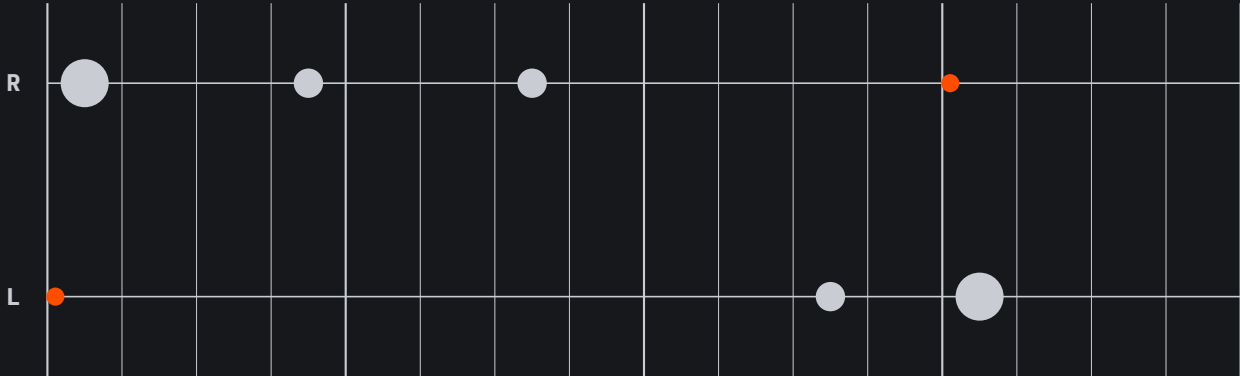


RESEARCH NOTE



FLAM PARADIDDLE >1R L R R >1L R L L
GRAFTED ONTO SON CLAVE 3-2

>1R - - R - - R - - L - >1L - - -
THE CLAVE SAYS WHERE. THE PARADIDDLE SAYS HOW.

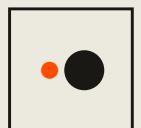
RUDE

RUDIMENT GENERATOR, A MIDI NOTE EFFECT

Model of 2026

The forty standard drum rudiments and 79 figures from outside the list · a sticking notation a drummer can already read · seven ways to breed two rudiments into a third, and one to chop them · Steve Reich's Clapping Music as a setting · the Noh drummers' eight-beat frame · the 35 Carnatic talas, six Turkish usuls and an Aka timeline · and why a flam is two notes

DATABURN
AUDIO RESEARCH
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RHYTHM RESEARCH

A rudiment is a short sticking pattern that a drummer drills until it is automatic, then builds music from: which hand plays, how loud, and what ornaments lead into the stroke. They began as military signalling. Fife and drum carried orders across a field, so the patterns had to be distinct, repeatable and teachable, and every army wrote its own. The list most drummers learn today was fixed twice in the twentieth century, once by the National Association of Rudimental Drummers (NARD) in 1933 and again by the Percussive Arts Society (PAS) in 1984, which kept the 26 and added 14 drum corps, orchestral, European and contemporary patterns.

The PAS list sorts the forty into four families by what the hands do. Rolls sustain a sound with repeated strokes, single, bounced or doubled. Diddles put two strokes on one hand inside a single-stroke pattern. Flams lead a stroke with one quiet grace note from the other hand, a thickened attack. Drags lead it with two. Every rudiment is a combination of four decisions per stroke: hand, level, ornament, and how many strokes share the time. RUDE writes those four down as text, and then treats the rudiments as material to recombine rather than a list to master.

SIX CENTURIES OF WRITING DRUMMING DOWN

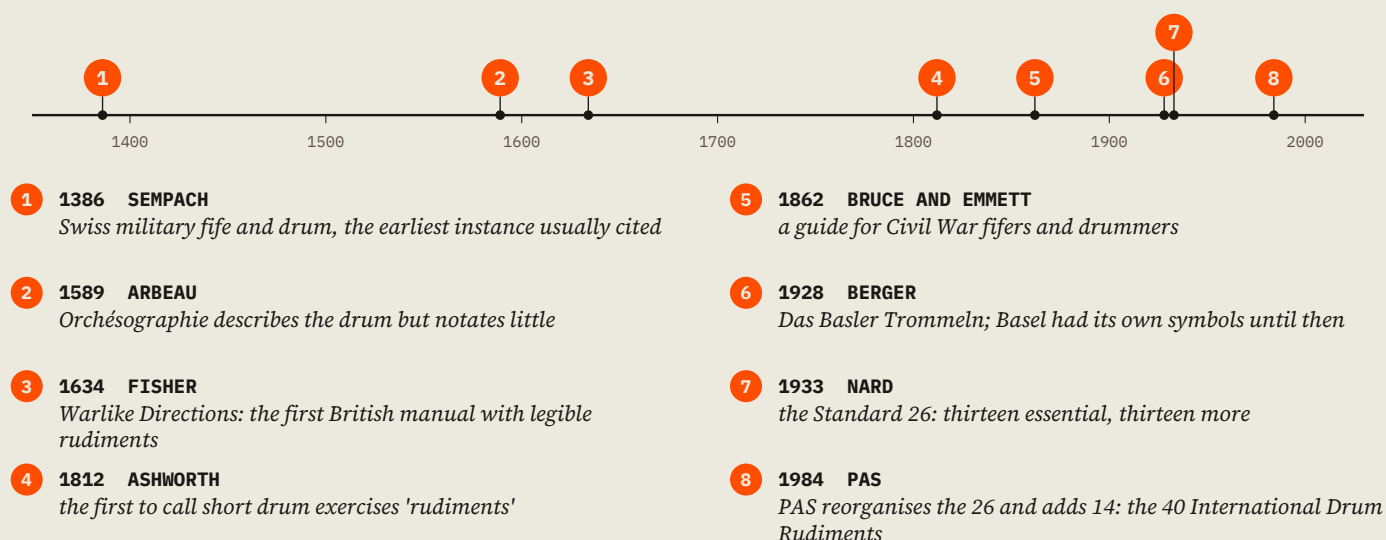


fig. 1: Dates from the history in the drum rudiment literature summarised by Wikipedia (sources, page 16). Fisher's ruff-based patterns are the oldest decipherable British rudiments; Ashworth is the first to use the word; Berger brought Basel drumming, and its notation, to the United States in the 1930s.

