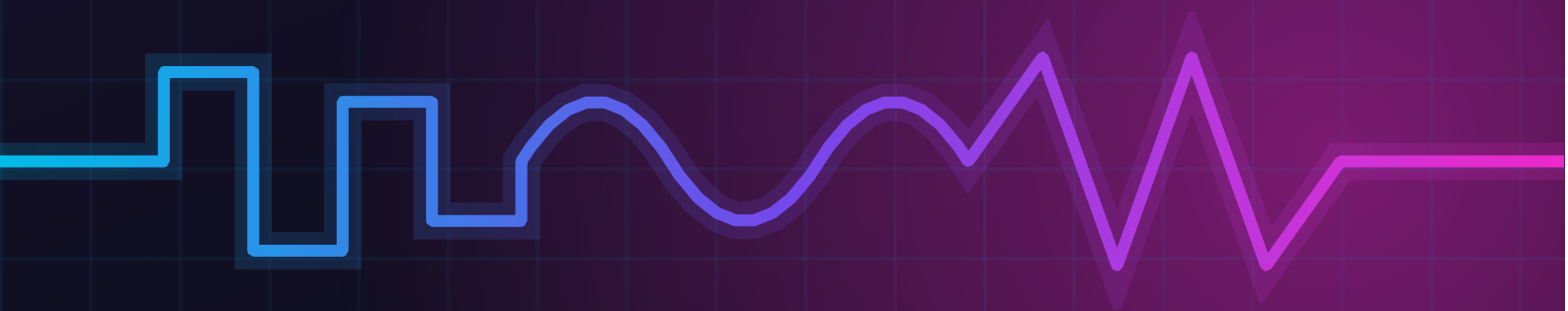




ChipWave Studio

USER MANUAL

0.2.17.0



Free for everybody, made with love by **Del (postmanpat)**

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HOW TO READ THIS New to music software? Read chapter 1, make the song in chapter 2, then take the tour in chapter 3. Everything else is there for when you need it. Words in **bold** are buttons or menu items you'll see on screen, and keys look like **Ctrl** + **S**. On a Mac, use **Cmd** where this manual says **Ctrl**.

Welcome and installing

ChipWave Studio is a free music studio for your computer. You arrange songs on a **Timeline** and play them with built-in synths, drum kits, a synthetic voice and samples. Generators write chords, melodies and bass lines with you, and a mixer with effects and a loudness meter gets the song ready to share. If you like old-school trackers, there's a Tracker under the hood too.

It's open source (GPL-3.0-or-later), and it runs on Windows, macOS and Linux. There are no accounts, no subscriptions and no ads.

NEW IN 0.2.17.0

- **This manual is built in:** **Help › User Manual**, or the button on the About page. No internet needed.
- **Digital rain:** the About page appears out of falling code, straight away. Any key or click skips it.
- **Exports end cleanly** at the end of your song, without the first row playing again.

Your songs open and play just as they did in 0.2.16.0.

Windows

1. Go to github.com/postmanpat-303/ChipWaveStudio/releases/latest.
2. Download `ChipWave-setup-x64.exe` (installer) or `ChipWave-windows-x64.zip` (portable: unzip it anywhere and run it).
3. Run it. ChipWave isn't code-signed yet, so Windows SmartScreen may warn you. Click **More info**, then **Run anyway**.

macOS (Apple Silicon and Intel, macOS 11 or newer)

1. From the same releases page, download `ChipWave-macos-universal.dmg` (or the zip) and drag ChipWave into Applications.
2. The app isn't notarised yet, so the first time, **Control-click** it and choose **Open**. If macOS still refuses, run this in Terminal:

```
xattr -dr com.apple.quarantine /Applications/ChipWave.app
```
3. Shortcuts shown as `Ctrl` also work with `⌘` `Cmd` (`⌘S` saves, `⌘Z` undoes).

Linux

Build from source. Install Rust (from rustup.rs) and the ALSA development package (`Libasound2-dev` on Debian and Ubuntu), then in the project folder run:

```
cargo run --release
```

First start

ChipWave opens with a clean song on the Timeline. For a quick taste, choose **File › Demo songs**, pick one and press `Space`. The first time, ChipWave also offers to **find plugins**. You can scan automatically, choose folders, or skip (see chapter 11).

UPDATES **Help** › **Check for updates...** tells you when a new version is out. You can also turn on **Check for updates at startup** in **Settings** › **Files & Safety**.

Your first song in 10 minutes

This walk-through builds a short loop with drums, chords, bass and a melody, then exports it as an MP3. Don't worry about getting it "right": everything can be undone with **Ctrl + Z**.

- 1 **Start fresh.** Choose **File > New** (**Ctrl + N**). You get an empty Timeline with only the **Song / Master** track. 0:30
- 2 **Add drums.** Press **Ctrl + B** to show the **Browser**. On the **Instruments** tab, drag **Drum Kit** onto the empty Timeline. In the Drum Kit editor below, click **DICE KIT** until you like the sounds, paint a few steps, then click **ADD TO TRACK**. 2:00
- 3 **Add a chord instrument.** Drag **WaveForge** (or **Synth**) from the Browser onto the Timeline. A new track appears. 3:00
- 4 **Write chords.** Click **Chords...** under the tracks. Pick a **Style** (try *Synthwave*) and a **Key**, press **Preview**, and click **Another one** until it sounds good. Then click **Write to timeline**. 5:00
- 5 **Add a bass line.** In the same generator panel, open the **Bass** tab, pick a style (for example *Octave pump*) and write it. It goes on a new "Bass" track. 6:00
- 6 **Add a melody.** Open the **Melody** tab, try a few **Another one** rolls, and write it to a new "Melody" track. 7:00
- 7 **Listen.** Press **Space** to play and stop. Press **L** to turn looping on or off, or Shift-drag the ruler to choose the loop. 7:30
- 8 **Balance it.** Open the Mixer (**Ctrl + 3** or the **MIX** tab) and pull the faders until nothing is too loud. The master limiter keeps peaks safe. 8:30
- 9 **Save.** Press **Ctrl + S** and give your song a name. It's saved as a **.cwt** file. 9:00
- 10 **Export.** Press **Ctrl + Shift + E**, choose **MP3** and click **Export**. Your song lands in **Music/ChipWave**. Done! 10:00

NO SOUND? Check **Settings > Audio**: choose your output device and click **Play test tone**. Chapter 15 has more help.

A tour of the screen

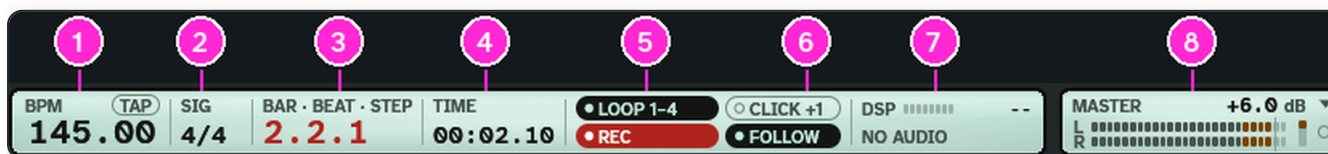
This is ChipWave with the demo song *Neon Overdrive* open, in the default layout: the Timeline on top and the piano roll below.



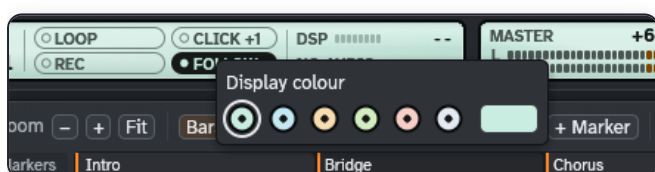
The main window at 1366×768. (Audio was off while these screenshots were taken, so the display says NO AUDIO.)

- 1 **Menu bar:** File, Edit, View, Song and Help. The song's name is on the right, with a dot when there are unsaved changes.
- 2 **Transport:** go to start, Play / Stop, Record, Loop and the Metronome. The small arrow next to the Metronome sets the count-in.
- 3 **The display (LCD):** tempo, position, time and status lights. See below.
- 4 **Master:** the master level and meter. Click it to open the Master panel.
- 5 **MIDI light, Chord, Keys → Notes and Panic.** The piano button (**Ctrl** + **K**) lets you play notes on your computer keyboard. **Panic** (**Ctrl** + **.**) stops every sound.
- 6 **Clip Arranger:** launch parts of the song live (chapter 4). **Ctrl** + **8** swaps it for the Instruments list.
- 7 **Timeline header:** Follow, zoom, Fit, Bars / Time, Snap, Loop, + Marker and the play position.
- 8 **Track headers:** icon, name, **A** (automation lanes), **M** (mute), **S** (solo) and volume.
- 9 **Clips:** the parts of your song, laid out in time. Markers (Intro, Bridge...) sit above them.
- 10 **Lower panel: Notes** (piano roll) or **Rack** (instrument and effects).
- 11 **Piano roll:** the notes of the selected clip (chapter 5).
- 12 **View tab bar:** TIMELINE, MIX, FX and SAMPLE.
- 13 **Inspector and Browser toggles** (**I** and **Ctrl** + **B**).
- 14 **Status line:** hints and what just happened. The song length and peak level are on the right.

● The top display



- 1 **BPM:** drag up or down (Shift for fine steps), double-click to type, or click **TAP** four times or more in time.
- 2 **SIG:** the time signature.
- 3 **BAR · BEAT · STEP:** where the playhead is.
- 4 **TIME:** minutes, seconds and hundredths.
- 5 **LOOP** (L) with the loop range, and **REC**.
- 6 **CLICK:** the metronome. +1 or +2 is the count-in in bars (right-click to set it). **FOLLOW** makes the view page along with the playhead.
- 7 **DSP:** how hard the audio engine is working. The light turns amber after a dropout. The line below shows the audio status.
- 8 **MASTER:** the master volume and meter.



