

Synthetic Twin

for percussion quartet

Charles Peck

Program Notes

Synthetic Twin is an exploration of physicality and communication in music. The sound world is entirely electronic, generated from two instruments designed specifically for this piece. These instruments, called Rooks, are an extension of standard performance techniques for percussionists. Infrared sensors interpret hand movement, while a contact microphone provides subtle rhythmic control. Spatially, the quartet is divided into pairs with two performers standing on either side of each instrument. This orientation creates two “twin” layers. Each individual pair can rely on visual and gestural communication, while the pairs collectively must use sonic cues to effectively generate the music.

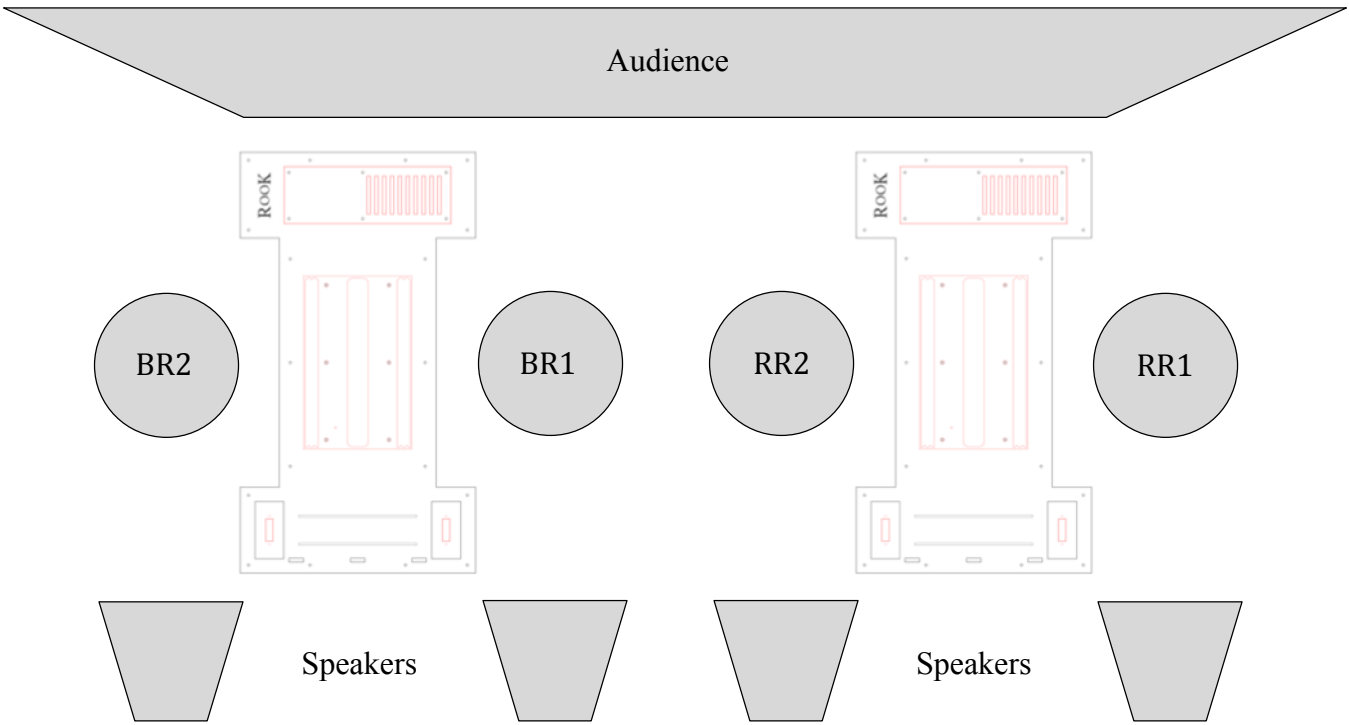
Instrumentation

Percussion Quartet – Red Rook 1 (RR1), Red Rook 2 (RR2), Blue Rook 1 (BR1), Blue Rook 1 (BR2)