FAMILY	PAS NUMBERS	WHAT THE HANDS DO
Rolls	1 to 15	sustain: single strokes, multiple bounce, or doubles; most are named for their stroke count
Diddles	16 to 19	a double stroke inside a single-stroke pattern: the paradiddles
Flams	20 to 30	one grace note from the other hand just ahead of the stroke
Drags	31 to 40	two grace notes ahead of the stroke, a double at twice the speed

THE STROKES

Drummers already have a notation that fits on one line: the sticking, R and L under the notes, with small letters for grace notes and a wedge for an accent. RUDE reads that notation directly. Each token is one step of a grid, and the grid's steps per beat belong to the rudiment (a flam accent is counted in triplets, a paradiddle in sixteenths). The table is the whole grammar. A pattern that breaks it is refused with the column of the offending character.

TEXT	MEANS	EXAMPLE
R L K @	a stroke: right hand, left hand, kick, call (a voice)	R L R R
r l k	grace notes, played ahead of the step's first stroke	lR flam, llR drag, lrlR ruff
>	the next stroke is accented	>lR, an accented flam
()	ghost strokes, as quiet as a stroke gets	(R) L (R) (R)
~	a buzz: the stroke bounces as several decaying hits	R~ L~
RR	two strokes divide the step: a diddle, at twice the speed	RR LL >R
R+L	a double stop, both at once; R+K is a hand with the kick	>R+K L
R.R	inside a step, . is a silent part: a triplet with a hole	R.R L
- or . alone	a rest step	R - - L

■ NINE STROKES, AS THE ENGINE TIMES THEM AT 120 BPM



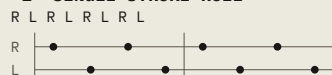
fig. 2: Each stroke as note-ons on a time axis, height for velocity, at the plugin's defaults: a sixteenth step (shaded) is 125 ms at 120 bpm, grace notes (accent colour) sound 22 ms apart (one grace gap) ahead of the stroke, and a buzz is six bounces fading inside its step. A grace is a separate MIDI note, so on one drum the plugin has to release the grace before it can strike the stroke (page 14).

Each specimen is the loop RUDE plays: both sides of an alternating rudiment, so it lands where it started, drawn from the engine's own output. Large dots are accents, small dots taps, open dots ghosts, two dots in a step a diddle, a zigzag a buzz. A roll is named for its stroke count, which the build checks against the engine.

PAS 1 TO 19: ROLLS AND DIDDLES

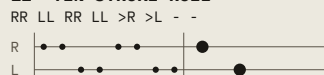
1 SINGLE STROKE ROLL

4/BEAT 8 STEPS



11 TEN STROKE ROLL

4/BEAT 8 STEPS



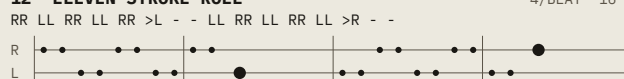
2 SINGLE STROKE FOUR

6/BEAT 12 STEPS



12 ELEVEN STROKE ROLL

4/BEAT 16 STEPS



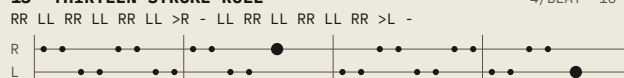
3 SINGLE STROKE SEVEN

6/BEAT 24 STEPS



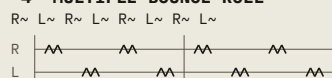
13 THIRTEEN STROKE ROLL

4/BEAT 16 STEPS



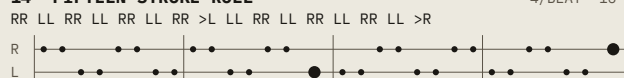
4 MULTIPLE BOUNCE ROLL

4/BEAT 8 STEPS



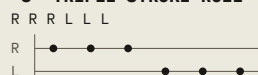
14 FIFTEEN STROKE ROLL

4/BEAT 16 STEPS



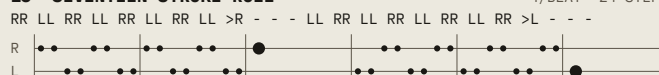
5 TRIPLE STROKE ROLL

6/BEAT 6 STEPS



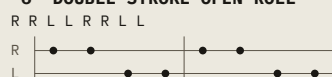
15 SEVENTEEN STROKE ROLL

4/BEAT 24 STEPS



6 DOUBLE STROKE OPEN ROLL

4/BEAT 8 STEPS



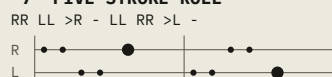
16 SINGLE PARADIDDLE

4/BEAT 8 STEPS



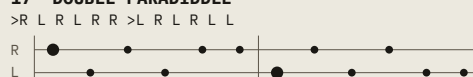
7 FIVE STROKE ROLL

4/BEAT 8 STEPS



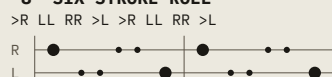
17 DOUBLE PARADIDDLE

6/BEAT 12 STEPS



8 SIX STROKE ROLL

4/BEAT 8 STEPS



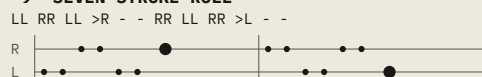
18 TRIPLE PARADIDDLE

4/BEAT 16 STEPS



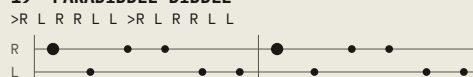
9 SEVEN STROKE ROLL

6/BEAT 12 STEPS



19 PARADIDDLE-DIDDLE

6/BEAT 12 STEPS



10 NINE STROKE ROLL

4/BEAT 16 STEPS

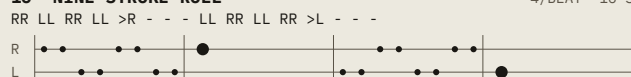


PLATE II

Grace notes are the accent colour, drawn just ahead of the stroke they lead into and not to scale: the real gap is milliseconds (page 3). (r) marks a sticking reconstructed from a written description, not read off a chart. Check the three marked (r) against a printed PAS sheet before teaching from them.

