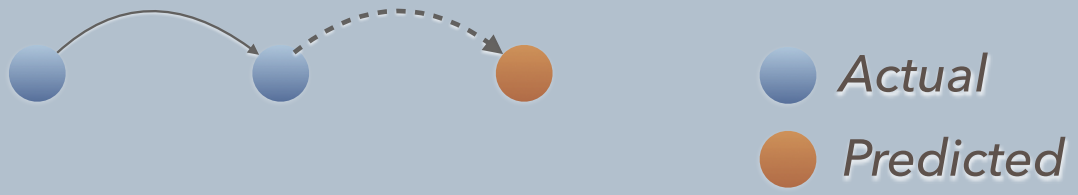
BREAKING OUT OF 4/4

HOW TO CREATE, BEND AND DESTROY STANDARD RHYTHMIC PATTERNS

MILTON MERMIKIDES **PHE**LAN KANE

RHYTHM IS PREDICTION (BODY MATHS)



At its core Rhythm is about
(often subconscious) **prediction**: One event is heard as a sonic entity,
when we hear two events in time, we pattern seek the next,
hunting the simplest explanation

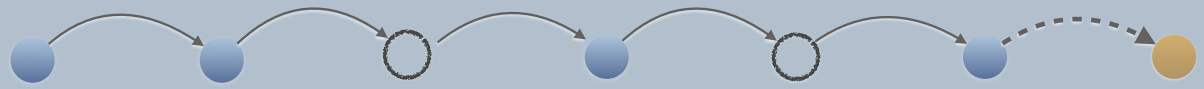
RHYTHM IS PREDICTION (BODY MATHS)

Actual

Predicted

If an event confirms our prediction,
we maintain the predictive pattern,
if not we modify it (all generally unconsciously)

RHYTHM IS PREDICTION (BODY MATHS)



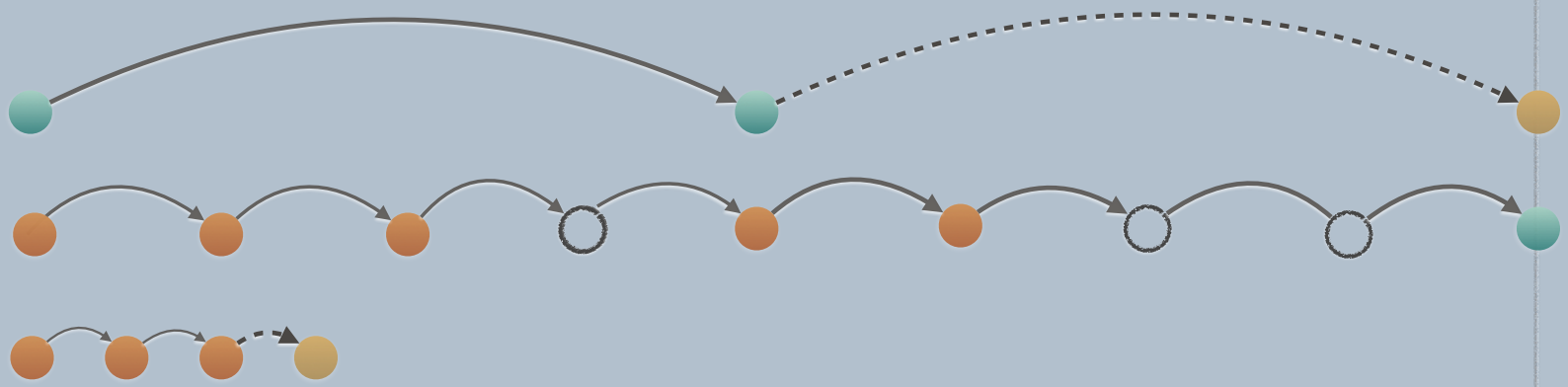
These predictive patterns can tolerate gaps, and we build a '**virtual structure**' of nodes, which make sense of events

Actual

Predicted

Gap

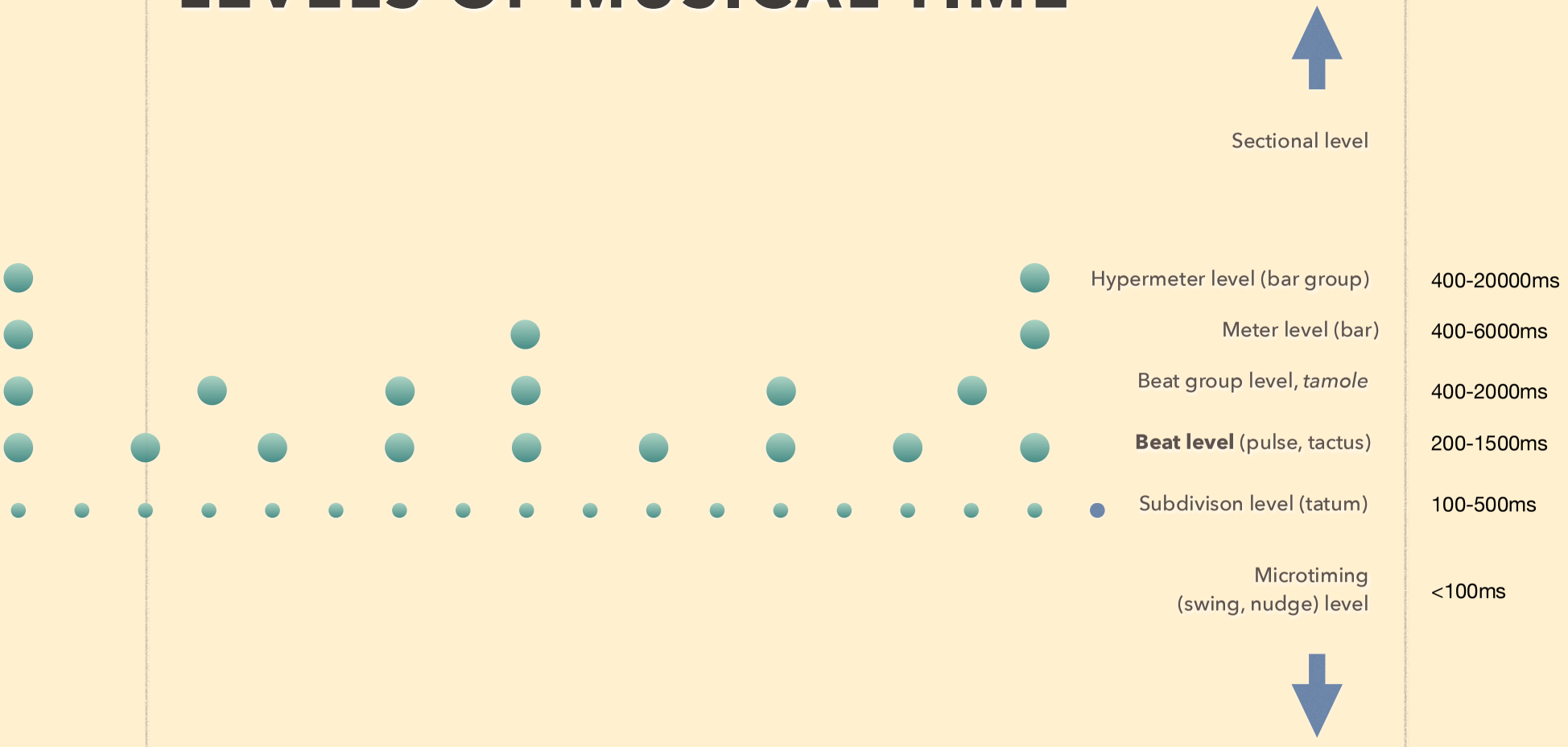
RHYTHM IS PREDICTION (BODY MATHS)



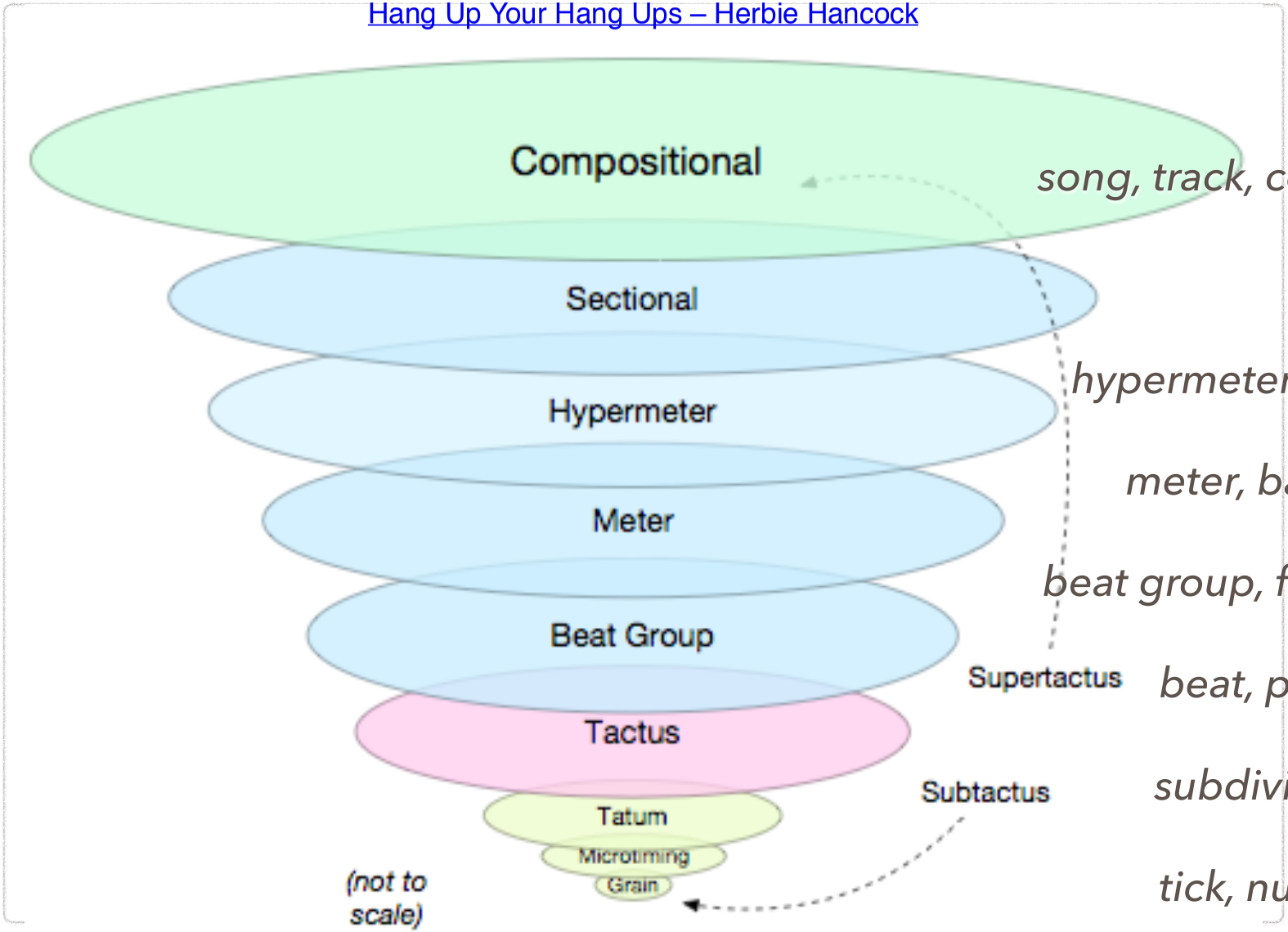
And once this virtual structure is set up,
we can accommodate multiple gap patterns,
and even add additional *predictive layers*

