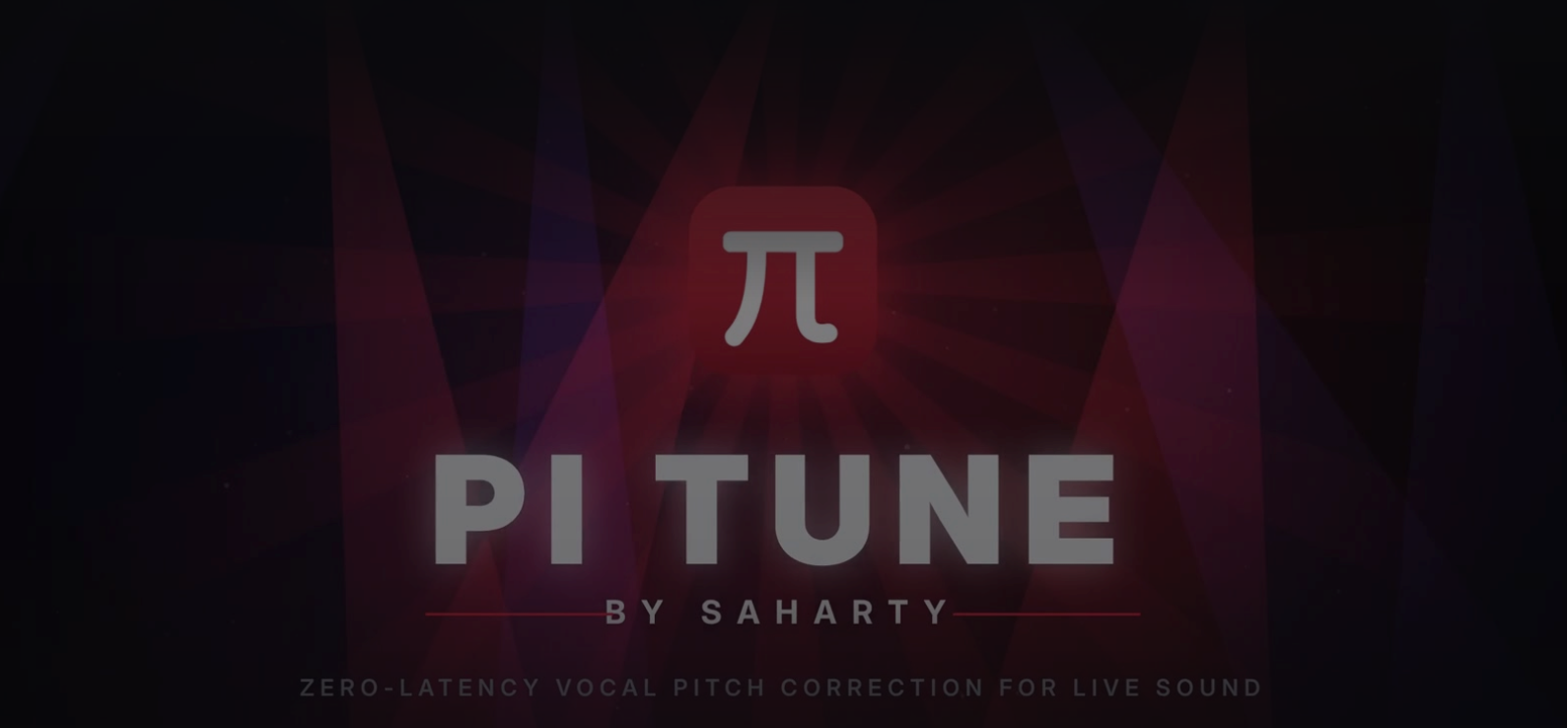
PI BY SAHARTY

PI TUNE

Zero-latency vocal pitch correction



USER MANUAL

Version 1.3.0 · macOS & Windows

www.pi-ware.com · support@pi-ware.com

Precision is a constant.

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WELCOME

Pi Tune is a real-time vocal pitch-correction plug-in from Pi by Saharty, built first for the live stage. It reports **zero samples of latency** to your console or host, so it can sit on a lead vocal without pulling the singer out of time with the band or the in-ear mix. It works just as well in the studio, on recorded vocals.



Figure 1. Pi Tune by Saharty - zero-latency vocal pitch correction for live sound

Pi Tune is for front-of-house and monitor engineers, live vocalists, worship and theatre teams, and studio engineers who want natural correction or a crisp hard-tune effect. What makes it different:

- **Zero lookahead.** The default **Formant** engine re-times the glottal pulses of the voice. The voice path is delayed by only about half a pitch period (typically 1-3 ms), and the singer's timbre is kept even for large shifts.
- **The world's scales.** 213 scales, modes, ragas, maqamat, makamlar and dastgah-ha in ten families, with true quarter tones for Arabic maqamat and 53-comma tuning for Turkish makamlar.
- **Built for loud stages.** Two pitch detectors vote on every frame, consonants and breaths are released instantly, **Learn Voice** calibrates to your singer in 10 seconds, and **Bleed reject** uses a band feed to stop Pi Tune from following the instruments.
- **Show control. Key Listen** learns the key from a side-chain feed. MIDI target notes, MIDI scale, Program Change and SMPTE timecode snapshots let the tuning follow the setlist.

What's new in version 1.3.0

- **Formant engine** is now the default: pitch-synchronous re-timing with output pulses placed exactly one target period apart, so a hard tune lands exactly on the note with no warble. Consonants and breaths go

through the same path at a constant delay, so there is no dry/wet switching, chirp or comb filtering. The **Classic** engine is still available.

- **Live voice-path delay readout** on the **TUNE** page.
- **Learn Voice** calibration and the **Learned Voice** input type.
- **Bleed reject** from the side-chain.
- Better note selection: vibrato-aware hysteresis, and a quick switch (about 40 ms) to a new note when the singer has clearly moved.
- Pi by Saharty licensing with a 15-day free trial and online or offline activation.

QUICK START

1. Download the installer from your account at pi-ware.com and run it: the `.dmg` on macOS, or the `.exe` on Windows.
2. Open your host (Logic Pro or MainStage, Pro Tools, Ableton Live, Cubase, Reaper, Studio One, Bitwig Studio, Pi Live, or any other AAX, VST3 or AU host). Rescan plug-ins if your host asks.
3. Insert **Pi Tune** on the vocal channel as an insert effect. In VST3 hosts it is listed under *Fx / Pitch Shift*.
4. Click the licence button at the top right of the window (it reads **ACTIVATE** at first). Paste your licence key and click **Activate**, or click **Start 15-day free trial**.
5. On the **TUNE** page, set **Key** and **Scale / Maqam** to match the song. If you are not sure of the key, see *Learning the key with Key Listen*.
6. Set **Input Type** to the singer's voice (**Soprano**, **Alto / Tenor** or **Low Male**). For the best tracking, press **LEARN VOICE** and have the singer sing normally for 10 seconds.
7. Choose a style from the **Factory presets** menu in the header. **Natural Live Vocal** is a good start; use **Hard Tune Effect** for the classic robotic sound.
8. Sing, and watch the pitch display: blue is the input, red is the corrected output, and the faint white band is the target note.
9. Fine-tune with **Retune Speed**, **Humanize** and **Bend Freedom**, then set **Output** to match the bypassed level.



Figure 2. The TUNE page: key and scale on the left, pitch display, note strip and the correction knobs

INSTALLATION

macOS

Pi Tune for macOS is a universal build that runs natively on Apple silicon and Intel Macs.

1. Open `PiTune-1.3.0-mac.dmg`.
2. Double-click **Install Pi Tune.pkg** and follow the steps.
3. Open your host and insert **Pi Tune** on the vocal channel.

The installer places these components:

Component	Location
VST3	`/Library/Audio/Plug-Ins/VST3`
Audio Unit	`/Library/Audio/Plug-Ins/Components`
AAX (Pro Tools)	`/Library/Application Support/Avid/Audio/Plug-Ins`
Standalone app	`/Applications`

> **Note:** In Pro Tools, insert Pi Tune from the **Pitch Shift** category on a mono or stereo vocal track. The AAX version is signed for Pro Tools on macOS.

If macOS says the installer is from an unidentified developer, right-click the `.pkg` and choose **Open**, or allow it in **System Settings > Privacy & Security**.

The first time you open the standalone app, macOS asks for microphone access ("Pi Tune needs audio input to tune your voice."). Click **Allow**. Pi Tune cannot hear your voice without it.

Windows

1. Run `PiTune-1.3.0-win-setup.exe` and follow the steps.
2. The VST3 plug-in is installed in the standard VST3 folder (`C:\Program Files\Common Files\VST3`).
3. Open your host, rescan plug-ins if needed, and insert **Pi Tune** on the vocal channel.

Windows builds are 64-bit (x64). Audio Units is a macOS-only format.

Channel layouts

Bus	Supported layouts
Main input / output	Mono in > mono out, or stereo in > stereo out (input and output must match)
Side-chain **Key / LTC**	Optional; mono or stereo

The side-chain is used by **Key Listen**, **Bleed reject** and SMPTE LTC. You do not need it for normal tuning.

First launch

When you first open Pi Tune, the window shows the **TUNE** page at its design size. You can resize the window from the bottom-right corner, from 60 % to 200 % of the original size. The proportions stay fixed so nothing is cropped. Until you activate a licence or start the trial, audio passes through untuned and the licence button reads **ACTIVATE**.

ACTIVATION & LICENSING

Pi Tune uses the Pi by Saharty licensing system. One licence activates one computer, and every format on that computer (AAX, VST3, AU and Standalone) shares the same licence.

Buying a licence

Buy Pi Tune at **pi-ware.com**. Your licence key arrives by email after purchase. It looks like `XXXXX-XXXXX-XXXXX-XXXXX`. Every purchase includes free updates. You can also click **BUY AT PI-WARE.COM** on the **SETUP** page, or **Buy a licence** in the licence window.

Opening the licence window

Open the licence window in either of these ways:

- Click the licence button at the right of the header.
- Go to **SETUP** and click **LICENCE...**.

The licence button shows your status at a glance:

Button	Meaning
LICENSED (green)	Activated with a full licence. Every feature is on.
TRIAL (amber)	The free trial is running. Every feature is on.
NOTICE (amber)	A change is coming (for example, the licence was moved). Every feature still works during the notice period.
ACTIVATE (red)	Not activated, or limited. Audio passes through untuned.

Starting the 15-day free trial

1. Open the licence window.
2. Click **Start 15-day free trial**.

The trial unlocks every feature for 15 days on this computer. The **SETUP** page shows the time left ("Free trial: ... left."). From three days before the end, a banner reminds you that the trial is ending.

Activating online

1. Make sure the computer is connected to the internet.
2. Open the licence window and paste your key into **Licence key**.
3. Click **Activate**.

When activation succeeds, you see "Activated. Thank you!" and the **SETUP** page shows **LICENSED – EVERY FEATURE ON**.

Activating offline

Use offline activation for a show computer that never goes online.

1. Open the licence window, paste your licence key into **Licence key**, then click **Offline activation**.
2. A request code appears. Click **Copy code**.
3. On any device with internet access, go to **pi-ware.com/activate** and paste the request code. Download the licence file you receive.
4. Bring the licence file back to the show computer. In the licence window, click **Load licence file...** and choose it (`.pilic` or `.txt`).