PAS 20 TO 40: FLAMS AND DRAGS

20 FLAM

1R rL 1R rL



2/BEAT 4 STEPS

31 DRAG

11R rrL 11R rrL



2/BEAT 4 STEPS

21 FLAM ACCENT

>1R L R >rL R L



3/BEAT 6 STEPS

32 SINGLE DRAG TAP

11R >L rrL >R



2/BEAT 4 STEPS

22 FLAM TAP

>1R R >rL L >1R R >rL L



4/BEAT 8 STEPS

33 DOUBLE DRAG TAP

11R 11R >L rrL rrL >R



3/BEAT 6 STEPS

23 FLAMACUE

1R >L R L 1R - - - rL >R L R rL - - -



4/BEAT 16 STEPS

34 LESSON 25

11R L >R - 11R L >R -



4/BEAT 8 STEPS

24 FLAM PARADIDDLE

>1R L R R >rL R L L



4/BEAT 8 STEPS

35 SINGLE DRAGADIDDLE (R)

>RR L R R >LL R L L



4/BEAT 8 STEPS

25 SINGLE FLAMMED MILL

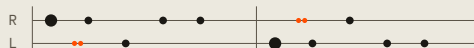
>1R R L R >rL L R L



4/BEAT 8 STEPS

36 DRAG PARADIDDLE NO. 1

>R 11R L R R - >L rrL R L L -



6/BEAT 12 STEPS

26 FLAM PARADIDDLE-DIDDLE

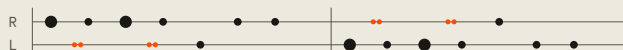
>1R L R R L L >rL R L L R R



6/BEAT 12 STEPS

37 DRAG PARADIDDLE NO. 2 (R)

>R 11R >R 11R L R R - >L rrL >L rrL R L L -



8/BEAT 16 STEPS

27 PATAFLAFLA

>1R L R >rL >1R L R >rL



4/BEAT 8 STEPS

38 SINGLE RATAMACUE

11R L R >L rrL R L >R



4/BEAT 8 STEPS

28 SWISS ARMY TRIPLET

>1R R L >1R R L



3/BEAT 6 STEPS

39 DOUBLE RATAMACUE

11R 11R L R >L - - rrL rrL R L >R - - -



4/BEAT 16 STEPS

29 INVERTED FLAM TAP

1R L rL R 1R L rL R



4/BEAT 8 STEPS

40 TRIPLE RATAMACUE

11R 11R 11R L R >L - - rrL rrL rrL R L >R - -



4/BEAT 16 STEPS

30 FLAM DRAG (R)

>1R - L L R - >rL - R R L -



4/BEAT 12 STEPS

PLATE III

Plate III holds hybrids from drum corps (there is no canonical list: one catalogue holds over 540), Swiss and Basel figures, timelines from outside the rudiment tradition, and linear patterns that pass the stroke between hands and feet (K). The Noh entry calls with @, the drummers' voices, on a lane of its own (page 10).