Actual
Predicted
Gap

LEVELS OF MUSICAL TIME



[Hang Up Your Hang Ups – Herbie Hancock]



song, track, composition

section

hypermeter, bar group

meter, bar, measure

beat group, figure,tamole

beat, pulse, tactus

subdivision, tatum

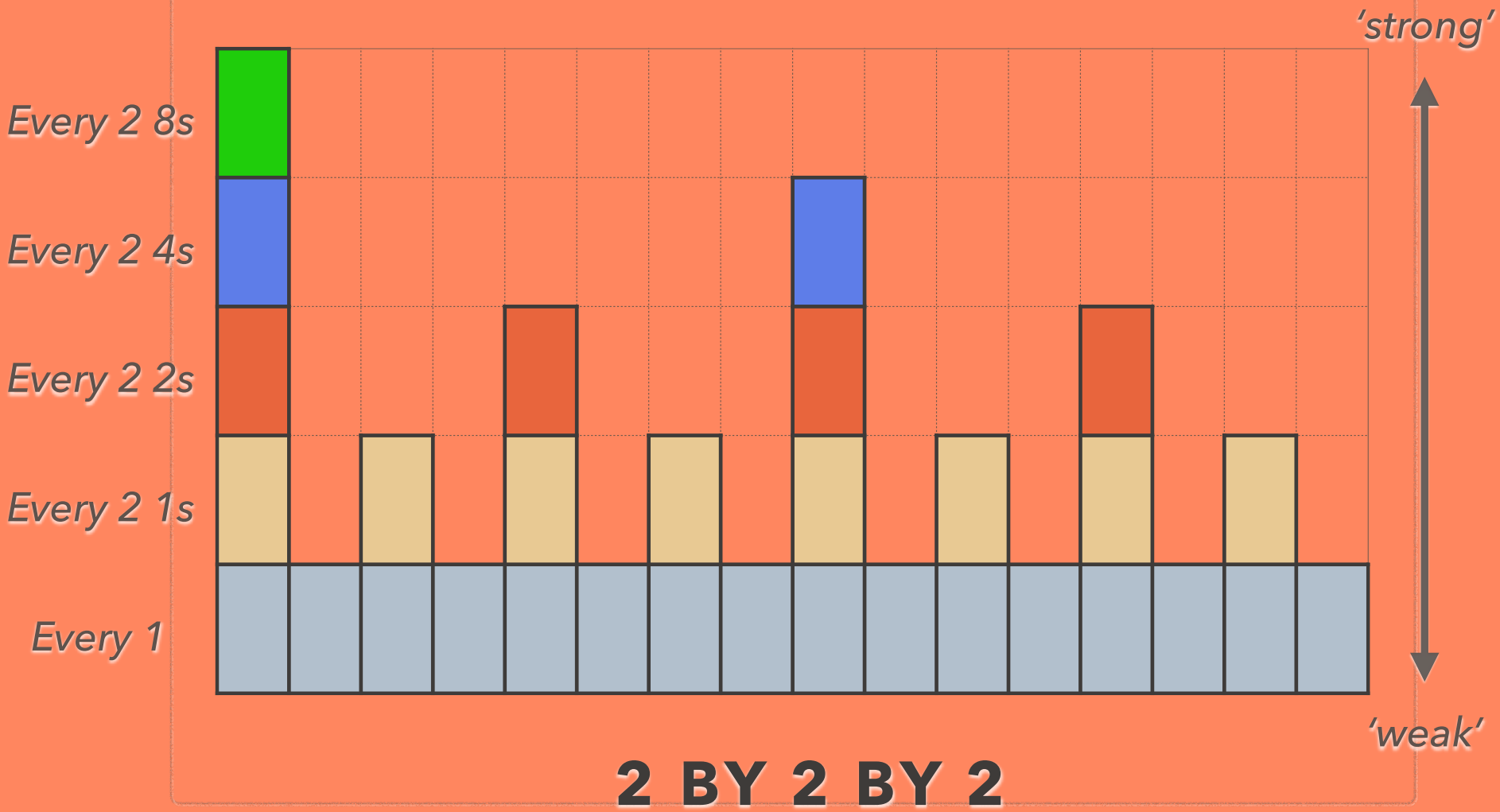
tick, nudge, swing

grain

THE BINARY DEFAULT

The simplest prediction to make (at any time level) are binary ones, left-right, on-off, that's why groupings of 2/4/8/16/32/64 beats/subdivisions and bars are so common in all forms of music (groupings of 3 being the (distant at the beat/subdivision layer) runner up)
We will use this **binary default** as the background canvas of our rhythmic adventures.
The amount of rhythmic interest, challenge, dissonance and confusion is often associated with the amount that the binary default is subverted, as well as the degree to which various predictive layers are thwarted or reconfigured.

THE BINARY DEFAULT



2 BY 2 BY 2

THE FUNDAMENTAL CONCEPTS

RHYTHMIC APPRECIATION RELIES ON **PREDICTION** ON **MULTIPLE LAYERS** (BEAT, SUBDIVISION & BELOW, BEAT GROUP, BAR & ABOVE).

TO PREDICT **WE BUILD INTERNAL VIRTUAL STRUCTURES**
(SO WE DON'T HAVE TO HEAR EVERY GRID POINT TO UNDERSTAND THEIR RHYTHMICALLY MEANING)

AND THE **BINARY DEFAULT** IS IMMEDIATELY ACCESSIBLE.

RHYTHMIC INTEREST...

...PLAYS WITH/DEFIES/ADAPTS **PREDICTION**, DEFYING IT REGULARLY AND/OR SIGNIFICANTLY AT ANY NUMBER OF TIME LEVELS

...INVOLVES **RHYTHMS** AND **INTERNAL VIRTUAL STRUCTURES** WHICH CHALLENGE THE NORMATIVE **BINARY DEFAULT** AT ONE OR MORE TIME LEVEL

OVERVIEW OF TOOLS

SYNCOPATION

GROUPING DISSONANCE & POLYMETER

EUCLIDEAN RHYTHMS

PRIMES IN METER, HYPERMETER & SUBDIVISION

GRID DECEPTION, MODULATION & BENDING

TIME-FEEL

MELTING THE GRID (THE UPSIDE-DOWN)

OMISSION

OMISSION

From heard to virtual grids

SYNCOPATION

(AKA DISPLACEMENT DISSONANCE)

POWER THE WEAK
WEAKEN THE STRONG

Hey Jude - Remastered 2015 – The Beatles

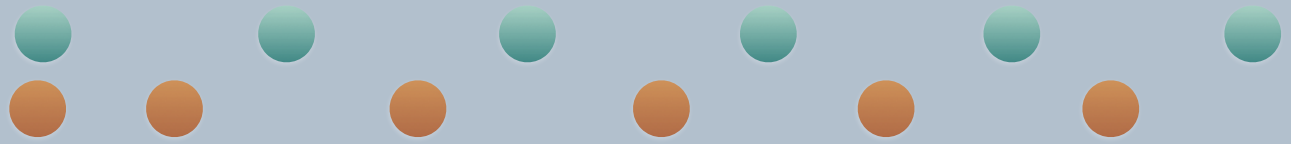
WEAK SYNCOPATION

Smells Like Teen Spirit – Nirvana

MEDIUM SYNCOPATION

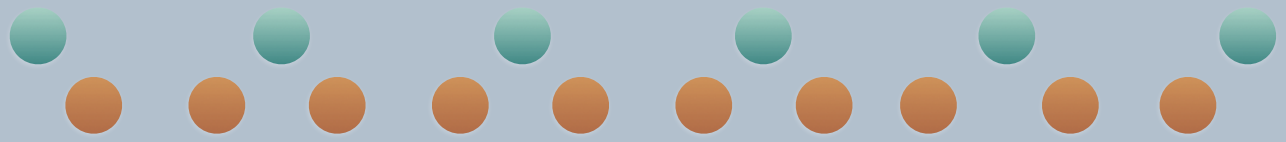
Paranoid - 2009 Remastered Version – Black Sabbath

