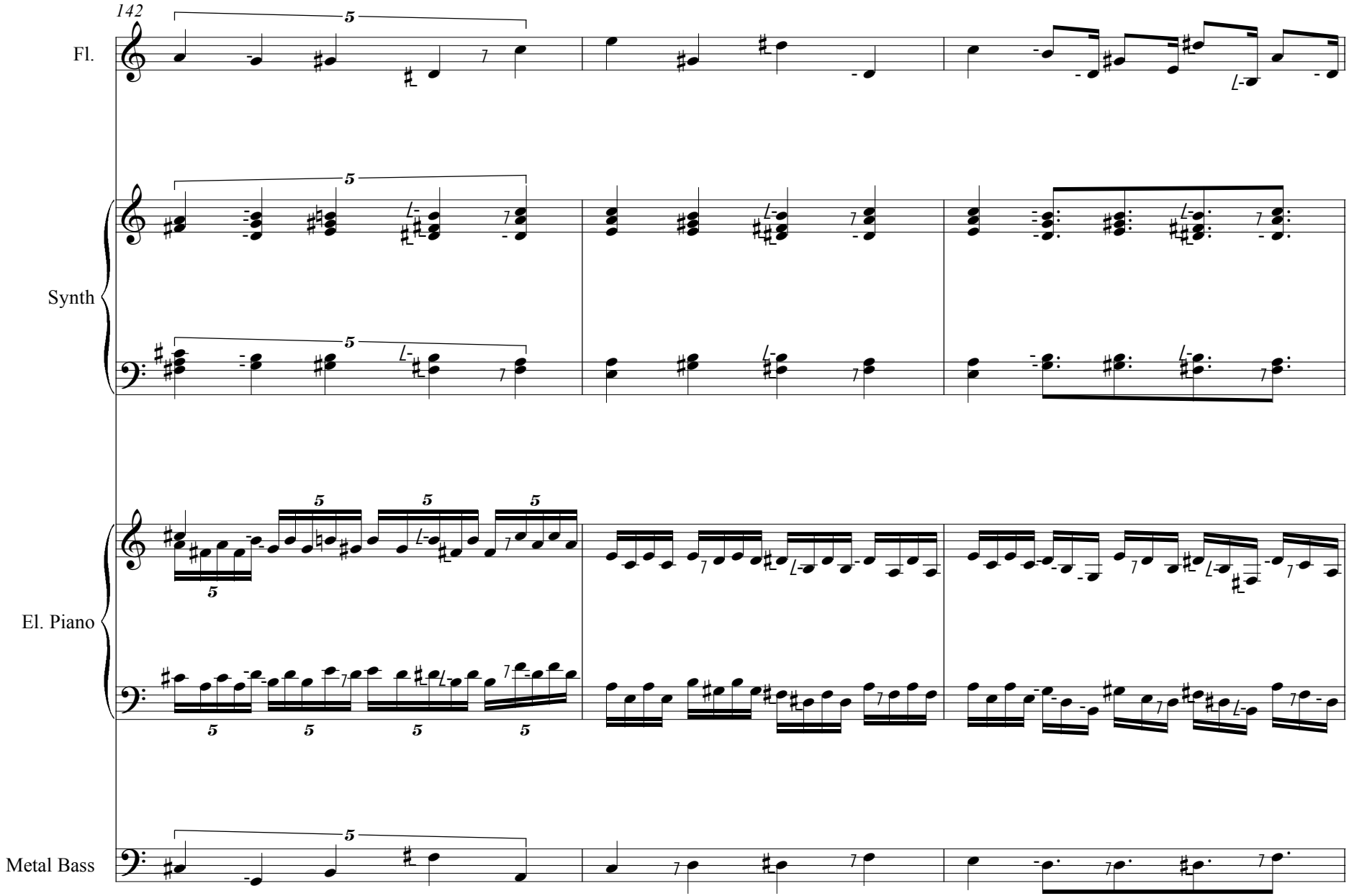

125
Fl.
Synth
El. Piano
Metal Bass

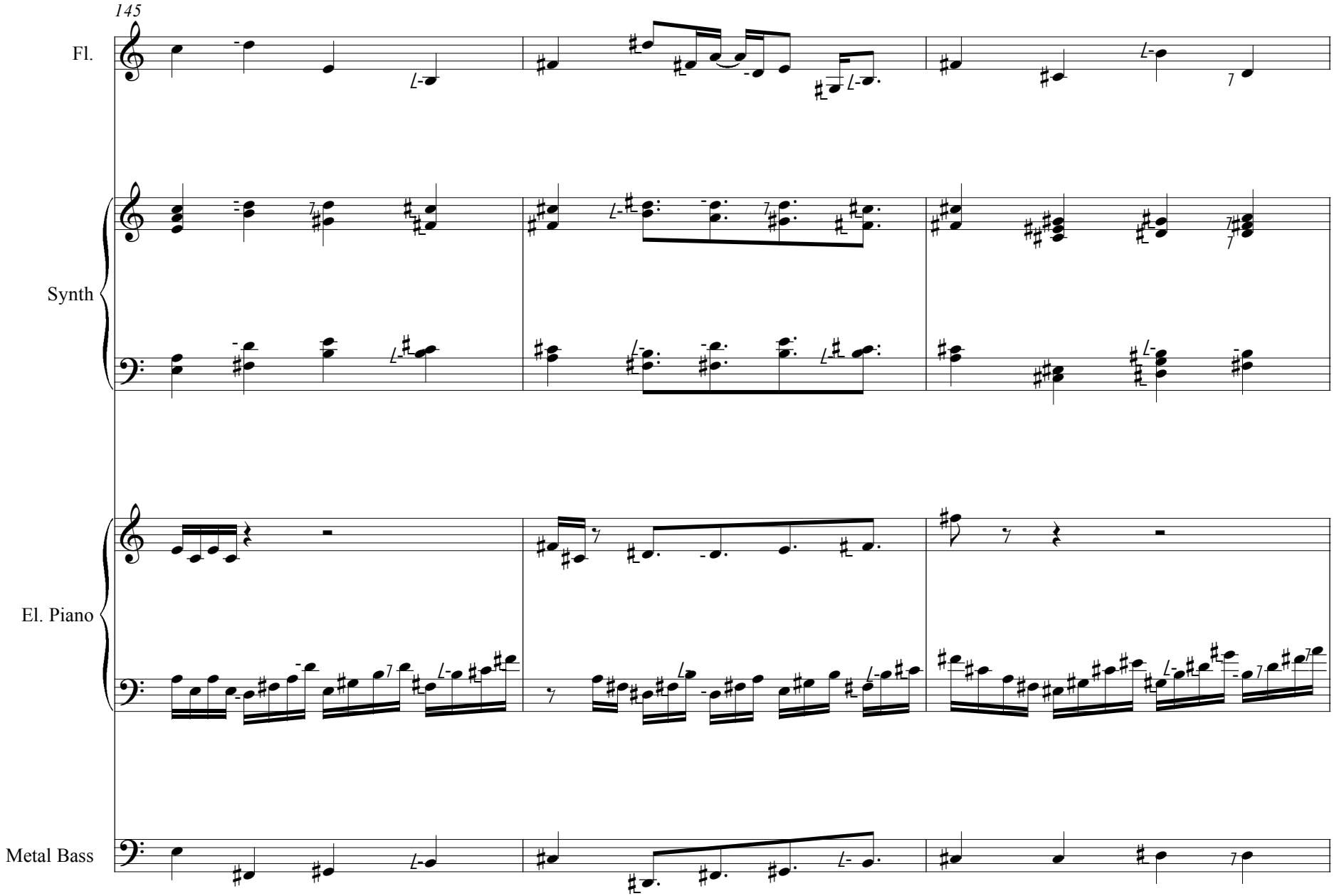

130
Fl.
Synth
El. Piano
Metal Bass

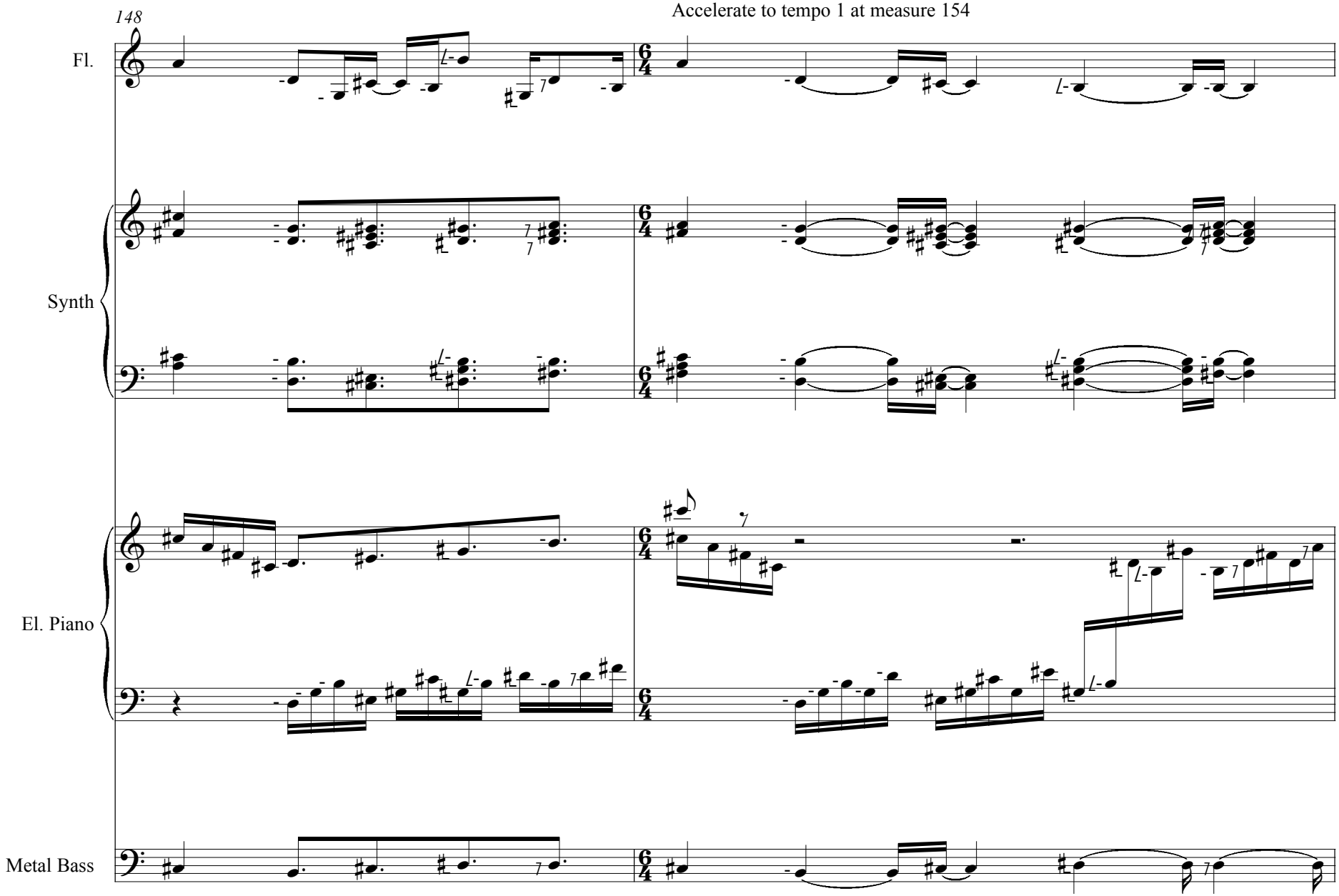

134
Fl.
Synth
