

GAME DESIGN DOCUMENT



Hexapuss Synth — Game Design Document

a cosmic horror instrument

Tune the three frequencies and open the portal.

A browser-based interactive musical instrument and deterministic frequency-lock game rendered as engine filigree.

STEVE HINAN PRESENTS

Free play conceals an interdimensional lock

Hexapuss Synth lets players build a three-voice performance while learning the exact controls that later reconstruct creator-authored frequency keys.

FORMAT

A responsive browser-based interactive musical instrument powered by the Web Audio API, Canvas 2D, and MediaRecorder.

CREATIVE DIRECTION

Cosmic horror rendered as engine filigree: near-black space, precise gold and bronze engraved linework, symmetrical ornament, and a central mingled sigil.

PLAYER FANTASY

The player is not entering a password. They are reconstructing a forbidden frequency pattern that draws Hexapuss across from the sixth dimension.

DESIGN PILLAR

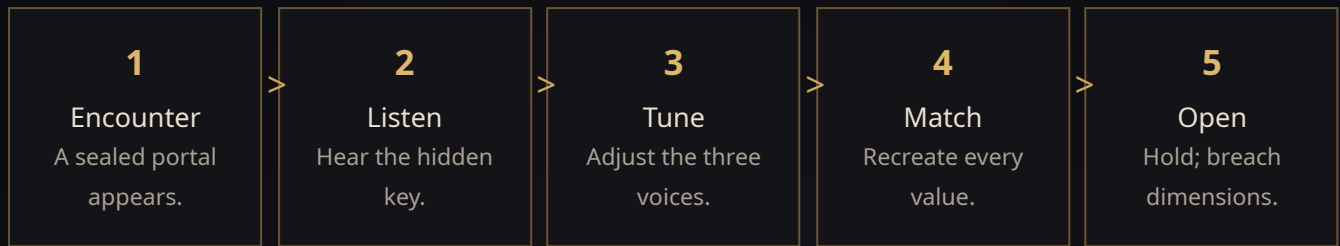
The lock never asks the player to stop making music. Every adjustment remains expressive, even when it moves away from the solution.

PLAY FLOW

1. Play the keyboard at the top.
2. Turn **Keyboard sustain** on to latch and layer notes.
3. Optionally turn **Keyboard sound mute** on to silence the keyboard's direct note layer while pressed notes continue to drive all three oscillators.
4. Choose Oracle, Abyss, Glass, or Doom.
5. Shape each oscillator independently.
6. Drag the colored sigils horizontally for stereo placement.
7. Adjust Tone & movement.
8. Start the automatic pulse and set its tempo.
9. Record up to 60 seconds of branded video and synth audio.

Game goal: Tune the three frequencies and open the portal.

Rebuild the frequency key and open the portal



MOMENT-TO-MOMENT PLAY

1. The sealed portal broadcasts a brief rendering of its stored frequency key.
2. The player selects an oscillator and adjusts its active controls.
3. Audio and visual feedback show which values are approaching their targets.
4. The player reproduces the orange, green, and purple state across every active control.
5. The complete exact state is held for 1.5 seconds and the portal opens.

SUCCESS FEELS PHYSICAL

- **Audio:** beating and dissonance collapse into a resonant chord.
- **Visual:** the three colored forms overlap and the Mingled Echo resolves toward gold.
- **Motion:** the lock rings rotate into register and stop cleanly.
- **State:** the seal ruptures and Hexapuss advances toward our dimension.

No blind guessing: every meaningful adjustment changes at least two feedback channels. Proximity guidance may be continuous, but success occurs only at the exact stored values.

FAILURE IS INFORMATION

There is no damage state in the base mode. Moving away from the snapshot increases visual instability and harmonic beating, teaching the lock's response. Optional challenge modes may later add time, move, or stability limits.

One captured snapshot is the authoritative key

The creator tunes the full instrument state once, captures it, and validates that the same public controls can reproduce every stored value.

LAYER	WHAT THE LOCK CHECKS	HOW THE PLAYER READS IT
Voice values	Wave, volume, tune, transpose, speed, LFO amount, and LFO rate when enabled	Pitch, timbre, size, contour, and movement
Shared values	Active Tone & movement settings	Weight, saturation, brightness, resonance, reverberation, and echo
Relationships	Intervals, balance, and phase behavior	Beating, symmetry, and overlap
Spatial values	Stored sigil positions when active	Position and stereo placement
Confirmation	1.5 seconds at complete equality	Gold portal ring fills clockwise

EXACT EVALUATION

Every puzzle-active live value must equal the creator snapshot. Distance scores support hints only and never unlock a lock.