STRONGER SYNCOPATION

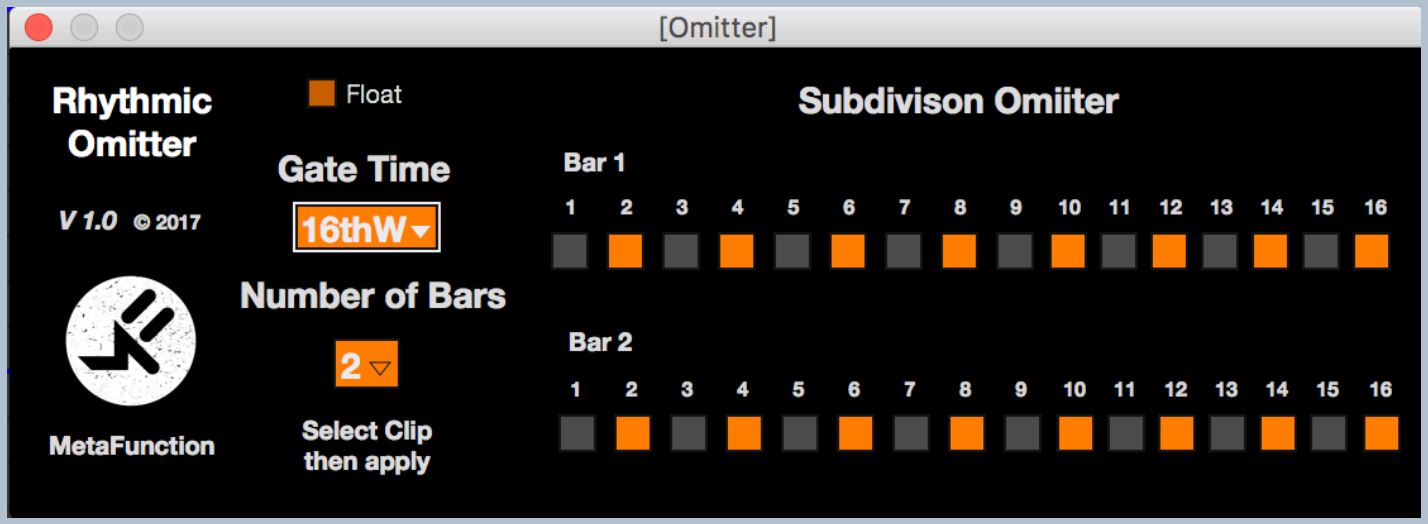


Wave – Antônio Carlos Jobim

STRONGER (BINARY) SYNCOPATION



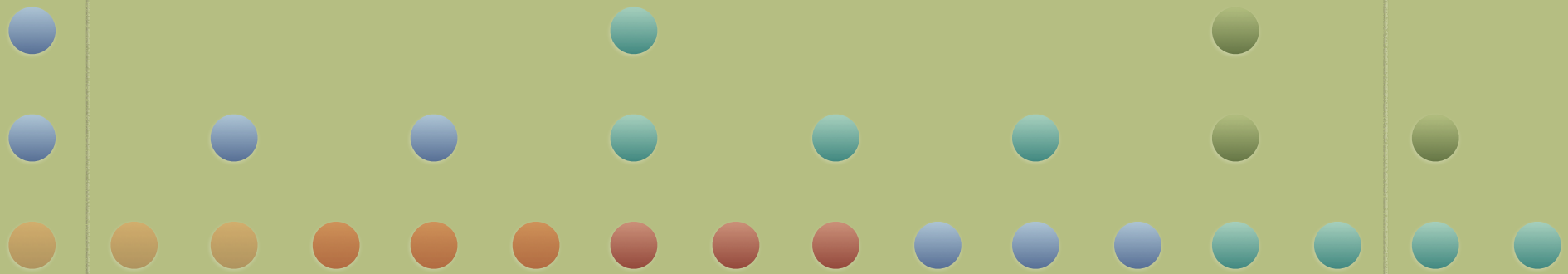
RHYTHMIC OMITTER



GROUPING DISSONANCE

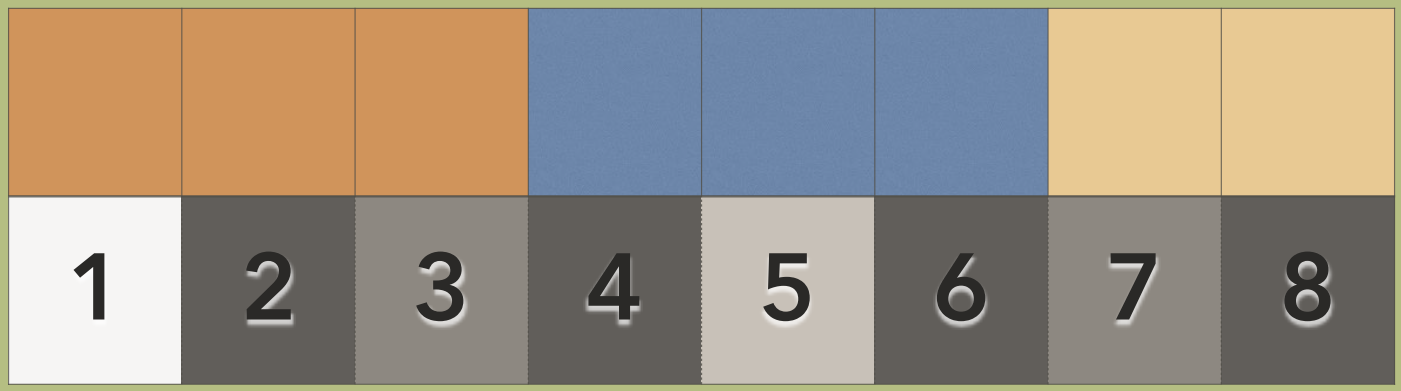
MAKE NON- BINARY CONNECTIONS

GROUPING DISSONANCE



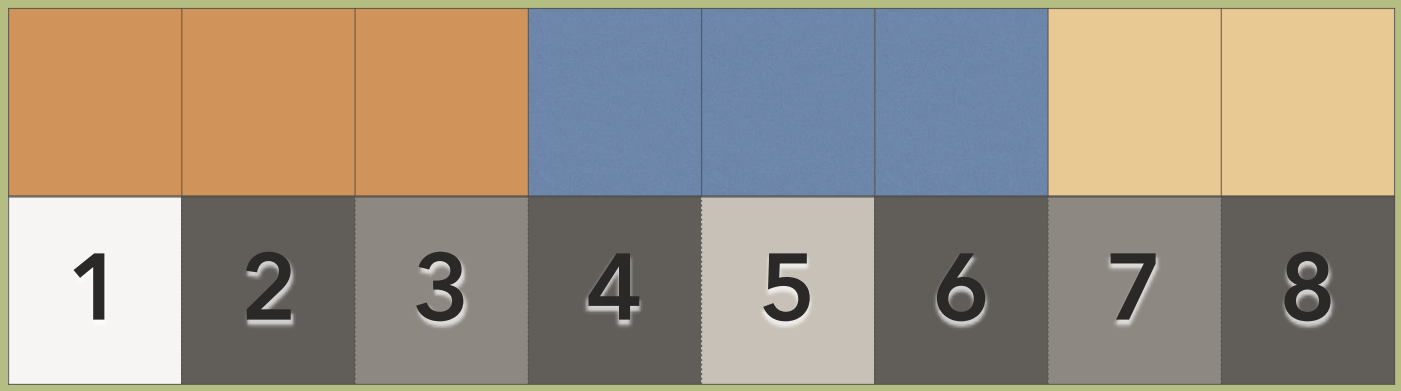
THE TRESILLO, DOUBLE TRESILLO & BEYOND

TRESILLO



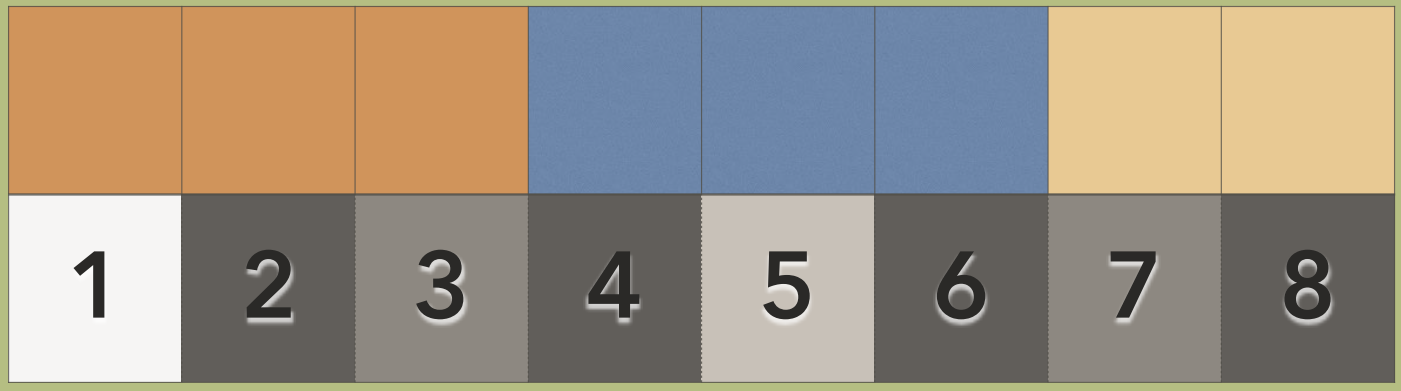
Libertango – Astor Piazzolla, Yo-Yo Ma

TRESILLO EXAMPLE 1



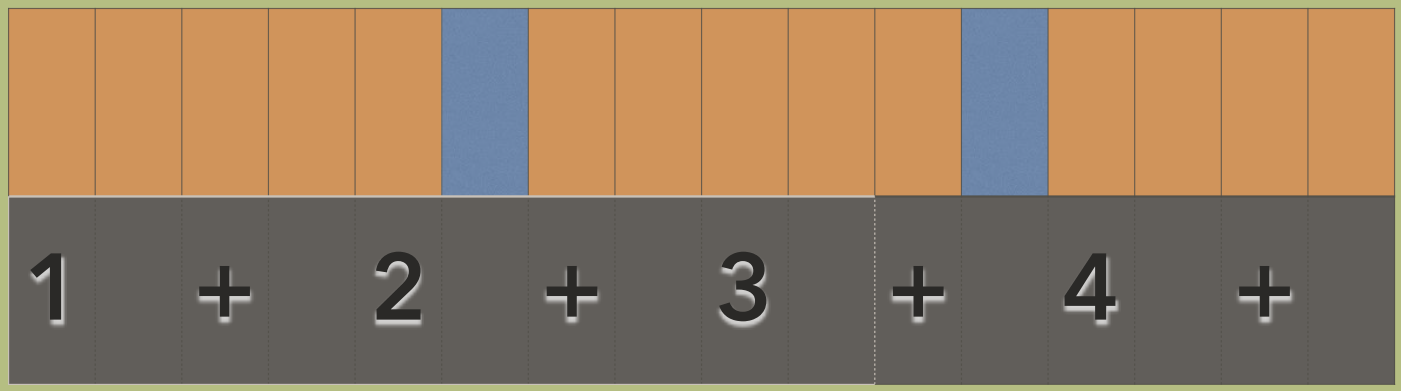
Oblivion – Malena Tango Quintet

TRESILLO EXAMPLE 2

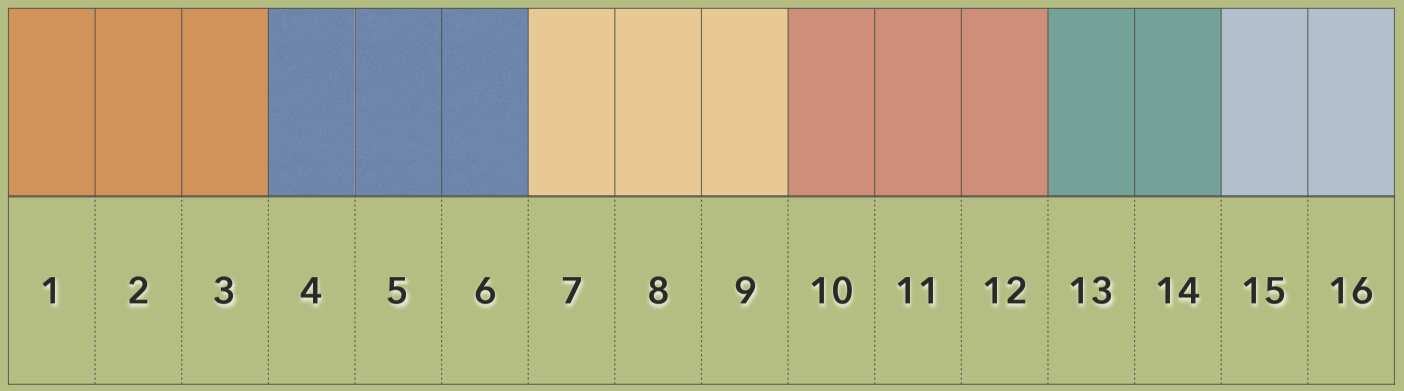


Wake Up - Remastered – Rage Against The Machine

TRESILLO EXAMPLE 3



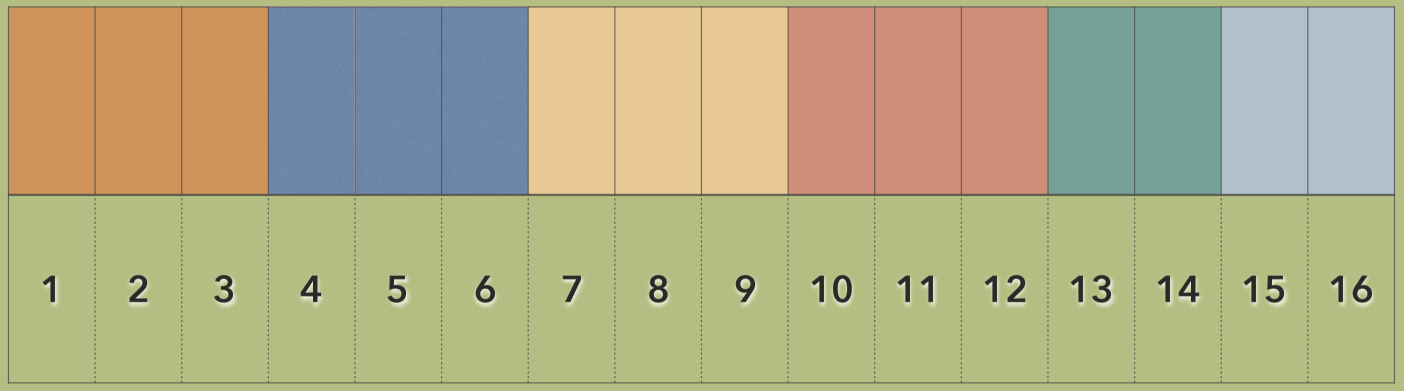
DOUBLE TRESILLO