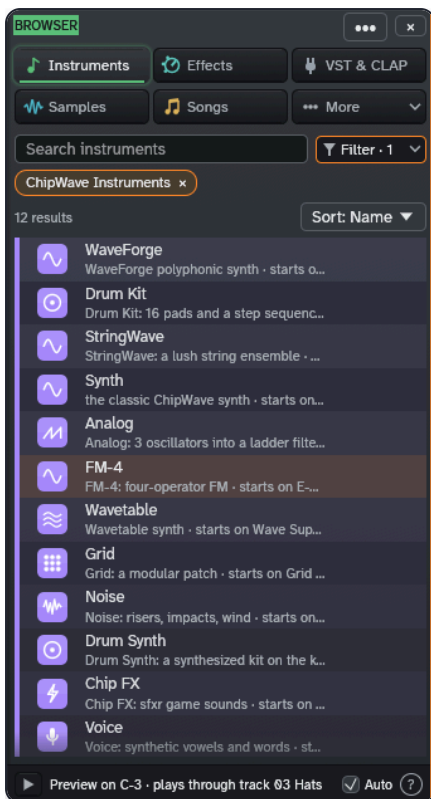
Right-click the display to change its backlight colour.

MAKE IT YOURS The display has a soft glow and a glassy shine, tinted by its backlight colour. Pick one of the colours or any colour you like. **Settings > Look** has the same choice.

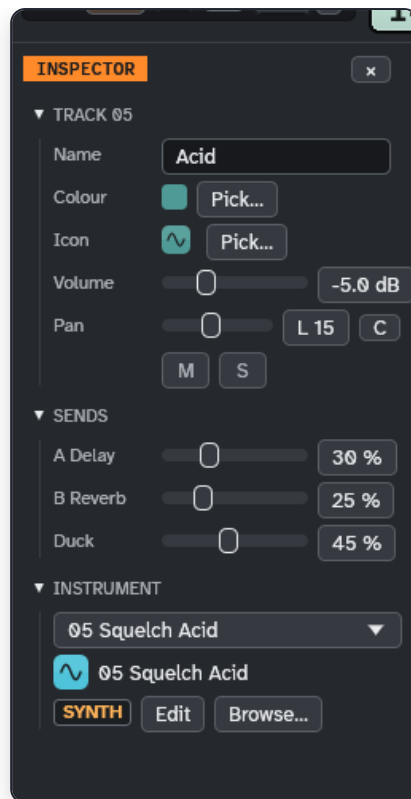
● The views

View	Open it with	What it's for
Timeline	Ctrl + T	Arrange the song with tracks and clips (the main view).
Mixer	Ctrl + 3, MIX tab	Levels, panning, sends, the master limiter and loudness.
FX	Ctrl + 4, FX tab	The effects chain of the selected instrument.
Sample	Ctrl + 5, SAMPLE tab	Import, view, loop and slice samples.
Tracker	Ctrl + 1	The classic row-by-row editor. It's hidden unless Show Tracker (experimental) is on in Settings.

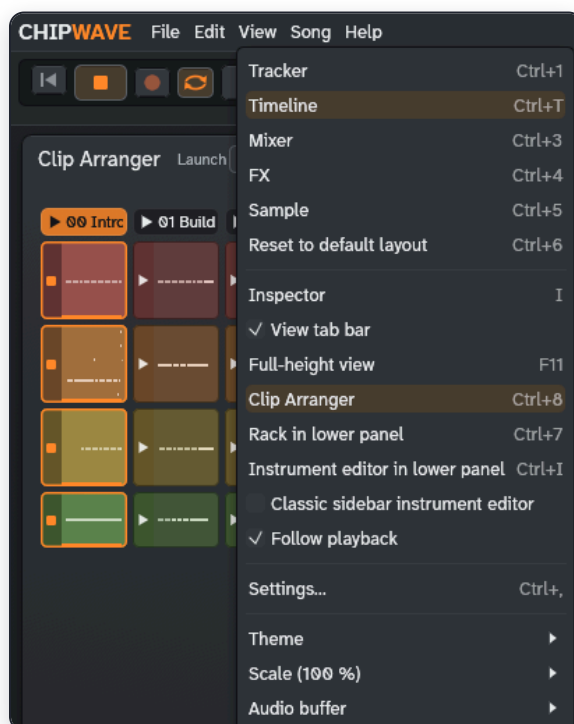
Ctrl + Tab cycles through the views. If you rearrange the panels and get lost, **View > Reset to default layout** (Ctrl + 6) brings everything back.



The Browser (**Ctrl** + **B**): instruments, effects, plugins, samples, songs and more. Drag anything onto the Timeline.



The Inspector (**I**) shows the clicked clip or track: name, colour, icon, volume, pan, sends and instrument.



The View menu, with every view and panel and their shortcuts.

The Timeline and clips

The Timeline is where your song comes together. Tracks run down the screen, time runs from left to right, and each track holds **clips**: short pieces of music you can move, copy, loop and split.



A new song (**File > New**): only the Song / Master track, with the hint "Drag an instrument from the Browser here, or + Add track".

Adding tracks

- **Drag an instrument** from the Browser (**Ctrl + B**) onto the empty Timeline. You get a new track that plays it.
- Click **+ Add track** under the tracks, or **Chords...** next to it to start with the chord generator.
- **Right-click the empty space** under the tracks for the New track menu: Instrument track, Drum pattern, Audio track, Empty track or Browse....



Right-click a track header for the round **track** menu: Rename, Colour, Icon, Add, Edit, Devices, Routing, Organize and Delete.



Right-click a clip for the **clip** menu: Edit, Split..., Copy, Cut, Duplicate, Make unique, Colour, Rename, Mute, Delete, To launcher, Notes and Variations.

To use a round menu, point at a slice and click. You can also hold the right button, drag onto a choice and let go. Choices marked › open more options. **Esc** or a click in the middle closes it.

● Making and editing clips

To do this	Do this
Make a note clip	Shift+double-click empty space on a track, or right-click › New note clip here .
Open a clip	Click it: its notes appear in the piano roll below. Double-click (or Enter) to open it focused.
Select	Click a clip. Ctrl-click or Shift-click adds more. Drag on empty space for a box. Ctrl + A selects all; Esc clears.
Move	Drag it (across tracks too). It snaps to the grid.
Copy	Alt-drag , or Ctrl + D to duplicate right after itself. Copies are linked : edit one and they all change.
Make unique	Ctrl + Shift + D gives a copy its own notes.
Loop / resize	Drag the right edge . Past its end the clip repeats.
Trim the start	Drag the left edge .
Split	Press S , then click where to cut. Esc cancels.
Glue	Ctrl + J joins the selected clips of one track into one.
Mute	M mutes or unmutes the selected clips.

Delete

Del or Backspace.

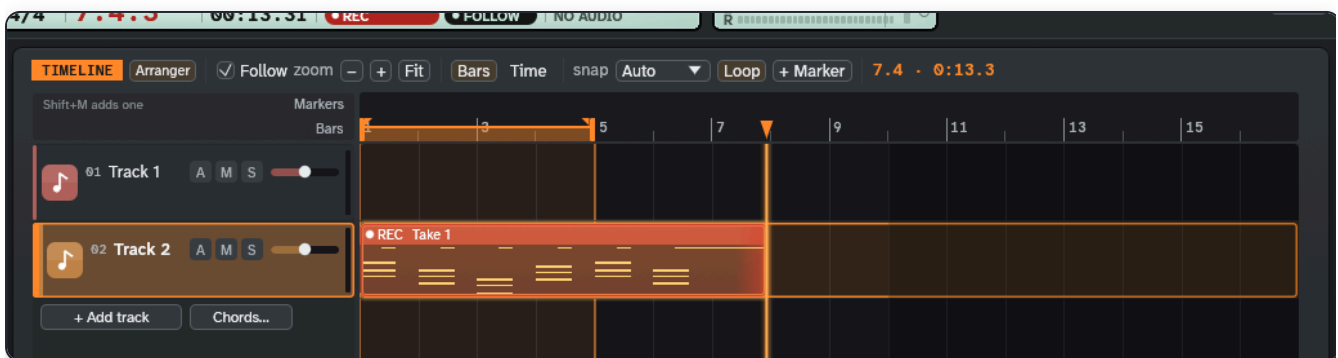
UNDO Every edit is one undo step. The **Edit** menu names it (**Undo: Move clip**, **Redo: Add note...**).

Ctrl + **Z** undoes and **Ctrl** + **Y** or **Ctrl** + **Shift** + **Z** redoes.

● Playing, looping and markers

- **Space** plays the song from the play marker and stops it. Click or drag in the ruler to move the play marker.
- **Shift-drag the ruler** to set the loop region, or press **Ctrl** + **L** to loop around the selected clips. **L** (or **Loop**) turns looping on and off.
- **+ Marker** or **Shift** + **M** adds a named marker (Intro, Chorus...). Click a marker to jump there, drag it to move it, and double-click to rename it.
- Zoom with **Ctrl** + mouse wheel or **+** / **-**. **Fit** (**F**) shows the whole song. **Snap** sets the grid.
- **F11** hides the lower panel so the Timeline gets the whole height.

● Recording from a keyboard



Recording a take. The notes you play appear live in a new "Take" clip.