BEYOND THE FORTY: 26 MORE

41 CHEESE

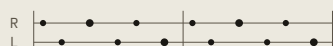
1RR rLL 1RR rLL



4/BEAT 4 STEPS

42 HERTA

RL R LR L RL R LR L



4/BEAT 8 STEPS

43 EGGBEATER

R R R L L L L L R R



5/BEAT 10 STEPS

44 CHEESE PATAFLAFLA (R)

1RR L R rL 1RR L R rL



4/BEAT 8 STEPS

45 FLAM FIVE (R)

>1R L R L R >rL R L R L



5/BEAT 10 STEPS

46 INVERTED PARADIDDLE

>R L L R >L R R L



4/BEAT 8 STEPS

47 MILL STROKE

>R R L R >L L R L



4/BEAT 8 STEPS

48 DOUBLÉ (BASEL) (R)

>rL R >1R L >rL R >1R L >rL R >1R L



3/BEAT 12 STEPS

49 TAGWACHT / REVEILLE STROKE (R)

11R 11R >L - r1L r1L >R -



4/BEAT 8 STEPS

50 3-STROKE RUFF

r1R 1rL r1R 1rL



2/BEAT 4 STEPS

51 4-STROKE RUFF

1r1R r1rL 1r1R r1rL



2/BEAT 4 STEPS

52 SWISS ARMY TRIPLET, ALTERNATING (R)

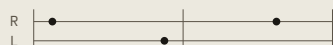
>1R R L >1R R L >rL L R >rL L R



3/BEAT 12 STEPS

53 TRESILLO E(3,8)

R - L - - R -



4/BEAT 8 STEPS

54 CINQUILLO E(5,8)

R - L R - L R -



4/BEAT 8 STEPS

55 SON CLAVE 3-2

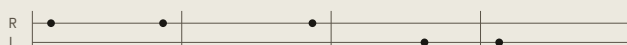
R - - R - - R - - L - L - -



4/BEAT 16 STEPS

56 RUMBA CLAVE 3-2

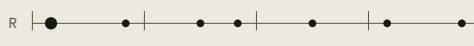
R - - R - - R - - L - L - -



4/BEAT 16 STEPS

57 EWE BELL E(7,12)

>R - R - R R - R - R - R



3/BEAT 12 STEPS

58 CLAPPING MUSIC (REICH)

R R R - R R - R - R R -



3/BEAT 12 STEPS

59 KOTEKAN (INTERLOCK) (R)

R L R R L R L R R L R R L R L R



4/BEAT 16 STEPS

60 KONNAKOL KHANDA (5)

>R L R L R >L R L R L



5/BEAT 10 STEPS

61 KONNAKOL MISRA (7)

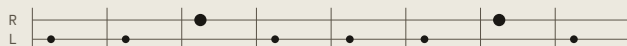
>R L R >L R L R >L R L >R L R L



7/BEAT 14 STEPS

62 NOH HON-JI (SKETCH) (R)

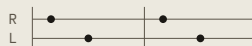
L @ L @ >R - L @ @ L @ L @ >R @ L @



2/BEAT 16 STEPS

63 LINEAR RLK

R L K R L K



3/BEAT 6 STEPS

64 LINEAR RLK

>R L R K >L R L K



4/BEAT 8 STEPS

65 PARADIDDLE WITH FEET

>R L K K >L R K K



4/BEAT 8 STEPS

66 GALLOP

>R L K - - >R L K - -



6/BEAT 12 STEPS

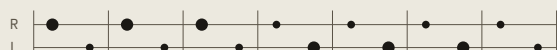
The aksak meters of Bulgarian dance group a fast pulse in twos and threes; each bar plays twice, the second from the other hand, so the loop is whole beats. Jhaptal is clapped on 1, 3 and 8 with the wave, the khali, on 6 as a ghost. The Xeno family is made by rule, for a drummer nobody has met: the Fibonacci word (R to RL, L to R), Thue-Morse (L where the step number has an odd count of 1s in binary), E(8, 13), the steps whose numbers are prime (counting from 0, up to 29), and a nine-step 4 + 5 cycle invented after the nine tones Marc Okrand gave Klingon music. The build checks every rule.

UNEVEN METERS AND XENO

67 RACHENITSA 7 (2+2+3)

2/BEAT 14 STEPS

>R L >R L >R L R >L R >L R >L R L



72 FIBONACCI WORD (13:8)

3/BEAT 21 STEPS

R L R R L R L R R L R R L R L R R L R L R



68 DAYCHOVO 9 (2+2+2+3)

2/BEAT 18 STEPS

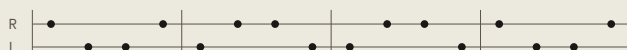
>R L >R L >R L >R L R >L R >L R >L R >L R L



73 THUE-MORSE (16)

4/BEAT 16 STEPS

R L L R L R R L L R R L L R R L L R



69 KOPANITSA 11 (2+2+3+2+2)

2/BEAT 22 STEPS

>R L >R L >R L R >L R >L R >L R >L R >L R L >R L >R L



74 GOLDEN EUCLID E(8,13)

2/BEAT 26 STEPS

>R R - R R - R R - R - >L L - L L - L L - L -



70 MAQSUM (ARABIC)

2/BEAT 8 STEPS

>K R - R >K - R -



75 PRIME PULSES (UNDER 30)

6/BEAT 30 STEPS

- - >R R - R - R - - - R - R - - - R - R - - - R - - - - R



71 JHAPTAL 10 (2+3+2+3)

2/BEAT 10 STEPS

>R L >R L R (L) R >L R L



76 NINE-STEP CYCLE (4+5)

3/BEAT 18 STEPS

>R L R L >R L R L R >L R L R >L R L R L



A Carnatic tala is a count kept with one hand: a laghu is a clap and finger counts (3, 4, 5, 7 or 9 in all, the jati), a drutam a clap and a wave, an anudrutam a clap. Seven families fix the order, five jatis the laghu, so there are 35. RUDE plays the hand: claps accented on R, finger counts on L, waves as ghosts, a beat a step. The Turkish usuls follow the theoretical stroke weights in Holzapfel and Bozkurt (2012), with düyek's first two strokes in the order every notation gives them: the düm on the kick, the strong tek accented, the light tek a tap. The Aka pattern is the one Arom's rhythmic oddity is shown with: no two strokes are half a cycle apart.

THE 35 TALAS, IN BEATS

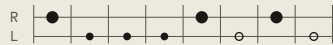
FAMILY	PARTS	TISRA 3	CHATUSRA 4	KHANDA 5	MISRA 7	SANKEERNA 9
EKA	L	3	4	5	7	9
RUPAKA	D L	5	6	7	9	11
TRIPUTA	L D D	7	8 ADI	9	11	13
MATYA	L D L	8	10	12	16	20
JHAMPA	L A D	6	7	8	10	12
ATA	L L D D	10	12	14	18	22
DHRUVA	L D L L	11	14	17	23	29

L laghu, D drutam, A anudrutam. Every cell is counted from the plugin's own entry and checked against the rule.

ADI TALA, SIX USULS AND AN AKA TIMELINE

88 CHATUSRA TRIPUTA 8 (ADI)

>R L L L >R (L) >R (L)



1/BEAT 8 STEPS

115 SEMAI 3/4

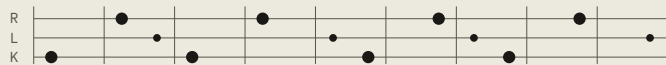
>K >R L



1/BEAT 3 STEPS

112 AKSAK 9/8

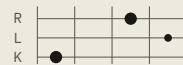
>K - >R L >K - >R - L >K - >R L >K - >R - L



2/BEAT 18 STEPS

116 SOFYAN 4/4

>K - >R L



1/BEAT 4 STEPS

113 CURCUNA 10/8

>K - L >R - >K - >R - L



2/BEAT 10 STEPS

117 TÜRK AKSAĞI 5/8

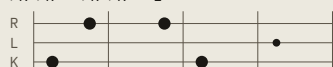
>K - >R - L >K - >R - L



2/BEAT 10 STEPS

114 DÜYEK 8/8

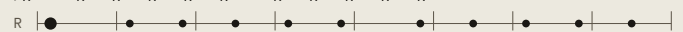
>K >R - >R >K - L -



2/BEAT 8 STEPS

119 AKA ODDITY 24

>R - - R - R - R - R - R - - R - R - R - R - R -



3/BEAT 24 STEPS

Outside the rudiment books, much of the world's drumming hangs on a timeline: a short asymmetric pattern, often on a bell or claves, that the other parts orient to. Godfried Toussaint showed in 2005 that many of them are what Euclid's algorithm for the greatest common divisor produces when it is asked to spread k onsets as evenly as possible over n steps. That family is written $E(k, n)$. The Cuban tresillo is $E(3, 8)$, the cinquillo $E(5, 8)$, and the West African 12/8 bell pattern $E(7, 12)$: maximally even, and therefore never quite even.