Duration

~ 10 minutes

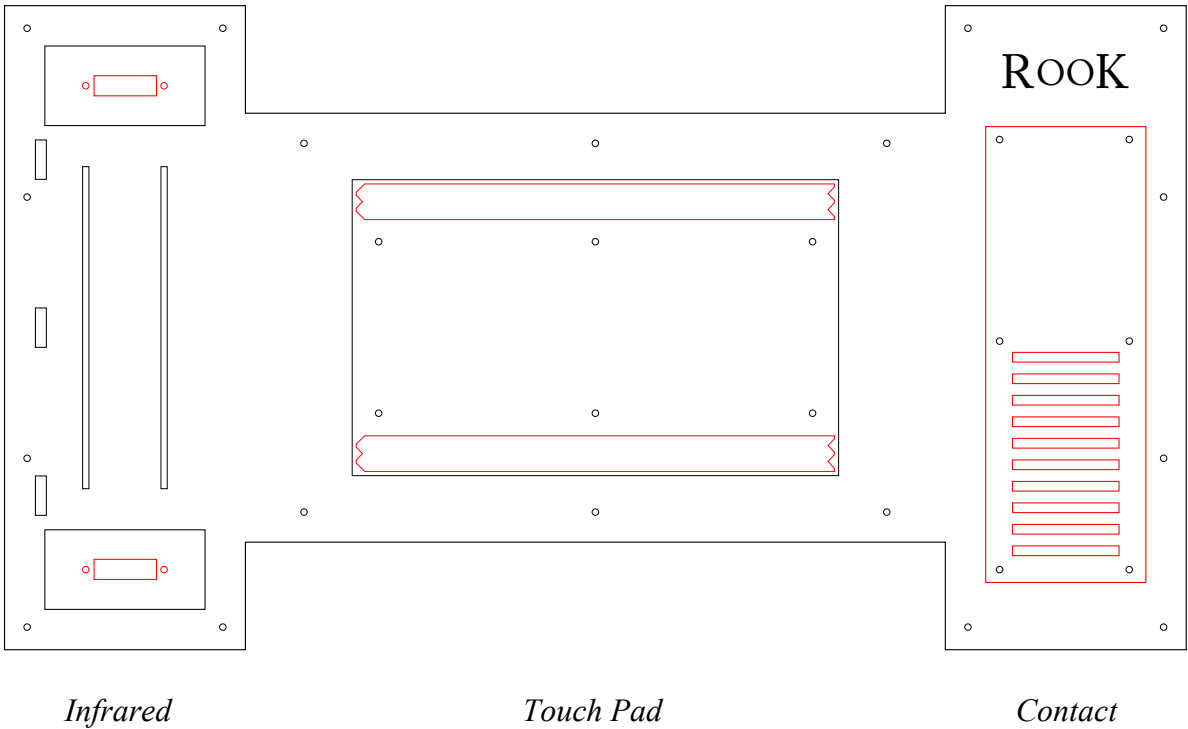
Orientation



*Commissioned by the Kansas University Percussion Group
Rook instrument designs supported by the Philadelphia Chapter of the American Composers Forum*

Rook Details

Introducing *Rook*, a new instrument designed to bring physical performance to electronic music. The instrument includes three distinct sections, referred to as infrared, touch pad, and contact, each of which controls a variety of musical parameters. Below, is an overhead view of the layout, with each section highlighted in red.



Infrared – The section on the left features two infrared sensors. Each sensor determines the distance between itself and any object above it. In this piece, each performer is allotted one infrared sensor (the one closest to them), which can be controlled by raising and lowering a hand above the sensing area. The sensing distance stretches from the top of the instrument to about 18 inches above it.

Touch Pad – The middle section features two capacitive touch sensing sliders. The performers interact with this section by simply touching a slider with one or several fingers. A variety of sounds are selected from depending on where the performer touches it and how many fingers he/she touches it with. Again, each performer is allotted the one touch pad closest to them.

Contact – The section on the right features a contact microphone and two playing areas. The top, flat section is intended to be tapped with fingernails, while the bottom, ridged section can be run over with fingernails to create an effect similar to a drum roll.

To use the Rooks, connect speakers to the “Audio Out” jack on the side of the instrument. *Note: Small speakers are included for rehearsal simplicity, but larger speakers are recommended for performances.* Then plug the power cord into the “Power” jack. *Note: It will take about a minute to start up.* The Red Rook and Blue Rook control different musical sounds. They can be distinguished by the color of the LED inside the body.

Performance Notes

STAVES

Top staff – Always dedicated to the *Infrared* section. The top of the staff is the furthest from the instrument (~18”), while the bottom of the staff is closest.

Bottom staff – Can be either the *Touch Pad* or *Contact* section.

STAFF FORMAT

5-line – This format implies that a section is divided into 5 parts.

3-line, wide – This format implies that a section is divided into three parts.