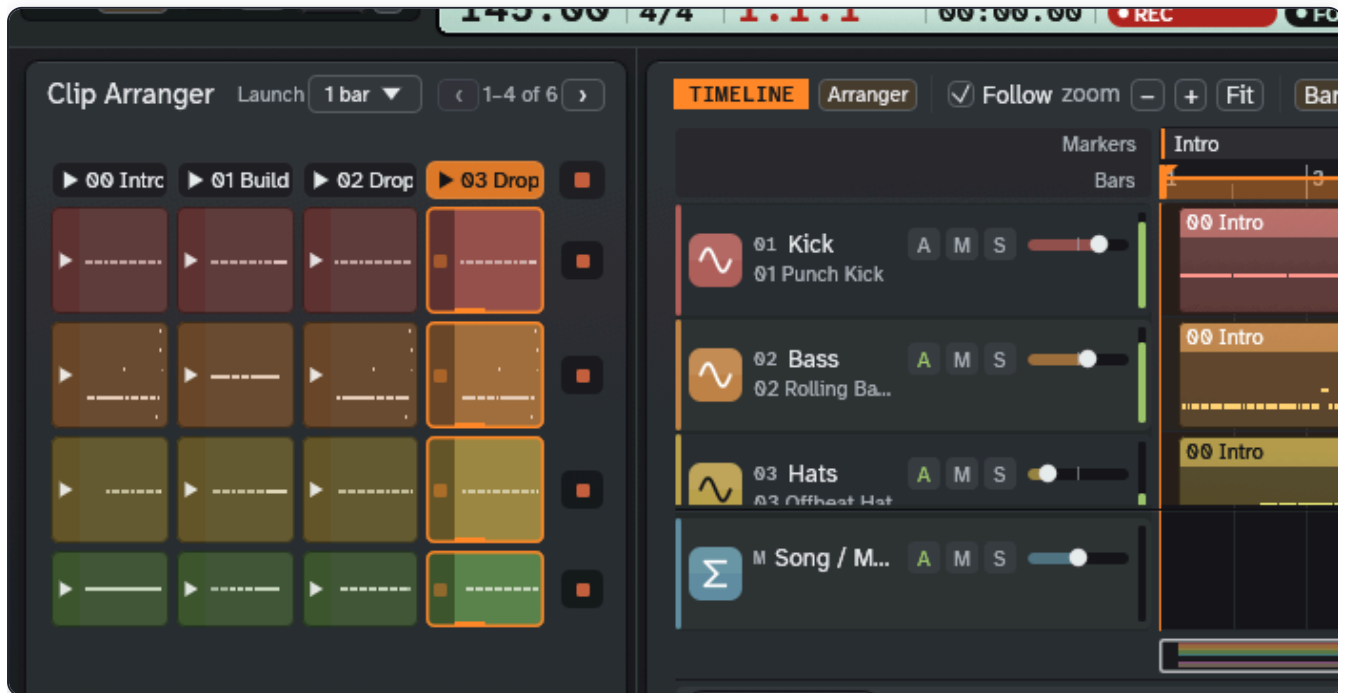
Press **Record** (●) or **R** to record what you play on a MIDI keyboard, or on your computer keyboard with **Keys → Notes** (**Ctrl** + **K**), onto the armed or selected track. ChipWave counts in one bar first. You can set the count-in to Off, 1 bar or 2 bars with the arrow next to the Metronome, or by right-clicking it. Loop recording adds layers, and each take is one undo step.

KEYS → NOTES **A S D F G H J K L** are the white keys from C, and **W E T Y U O P** are the black keys. **Z** / **X** move an octave down / up, and **C** / **V** change velocity. While it's on, those letters play notes instead of their shortcuts.

● Audio clips

Drag a sample from the Browser's **Samples** tab onto a track's lane to place it as an **audio clip**. In the Inspector you can set its gain and fades. ChipWave doesn't record audio yet.

● The Clip Arranger



The Clip Arranger, to the left of the Timeline (**Ctrl** + **8** or **View > Clip Arranger**).

This is a grid for jamming. Each **scene** (column header) is one section of the song, and each **slot** is one track's part of it.

- Click a scene to play it, looping, from the next bar. Click a slot's ► to play just that track.
- ■ at the end of a row stops that track, and ■ in the header stops everything, at the next bar.
- **Launch** sets when changes happen: 1 bar, ½ bar, Beat or Off.
- Drag a slot onto the Timeline to place it there as a clip.

Notes: piano roll and Tracker

The piano roll

The piano roll is the **Notes** side of the lower panel. It shows the notes of the clip you clicked. Piano keys run up the left side, time runs from left to right, and the **Vel** lane at the bottom sets how hard each note is played.

To do this	Do this
Draw a note	Click empty grid with the Pointer tool (1). The note is as long as the last one you drew, and dragging sets the length. The Pencil (3) paints a run of notes.
Select	Click a note. Shift+click adds. Drag a box on empty space, or use the Select tool (2). ALL or Ctrl + A selects everything.
Move / resize	Drag notes to move them in time and pitch, or drag a note's right edge. The arrow keys move by a semitone or a grid step, and Ctrl + ↑ / ↓ by an octave.
Copy	Ctrl-drag, or Ctrl + C / X / V . Ctrl + D repeats the selection right after itself.
Delete	Del . You can also right-click a note, or right-drag across several.
Tidy timing	Q (Quantize) snaps notes to the grid.
See everything	F (Fit) zooms to the notes. Hold the mouse on empty grid for a moment to pan.

- **SCALE** highlights the notes of the song's key, and **Len** sets the length the next click draws.
- **Chords** shows the chord lane above the notes, and **Generate** opens the Chords, Melody and Bass generators (chapter 7).

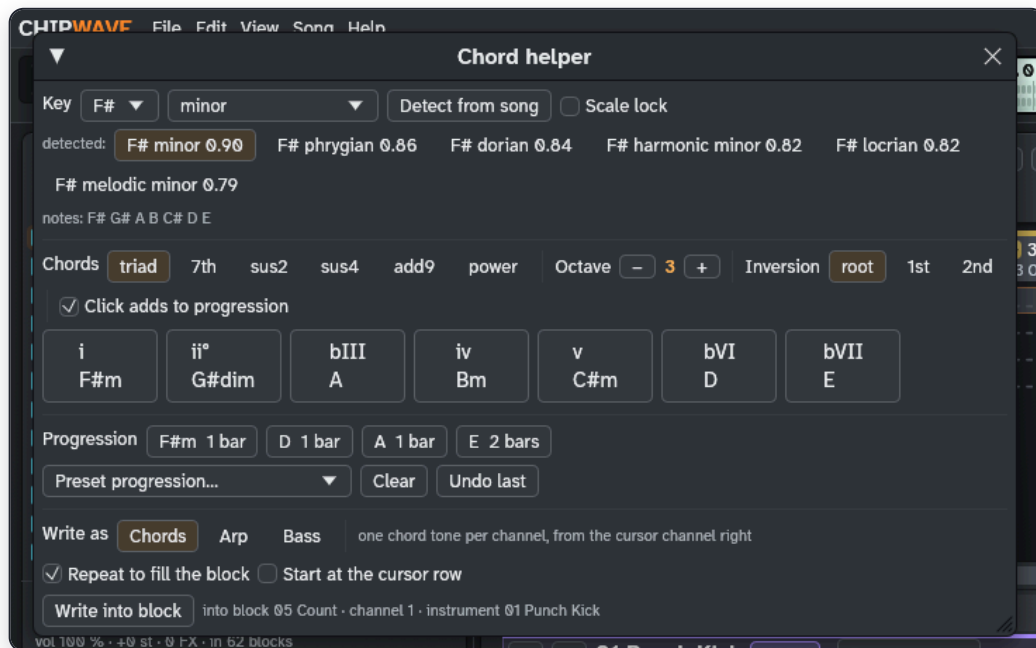
The Tracker (experimental)



The Tracker: rows run down the screen and channels go across (shown in the Amiga theme).

ChipWave grew out of a music **tracker**, the row-by-row editor used for game and demo music. It's hidden by default. Turn on **Settings > Show Tracker (experimental)** to get the **ORDER** and **TRACKER** tabs (**Ctrl + 2** and **Ctrl + 1**).

- Each channel has Note, Instrument, Volume and effect columns. **Esc** turns edit mode on and off.
- Note keys: **Z S X D C V G B H N J M** play C to B, and **Q 2 W 3 E ...** play the octave above.
- The **Order list** sets the order the blocks play in. **Song > Fill to length...** (**Ctrl + Shift + F**) can fill a song out to a set length.
- Block length: **Ctrl + Shift + PgDn** doubles it and **Ctrl + Shift + PgUp** halves it. **F9 / F10** mute / solo the channel.



The Chord helper (**Song > Chord helper...**) writes chords into Tracker blocks. It also has **Scale lock** and **Detect from song**.

OLD SONGS Songs made in the Tracker open on the Timeline in timeline mode and play the same.

Instruments and sounds

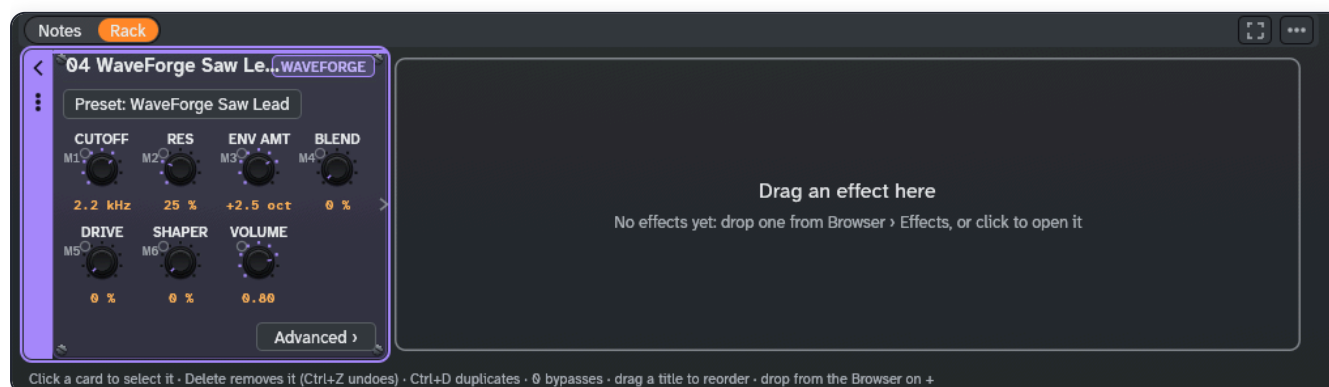
Every sound in ChipWave is made inside the app. There are synths, drum machines, a synthetic voice and sample players, and none of them need anything else installed.