DISCRETE REPRODUCTION

Each saved parameter uses the same visible, audible step exposed by the player interface. No solution depends on hidden precision or pixel-perfect dragging.

CONFIRMATION HOLD

The portal charge accumulates only while the entire active state is exact. Any changed value drains the ring and pauses the unlock.

CREATOR FLOW

Tune the solution, preview it, capture one authoritative snapshot, then replay the puzzle through the public controls before publishing.

Fairness rule: exact does not mean microscopic. Quantize every saved parameter, including any stored position, to a reproducible step.

The keyboard leads a clear top-to-bottom instrument

The mobile-friendly interface is one continuous page. Controls remain outside the artwork, labels state their real function, and the 16:9 visualizer remains a clean performance surface.

- 1 Keyboard.** One-octave-plus chromatic range from C4 through C#5, with pointer and computer-keyboard input.
- 2 Keyboard switches.** Two matching on/off switches sit centered as a pair directly beneath the keys. **keyboard sustain** latches and layers notes. **keyboard sound mute** silences the keyboard's direct note layer while every pressed note continues to trigger all three oscillator voices.
- 3 Oscillators.** Oscillator 1 orange, Oscillator 2 green, and Oscillator 3 purple. Each centered name is followed by centered Volume, Wave shape, Tune, Frequency, Speed, LFO amount, then LFO rate at the bottom.
- 4 Tone & movement.** A centered translucent-white panel sits below the oscillators with visible separation. It contains Sub, Drive, Cutoff, Resonance, Reverb, and Delay. There is no Space control.
- 5 Main controls.** Main volume occupies the upper right. Sounds, auto pulse, tempo, and the eight-step pulse meter support performance.
- 6 Recording and visualizer.** **Record Video (60 seconds max)** sits above the branded 16:9 artwork.
- 7 Stereo reset. center stereo positions** is centered under the visualizer and centers all three sigils and pan values.
- 8 Global oscillator reset. Reset All Oscillators** is centered at the very bottom and restores all three oscillator panes to their defaults.

Copy rules: The header reads STEVE HINAN PRESENTS / HEXAPUSS SYNTH / a cosmic horror instrument / Tune the three frequencies and open the portal. The goal line uses the same subtle visual treatment as the tagline. Use Sounds, not Songs. Keep the control labels self-explanatory.

Three voices share one reproducible pitch model

OSCILLATOR 1 / ORANGE

Anchor voice. Default sawtooth, Tune 0 cents, Frequency 0 semitones, Speed 100%, Volume 100%, LFO amount 0%, LFO rate 1.00 Hz.

OSCILLATOR 2 / GREEN

Relationship voice. Default sawtooth, Tune +7 cents, Frequency 0, Speed 100%, Volume 100%, LFO amount 0%, LFO rate 1.00 Hz.

OSCILLATOR 3 / PURPLE

Transformation voice. Default triangle, Tune -7 cents, Frequency 0, Speed 100%, Volume 100%, LFO amount 0%, LFO rate 1.00 Hz.

oscillator Hz = pressed-key Hz × $2^{(\text{Frequency semitones} / 12)}$ × (Speed / 100)
Tune is applied separately as detune in cents.

CONTROL	RANGE / OPTIONS	BEHAVIOR
Volume	0% to 150%; step 1	Per-oscillator gain
Wave shape	Saw, Square, Triangle, Sine	Oscillator waveform
Tune	-50 to +50 cents; step 1	Fine detune
Frequency	-12 to +12 semitones; step 1	Pitch transposition
Speed	25% to 200%; step 1	Frequency multiplier
LFO amount	0% to 100%; step 1	Pitch-modulation depth; default zero
LFO rate	0.05 to 12 Hz; step 0.05	Sine-wave modulation speed

Independent modulation: each oscillator owns its own sine-wave low-frequency oscillator. Rate and amount affect that oscillator only and update sounding voices immediately.

Four presets establish distinct performance characters

ORACLE

The default balanced voice. Layered sawtooth and triangle tones, light sub, restrained drive, open filtering, modest reverb and delay, and no default LFO pitch movement make it the neutral starting instrument.

ABYSS

A loud, unstable cosmic-horror voice. Contrasting sawtooth, triangle, and square waves occupy sub-octave, lower-mid, and raised harmonic registers. High levels, deep sub, resonant filtering, long reverb, delay, and slow asynchronous LFOs form a cavernous moving mass.

