

## Stratum2 Narrative

a composer says to his computer, "Siri, I'm feeling creative." this launches a window which has a dark theme. musicians like dark app themes. the UI is elegant and sleek, like polished onyx with grains and striations. the app connects to the composer's MIDI piano. the composer sees the names of pieces he'd been working on in previous sessions in a list comprised of the nordstrom font set against a parchment background, glowingly illuminated around the edges of its rounded-corner display pane.

the composer chooses to start something new instead. he says, "Siri, let's jam." the app replaces the initial pane with a display of two elements: a rounded-corner pane, the same width as the initial pane (containing 8 measures of a grand staff) above a second rounded-corner pane with 8 measures of MIDI piano roll aligned with the measures of the grand staff pane. like the initial pane, the grand staff pane resembles parchment and is glowingly illuminated around its edges. on the backend, this has created a new project, but one without a tonal center or song form, one without modality, harmonic function, cadence, or color. the project is awaiting its name and a field of sound.

the app is listening for MIDI, ready to detect and analyze tonal center, and any hint of meter, beat, and rhythm. there's a blank, round display (about the size of a nickel) near the meeting of the top left rounded corner of the MIDI piano roll pane and the bottom left rounded corner of the grand staff pane, which are separated by about a half inch of the polished black onyx surface. the composer begins to improvise on his piano, which routes MIDI to the app as well as a standalone virtual instrument which the composer leaves open on his desktop at all times. when he plays, the app removes the bar lines from the grand staff as well as the beat & subdivision lines on the MIDI piano roll. the app displays the sequence of tones performed by the composer on both the timeless grand staff and MIDI piano roll. as he continues to play, the tones scroll by on both panes, and once the app detects a tonal center, it is displayed in graphite against a light patina within the small circular pane. on the backend, the app has been accumulating the tones from this session in order to analyze them. but the app is not going to present its analysis to the composer unless asked. within the collation of tones which comprise the composer's improvisation, the app is looking for objects it was designed to manage — harmonic phrases.

harmonic phrases each have a harmonic rhythm relative to 4, 6, 8, 12, or 16 bars (8 by default). the phrase's tonality and harmonics are determined by the paths of lines & intervals (foundation, support, and color) from bar 1 beat 1 to phrase's end.

within a musical moment, the interplay of intervals, whether spread or clustered in open or closed positions, produces a field of sound. a sequence of changes in the field of sound manifests as harmonic rhythm within the harmonic phrase. an interval is comprised of two tones sounding at once. each tone has a myriad of attributes, including (but not limited to) note name, MIDI ID, octave, wavelength, frequency, and wave interference pattern, as well as relationships with every other tone in the 88 tone cymatically-tuned or equally-tempered system. two simultaneously sounding wavelengths and wave interference patterns manifest as an interval. multiple intervals sounding simultaneously, and their resulting wave interference patterns manifest as chords, which are experienced in all their modality, function, color, and emotional resonance.

the app looks for a pulse of physics within the gathered sequence of tones. this is aided by the sustain & dynamics information embedded in the MIDI data. these signal meter, beat, rhythm, and phrase length. the app creates records of each harmonic phrase it has discerned from the tones based on its analysis. when the composer is ready, he presses the C8 key on his piano (a configurable choice for this next function) and the app replaces the grand staff and MIDI piano roll panes with a vertically scrollable column of panes, varying in width from 4 to 12 bars wide. the configurable default view of each pane is either grand staff or MIDI piano roll. what was once placed one above the other is now layered opaquely within each harmonic phrase pane. if the composer wants to examine a moment more closely, there is an interdependence between all harmonic phrase panes in that all bars, beats, and subdivisions remain vertically aligned such that click + hold + drag horizontal zoom action in one pane horizontally zooms the other panes. the pane sizes don't change, and all phrases are a consistent height. only the displayed music moves and horizontal scrolling action is independent in each pane. each harmonic phrase includes a grand staff key signature, meter changes (if applicable), initial tempo, and tempo change indications in the forms of accelerando and decelerando symbols. sustain pedal, expression, and dynamics are also notated, as well as above-staff chord symbols and below-staff roman numeral analysis. when any one harmonic phrase view is toggled display its MIDI piano roll, sustain and velocity lanes appear below the composition area, which colors MIDI notes according to detection of bass line & inversion, triadic figuration, color tones & intervals, and pedal / atmosphere tones, all of which are discerned by the app's internal logic. a strip above the MIDI note area displays the key, meter, tempo, and harmonic analysis & chord spellings in green LED-simulated characters. phrase beginnings are determined by identification of a strong downbeat relative to the context of the beats, rhythm, and harmonies which follow. if the app is unable to distinguish a harmonic phrase from any collection of tones which were not used to construct other harmonic phrases, these segments of time display as empty staves and MIDI regions without bar and beat lines. the panes displaying these timespans use the default 8 bar width and are placed in the order they were performed relative to the panes containing established phrases.

