# PangoBeats Documentation

## Introduction

PangoBeats is a stand-alone cutting-edge Windows application designed to enhance the audio experience by providing real-time Beats Per Minute (BPM) detection. It seamlessly integrates with BEYOND/QuickShow software, offering users the capability to synchronize their audio with visual performances. PangoBeats stands out with its user-friendly interface and powerful audio processing features, making it an indispensable tool for DJs, musicians, and live performers.

PangoBeats requires at least Windows 10 64-bit to function.

## Features

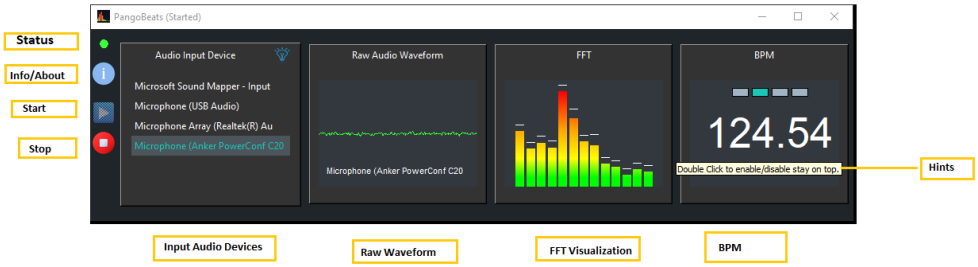
PangoBeats comes packed with an array of features tailored to enrich your audio-visual projects:

- **Real-Time BPM Detection**: The core functionality of PangoBeats is its ability to detect the BPM from any selected audio source in real time.
- **Integration with BEYOND/QuickShow**: After detecting the BPM, the application communicates directly with BEYOND/QuickShow, running on the same computer to synchronize your shows.
- **FFT Visualizer**: For an additional layer of visualization, the app includes a Fast Fourier Transform (FFT) visualizer that displays the spectrum of audio being processed.
- **Raw Audio Waveform Display**: Users can view the raw audio waveform in real time, providing immediate visual feedback of the audio track being analyzed.

## Interactive Elements

PangoBeats is designed with interactivity in mind, offering hints and actions to enhance user engagement:

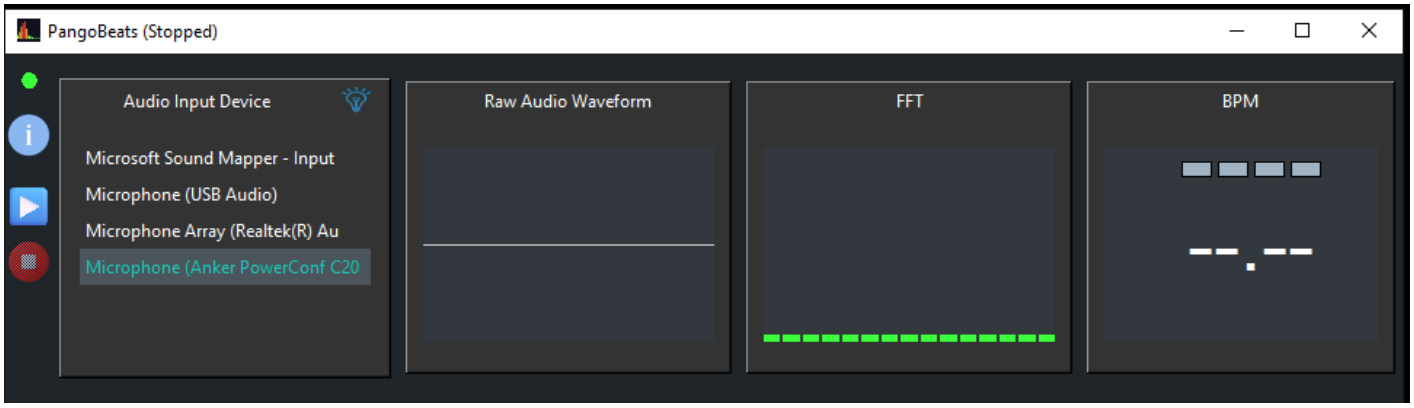
- **Tooltips**: When hovering over different windows and elements, helpful tooltips appear, like “Double click to enable/disable stay on top”.
- **Start/Stop Processing**: Users can click on the Start/Stop button after selecting their audio source to begin the BPM detection and processing.
- **Information and Help**: The Info button opens an About window, which contains links to support, checks for updates, and accesses the PangoBeats Wiki for additional help.