El. Piano
Metal Bass

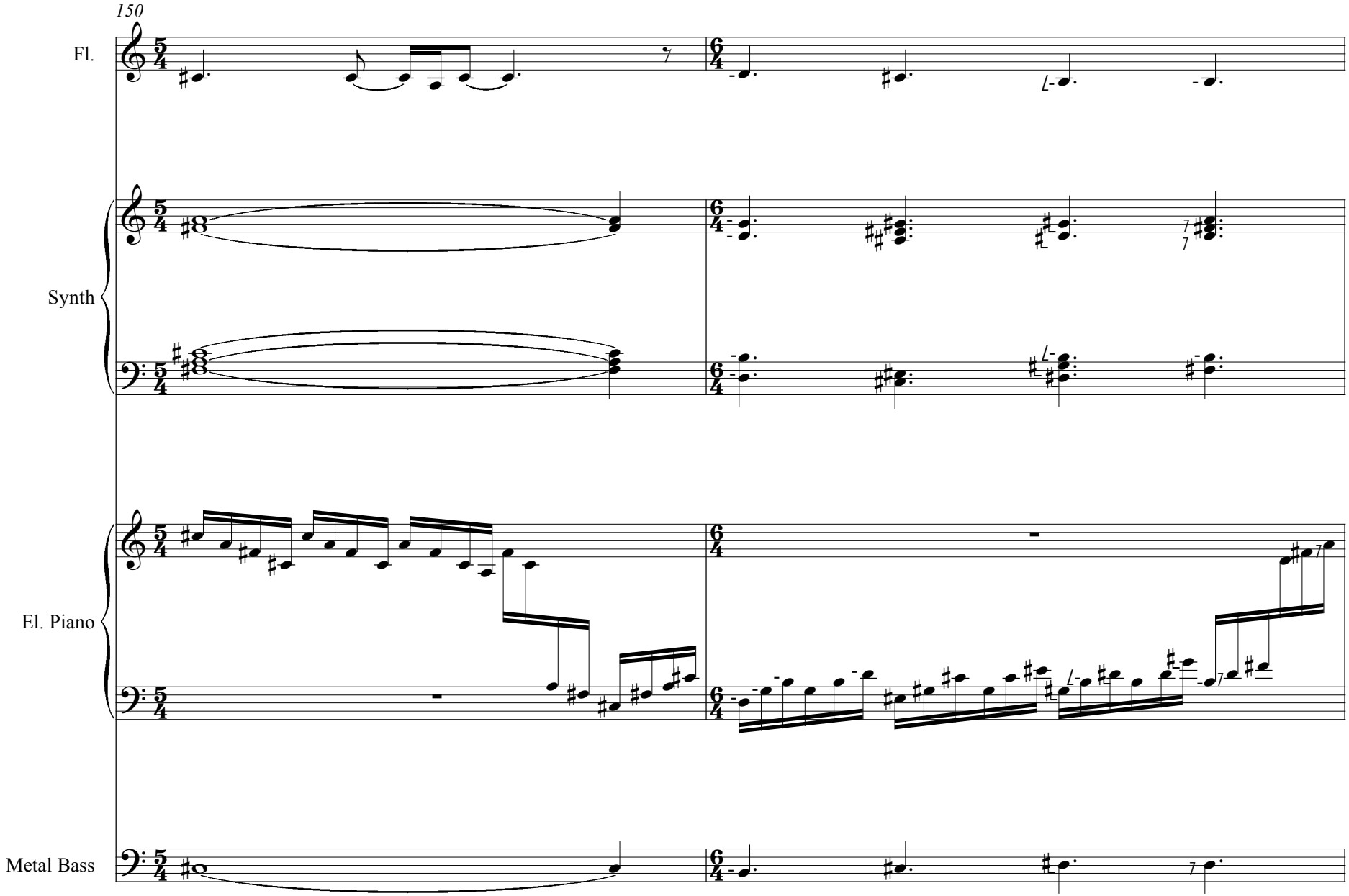

137
Fl.
Synth
El. Piano
Metal Bass

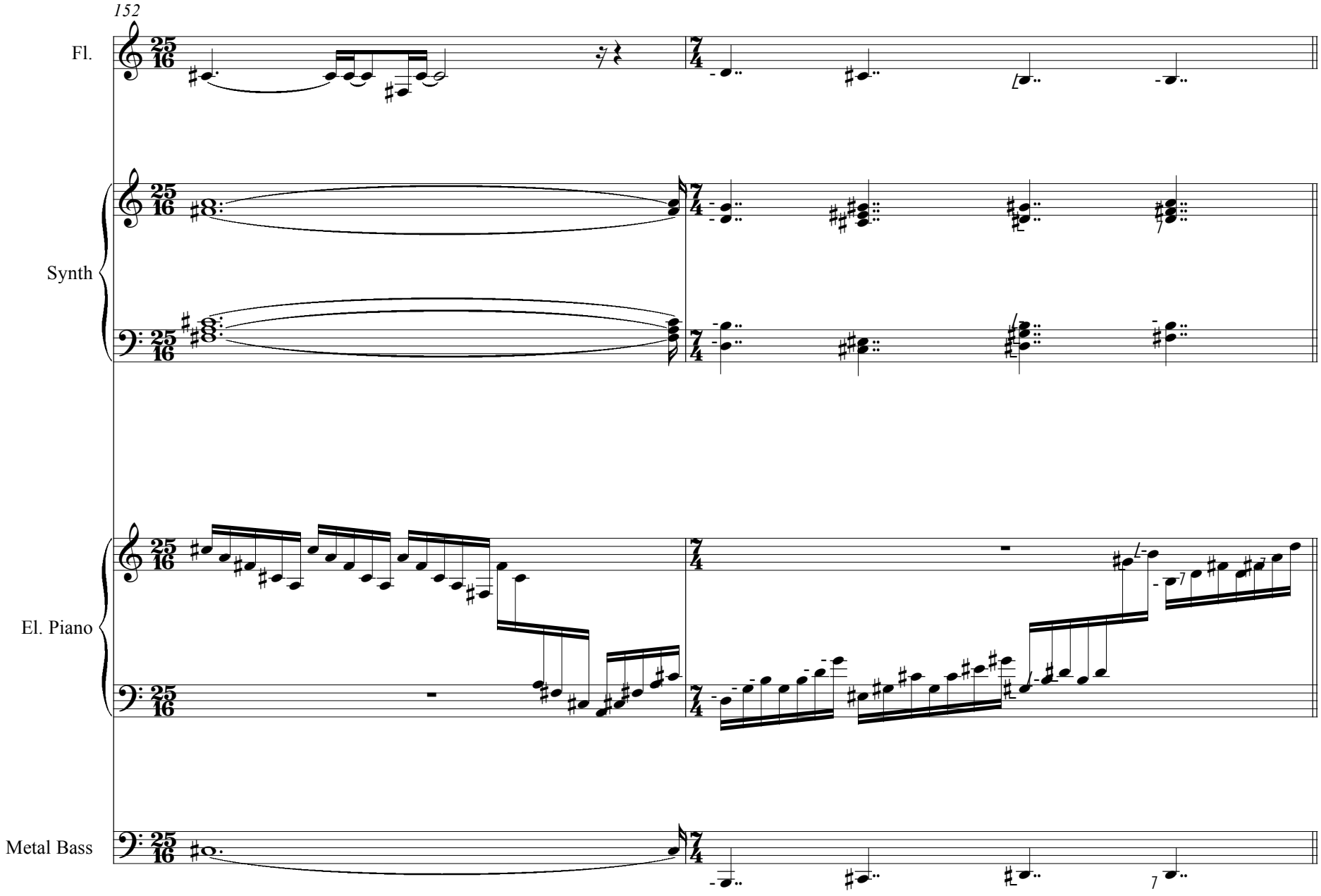

140
Fl.
Synth
El. Piano
Metal Bass

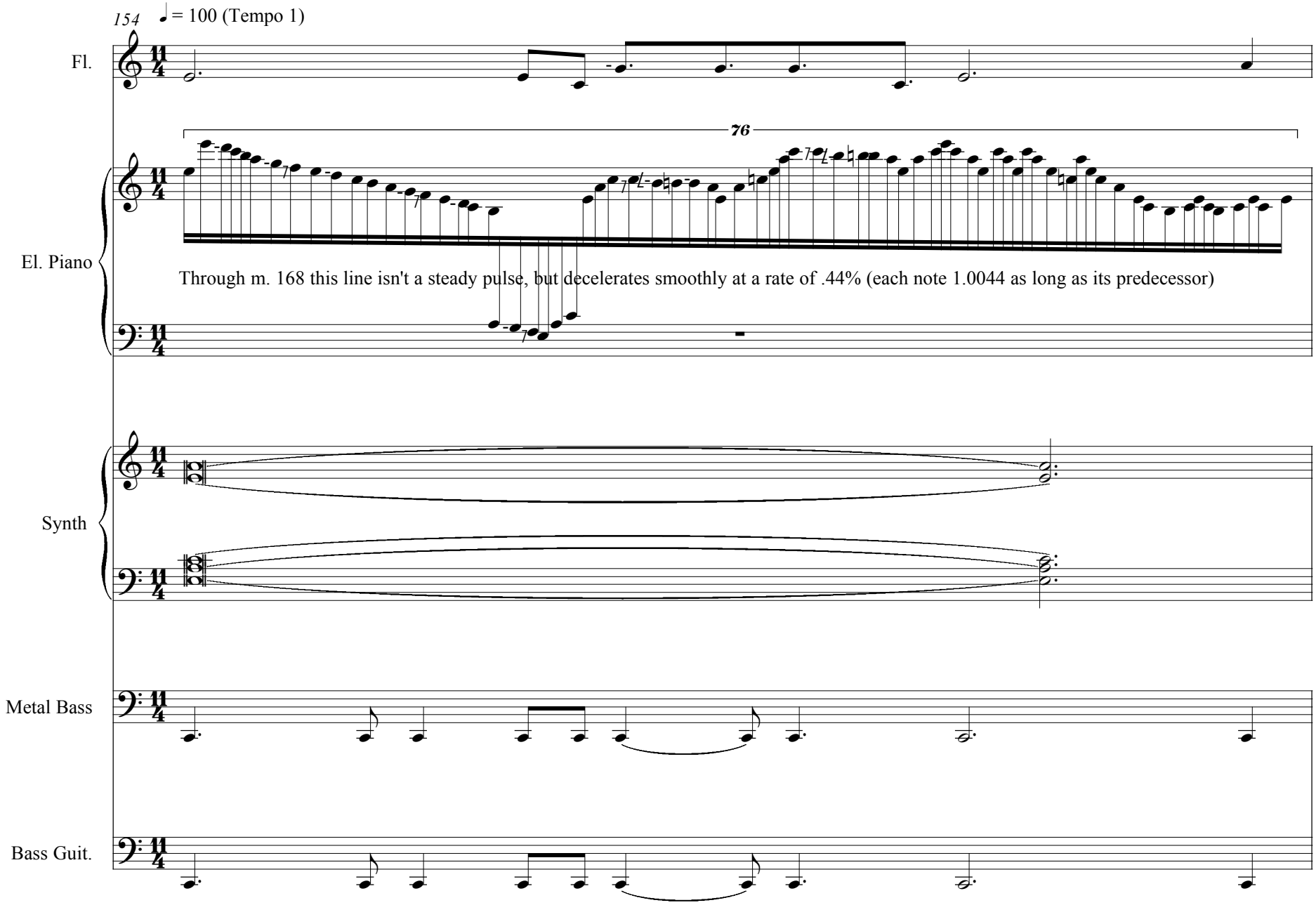