the composer auditions the first harmonic phrase using the controls which have now appeared to the left of the top phrase pane. the controls are vertically aligned with the round patina tonal center window, which persisted when the app view changed after the C8 change-view action. the controls include a stop/play toggle action (mapped to A0 on the piano) and a save button, which flags the phrase for later use, and is a single-trigger action mapped to B0 on the piano. these buttons are square with rounded corners and are each about the width of a dime. they appear as physical buttons made from matte-finish black plastic with LED-simulated icons, red/green for stop/play, and a tiny golden piano for save. each harmonic phrase always loops when played, and always plays from the beginning once stopped. the composer scrolls to the next harmonic phrase by briefly pressing the A#0 piano key. if he holds that same key, the phrases will scroll by on a continuous loop, like the fruits in a jackpot machine, buttons and patina window remaining stationary on the left. this is a listening exercise, not a time for editing and arranging. favorite phrases will have been flagged for later use.

once the composer is satisfied (or not), he may move to a more intentional mode (A0 a second time), attending to each line, each interval as its own harmonic layer in a stack of relationships which comprise a harmonic phrase. a third view in the app replaces the scrolling phrase windows with a single phrase window, still horizontally aligned with the buttons & patina window. but now there is a pane to the right of the phrase pane. it looks modern and sleek, metallic controls which will allow the composer to manipulate his saved ideas from any improvisation session that produced a set of harmonic phrases, or he may have arrived at this view by pressing A0 twice in the first place, having bypassed improvisation. if the composer had skipped asking Siri to launch the app, it would have launched with an initial strike of the A0 key, in which case the current view would have been reached through three strikes of the key, once to launch & capture, once to display & audition analysis, and a third to compose harmonic phrases using layers and variation. one of the metallic buttons will disable the standalone instrument with a single click. in this view, phrases can be composed in any order and can be re-ordered vertically through drag + drop action. phrases can be looped and linked on any beat for playback. but for now, because no previous session and no template was selected from the file-open control in the right pane, a single harmonic phrase pane (8 bars by default) displays a MIDI piano roll which matches the those from the previous view, including MIDI lanes below and harmonic analysis above the draw area. but there is an additional window, about the size of a hair barrett, which floats above the phrase pane and can be dragged anywhere. the controls on this tiny window match the matte black buttons from the previous view. the number 1 glows in LED violet on the first button while the others remain dark. 1 indicates something the composer can't see, the transparent layer above the MIDI piano roll and its invisible grid, which is glued to the bars, beats, subdivisions and zoom

functions of the piano roll. layer 1 is the draw surface on which the composer begins to compose.