Drawn on a circle, a timeline's shape is visible at once, and so is what a rotation does: the same necklace started at a different bead is a different rhythm. RUDE's Rotate control does exactly that, and its Hocket blend makes the kind of interlock other parts play against a timeline.

■ FIVE TIMELINES AS NECKLACES

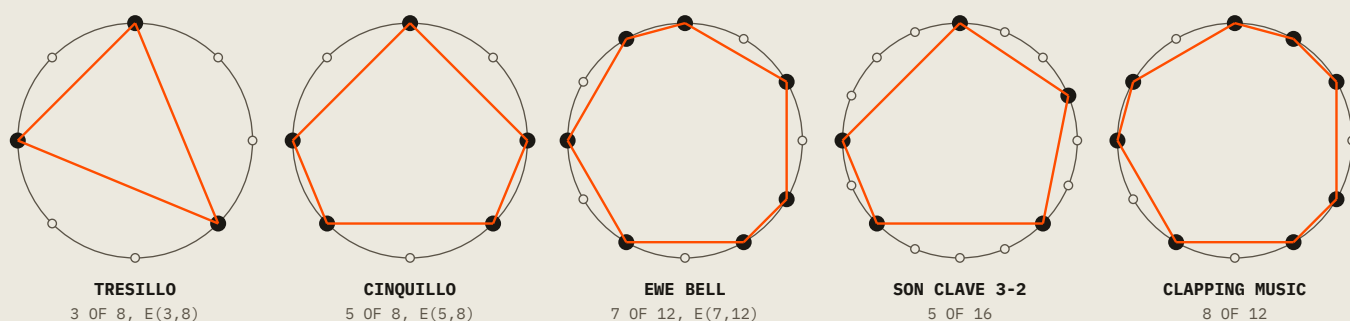


fig. 3: The library's timelines, read from the engine. Step 1 is at the top, time runs clockwise, and the accent line joins the onsets. The three Euclidean patterns are checked at build time to be rotations of $E(k, n)$ as Toussaint defines it. Son clave's gaps are $3 + 3 + 4 + 2 + 4$, which Euclid's algorithm does not give ($E(5, 16)$ is $3 + 3 + 3 + 3 + 4$); Clapping Music is Reich's 3, 2, 1, 2 claps with a rest after each group.

NAME	ONSETS	SOURCE	NOTE
Tresillo	x.x..x..	Cuba, and much of the Americas	the 3 of 3-3-2
Cinquillo	xx.xx.x.	Cuba	tresillo with two more
Ewe bell	x.x.xx.x.x.x	Ghana (Agbadza and others)	the 12/8 'standard pattern'; library written from its downbeat
Konnakol khanda	5 per beat	South India	ta-ka-ta-ki-ta: a five in the hands
Konnakol misra	7 per beat	South India	ta-ki-ta ta-ka-di-mi: three plus four

The Noh ensemble, the hayashi, is a flute and three drums: the shoulder drum (kotsuzumi), the hip drum (ōtsuzumi) and, in some plays, a stick drum (taiko). Chant and drums share an eight-beat frame, hon-ji. The drummers also call. Their kakegoe are part of the rhythm and the way two players who never look at each other keep time. In the usual placement 'ya' comes before beats 1 and 5, splitting the eight into halves, and 'ha' before 2, 3, 6 and 7, and for the shoulder drum also before 8. In one Stanford analysis, most lines of a passage fit between successive strong 'chon' strokes of the hip drum, which fall on beat 3.

RUDE's Noh entry is a sketch of that frame, not a piece: calls on their own voice before the beats, the shoulder drum on L, the hip drum's chon on R at beats 3 and 7. Placements differ between schools and passages, and the timing stretches, the space called ma, in a way no grid holds. The hip drum's head is dried over charcoal before a performance to make it hard enough for that dry crack.

■ THE HON-JI FRAME, AS THE LIBRARY ENTRY PLAYS IT

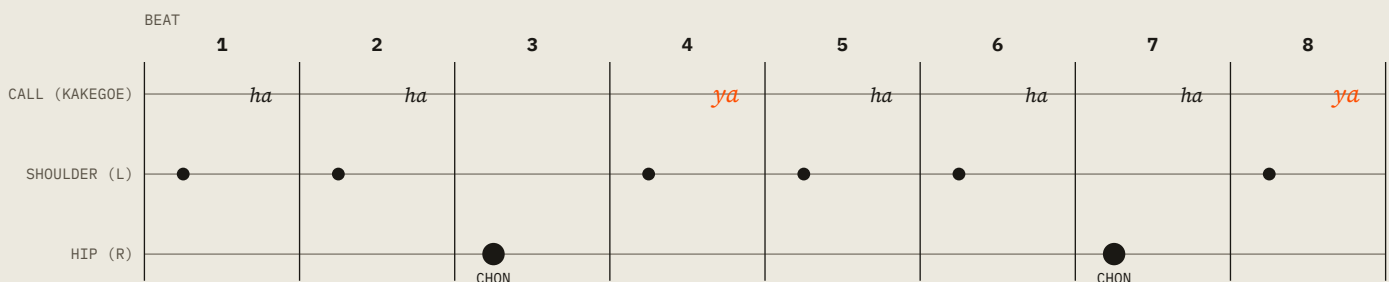


fig. 4: The library's Noh entry, read from the engine: eight beats at two steps a beat, the calls in the half-step before each beat. 'ya' (accented, before 1 and 5) is drawn in the accent colour, 'ha' in ink. The calls play on the Call note, General MIDI's mute cuica by default, the nearest the GM kit gets to a voice.

