ensembles

User Manual

APPLIES TO

AW100

Ensembles is a virtual arranger workstation app. It is made using Vala and Gtk, for **elementary OS**.
Ensembles is powered by **FluidSynth** and **E-mu 10K1** sound engine.

Please keep all information for future reference.

Important!

Ensembles is still in Alpha and is not yet ready for production.

The software does require quiet a lot of CPU power. If you notice bad delay or stuttering audio, launch the app from terminal; check to see if there is any error messages stating that FluidSynth was unable to set realtime priority. In that case, edit the file- /etc/security/limits.conf and add the following lines:

```
@audio   -  rtprio      90
@audio   -  memlock     unlimited
```

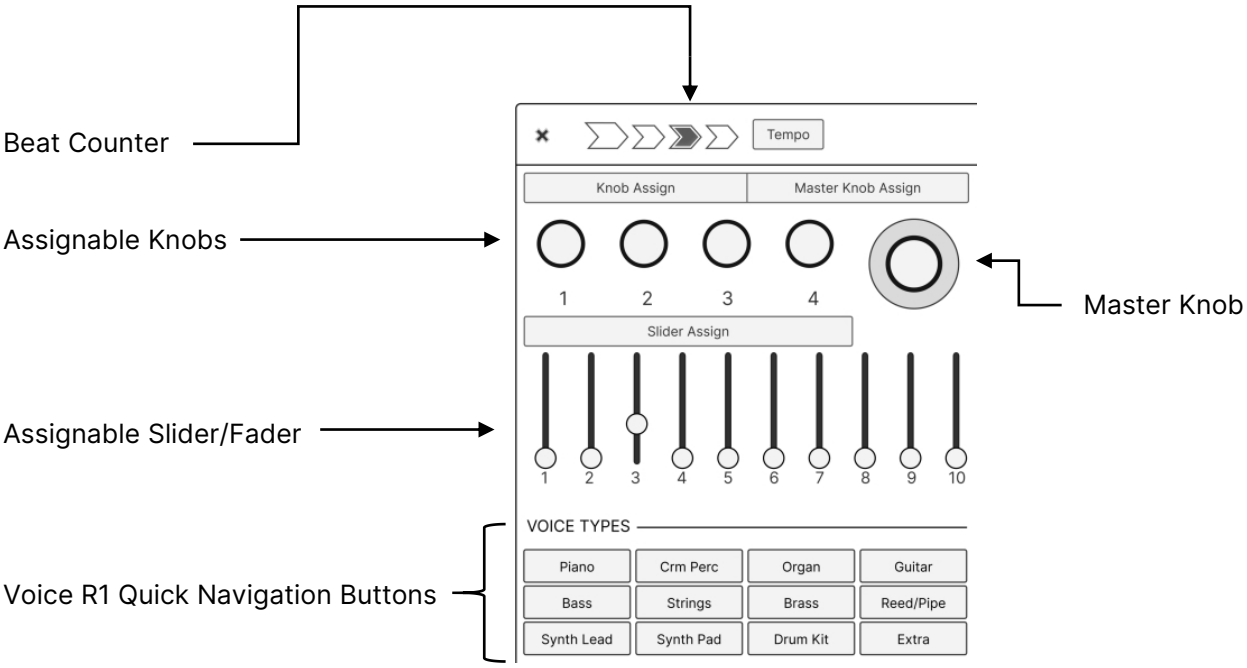
The problem currently usually happens with the Flatpak version.

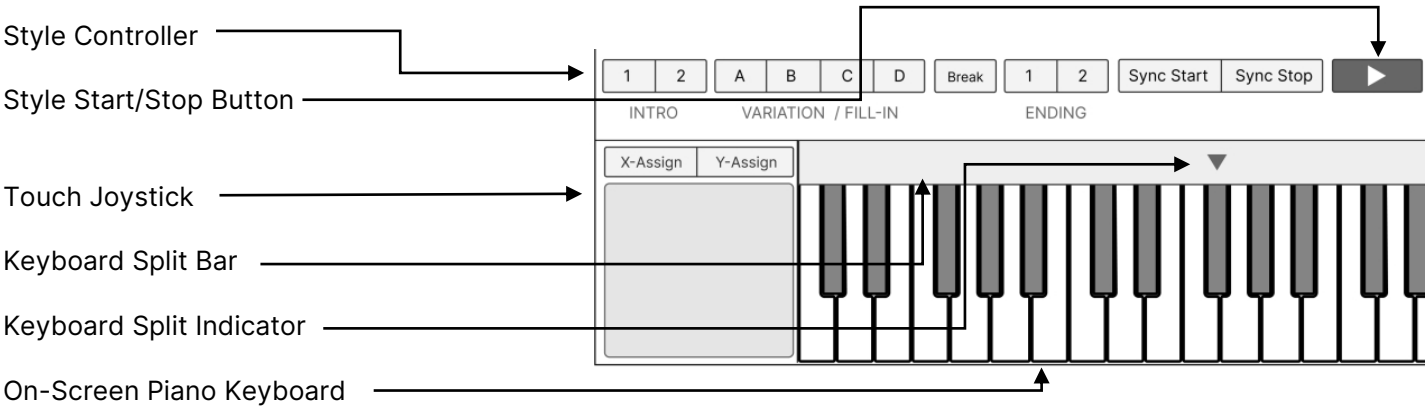
To connect a MIDI Controller, connect your controller to your PC first and then start Ensembles and turn on MIDI Input.