A timing-aligned transparent MIDI draw layer can be routed to one or more DAW instrument tracks. it can be saved and deleted. MIDI from previously saved layers can be loaded to the current layer. each layer is independently version controlled and can be exported as MIDI. MIDI transformation such as reversal, inversion, humanization, and dynamics & timing (such as groove) can be applied to a layer. a layer can automate audio plugins which have been loaded on a DAW instrument track to which it's routing MIDI, which allows the layer to enable, disable, and control parameters on audio plugins which manage the sound field using EQ, compression, saturation, gain, panning, width, delay, and reverb. the app is not an audio effect or mixer, but it can leverage parameters in the DAW and third party plugins to shape the sound field. the composer has the option of either drawing a line of tones into layer 1 or clicking a metallic MIDI capture button after performing a melody. there is also a metallic metronome button which reveals meter and click noise configuration options when right-clicked. the harmonic analysis bar, which sits above the draw space, displays the notes of the composer's line and displays any modal information detected based on note tendency, range, scale, and alterations.

the composer chooses to draw, capture, or perform a second line on layer 1, which results in dynamically updated interval, tension, and tendency information in the analysis bar. the analysis will update for every additional line added to layer 1, spelling triads, suspensions, augmentation, diminishment, sevenths, extensions, inversions, color, alterations, and pedal tones. voice leading across the harmonic phrase is either determined based on the order in which they were added monophonically or detected based on key, mode, modulation, range, and spread if they were added polyphonically. each line is automatically assigned a different color. lines are shaded from violet to yellow (low to high). when an individual line receives a click + hold action, it will play as long as the click is held. small interval labels automatically appear at the beginning of an automatically detected intervalic line within the harmonic phrase. if one of these labels receives a click + hold action, the intervalic line will play as long as the click is held. the composer is happy with his composition, but decides to break the voices from layer 1 into additional layers. when an individual line or interval is selected, right-click reveals a menu which allows the composer to create an additional layer from the selection. another option does the same, but removes the selection from the current layer when the new layer is created. this can be repeated to create a stack of layers, all of which are transparent, meaning the piano roll background and timing bar are still visible, regardless of which layer is the focus. layers are indicated by slight opacity of different colors assigned to different layers. layer 1 is hued slightly violet, layer 2 is slightly blue, layer 3 is slightly green, etc.. As additional layers are added, the composer sees that the floating bar displays an additional color-

correlated numeric button. these numeric buttons can be MIDI-mapped to piano keys. when the mapped key is stuck, the layer will play from the beginning of the harmonic phrase, allowing the composer to leave the screen, close his eyes, and hear the addition and subtraction of layered lines, intervals, and chords.

the composer then adds another harmonic phrase pane and begins the process again. he notices that his first phrase was, in fact the B section of his song, or possibly unrelated to the phrase he's creating now. no matter, phrases don't need to be composed in order. he hasn't even considered song form yet, though he could have selected a song form template from a menu that's revealed from one of the metallic controls in the pane to the right of the phrase column. this would have generated a column of time-linked phrase panes automatically, but the composer is just capturing musical ideas without regard for arrangement. he proceeds to create the first stack of layers in his second harmonic phrase and can now appreciate that his first phrase was, in fact the B section of his song. upon finishing the first stack in his second harmonic phrase, the composer identifies an altered/non-chord tone he wants to resolve when this phrase iterates, but he doesn't want to use his screen real estate to create another phrase window just to change one note for a second pass of the phrase after the B section plays. fortunately, he can duplicate the stack of layers he's composed, which creates a second stack atop the first, which allows him to alter the focus tone without impacting the earlier moment in his composition. he's beginning to form an arrangement. he decides to drag the lower phrase pane (the A section) above the B section. because the app is able to interact with the DAW timeline and transport, the app can begin playing the A section on bar 1 beat 1 on the DAW timeline. when the end of the first stack of layers in the A section is linked to the beginning of the B section, the bar & beat values from the DAW are reflected in the B section phrase window timeline. when the end of the B section is linked to the beginning of the second stack of layers in the A section, bar and beat values from the DAW update the timeline bar in the upper phrase window. during the first iteration of the A section, the phrase window timeline displayed measures 1 through 8. the B section phrase window below displayed measures 9 through 16. when the upper phrase window plays the second iteration of the A section, the timeline displays measures 17 through 24. additionally, even though the layer stacks are visually divided when an opacity layer is automatically inserted between the top layer of the first stack and the bottom layer of the second stack, the composer is presented with an indicator of the color note he altered between stacks. variations between stacks within a phrase pane are indicated to help the composer retain control over the harmonic context of his arrangement while allowing him to confidently introduce variation and excitement to his composition, without zooming and scrolling around on a long DAW timeline or skipping back & forth between markers and searching for moments of variation. playing a phrase window, rather than linked phrases bypasses phrase linking and plays all stacks within the phrase window in order so that the composer is able to hear phrase