2-line, wide – This format is used to for the *Contact* section only.

2-line, very wide – This format implies the entire range is continuous.

NOTATION

Circle Noteheads – These are used to provide checkpoints for the *Infrared* section. They do not imply any particular rhythm, EXCEPT during the Melody section.

Lines – A variety of lines are used in conjunction with the circle notehead checkpoints. They show the position of the hand above the *Infrared* section.

Numbers – These indicate the number of fingers required for the *Touch Pad* section

Diamond Noteheads – These are not exact rhythms, but instead show general activity in the Rhythm section.

TIME

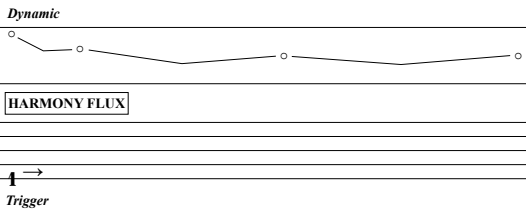
The duration of each page and gesture is not strictly fixed. Ideally, each page of the score should last about 2–2.5 minutes and each entrance/gesture should remain loosely proportional to their allotted space on the page. However, the performance is not about locking to an exact time grid. Instead, the performers should focus on communication and the experience of executing the music as an ensemble.

GESTURE

There are 8 different “effects” used in this piece, which are highlighted below and to the right. Each of these effects includes a specific hand gesture for the infrared sensor, or in one case for the contact sensor.

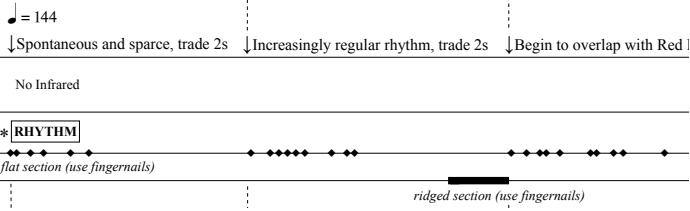
HARMONY FLUX GESTURE

Hand should be flat, will all fingers held together tightly. Form a straight line with hand and forearm, then move very smoothly and consistently.



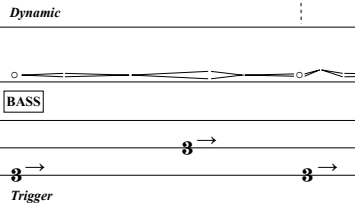
RHYTHM GESTURE

Use fingernails to play this section. Tap rhythm on the top area of the Contact section and run a fingernail from the bottom upward on the ridged portion.



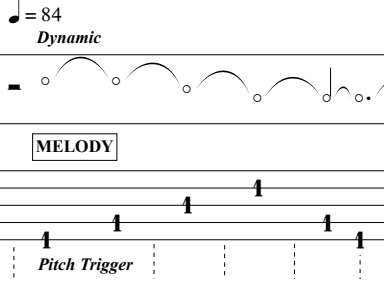
BASS GESTURE

Open hand and slowly tilt to the left and right. Match angle of tilt to width of the hairpin. Never go past a 45 degree tilt.



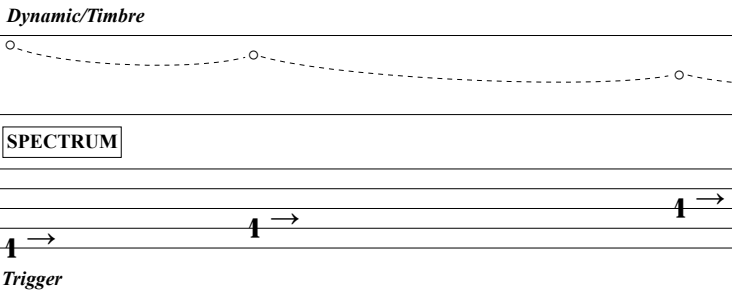
MELODY GESTURE

Hand should be flat, will all fingers held together tightly. Begin each note below the circle checkpoint, but above the top of the arc. Then bend downward 30 degrees from the wrist to reach checkpoint and up 60 degrees (30 degrees above starting position) to follow arc.



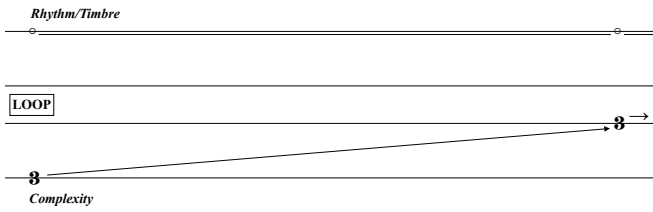
SPECTRUM GESTURE

With a relaxed, open hand gently oscillate fingers up and down. Fingers shouldn’t move by more than two inches.



