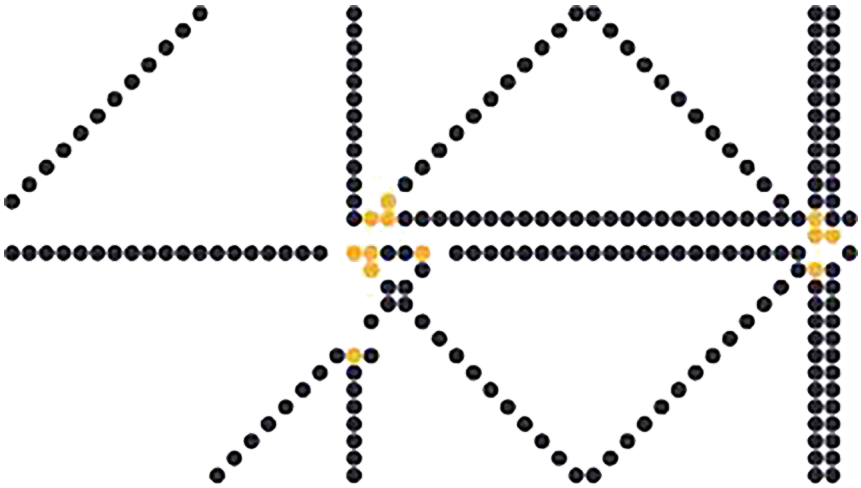
version for Kontakt percussion samples

ANTS

six* algorithmic melodies
for untuned percussion

* There is no score for "darting: three lines with four sounds"
track 1 on both the audio and video ANTS collections.

Andrew Byrne



© Andrew Byrne 2022

PERFORMER NOTES:
The instrumentation for six melodies in ANTS is left up to the performers. I imagined the melodies would be played on untuned percussion. If performers would like to play the melodies with collections of pitches, they are free to do so.

The six melodies in ANTS can be performed as standalone works or as a set in any order.

Here are arrangements of ANTS for percussion samples from Kontakt sample libraries. The types of percussion instruments I used are shown at the beginning of each piece. These should be seen as suggestions only.

ABOUT THE PIECES:
ANTS is a collection of melodies generated by the cellular automaton Langton's Ant.

In this cellular automaton, an 'ant' travels across a grid, its movements dictated by the following simple rules. An ant sits on a square of the grid. If this square is black, it turns right (a quarter turn) then moves one space forward (changing the original cell to white). If the square it is currently sitting on is white, it turns left and moves forward one space (changing it to black).

In ANTS, I map the ant journeys into a musical environment by assigning pitches/sounds that correspond to the the direction in which the ant travels. For example, on a grid of squares, the ant can move in four directions (as in the original Langton's Ant), and so there are only four discrete sounds/pitches. On the grid made up of hexagon cells, there are six possible directions the ant can move and there are six sounds/pitches in the musical versions, likewise for octagon cells, eight possible sounds/pitches.

What intrigues me about Langton's Ants is the variety of melodic patterns generated from the cellular automaton. All melodies are completely logical (as they are shaped by therules of the cellular automaton) and yet are varied and complex.

Some melodies are periodic with a clear repeating pattern of notes, some amble around, changing directions in a seemingly arbitrary manner, some obsessively repeat notes before ricocheting off to another repeating note.

ANTS: six algorithmic melodies for untuned percussion

I - one line with six sounds (strolling) for tabla, drumkit and synthesiser

II - one line with eight sounds (pacing) for frame drums and tambourines

III - one with three sounds (shuffling) for deconstructed drumkit

IV - one line with six sounds divided into two (ambling) for 1 cowbell, cymbal, high drum, 2 low conga, floor tom and scratch sample

V - one line with eight sounds in canon (lurching) for shakers, snare drums, highhat & cabasa

VI - two lines with six sounds (marching) for percussion marching band

---

More details about each of the six melodies (including rules of the cellular automatom, grid shape, and brief description of the behaviour of the ants), can be found at the back of the score.

Audio recordings* of these Kontakt sample arrangements are available on bancamp. Link is available from andrewbyrne.net.

Videos of the seven* ANT melodies created from the Langton's Ant app (developed by Jeff Hotlzkene) and paired with audio of Kontakt sample arrangements can be found on Andrew's youtube channel. Link is available from andrewbyrne.net.

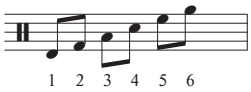
* There is no score for "darting: three lines with four sounds" track 1 on both the audio and video ANTS collections.