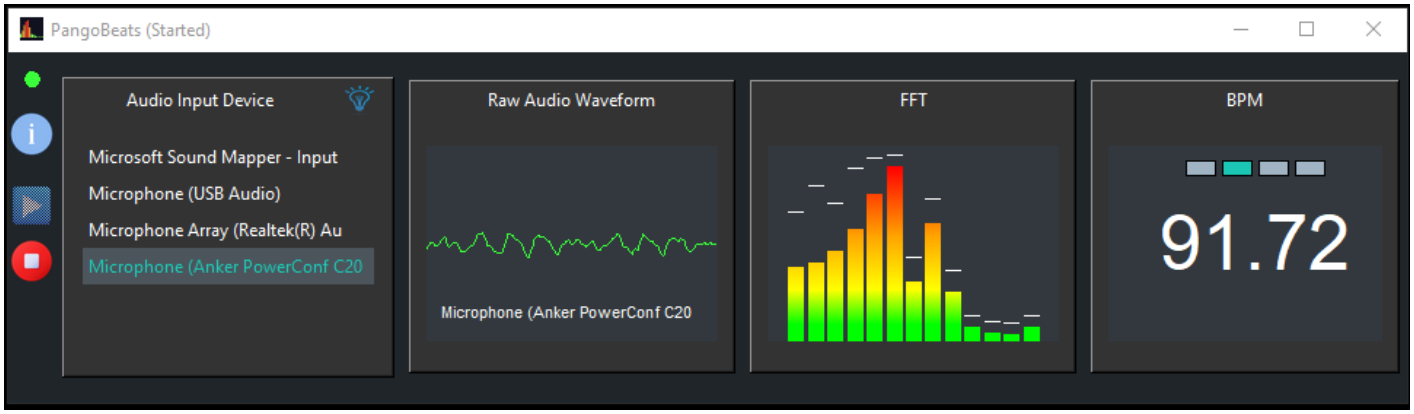

## Quick Demo

Here's a quick start guide to using PangoBeats with the help of screenshots:

- Select your audio input device from the scrollable list.
- Click on **Start** to begin BPM detection and see the application in action.



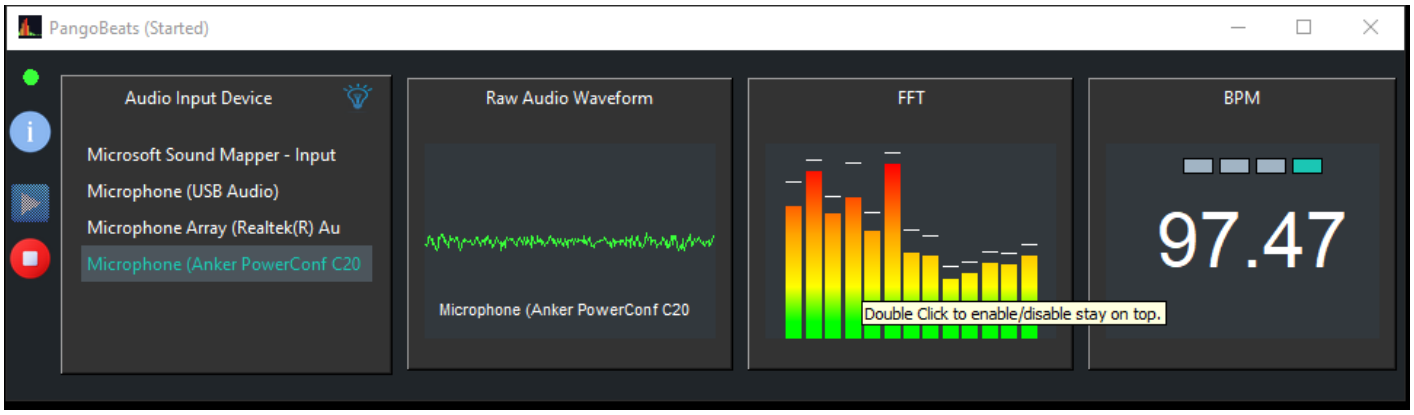

- Observe the real-time raw audio waveform, FFT visualizations, and BPM adjustments as the music plays.