variation without an intermediary section intermediary section shifting the ear of the listening to another modal or tonal field. on the backend, the app makes a folder structure to keep layers organized by project, session, phrase, layer, stack, and arrangement, as well as configuration records for each of these logical containers.

the composer has arranged a composition which sits neatly within a column of only five phrase windows, each containing one to three linked stacks of layers. some layers have links to other layers in the middle of the phrase. bar-and-beat-level linking allows the composer to compose phrases in any order and link partial phrases. one of the phrase windows in this project contains only 4 bars, the last two of which are a cadence, which is recalled with variation, throughout the piece. at the end of the arrangement, when the B section repeats without being interrupted by the cadence, the cadential phrase is simply not linked to the end of the first occurrence of the last iteration of the B section. the composer is able to export the entire arrangement as MIDI or remote arm all MIDI-routed instrument tracks in the DAW and remotely control the DAW transport in order for the app to perform the arrangement into the DAW instrument tracks. the composer may also print any layer, stack of arrangement on a full score, which displays layers as their corresponding, MIDI-routed DAW instrument tracks.

the composer also uses Dreamtonics Synthesizer V to generate multi-part vocals. he wants to hear his arrangement with a previously rendered multi-track AI vocal performance, and he wants to see the vocal lines displayed, in time, with his arrangement. another metallic button reveals a configuration menu upon right-click. he is able to set the path to his working Synth V folder in the project configuration, which superimposes the melody lines from Synth V on the MIDI piano roll backgrounds of beneath the layer stacks. because both the app and Synth V use the DAW transport each phrase window follows both the DAW timeline as well as the corresponding moment in the Synth V project. when a phrase iterates, the corresponding vocal performance is displayed on the opacity layer between stacks within the phrase pane. individual layers can be linked to individual Synth V tracks so that when a layer is soloed, the vocal is soloed with it.

the next day, the composer decides to revisit his improvisations and compose a new piece based on the collection of musical ideas he performed, auditioned, and flagged for later use. the composer strikes A0 three times to launch the third view, then clicks a metallic button with a little piano on it. this button is with the other metallic buttons in the pane to the right of the harmonic phrase column. when it receives a right-click, a menu is revealed which allows the composer to browse improvisation sessions, which are automatically named by date and organized in folders based on detected attributes such as key, mode, meter, and tempo, with an additional folder for indeterminate segments of the session. the composer can click + hold any phrase or segment to audition it from the menu, or right-click the

item to load it into layer 1 in the phrase pane. he is also able to print or export MIDI of determinate phrases which were detected and displayed by the app during the improvisation session.

the composer now has another arrangement, but he isn't certain about the orchestration and management of the sound field in terms of EQ, compression, saturation, gain, panning, width, delay, and reverb. he may want to change the layer-level MIDI routing to take advantage of the differences in sonic space and texture between each DAW instrument track, and he may want to exchange these tracks between layers at different moments in his arrangement based on shifting harmonies within the arrangement as well as the lyrical meaning of the Synth V vocal performance. however, the composer wants to step back from the computer and use his ears while making these choices, so he opens the iOS version of the app on his iPad, sits across the room, and begins to manage the space his arrangement occupies by way of the pre-mixed DAW instrument tracks. the iOS app interface he's presented with is a grid of layer-derived parts and DAW instrument tracks, allowing him to practice these layer-level routing changes over multiple passes, without spending most of his session looking at the screen. orchestration sessions are logged & versioned in the iOS app, and can be exported and saved to the same cloud drive directory where his improvisation & composition sessions were stored. once his orchestration session is complete, the composer returns to his DAW for production before rendering and sharing his audio.