ANTS I

one line with six sounds (strolling)
for tabla, drumkit and synthesiser

Directions

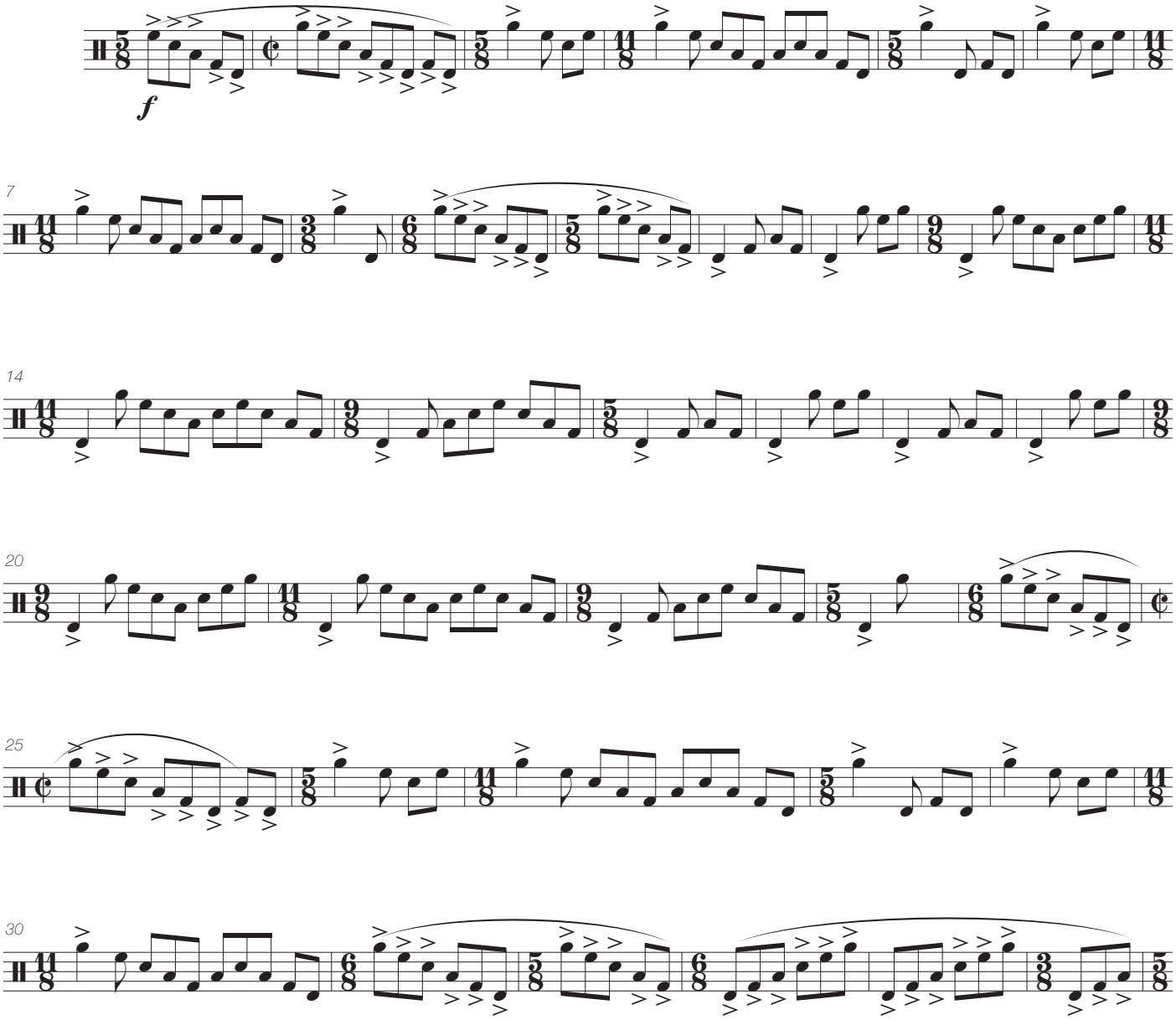
1
6 2
5 3
4



Arrangement for 3 players: tabla, drumkit, synthesiser

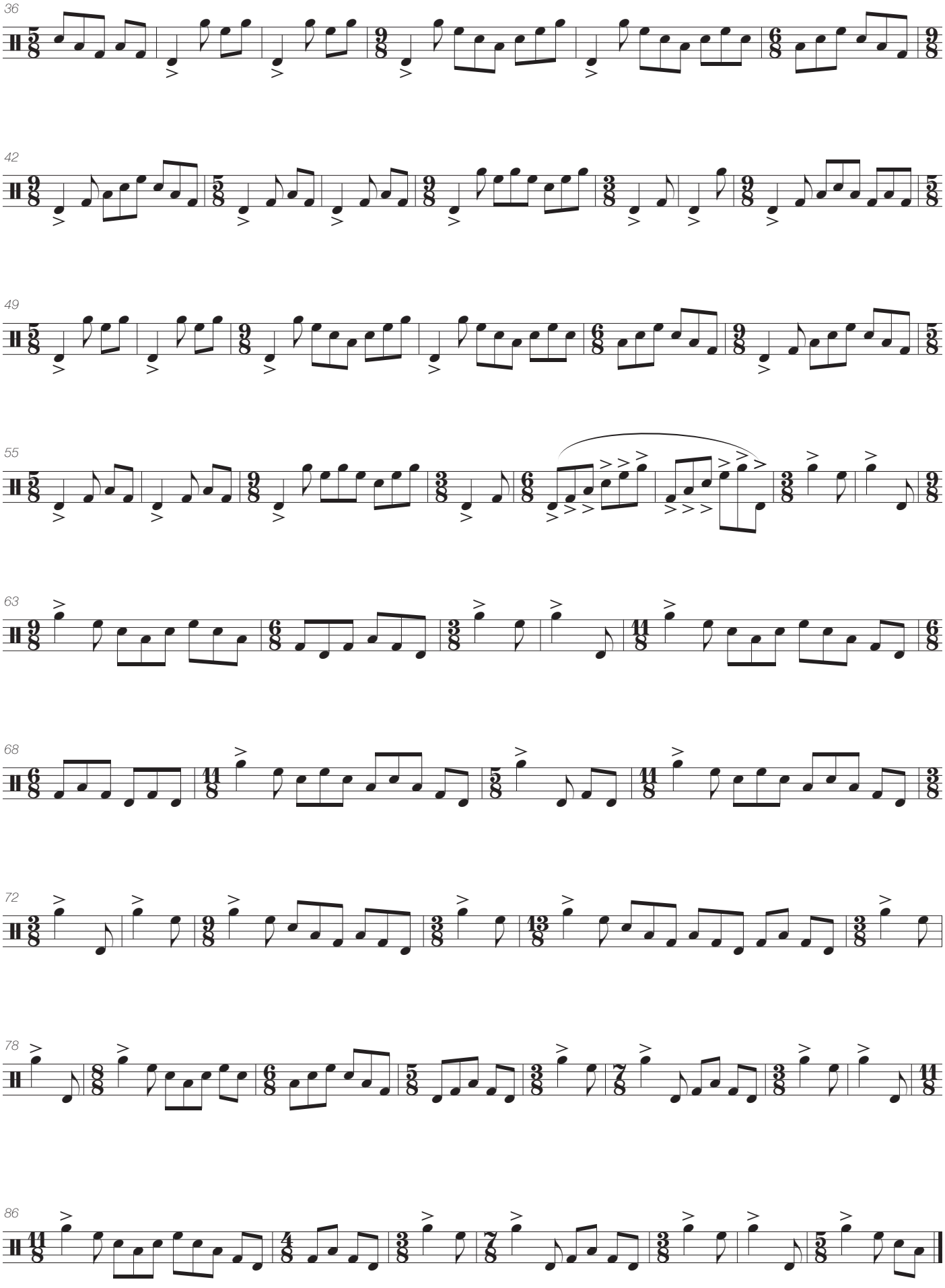
Player 1 (tabla)	Player 2 (drumkit)	Player 3 (synth)
1. tabla long	1. kick	1. scratch 1
2 .clap	2. snare	2. scratch 2
3. tabla mute	3. kick shake	3. hit 1
4. rest	4. ride	4. triangle sound
5. tabla,	5. kick shake	5. hit 2
6. tabla	6. clave	6. low sound

Strolling (♩= 180)



© 2022 Andrew Byrne

ANTS I

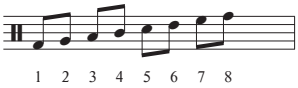


ANTS II

one line with eight sounds (pacing)
for frame drums and tambourines

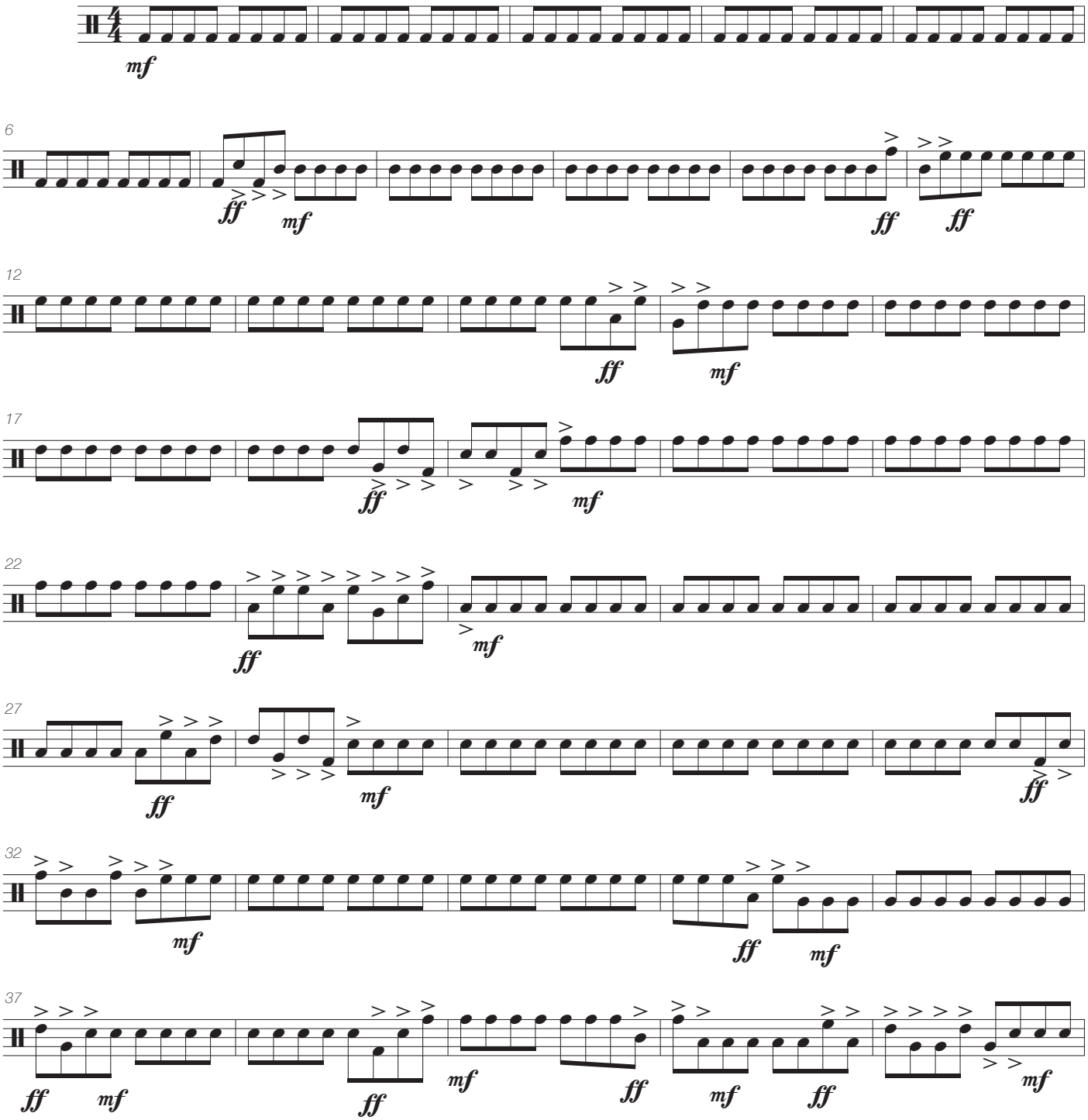
directions

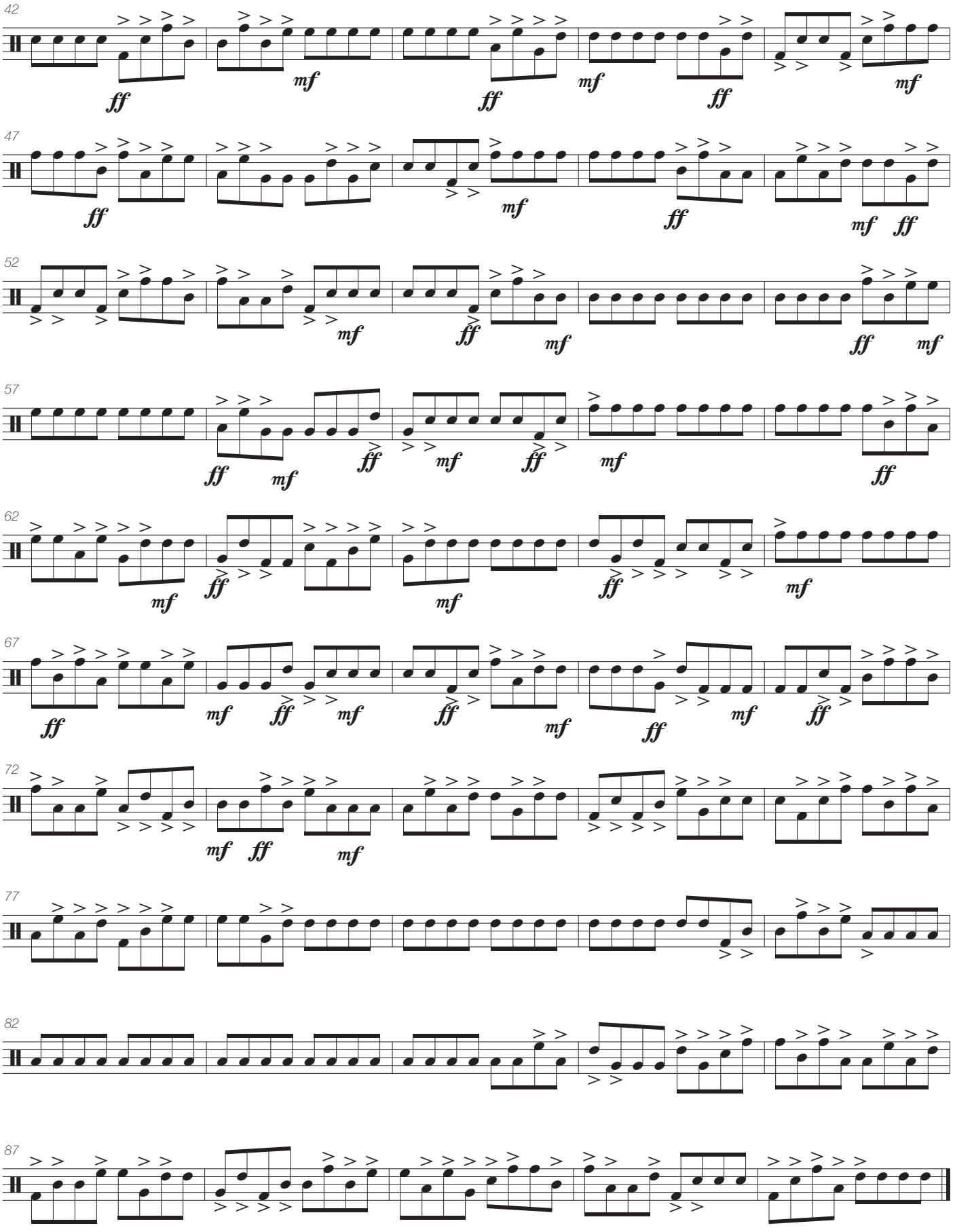
7
6 8
5 1
4 2
3



Arrangement for three performers,
playing a variety of frame drums and tambourines.