142
Fl.
Synth
El. Piano
Metal Bass

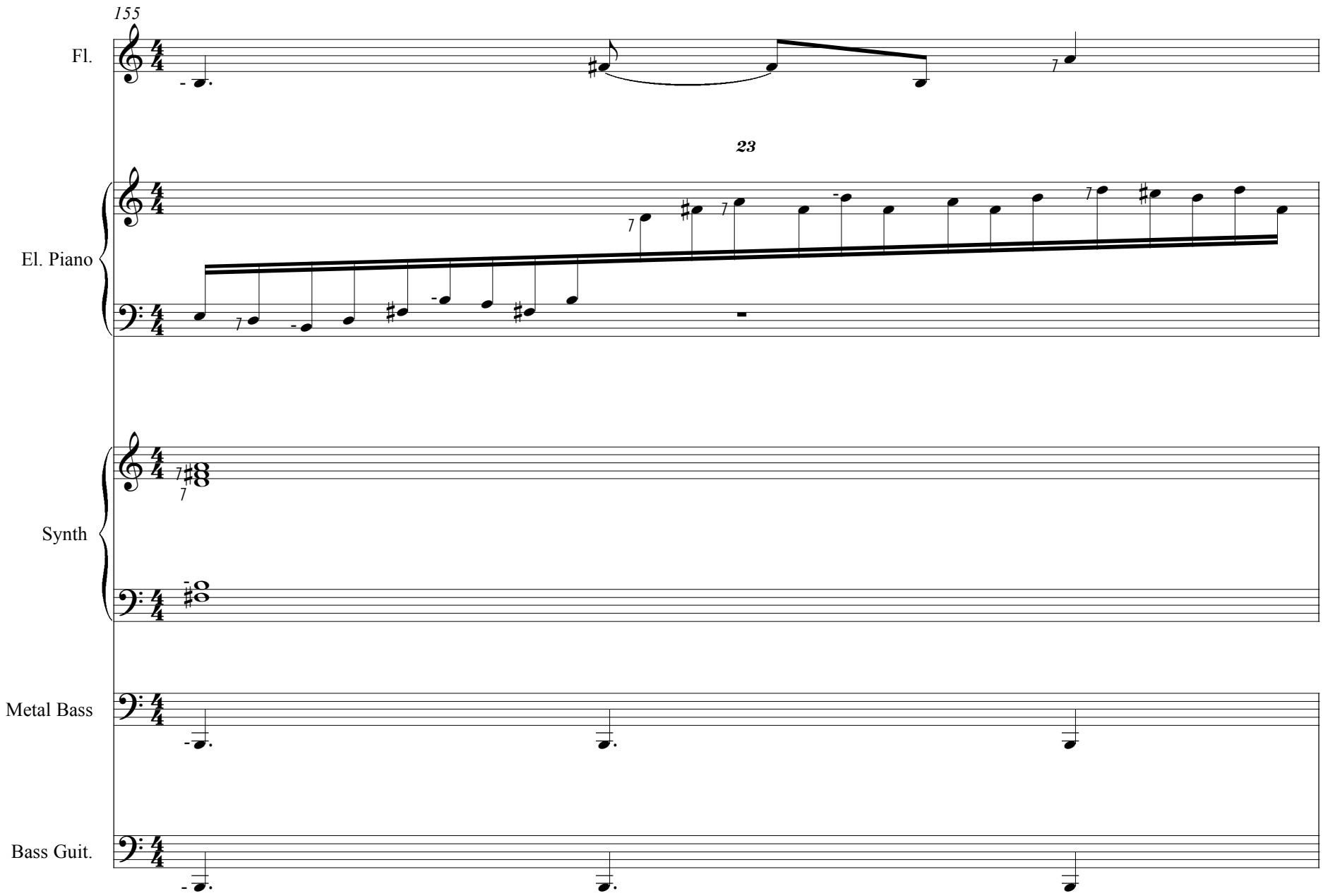

145
Fl.
Synth
El. Piano
Metal Bass

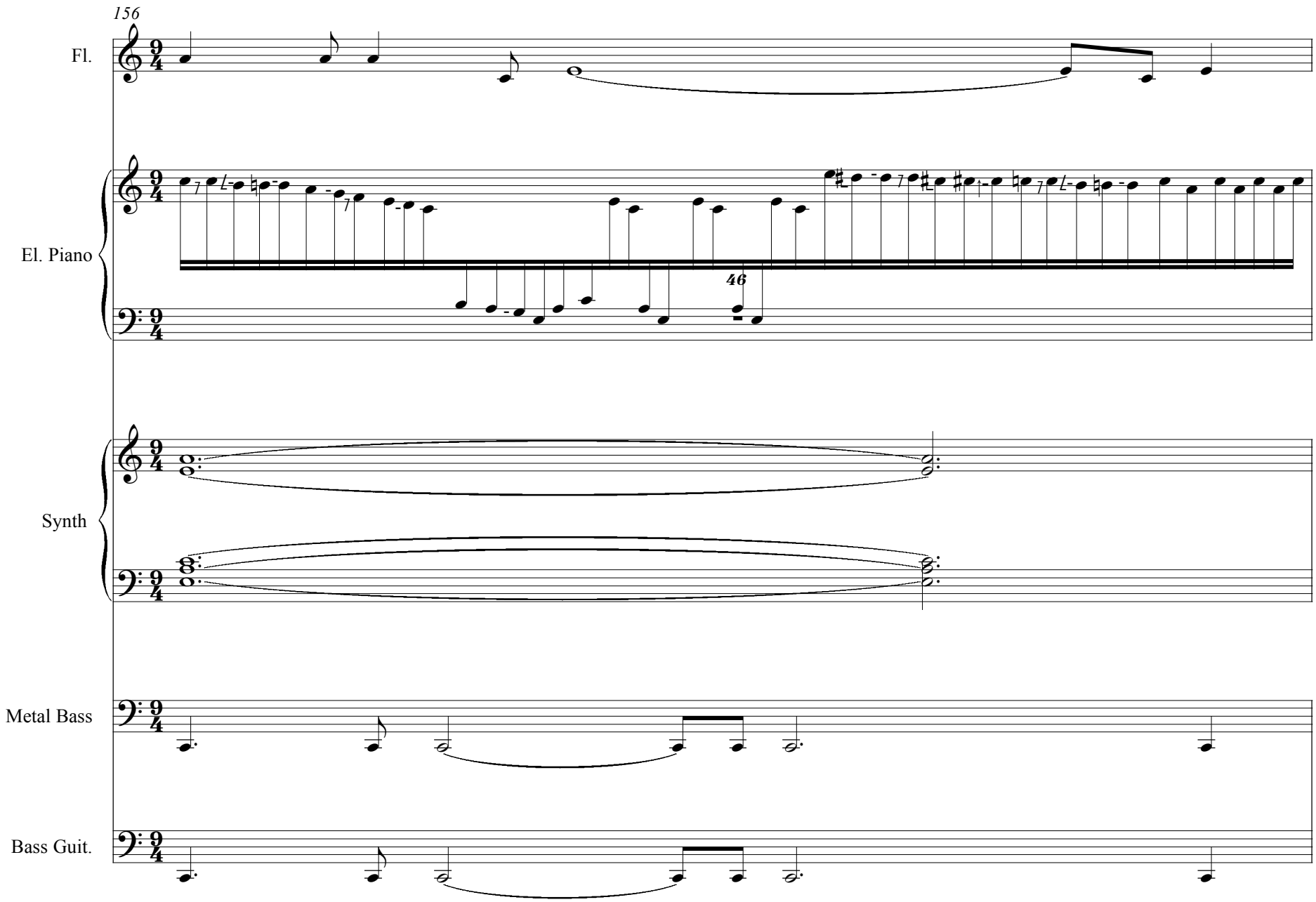

148
Accelerate to tempo 1 at measure 154
Fl.
Synth