DRUM	SOUND	REGISTER	STRENGTH
kotsuzumi	po	low	strong, the open resonant stroke
kotsuzumi	pu	low	weak
kotsuzumi	ta	high	strong
kotsuzumi	chi	high	weak
kotsuzumi	tsu		no resonance
ōtsuzumi	chon	high	strong, sharp: the dried head

BREEDING I

A hybrid rudiment is two rudiments combined into a third (the cheese is a flam on a diddle), and drum corps have invented hundreds. RUDE makes the combining a control. Rudiment A and Rudiment B go into one of seven blends, or Chop cuts A on its own; Mutate, Rotate, Reverse and Invert then work on the result. Blends count steps, not time, so B is always played on A's grid. A triplet rudiment blended into a sixteenth one is squeezed into sixteenths, on purpose. That changes the rhythm itself, and it is where the strange ones come from.

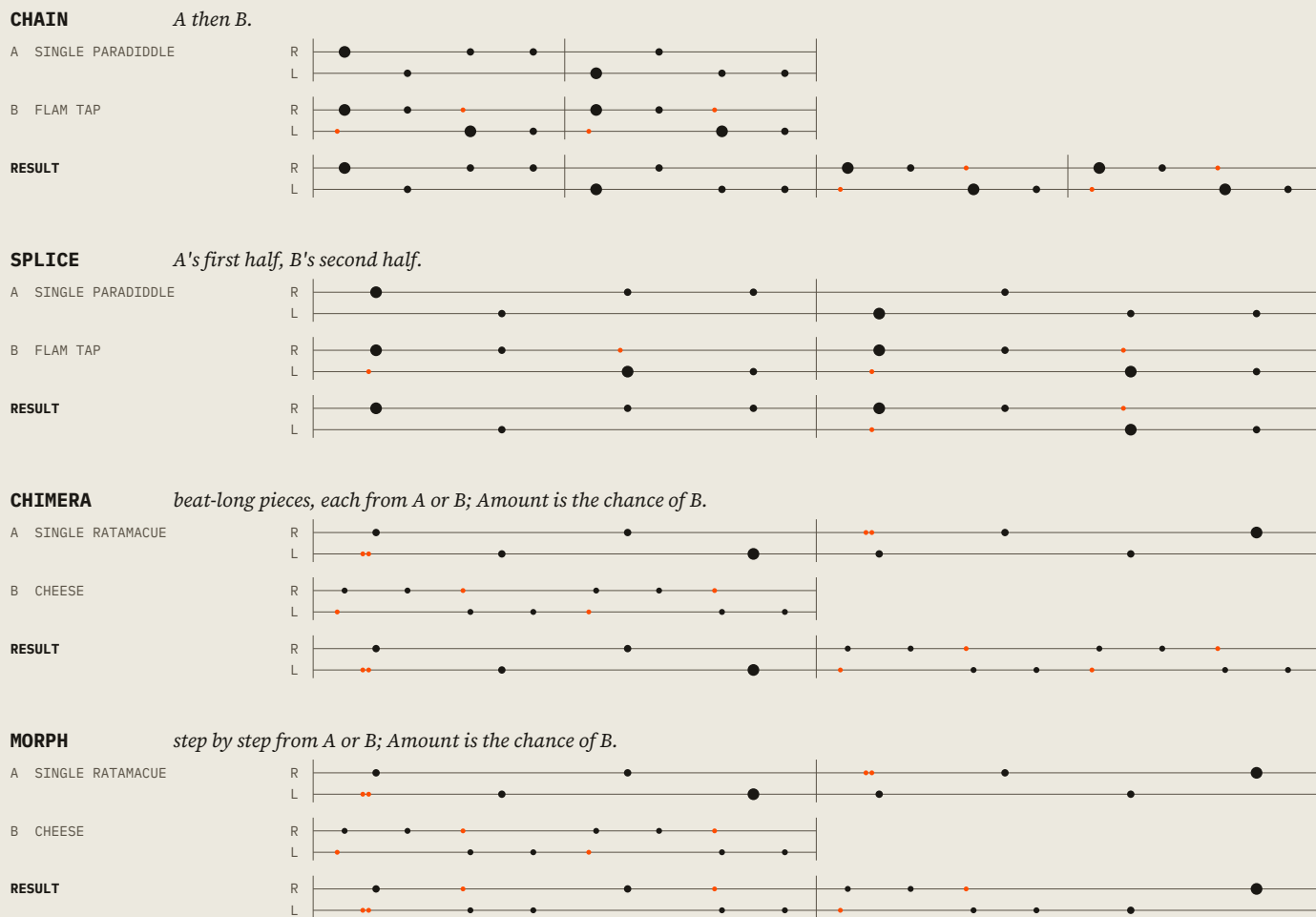


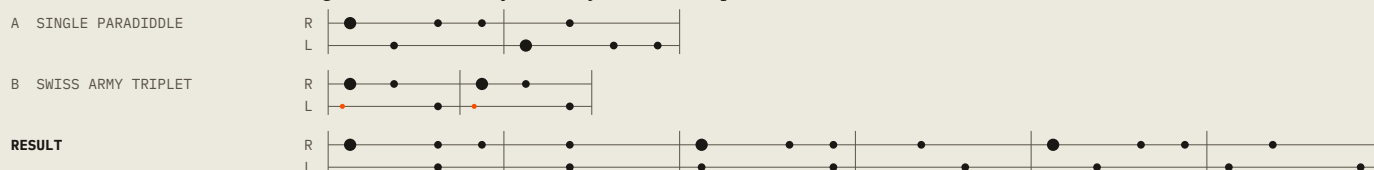
fig. 5: Four blends of the engine's own output. Chimera and Morph draw from the same seed (3) at Amount 50%; the same settings always give the same notes, so a pattern found by chance can be found again. With Evolve on, the seed changes every loop and the pattern keeps breeding.