● Finding a sound

Open the Browser (**Ctrl** + **B**) and pick the **Instruments** tab. Drag an instrument onto the Timeline to make a new track with it, or onto a track header to make that track play it. Press **Preview** at the bottom of the Browser to hear a sound first. The round track menu's **Add › Instrument ›** ring makes a new track with a built-in instrument.

Instrument	What it is
WaveForge	A two-oscillator polyphonic synth for leads, pads and chords.
Synth	ChipWave's original synth: oscillator with unison, filter, envelopes and modulation.
StringWave	A string ensemble with layers, a sub and a drone.
Analog	A Moog-style voice: three oscillators, noise, ladder filter and glide.
FM-4	Four-operator FM with 8 algorithms, for bells, keys and basses.
Wavetable	A wavetable synth (supersaws, vowel basses, glassy keys).
Grid	A modular patch you can wire up yourself.
Noise	Risers, downlifters, impacts and textures.
Chip FX	Retro game sound effects (based on sfxr).
Drum Synth	Six kinds of synthesized drum, each with several models and eight macros.
Drum Kit	Up to 32 drum pads with a step sequencer (see below).
Voice	A synthetic voice that sings vowels, babbles and speaks words, with no recordings needed.
Sample	Plays a WAV or other audio file you import (see below).

● The Rack and the instrument editor



The **Rack** side of the lower panel (**Ctrl** + **7**): the track's instrument card, then its effects.

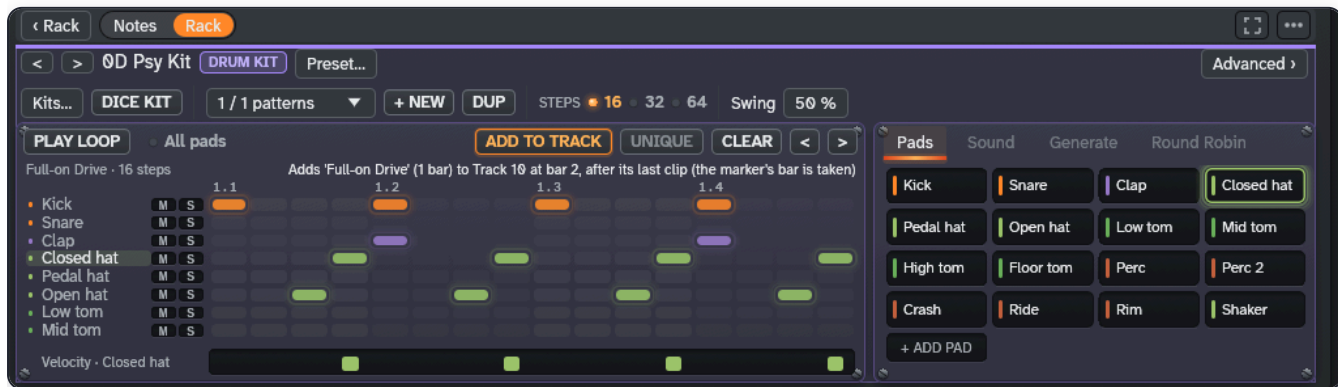
Click a track and its sound appears in the **Rack**: the instrument first, then its effects from left to right. The card shows the most useful knobs and a **Preset** menu. Click **Advanced** › for the full editor.



The instrument editor (**Ctrl** + **I**): macros on top, then Sound, Filter and Envelope.

- **Macros** are big friendly knobs such as Bright, Width, Attack, Release, Motion and Drive. Each one moves several settings at once.
- **ADVANCED** › has the **Main**, **Modulation**, **FX** and **Advanced** tabs. **Ctrl** + **F** searches the instrument's parameters.
- **A** / **B** compares two versions. B starts as a copy of A, so edit one, then switch to hear the other.
- Right-click any knob to **Reset to default**, **Add automation lane**, **MIDI learn it** or **Modulate with** ›.
- In the Rack, click a card to select it. **Del** removes it, **Ctrl** + **D** duplicates it and **0** bypasses it. Drag a title to reorder.

Drum Kit



The Drum Kit editor: the step sequencer on the left, and pads on the right.

- **Kits...** has 13 ready kits: Psy, 808, 909, Techno, Trap, Lo-fi, Chip, Acoustic-ish, Disco, Latin, DnB, Synthwave and Dembow. **DICE KIT** rolls brand-new sounds for every pad.
- Click the grid to paint steps, and use the velocity lane underneath for accents. Choose **STEPS** 16 / 32 / 64, add **Swing**, and press **PLAY LOOP** to hear it.
- **+ NEW** and **DUP** make more patterns. **ADD TO TRACK** puts the pattern on the Timeline (the line above the grid tells you where). **UNIQUE** unlinks a copied pattern, and **CLEAR** empties it.
- The side tabs: **Pads** (click to hear and select, **+ ADD PAD** up to 32), **Sound** (edit the selected pad), **Generate** (a new groove by style, energy and fill) and **Round Robin** (small changes on each hit).

Voice



The Voice instrument with the *Glitch Babble* preset.

Voice makes synthetic "ahh, eee, ohh" vowels, babble, chops, stutters and even spoken words. Try the presets, then shape the sound with **Formant**, **Breath**, **Babble** and the **Register** menu. The **Tract** menu switches between **Formant** and **Throat** modes.

Samples

- Import WAV (and other audio files) from the Browser's **Samples** tab or the Sample view (**Ctrl + 5**). WAV, FLAC, MP3 and OGG files work.
- **Slice** a loop by **Transients** (hits) or into an even **Grid** of 2–64 pieces. Alt+click adds a slice and right-click removes one. **To instruments** makes each slice its own sound.

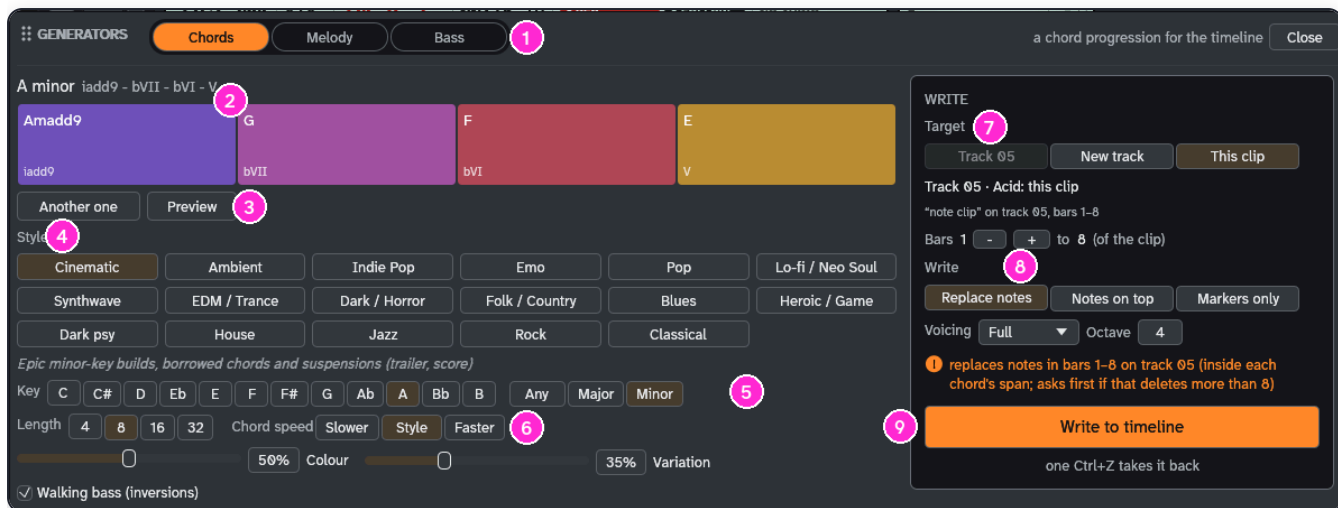
● Racks, presets and the library

- A **rack** is one instrument made of up to four instruments that play together. Right-click an instrument card › **Make rack**, and use **Save rack...** to keep it in **My Racks** for any song.
- **File › Instrument library...** holds your saved sounds. **Import instrument (.cwi)...** and **Export instrument (.cwi)...** share single instruments.
- Generators such as the Drum Synth and Drum Kit have **Dice** (roll new random settings), **Mutate** (nudge them a little) and **lock** (keep a knob as it is). Every roll has a seed, so you can get it back.

Chords, Melody and Bass generators

Stuck for ideas? The generators write chord progressions, melodies and bass lines in the style you pick. Keep rolling until something clicks, then write it onto the Timeline.

Open them with **Generate** in the piano roll, **Chords...** next to + Add track, or a track's right-click menu (**Chords...**). Drag the  grip to move the panel, and double-click the grip to put it back.



1 **Chords · Melody · Bass** tabs.

2 **The progression:** the key and chords, shown as coloured pads. Click a pad to hear it.

3 **Another one** rolls a new progression, and **Preview** plays it.