El. Piano
Metal Bass

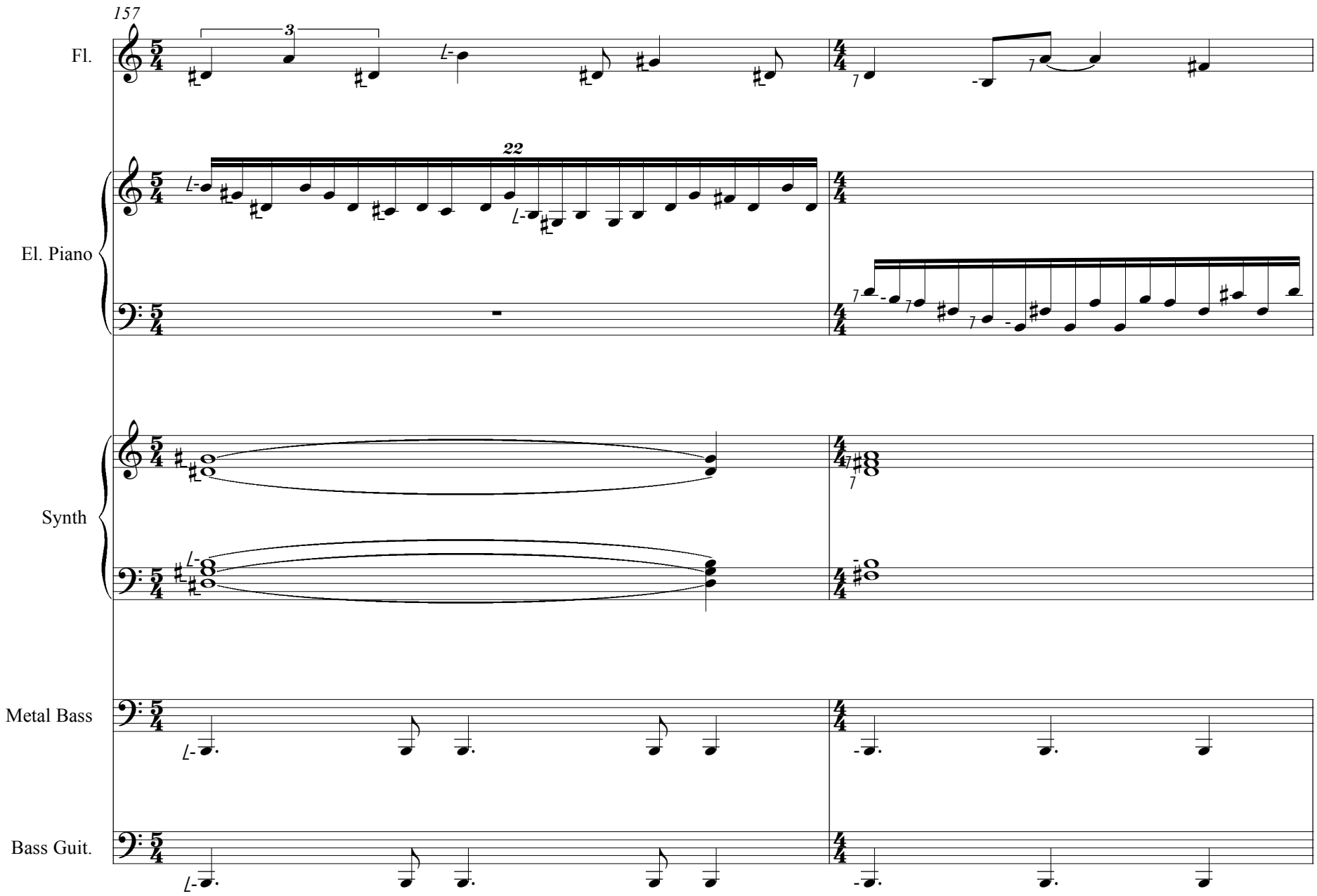

150
Fl.
Synth
El. Piano
Metal Bass

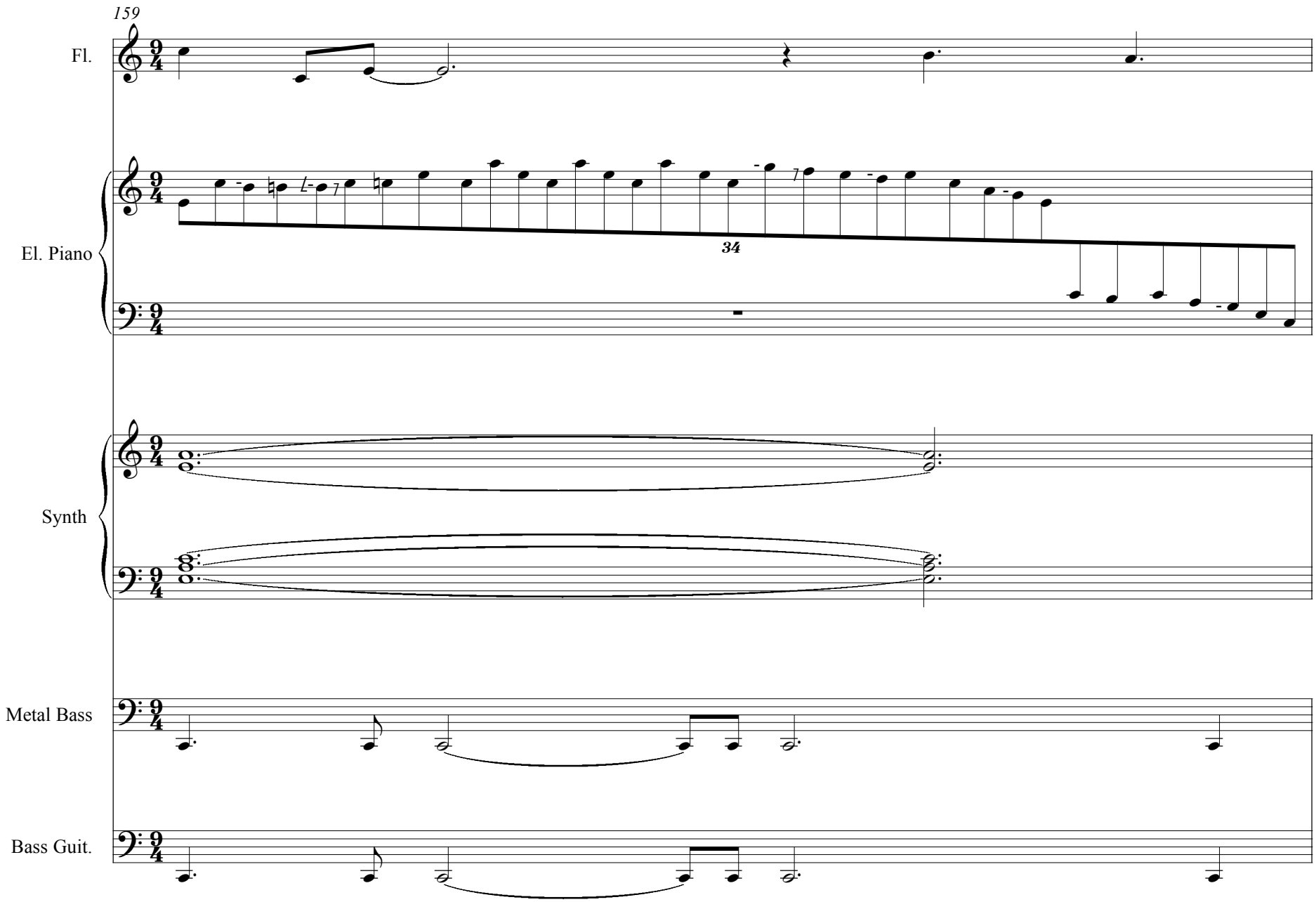

152
Fl.
Synth
El. Piano
Metal Bass

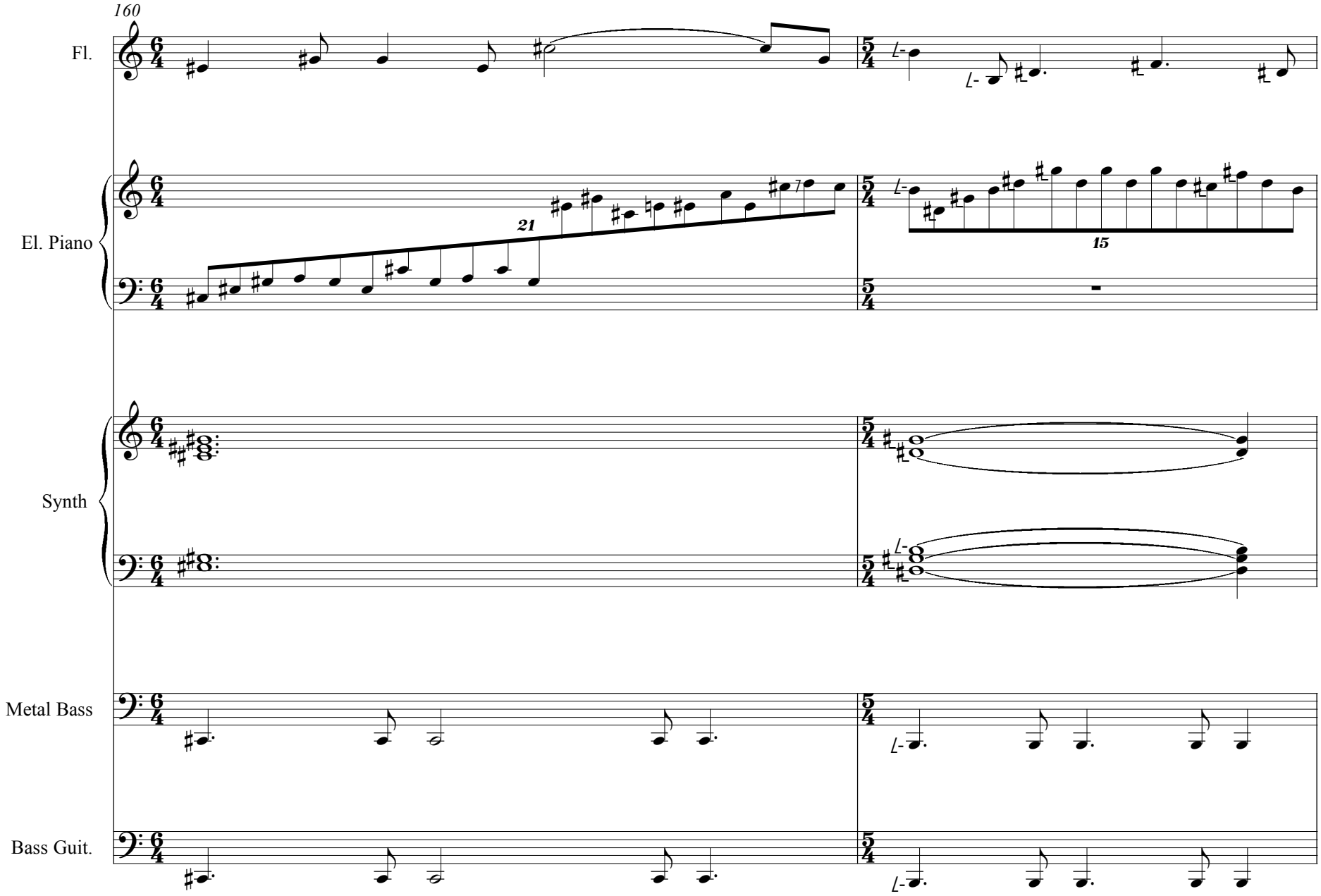

154
♩ = 100 (Tempo 1)
Fl.
76
El. Piano
Through m. 168 this line isn't a steady pulse, but decelerates smoothly at a rate of .44% (each note 1.0044 as long as its predecessor)
Synth
Metal Bass
Bass Guit.