BREEDING II

When A and B differ in length, the step-wise blends loop at their least common multiple, so both come round together: a paradiddle (8 steps) hocketed with a Swiss army triplet (6) is a 24-step loop. RUDE's Hocket is modelled on Balinese kotekan, two players whose interlocking parts make one fast line neither plays alone. Graft is the hybrid-maker: the clave keeps its rests and its hands, and every stroke it plays borrows the paradiddle's flam. Chop is the jungle producer's edit, a break cut into beats and resequenced, which drummers like Johnny Rabb then learned to play by hand.

HOCKET

Interlocks A's right hand with B's left, the way two kotekan parts make one line.



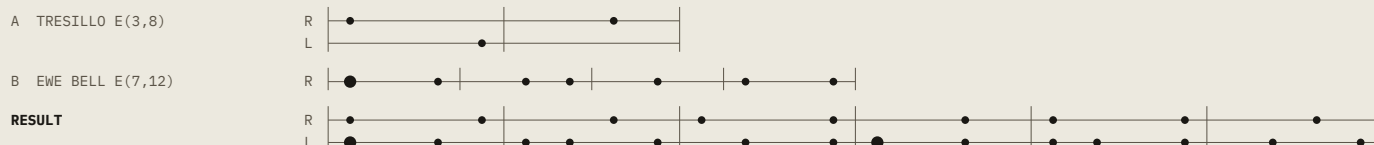
GRAFT

B decides where and which hand, A decides what kind of stroke.



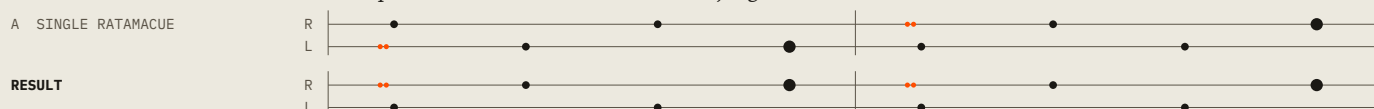
DUET

Plays A on the right-hand voice and B on the left at once; unequal lengths make a polymeter.



CHOP

Cuts A into beats and puts them back in a seeded order: the jungle edit.



MUTATE

Each plain stroke may gain a flam, drag, diddle, accent, buzz or ghost, or become a rest.



fig. 6: Hocket, Graft, Duet, Chop and Mutate. The build asserts each definition against the engine: every right-hand stroke of the hocket is A's and every left-hand stroke B's, the graft rests exactly where the clave rests, and the duet of the tresillo (8 steps) and the Ewe bell (12, played on the tresillo's grid) comes round after 24, where the two meet.

Steve Reich's Clapping Music (1972) is two players and one twelve-beat pattern: three claps, two, one, two, each followed by a rest. One player repeats it unchanged. The other, after a number of repeats, jumps one eighth note ahead, and keeps doing so until, twelve shifts later, the two are back in unison. In his earlier tape pieces two loops drift apart continuously; here the shift is abrupt, one eighth at a time, which two people clapping can actually do. In RUDE the piece is a setting: Clapping Music as both A and B, the Duet blend, and Drift, which moves B one more step every N loops. The figure is the engine's output for Drift 1, one section per row. What changes from row to row is not either part but where they coincide, and that is what a listener hears: the resulting patterns of the combined line.

THIRTEEN SECTIONS, ONE STEP OF DRIFT EACH



fig. 7: Each section: player 1 above, player 2 below, one square per eighth note, claps filled, claps that land together in the accent colour. Sections 1 and 13 are unison (8 of 8 together). In between, the two coincide on as few as 4 and as many as 6 beats, and no two middle sections are alike, which the build checks.

RUDE has no audio. It is a note effect: notes in, notes out, and the drum machine or sampler after it makes the sound. Every stroke becomes a General MIDI note on channel 10, on the key its voice is given: by default both hands on the acoustic snare (38), the kick on 36, the call on the mute cuica (78). A Voicing control moves the two hands around the kit: snare and side stick, toms, hats, bongos, congas, woodblocks.

Two details decide whether a pattern sounds right. A grace note is a separate note on the same key as its stroke, a grace gap ahead of it, and with a 40 ms gate the grace is still held when the stroke arrives. A key cannot be struck while it is down, so the plugin releases it first, at the same instant. And a stroke that falls exactly on the edge between two audio blocks belongs to the block holding its nearest sample; the first build truncated instead and put such strokes one sample early, in the wrong block, where host rounding could double or drop them. Both are checked against the built plugin at four block sizes and tempos.

■ ONE BEAT OF FLAM TAP AT 120 BPM, AS NOTE-ONS AND NOTE-OFFS

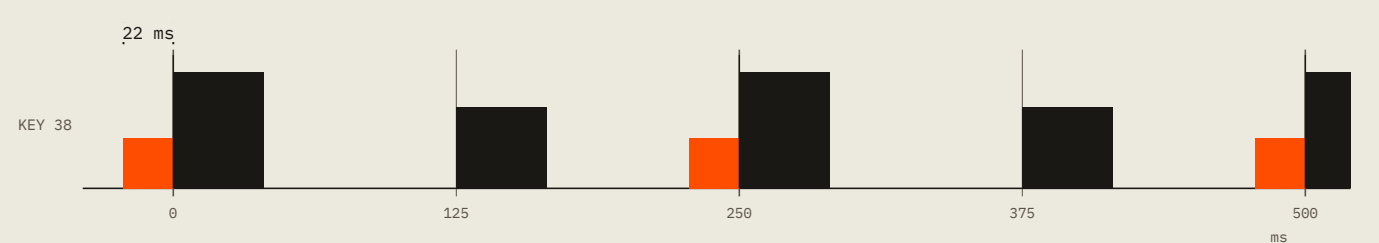


fig. 8: Bars run from note-on to note-off, height for velocity; grace notes in the accent colour. Every grace is cut short where its stroke begins (the thin rule), because the same key cannot be struck twice without a release between. Taps and accents ring for the full 40 ms gate.