GLASS

A bright, delicate high-register voice. Sine and triangle layers, fast speeds, open filtering, resonance, reverb, and delay create a brittle luminous texture without default LFO modulation.

DOOM

A loud, brutal doom-metal voice. Stacked square and sawtooth oscillators fill low registers at high levels, reinforced by maximum sub and drive. Slow LFOs add unstable weight, and the automatic pulse descends through a tritone-heavy figure.

PULSE FIGURES

SOUND	EIGHT-NOTE MIDI SEQUENCE	CHARACTER
Oracle	48, 55, 51, 58, 53, 60, 55, 63	Balanced ascent
Abyss	43, 38, 46, 34, 41, 47, 36, 50	Unstable low motion
Glass	60, 67, 64, 72, 69, 76, 71, 79	Bright upper figure
Doom	36, 43, 34, 41, 31, 38, 29, 36	Descending tritone weight

Preset behavior: selecting a Sound loads its full oscillator, LFO, envelope, Tone & movement, and pulse identity. Manual control changes move the instrument into a custom state.

Independent voices converge through one controlled master bus

tone & movement

- **Sub:** octave-down square reinforcement.
- **Drive:** gain and saturation intensity.
- **Cutoff:** shared low-pass filter cutoff.
- **Resonance:** shared low-pass filter emphasis.
- **Reverb:** separate convolution-reverb level.
- **Delay:** separate delay level with feedback.

voice path

- Three primary oscillators per played note.
- Independent waveform, gain, frequency, detune, panner, and sine LFO.
- Optional octave-down sub oscillator.
- Polyphonic keyboard voices plus one short auto-pulse voice.
- Active voices update smoothly when controls change.

audio graph

3 primary oscillators + sub > note envelope > shared low-pass filter > parallel dry + delay/feedback + convolution reverb > master gain > compressor > analyser > speakers + recording destination

gain model

Oscillator 1 uses base gain 0.36; Oscillators 2 and 3 use 0.28. Per-oscillator Volume multiplies that base. Main volume ranges from 0% to 100% and defaults to 62%.

peak control

The master bus is boosted for presence and protected by compression: threshold -16 dB, knee 16 dB, ratio 5:1, attack 0.006 seconds, release 0.18 seconds.

Audio safety: maintain strong perceived loudness while preserving headroom, compressing peaks, and feeding the recorder from the same post-master mix heard by the player.

The lock face moves with the sound

Three colored sigils and one central Mingled Echo translate the live instrument state into a readable engine-filigree performance.

ORANGE, GREEN, PURPLE

Each oscillator owns one draggable sigil. Horizontal drag maps directly to StereoPanner from left to right. Positions persist for the session.

AMPLITUDE

Each colored sigil becomes smaller as its oscillator Volume decreases and larger as Volume increases. A small readable trace remains at zero.

SHAPE AND MOTION

Wave shape changes the contour family, Tune adds fine warping, Frequency transposition changes complexity, Speed drives rotation, and analyser energy creates pulse and glow.

MINGLED ECHO

The central form blends all three oscillators' waveforms, tuning, frequency, speed, energy, and color. Its size follows their combined weighted amplitude.

BRANDED BACKGROUND

The 16:9 background is a near-black engine-filigree field built from hairline gold and bronze engraved linework, perfect bilateral or radial symmetry, banknote-density guilloche, baroque scrolls, and ornament framing a central void. The bottom-left permanently carries **STEVE HINAN PRESENTS**, a hairline gold rule, and **HEXAPUSS SYNTH**.

- **center stereo positions** moves all colored sigils to the center and sets all pan values to zero.
- Gold ornament communicates puzzle proximity; the confirmation ring fills only at complete equality.
- The visualizer has no legend. Panel color, contour, position, and accessible names establish identity.

Visual principle: amplitude affects scale, position affects pan, speed affects rotation, and transpose affects complexity.

The performance is shareable, measurable, and playable anywhere

RECORDING

- The button reads **Record Video (60 seconds max)**.
- Capture combines the branded 16:9 visualizer with the post-master synth audio.
- During capture the control becomes **Stop & save** and shows remaining time.
- Manual stop or the 60-second limit creates and downloads the supported video file.
- Surrounding controls remain outside the recorded frame.

ANALYTICS

- Google tag **G-KH71YJR3E9** loads with the instrument.
- The first triggered sound in a page session emits one **synth_play** event.
- **play_source** records keyboard or auto_pulse.
- Later notes in the same session do not duplicate the play event.