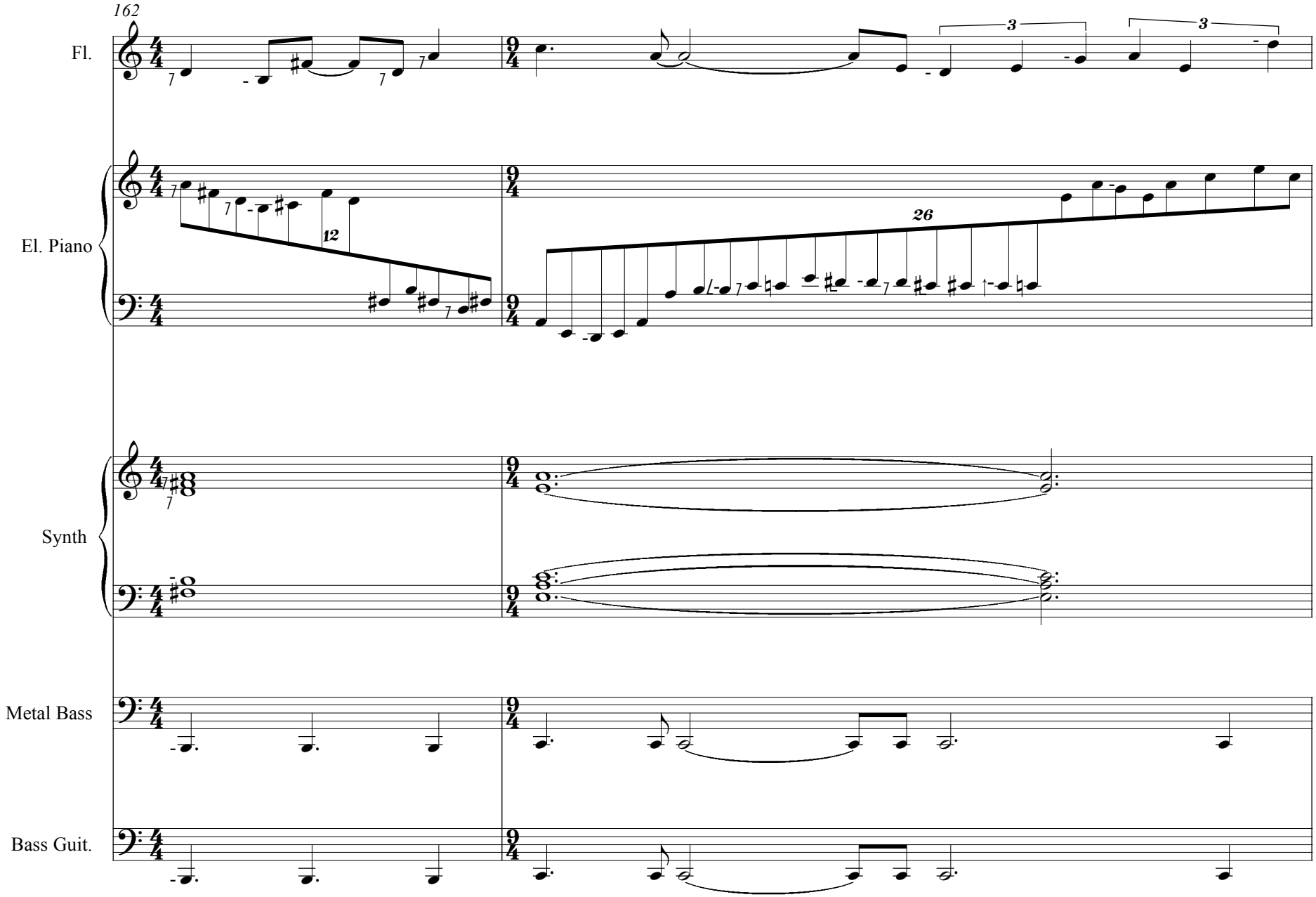

155
Fl.
23
El. Piano
Synth
Metal Bass
Bass Guit.

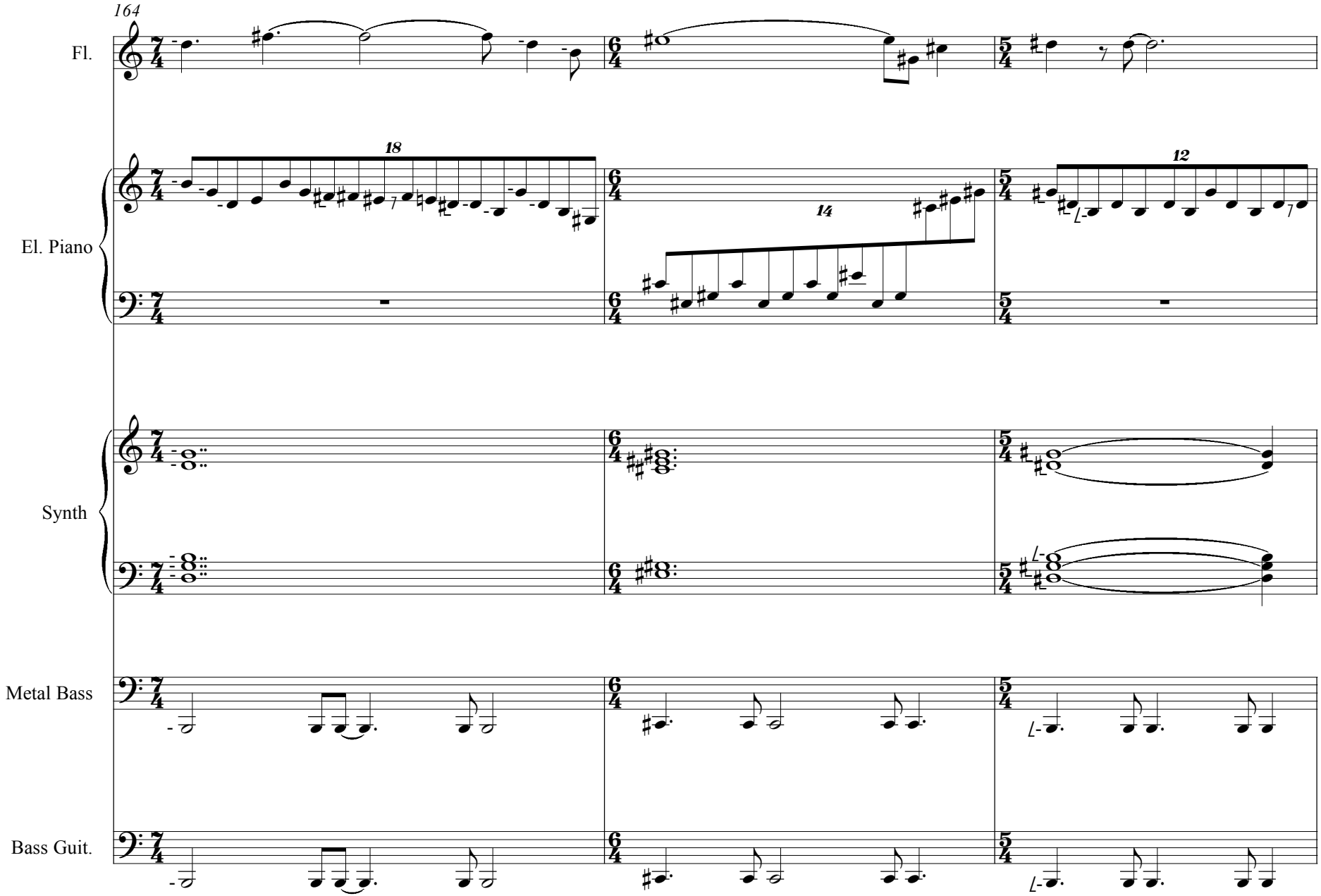

156
Fl.
El. Piano
46
Synth
Metal Bass
Bass Guit.

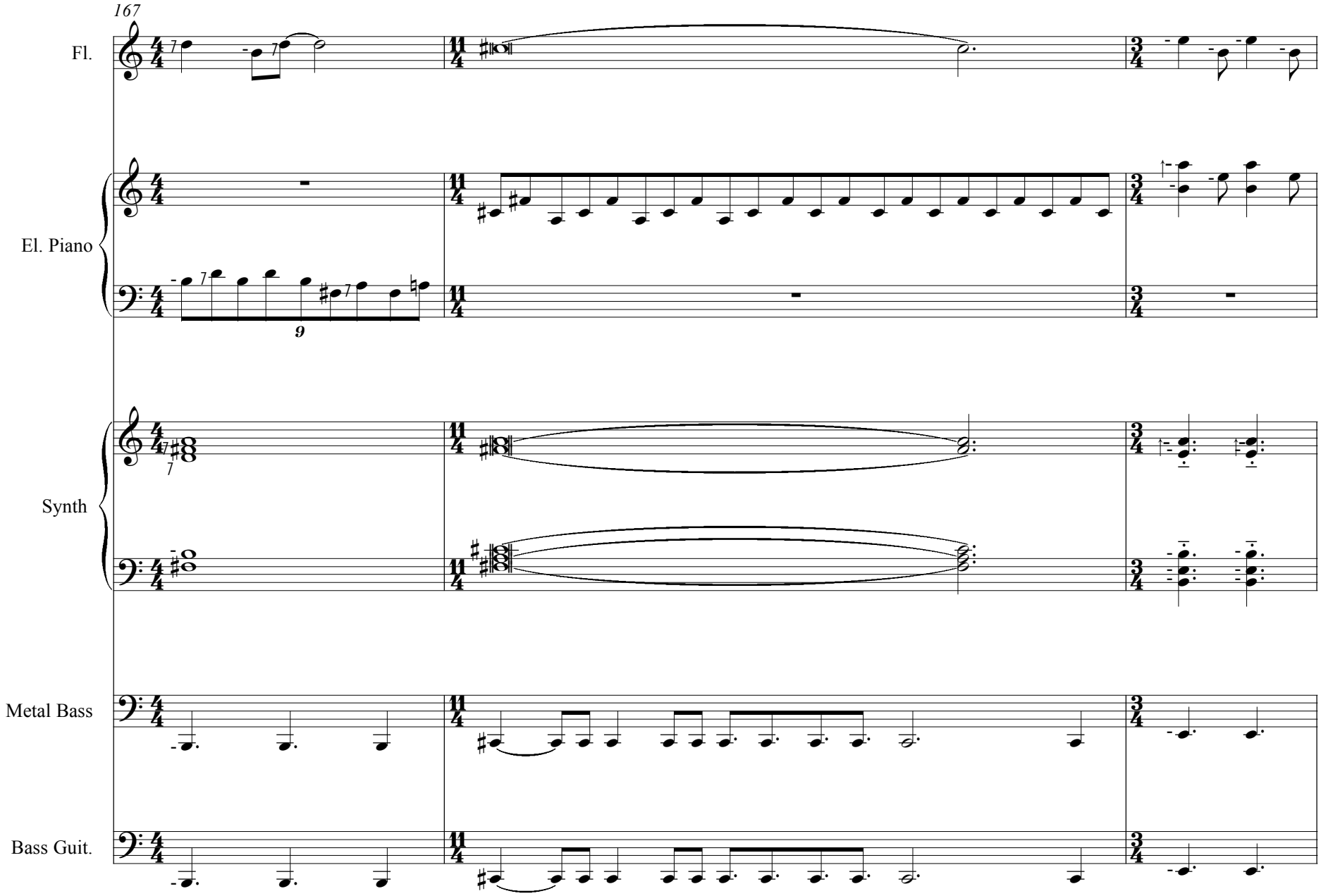

157
Fl.
El. Piano
Synth
Metal Bass
Bass Guit.