> **Note:** A licence file is made for one specific computer. If you load it on another computer, Pi Tune shows "That licence file was made for a different computer."

Moving a licence to a new computer

One licence activates one computer at a time. To change computers, do one of the following:

- **From the old computer:** open the licence window and click **Deactivate this computer**, then activate on the new one.
- **From the new computer:** activate as usual. If the key is active elsewhere, Pi Tune asks whether to move it ("This licence is active on another computer... Move it to this computer?"). Click **Move it here**. The old computer gets a 24-hour notice, then switches to limited mode. The dialog shows how many moves you have left this year.
- **From your account:** sign in at **pi-ware.com/account** to see your licences and computers and to deactivate or reset machines, for example when the old computer is lost or broken.

Online checks and the notice period

Pi Tune checks the licence whenever it finds an internet connection, and it keeps working offline with no time limit. If the server cannot be reached, everything keeps working and Pi Tune checks again later.

Pi Tune never changes during a show without warning. Nothing is limited without at least 24 hours of notice on that computer (for example, after the licence is moved, a trial ends or a refund is made). During the notice period every feature works and a banner below the header shows the countdown. Click the banner to open the licence window.

Limited mode

Without a valid licence, Pi Tune runs in limited mode. The audio passes through **untuned**, with a smooth 50 ms crossfade so you never hear a click. The window and every control stay available, so you can still prepare a session.

Where the licence is stored

System	Licence file
macOS	`~/Library/Application Support/Pi by Saharty/Licences/pi-tune.pilic`
Windows	`%APPDATA%\Pi by Saharty\Licences\pi-tune.pilic`

INTERFACE TOUR

The Pi Tune window has a header and three pages: **TUNE**, **SNAPSHOTS** and **SETUP**.

Header

Control	What it does
TUNE / **SNAPSHOTS** / **SETUP**	Switch pages.
Factory presets	Loads a tuning style (see *Choosing a tuning style*). Key and scale are kept.
BYPASS	Turns correction off; the audio passes through untouched. This is also the host's bypass parameter.
Licence button	Shows the licence status and opens the licence window.

The header also shows the **ZERO LATENCY | LIVE** label. When a licence notice is active, a banner appears just below the header.

TUNE page: Key & Scale panel (left, top)

Control	What it does	Range / default
Key	Tonic of the scale, in quarter tones (C, C½#, C#, D½b, D … B½#).	24 tonics / **C**
Direction	Which form of the scale is used when the ascending and descending forms differ.	**Auto**, Ascending, Descending, Both / **Auto**
Scale / Maqam	Scale, mode, raga, maqam, makam or dastgah, grouped by family in sub-menus.	213 entries / **Major**
Input Type	Pitch range of the source. Pi Tune ignores pitches outside it.	Soprano, **Alto / Tenor**, Low Male, Instrument, Learned Voice
MIDI	How incoming MIDI notes are used.	**Off**, Target Notes, Scale From Notes
Reference A4	Concert pitch for all scales.	400-480 Hz / **440 Hz**
RESET NOTES	Restores the notes of the selected scale after you edit the note strip.	-

TUNE page: Key Listen (Side-chain) panel (left, bottom)

Control	What it does	Range / default
Mode	Key-learning mode.	**Off**, Learn Once, Continuous

Control	What it does	Range / default
Source	Which signal Pi Tune listens to for the key.	**Side-chain L+R**, Side-chain L, Side-chain R, Main Input
Family	Limits the result to one group of scales.	**All**, Western, Arabic Maqam, Turkish Makam, Persian Dastgah, World
Learn Time	How long Pi Tune listens in Learn Once (and the memory for Continuous).	2-60 s / **12 s**
LEARN KEY	Starts a Learn Once pass now.	-
Bleed reject	Uses the side-chain to remove instrument leakage from pitch detection.	Off by default
Progress bar	Shows learning progress.	-
Result line	Shows the status, for example "Detected: D Hijaz (81 %)".	-
Suggestion buttons	The top three candidates; click one to apply it.	-
Chroma view	A 24-bar quarter-tone profile of what Pi Tune hears.	-

TUNE page: tuner and engine panel (right, top)

The **tuner readout** shows the target note name in large letters with its octave, and a cents meter (-50 to +50 cents). The blue marker is the singer's pitch and the red marker is the corrected output. The line below shows the input deviation, for example `IN +12.4 c`. When nobody is singing, it shows "Waiting for voice".

The **engine panel** contains:

Control / readout	What it does	Options / default
Engine	Chooses the pitch-shifting engine.	**Formant (lowest latency)**, Classic
LEARN VOICE	Starts a 10-second voice calibration. Changes to **CANCEL** while it runs.	-
Latency line	`LATENCY 0 smp reported | voice path x.xx ms | buffer x.x ms`	-
Voice line	The learned range and gate (for example "Voice: A2 - E5, gate -52 dB"), plus "bleed removed nn %" when **Bleed reject** is working.	-

TUNE page: pitch display and note strip (right, centre)

The scrolling **pitch display** shows the last five seconds:

- **Input** (blue): what the singer sings.

- **Corrected** (red): what Pi Tune outputs.
- **Target** (wide white band): the note Pi Tune is aiming for.

Horizontal lanes mark every semitone and quarter tone. Notes that belong to the active scale are highlighted and labelled. The view follows the singer up and down automatically.

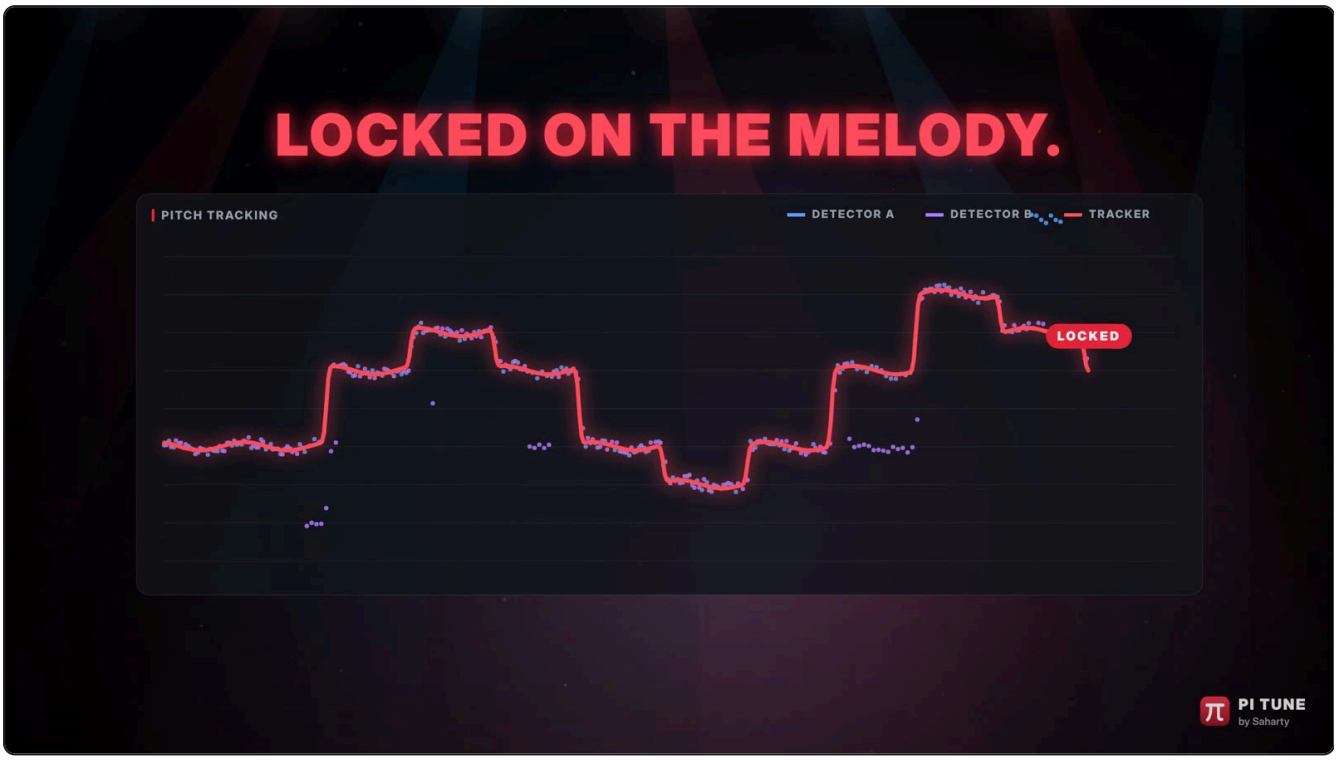


Figure 3. The pitch display locks onto the melody as the singer moves between notes ▶ Animated in the online manual

The **note strip** below the display has 24 cells, one per quarter tone from C to B½#. Red cells are notes Pi Tune may tune to. The tonic has a white outline, and the note currently targeted lights up brighter. Click any cell to switch that note on or off (see *Editing the notes by hand*).

TUNE page: correction knobs (bottom)

Drag a knob up/down or left/right to change it. Double-click a knob to return it to its default. Hover over a knob to see its tooltip.

Knob	What it does	Range / default
Retune Speed	How fast the voice is pulled to the target note. 0 ms = hard-tune effect.	0-400 ms / **20 ms**
Humanize	Slows the correction on sustained notes so long notes stay natural.	0-100 % / **0 %**
Bend Freedom	Only corrects when the singer is close to the note; expressive bends are left alone.	0-100 % / **0 %**
Vibrato (Natural Vibrato)	Natural vibrato depth: 0 % removes it, 100 % keeps it, 200 % doubles it.	0-200 % / **100 %**
Amount (Correction Amount)	How much of the correction is applied.	0-100 % / **100 %**

Knob	What it does	Range / default
Transpose	Shifts the output by whole semitones.	-12 to +12 st / **0**
Detune	Shifts the output by cents.	-100 to +100 cents / **0.0 c**
Tracking	Pitch-detection sensitivity. Raise for breathy voices, lower for noisy stages.	0-100 % / **50 %**
Mix	Blend of corrected and original voice.	0-100 % / **100 %**
Output	Output level.	-24 to +12 dB / **0.0 dB**



Figure 4. The correction knobs and the quarter-tone note strip

SNAPSHOTS page

The left **Timecode** panel shows the current timecode in large digits, the lock status (**LOCKED** with the frame rate, or **NO TIMECODE**), the **SOURCE** menu, and the **Follow timecode snapshots** and **Follow MIDI program changes** switches. The right **Snapshots** panel holds the snapshot list and the **CAPTURE NEW**, **UPDATE**, **RECALL**, **DELETE**, **SET TC = NOW** and **SORT BY TC** buttons. See *Snapshots for the whole show*.

SETUP page

The **Licence** panel shows a status badge (for example **LICENSED - EVERY FEATURE ON** or **NOT ACTIVATED - AUDIO PASSES THROUGH UNTUNED**), the licence message, "This computer:" with the computer name, and the **LICENCE...** and **BUY AT PI-WARE.COM** buttons. The **About** panel shows the version number, a feature summary and the current wet-path delay.

HOW PI TUNE CORRECTS IN REAL TIME

You do not need to understand the engine to use Pi Tune, but knowing what it does helps you set it up well.

Zero lookahead

Many pitch correctors wait for a block of audio before they decide on the pitch. Pi Tune does not look ahead. It reports **0 samples** of latency to the host, so your console or DAW never needs to delay-compensate the vocal channel.