RECORDED SIGNATURE

STEVE HINAN PRESENTS HEXAPUSS SYNTH

Hairline engraved lettering inside the permanent bottom-left lockup.



RESPONSIVE AND ACCESSIBLE BEHAVIOR

Mobile

Controls reflow without horizontal scrolling and the visualizer retains 16:9.

Keyboard

Native controls and the musical keyboard support keyboard input with visible focus.

Motion

Reduced-motion preference suppresses nonessential animation while preserving feedback.

DISTRIBUTION

The static website package keeps **index.html**, its local assets, and this game design document together. The HTML and assets retain their relative paths when uploaded.

Every solved lock draws Hexapuss closer

ACT I - THE FIRST SIGNAL

One active oscillator. Match its stored pitch and hold. A pinprick portal reveals that something is listening from the sixth dimension.

ACT II - HARMONIC PAIRS

Orange and Green must match their captured values. Their exact interval gives the presence beyond the portal a clearer form.

ACT III - THE THIRD VOICE

Purple completes the three-voice frequency key. The portal begins to hold open instead of collapsing after each solve.

ACT IV - THE THINNING VEIL

Snapshots add waveform, volume, speed, fine tune, LFO behavior, shared tone, and position. Each exact reconstruction removes another barrier between dimensions.

ACT V - THE HEXAPUSS BREACH

The player reproduces the master snapshot. The complete portal opens and Hexapuss enters our dimension.

SCORING

- Completion is the primary reward.
- Optional rank measures time, excess moves, and stability.
- Discovery mode removes score pressure.

REPLAY VALUE

- Creator-authored alternate snapshots.
- A daily lock from one shared snapshot.
- Performance replay after unlock.

Campaign rhythm: place a free-play interlude after every two or three locks so the player can enjoy the instrument between constraints.

Three locks prove the complete mechanic

The first playable milestone tests whether exact three-oscillator reconstruction is understandable, musical, and satisfying.

MVP SCOPE

- Three handcrafted creator snapshots.
- Orange, green, and purple oscillator panes with all current controls.
- Waveform, volume, tune, transpose, speed, LFO amount, LFO rate, and optional spatial dimensions.
- Proximity feedback plus a 1.5-second exact-match confirmation ring.
- Keyboard sustain, Keyboard sound mute, four Sounds, auto pulse, center stereo positions, and Reset All Oscillators.
- Visualizer-and-audio recording with manual stop and 60-second auto-stop.

NOT IN THE MVP

- Procedural campaign generation.
- Online leaderboards or accounts.
- Competitive timers by default.
- Large inventory, currency, or upgrade systems.

ACCEPTANCE CRITERIA

QUESTION	PASS CONDITION
Can players start?	Keyboard, sustain state, and Sounds are immediately clear
Can players read direction?	Most adjustments are judged better or worse through two cues
Can players solve?	All three snapshots are matched exactly without outside explanation
Does it stay musical?	Exploration avoids clipping, punishing spikes, and dead zones
Can players share?	Manual stop or the cap creates a playable branded clip with audio

PLAYTEST PROMPTS

Ask what changed, what the lock wants, and why the player believes it opened. Observe before teaching.

GO / NO-GO SIGNAL

Proceed when players describe adjustment as intentional rather than random and ask to try another lock after completing the third.

Authoring requirement: provide creator-only snapshot capture and a debug overlay showing live value, stored value, equality state, error, and confirmation progress.

Appendix: Recreation Prompt

Copy everything inside the bordered area, continuing through END OF PROMPT.

Create a complete, production-ready HTML5 single-page web application called "Hexapuss Synth." Deliver one static-host-ready index.html with semantic HTML, responsive CSS, and vanilla JavaScript, plus one local WebP asset for the branded visualizer background and a PDF titled "Hexapuss Synth — Game Design Document." Put the HTML, assets, and PDF together in one website-upload zip. Use the Web Audio API for synthesis, Canvas 2D for reactive artwork, and MediaRecorder for video capture. Do not require a server, database, framework, or application runtime dependency. The only network integration is the specified Google analytics tag. The result must work on current desktop and mobile browsers.

IDENTITY AND EXPERIENCE. Brand the page "STEVE HINAN PRESENTS" / "HEXAPUSS SYNTH." The tagline is exactly "a cosmic horror instrument." Directly beneath it place the goal line "Tune the three frequencies and open the portal." Style the goal line subtly, matching the tagline rather than the main title. Spell Hexapuss with two final s characters. The creative direction is cosmic horror rendered as engine filigree: near-black space, precise gold and bronze engraved linework, exact symmetry, dense ornament, and a central mingled sigil. The four selectable items are labeled "Sounds," never "Songs," and are Oracle, Abyss, Glass, and Doom. Keep controls and explanatory labels outside the visual artwork.