4 **Style:** Cinematic, Ambient, Indie Pop, Emo, Pop, Lo-fi / Neo Soul, Synthwave, EDM / Trance, Dark / Horror, Folk / Country, Blues, Heroic / Game, Dark psy, House, Jazz, Rock and Classical.

5 **Key:** C to B, with Any, Major or Minor.

6 **Length** (4, 8, 16 or 32 chords) and **Chord speed**. The **Colour** and **Variation** sliders add spice, and **Walking bass** adds inversions.

7 **Target:** this track, a new track, or this clip.

8 **Write:** Replace notes, Notes on top, or Markers only. Pick a **Voicing** (Full, Triads, Shell, Bass only, Pad, Light, Open or Power) and an **Octave**.

9 **Write to timeline.** The card tells you exactly what will happen, and one **Ctrl + Z** takes it back.

GOOD TO KNOW Chords only go onto pitched sounds, so the Chords tab is hidden on drum tracks. If more than 8 notes would be replaced, ChipWave asks first.

Melody



- The melody follows your chords: either the Chords tab or the clip's chord lane (**Over**).
- **Preview**, **Dice** and **Another one** try new ideas. The **Seed** number brings back a favourite.
- **Rhythm**: Quarters, Eighths, Syncopated, Sixteenths, Long notes or Euclid. **Contour**: Arch, Rise, Fall, Wave or Walk. **Motif**: Off, AABA, ABAB or Call & response.
- **Density**, **Range** and **Octave** shape it. **Lock rhythm** or **Lock notes** keeps one part while you re-roll the other. **Advanced...** has more options, such as **End on tonic**.
- By default it writes to a new "Melody" track.

Bass

- **Styles**: Root, Octave pump, Walking, Acid, Syncopated and Euclid, with **Density**, **Range** and **Octave**.
- It writes to a new "Bass" track. It copies the current track's sound. If that track has no instrument or plays drums, you get a bass synth instead (*Fat Moog Bass*, or *Acid Squelch* for Acid).

The chord lane

In the piano roll, **Chords** shows a **chord lane** above the notes. Double-click it to add a chord, or drag to draw one. Click a chord to hear it, and press **DeL** to delete it. Right-click an empty spot on the lane for a round menu of styles and progressions, or right-click a chord to play, transpose, change its type, see suggestions, write its notes or edit it. If you prefer plain lists, choose **Settings > Look > Chord menus > List**. The list also has **Detect chords from the notes**.

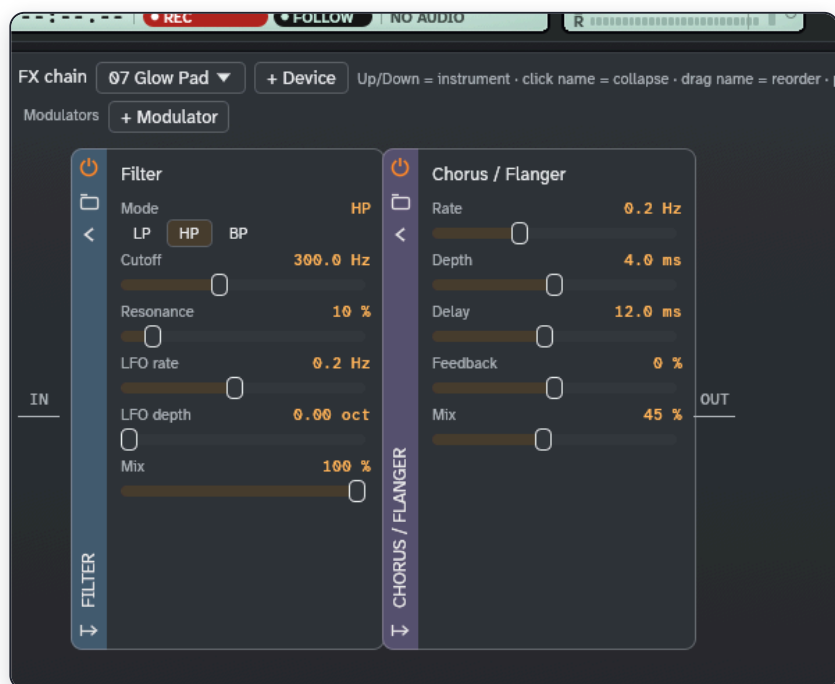
Mixer and effects

The Mixer (**Ctrl** + **3**) gives every track a channel strip. The FX view (**Ctrl** + **4**) shows the effect chain of the selected instrument.



- 1 **Sidechain key / release:** pick the track that "pumps" the others (usually the kick).
- 2 **+ Insert** adds an effect to the channel.
- 3 **A DLY / B REV** send the channel to the shared delay and reverb.
- 4 **Pan**, and **Duck** (how much this channel dips when the key track plays).
- 5 **Fader and meter.** Double-click the fader for 0 dB.
- 6 **M / S:** mute and solo (also **F9** / **F10**).
- 7 **Master strip**, the final output.
- 8 **Limiter & loudness:** the true-peak limiter (gain, ceiling, release) and LUFS loudness meters.
- 9 **Target** shows how your loudness compares with a goal (streaming -14, podcast -16, club -9 or broadcast -23).

TIP The limiter is on by default, and exports go through it too, so your WAV or MP3 sounds just like playback. The Master readout in the toolbar's LCD opens the Master panel.



The FX view: a Filter and a Chorus / Flanger on the *Glow Pad* instrument. The signal runs from IN to OUT.

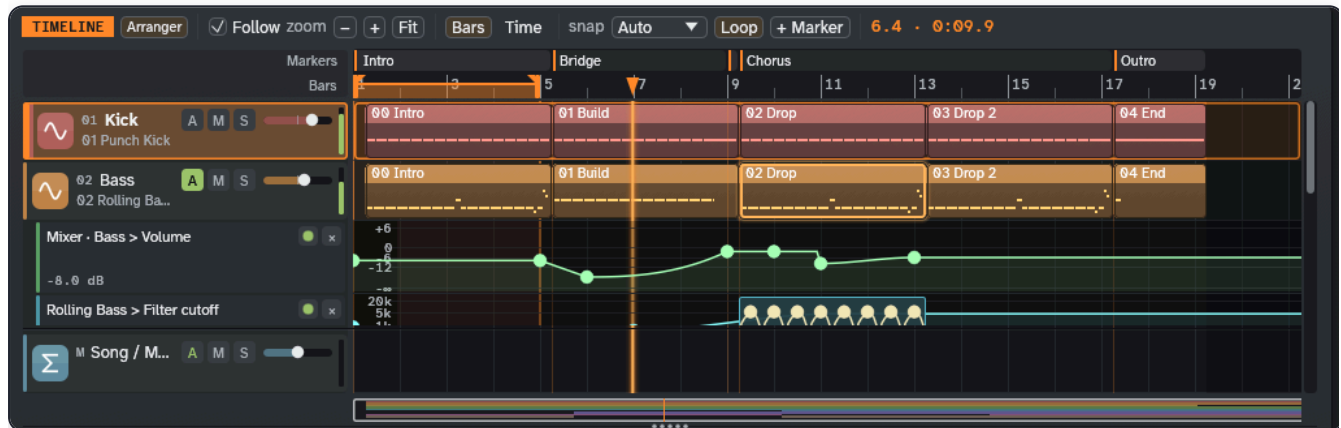
Use **+ Device** to add an effect, or drag one from the Browser's **Effects** tab onto a track or into the Rack. Every effect card has a power button (bypass), a folder icon for presets, and its own **Mix** knob.

Effect	What it does
Delay	Echoes, synced to the tempo or set in ms, with ping-pong.
Reverb	Rooms and halls, with pre-delay and width.
Drive	Soft, hard or fold distortion.
Chorus / Flanger	Thickens and swirls the sound.
Filter	Low-pass, high-pass or band-pass, with an LFO.
EQ	4 bands: low shelf, two peaks and a high shelf.
Compressor	Evens out the level.
Bitcrusher	Lo-fi bit depth and sample-rate reduction.
Phaser	A sweeping, whooshing phase effect.
Frequency shifter	Shifts every frequency up or down for metallic, detuned effects.
Metal resonator, Digital distortion, Sub bass	The Voice instrument's Transform stages, usable on any sound.
Plugin effect	Any installed CLAP or VST3 effect (see chapter 11).

A **Split** sends the sound down 2 to 4 parallel paths and mixes them back together. Add it from **+ Add Device** in the chain editor (right-click a Rack card › **Open in the chain editor**).

Automation and modulation

Automation draws how a knob changes over the song. Modulation makes a knob wobble on its own, in time with the music.



Two automation lanes under the Bass track: the mixer volume, and the filter cutoff of the *Rolling Bass* sound.

Automation lanes

1. **Open:** click the **A** button on a track header. The lanes appear under the track.
2. **Add a lane:** use **+ lane** under the open track, or right-click any knob > **Add automation lane**. You can automate the volume, pan, sends, instrument and effect knobs, plugin parameters, and more.
3. **Draw:** click to add a point and drag it to move it (it snaps; hold **Shift** for free movement). **Ctrl**-drag draws freehand. **Alt**-drag a line to bend it into a curve. Double-click a point to delete it.
4. **Lane header:** the dot turns the lane on or off, and **x** removes it (**Ctrl** + **Z** brings it back).
5. **Per clip:** right-click a lane inside a clip > **Add clip automation to this clip**. That automation then moves, loops and splits with the clip.

Tempo changes live on the **Song / Master** track. Lanes play in your exports exactly as you hear them.