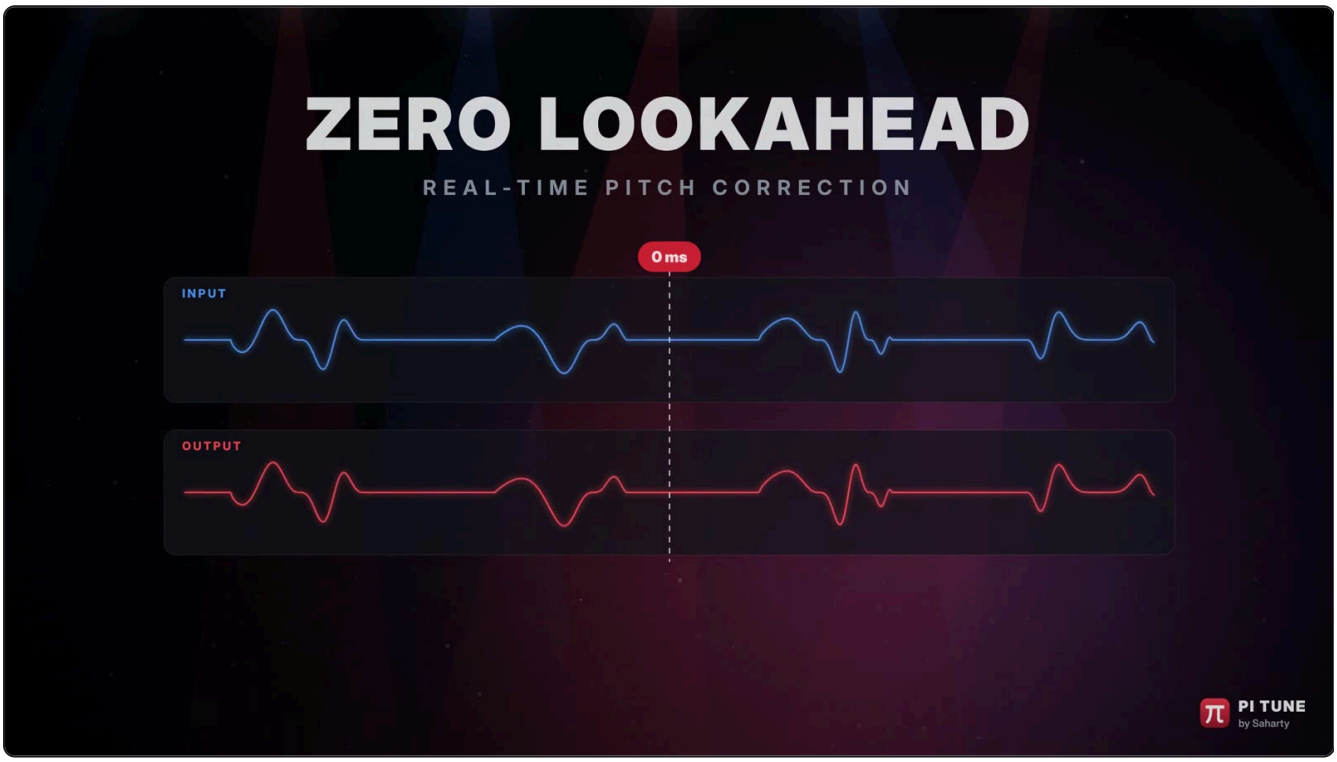


Figure 5. Zero lookahead: the corrected signal stays aligned with the input ▶ Animated in the online manual

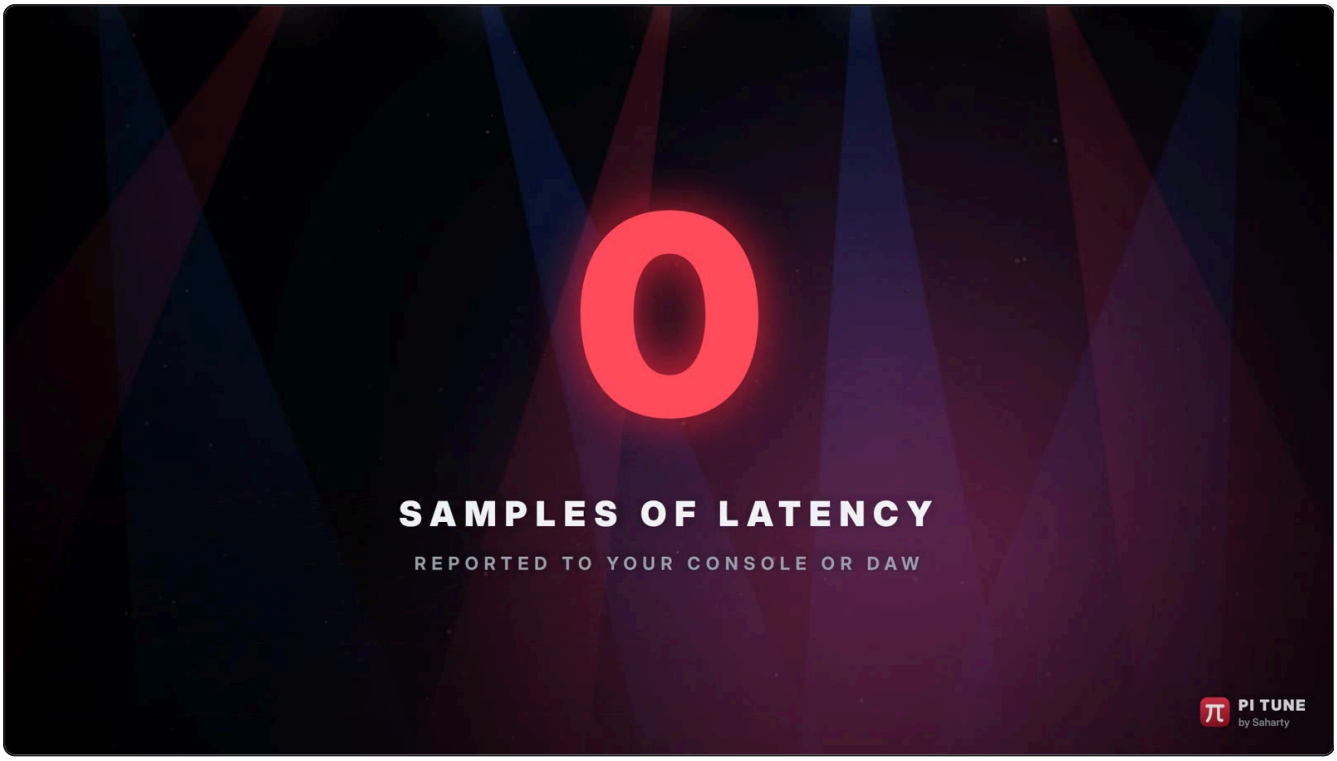


Figure 6. Zero samples of latency reported to your console or host

The in-ears and front of house hear the corrected note at the same moment the singer sings it.

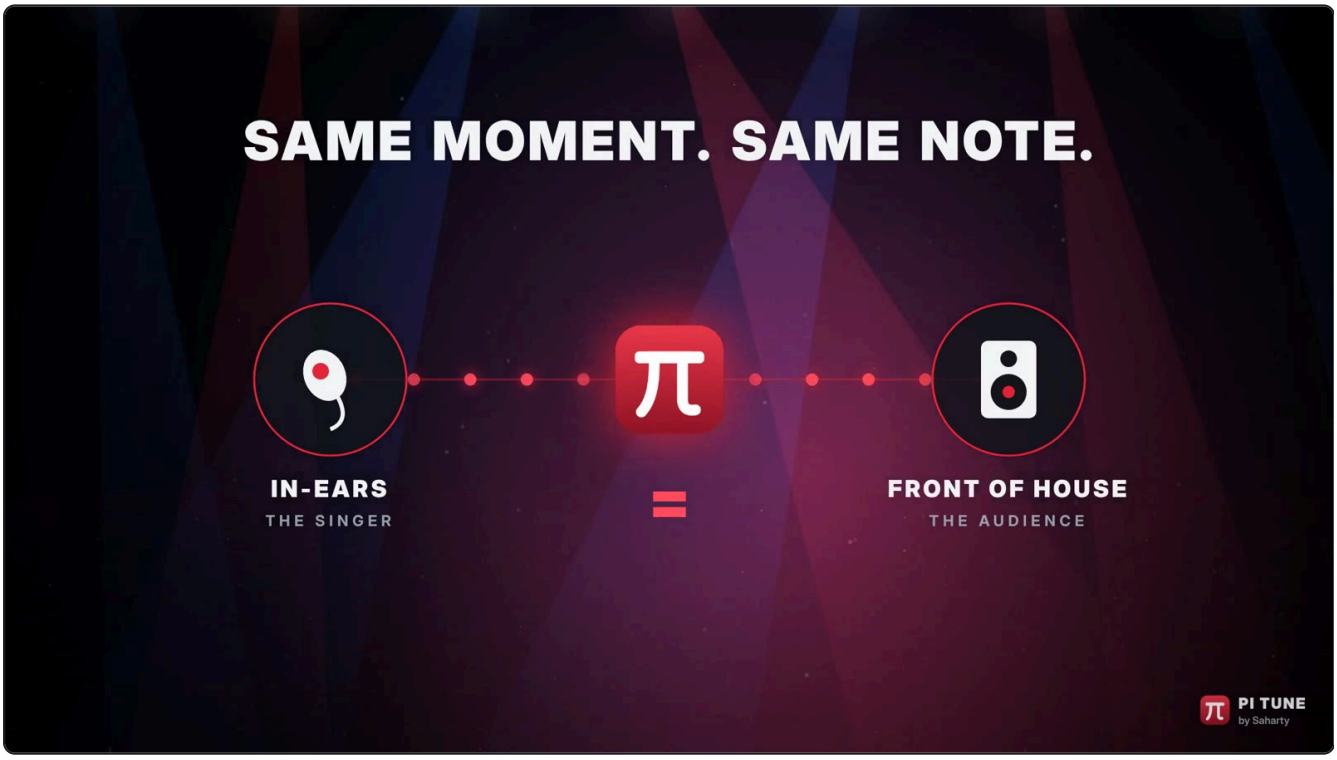


Figure 7. Same moment, same note - in the in-ears and at front of house

The two engines

Engine	How it works	Voice-path delay	When to use it
Formant (lowest latency) (default)	Re-times the glottal pulses of the voice (pitch-synchronous overlap-add). Output pulses are spaced exactly one target period apart.	About half a pitch period, typically 1-3 ms	Almost always. Keeps the singer's timbre, even for large shifts, and gives an exact hard tune.
Classic	The original zero-lookahead delay-line shifter.	Up to about two pitch periods	Try it if you prefer its character on a particular voice or instrument.

The latency line on the **TUNE** page shows the live voice-path delay, and the **About** panel shows the current wet-path delay. Neither engine adds plug-in latency reported to the host.