PLAY FLOW. Let the player use the keyboard at the top; turn Keyboard sustain on to latch and layer notes; optionally turn Keyboard sound mute on to silence the keyboard's direct note layer while pressed notes continue to drive all three oscillators; select a Sound; shape each oscillator independently; drag the colored sigils horizontally for stereo placement; adjust Tone & movement; start or stop the automatic pulse and set Tempo; then record up to 60 seconds of the branded visualizer with synth audio.

TOP-TO-BOTTOM INTERFACE. Place a full-width one-octave-plus chromatic keyboard at the absolute top. It spans C4 through C#5: white keys C4, D4, E4, F4, G4, A4, B4, C5 and black keys C#4, D#4, F#4, G#4, A#4, C#5. Support pointer input and a computer-key mapping. Center two matching on/off switches directly beneath the keys as a pair: "keyboard sustain" and "keyboard sound mute." In normal mode a note sounds while pressed. In sustain mode, tapping a note toggles an indefinitely held voice, allowing layered notes while parameters change. Turning sustain off releases all latched notes. When Keyboard sound mute is on, mute only the keyboard's direct note layer; every pressed or latched note must still trigger and control all three primary oscillator voices.

Place the brand header beneath the keyboard area, with Main volume at the upper right. Then place three equal oscillator panes, stacking them cleanly on narrow screens. Center their headings: Oscillator 1 is orange, Oscillator 2 is green, and Oscillator 3 is purple. Order each pane exactly: centered oscillator name; centered Volume slider; Wave shape buttons Saw, Square, Triangle, Sine; Tune in cents; Frequency transposition from -12 to +12 semitones; Speed from 25% to 200%; LFO amount; LFO rate at the very bottom. Tune ranges from -50 to +50 cents in integer steps. Volume ranges from 0% to 150% in integer steps. LFO amount ranges from 0% to 100% in integer steps. LFO rate ranges from 0.05 to 12 Hz in 0.05-Hz steps.

Each primary oscillator owns a sine-wave low-frequency oscillator. LFO rate sets modulation speed. LFO amount sets pitch-modulation depth for that oscillator only, with a default of zero. Map LFO amount to oscillator detune depth as $\text{amount} \times 4.5$ cents. Changing an LFO control must update already sounding voices smoothly.

Use these exact oscillator defaults. Oscillator 1: sawtooth, Tune 0 cents, Frequency 0 semitones, Speed 100%, Volume 100%, LFO amount 0%, LFO rate 1.00 Hz. Oscillator 2: sawtooth, Tune +7 cents, Frequency 0, Speed 100%, Volume 100%, LFO amount 0%, LFO rate 1.00 Hz. Oscillator 3: triangle, Tune -7 cents, Frequency 0, Speed 100%, Volume 100%, LFO amount 0%, LFO rate 1.00 Hz.

Below the oscillator panes, place a centered Tone & movement panel with visible separation from the oscillators. Give it a translucent off-white background that separates the section without hiding the dark page beneath. Include six independent controls: Sub 0-100 default 32; Drive 0-100 default 18; Cutoff 0-100 default 61; Resonance 0-100 default 26; Reverb 0-60 default 22; Delay 0-60 default 22. Do not include or label any control as Space. Sub is octave-down square reinforcement. Reverb controls only convolution reverb. Delay controls only the echo and feedback path.

Provide four Sounds buttons, the automatic pulse button, Tempo, and an eight-step pulse meter. The pulse button reads exactly "Start auto pulse" when idle and "Stop auto pulse" while running. Tempo is 55-170 BPM, integer step, default 92 BPM. Advance one sequence step every 60000/Tempo milliseconds and play it for 68% of one step. Use these exact MIDI sequences: Oracle [48,55,51,58,53,60,55,63]; Abyss [43,38,46,34,41,47,36,50]; Glass [60,67,64,72,69,76,71,79]; Doom [36,43,34,41,31,38,29,36].

Use these exact Sound presets. Oracle: waves sawtooth/sawtooth/triangle; tunes 0/+7/-7; Frequency 0/0/0; Speed 100/100/100; Volume 100/100/100; LFO amount 0/0/0; LFO rate 1/1/1 Hz; Sub 32, Drive 18, Cutoff 61, Resonance 26, Reverb 22, Delay 22, Attack 12, Decay 38, Sustain 62, Release 36. Abyss: waves sawtooth/triangle/square; tunes -23/+17/-37; Frequency -12/-5/+7; Speed 67/91/42; Volume 145/136/128; LFO amount 38/62/47; LFO rate 0.12/0.37/0.21 Hz; Sub 100, Drive 78, Cutoff 39, Resonance 82, Reverb 58, Delay 52, Attack 34, Decay 88, Sustain 86, Release 96.