Pacing (♩= 120)




42
47
52
57
62
67
72
77
82
87

ANTS III

one with three sounds (shuffling)
for deconstructed drumkit

Directions*

1

6 2

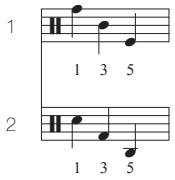
5 3

4

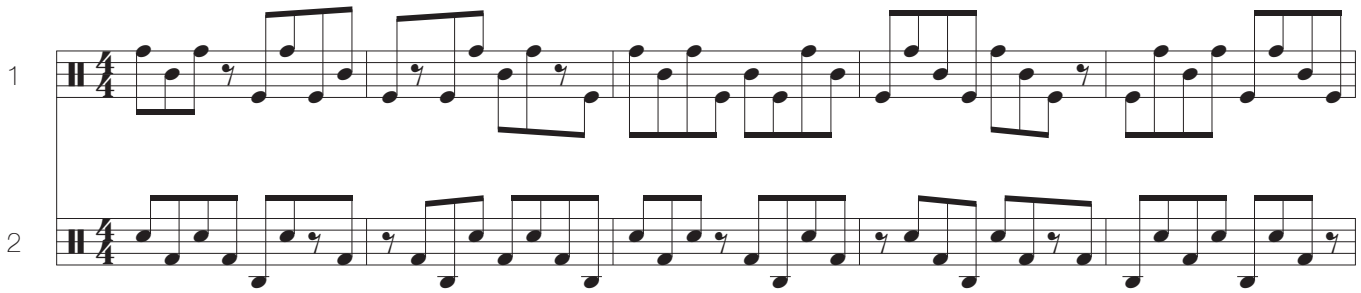
Player 1
1. clap or snare
3. low bongo
5. scratch push

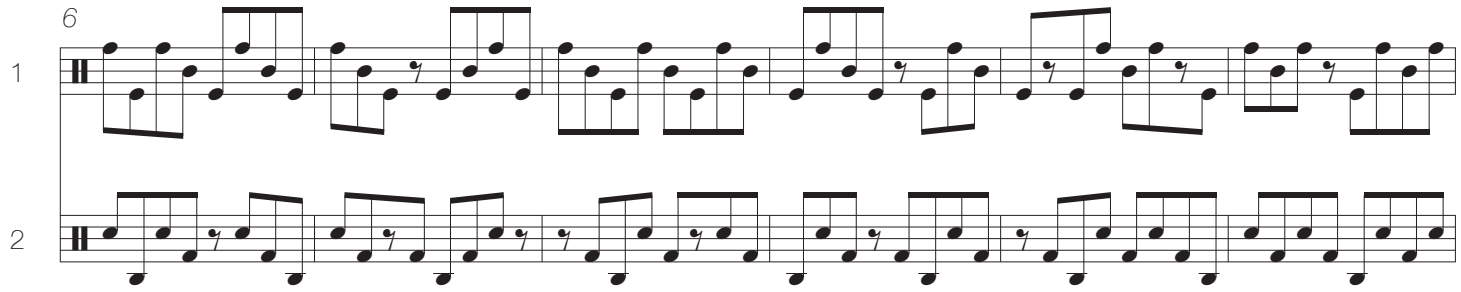
Player 2
1. highhat
3. neutral dum/tom tom (softer)
5. kck drum/low drum

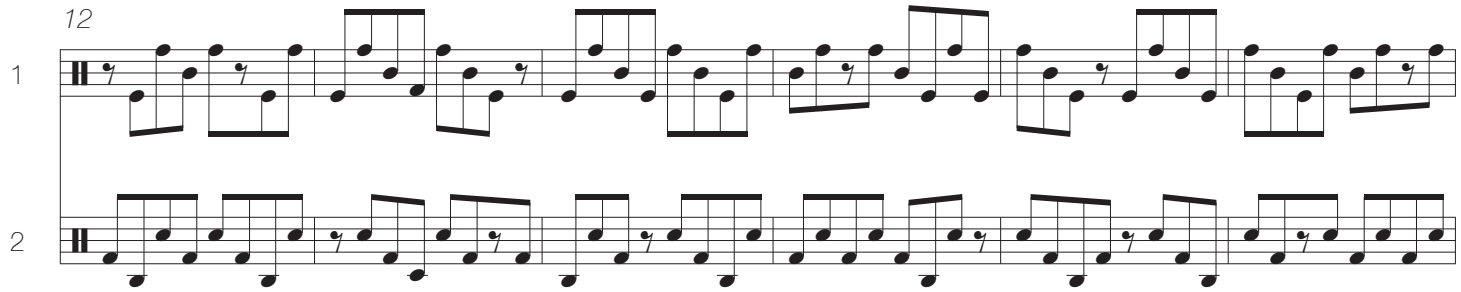
(The rules of the automaton mean that the ant only moves in three directions 1, 3 & 5.)

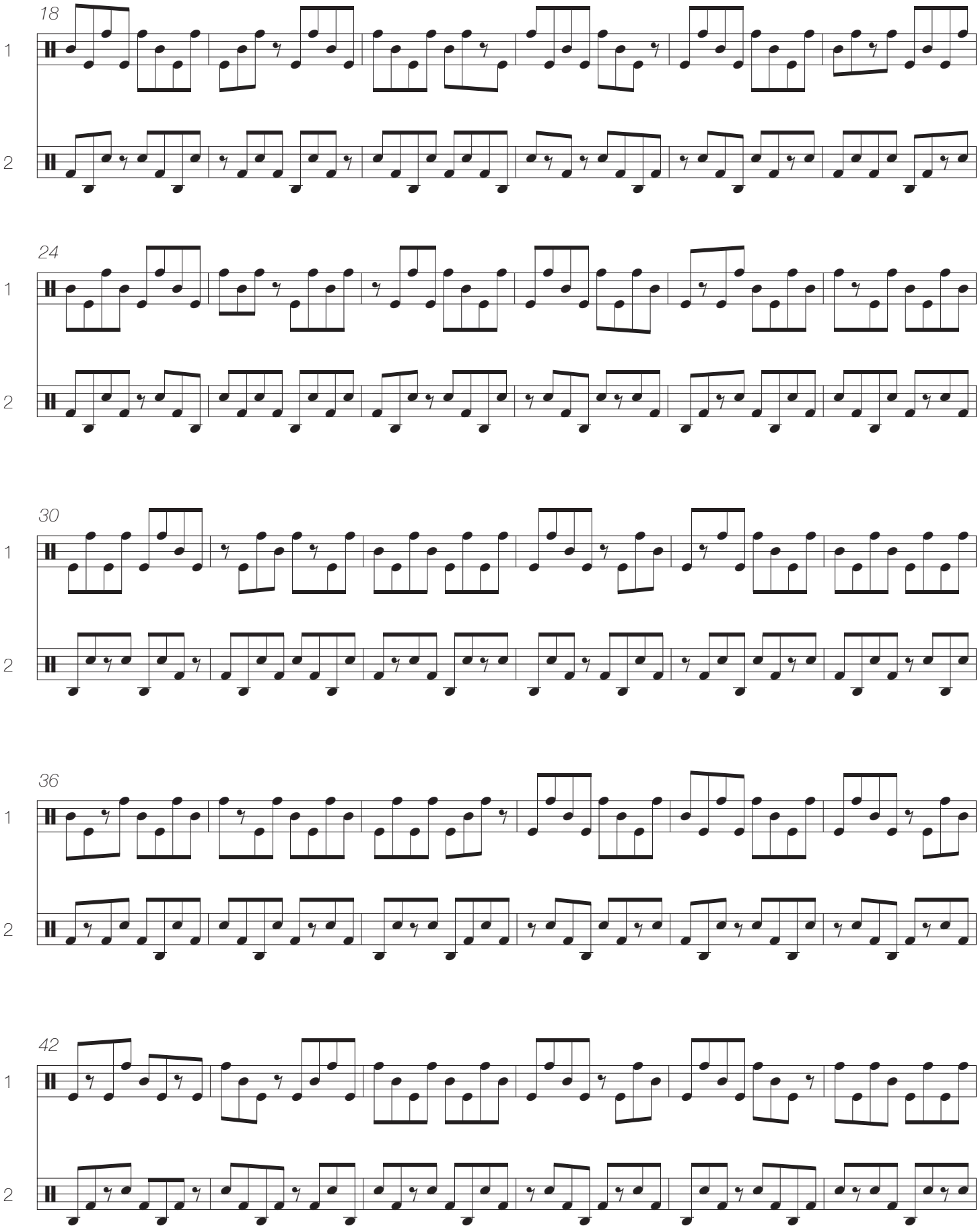


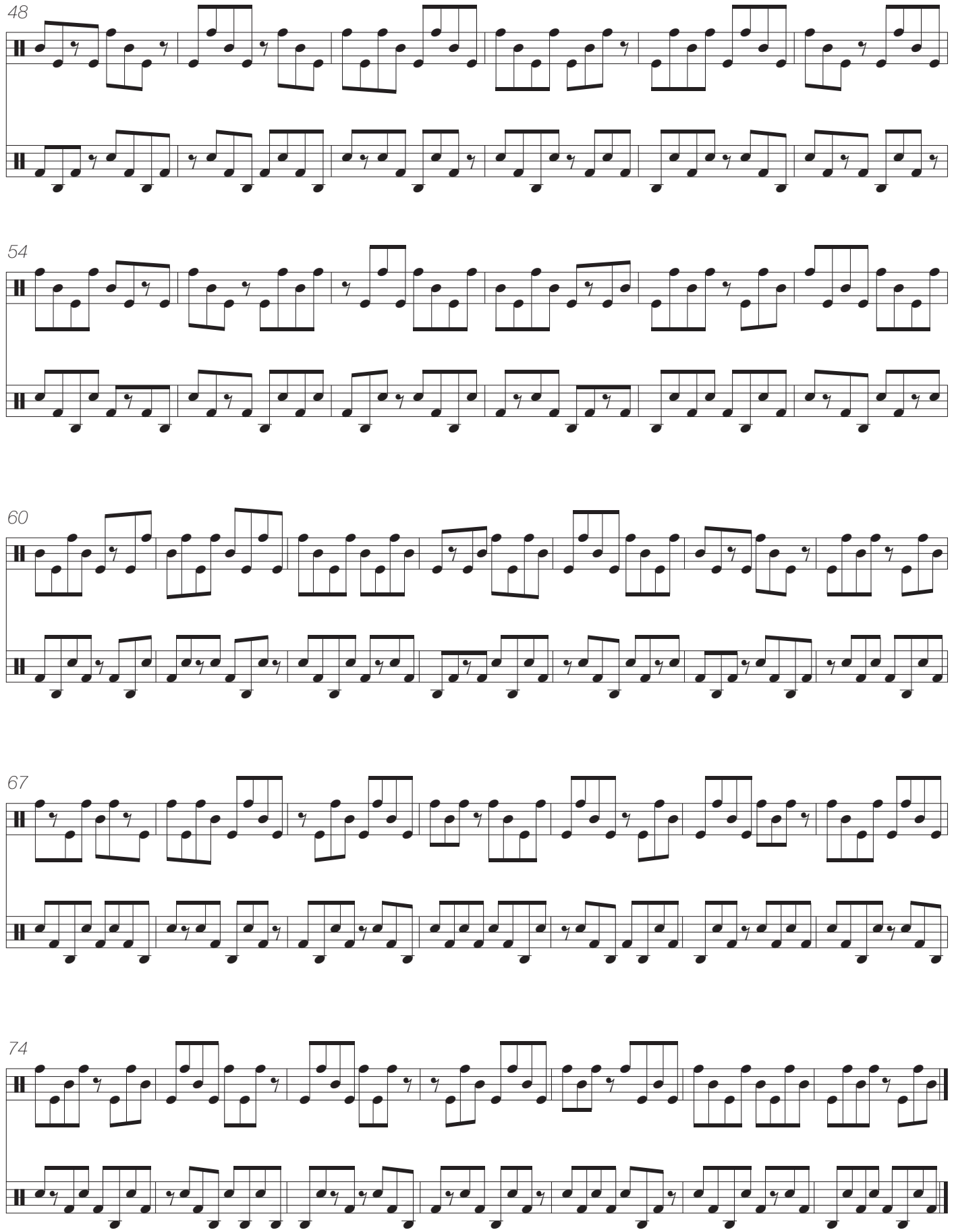
Shuffling (♩=166)