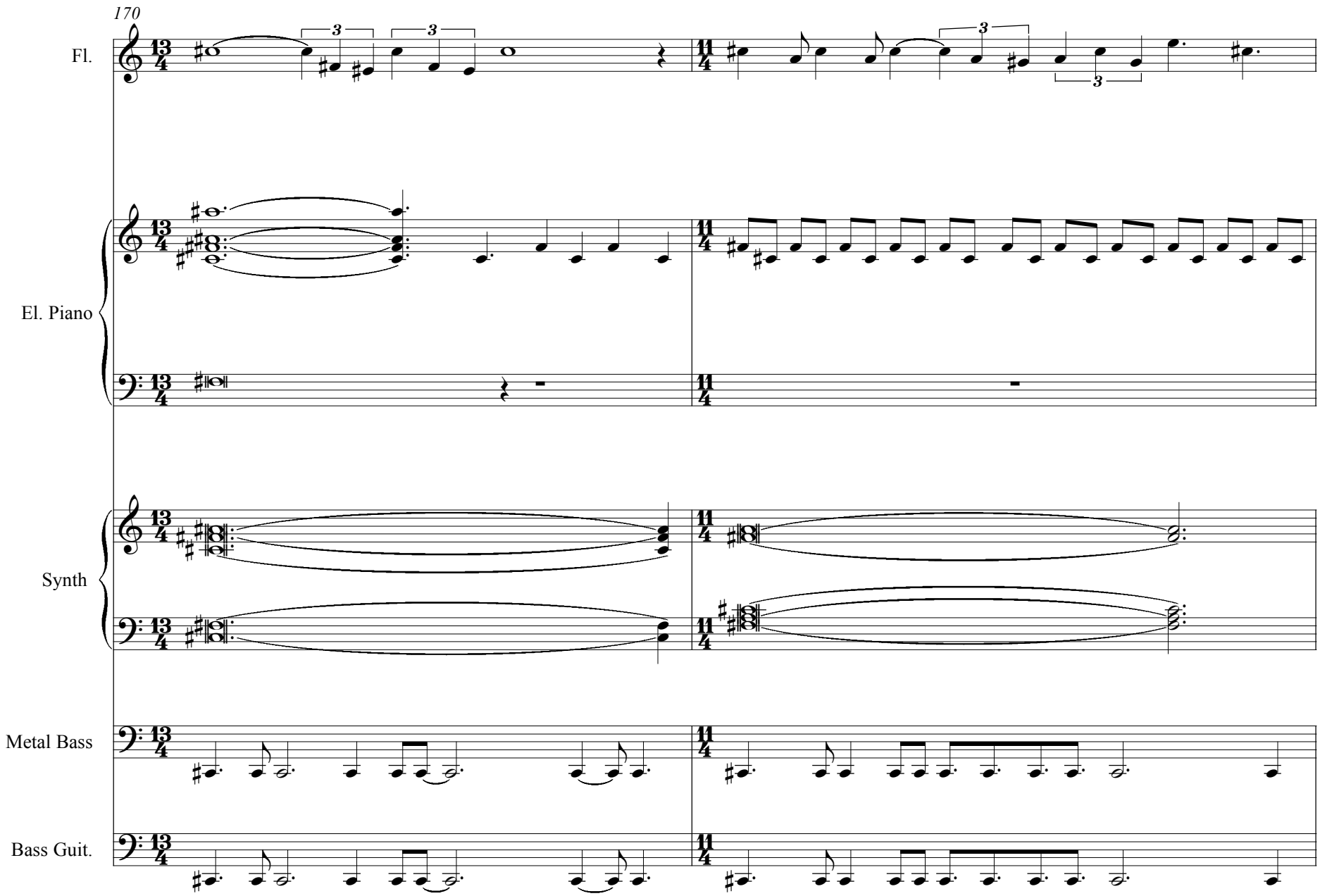

159
Fl.
El. Piano
34
Synth
Metal Bass
Bass Guit.

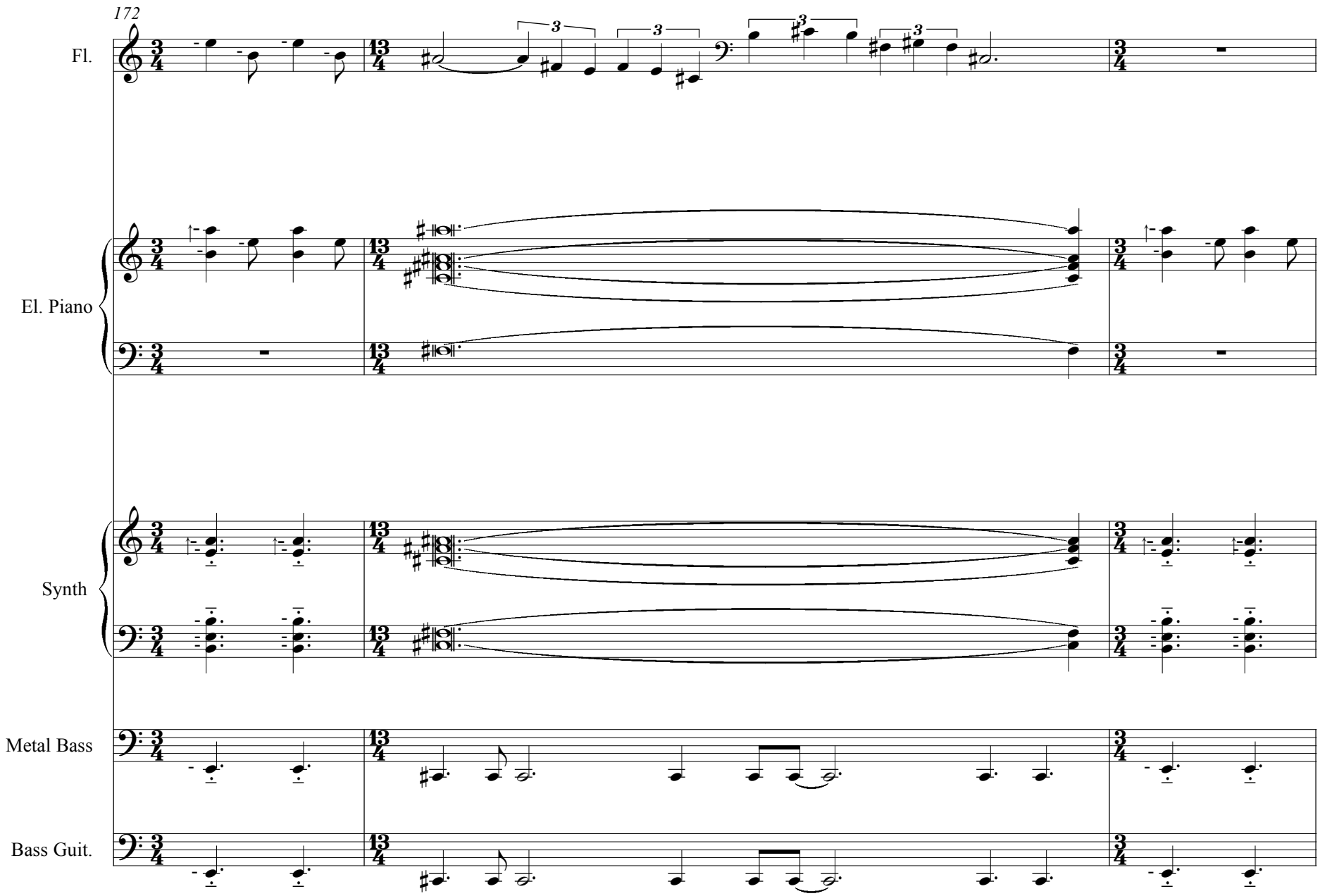

160
Fl.
El. Piano
21
15
Synth
Metal Bass
Bass Guit.

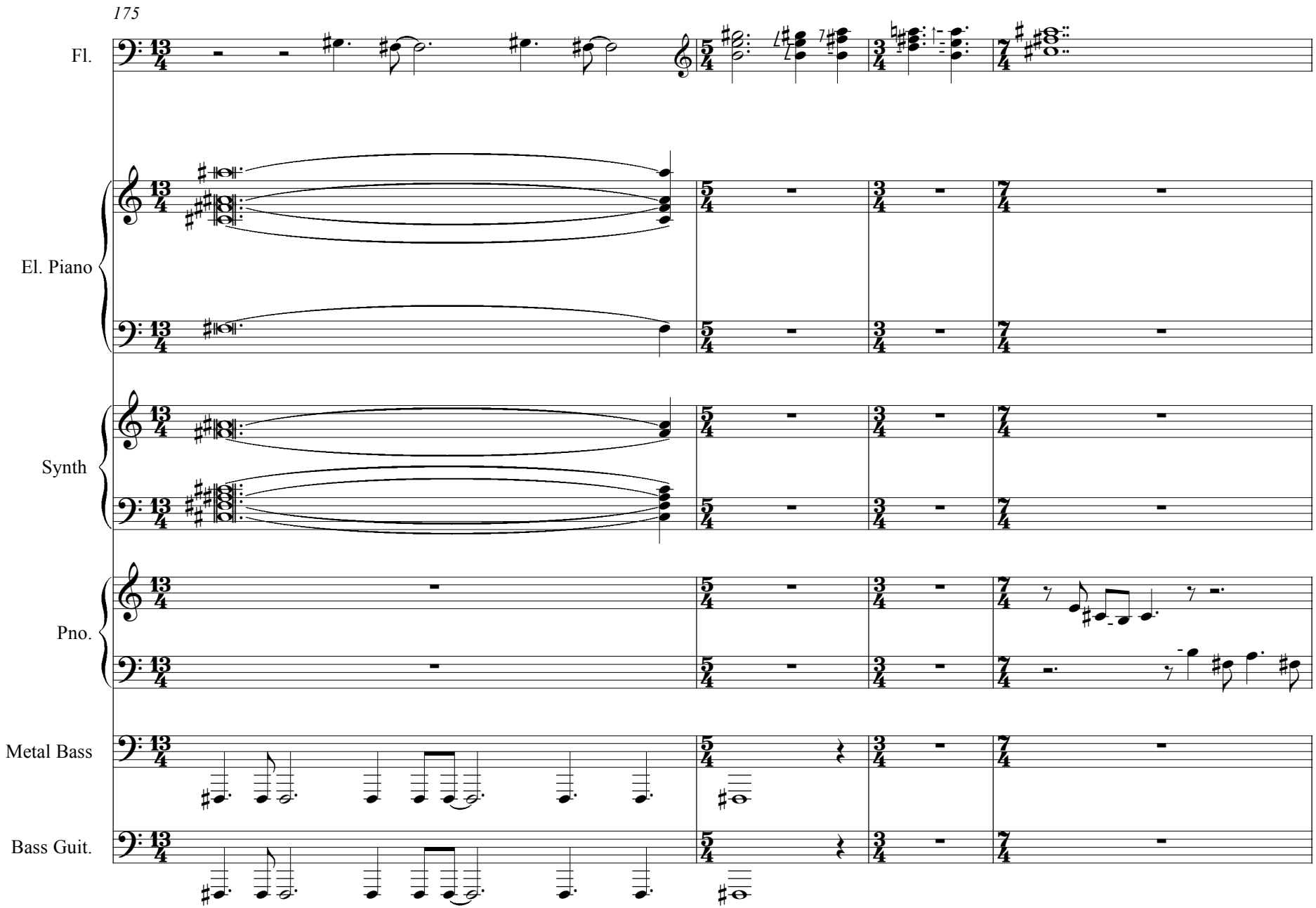

162
Fl.
El. Piano
Synth
Metal Bass
Bass Guit.
12
26
3
3

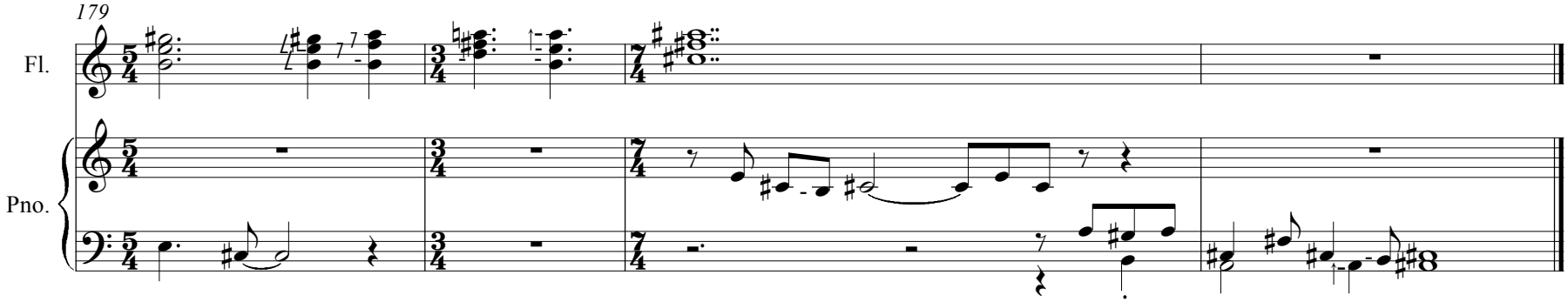

164
Fl.
El. Piano
18
14
12
Synth
Metal Bass
Bass Guit.


167
Fl.
El. Piano
Synth
Metal Bass
Bass Guit.


170
Fl.
El. Piano
Synth
Metal Bass
Bass Guit.


172
Fl.
El. Piano
Synth
Metal Bass
Bass Guit.


175
Fl.
El. Piano
Synth
Pno.
Metal Bass
Bass Guit.




May 1997
Lewisburg, PA