This manual uses elementary OS 6 Odin as base and assuming that the app was downloaded via AppCenter

Content Type Rating: OARS 1.1

User Interface Guide



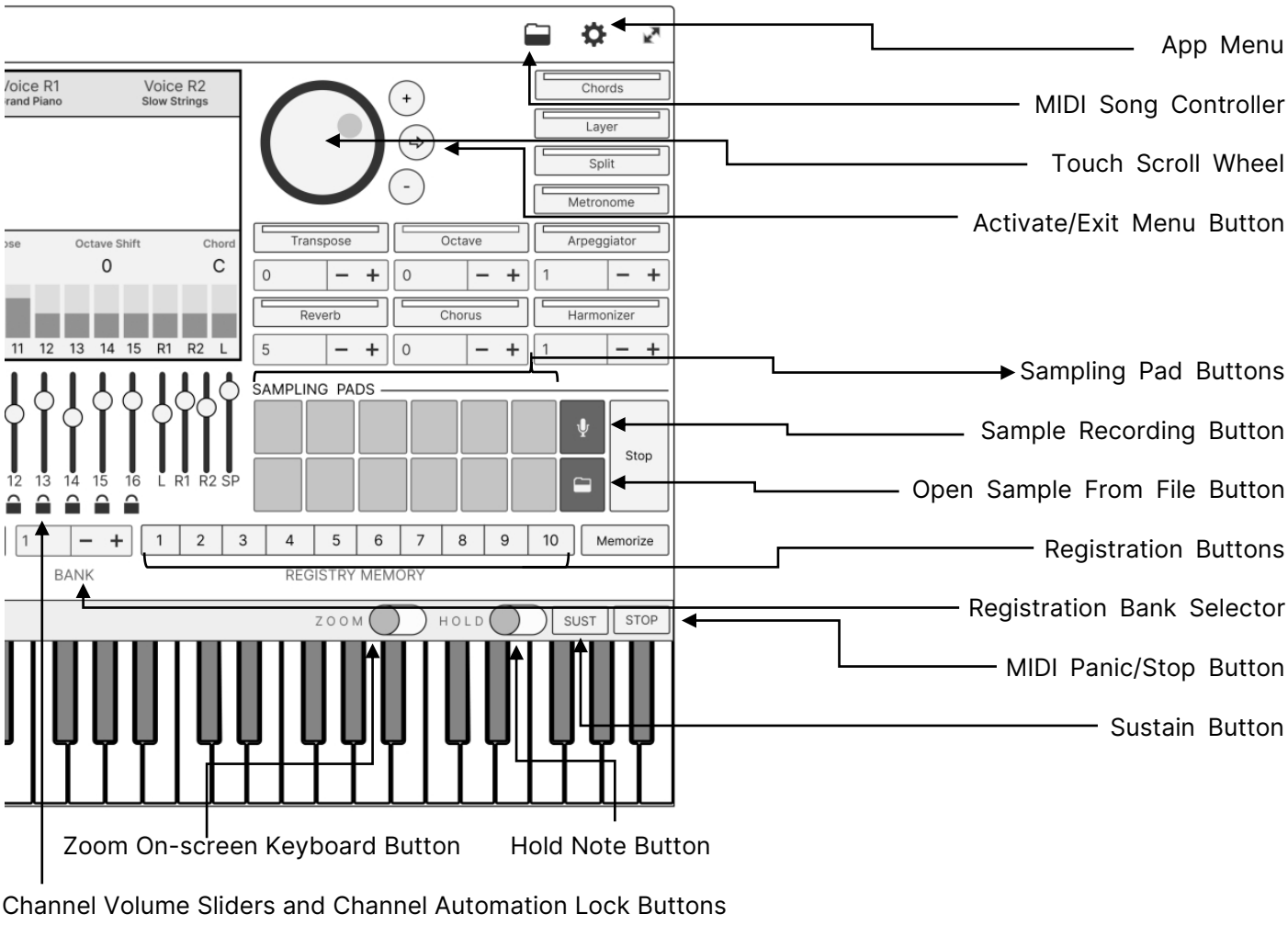


The knobs, master knob, sliders and joystick has their respective assign buttons. More on them later.

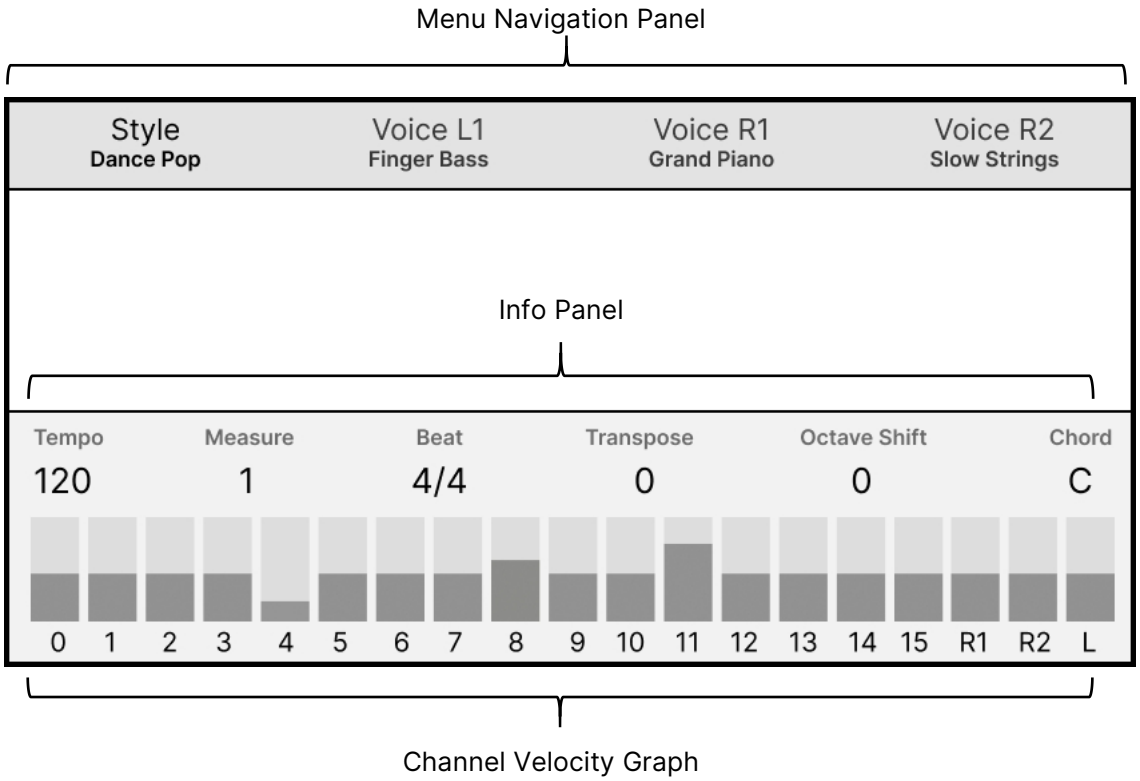
The Split Bar is clickable and clicking on the bar causes the split point (as well as the split indicator) to shift.