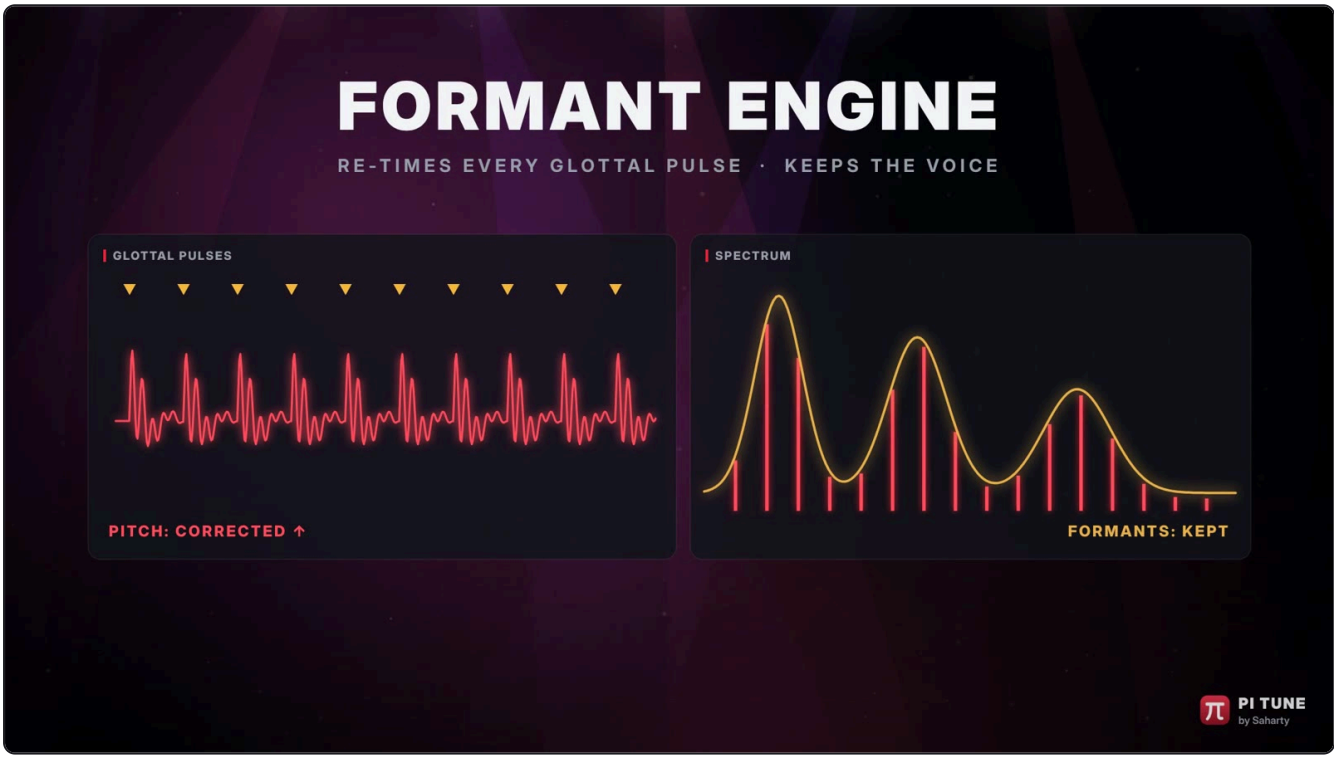


Figure 8. The Formant engine re-times every glottal pulse and keeps the formants ▶ Animated in the online manual

Because the formants are kept, large corrections do not sound like a chipmunk or a robot, unless you want the robot. The hard-tune sound is there when you set **Retune Speed** to 0 ms.

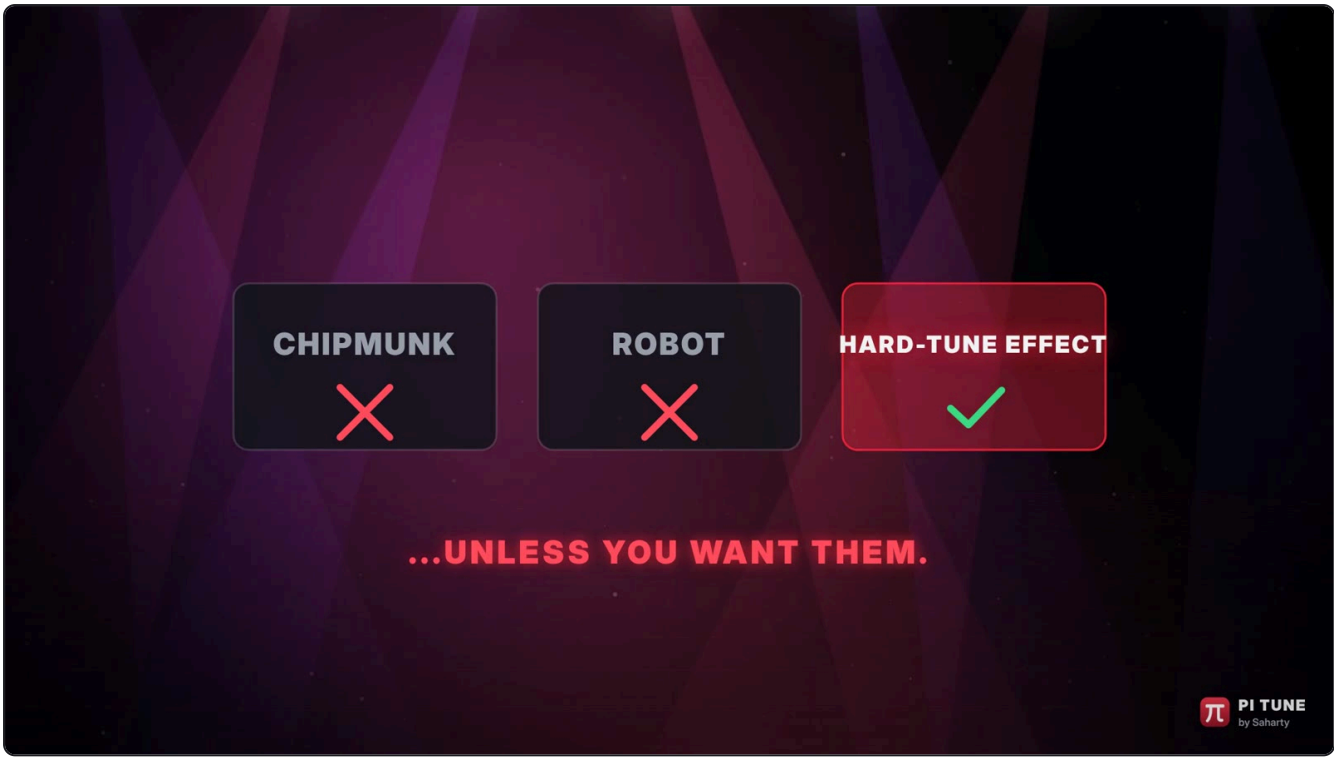


Figure 9. No chipmunk, no robot - unless you want the hard-tune effect

Breaths and consonants

A fast consonant detector releases "s", "sh" and "t" sounds at once, even under a reverb tail. Its threshold adapts to the singer's vowels. With the Formant engine, breaths and consonants go through the same path at a constant delay, so there is no switching, chirp or comb filtering between corrected vowels and uncorrected consonants.

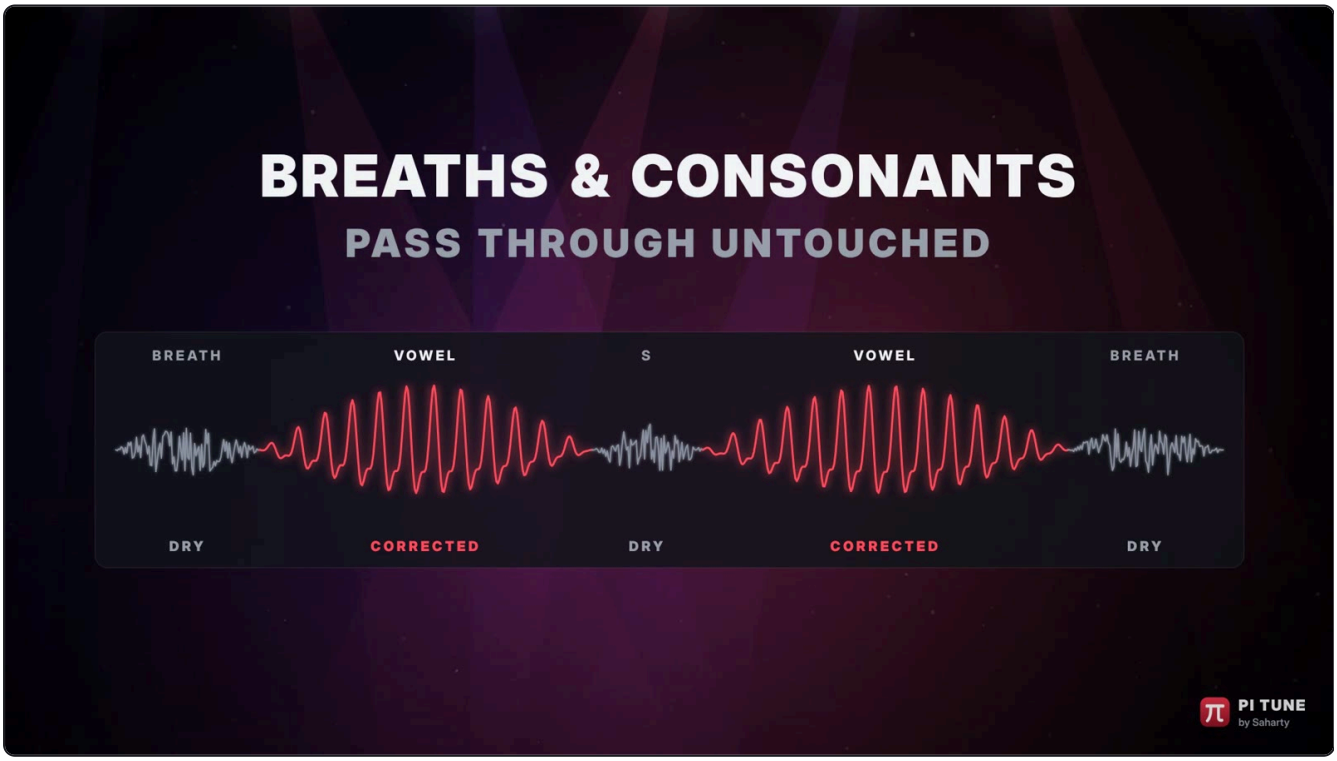


Figure 10. Breaths and consonants pass through untouched while vowels are corrected ▶ Animated in the online manual

Detection and note choice

Two detectors (YIN and McLeod) vote on every frame, and a tracker rejects octave and other harmonic jumps. Pi Tune then picks the nearest allowed note:

- **Vibrato-aware hysteresis** keeps the current note through vibrato, so the output does not flip between neighbouring notes.
- When the singer has clearly moved to a new note, Pi Tune follows within about 40 ms, so no wrong note is held after a scoop.
- When a scale has different ascending and descending forms and **Direction** is **Auto**, Pi Tune follows the melodic direction of the line.

CHOOSING A KEY AND SCALE

How to set the key and scale

1. On the **TUNE** page, open **Key** and choose the tonic. Quarter-tone tonics such as **E½b** or **B½b** are included for maqam music.
2. Open **Scale / Maqam**. Point to a family to open its sub-menu, then choose the scale.
3. Check the note strip: the red cells show the notes Pi Tune will tune to.