Quick modulation

Every knob that can be modulated has a small **dot**. Click it (or right-click > **Modulate with...**) and choose a source:

Source	Controls
LFO	Shape, Speed and Amount: a steady wobble.
Envelope	Length , Attack and Amount: a movement on each note.
Random	Speed , Smooth and Amount: wandering movement.
Velocity, Mod wheel	Amount only.

- **Speed** reads in plain words, such as "1/8 note", "1 beat (1/4 note)" or "2 bars". Untick **Sync to tempo** for a free speed in Hz.

- **Amount** (" +25 %") is how far it moves the knob. **Ctrl**-drag a slider for fine steps, and double-click to reset it.
- Each instrument's **Movement** list shows everything that moves, for example "LFO 1 sine · 1 beat → Cutoff · +25 %". Click a row to edit it.

MIDI keyboards and controllers

Plug in a MIDI keyboard and play any ChipWave instrument. Its knobs and faders can also drive what's on screen.

Connecting

1. Plug in the keyboard, then open **Settings > MIDI** (or click the **MIDI** light on the toolbar).
2. Choose your **Input device** (or **All devices**). Press **Rescan** if it isn't listed.
3. The light is grey when nothing is connected, dark green when connected, and flickers bright green as notes arrive.

The sustain pedal, pitch bend and mod wheel work. Key pressure (aftertouch) is recorded with each note. Press **R** or the **●** button to record what you play into a clip (see chapter 4). **Chord** on the toolbar spreads chords across channels in the Tracker.

NO KEYBOARD? Turn on **Keys→Notes** (**Ctrl + K**) and play with your computer keyboard instead.

MIDI learn

1. Right-click a control and choose **MIDI learn**. This works on mixer faders, pans and sends, the master fader, the instrument Volume, Cutoff, Resonance and Drive, and the toolbar BPM. A coloured ring shows it's waiting.
2. Move a knob or slider on your controller. It now drives that control.
3. Right-click again > **Forget MIDI CC n** to undo it, or use the list in **Settings > MIDI**.

Controller maps

File > Save controller map... saves your learned controls for a controller as a small text file. **File > Load controller map...** puts them back. The same buttons are under the list in **Settings > MIDI**.

IN THIS VERSION A map holds knob (CC) learning only, not notes, pitch bend or pressure. Loading a map replaces the learned list.

MIDI files

Your **.mid** files appear in the Browser. Drag one onto a track, or double-click it, and it comes in as a note clip.

Plugins

ChipWave can load **CLAP** and **VST3** plugins, both instruments and effects. They play notes from your clips, go through the mixer and are saved inside your song.

Which plugins work

Format	In 0.2.17.0
CLAP	Instruments and effects. The plugin's own editor opens embedded on Windows, or floating where the plugin offers a floating window.
VST3	Instruments and effects. The plugin's own editor opens on Windows. On macOS and Linux, use ChipWave's parameter list instead.
VST2	Not supported.
LV2	Not supported (not planned yet).

Many plugins ship both a CLAP and a VST3 version. Either works, and the Browser marks each one CLAP or VST3.

Finding your plugins

The first time you start ChipWave, it asks how to find your plugins. You can **scan automatically** (the standard folders, with an optional deeper search of the drive), **choose folders yourself**, or **skip for now**. You can run it again any time from **Settings > Plugins > Find plugins...** or the Browser's **... > Find plugins...**

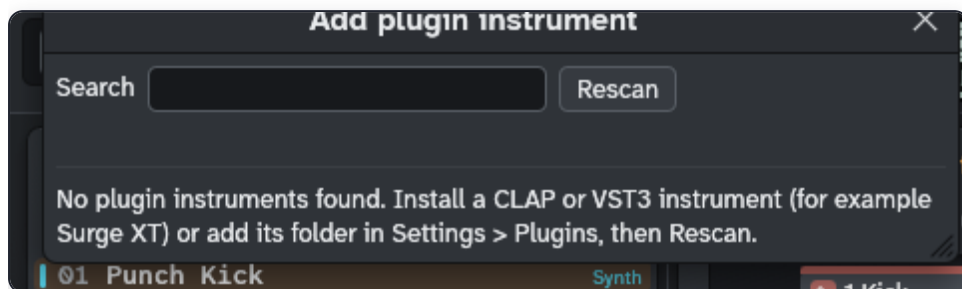
System	Standard folders
Windows	%COMMONPROGRAMFILES%\CLAP , %LOCALAPPDATA%\Programs\Common\CLAP and the matching VST3 folders
macOS	/Library/Audio/Plug-Ins/CLAP , ~/Library/Audio/Plug-Ins/CLAP and the matching VST3 folders
Linux	~/.clap , /usr/lib/clap , /usr/local/lib/clap and ~/.vst3 , /usr/lib/vst3 , /usr/local/lib/vst3

Keep your plugins somewhere else? Add the folder in **Settings > Plugins**, then rescan. After you install a new plugin, use the Browser's **... > Rescan plugins**.

FREE INSTRUMENTS Browser > ... > **Get showcase instruments...** lists well-known free, open-source instruments such as Surge XT, Dexed, OB-Xf and Odin 2. Tick the ones you want and press **Download & install**. Each download comes from its creator's own release and is checked before it's installed. When a creator only offers an installer, you get an **Open download page** button instead.

● Using a plugin

- Open the Browser (**Ctrl + B**) and pick the **VST & CLAP** category. Drag a plugin onto the Timeline or a track, or double-click it. Plugins aren't previewed in the Browser.
- Effect plugins also appear on the Browser's **Effects** tab, and in the FX chain as **Plugin effect**.
- The plugin card has **Configure...** to open the plugin's own window, **Reload** to try again after a failure, eight **macros** you can point at any plugin parameter, and a searchable list of every parameter.
- The macros can be automated (chapter 9) and MIDI-learned (chapter 10).



The *Add plugin instrument* window, with Search and Rescan. On this test computer no plugins were installed, so it explains what to do next.

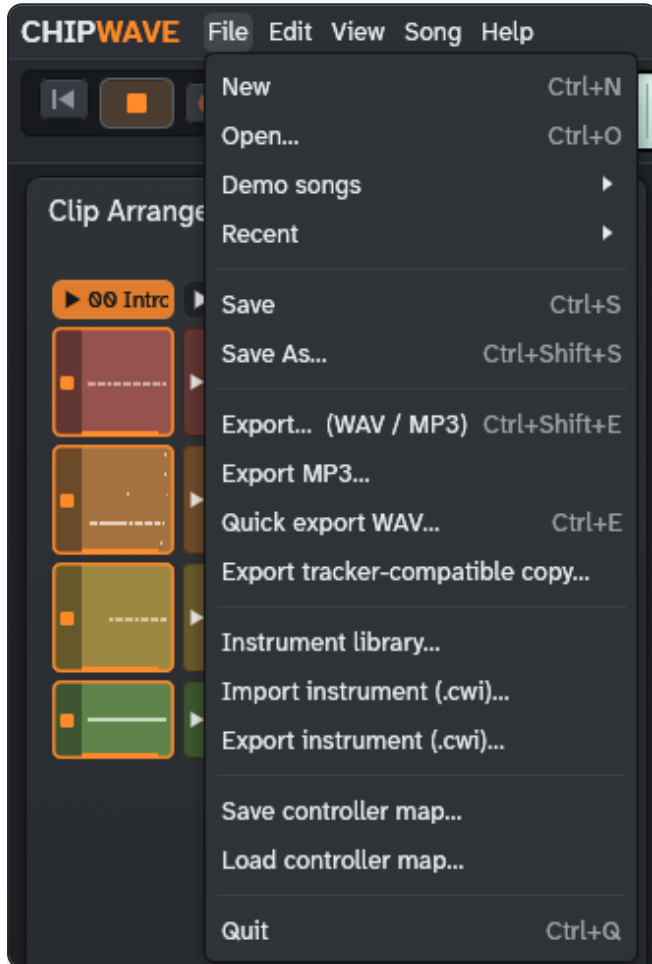
● Safe scanning

Each plugin is tested in a separate process before ChipWave uses it. A plugin that crashes or hangs can't take ChipWave down with it. Plugins that crash, time out or aren't supported are listed as **skipped**, with the reason.

MISSING PLUGINS If a song uses a plugin that isn't installed on this computer, the instrument stays in the song as a silent placeholder. Its settings are kept, so nothing is lost when you save. A warning lists the missing plugins when the song opens.

Saving, loading and exporting

Your song is saved as one `.cwt` file. Export turns it into a WAV or MP3 you can share anywhere.



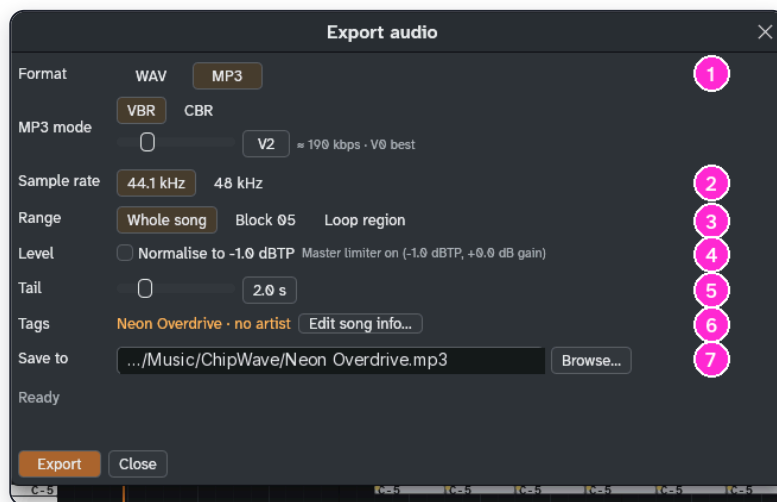
The File menu.