Knobs and Sliders remain in the state that you leave them with you release the mouse button (or take off your finger from the screen, in case of touch screen). Joysticks on the other hand reset back to center the very moment you release the mouse.

Master Knob is used to control multiple knobs and sliders at the same time. More on that later.



Musical Info Display



Playing Ensembles

1. Start the Ensembles from the Applications menu
2. You can start playing by typing keys on your PC keyboard:
   Keys [AWSEDFTGYHUJKOLP] are used to play right hand side. Use shift or caps lock to quickly switch octave. Keys [ZXCVBNM,./;'[]] are used to play chords (when accompaniment is on) or play left hand side.
3. On touch screen you can directly tap the on-screen piano keyboard to play tunes.
4. You can adjust volume of playback either by sliding the R1 volume slider or using the volume panel of your OS. In elementary OS use sound indicator in the top (wing) panel, or scroll your mouse over the icon.

Let's use a Real Keyboard

While its okay to play using your Desktop or Laptop keyboard, but its recommended to connect to an external MIDI keyboard for best results.

1. Close Ensembles if already running
2. Connect your MIDI Keyboard to your computer
3. Start Ensembles
4. Open App Menu (see User Interface Guide), and enable MIDI Input
5. Your keyboard name should appear in the list. Don't worry if it's not the exact name, but so long you recognize it, its okay. Double click the name
6. You should now be able to play using the keyboard

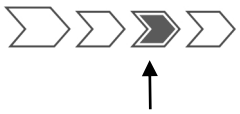
MIDI Keyboard Touch Pressure

1. Sound intensity depends on how fast you press the keys on your MIDI Keyboard
   a) Softly or slowly press the keys and you get a faint sound
   b) Press faster and you get much more intense sound
   c) Don't press too hard as it can damage your keyboard

2. We refer to this functionality as "Touch sensitivity". Availability of this feature depends on the MIDI Keyboard. Touch screen doesn't mean touch sensitivity. It's also unavailable if you use your computer keyboard or your mouse to click on the on-screen keyboard.

Using the Metronome

Click the "Metronome" button to start the metronome.



This graphic (beat counter) changes with every beat.

Changing Metronome Beats Per Bar

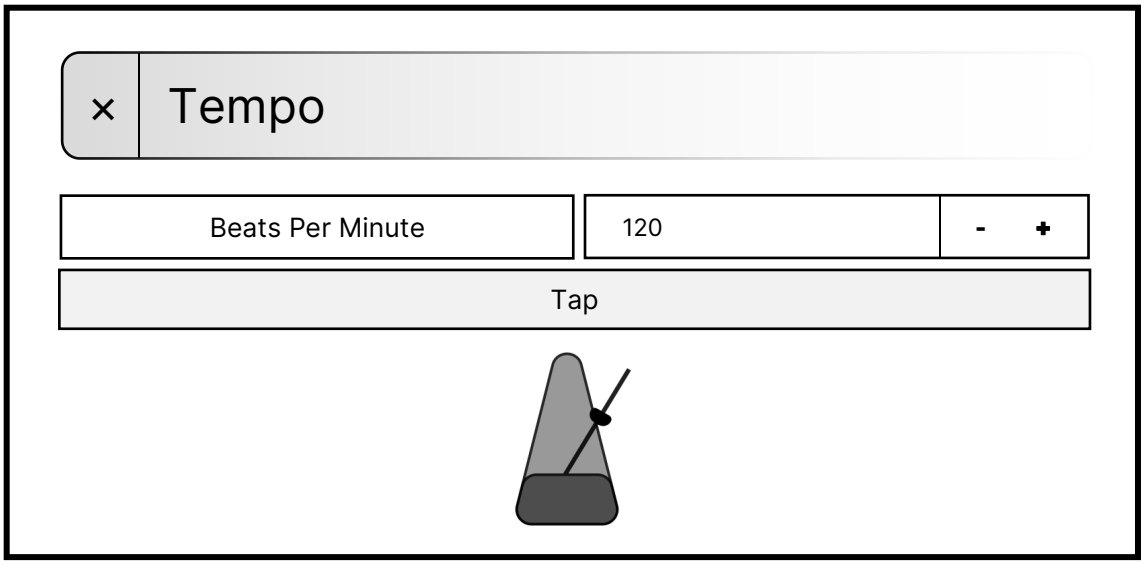
You can change the number of beats per measure by selecting a Style* with the required time signature.

Changing Metronome Tempo or Speed

1. Click the “Tempo” button in the header bar
2. On the virtual info display, click on + or - to change tempo (We will call this spin button). You can also type in a value or use the touch scroll wheel to change tempo faster
3. Click “Tap” in the info display to tap to the beats of any song that you are listening and match to the tempo of that song

[Note: For now there is no way to set metronome time signature explicitly. Metronome picks up time signature and tempo from the currently selected style.