THE TRESILLO, DOUBLE TRESILLO & BEYOND

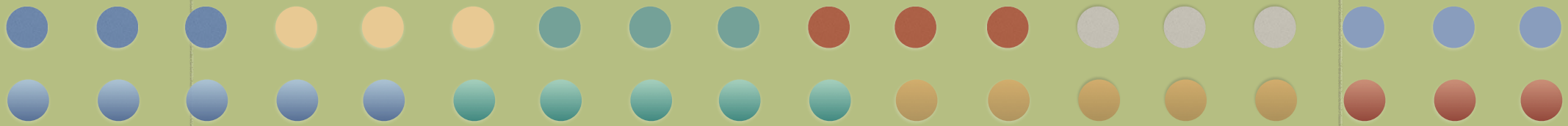
Kashmir – Led Zeppelin

DOUBLE TRESILLO EXAMPLE



GROUPING DISSONANCE

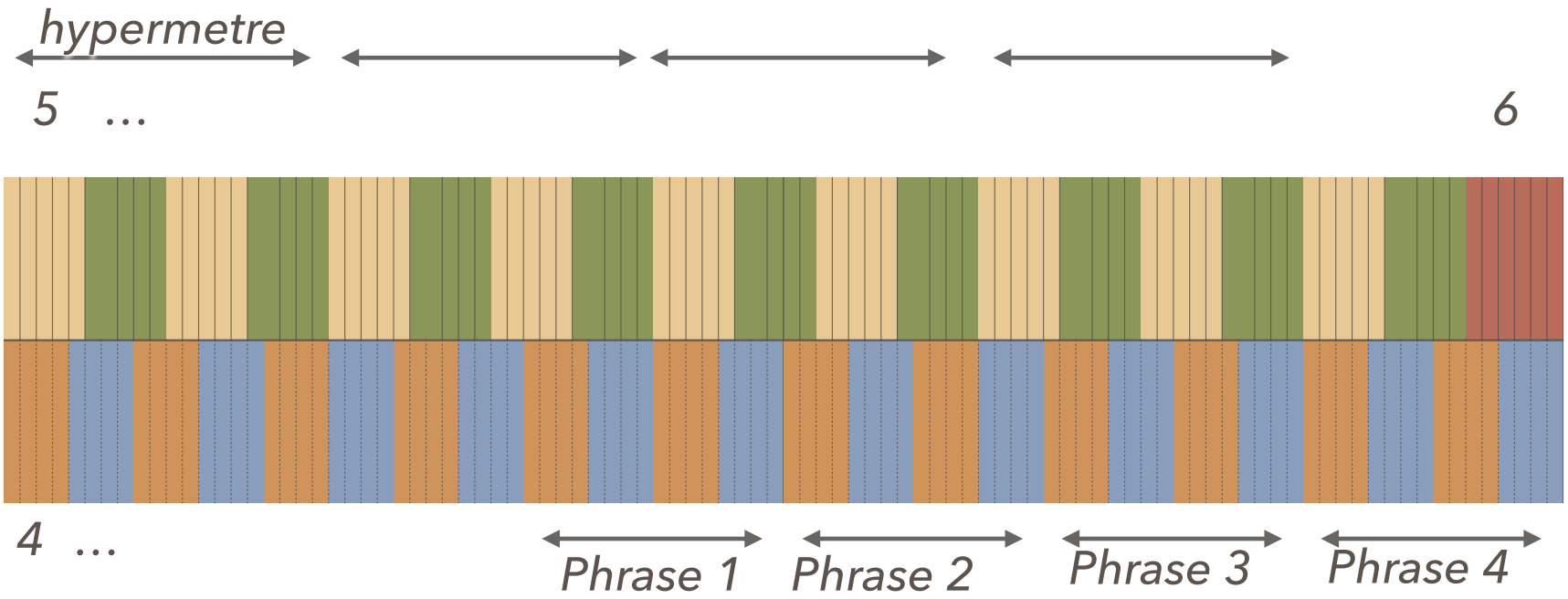
(SHARED PULSE POLYMETER)



[Touch And Go – The Cars]

Polymeter

The Cars - *Touch and Go*



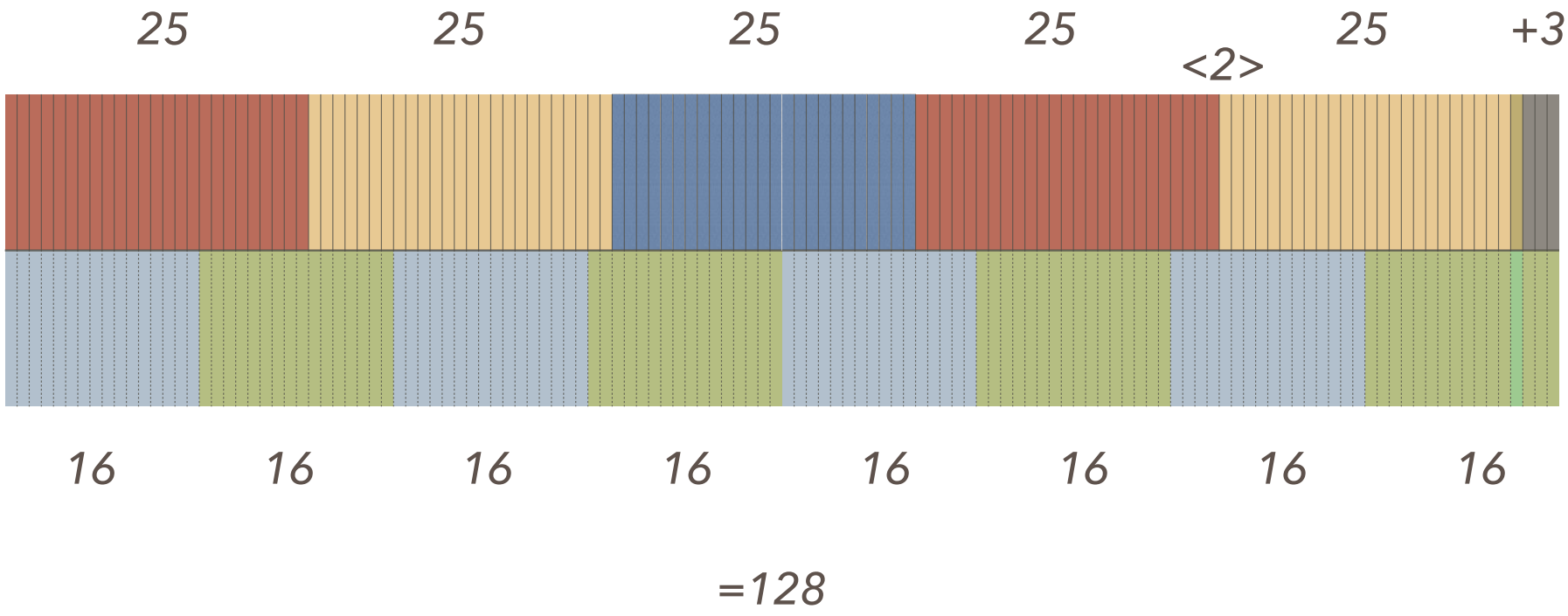
18 bars of 5 + 1 x 6 = 96

24 bars of 4 = 96

[Rational Gaze – Meshuggah]

Polymeter

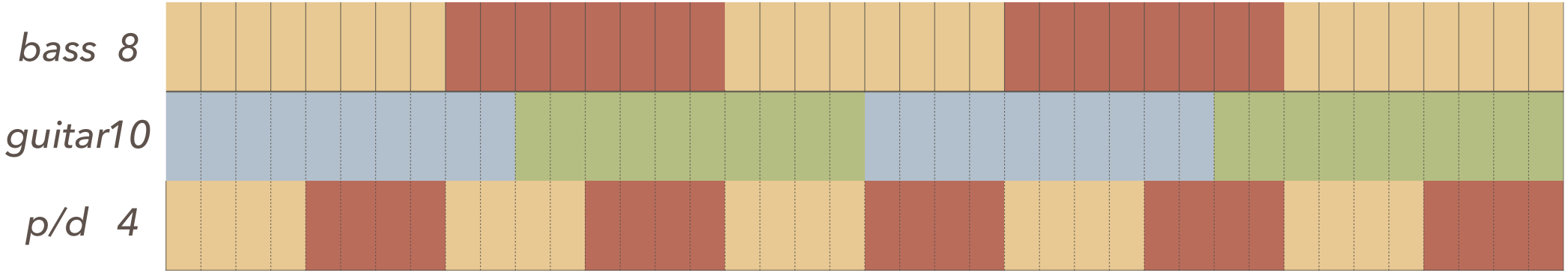
Meshuggah - *Rational Gaze* (0:00-0:29)



[Laid Back Schematics - Live – Steve Coleman and Five Elements]

Polymeter

Steve Coleman - *Laid Back Schematics*

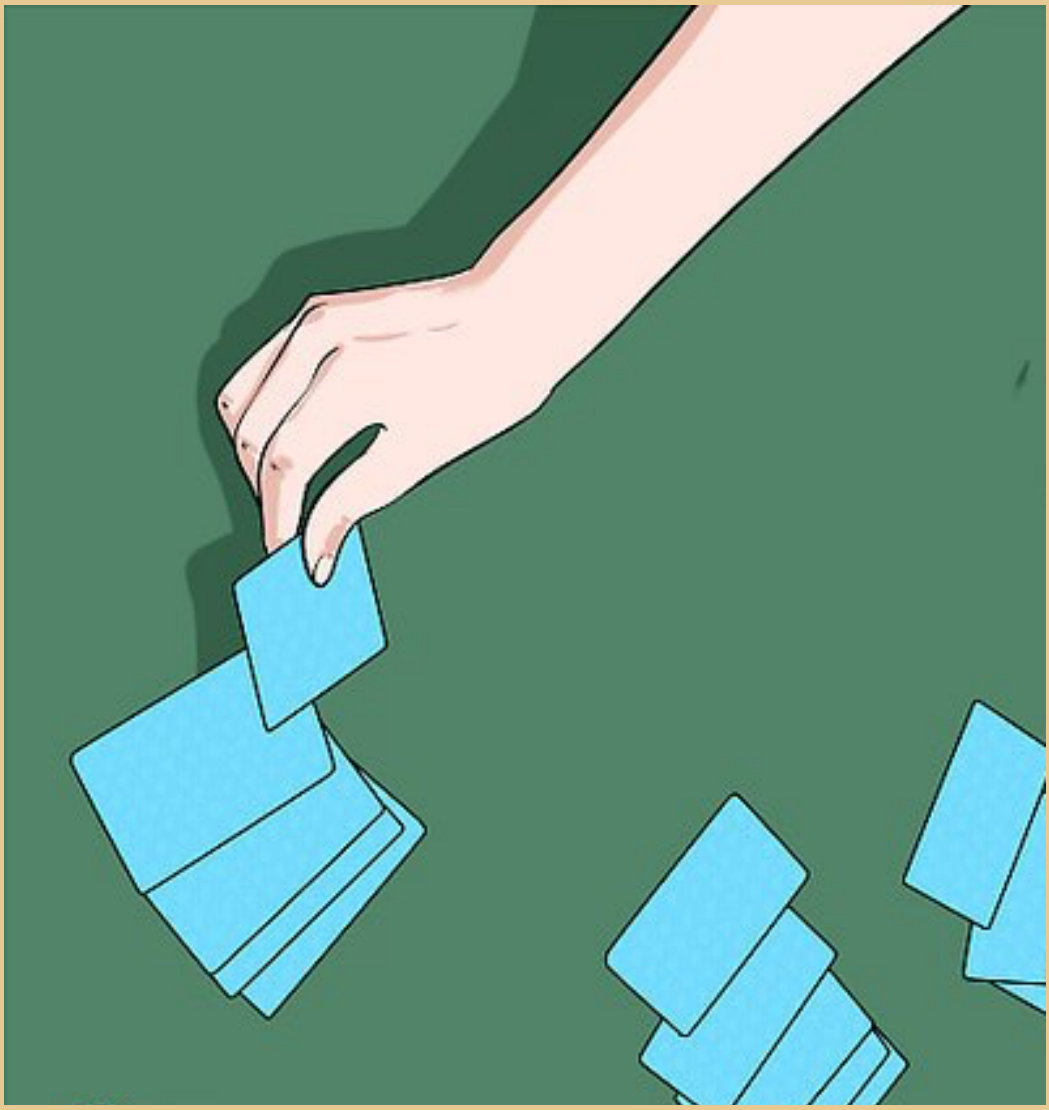


DISPLACE JUNCTION

(SHARED PULSE POLYMETER)

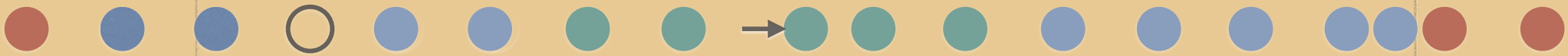
(NON-) EUCLIDEAN & (NON) MAXIMALLY EVEN RHYTHMS