18
1
2
24
1
2
30
1
2
36
1
2
42
1
2


48
1
2
54
1
2
60
1
2
67
1
2
74
1
2

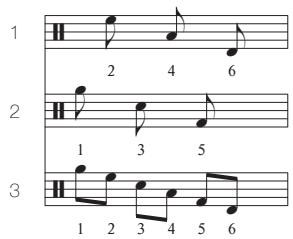
ANTS IV

one line with six sounds divided into two (ambling)
for cowbell, cymbal, high drum, 2 low conga, floor tom and scratch sample

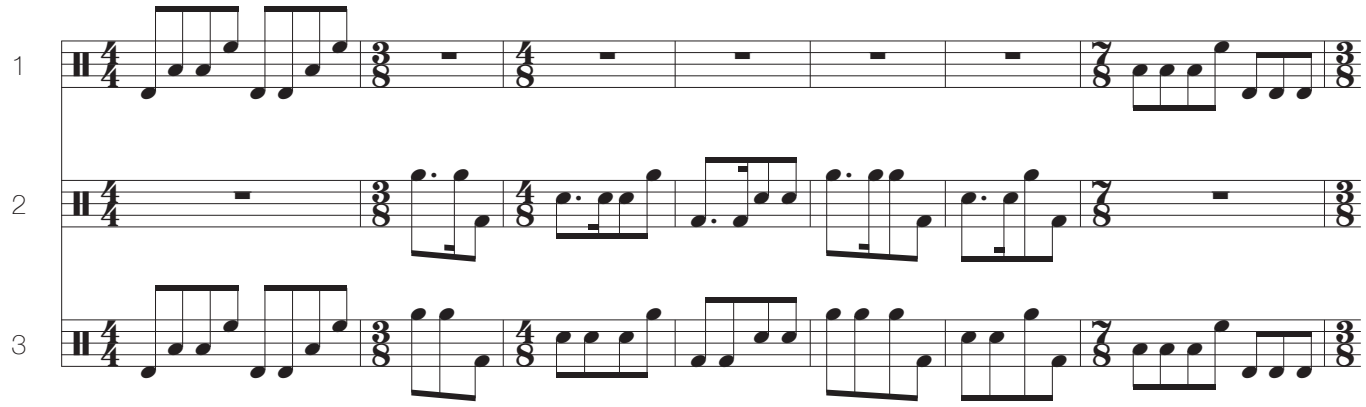
Directions

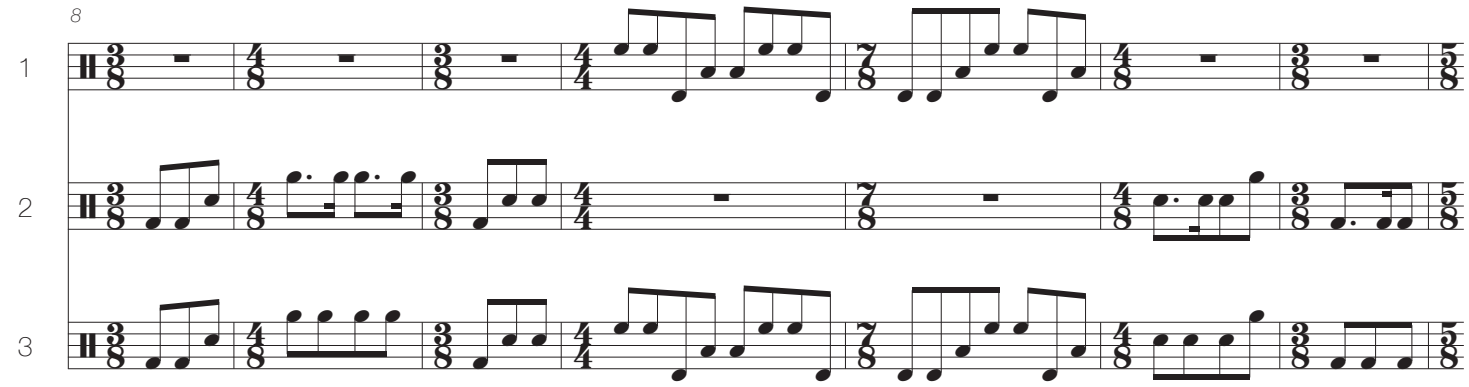
1
6 2
5 3
4

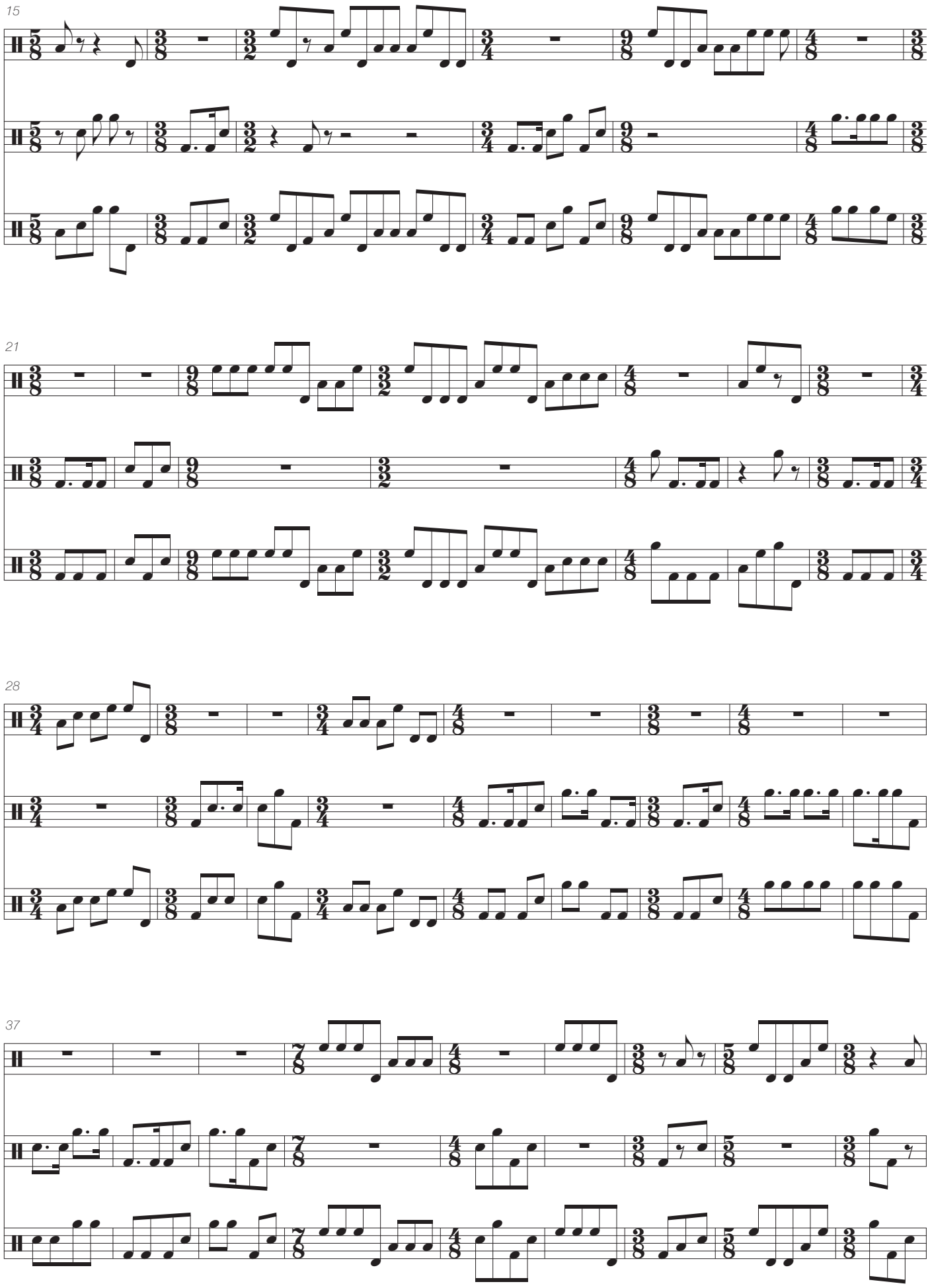
Arrangement for 3 players:
player 1, cowbell, cymbal, high drum
player 2, low conga, floor tom, scratch
player 3, bass drum, clap, floor tom, kickdrum, low tom, ride