* Style or auto-accompaniment is a feature that provides background music while you are playing melodies. More on this later]



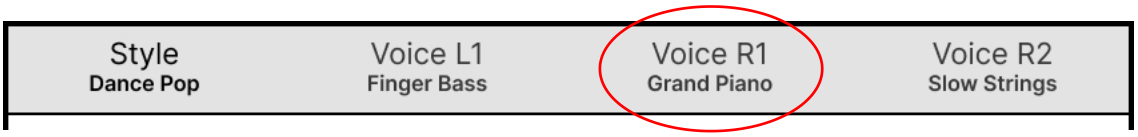
Changing Sounds

Ensembles let's you select from a wide variety of instruments like guitar, violins, etc. You can layer two instruments or even play two different instruments on using both hands.

Selecting An Instrument For Playing

1. Click on the "Voice R1" button on the info display. That opens the instrument selection menu
2. Instruments are categorized
3. Click on an instrument to select it
4. You can also use the touch scroll wheel to go up or down the list quickly
5. You can click on one of the "Voice Types" to quickly navigate to a category (only for R1 voices)

[Note: R1 refers to instrument that play on the main (right hand side of split) keyboard. R2 refers to layered instruments usually on the right hand side. L refers to Instrument selected for the left hand side when the keyboard is split. Layering and Splitting are discussed in the next section]



Layering Two Instruments

1. Click on the "Layer" button (see User Interface Guide). The light on the button indicates that layer is active
2. If you play anything, you should now be able to here another instrument (usually strings for first time run) playing at the same time as the main instrument
3. Click on the "Voice R2" button on the info display, which opens the Instrument menu for R2
4. Select any instrument as you like and it will be layered with the main instrument

You can modify the volume of layered instrument by moving the volume slider that says "R2".

Splitting The Keyboard

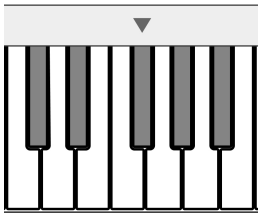
1. Click on the "Split" button (see User Interface Guide). The light on the button indicates that split is active
2. If you play anything on the left side the split indicator (which is a small downward triangle over the on-screen keyboard), you should now be able to hear a different instrument. Playing on the right of the split should play your main instrument
3. Click on the "Voice L" button on the info display, which opens the Instrument menu for L
4. Select any instrument as you like and it will be set for the left hand side of split

You can modify the volume of split instrument by moving the volume slider that says "L".

Changing Split Point

Click any where on the Keyboard Split Bar (see User Interface Guide) to set that as the new split point.

This also changes the chord detection area as well. More on Styles later.



Using Reverb

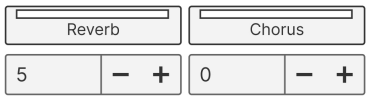
Reverberation is an effect that simulates sound bouncing off walls of a hall for example.

1. Click on the “Reverb” button (see User Interface Guide). The light on the button indicates that reverb is active
2. You can change reverb intensity using the spin button below the “Reverb” button, or you can type in a value

Using Chorus

Chorus effect adds some depth to notes and also kind of spreads the sounds over stereo

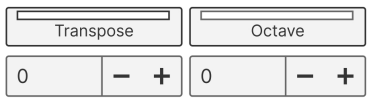
1. Click on the “Chorus” button (see User Interface Guide). The light on the button indicates that chorus is active
2. You can change chorus intensity using the spin button below the “Chorus” button, or you can type in a value



Changing Transpose or Octave

Transpose is used to shift the pitch by semitones. Use the “Transpose” button (see User Interface Guide) to turn transpose ON or OFF. While it’s ON, using the spin button below it, you can change the transpose amount.

Octave shift can be used to pitch shift by an entire octave. Use “Octave” button to turn octave shift ON or OFF. While ON, you can change shift amount using the spin button below it.
(Alpha: Octave shift for Voice L hasn’t been implemented yet)



Using Sampling Pads

You can use the Sampling Pads to record & play or play prerecorded audio with your music.

To record audio from mic or computer sounds, press and hold the button. Once you are done recording, let go of the button and you can see the pad buttons light up with a golden glow. This indicates, they are ready to be assigned. Click on one of them to assign the recorded sound to that pad button.

You can change the recording source from app menu .

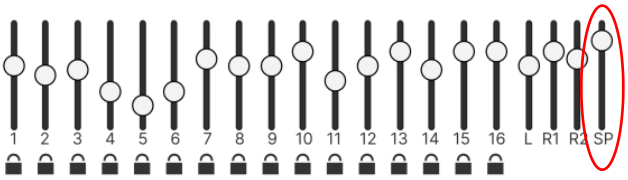
To use a previously recorded sounds click on the button. Browse to your recorded audio (wav and mp3 files supported). Click “Open”. The pad buttons light up signifying that they are ready to be assigned. Click on one of them to assign the audio file to that button.

After a sampling pad button has been assigned, you can play it by clicking/tapping on it. To stop all pads that are playing audio, click on the “Stop” button.

[Note: Recorded audio is stereo. While recording from system, it may also include operating system sounds like notification Dings. You can turn on “Do Not Disturb” to prevent unwanted notifications during recording. Sampled sounds are no longer available after you close the app. Clean Up protection for sampled sounds isn’t available in this Alpha. Prerecorded audio gets unassigned after app close, the original file will still be in tact.]

- You can assign to the same button again overwriting the previous assignment.

- You can move the “SP” Volume slider to change Sampling Pad volume.