The scale families

Family	Entries	Examples
Western	20	Chromatic, Major, Natural Minor, Harmonic Minor, Melodic Minor, pentatonics, blues, whole tone, diminished, triads, Power (Root & Fifth)
Modes	19	Ionian, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, Locrian and more
Jazz & Bebop	8	Jazz and bebop scales
Exotic & Synthetic	20	Exotic and synthetic scales
Indian (Thaat & Raga)	25	Thaats and ragas
East Asian	14	East Asian scales
African & Indonesian	10	African and Indonesian scales
Arabic Maqamat	51	Rast, Bayati, Sikah, Hijaz, Saba, Nahawand, Ajam, Kurd, Nikriz, Huzam, Iraq, Hijazkar, Shadd Araban, Nawa Athar and more
Turkish Makamlar	34	Rast (Makam), Ussak, Huseyni, Hicaz, Hicazkar, Karcigar, Kurdilihicazkar, Nihavend, Segah, Huzzam, Saba (Makam), Suzinak and more
Persian Dastgah	12	Shur, Abu Ata, Dashti, Bayat-e Tork, Afshari, Segah (Dastgah), Chahargah, Homayoun, Bayat-e Esfahan, Mahur (Dastgah), Rast-Panjgah, Nava



Figure 11. 213 scales across ten families

Arabic maqamat use true quarter tones (24 notes per octave). Pi Tune targets the real neutral intervals of the tradition, including the notes between the piano keys.



Figure 12. Arabic maqamat in true quarter tones

Turkish makamlar use the 53-comma system, so their intervals are even finer than a quarter tone. **Persian dastgah-ha** use the common 24-tone approximation (koron and sori).



Figure 13. Turkish makamlar in 53-comma tuning

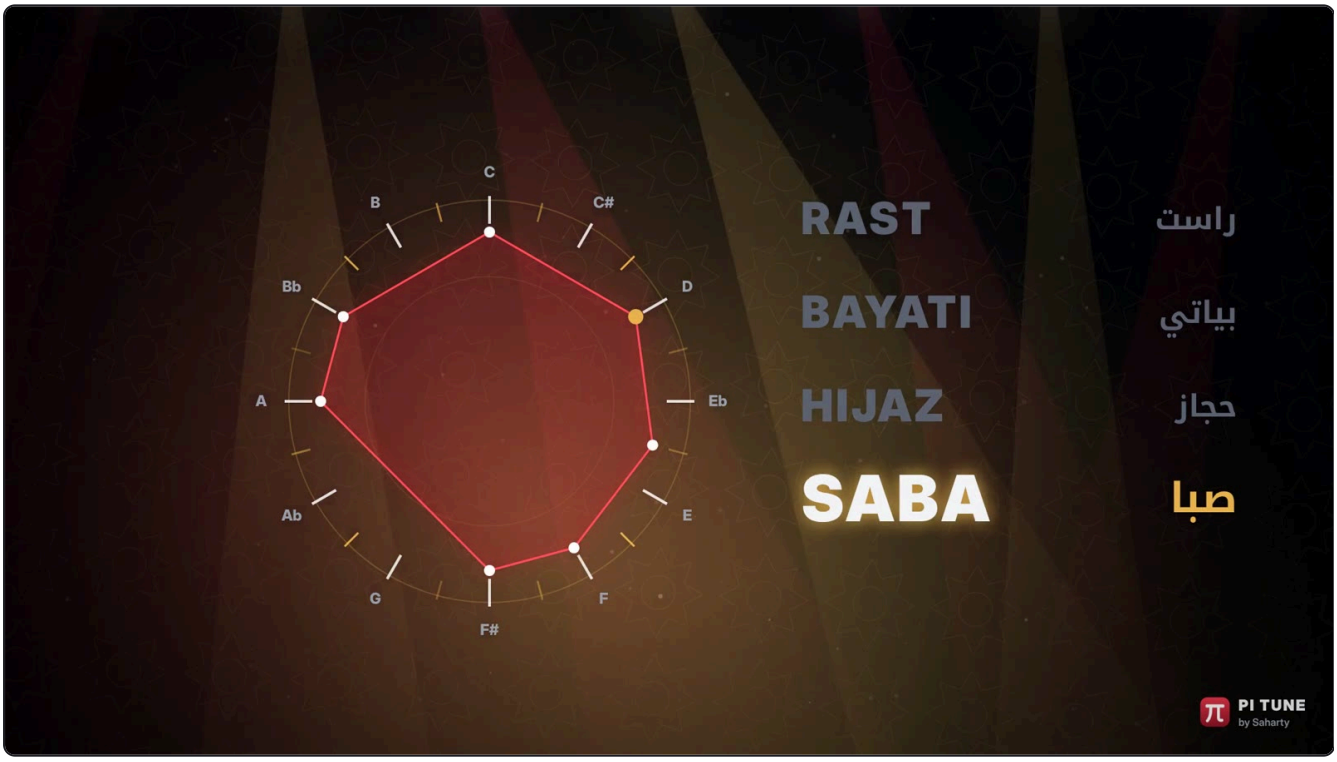


Figure 14. Each maqam has its own shape - Rast, Bayati, Hijaz, Saba ▶ **Animated in the online manual**

> **Tip: Chromatic** tunes to every semitone. Use it when the song changes key often or you are not sure of the key. It still tightens pitch without forcing notes into a scale.

How to use Direction

Some scales, such as **Melodic Minor** and several maqamat and makamlar, use different notes going up than coming down. **Direction** controls this:

Setting	Behaviour
Auto	Follows the melody: ascending notes when the line rises, descending notes when it falls.
Ascending	Always uses the ascending form.
Descending	Always uses the descending form.
Both	Allows the notes of both forms at any time.

For scales with a single form, **Direction** makes no difference.

How to set the reference pitch

If the band tunes to something other than A = 440 Hz (for example A = 442 Hz, or an instrument tuned to its own reference), drag **Reference A4** to match. The range is 400-480 Hz in 0.1 Hz steps.

Editing the notes by hand

You can switch any of the 24 quarter-tone notes on or off on the note strip.

1. Choose the **Key** and **Scale / Maqam** first.
2. Click a red cell to remove that note, or a grey cell to add it.
3. To return to the scale's own notes, click **RESET NOTES**.

Your edits belong to the current key and scale combination. If you choose a different key or scale, the strip shows the new scale's notes. If you return to the edited combination, your edits come back. Edited notes are saved with your session and in snapshots.

> **Tip:** Remove a note the singer tends to land on by mistake, or a passing note you do not want "corrected" into. Fewer notes make the correction feel firmer.
>
> **Note:** For Turkish makamlar and other fine-tuned scales, the notes of the scale keep their exact pitch. The strip shows them at the nearest quarter tone. A note you add by hand is placed exactly on its quarter tone.

SHAPING THE CORRECTION

Choosing a tuning style

The **Factory presets** menu sets the five style knobs. It does not change key, scale, input type or any other setting.

Preset	Retune Speed	Humanize	Bend Freedom	Vibrato	Amount
Natural Live Vocal	25 ms	30 %	20 %	100 %	100 %
Pop Tight	10 ms	15 %	0 %	85 %	100 %
Hard Tune Effect	0 ms	0 %	0 %	0 %	100 %
Gentle Pitch Assist	60 ms	50 %	55 %	100 %	80 %
Ballad Smooth	40 ms	45 %	15 %	100 %	100 %
Maqam / Tarab Natural	35 ms	40 %	30 %	110 %	100 %
Melodic Rap	4 ms	0 %	0 %	30 %	100 %
Choir / Backing	15 ms	25 %	10 %	70 %	100 %



Figure 15. Choosing a tuning style from the Factory presets menu ▶ Animated in the online manual

How to get natural correction

1. Start from **Natural Live Vocal** or **Gentle Pitch Assist**.

2. Raise **Retune Speed** (30-60 ms) so the voice glides into the note instead of snapping.
3. Raise **Humanize** so long, held notes are corrected more gently and keep their life.
4. Raise **Bend Freedom** so deliberate slides, falls and blue notes are left alone. Pi Tune then corrects only when the singer is already close to a note.
5. Keep **Vibrato** at 100 % to keep the singer's own vibrato.
6. If it still sounds processed, lower **Amount** or **Mix**.



Figure 16. Humanize keeps long notes natural

How to get the hard-tune effect

1. Choose **Hard Tune Effect** (or set **Retune Speed** to 0 ms).
2. Keep **Humanize** and **Bend Freedom** at 0 %.
3. Set **Vibrato** to 0 % to flatten the vibrato completely.
4. Use a scale with few notes (for example **Minor Pentatonic**) for a more obvious effect.

With the Formant engine, the output pulses are placed exactly one target period apart, so a 0 ms hard tune lands exactly on the note with no residual detune or warble.

Vibrato control

Vibrato acts on the singer's natural vibrato:

- **0 %** removes the vibrato (a straight, steady note).
- **100 %** keeps it as sung.
- **200 %** doubles its depth.



Figure 17. Vibrato keeps, removes or deepens the singer's own vibrato

Transpose, Detune and Mix

- **Transpose** shifts the corrected voice by -12 to +12 semitones, for an octave or harmony effect.
- **Detune** moves the output by up to ±100 cents. Use small values (5-10 cents) on a doubled part for width.
- **Mix** blends the corrected voice with the original voice.
- **Output** sets the level after Pi Tune (-24 to +12 dB).

CALIBRATING TO THE SINGER

Choosing the Input Type

Input Type tells Pi Tune where to look for the pitch. A range that fits the voice avoids octave errors and stops Pi Tune from reacting to sounds outside the voice.

Input Type	Detection range
Soprano	150-1300 Hz
Alto / Tenor (default)	85-900 Hz
Low Male	55-500 Hz
Instrument	40-1600 Hz
Learned Voice	The range measured by **LEARN VOICE**

How to use Learn Voice

Learn Voice measures the singer's real range and the noise floor of the stage. It then sets a detection range and a gate made for that singer.

1. Make sure the vocal mic is live and the stage is at its normal level (band soundcheck or line check).
2. On the **TUNE** page, click **LEARN VOICE**. The button changes to **CANCEL** and a progress bar fills over 10 seconds.
3. Ask the singer to sing a few phrases across their range, as they would in the show.
4. When the bar is full, Pi Tune sets **Input Type** to **Learned Voice** and shows the result, for example "Voice: A2 - E5, gate -52 dB".