STEP	WHAT HAPPENS
compile	once per loop: A and B from the library, the blend, then mutate, rotate, reverse, invert. Drift and Evolve make each loop different.
time	each stroke at its step; swing delays odd steps; grace notes a grace gap apart ahead of the first stroke; a buzz bounces inside its step; humanise moves time and velocity by a seeded amount.
voice	the key comes from Voicing (or from the held key, in Custom voicing with a key held); the channel is 10 unless set.
release	after the gate, or at once if the same key is struck again first.
export	the Export MIDI button writes the same notes to a .mid in Documents\RUDE, named for its settings.

CONTROLS

RUDE has 34 parameters, every one automatable. The panel's front page holds what you play with; keys, channel, dynamics and stroke timing are under ADVANCED. Ranges and defaults below are read from the plugin's source at build time.

CONTROL	RANGE, DEFAULT	WHAT IT SETS
Rudiment A	119 entries	the first rudiment, chosen by name from the library.
Rudiment B	119 entries	the second; the seven blends use it, A and Chop ignore it.
Blend	9 settings, Hocket	A alone, seven blends (Chain to Duet), or Chop.
Amount	0 to 100%, 50	Chimera and Morph: the chance of taking B. Chop: the chance a beat is swapped.
Seed	1 to 999, 1	fixes every random choice; the same seed plays the same notes.
Evolve	off / on	reseed every loop, so the pattern keeps changing.
Mutate	0 to 100%, 0	the chance a plain stroke gains an ornament or becomes a rest.
Phase	0 to 63, 0	B starts this many steps in.
Drift	0 to 32, 0	B moves one more step every N loops.
Grid	0 to 8, 0	steps per beat; Natural is A's own.
Rate	0 to 2, 1	half, normal or double speed.
Rotate	0 to 63, 0	start the loop this many steps in.
Reverse	off / on	play the loop backwards; graces still lead their strokes.
Invert	off / on	swap the hands.
Swing	0 to 50%, 0	delay odd steps by this fraction of a step.
Trigger	hold / transport	Hold key: plays while a key is down. Transport: follows the host.
Voicing	17 voicings	which GM keys the two hands play; Custom uses Note R and Note L.
Note R	0 to 127, 38	the right hand's key in Custom voicing.
Note L	0 to 127, 38	the left hand's key in Custom; with a key held, its offset from the held key.
Kick note	-1 to 127, 36	the K voice's key, or off.
Call note	-1 to 127, 78	the @ voice's key, or off.
Channel	1 to 16, 10	MIDI channel; 10 is General MIDI percussion.
Accent vel	1 to 127, 120	velocity of an accented stroke.
Tap vel	1 to 127, 84	velocity of a plain stroke.
Ghost vel	1 to 127, 36	velocity of a ghost stroke.
Grace vel	1 to 127, 52	velocity of a grace note.
Grace gap	5 to 80 ms, 22	time between grace notes and their stroke.
Buzz bounces	2 to 12, 6	how many hits a buzz stroke makes.
Gate	5 to 500 ms, 40	how long each note is held.
Human vel	0 to 30, 0	plus or minus this much velocity, seeded.
Human time	0 to 20 ms, 0	plus or minus this much time, seeded.
Export MIDI	button	press to write the pattern as a .mid.
Export loops	1 to 64, 4	how many loops the file holds.
Roll styles	11 families, all	which families ROLL draws from: the dot on each tab of the library, or ROLL DRAWS FROM on ADVANCED. ROLL picks a family first, then an entry, so a big family is no likelier than a small one.

11 of the 119 library entries were reconstructed from a written description rather than read off a chart or a primary definition. They are marked (r) in the plugin and on the plates. The three PAS ones are the priority, because people learn from them.

ENTRY	STICKING AS PLAYED	WHY IT IS (R)
Flam Drag	>IR - L L R - >rL - R R L -	described as a flam followed by a drag, eighth-sixteenth-sixteenth-eighth; the grace placement is a guess
Single Dragadiddle	>RR L R R >LL R L L	described as a paradiddle whose first note is the drag
Drag Paradiddle No. 2	>R lIR >R lIR L R R - >L rrL >L rrL R L L -	described as one note, two drags, then a paradiddle
Cheese Pataflafla	lRR L R rL lRR L R rL	a pataflafla with cheese on the downbeat; names vary between sources
Flam Five	>IR L R L R >rL R L R L	a flam and four singles in a five; not on any chart consulted
Doublé (Basel)	>rL R >IR L >rL R >IR L >rL R >IR L	an inverted flam tap with Basel phrasing, which a grid only approximates
Tagwacht / Reveille Stroke	lIR lIR >L - rrL rrL >R -	the American double drag tap, under its Swiss name
Swiss Army Triplet, Alternating	>lR R L >lR R L >rL L R >rL L R	the common practice of switching the lead hand
Kotekan (interlock)	R L R R L R L R R L R R L R L R	an illustration of interlock, not a transcribed kotekan
Noh Hon-ji (sketch)	L @ L @ >R - L >@ L @ L @ >R @ L >@	a frame built from published call positions, not a passage
Diketo (24)	>R - R - R - R - R - R - R - R - R - R - R -	from a search summary of Poole's table, unchecked against Arom 1991; it lacks the oddity property

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Built from plugins/rude: the figures from build/rude-render.exe, the controls from src/params.h. The plugin is checked by tests/run.sh: the library parses and writes back unchanged, the rolls count right, the timelines are Euclidean, every blend does what this note says, and the built plugin plays on its samples.