Playing MIDI Songs

You can play MIDI files using Ensembles synthesizer. In that case it will by default use the in-built sounds to play.

You can directly open a MIDI song from Files app by double clicking the MIDI file. In case Ensembles is not the default app for handling MIDI files, right click on the file > Open with > Ensembles.

You can open files from Ensembles by clicking the button in the Song Controller (see User Interface Guide). Browse to the MIDI file and click “Open”.

The song should start playing on opening. The header bar changes to show the song name and seek bar. The Song Controller will now show Rewind, Play/Pause and Repeat buttons respectively.

You can drag the seek bar to any point to go back or forward in the song. Clicking the button will cause the song to play from the beginning. Clicking the button will turn repeat ON or OFF. Pausing the song hides the song name and seek bar.

You can also control the Song Player via Sound Indicator in wing panel or media keys on your PC keyboard.

Song Note Tracking

Ensembles can track notes playing on a particular channel of the song and show them on the on-screen keyboard. You can use this to practice songs. [Alpha: Feature not yet implemented]

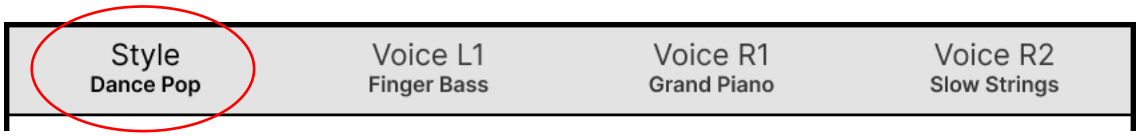
Playing With “Style”

You can play as an one person band and have Ensembles provide backing track while you play the melodies. This is called Auto-Accompaniment Style or Style for short. You can select a certain Accompaniment Style depending on the genre of music you want to play. Think of Styles like your personal band. This band comes complete with Bassists, Pianists, Orchestra, Drummer, etc. You can control the Style chord using your left hand and also the amount of variation and trigger fills. Every Style has two kinds of Intros (starts the accompaniment with some appropriate tunes), two kinds of Endings (stops the song gradually in style), four variation modes (A, B, C, D corresponding to Verse, Pre-Chorus, Bridge and Chorus, not in any particular order) and four fills (some piece of intense music to signify transition from one part to another).

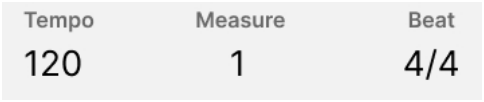
Auto-Accompaniment Styles are made up of several channels playing Drums, Bass, Chords, Leads, etc.

Starting Accompaniment

1. Press the red ▶ button in the Style Controller (see User Interface Guide) to start a style
2. Click on the “Style” button in the info display



3. This open the Style selection menu. Click on any style name (sub genre) to change to that style. You can also use the scroll wheel to skip several styles at once. (Its the same kind of menu as the Voice Menu). Every style item shows the default tempo* and time signature. Styles are categorized based on genre
4. Exit out of the menu by clicking the close menu button at the top of the info display
5. The info display shows information about the status of the style playback. You can check the tempo in beats per minute, time signature (referred to in the display as “Beat”) and measure. Measure counts the number of bars played since beginning playback



6. Try playing along with rhythm. See when the measure changes and also how the pattern in the beat counter changes with the beats. This graphic at the top left corner of the app:

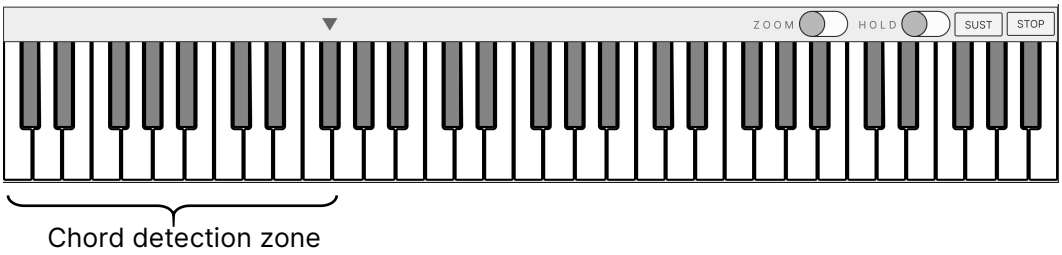
7. To stop accompaniment, click the ▶ button in the Style Controller again

[Note: Time signature “Beat” has two parts separated by a “/”. The left side is the number of beats per bar and the right side is the number of quarter notes per bar. Time signature also changes the beat counter animation]

Enable The Chords

Now let's bring in the rest of the band.

1. Click on the "Chords" button (see User Interface Guide)
2. Start the style. This immediately starts playing all the other parts of the style in default C major chord
3. Press any key on the left side of split indicator too change chords to that key (major)
4. Press more than one keys to play other types of chords like minor, sus, dim, etc. [Alpha: Only major and minor chords are currently available]. Current chord is shown in the info display
5. Click on the "Chords" button to disable all parts except drums and percussion



Playing Various Parts Of Style

1. Click on the ▶ button in Style Controller to start accompaniment
2. Notice that by default the variation button "A" is highlighted
3. Click on variation button "B". This adds some more variety to the instruments playing and the melodies when the next bar is played
4. Similarly you can click any other variation button to change to that. Click on the current variation button again to trigger a fill-in. This adds some momentary extra bits of melodies and drums
5. You can trigger a fill-in and quickly click on a different variation to smoothly transition from one variation to another

Synchronous Start & Intro

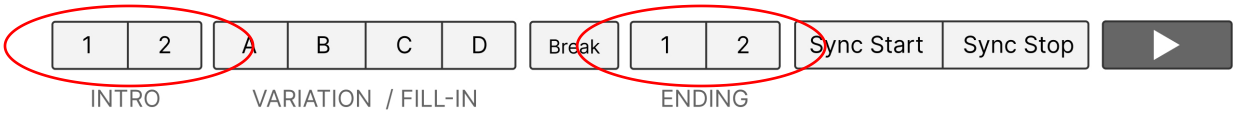
1. Click on the "Sync Start" button and then the Intro button "1". This set the style to start the very moment you press one of the chord keys
2. Press down any chord key (or a combination of keys for different types of chords). This will start the accompaniment with a nice Intro music.