SMOOTHNESS & PREDICTION IN RHYTHMS



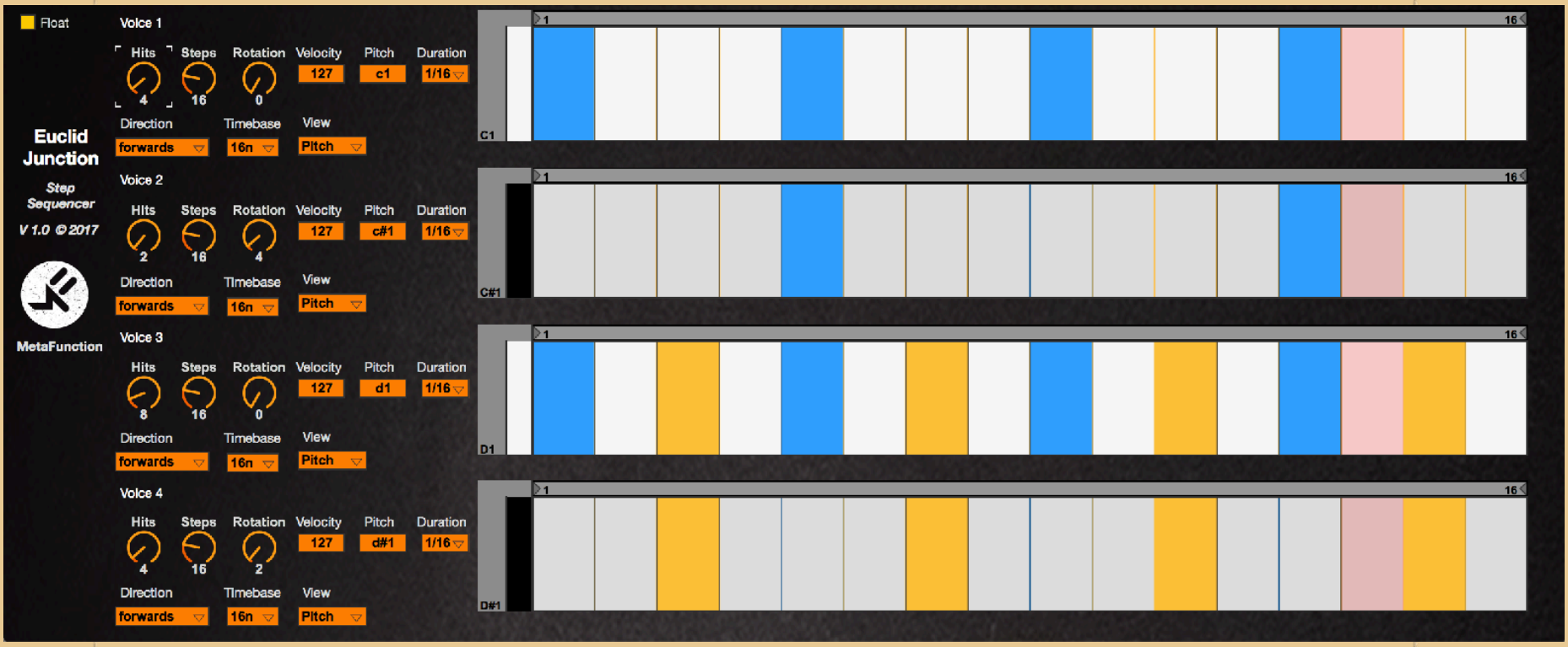
1 IN 8	1 IN 16
2 IN 8	2 IN 16
3 IN 8	**3 IN 16**
4 IN 8	4 IN 16
5 IN 8	**5 IN 16**
6 IN 8	6 IN 16
7 IN 8	**7 IN 16**

NON-EUCLIDEAN RHYTHMS



NUDGES, SKIPS & SPLITS

EUCLID JUNCTION



POWER OF PRIMES

IN METER

POWER OF PRIMES

IN HYPERMETER

I Am The Walrus - Remastered 2009 – The Beatles

POWER OF PRIMES

HYPERMETRIC GROUPING DISSONANCE

(WALRUS)

POWER OF PRIMES

IN METER

POWER OF 12

Electric Counterpoint - Fast (movement 3) – Steve Reich, Pat Metheny

POWER OF 12

4 X 3 **VS** 3 X 4

System – Brotherly

It's bending

POWER OF 12

4 X 3 **VS** 3 X 4

It's broken

(ODD) EUCLIDEAN RHYTHMS

2 IN 5

Seven Days – Sting

(ODD) EUCLIDEAN RHYTHMS

2 IN 5

2 + 3

Ex 1

[A Weight in the Hollow – Vennart]