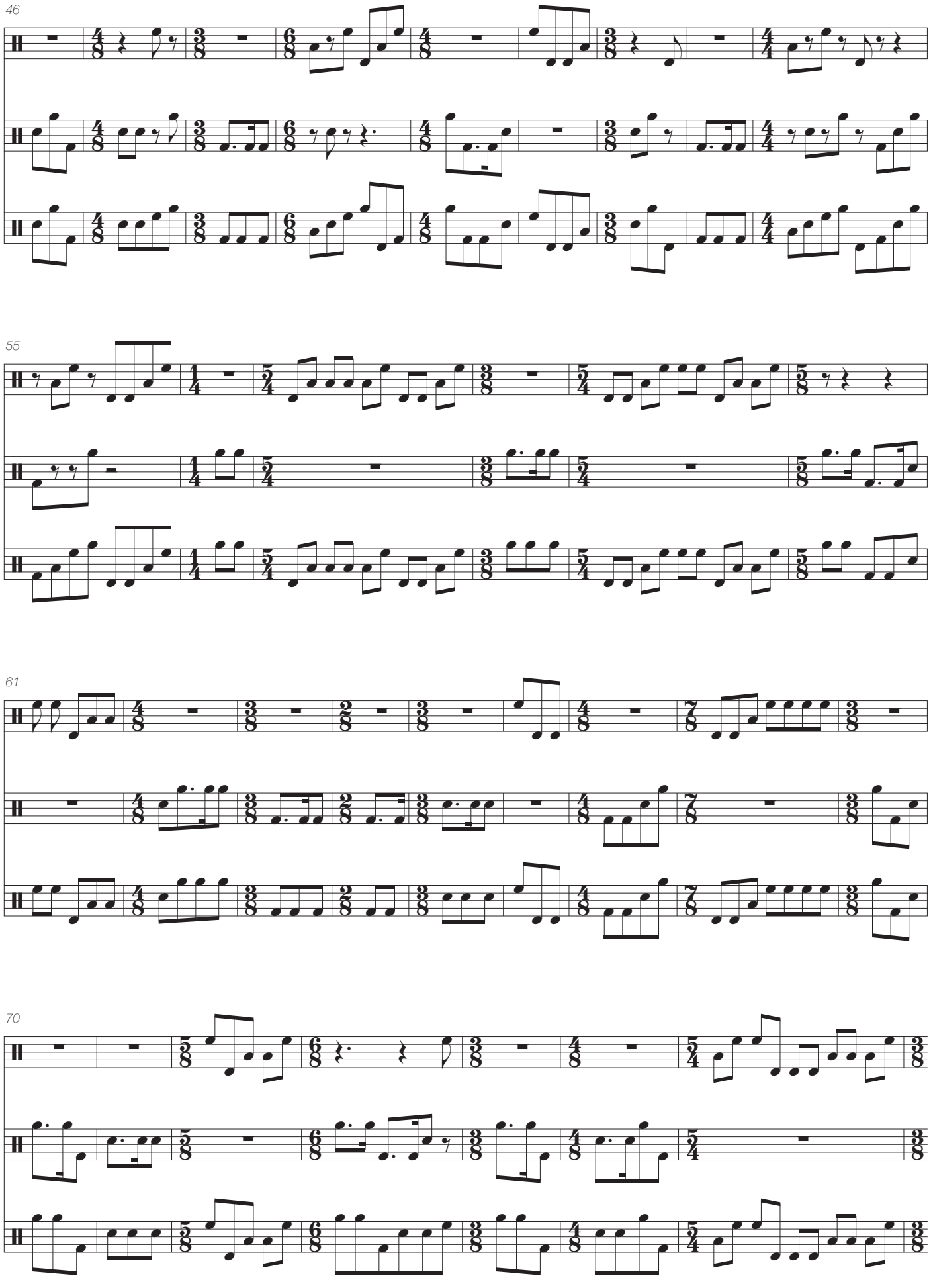


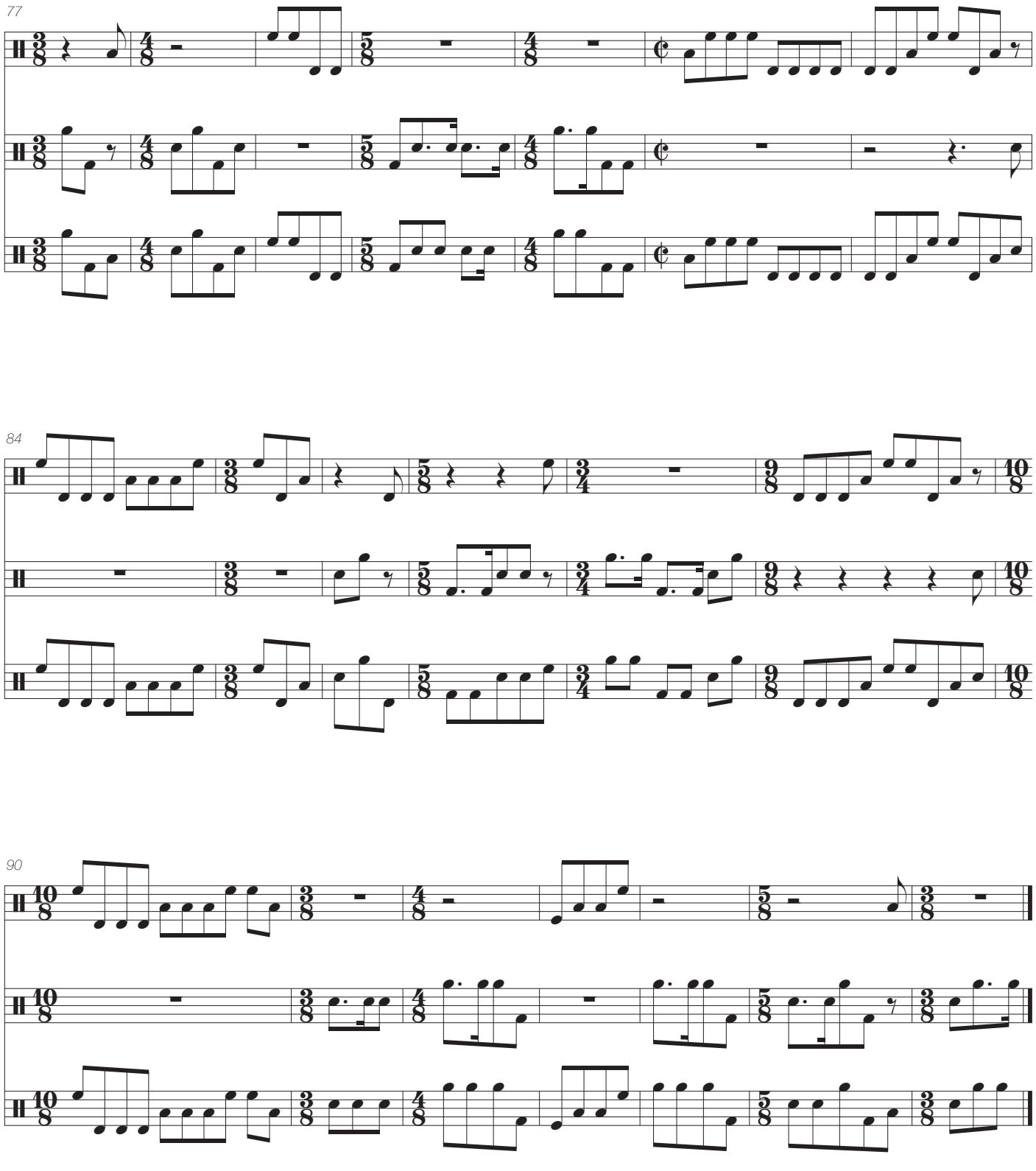
Ambling (♩ = 110)






15
1
2
3
21
1
2
3
28
1
2
3
37
1
2
3

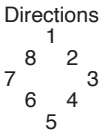

46
1
2
3
55
1
2
3
61
1
2
3
70
1
2
3


77
84
90
1
2
3

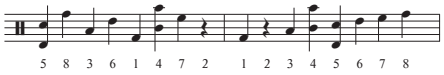
ANTS V

one line with eight sounds in canon (lurching)
for shakers, snare drums, highhat & cabasa

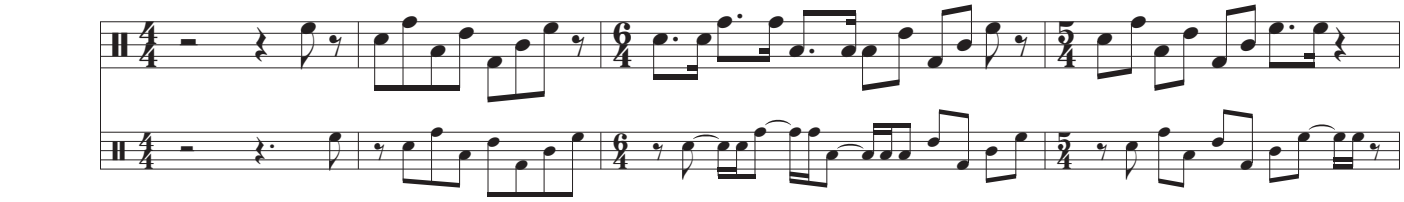
Directions

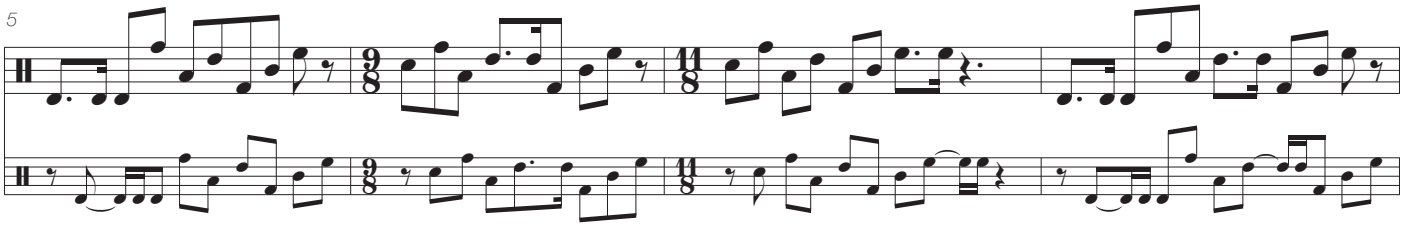


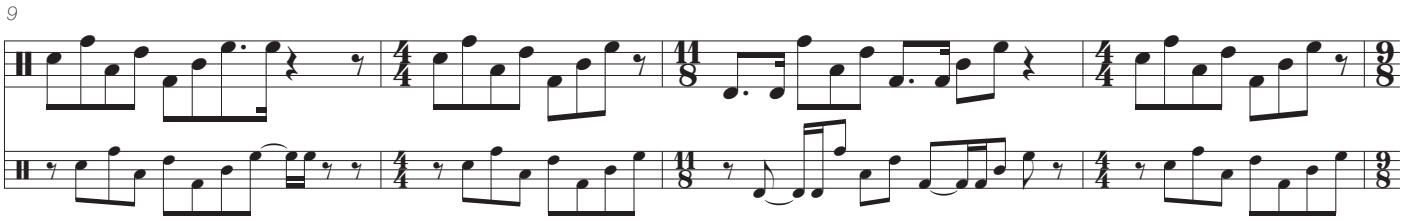
1. shaker
2. silence
3. snare drum 2
4. snare durm 3 + click
5. snare drum + cabasa
6. shaker 2
7. shaker
8. closed highhat