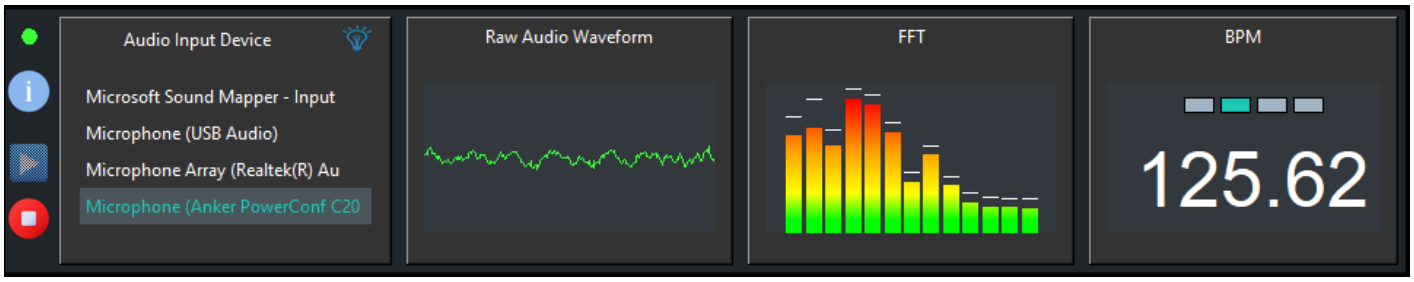



- The BPM will be displayed in the top bar of BEYOND/QuickShow, updating as the music changes.

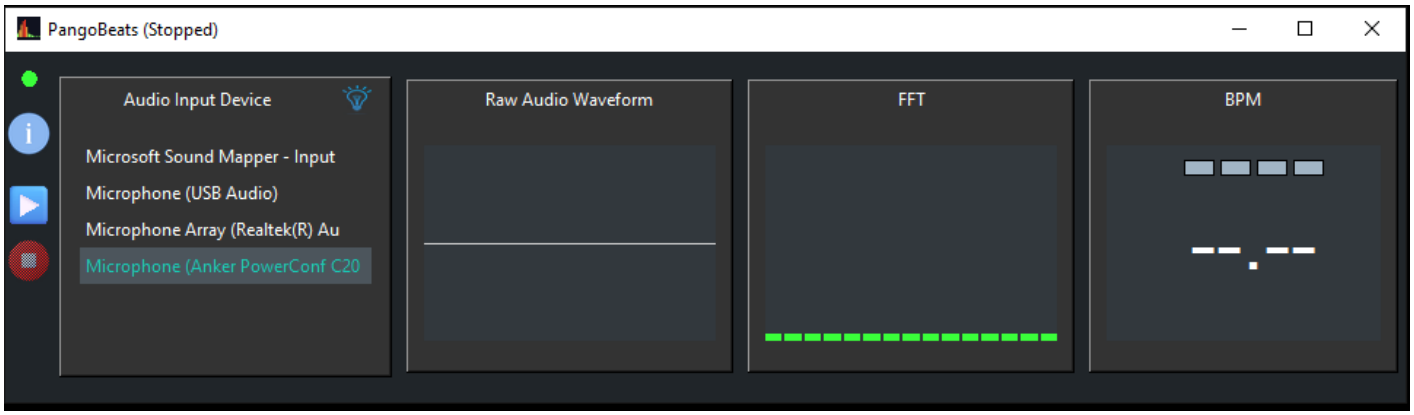



- To keep PangoBeats on top of other windows, double-click anywhere on the window where you see the hints.




- When you wish to stop the processing, click on Stop.