[Note: Intro 1 usually a shorter version of Intro 2. Use Intro 2 if you want a longer more defined Intro music]

Synchronous Stop & Ending

1. While the accompaniment is still playing, click on the "Sync Stop" button. This will stop the accompaniment after the current bar completes.
2. Alternatively, click on the Ending button "1". This will stop the accompaniment with some additional tunes in a proper way.

[Note: Ending 1 usually a shorter version of Ending 2. Use Ending 2 if you want a longer more gradual ending]



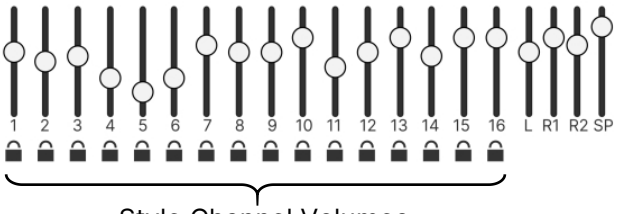
Break Play

You can cause the accompaniment to momentarily stop playing before starting again at the next bar. This can be done by clicking the “Break” button at any time when the accompaniment is playing.

Modifying Style Mixing

When a style starts playing, the Mixer volume sliders/faders automatically move according to the programmed mix of the style. You can however manually modify them realtime.

1. Move one of the volume sliders for example the one that says “1”. This will change the volume of the instrument playing in channel 1 of style. [More on channels later]
2. Notice that there is a small lock icon below every slider which changes to an unlocked icon when you move a slider. This means that the channel volume will now obey the slider instead of its programming
3. Click on the unlocked lock icon below one of the slider to set it to follow its programming instead



Style Channel Volumes

Using Harmonizer

This add harmony whenever you are playing some melody with your right hand while “Chords” is ON.

1. Click on the “Harmonizer” button to activate it
2. Play some notes with your right hand. Provided that “Chords” is activated, you will hear some more tones playing along side the keys you are holding
3. You can change the type of harmony by using the spin button below it

[Alpha: Harmonizer still as some issues with it not stopping certain notes. If notes get stuck, play that note again or click on the “STOP” button above the on-screen keyboard]

Type Number	Name	Description
1	Duet	Plays another note below the current note usually maintaining a 2 to 4 degrees separation. It depends on the chord.
2	Duet Alt	Plays another note above the current note usually maintaining a 2 to 4 degrees separation. It depends on the chord.
3	Duet Root	Plays another note in open to (above or below) the current note which is also the root note of the chord.
4	Country	Plays a country harmony depending on the chord.
5	Duet Octave	Adds an open harmony note which is exactly one octave above or below the current note. It does not depend on the chord.
6	Duet Fifth	Adds an open harmony note which falls on the fifth degree. It does not depend on the chord.

Using Arpeggiator

Arpeggio refers to playing certain notes repeatedly in a pattern. If you are worried of your hands tiring from playing the same thing over and over again, Ensembles can play them for you.

1. Click on the “Arpeggiator” button to turn it ON
2. Press down a couple of notes on the keyboard and the notes will alternate automatically in a pattern
3. Use the spin button below it to change the arpeggio pattern

Type Number	Pattern
1	2 Notes Per Beat Up
2	3 Notes Per Beat Up
3	4 Notes Per Beat Up
4	2 Notes Per Beat Down
5	3 Notes Per Beat Down
6	4 Notes Per Beat Down
7	2 Notes Per Beat Up/Down
8	3 Notes Per Beat Up/Down
9	4 Notes Per Beat Up/Down
10	2 Notes Per Beat at Random
11	3 Notes Per Beat at Random
12	4 Notes Per Beat at Random

You can also combine Harmonizer and Arpeggiator.

Saving Ensembles States

Ensembles being an elementary OS App, comes with the usual state saving functionality. To briefly go over it, when you close the app, most of the Ensembles UI state (eg. Style, Voices, various activation buttons) is saved into your PC memory. Next time you open Ensembles it will automatically restore that state from memory.

Now this is standard design for most elementary Apps.

But what Ensembles also allow you to do is manually save the app state (at least musically relevant information) in **Registry Memory**. Registry Memory provides multiple memory slots grouped in banks. You can save Ensembles (musically relevant) settings in various slots and restore them with one click. The bank based grouping allows you to organize settings based on the music that you want to play. For example, you are using Ensembles for a school play. You can save settings for the play sound effects in one slot, background music in another and settings related to an ending music in a different bank. If you are using Ensembles for various plays, store the settings for every play in separate banks. Best of all, you can set all this the day before final performance day during rehearsal, shutdown your PC, start Ensembles and all the slots still have the settings you stored in them.

You can store settings in 10 slots in every bank out of 16 available banks

1. Make some changes or music related settings and click the “Memorize” button
2. All the registry slot buttons will start glowing, indicating that they are now assignable. Click one of the Registry buttons, say for example “1”
3. Change some more settings and repeat the previous steps and use a different Registry button now, say “2”
4. Now click on the first button, say “1”, and all your settings for that slot are restored
5. Click the other button, say “2”, and all the new settings stored in that button are restored
6. Use the Bank spin button to change bank

Registry Memory can be overwritten if you memorize to the same slot you used before to store some settings.