(ODD) EUCLIDEAN RHYTHMS

2 IN 5

2 + 3

Ex 2

(ODD) EUCLIDEAN RHYTHMS

4 IN 10

The Incredits – Michael Giacchino

(ODD) EUCLIDEAN RHYTHMS

4 IN 10

3 + 3 + 2 + 2

Ex 1

Morning Bell – Radiohead

(ODD) EUCLIDEAN RHYTHMS

4 IN 10

3 + 3 + 2 + 2

Ex 2

(ODD) EUCLIDEAN RHYTHMS

3 IN 7

I Am The Doctor – Murray Gold

(ODD) EUCLIDEAN RHYTHMS

3 IN 7

2 + 2 + 3

Ex 1

2 + 2 = 5 – Radiohead

(ODD) EUCLIDEAN RHYTHMS

3 IN 7

2 + 2 + 3

Ex 2

Unsquare Dance – The Dave Brubeck Quartet

(ODD) EUCLIDEAN RHYTHMS

3 IN 7

2 + 2 + 3

SHADOW RHYTHM

Ex 3

(ODD) EUCLIDEAN RHYTHMS

5 IN 14

(ODD) EUCLIDEAN RHYTHMS

5 IN 14

3 + 3 + 3 + 3 + 2

The Walking Dead Theme – Retrospectre

PALINDROMIC (ODD) EUCLIDEAN RHYTHMS

5 IN 14

3 + 3 + 2 + 3 + 3

Gankino Horo – Barcelona Gipsy Klezmer Orchestra

PALINDROMIC (ODD) EUCLIDEAN RHYTHMS

NON-ISOCHRONOUS ADDITIVE METER

5 IN 11

2 + 2 + 3 + 2 + 2

(ODD) EUCLIDEAN RHYTHMS

NON-ISOCHRONOUS ADDITIVE METER

15 IN 35

(ODD) EUCLIDEAN RHYTHMS

NON-ISOCHRONOUS ADDITIVE METER

15 IN 35

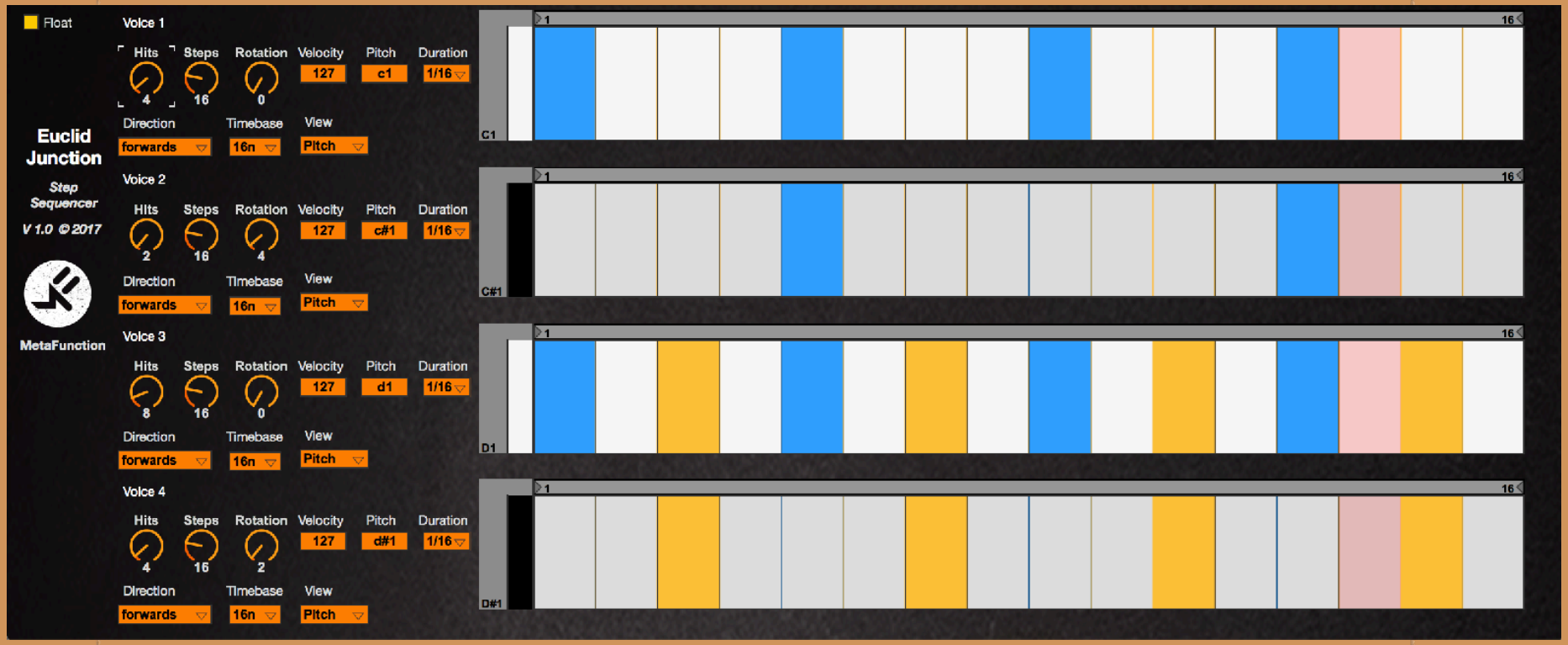
3 3 3 3 3 2 2 2 2 2 2 2 2 2 2

Yovino horo – Bulgarian Folk Ensemble

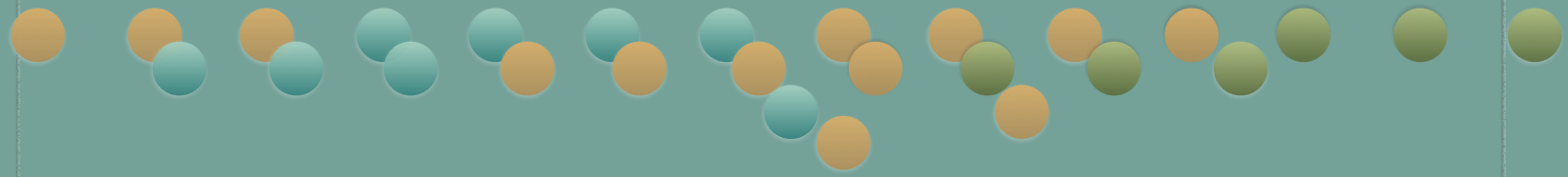
15 IN 35

3 + 3 + 2 + 2 + 3 + 2 + 2 + 3 + 2 + 2 + 2 + 2 + 3 + 2 + 2

ODD-METER EUCLID JUNCTION

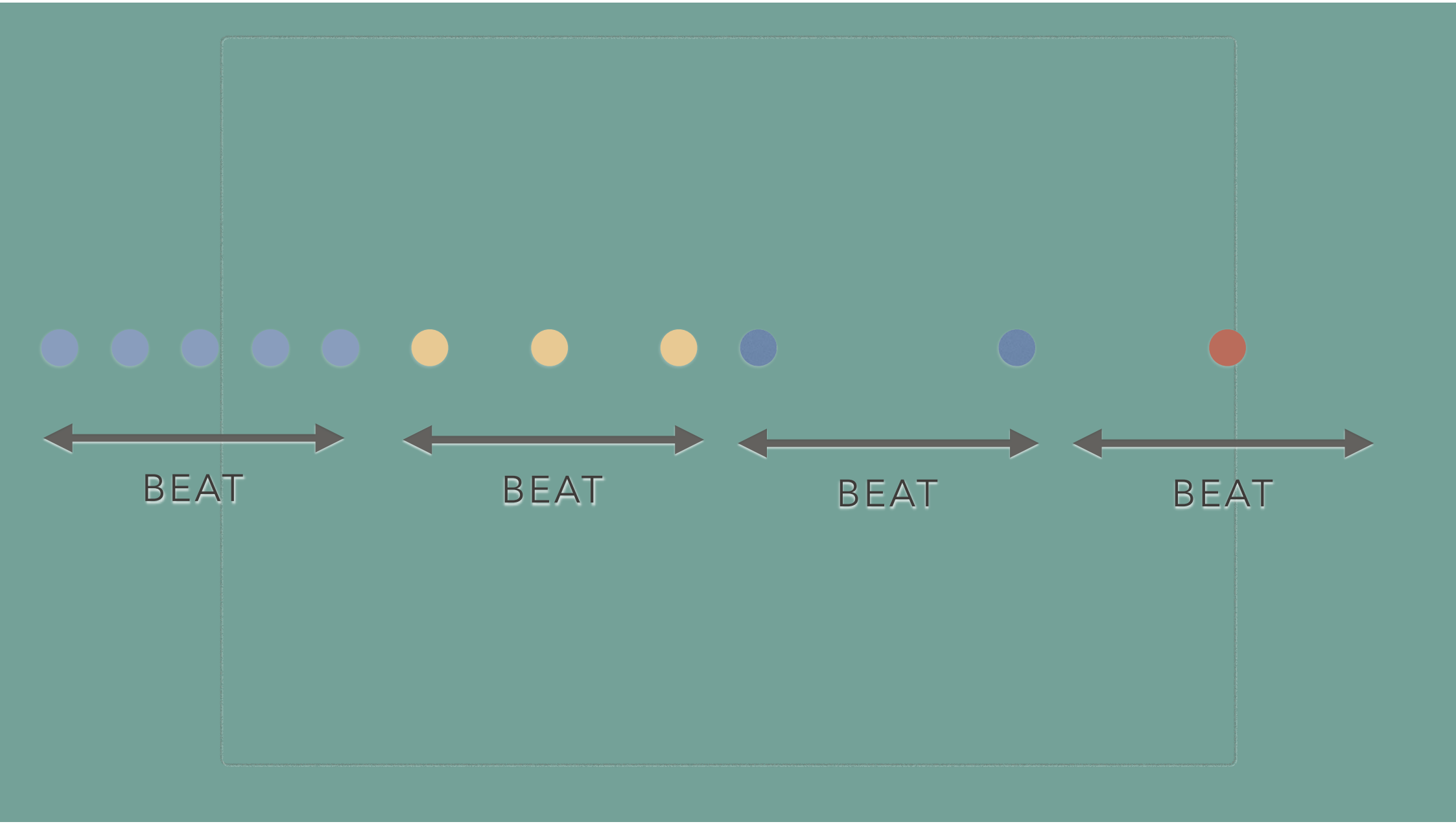


GRID DECEPTION, MODULATION & BENDING



POWER OF PRIMES

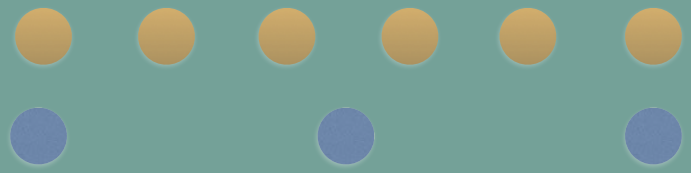
IN SUBDIVISIONS