Glass: waves sine/triangle/sine; tunes 0/+4/-4; Frequency 0/+12/+12; Speed 126/146/164; Volume 100/100/100; LFO amount 0/0/0; LFO rate 1/1/1 Hz; Sub 8, Drive 4, Cutoff 88, Resonance 57, Reverb 48, Delay 48, Attack 4, Decay 50, Sustain 44, Release 55. Doom: waves square/sawtooth/square; tunes -12/+9/-24; Frequency -12/-7/-12; Speed 100/76/49; Volume 150/145/138; LFO amount 16/28/21; LFO rate 0.19/0.31/0.14 Hz; Sub 100, Drive 100, Cutoff 45, Resonance 46, Reverb 24, Delay 18, Attack 2, Decay 78, Sustain 94, Release 84. Oracle is selected by default. Selecting a Sound applies all listed values. Manual changes clear the active preset highlight.

PRESET CHARACTER. Oracle is the balanced default voice. Abyss must be loud, unstable, and unmistakably cosmic horror: contrasting waveforms across sub-octave, lower-mid, and raised harmonic registers; high oscillator levels; deep sub; resonant filtering; long reverb; delay; and slow asynchronous LFOs. Glass must be bright, delicate, and high-register. Doom must be loud, brutal doom metal: stacked square and sawtooth oscillators across low registers, maximum sub and drive, slow LFOs, and a descending tritone-heavy pulse figure.

GLOBAL CONTROLS. Main volume is in the upper-right area, ranges 0-100%, and defaults to 62%. Place the recording toolbar above the visualizer. The idle record button label is exactly "Record Video (60 seconds max)" and changes to "Stop & save" during recording. Place the branded visualizer at an exact 16:9 aspect ratio. Directly beneath it center a button labeled exactly "center stereo positions"; it moves all three colored sigils to the center over the Mingled Echo and sets all three StereoPanner values to zero. At the very bottom of the entire page center "Reset All Oscillators." It restores Wave shape, Tune, Frequency, Speed, Volume, LFO amount, and LFO rate for all three oscillators to the exact defaults above, updates sounding voices immediately, clears the active Sound highlight, and does not reset Main volume, shared Tone & movement controls, Tempo, sustain, Keyboard sound mute, pulse state, or sigil positions.

AUDIO ENGINE. Create one AudioContext on first user interaction. Keep the keyboard's direct note layer on its own gain path so Keyboard sound mute can silence that layer without interrupting note events or oscillator voices. Each played note creates three primary OscillatorNodes. Convert MIDI note n to base frequency $f = 440 \times 2^{(n-69)/12}$. For oscillator i , set $\text{Hz} = f \times 2^{(\text{Frequency}_i/12) \times (\text{Speed}_i/100)}$, then apply Tune_i to detune in cents. Wave shape directly selects the OscillatorNode type. Give Oscillator 1 base gain 0.36 and Oscillators 2 and 3 base gain 0.28, each multiplied by $\text{Volume}_i/100$. Route each oscillator through its own GainNode and StereoPannerNode into the note envelope. Connect its sine LFO through a gain of $\text{LFOAmount}_i \times 4.5$ to oscillator.detune , with the LFO frequency set by LFORate_i .

Use a note-envelope gain with internal Attack, Decay, Sustain, and Release values. Map attack seconds = $0.006 + (\text{Attack}/100)^2 \times 2.2$; decay seconds = $0.05 + (\text{Decay}/100)^{1.65} \times 2.1$; sustain gain = $\text{Sustain}/100$; release seconds = $0.045 + (\text{Release}/100)^{1.5} \times 3.4$. Peak envelope gain = $0.13 + \text{Drive}/420$. Short auto-pulse notes use 0.006-second attack, decay no longer than 0.18 seconds, sustain 0.25, and forced release 0.12 seconds.