Types of settings that are stored in Registry Memory:

- Voice R1
- Voice R2
- Voice L
- Style
- Tempo
- Chords Enabled State
- Transpose
- Octave Shift
- Reverb
- Chorus
- Layer Enabled State
- Split Enabled State
- Harmonizer
- Arpeggiator

Basically everything we have seen in this manual up until now are stored in Registry Memory (except split point, channel modulator state and mixer)

Spice Up Music With Effects

Ensembles comes with several DSP (Digital Signal Processing) effects (including Reverb and Chorus), pitch bend and stereo panning. You can change these effects for every channel in a style during playback or for the instruments you are playing.

Available Modulators:

- Pan (stereo balance)
- Reverb Intensity
- Chorus Intensity
- Pitch (One full tone up/down)
- Expression
- Modulation
- Cut Off (IIR based frequency cut off filter)
- Resonance

Change Effects in Styles

Styles usually have their own set of programmed automation of the effects, which can be modified individually.

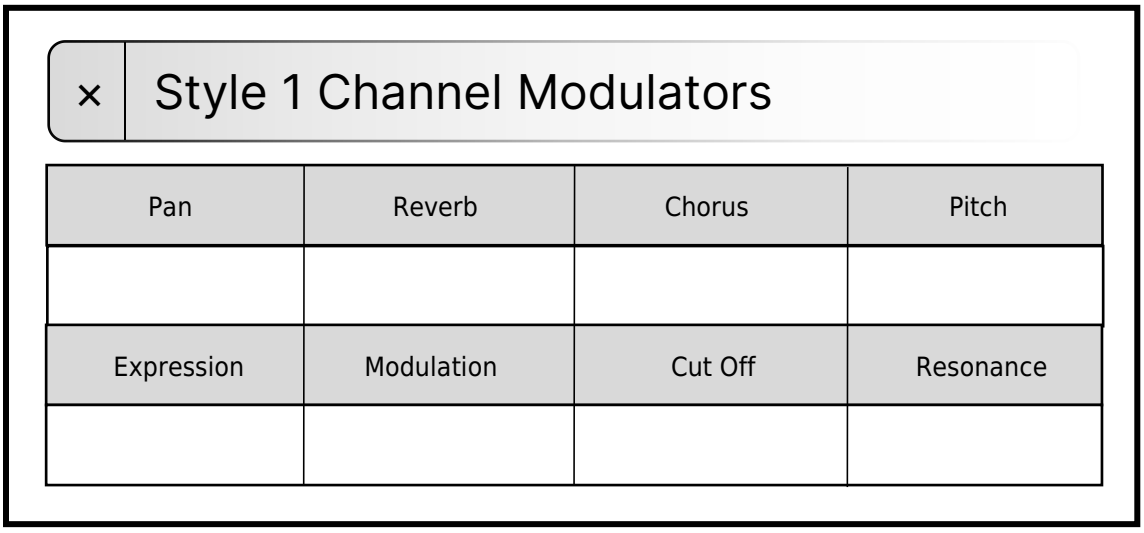
1. Click on the little ⚙ icon below the channel velocity graph in the info display. That open the modulators screen for that particular channel of the style. Note that the modulator values keep changing on their own based on the programmed automation in the style
2. Change any of the value to observe how that changes the sound characteristics for the instrument playing in that channel
3. When you change one of the modulators, a lock icon appears beside the name of the modulator. This means that the modulator will now obey what you set in the spin button. Click on the lock icon to set the modulator to follow it's programmed automation instead

Change Effects for Voice R1, R2 and L

You can modify effects for the instruments selected as main voice, layered or on the left side of split.

1. Click on the ⚙ icon below the velocity graph of Voice R1, R2 or L
2. Change any of the value to observe how that changes the sound characteristics of the instrument

[Note: There are no lock icons beside the modulator names when you change them, that's because these modulators always obey the settings you set for them]



Using Knobs And Sliders

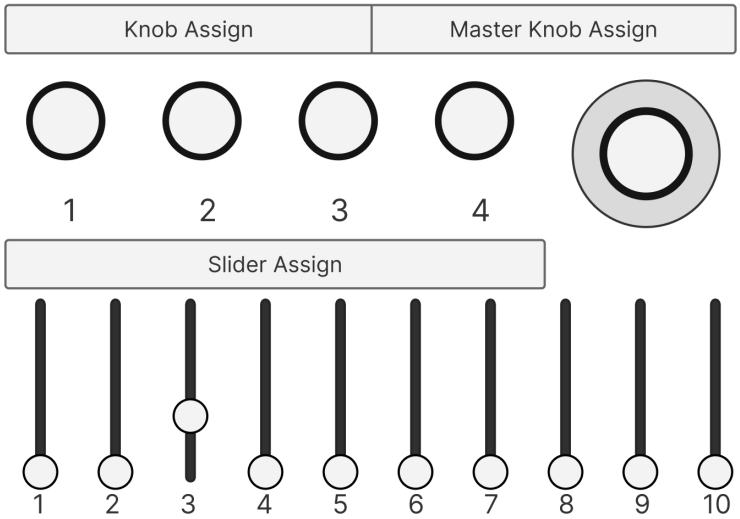
Ensembles comes with a set of knobs and sliders that can be assigned to certain modulators (discussed above).