BEAT
BEAT
BEAT
BEAT

Peaches En Regalia – Frank Zappa

BEAT BEAT BEAT BEAT

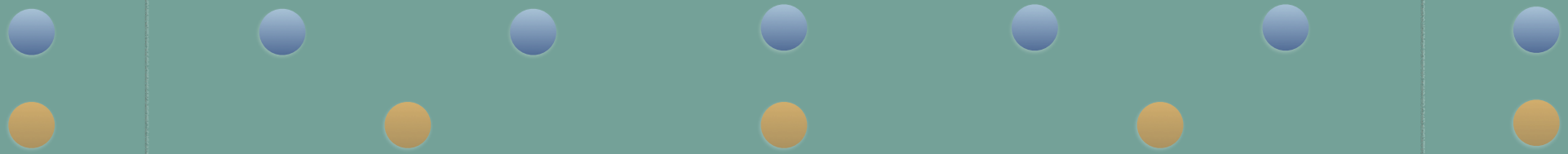
POWER OF PRIMES



IN SHARED BARLINE POLYRHYTHM

Glassworks – John Lenehan

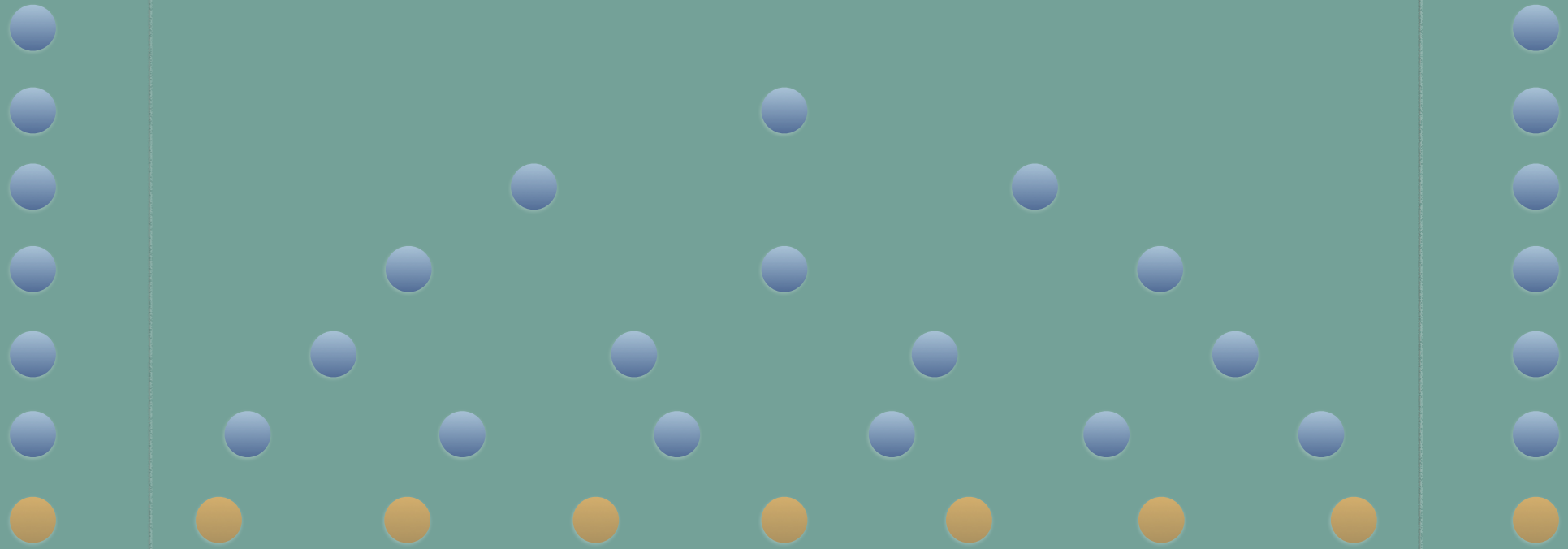
3 AGAINST 2



IN SHARED BARLINE POLYRHYTHM

1-8 AGAINST 8

Autumn Leaves – Wynton Marsalis



IN SHARED BARLINE POLYRHYTHM

Desired Constellation – Björk

METRIC AMBIGUITY

DISPLACEMENT OR GROUPING

METRIC DECEPTION

DISPLACEMENT OR GROUPING

Time Keeps Crawling – The Voodoo Trombone Quartet

METRIC DECEPTION

DISPLACEMENT OR GROUPING

Ex. 1

Wauraiwa – Thomas Mapfumo And The Blacks Unlimited

METRIC DECEPTION

DISPLACEMENT OR GROUPING

Ex. 2

Packt Like Sardines In a Crushed Tin Box – Radiohead

METRIC DECEPTION

DISPLACEMENT OR GROUPING

Ex. 3

Mean Mr Mustard - Remastered – The Beatles

Polythene Pam - Remastered – The Beatles

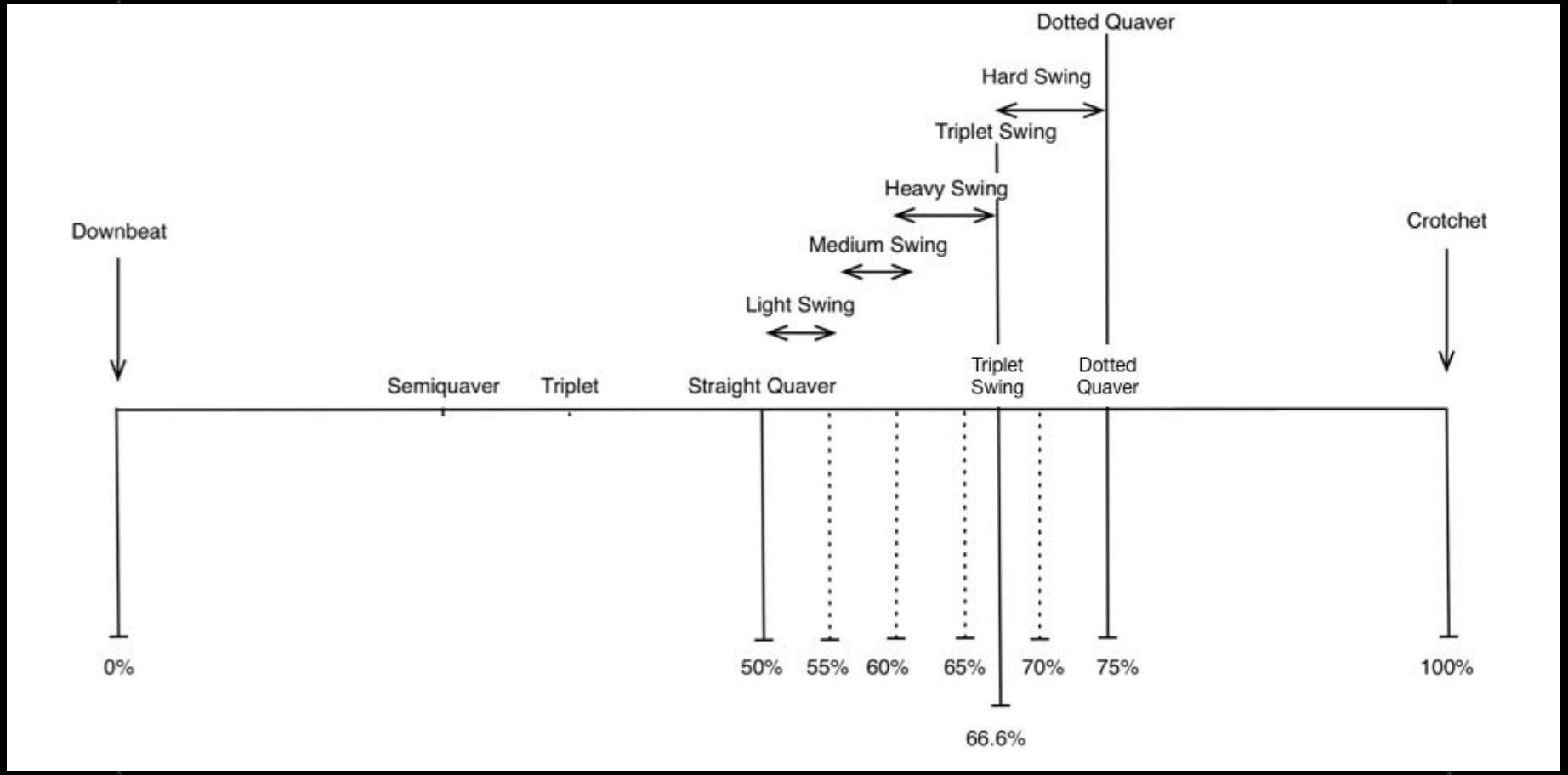
METRIC MODULATION

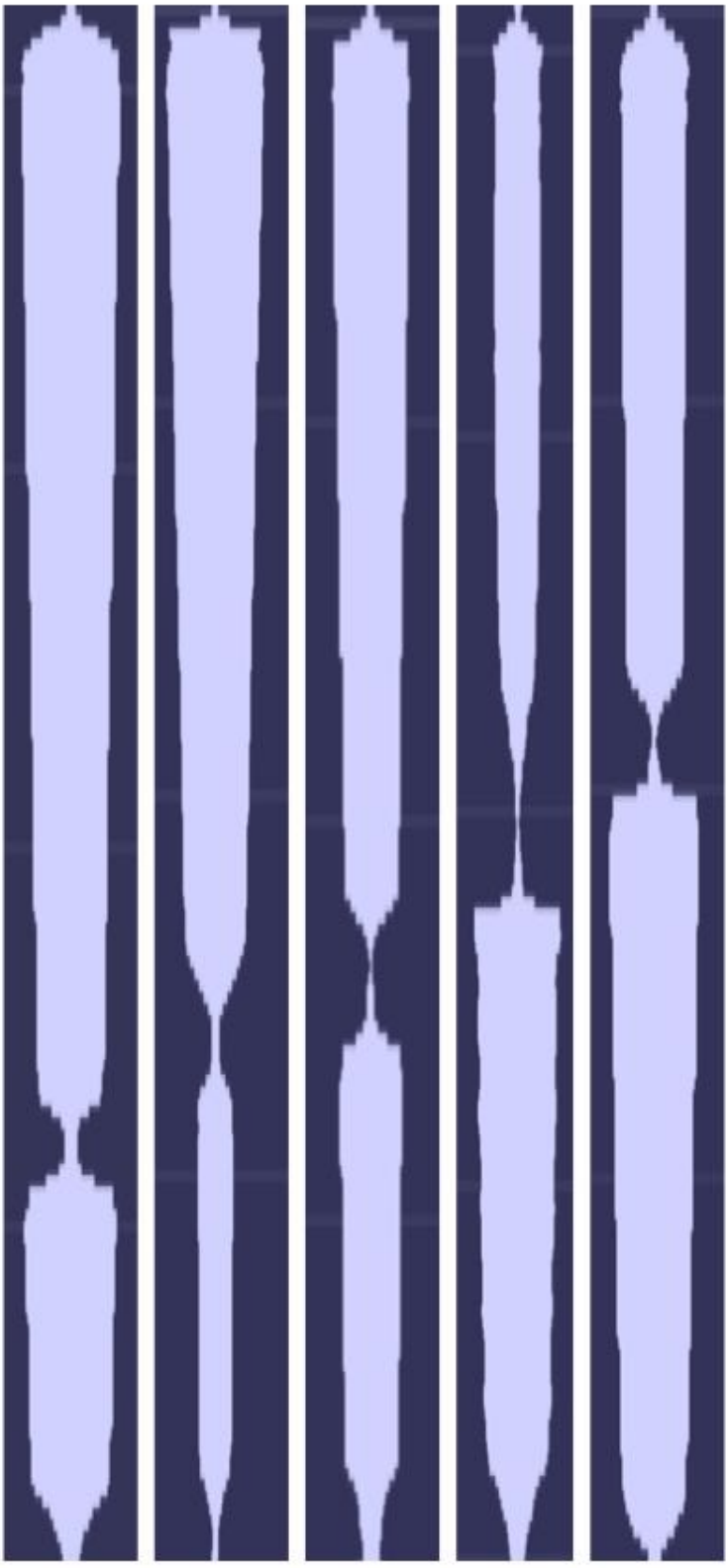
TEMPO CHANGE BY REGROUPING

Before I Move Off – Mount Kimbie

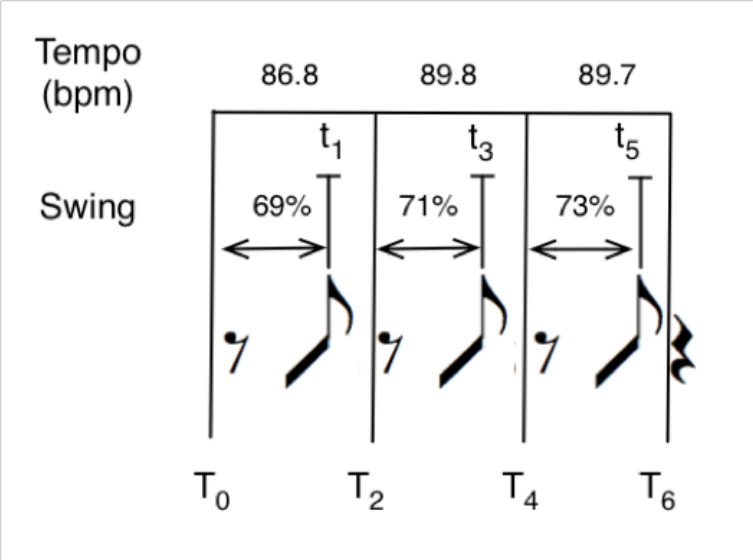
BENDING THE GRID

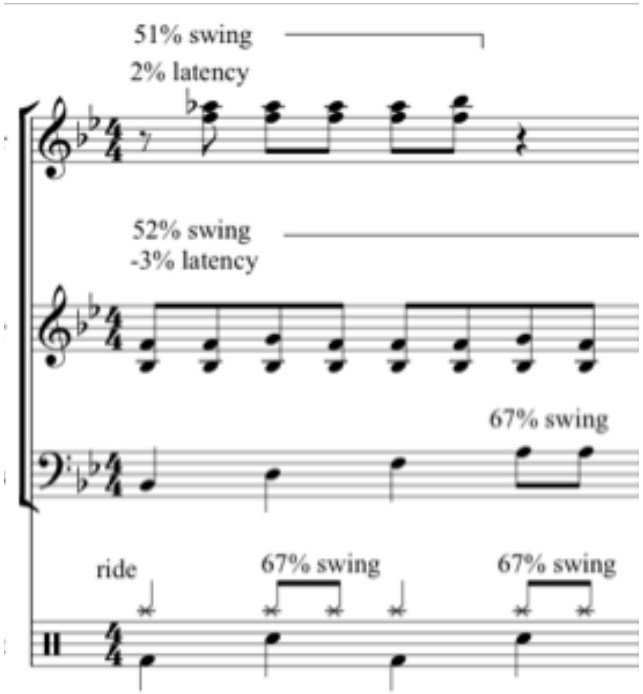
SWING, NUDGE AND EGG SHAPED RHYTHM

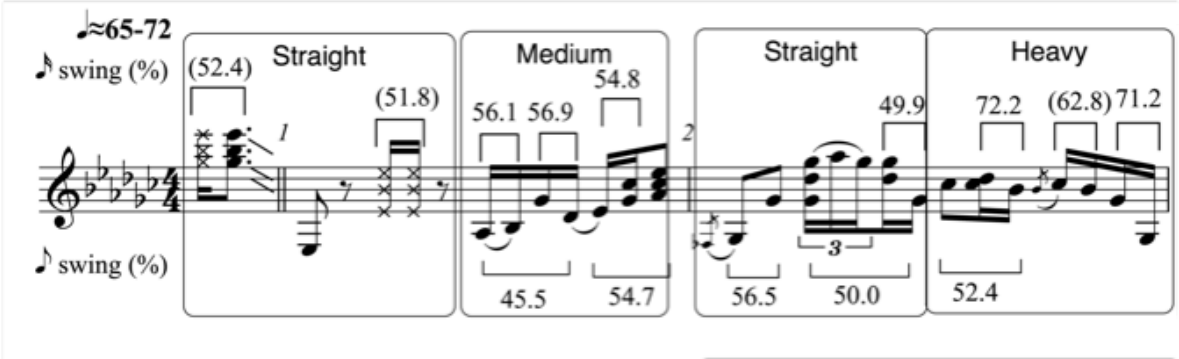

Dotted Quaver
Hard Swing
Triplet Swing
Heavy Swing
Medium Swing
Light Swing
Downbeat
Crotchet
Semiquaver
Triplet
Straight Quaver
Triplet Swing
Dotted Quaver
0%
50%
55%
60%
65%
70%
75%
100%
66.6%