Add a square-wave sub oscillator one octave below the pressed note when Sub is above zero, with gain $\text{Sub}/420$. Route the note envelope into a shared low-pass BiquadFilter. Map cutoff Hz = $90 \times 75^{(\text{Cutoff}/100)}$, and filter Q = $0.2 + \text{Resonance}/7.5$. Split the filtered signal into parallel dry, delay, and convolution-reverb paths. Set dry gain = $1 - \max(\text{Reverb}, \text{Delay})/130$. Set reverb wet gain = $\text{Reverb}/118$ using a stereo 3.2-second decaying-noise impulse. Set delay wet gain = $\text{Delay}/100$, delay time = $0.16 + \text{Delay}/260$ seconds, and feedback gain = $0.16 + \text{Delay}/150$. Recombine at the master gain.

Map master gain = $\text{MainVolume}/100 \times 1.45$. After the master gain use a DynamicsCompressor with threshold -16 dB, knee 16 dB, ratio 5:1, attack 0.006 seconds, and release 0.18 seconds. Connect it to an AnalyserNode with fftSize 1024 and smoothingTimeConstant 0.84, then to both device output and a MediaStreamAudioDestinationNode. Smooth active-voice updates with setTargetAtTime around 0.018 seconds. Preserve strong output without clipping.

VISUALIZER. Use a transparent 2D canvas above the branded background. Render three draggable audio-reactive engraved sigils: Orange RGB 184,142,96; Green RGB 99,161,109; Purple RGB 145,105,169. Default normalized positions are Orange (0.24,0.49), Green (0.50,0.49), Purple (0.76,0.49). Allow pointer dragging inside the canvas; clamp x to 0.08-0.92 and y to 0.18-0.78. Horizontal position sets pan = $x \times 2 - 1$. Update active voices immediately and retain positions for the session.

Each colored sigil encodes its oscillator. Rotation follows Speed. Wave shape changes the contour family. Tune introduces fine warping. Absolute Frequency transposition increases lobe or petal complexity. Live analyser energy adds pulse and glow. Overall size follows its own Volume using $\text{volumeScale} = 0.22 + 0.78 \times (\text{Volume}/100)$, multiplied into the normal reactive size. This leaves a readable trace at zero, produces default size at 100%, and grows above default through 150%.

Draw a fourth central form called the Mingled Echo. It is not draggable. Blend the three oscillators' colors, waveform values, Tune, Frequency, Speed, and analyser energy into its contour, rotation, interference, and glow. Weight mixed color by each oscillator's current influence. Scale it with combined amplitude using $\text{combinedVolume} = (0.36 \times \text{Volume1} + 0.28 \times \text{Volume2} + 0.28 \times \text{Volume3})/92$ and $\text{combinedVolumeScale} = 0.22 + 0.78 \times \text{combinedVolume}$. Apply that scale to the blended pre-volume radius. Draw faint delayed echo contours behind it with restrained additive glow so the background remains visible.

Advance animation with `requestAnimationFrame` and use `devicePixelRatio` capped at 2. Respect prefers-reduced-motion by suppressing nonessential pulsing without disabling feedback. Add a slim unlabeled 15-segment output meter outside the artwork. Reinforce oscillator identity through position, contour, centered pane headings, and accessible names, never color alone.

BACKGROUND GRAPHIC. Create a 16:9 image at exactly 2048x1152 pixels and save it locally as a WebP asset. The art direction is "engine filigree": delicate scrolling metal threads, baroque flourishes, acanthus curls, and hand-wrought warmth fused with exact guilloche symmetry, interlaced geometric repeats, rosettes, uniform hairline weight, and banknote-engraving density. Use a near-black ground with hairline gold and bronze engraved linework. Nothing is photorealistic. Enforce perfect bilateral or radial symmetry. Use horror vacui: fill the frame edge-to-edge with ornament, leave no bare borders, clip no flourish, and make every pattern frame and point inward toward a central sigil or void. Keep the center dark enough for four live sigils to read. Include no characters, literal scenes, objects, or UI controls.

Bake this exact bottom-left signature into the background as part of every recorded image: "STEVE HINAN PRESENTS" in small uppercase engraved gold lettering, then a thin hairline gold horizontal rule, then "HEXAPUSS SYNTH" in larger uppercase engraved gold lettering. Keep the lockup inside safe margins and crisp at 1280x720 capture size. If image generation cannot render the wording exactly, create the ornament without words and deterministically composite the exact typography and gold rule before saving the final 2048x1152 WebP. The live canvas stays transparent over the background except where it draws sigils and glow.