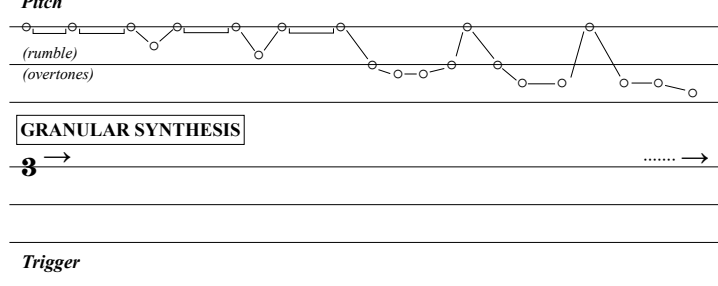
LOOP GESTURE

Spread hand wide. Really stretch.



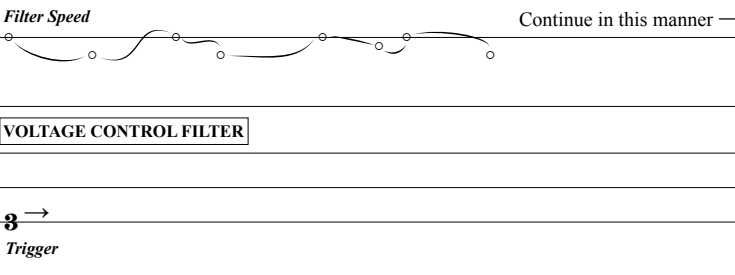
GRANULAR SYNTHESIS GESTURE

Open fingers wide, then curl all finger downward to create a claw. Hand should appear tense and powerful.



VOLTAGE CONTROL FILTER GESTURE

Hand should create a wave. The fingers dip first, then the palm and wrist follow as the fingers rise back up. Akin to putting a hand outside a car window.



Score

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Dynamic/Timbre

SPECTRUM

*move with increasing speed
and energy to the end of the page*

1 →
Trigger

1 →

1 →

..... →

Dynamic

HARMONY FLUX

*move with increasing speed
and energy to the end of the page*

1 →

Trigger

..... →

Filter Speed

Continue in this manner →

..... →

VOLTAGE CONTROL FILTER

*move with increasing speed
and energy to the end of the page*

3 →

Trigger

..... →

Pitch

(rumble)

(overtones)

GRANULAR SYNTHESIS

*singing, search for 7th-11th harmonics in the overtones section
move with increasing speed and energy to the end of the page*

3 →

..... →

Trigger



* Rhythms are only shown to indicate texture. Actual rhythms may include any duple or triple subdivisions of the tempo and should be improvised by the performer.
Each checkpoint should be repeated. The number of repetitions is subject to the discretion of the performers.

The image displays a musical score for a four-part ensemble, organized into two systems. Each system consists of two staves labeled 'Infrared' and 'Touch Pad'.

System 1 (RR1, RR2):

- RR1:** Labeled 'No Tempo' and 'Dynamic/Timbre'. The 'Infrared' staff shows a dashed line with circles. The 'Touch Pad' staff features a 'SPECTRUM' box and a sequence of notes with arrows indicating movement.
- RR2:** Labeled 'No Tempo' and 'Dynamic/Timbre'. The 'Infrared' staff shows a solid line with circles. The 'Touch Pad' staff features a sequence of notes with arrows, including a '2x' multiplier.

System 2 (BR1, BR2):

- BR1:** Labeled 'No Tempo' and 'Dynamic'. The 'Infrared' staff shows a solid line with circles. The 'Touch Pad' staff features a 'MELODY' box and a sequence of notes with arrows, including a 'switch to touch pad section' label.
- BR2:** Labeled 'No Tempo' and 'Dynamic'. The 'Infrared' staff shows a solid line with circles. The 'Touch Pad' staff features a 'MELODY' box and a sequence of notes with arrows, including a 'Pitch Trigger' label and a tempo marking of 84.

The score includes various musical notations such as notes, rests, and dynamic markings, along with a 'SPECTRUM' and 'MELODY' section. The 'Touch Pad' staves include a 'Pitch Trigger' section with a tempo marking of 84.