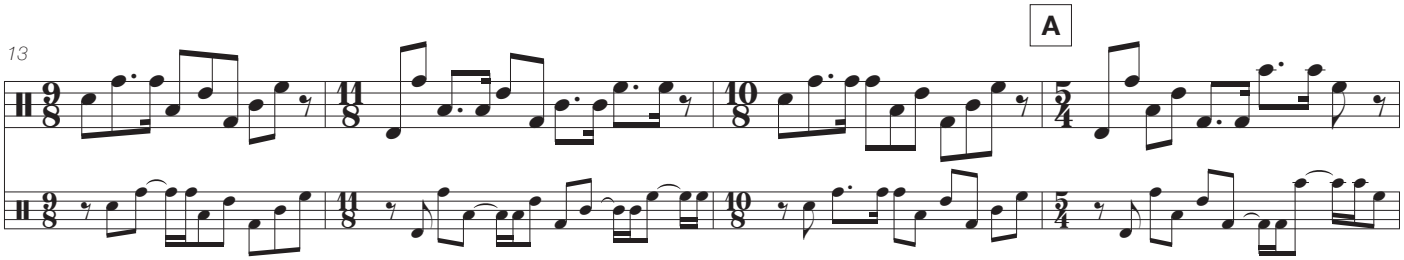


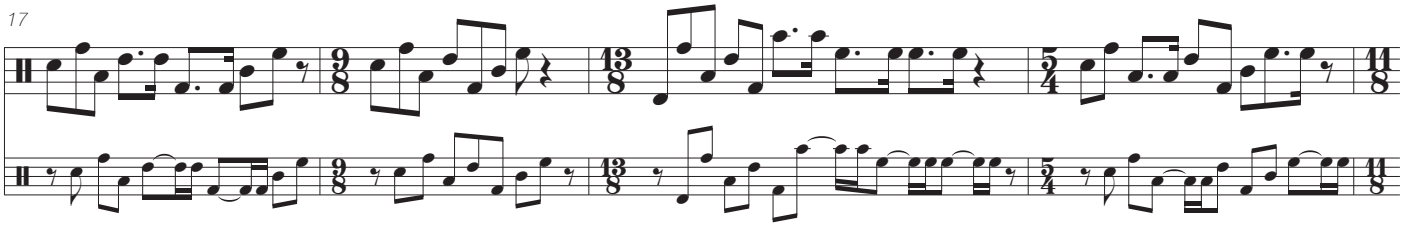
Lurching (♩ = 140)