To assign a knob to a modulator:

1. Click on the “Knob Assign Button”. All the knobs light up, indicating that they are assignable
2. Move one of the knobs. All the other knobs go back to normal, while the one you moved keeps glowing
3. Open one of the modulator screens (as discussed above), and click one of the modulator names
4. Now move the knob and watch the modulator values changing based on that

To assign a slider to a modulator:

1. Click on the “Slider Assign Button”. All the sliders light up
2. Move one of the sliders
3. Open one of the modulator screens and click one of the modulator names
4. Now move the slider and the modulator value should now change according to that as well



Using the Master Knob:

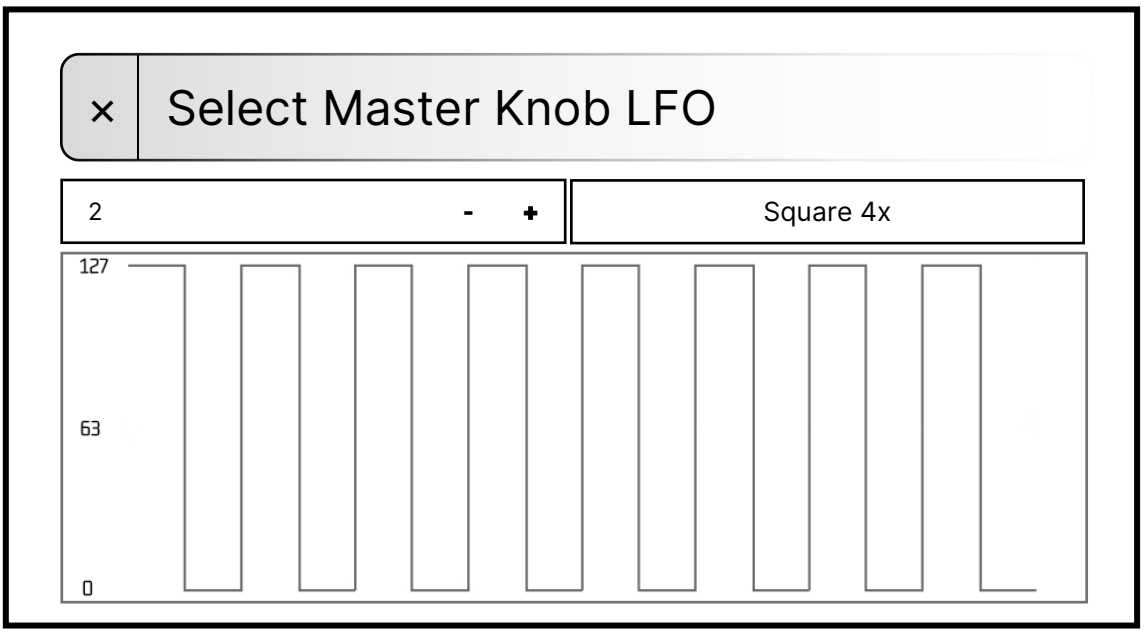
You can also assign multiple knobs and sliders to the master knob. This allows you to control multiple modulators using a single knob, i.e. the master knob. (It glows and pulses all the time, that’s how you identify it). Follow the below steps after you have some knobs and sliders assigned to some modulators.

1. By default the master knob pulses and glows. Click on the “Master Knob Assign” button. All the knobs and slider start glowing indicating that they can be assigned to the master knob
2. Move the knobs and sliders that you want to assign one by one
3. Lastly move the master knob. The knob stops pulsating and glow becomes constant indicating that it’s now in control
4. Move the master knob and all the assigned knobs and sliders move according to it

Knobs, Sliders and Master Knob can be reassigned any number of times. Every time you click the Master Knob Assign button you have to go over all the knobs and sliders you want assigned to master knob again.

Master Knob LFO

Master Knob can be set to automatically move in a set pattern (using a Low Frequency Oscillator). Every time you move the master knob during the last step of master knob assignment, the LFO screen shows up in the info display. Use the spin button to change the LFO pattern.



Once an LFO pattern is set the only way to change or disable it is go through the above steps again

[Alpha: Currently it is not possible to assign these knobs and sliders to the ones provided in MIDI controllers]

Using The Touch Joystick

You can assign certain modulators to the touch joystick. Unlike the knobs and sliders, the Joystick has an elastic nature and it comes back to the center after you stop moving it. Joystick also provides two-dimensional control of modulators by assigning two modulators on the two axes.

1. Click on the “X-Assign” button
2. Open one of the modulator screens and and click one of the modulator names to assign it.
3. Drag your mouse or finger on the joystick area to control the modulators
4. Similarly you can assign the y-axis

Using Sustain

Hold any key and click and hold the “SUST” button above the on-screen keyboard. This will cause the sound to continue after you let go of the key. Its not the same thing as Reverb.

[Alpha: Currently you cannot bind this to Sustain pedal or MIDI controller]

Using External Data

You can load custom styles built using Ensembles styles specification by placing them in special folders in your Documents folder `Documents/Ensembles/Styles/` .

You can also load other sound fonts by placing them in these folder [Alpha: Not implemented yet]

Audio Software Interface

Ensembles uses PulseAudio for output. PulseAudio is CPU intensive, so sound quality can suffer on higher CPU loads.

Ensembles can potentially interface with other MIDI software running at the same time or other synthesizer or arrangers connected to the PC.

Specifications

[Not Implemented Yet]

MIDI Implementation Chart


Tempo
Ensembles
Knob Assign
Master Knob Assign
Slider Assign
Style
Dance Pop
Voice L
Fingered Bass
Voice R1
Grand Piano
Voice R2
Strings
Tempo
125
Measure
0
Beat
4/4
Transpose
0
Octave
0
Chord
C
Accompaniment
Layer
Split
Metronome
Transpose
Octave
Arpeggiator
Reverb
Chorus
Harmonizer
VOICE TYPES
Piano
Crm Perc
Organ
Guitar
Bass
Strings
Brass
Reed/Pipe
Synth Lead
Synth Pad
Drum Kit
Extra
SAMPLING PADS
Stop
Sync Start
Sync Stop
Memorize
INTRO
VARIATION / FILL-IN
ENDING
BANK
REGISTRY MEMORY
X-Assign
Y-Assign
HOLD
ZOOM
SUST
STOP