The File menu

- **New** `Ctrl + N`, **Open...** `Ctrl + O`.
- **Demo songs** › opens a ready-made song to explore.
- **Recent** › lists your last 20 songs. You can pin favourites.
- **Save** `Ctrl + S`, **Save As...** `Ctrl + Shift + S`.
- **Export... (WAV / MP3)** `Ctrl + Shift + E`, **Export MP3...**, and **Quick export WAV...** `Ctrl + E`.
- **Export tracker-compatible copy...** saves a copy for ChipWave 0.2.4.0 and older.
- **Instrument library...**, **Import / Export instrument (.cwi)...** and **Save / Load controller map...**
- **Quit** `Ctrl + Q`.

A • in the window title means there are unsaved changes.

Exporting audio



The Export audio dialog. (The folder path in the *Save to* box has been edited in this picture for privacy.)

- 1 **Format:** WAV (32-bit float, lossless) or MP3. For MP3, pick VBR or CBR and the quality with the slider (V2 is about 190 kbps).
- 2 **Sample rate:** 44.1 or 48 kHz.
- 3 **Range:** the whole song, the current block, or the loop region.
- 4 **Level:** normalise to -1.0 dBTP, with the master limiter on.
- 5 **Tail:** extra seconds at the end so echoes and reverb can fade out. The song stops cleanly at its end, without the first row playing again.
- 6 **Tags:** **Edit song info...** sets the title, artist and other details saved in the file.
- 7 **Save to:** the file name and folder (normally `Music\ChipWave`), with **Browse...**. Then press **Export**.

IN THIS VERSION Export writes one stereo file of the whole mix. Separate files per track (stems) aren't available yet.

Your work is safe

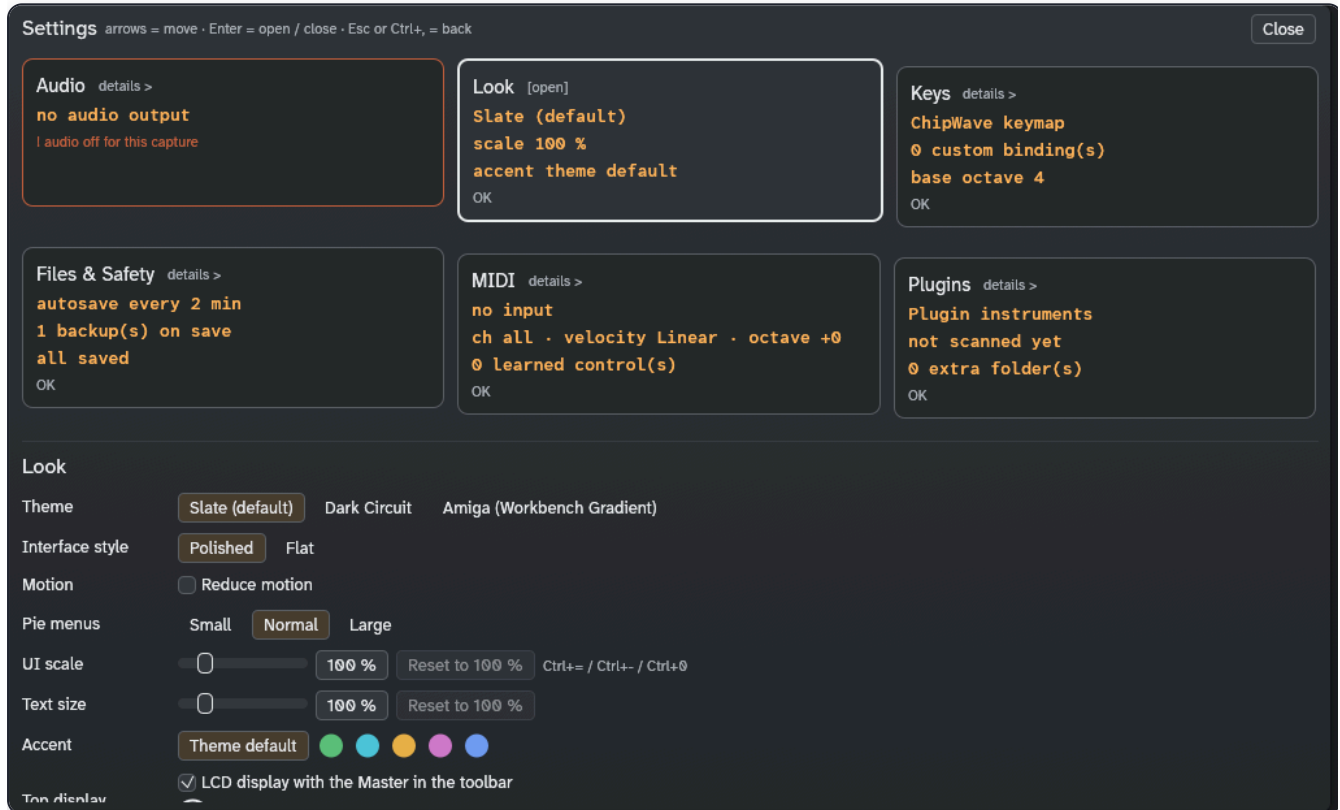
- **Autosave** keeps a safety copy every 2 minutes by default, only when there are unsaved changes. It never overwrites your own file.
- **Backups on save** keeps older copies (`song.cwt.bak` , `.bak2` ...) each time you save. Choose 0–10 in Settings.
- If ChipWave ever closes unexpectedly, it offers to bring your work back the next time it starts: **Recover**, **Compare**, **Discard** or **Later**.

Change all of these in **Settings > Files & Safety**, which also shows the Recovery folder and the update check.

System	Where ChipWave keeps its settings and safety copies
Windows	<code>%APPDATA%\ChipWave</code> and <code>%LOCALAPPDATA%\ChipWave</code>
macOS	<code>~/Library/Application Support/ChipWave</code>
Linux	<code>~/.config/chipwave</code> and <code>~/.local/share/chipwave</code>

Settings and display

Open Settings with **Ctrl** + **,**. Each card shows a short summary; click it (or use the arrow keys and **Enter**) to open its details. **Esc** or **Ctrl** + **,** goes back.



Settings with the Look card open. (Captured with audio switched off, so the Audio card says "no audio output".)

Card	What's in it
Audio	Output device, sample rate, buffer size, Play test tone and Restart audio .
Look	Theme, style, motion, menus, scale, text size, accent colour and the top display (below).
Keys	Change any shortcut: click a key, then press the new one (Esc cancels). A key that's already used is flagged. Reset all goes back to the defaults.
Files & Safety	Autosave, backups on save, the Recovery folder and the update check (chapter 12).
MIDI	Input device and your learned controls (chapter 10).
Plugins	Plugin folders, Find plugins... and rescans (chapter 11).

● Making it look your way

- **Theme:** Slate (the default), Dark Circuit, or Amiga (Workbench Gradient).
- **Interface style:** Polished, or Flat for a plainer look without bevels and glow.

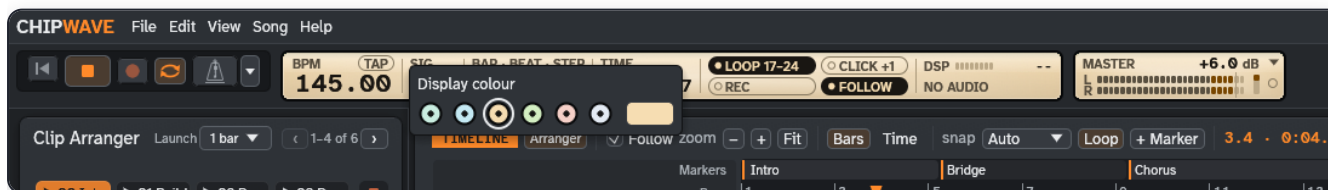
- **Reduce motion** stops the animations.
- **Pie menus:** Small, Normal or Large round menus.
- **UI scale** makes everything bigger or smaller: **Ctrl** + **=**, **Ctrl** + **-**, and **Ctrl** + **0** for 100 %.
- **Text size** grows only the text, on top of the UI scale.
- **Accent:** Theme default, or one of five colours for highlights.
- **Chord menus** and **Clip menus:** choose round (Pie) or ordinary list menus for right-clicks.



The same song in the Amiga (Workbench Gradient) theme.

● The glowing top display

Since 0.2.16.0, the LCD display at the top has a soft backlight glow in the middle and a glassy shine across the top. The text stays easy to read. The glow takes the colour of the backlight you pick.



Right-click the display to pick its backlight colour. Here it's Amber.

- The backlight colours are **Mint** (the default), **Cyan**, **Amber**, **Green**, **Red** and **Ice**.
- Right-click the display, or use the colour picker under **Settings > Look > Top display**.
- Turn off **LCD display** with the **Master** in the toolbar to go back to the classic toolbar. The Master then moves under the Clip Arranger.

Keyboard shortcuts

Press **F12** in ChipWave for the full key list. On a Mac, **Ctrl** shortcuts also work with **⌘**. You can change the keys in the first table in **Settings > Keys**.