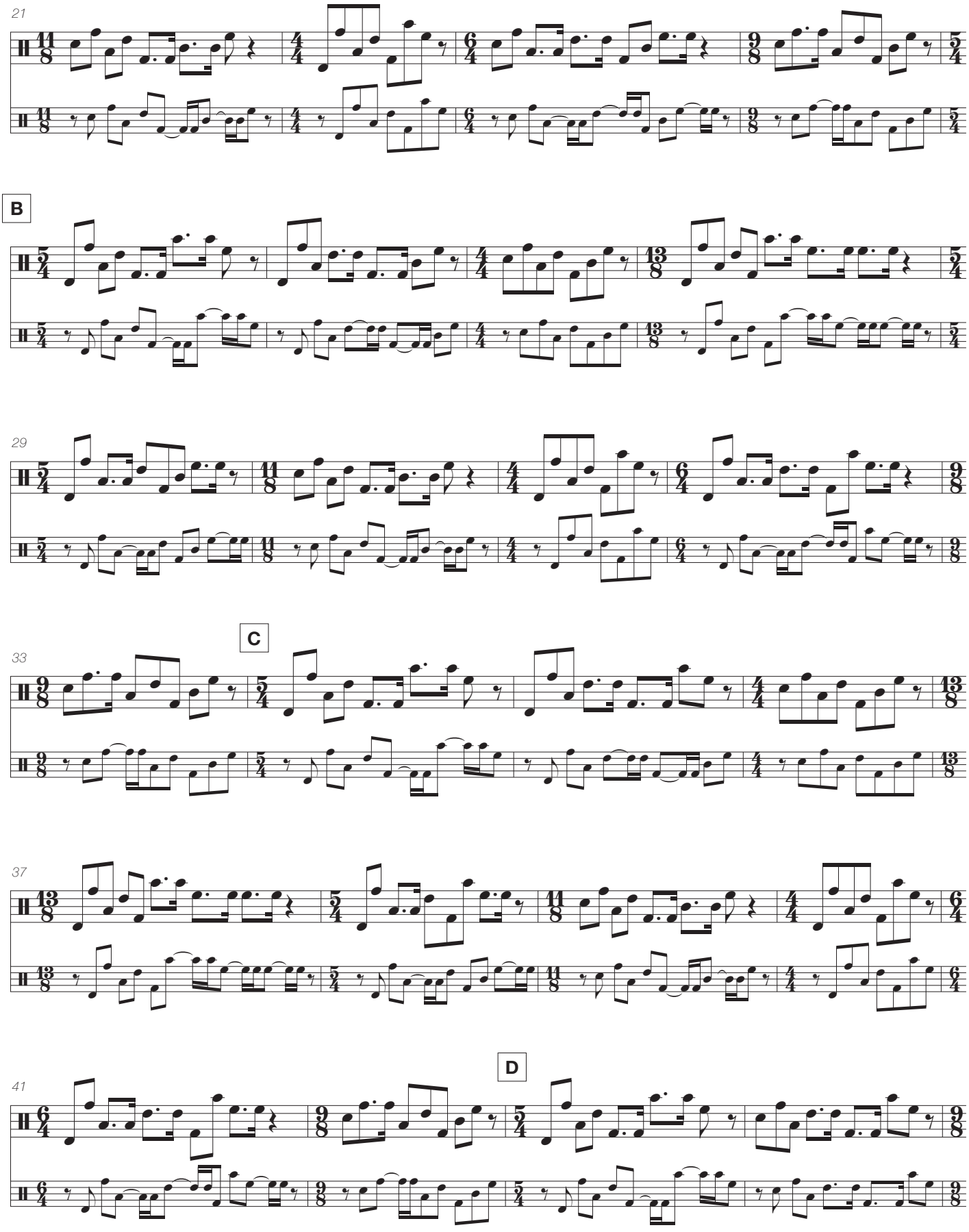


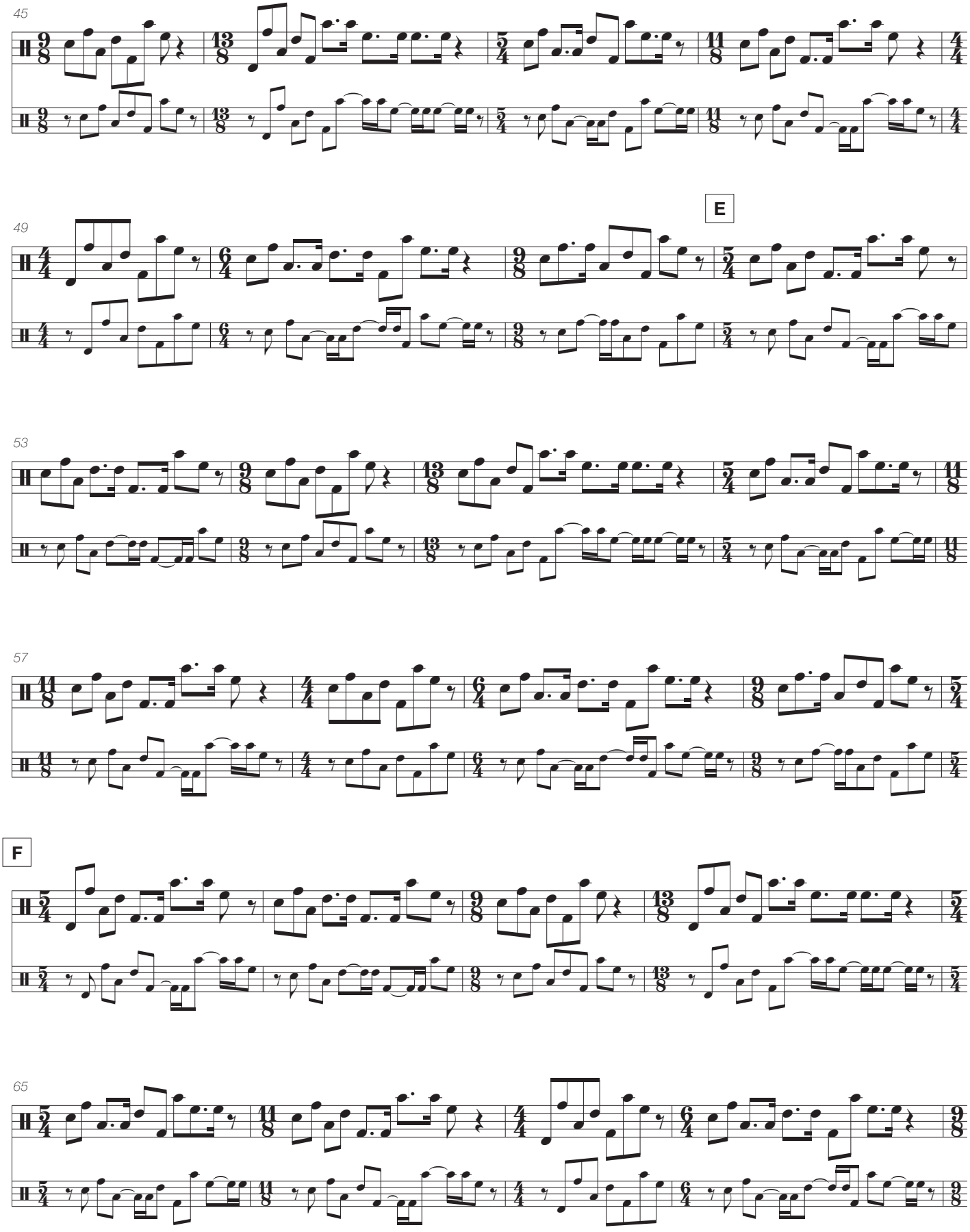


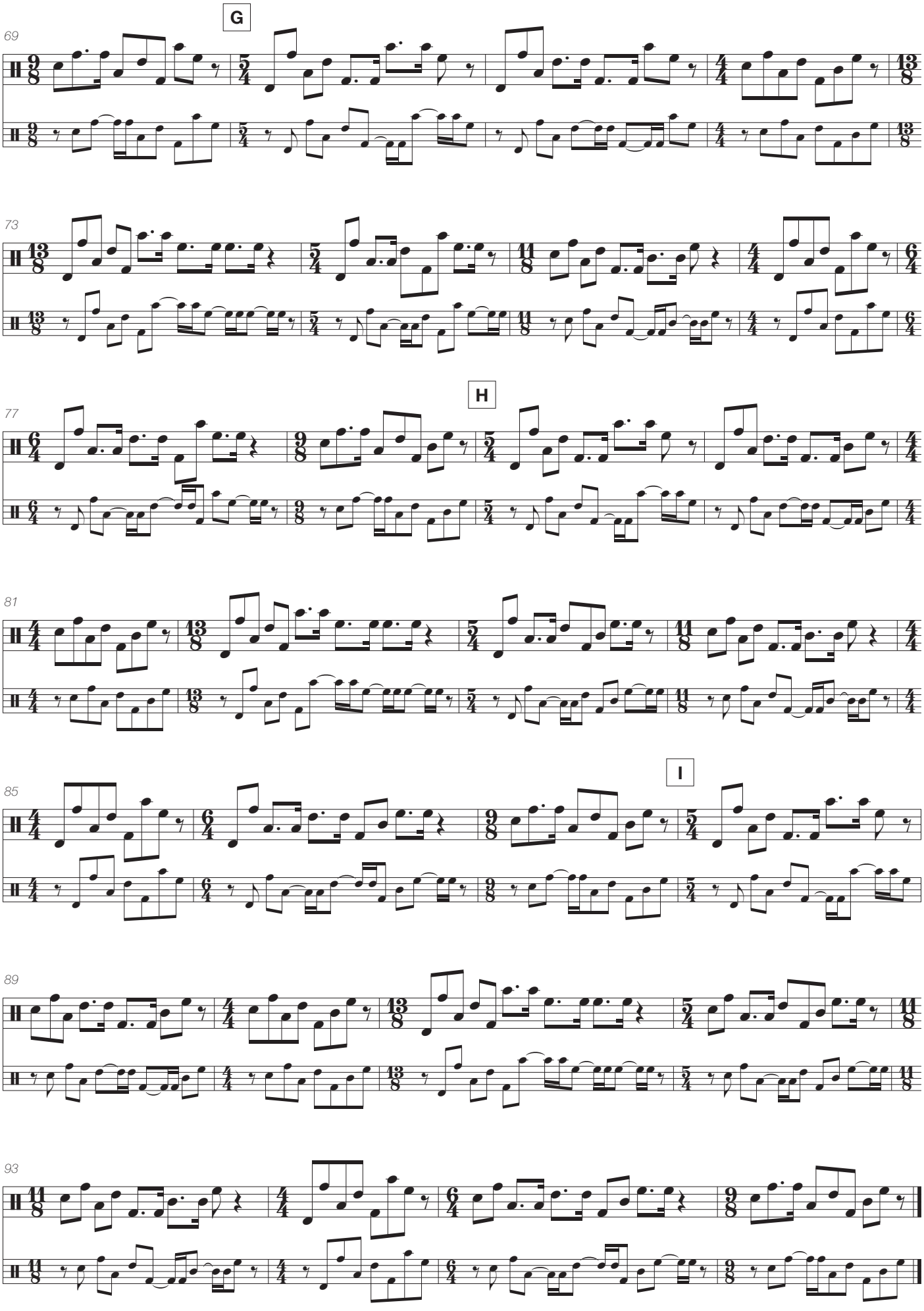







21
B
29
C
33
37
D
41


45
49
E
53
57
F
65


G
69
73
H
77
81
I
85
89
93

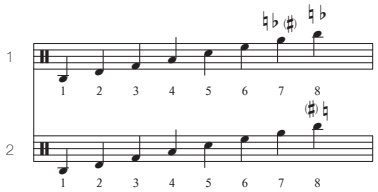
ANTS VI

two lines with eight sounds (marching)
for percussion marching band

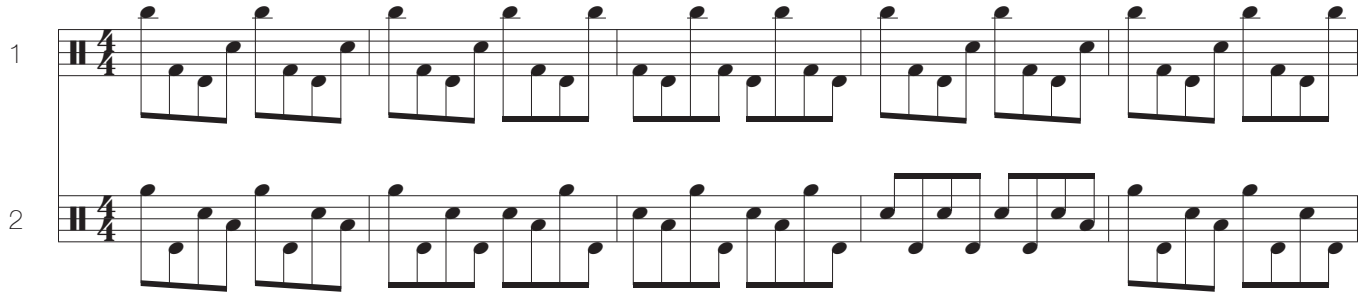
Directions

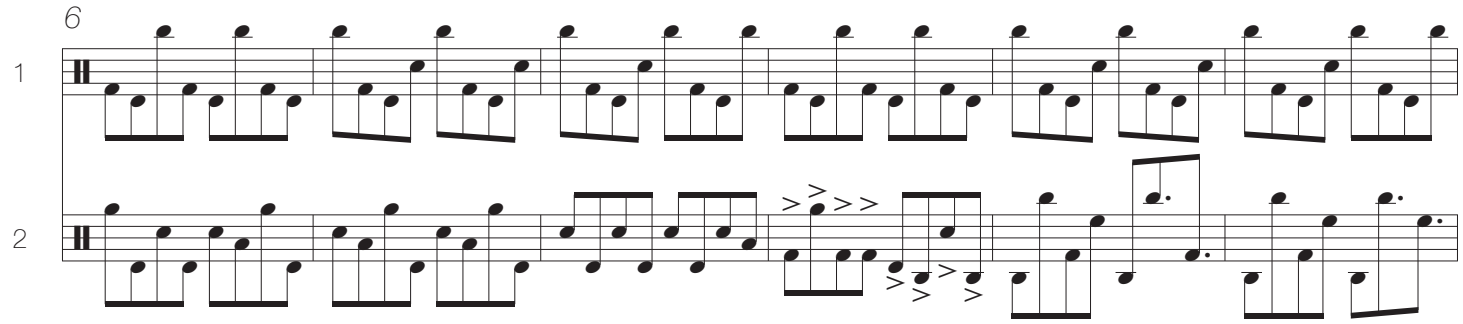
7
6 8
5 1
4 2
3

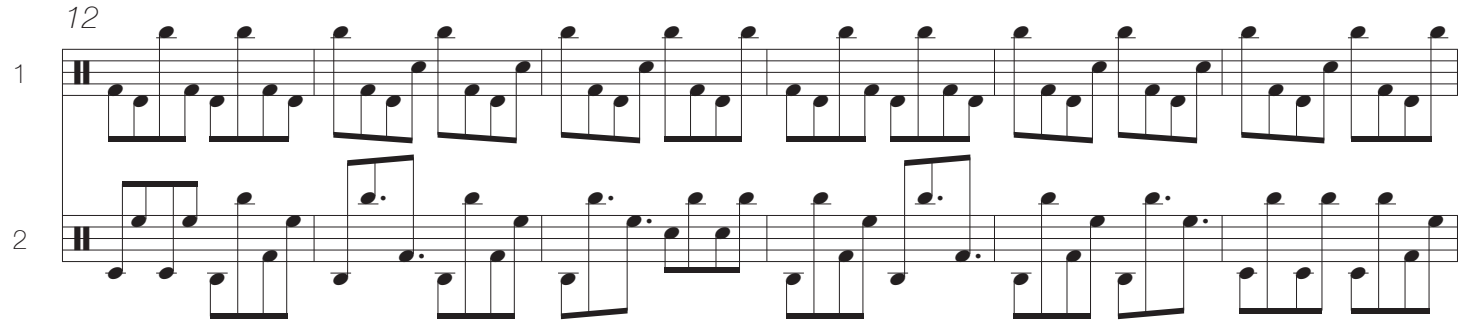
Parts 1 and 2 have the same 8 instruments, although distributed differently over the 8 notesie, snare is played on 1 in part 1 and 2 in part 2, for example. It is left up to the performers how to allocate the instruments.
Instruments list: kick drum, snare, low bongo, high bongo, cowbell, guiro, metal bar, tambourine