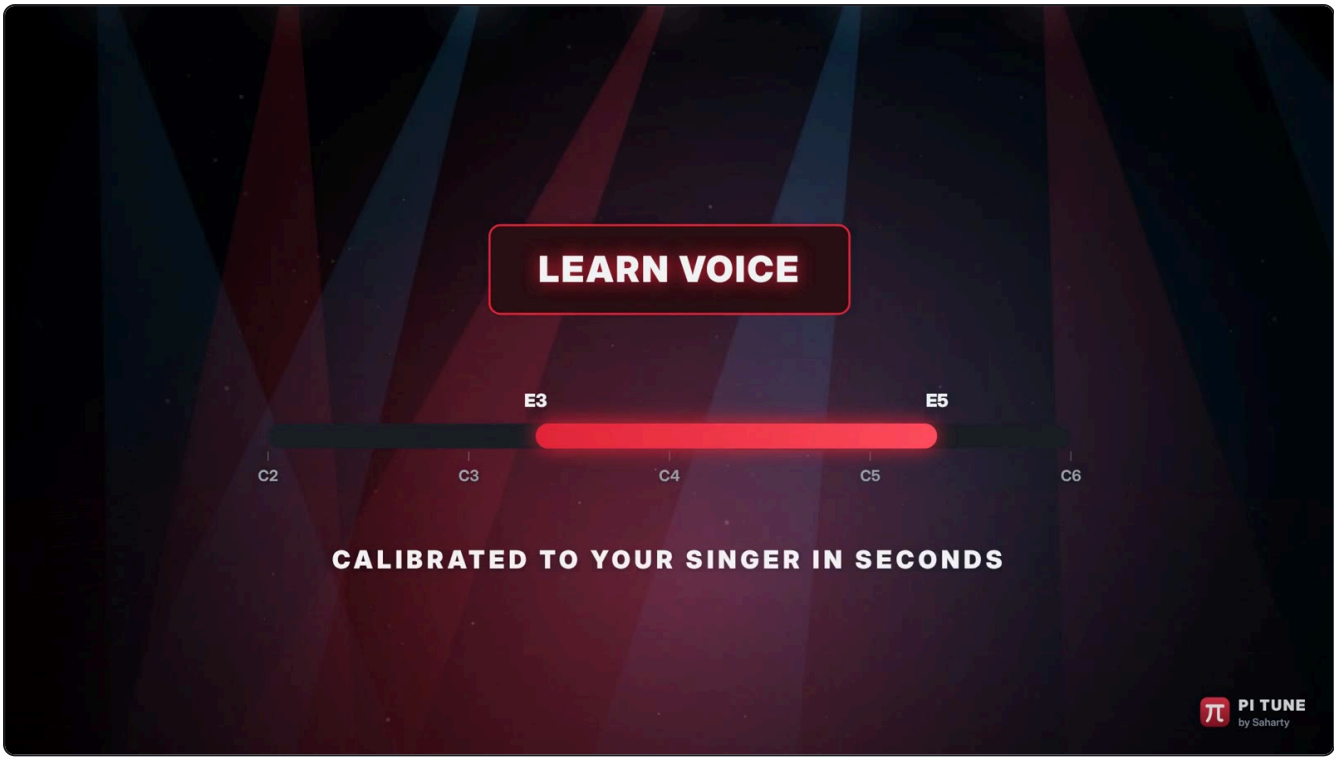


Figure 18. Learn Voice calibrates to your singer in seconds ▶ Animated in the online manual

If the singer is breathy, Learn Voice also raises **Tracking** (to between 50 % and 80 %) so the detector follows the voice more readily.

If the result says "Not enough singing heard - try again", Pi Tune did not hear enough sung notes. Run it again and make sure the singer sings during the full 10 seconds. Click **CANCEL** at any time to stop without changing anything.

The learned voice is saved with your session and project, so you only need to do this once per singer.

Setting Tracking

Tracking sets how readily Pi Tune decides it hears a pitch:

- **Raise it** for soft, breathy or airy voices that Pi Tune sometimes lets through untuned.
- **Lower it** on a loud, noisy stage where Pi Tune reacts to spill or noise between phrases.

REJECTING BAND BLEED ON STAGE

On a loud stage, the vocal mic also picks up drums, guitars and monitors. **Bleed reject** stops Pi Tune from following those instruments.

How to set up Bleed reject

1. Send a feed of the band **without vocals** (for example an instrument sub-group, or a mix of the loudest stage sources) to Pi Tune's side-chain input, **Key / LTC**. How you route a side-chain depends on your host.
2. On the **TUNE** page, turn on **Bleed reject** in the **Key Listen (Side-chain)** panel.
3. Have the band play. The voice line in the engine panel shows "bleed removed nn %" while it works.

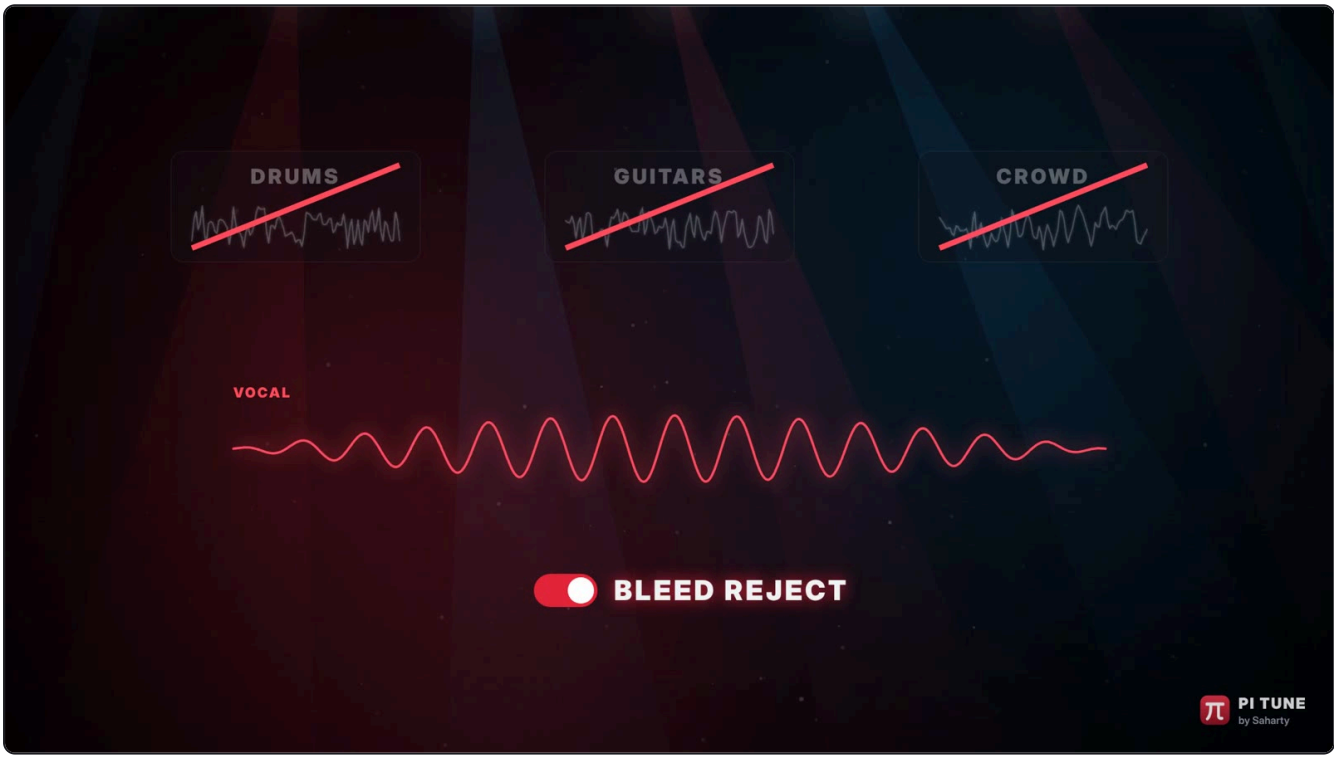


Figure 19. Bleed reject removes drums, guitars and crowd from pitch detection ▶ Animated in the online manual

An adaptive filter learns how the band feed leaks into the vocal mic and removes it from the **detector only**. Your vocal audio is not filtered, so the sound of the mic does not change. Pi Tune simply follows the singer and not the band.

> **Note:** If you use one side-chain channel for SMPTE LTC, Bleed reject never uses that channel. It uses only the other side-chain channel.
>
> **Warning:** Do not include the vocal itself in the bleed-reject feed. Pi Tune would then treat the voice as bleed.

LEARNING THE KEY WITH KEY LISTEN

Key Listen works out the key and scale (or maqam, makam or dastgah) by listening to a reference signal, such as the keys, a guitar, the band mix or the playback. It can also listen to the vocal itself.



Figure 20. Feed the band or playback into the side-chain and Key Listen learns the key

How to learn the key once

1. Route a reference signal to the side-chain input **Key / LTC**. Harmonic instruments (keys, guitar, strings, the full band or the playback) work best.
2. Set **Source** to **Side-chain L+R**, **Side-chain L** or **Side-chain R**. To learn from the singer instead, choose **Main Input**.
3. Set **Family** to the kind of music if you know it (for example **Arabic Maqam**). This avoids picking a scale from the wrong tradition. Leave it on **All** if you are not sure.
4. Set **Learn Time** (2-60 s; 12 s by default). Longer is more reliable; shorter is faster.
5. Click **LEARN KEY** (or set **Mode** to **Learn Once**). The progress bar fills and the result line shows "Listening… nn %".
6. When it finishes, Pi Tune sets **Key** and **Scale / Maqam** to the best match and shows it, for example "Detected: D Hijaz (81 %)".
7. If the best match is not right, click one of the three suggestion buttons below the result to apply it instead.



Figure 21. Key Listen analyses the reference and suggests the key and maqam ▶ **Animated in the online manual**

The **chroma view** at the bottom of the panel shows how strongly each of the 24 quarter tones is heard. It helps you see whether the reference signal is clear.

How to follow key changes automatically

Set **Mode** to **Continuous**. Pi Tune keeps listening with a sliding memory. It changes **Key** and **Scale / Maqam** only when:

- the same new result has held for several analyses in a row (about 1.5 seconds),
- it is reasonably confident (more than 55 %), and
- it has listened for at least half the **Learn Time**.

This avoids jumping around on a single chord.

> **Tip:** On a live show, **Learn Once** during the intro, or snapshots (see below), is usually safer than **Continuous**. Use **Continuous** for jams or unknown setlists.

Applying a learned key resets any hand-edited notes on the note strip. When **Mode** is **Off**, the result line shows "Off - choose a mode or press Learn". If there is no signal yet, it shows "Waiting for reference signal...".

CONTROLLING PI TUNE WITH MIDI

Pi Tune accepts MIDI from your host or, in the standalone app, from a MIDI input.

MIDI Target Notes: sing to the keyboard

1. Set **MIDI** on the **TUNE** page to **Target Notes**.
2. Route a MIDI track or keyboard to Pi Tune.
3. While keys are held, Pi Tune tunes the voice to the nearest held note. If the singer is far from every held key (more than a fifth), Pi Tune uses the same note names in the singer's octave instead.
4. When no keys are held, Pi Tune falls back to the selected scale.

This is ideal for exact melodies programmed from a MIDI file, or for a keyboard player who "plays" the vocal tuning.

MIDI Scale From Notes: a chord defines the notes

1. Set **MIDI** to **Scale From Notes**.
2. Hold a chord or a group of notes. Pi Tune allows only the note names you are holding, in any octave.
3. Release all keys to go back to the selected scale.

Program Change

When **Follow MIDI program changes** is on (on the **SNAPSHOTS** page; on by default), a MIDI Program Change recalls a snapshot. See the next chapter.

SNAPSHOTS FOR THE WHOLE SHOW

Snapshots store everything that defines the tuning of a song or a section, and recall it by timecode, MIDI Program Change or a click.