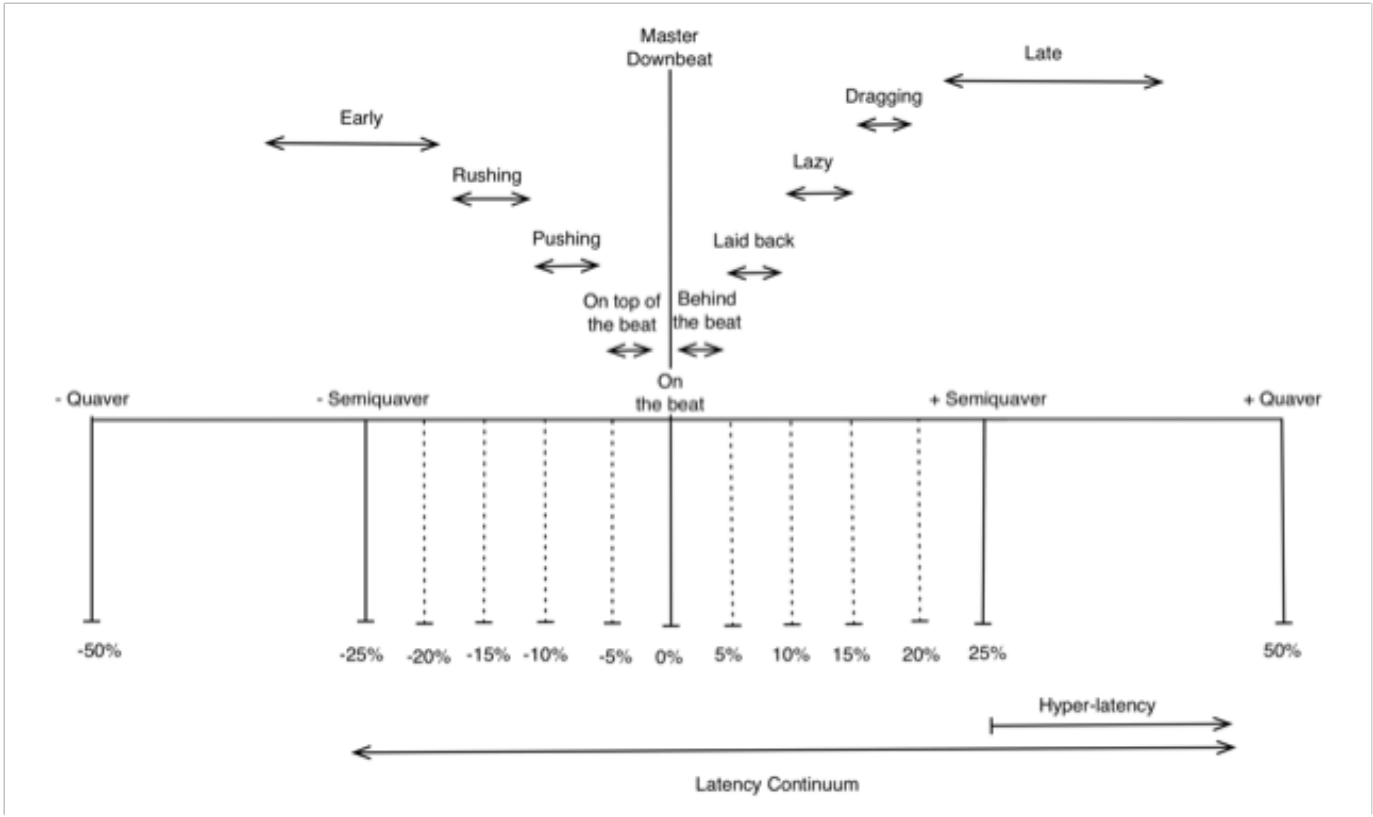
SWING EXAMPLES

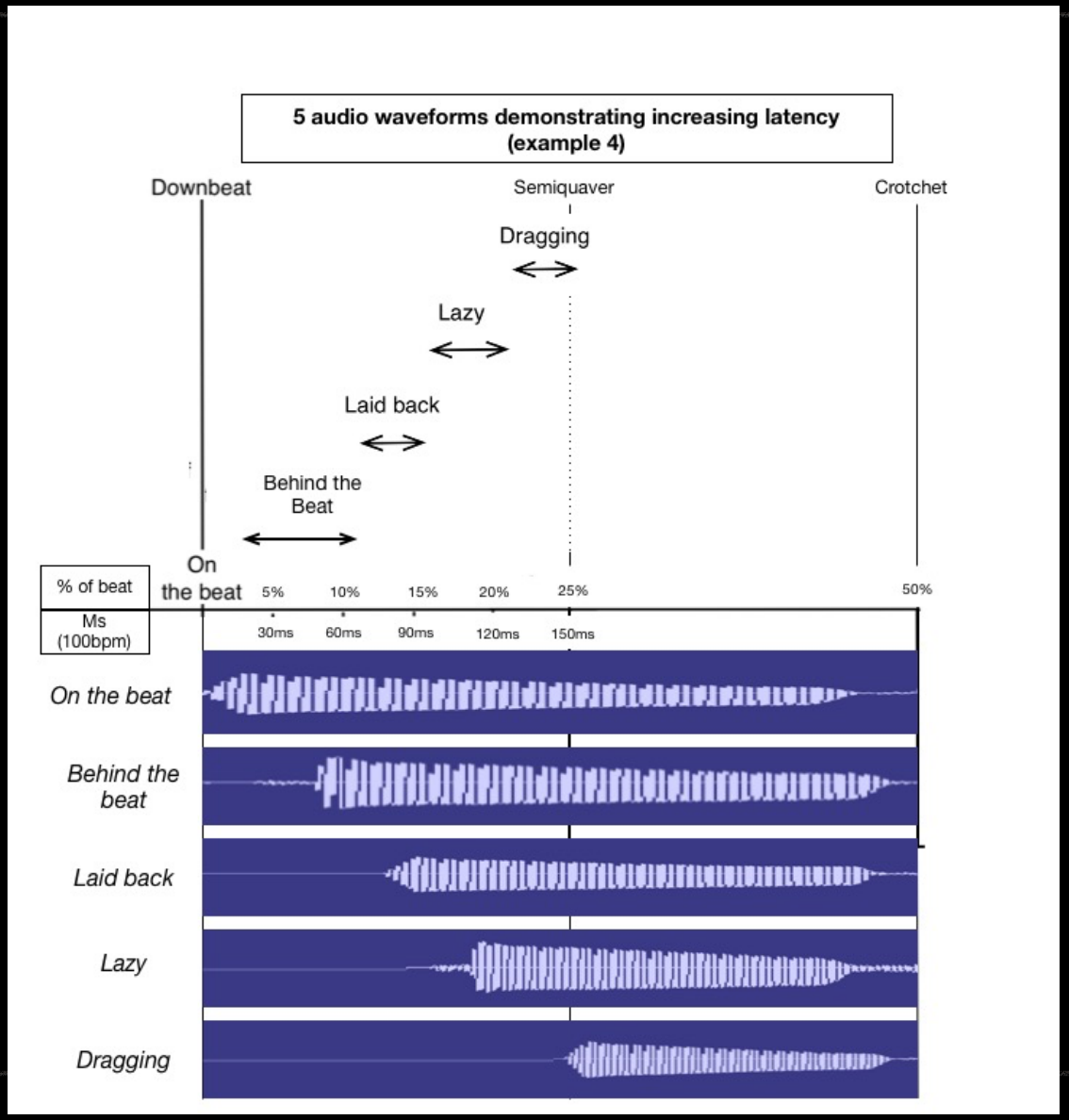




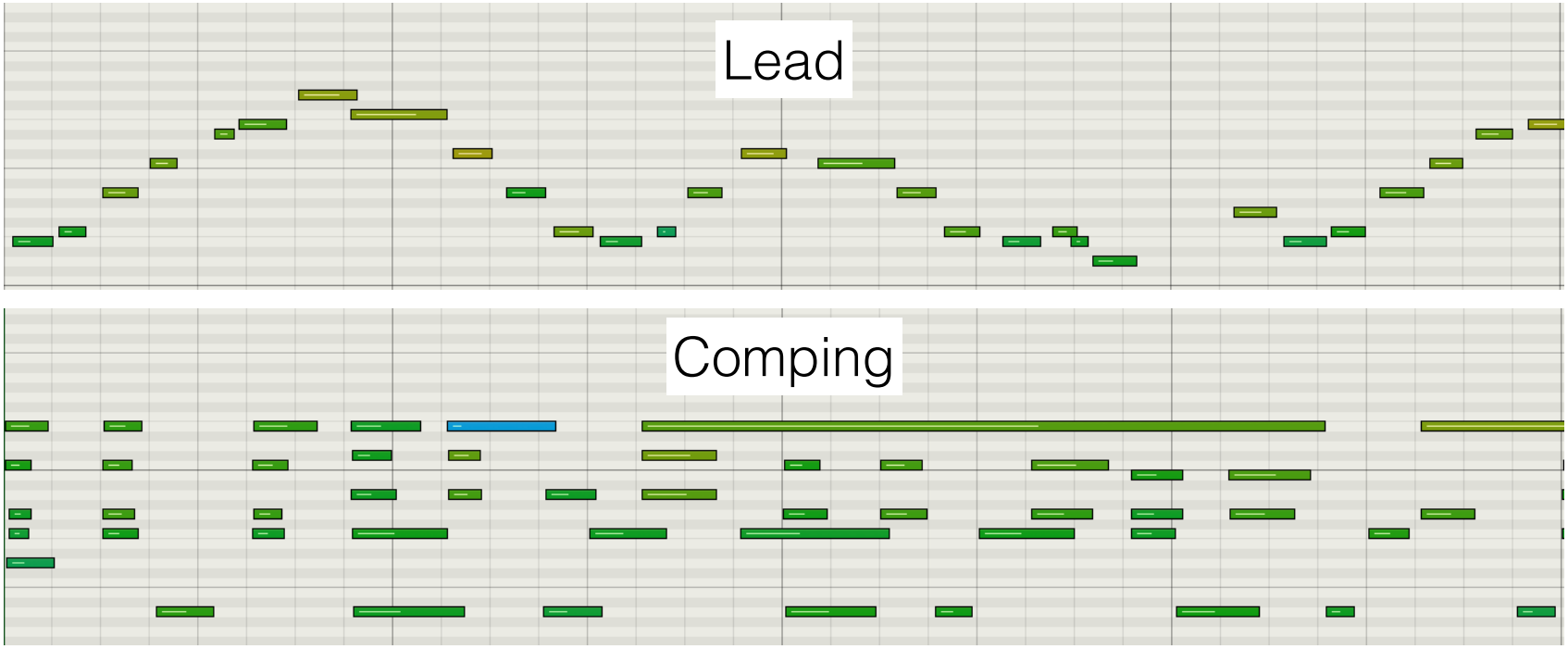


LATENCY CONTINUUM



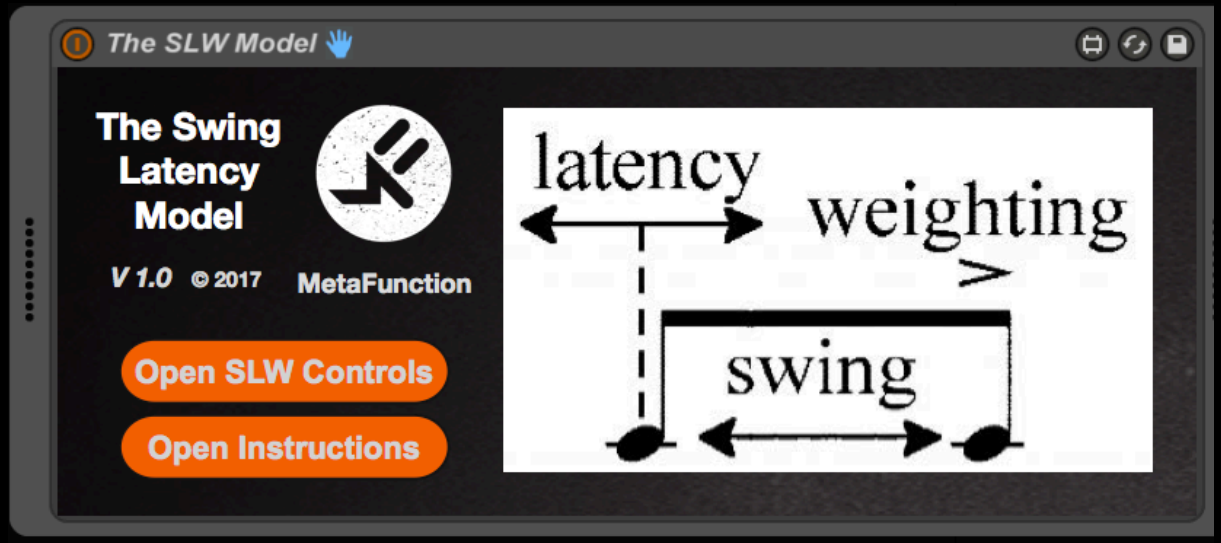

5 audio waveforms demonstrating increasing latency (example 4)
Downbeat
Semiquaver
Crotchet
Dragging
Lazy
Laid back
Behind the Beat
On the beat
% of beat
Ms (100bpm)
5%
10%
15%
20%
25%
50%
30ms
60ms
90ms
120ms
150ms
On the beat
Behind the beat
Laid back
Lazy
Dragging

LATENCY BY ENSEMBLE ROLE



Steve Hamilton on ***Seta Para Una*** (Mermikides 2014)

BENDING THE GRID



RHYTHM OF EVERYTHING

BEATS, HARMONY, PHRASES TO MODULATION, SIDECHAINS & LFOS

(SLACK THEORY, LISTENING CHOPS & HOW TO DO ALL THIS IN 4/4)

THE UPSIDE DOWN

STATISTICAL DENSITY, UNPREDICTABILITY, POLYTEMPO
& SOFT-ONSET AMBIENCE

RECOMMENDED READING

Nicole Biamonte's paper "Formal Function of Metric Dissonance in Rock Music" - which may be found here

KID A **LGEBRA: RADIOHEAD'S EUCLIDEAN AND MAXIMALLY EVEN RHYTHMS AUTHOR(S): BRAD OSBORN SOURCE: PERSPECTIVES OF NEW MUSIC, VOL. 52, NO. 1 (WINTER 2014), PP. 81-105 HERE**

HEARING IN TIME - JUSTIN LONDON HERE

Download materials here (case-sensitive)

www.bit.ly/LoopBreaking44

MILTONLINE.COM
MILTONLINE@ME.COM
@MILTONLINE

METAFUNCTION.CO.UK
INFO@METAFUNCTION.CO.UK
@META_FUNCTION

4/4 BREAKING OUT OF 4/4

HOW TO CREATE, BEND AND DESTROY
STANDARD RHYTHMIC PATTERNS

Spotify Playlist:

https://open.spotify.com/user/miltonline/playlist/3IvKWJJp4AAmVhhYXDQ96x

MILTON MERMIKIDES **PHE**LAN KANE