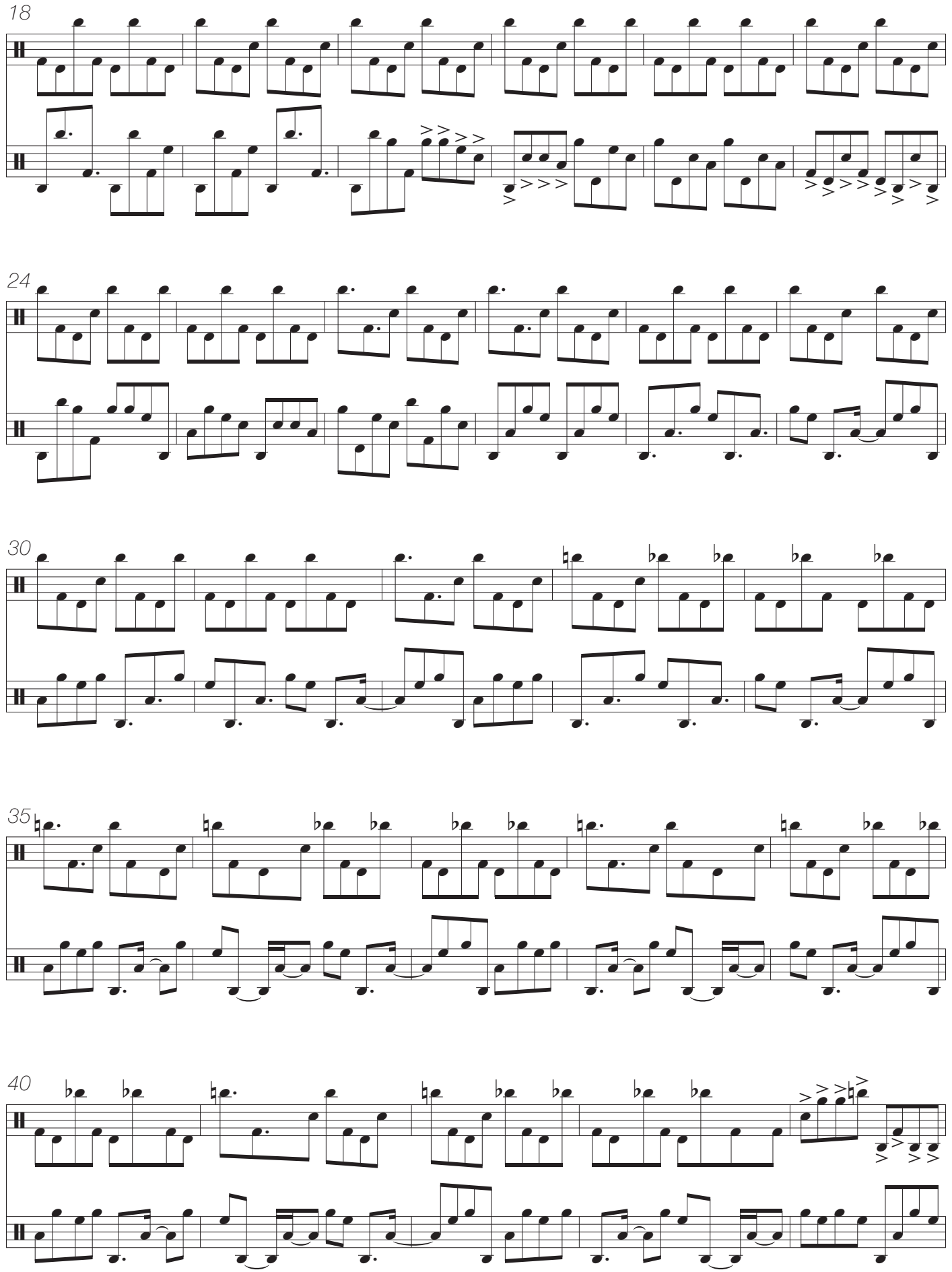


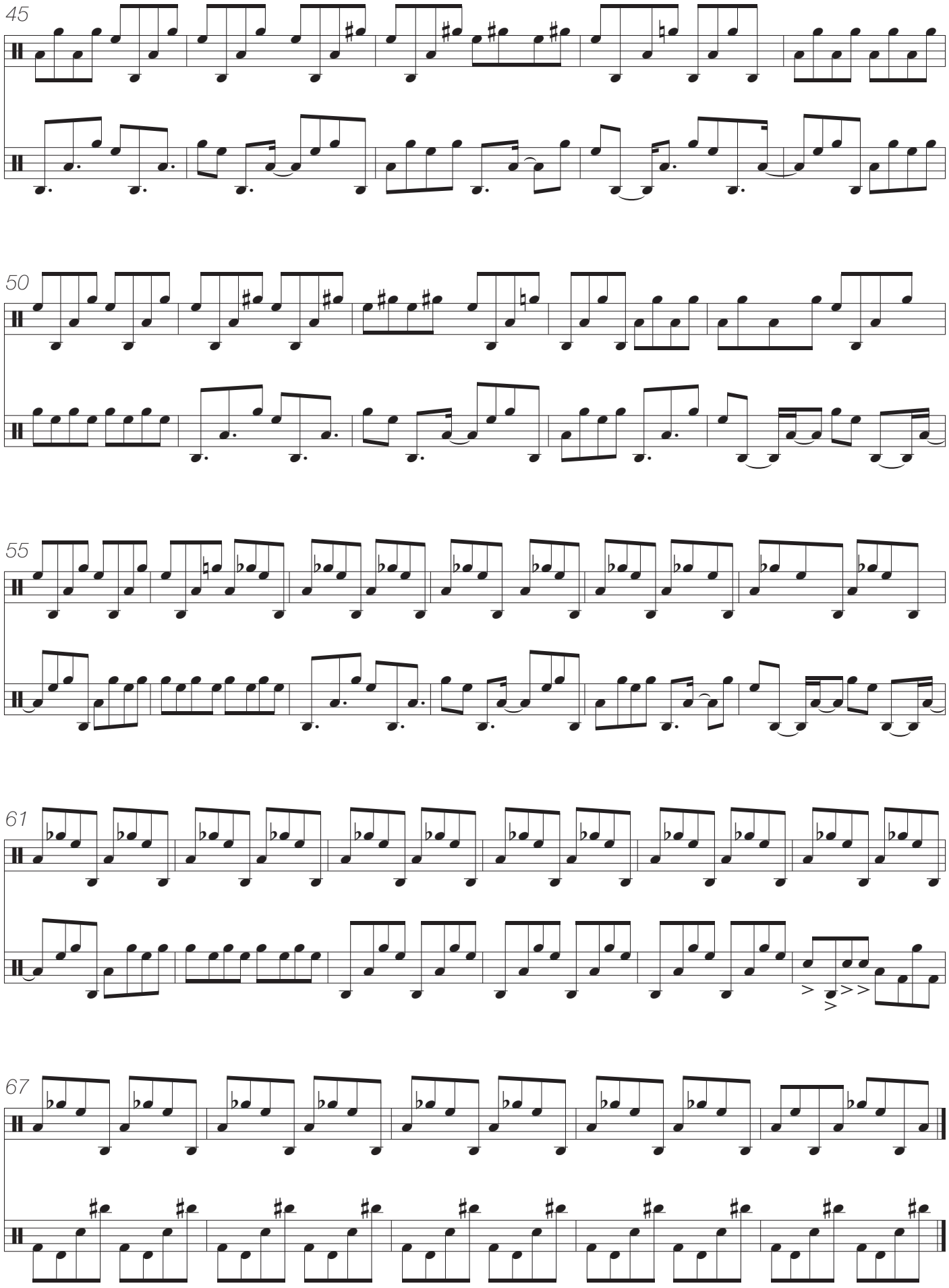
Marching (♩ = 150)








18
1
2
24
1
2
30
1
2
35
1
2
40
1
2


45
1
2
50
1
2
55
1
2
61
1
2
67
1
2

NOTES on
ANTS: six algorithmic melodies for untuned percussion

ANTS I (strolling) one line with six sounds

Rules: L1 L1 R1 R1 / on a hexagonal grid (six sounds)

The ant moves in only two directions according to the rules (diagonal left or diagonal right), creating hexagonal snowflake-like shapes as the ant ambles across the grid.

Two types of material emerge from this automaton: accented groups of between 11 and 15 notes that move in one direction functioning as a ritornello, and secondly, twisting melodic cells that orbit around either the notes 1 or 6. In my musical setting, notes 1 and 6 are given a crotchet rhythm (as opposed quaver rhythms for the other four notes) creating a feeling of downbeat in a constantly changing metric environment.

Hexagon (6 directions = 6 sounds)

(T) 1

(L1) 6 (R1) 2

(L2) 5 (R2) 3

(B) 4

T = top, B = bottom, L1 = upper left, L2 = lower left (likewise for R)

ANTS II (pacing), one line with eight sounds

Rules: T B R3 / on an octagonal grid (eight sounds)

The ant resolutely paces in a straight line (hence the constant repeating notes in the musical setting) until it collides with a coloured cell and veers off in a different direction.

Octagon (8 directions = 8 sounds)

(T) 7

(L1) 6 (R1) 8

(L2) 5 (R2) 1

(L3) 4 (R3) 2

(B) 3

L1 = upper left, L2 = left, L3 = lower left (likewise for R)

ANTS III (shuffling), one line with three sounds

Rules: R2 L2 R2 R2 R2 / on a hexagonal grid (six sounds)

In this piece, the ant can only move in three directions because of the particular rules of the cellular automaton. Even with only three sounds (1,3 ,5), the irregular sequence of sounds makes for an unpredictable journey.

Hexagon (6 directions = 6 sounds)

(T) 1

(L1) 6 (R1) 2

(L2) 5 (R2) 3

(B) 4

ANTS IV (ambling), one line with six sounds divided into two

Rules: L2, T, T, L1, L2, L1 / on a hexagonal grid (six sounds).

This melody always moves always in a counter-clockwise direction round the circle with repeating notes at irregular intervals. The melody naturally divides into two groups of three (1, 5, 3 and then 6, 4, 2), which is highlighted in my arrangement with a group of low drums and tom toms alternating with cowbells, cymbals and high drums.

Hexagon (6 directions = 6 sounds)

(T) 1

(L1) 6 (R1) 2

(L2) 5 (R2) 3

(B) 4

ANTS V (lurching), one line with eight sounds in canon

Rules: R3 R3 R3 T / on an octagonal grid (eight sounds)

An ant always moves in a clockwise direction, skipping two steps to create a fixed eight-note pattern (8, 3, 6, 1, 4, 7, 2, 5) with the only variable being repeating notes. After a chaotic start, the ant settles on a repeating 92-step pattern, which is represented by a continuous movement to the lower right of the grid.

Octagon (8 directions = 8 pitches)

(T) 1

(L1) 8 (R1) 2

(L2) 7 (R2) 3

(L3) 6 (R3) 4

(B) 5

ANTS VI (marching), two lines with eight sounds
Rules: R2 L1 B T R1 L2 / on an octagonal grid (eight sounds)

Each melody has a repeating 4-note pattern. With a pattern of 2, 5, 8, 3, the first moves in a lower right direction and while the second ant has a pattern of 4, 7, 2, 5 and moves to the lower left of the octagonal grid. The orderly movement is disrupted when the ants collide with each other.

Octagon (8 directions = 8 pitches)

(T) 1

(L1) 8 (R1) 2

(L2) 7 (R2) 3

(L3) 6 (R3) 4

(B) 5