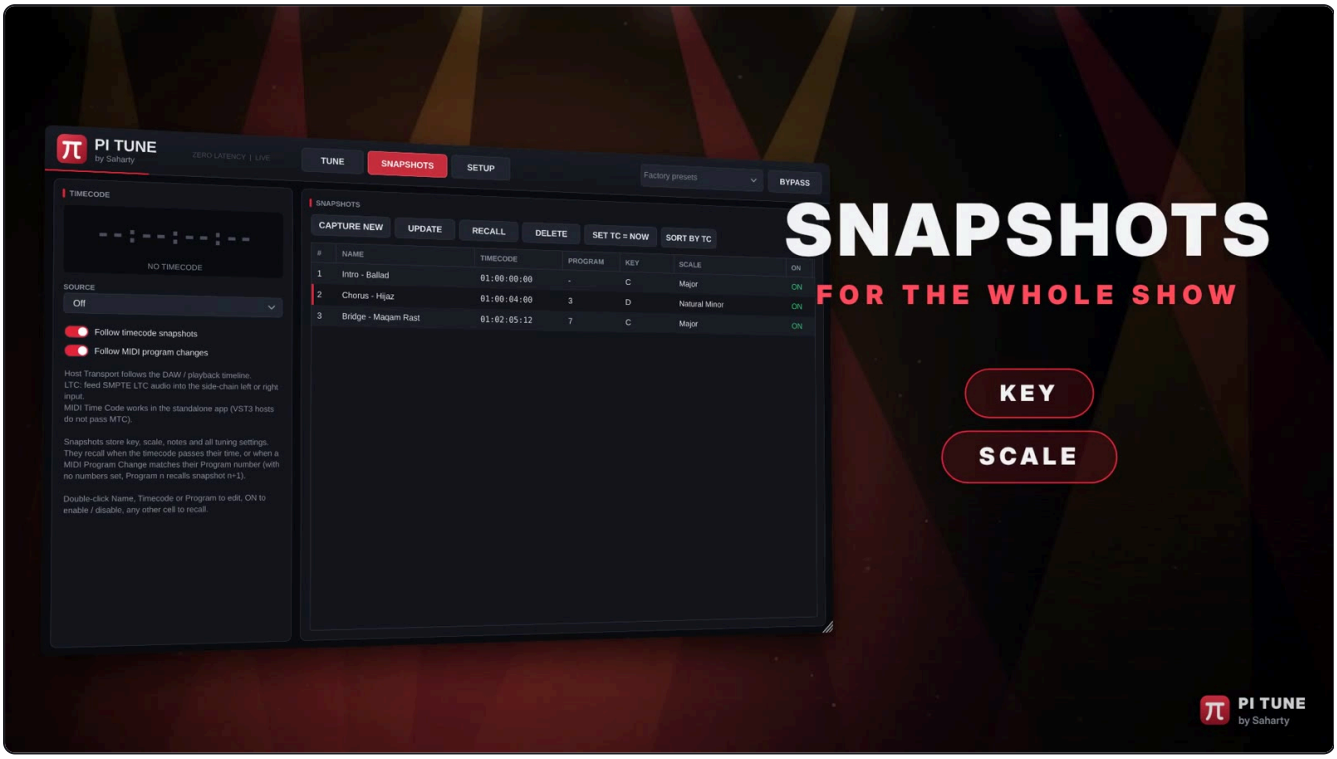


Figure 22. The SNAPSHOTS page: timecode panel and snapshot list

What a snapshot stores

Stored in a snapshot	Not stored in a snapshot
Key, **Scale / Maqam**, **Direction**, **Reference A4**, **Input Type**, **MIDI** mode, **Engine**	**BYPASS**
Retune Speed, **Humanize**, **Bend Freedom**, **Vibrato**, **Amount**	Key Listen settings (**Mode**, **Source**, **Family**, **Learn Time**)
Transpose, **Detune**, **Tracking**, **Mix**, **Output**	**Bleed reject**
Your hand-edited notes on the note strip	Timecode **SOURCE** and the follow switches

How to create snapshots

1. Set up the tuning for the first song on the **TUNE** page.
2. Go to **SNAPSHOTS** and click **CAPTURE NEW**. A new row appears ("Snapshot 1"). If timecode is running, its current time is stored with the snapshot; otherwise its time is 00:00:00:00.
3. Repeat for each song or section.

How to edit the snapshot list

Action	How
Rename	Double-click the **Name** cell, type, press Return.
Set the time	Double-click the **Timecode** cell and type `hh:mm:ss:ff` (`:`, `;` or `.` are accepted as separators). Or select the row and click **SET TC = NOW** to use the current timecode.
Assign a Program Change	Double-click the **Program** cell and type 0-127. Leave it empty for none.
Enable / disable	Double-click the **On** cell. Disabled snapshots are never recalled automatically.
Recall	Select the row and click **RECALL**, or double-click any other cell (**#**, **Key** or **Scale**).
Overwrite with the current settings	Select the row and click **UPDATE**.
Delete	Select the row and click **DELETE**.
Put in time order	Click **SORT BY TC**.

Press Escape while editing a cell to cancel. The active (most recently recalled) snapshot is marked with a red bar at the left of its row.

Recalling snapshots with MIDI Program Change

1. On the **SNAPSHOTS** page, turn on **Follow MIDI program changes**.
2. Either type a Program number into each snapshot's **Program** cell, or leave them all empty.
3. Send a Program Change to Pi Tune from your host, a show-control system or a MIDI pedal.

If any snapshot has a Program number, Pi Tune recalls the first enabled snapshot whose number matches. If **no** snapshot has a number, Program *n* recalls snapshot *n*+1 (Program 0 recalls snapshot 1, Program 1 recalls snapshot 2, and so on).



Figure 23. A Program Change recalls the matching snapshot

Recalling snapshots with timecode

1. Choose the timecode **SOURCE**:

Source	Use it when
Host Transport	The DAW or playback system's timeline drives the show. Pi Tune reads the host's position (including the session start time) and frame rate.
LTC on Side-chain L / LTC on Side-chain R	You have SMPTE LTC audio. Patch it into the left or right channel of the **Key / LTC** side-chain. 24, 25, 29.97 drop-frame and 30 fps are detected automatically.
MIDI Time Code	You send MTC. This works in the standalone app; VST3 hosts do not pass MTC to plug-ins.
Off	No timecode.

2. Check that the display shows the running time and **LOCKED** with the frame rate. **NO TIMECODE** means nothing is being received.
3. Turn on **Follow timecode snapshots** (on by default).
4. Give each snapshot its start time, then click **SORT BY TC** to keep the list tidy.

During the show, Pi Tune always applies the latest enabled snapshot whose time has been reached. A snapshot is recalled once, when the timecode passes its time. If you change a setting by hand afterwards, Pi Tune keeps your change until the next snapshot time is reached.

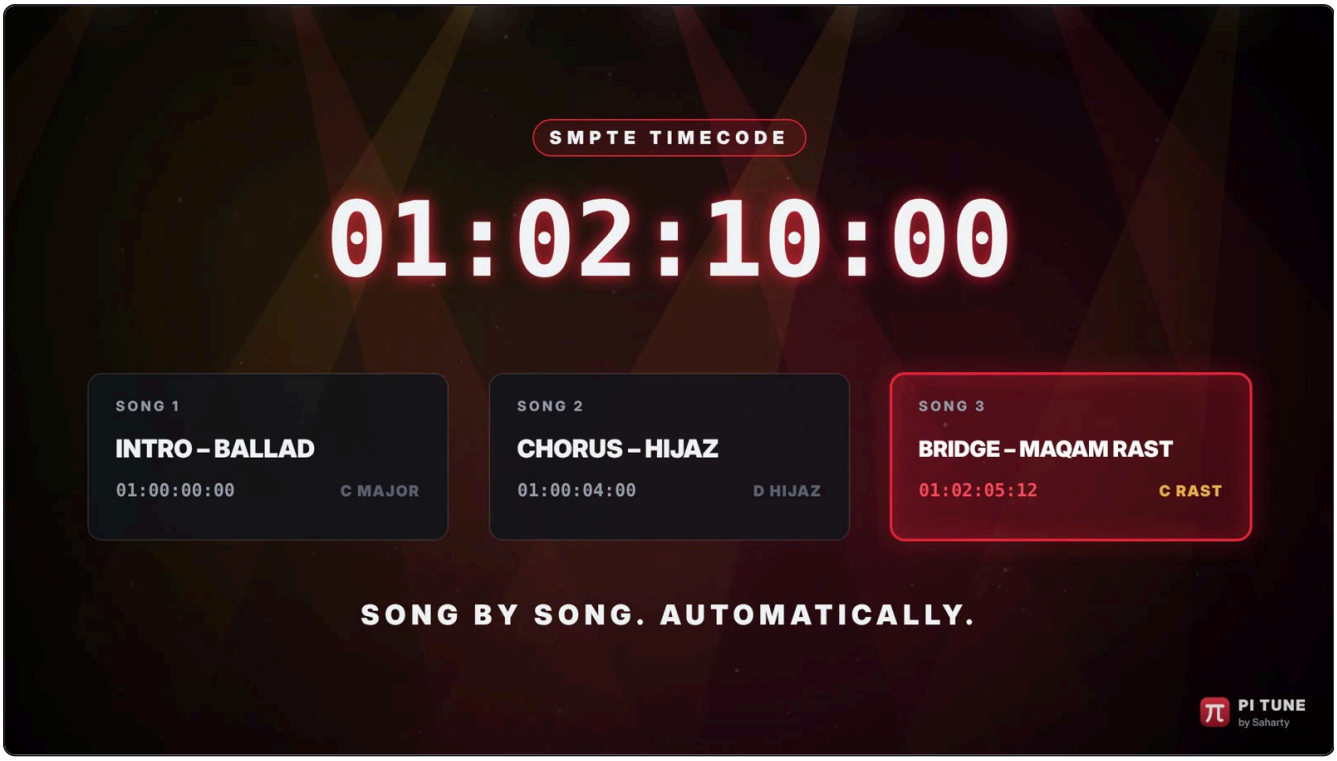


Figure 24. SMPTE timecode recalls each song's snapshot automatically ▶ Animated in the online manual

> **Note:** When LTC is on one side-chain channel, Key Listen and Bleed reject automatically ignore that channel. You can carry LTC on one side and a band feed on the other.

Snapshots are saved inside your host session or project (and in the standalone app's saved state), together with all other settings.

SETTINGS & PREFERENCES

Pi Tune has no separate preferences file. Every setting is part of the plug-in state and is saved with your host session, including:

- all parameters on the **TUNE** page,
- your hand-edited notes,
- the learned voice profile (range and gate),
- the snapshot list,
- the timecode source and follow switches.

All parameters can be automated from your host. The host's bypass control is linked to Pi Tune's **BYPASS** button.

Window size

Drag the bottom-right corner to resize the window between 60 % and 200 % of its normal size. The layout scales evenly.

Standalone app

The standalone app runs Pi Tune without a host, for example on a dedicated computer between the console and the PA, or for practice. Use the app's **Options** menu to choose the audio device, input and output channels, sample rate, buffer size and MIDI input. Choose the smallest buffer size your system can run without dropouts; the **TUNE** page shows the current buffer in milliseconds next to the voice-path delay.