RECORDING. Build an off-screen 1280x720 canvas. At 30 frames per second draw the branded background first and the live visualizer over it. Capture that stream and combine its video track with the post-master MediaStreamAudioDestination audio track. Prefer MediaRecorder types in this order: video/webm;codecs=vp9,opus; video/webm;codecs=vp8,opus; video/webm. Show a live "Recording - Ns left" status. Manual Stop & save or automatic stop at 60 seconds creates a Blob, downloads the supported file, restores "Record Video (60 seconds max)," and reports that it was saved. Disable recording with an accessible explanation when unsupported. Capture only the visualizer, permanent background branding, and synth audio, never surrounding controls.

ANALYTICS. Include Google tag G-KH71YJR3E9. On the first sound triggered in a page session, fire one synth_play event with play_source set to keyboard or auto_pulse. Never fire a second synth_play event during that session.

PUZZLE GAME. Make free play fully usable and structure the application for a three-lock minimum viable product. Creator-only authoring mode tunes the complete instrument and captures one authoritative Lock Snapshot for each lock. Every level record contains an ID, creator snapshot, active-parameter mask, discrete step definitions, a 1.5-second confirmation time, hint timing, proximity-feedback curve, portal reward, and schema version. Store each value in the same quantized representation exposed by the control. Never save an unreachable hidden value. When position is active, quantize normalized coordinates to a visible reproducible grid.

The player loop is Encounter > Listen > Tune > Match > Open. A sealed portal previews the stored frequency key. The player adjusts the three voices. Continuous proximity feedback communicates whether each active value is getting closer through at least two channels selected from beating, resonance, contour similarity, color, motion, position, and gold ornament. Hints may use distance, but unlocking never does: every active live value must equal the stored snapshot exactly. Once equality begins, fill a gold portal ring clockwise for 1.5 uninterrupted seconds. If any active value changes, drain the ring. On success, collapse beating into a resonant chord, overlap the three colored forms, resolve the Mingled Echo toward gold, stop the lock rings, rupture the seal, and advance the breach.

FICTION AND PROGRESSION. Each solved lock removes a barrier and brings Hexapuss closer from the sixth dimension. Lock 1 teaches one orange voice. Lock 2 teaches the Orange/Green relationship. Lock 3 adds Purple to complete the three-voice key. Later locks add waveform, volume, speed, fine tune, LFO behavior, shared tone, and stored position. The final master snapshot completes the breach, opens the portal, and allows Hexapuss to enter our dimension. Insert a free-play interlude after every two or three locks. Completion is the primary reward. Optional ranks may measure time, excess moves, and stability; Discovery mode removes score pressure.

STATE AND SAVE BEHAVIOR. Keep one explicit state object for oscillator values, waveform selections, sigil positions, sustain, Keyboard sound mute, pulse, selected Sound, shared audio controls, recording status, and puzzle progress. Derive every displayed value from that state. Persist unlocked lock IDs, best ranks, accessibility preferences, Main volume, and the last safe instrument state. Keep sigil positions for the current session. Never persist an active recording. Compare normalized quantized values, not floating-point display strings.

RESPONSIVE AND ACCESSIBLE BEHAVIOR. Use semantic controls, visible focus states, ARIA labels, pointer events, and layouts that stack cleanly on phones without horizontal scrolling. Preserve the visualizer's 16:9 aspect ratio. Prevent accidental page scrolling while dragging a sigil. Make controls keyboard accessible and the musical keyboard playable from computer keys. Expose recording status as live text. Respect reduced-motion preferences while preserving lock feedback.

THREE-LOCK MVP. Include three handcrafted creator-authored snapshots; all current oscillator and LFO controls; optional position dimensions; continuous proximity feedback; exact equality; the 1.5-second confirmation hold; Keyboard sustain; Keyboard sound mute; four Sounds; auto pulse and Tempo; center stereo positions; Reset All Oscillators; branded video-and-audio recording; and the sixth-dimension breach progression. Exclude procedural campaign generation, online accounts and leaderboards, default competitive timers, inventory, currency, and upgrade systems.

AUTHORING AND QUALITY. Provide a creator-only snapshot capture command and debug overlay showing every live value, stored value, normalized equality, per-value error, and confirmation progress. Verify keyboard and pointer play, sustain and layering, Keyboard sound mute without interrupting oscillator triggering, every active-voice update, independent LFO amount and rate, preset loading, separate reverb and delay, pulse timing, stereo dragging, center stereo positions, amplitude scaling, exact lock matching, the uninterrupted 1.5-second hold, mobile layout, accessibility labels, reduced motion, analytics firing once, and manual and automatic recording stop. Return the complete runnable static project, the local background asset, the current PDF game design document, and one upload-ready zip. Do not return a mockup, explanation, placeholder, partial code, or changelog.

END OF PROMPT