● Everywhere

Keys	What it does
Space	Play / stop
Ctrl + Z / Ctrl + Y	Undo / redo (Ctrl + Shift + Z also redoes)
Ctrl + N / Ctrl + O	New song / open
Ctrl + S / Ctrl + Shift + S	Save / save as
Ctrl + Shift + E	Export dialog (WAV / MP3)
Ctrl + E	Quick export WAV
Ctrl + ,	Settings
F12	Key list
Ctrl + Q	Quit
Ctrl + .	Panic: stop all sound
Ctrl + T	Timeline
Ctrl + 3 / 4 / 5	Mixer / FX / Sample view
Ctrl + 1 / Ctrl + 2	Tracker / Order list (when Show Tracker is on)
Ctrl + B	Show / hide the Browser
Ctrl + I	Edit the instrument in the lower panel
Ctrl + F	Search the instrument's parameters
F11	Full-height view (hide the lower panel)
F9 / F10	Mute / solo the channel
Ctrl + = / Ctrl + - / Ctrl + 0	UI scale up / down / 100 %

● Views and panels

Keys	What it does
Ctrl + Tab	Cycle through the views
Ctrl + 6	Reset to the default layout

Ctrl + 7	Show the Rack
Ctrl + 8	Clip Arranger / Instruments list
I	Inspector
Ctrl + K	Keys → Notes: play notes on the computer keyboard

Timeline

Keys	What it does
L / Ctrl + L	Loop on / off; loop around the selected clips
R	Record
Shift + M	Add a marker
F	Fit: show the whole song
Ctrl + A / Esc	Select all / clear the selection
Ctrl + D	Duplicate the selected clips right after themselves
Ctrl + Shift + D	Make a linked copy unique
S	Split: then click where to cut
Ctrl + J	Glue clips of one track together
M	Mute / unmute the selected clips
Del / Backspace	Delete
Enter	Open the clip focused

Piano roll

Keys	What it does
1 / 2 / 3	Pointer / Select / Pencil tool
Arrow keys	Move notes by a semitone or a grid step
Ctrl + ↑ / Ctrl + ↓	Move notes by an octave
Ctrl + C / X / V	Copy / cut / paste
Ctrl + D	Repeat the selection right after itself
Q	Quantize to the grid
F	Fit: zoom to the notes
Del	Delete the selected notes

● Keys → Notes and the Tracker

Keys	What it does
A S D F G H J K L	Keys → Notes: white keys from C
W E T Y U O P	Keys → Notes: black keys
Z / X, C / V	Keys → Notes: octave down / up, velocity down / up
Esc	Tracker: edit mode on / off
Ctrl + Enter	Tracker: play from the cursor row
Shift + Space	Tracker: play / stop the whole song (Space plays the block)
Ctrl + Shift + PgDn / PgUp	Tracker: double / halve the block length
Ctrl + Shift + F	Song › Fill to length...

Tips and troubleshooting

Most problems have a quick fix. Start here.

No sound

1. Open **Settings** › **Audio** and check the **Output device**. *System default* follows your computer's sound setting.
2. Click **Play test tone**. You should hear a one-second beep (440 Hz).
3. Still silent? Click **Restart audio**. This helps after you plug in headphones or an audio interface.
4. Check that the track isn't muted (**M**) and that another track isn't soloed (**S**), and that the master fader is up.

Crackles, clicks or dropouts

- Watch the **DSP** meter on the top display. It shows how hard the sound engine is working, and its light turns amber after a dropout.
- Choose a bigger **Buffer** in **Settings** › **Audio**. Sound takes a little longer to start, but it plays more smoothly. *Auto* lets ChipWave choose.
- Close other heavy programs, and bypass effects or plugins you don't need (the power button on each card, or  in the Rack).
- Exports are made separately from playback, so a crackle while playing doesn't end up in your exported file.

Stuck notes

Press **Panic** on the toolbar, or . It stops every sound at once, plugins included.

Other problems

Problem	Try this
A plugin doesn't show up	Check that it's CLAP or VST3 (not VST2), add its folder in Settings › Plugins and rescan. Look in the Browser's "skipped" list for the reason.
A song says a plugin is missing	Install that plugin on this computer. The song keeps its settings in the meantime (chapter 11).
ChipWave closed unexpectedly	Start it again and choose Recover (chapter 12).
The window is too small or too big	Change the UI scale:  ,  ,  .
The panels got jumbled	View › Reset to default layout ( .
Letters play notes instead of shortcuts	Keys → Notes is on. Press  to turn it off.

macOS won't open the app

Control-click it and choose **Open**, or use the Terminal command in chapter 1.

Animations are distracting

Turn on **Reduce motion** in Settings › Look.

● Good habits

- Save often with `Ctrl + S`, and use **Save As...** for big experiments.
- Keep the master limiter on, and leave some headroom on the faders.
- Use the Generators to get started, then change the notes so the song becomes yours.
- If you get stuck, every edit can be undone with `Ctrl + Z`.

NOT IN 0.2.17.0 Recording audio from a microphone, time-stretching samples, and separate stem exports aren't available yet.

Credits and support

ChipWave Studio was created by Del ([postmanpat](#)). It's free to use. If you enjoy it, please support the creator.

Support ChipWave

To keep the software going I need Coffee :)



Buy me a coffee

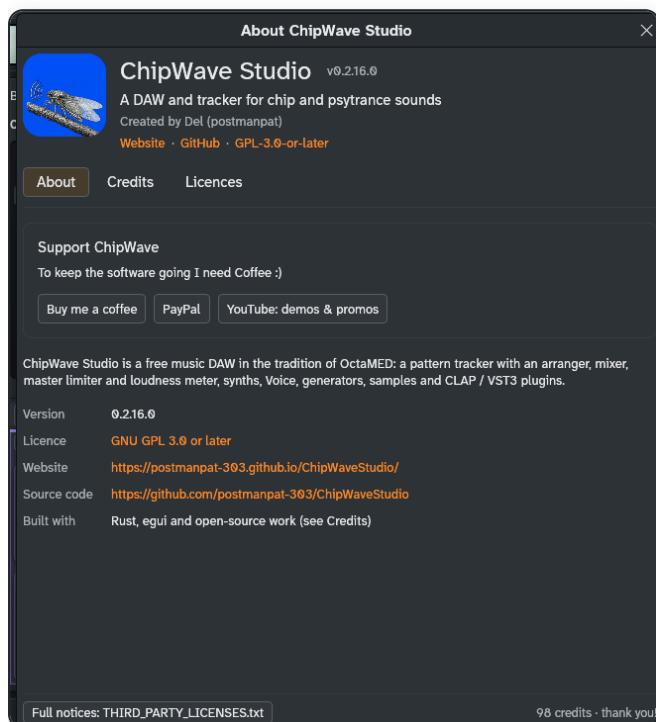
PayPal

Website



Watch the promo video

buymeacoffee.com/postmanpat · paypal.me/derekh100 · postmanpat-303.github.io/ChipWaveStudio · youtu.be/j1w23Pkuodg



Help > About ChipWave Studio: version, links, support buttons, the **User manual (PDF)** button, and the full Credits and Licences tabs. It opens with a short digital rain: press any key or click to skip it, or turn on **Reduce motion** in Settings to switch it off.

With thanks to

ChipWave stands on the shoulders of open source and published research. Highlights from the full list (the complete credits are in the About window and in `THIRD_PARTY_LICENSES.txt`):

- **Emilie Gillet:** the Voice instrument's design is inspired by the Plaits speech engine (MIT), and the Drum Synth recipes use the Plaits drum models (MIT), as ported to DaisySP by Electrosmith. No speech code is

Open source

ChipWave Studio is free software, licensed under the **GNU General Public License v3.0 or later** (GPL-3.0-or-later). The source code is at github.com/postmanpat-303/ChipWaveStudio.

More demos and promos are on the [YouTube channel](#).

A big thank you to [storytold](#), whose open-source PhotoCraft inspired the look of the Wave family icons.

copied.

- **Tomas Pettersson (DrPetter)**'s **sfxr** (MIT), via Teemu Erkkola's **sfxr-rs**: the Chip FX generator.
- **Neil Thapen**'s **Pink Trombone** (MIT): the Voice instrument's Throat mode.
- **Martin Galway**: the demo song "Oceans 11" is a ChipWave arrangement of his Commodore 64 music.
- **Sonic Pi**'s **sc808** (Sam Aaron and contributors, MIT), after Yoshinosuke Horiuchi's **TR-808: Drum Synth** recipes.
- **Vadim Zavalishin**, *The Art of VA Filter Design*, and **Antti Huovilainen** and **Vesa Välimäki**: the filters, the ladder filter and the oscillators.
- **Matt Tytel**'s **Vital**, the **Surge Synth Team**'s **Surge XT**, **Pascal Gauthier**'s **Dexed** and **Raph Levien**'s **MSFA**: ideas for the Analog and FM-4 instruments (no code copied).
- **The Csound community**, Peterson & Barney, Rosenberg, Fant, Liljencrants & Lin, and Klatt: the voice research behind Voice.
- **ITU-R BS.1770-4** and **EBU R 128**, **libebur128** and **pyloudnorm**, and **SignalSmith Audio**: the loudness meter and the master limiter.
- **Krumhansl & Kessler**: key detection in the chord helper. **Scaler** by Plugin Boutique: the inspiration for the chord pads and progressions.
- The Melody and Bass generators draw on ideas from **Computoser**, **Toussaint's Euclidean rhythms**, **total-serialism**, **isobar**, **acid-banger**, **aciduino**, **JC-303**, **acid-test** and **WalkingBass** (no code copied).
- **The free-audio project** (Alexandre Bique and contributors): **CLAP** (MIT), with **clap-sys** by micahrj. The **VST 3 SDK** by Steinberg (MIT).
- **Teijo Kinnunen** and **Ray Burt-Frost** for **OctaMED**, whose workflow ChipWave follows, and the **Roland TB-303**, whose glide and accent the tracker effects imitate.
- The fonts **Atkinson Hyperlegible Next** and **Mono** by the Braille Institute of America, and **Inter** by Rasmus Andersson (SIL Open Font License 1.1).
- The Rust crates ChipWave is built on: **egui** / **eframe**, **cpal**, **midir**, **hound**, **toml**, **zip**, **mp3lame-encoder** and more.

Free for everybody, made with love by Del (postmanpat). Thank you for making music with ChipWave! 🧡