KEYBOARD SHORTCUTS / REMOTE CONTROL

Mouse and keyboard

Action	Shortcut
Reset a knob to its default	Double-click the knob
Confirm a snapshot cell edit	Return (or click elsewhere)
Cancel a snapshot cell edit	Escape
Close the licence window	Escape

MIDI messages

Message	Effect
Note On / Note Off	Target notes (**MIDI** = **Target Notes**) or scale notes (**MIDI** = **Scale From Notes**)
All Notes Off / All Sound Off	Releases all held notes; Pi Tune returns to the selected scale
Program Change 0-127	Recalls a snapshot (when **Follow MIDI program changes** is on)
MIDI Time Code (quarter-frame and full-frame)	Timecode for snapshots (when **SOURCE** = **MIDI Time Code**)

Timecode

Source	Formats
Host transport	Host position and frame rate
SMPTE LTC audio on the side-chain	24, 25, 29.97 drop-frame, 30 fps
MIDI Time Code	24, 25, 29.97 drop-frame, 30 fps

TIPS FOR LIVE/STUDIO USE

- **Insert Pi Tune first in the vocal chain**, before compression and effects. Reverb or delay before Pi Tune makes detection harder.
- **Run Learn Voice at soundcheck**, with the band playing at show level. The gate it sets sits above the stage noise but below the singer's quietest notes.
- **Use the right Input Type.** A wrong range is the most common reason for octave errors. If you cannot run Learn Voice, choose the range closest to the singer.
- **Feed Bleed reject the loud stuff.** The instruments that leak most into the vocal mic (drums, guitar amps, wedges) are the ones to include in the side-chain feed.
- **One side-chain, two jobs.** Put LTC on one side-chain channel and a band feed on the other: you get timecode snapshots and Key Listen or Bleed reject at the same time.
- **Keep the buffer small.** Pi Tune adds no plug-in latency, but your host's buffer still delays the signal. The latency line on the **TUNE** page shows both the voice path and the buffer.
- **Prefer snapshots to Continuous key listening on a show.** Snapshots are predictable; Continuous mode is best for jams or unknown songs.
- **For maqam music**, choose the maqam, not a Western scale with the same tonic. Pi Tune then targets the real neutral intervals. **Maqam / Tarab Natural** is a good starting style, with enough **Bend Freedom** to leave ornaments alone.
- **For backing vocals and choirs**, try **Choir / Backing**, or lower **Mix** so the group keeps some natural spread.
- **In the studio**, the same settings work on recorded vocals. With **MIDI** set to **Target Notes**, you can draw the exact melody on a MIDI track.

TROUBLESHOOTING

Symptom	Cause	Fix
Audio passes through but is not tuned	Not activated, trial ended or licence moved (limited mode)	Check the licence button and **SETUP** page. Activate your key or start the trial.
Audio passes through but is not tuned	**BYPASS** is on, or host bypass is engaged	Turn off **BYPASS** in the header or in your host.
No correction; tuner shows "Waiting for voice"	Input too quiet, or below the learned gate	Check the input gain. Lower **Tracking** only if the stage is noisy; otherwise raise it, or run **LEARN VOICE** again.
Notes jump an octave or land on wrong notes	**Input Type** does not match the singer	Choose the right **Input Type** or run **LEARN VOICE**.
Pi Tune follows the band instead of the singer	Loud bleed into the vocal mic	Feed the band (without vocals) to the side-chain and turn on **Bleed reject**. Lower **Tracking**.
Breathy passages are left untuned	Detection is too strict for this voice	Raise **Tracking**, or run **LEARN VOICE**.
Correction sounds robotic	**Retune Speed** very fast, **Humanize** at 0 %	Use **Natural Live Vocal** or raise **Retune Speed**, **Humanize** and **Bend Freedom**.
Correction is too weak	Slow **Retune Speed**, low **Amount** or **Mix**, high **Bend Freedom**	Lower **Retune Speed**; raise **Amount** and **Mix**; lower **Bend Freedom**.
The wrong notes are targeted	Wrong key or scale, or edited notes	Check **Key** and **Scale / Maqam**; click **RESET NOTES**.
Key Listen shows "Waiting for reference signal..."	No side-chain signal, or the source is wrong	Route a signal to the **Key / LTC** side-chain and check **Source**.
Key Listen picks a scale from the wrong tradition	**Family** is set to **All**	Set **Family** to the style of music, or click one of the suggestion buttons.
"Not enough singing heard - try again"	Too little singing during Learn Voice	Run **LEARN VOICE** again and sing throughout the 10 seconds.
Timecode shows **NO TIMECODE**	No LTC or MTC received, wrong source or channel, or the host transport is stopped	Check **SOURCE**, the side-chain routing and the LTC channel (L or R). For MTC use the standalone app.
Snapshots do not recall on timecode	**Follow timecode snapshots** is off, or the snapshot is disabled	Turn it on; double-click **On** to enable the snapshot; check its time.
Program Change recalls the wrong snapshot	Some snapshots have Program numbers and some do not	Give every snapshot a Program number, or clear them all to use the order of the list.
MIDI notes have no effect	**MIDI** is **Off**, or MIDI is not routed to Pi Tune	Set **MIDI** to **Target Notes** or **Scale From Notes** and route MIDI to the plug-in.
Pi Tune does not appear in the host	Plug-in not scanned, or wrong format for the host	Rescan plug-ins. Use AU in Logic Pro and MainStage, AAX in Pro Tools, VST3 elsewhere.

Symptom	Cause	Fix
macOS blocks the installer	Gatekeeper	Right-click the `.pkg` and choose **Open**, or allow it in **System Settings > Privacy & Security**.
Standalone app hears nothing on macOS	Microphone permission denied	Allow Pi Tune in **System Settings > Privacy & Security > Microphone**.
"Could not reach the Pi licence server"	No internet connection	Check the connection, or use **Offline activation**.
"That licence file was made for a different computer."	The licence file was made from another computer's request code	Create a new request code on this computer and activate again at pi-ware.com/activate.
"This licence is active on another computer"	One licence, one computer	Click **Move it here**, or deactivate the other computer first.

SPECIFICATIONS & SYSTEM REQUIREMENTS

Specifications

Item	Value
Version	1.3.0
Formats	AAX (macOS), VST3, AU (macOS), Standalone
Latency	0 samples reported (no lookahead)
Voice-path delay	About half a pitch period with the Formant engine (typically 1-3 ms)
Engines	Formant (lowest latency), Classic
Channels	Mono or stereo in/out; optional mono or stereo side-chain **Key / LTC**
Scales	213 in 10 families, 24 quarter-tone tonics
Tuning systems	12-tone, 24-tone (quarter tones), 53-comma (Turkish makamlar)
Reference pitch	A4 = 400-480 Hz (440 Hz default)
Key detection	Learn Once / Continuous from the side-chain or the main input, top-3 suggestions
MIDI	Target Notes, Scale From Notes, Program Change, MIDI Time Code
Timecode	Host transport, SMPTE LTC (24 / 25 / 29.97 DF / 30 fps), MTC
Factory presets	8 tuning styles
Licence	One computer per licence, online and offline activation, 15-day free trial, free updates

System requirements

	macOS minimum	macOS recommended	Windows minimum	Windows recommended
OS	macOS 14 Sonoma	Latest macOS	Windows 10 64-bit	Windows 11 64-bit
Processor	Apple silicon or Intel (Universal)	Apple silicon	Intel / AMD, 64-bit, 2 cores	Intel Core i5 / AMD Ryzen 5
Memory	4 GB	8 GB	4 GB	8 GB
Disk	50 MB	50 MB	50 MB	50 MB
Host	Pro Tools (AAX), any VST3 or AU host, or standalone	Live host with a low-latency buffer	Any VST3 host, or standalone	Live host with a low-latency buffer

An internet connection is needed for online activation and the free trial. Offline activation is available for computers that never go online.

Compatible hosts

Host	Format
Logic Pro / MainStage	AU
Ableton Live	VST3 / AU
Cubase / Nuendo	VST3
Reaper	VST3 / AU
Studio One	VST3 / AU
Bitwig Studio	VST3
Pi Live	VST3 / AU
Pro Tools	AAX (macOS)

SUPPORT

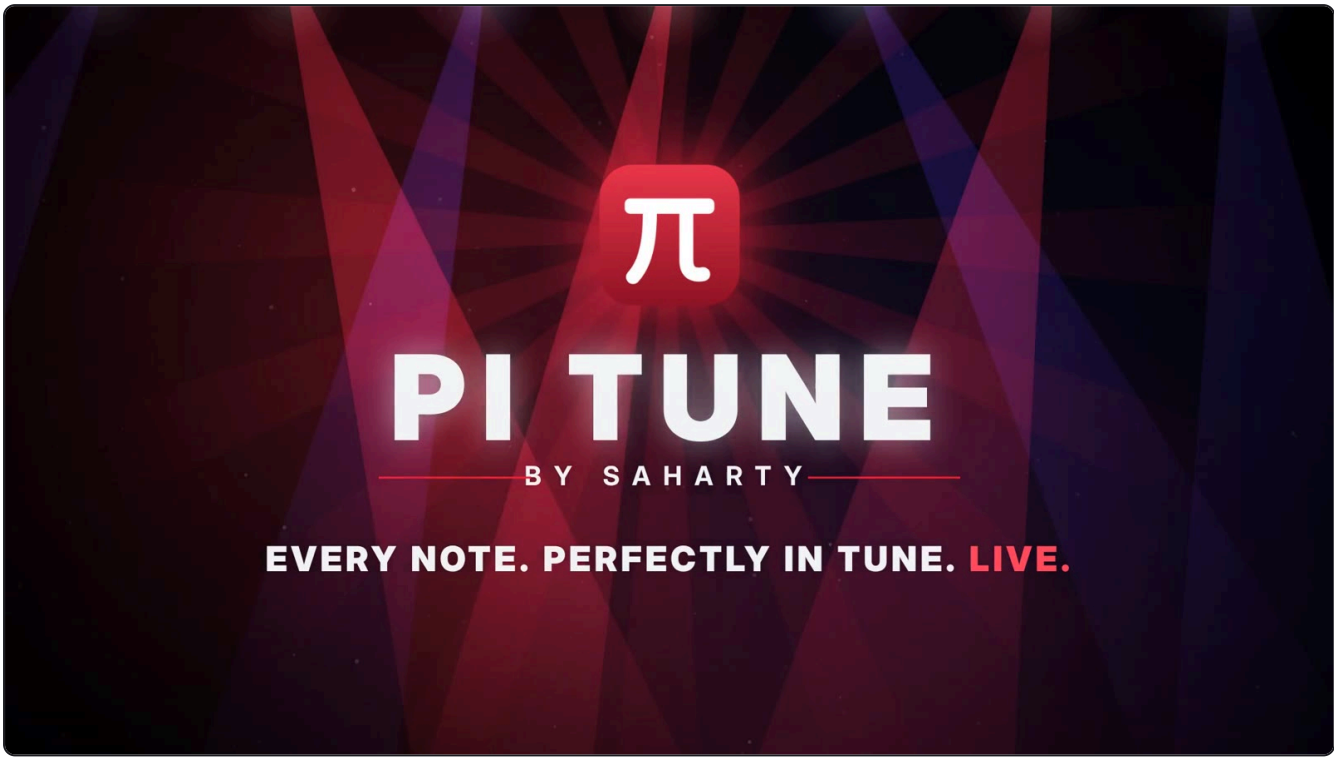


Figure 25. Pi Tune by Saharty - every note, perfectly in tune, live

- **Email:** support@pi-ware.com
- **Website:** www.pi-ware.com (product page, downloads, your licences and computers at pi-ware.com/account)
- **Tutorials:** youtube.com/@pibysaharty

When you contact support, please include:

- the Pi Tune version (shown on the **SETUP** page, in the **About** panel),
- your operating system and host (with its version),
- the format you use (VST3, AU or Standalone),
- what you expected and what happened, and the exact text of any message.

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www.pi-ware.com · support@pi-ware.com
Video tutorials: youtube.com/@pibysaharty
Online manual with animations: https://www.pi-ware.com/manuals/pi-tune/

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