## Updates

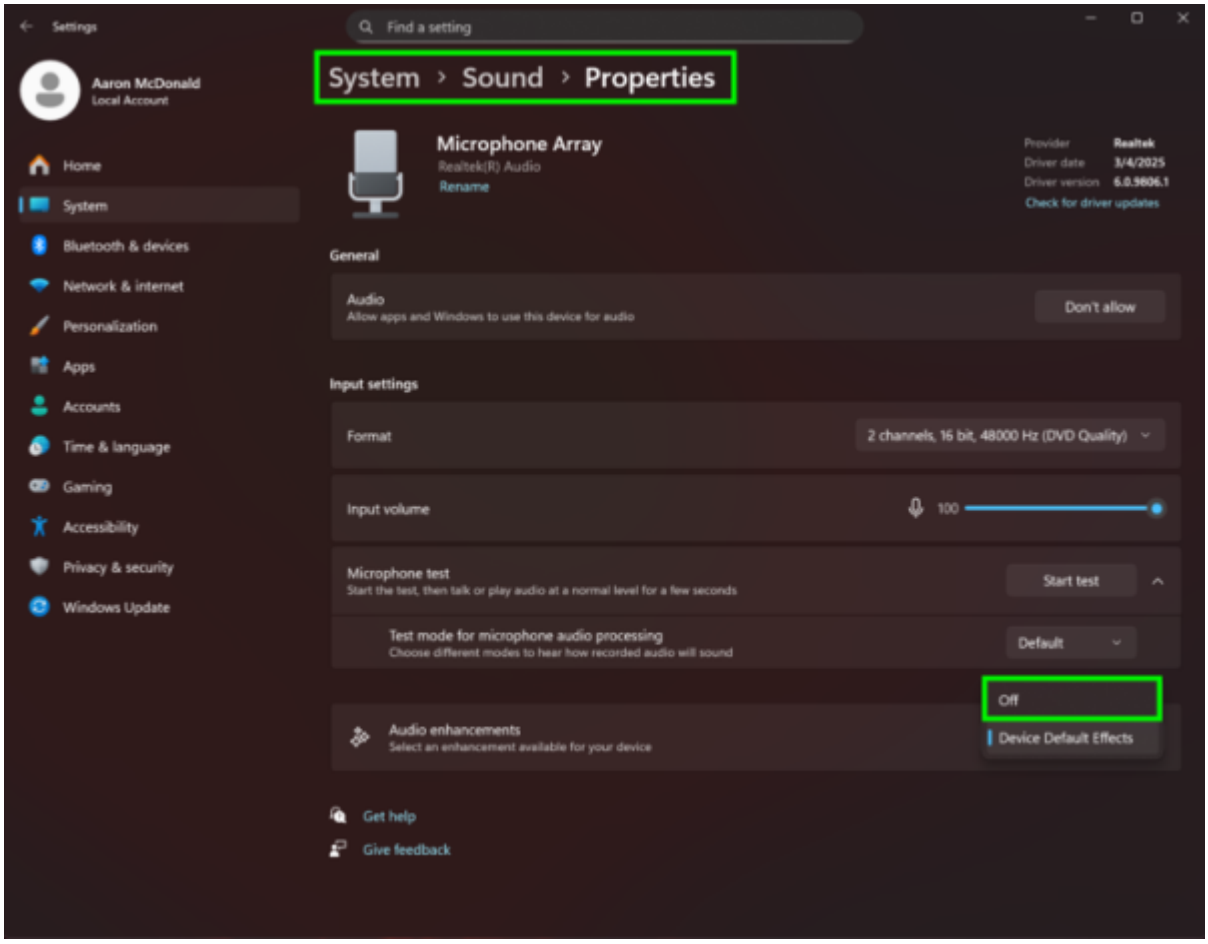
The PangoBeats documentation is a living document and will be updated regularly to reflect new features, improvements, and tips for using the application. Make sure to check back often to stay informed about the latest updates and get the most out of PangoBeats.

## Known issue

### PangoBeats is not responding to the beat

Windows has a microphone setting on board enhances the audio and removes any envoironment sounds. This includes the music and beat of audio.

Open up Windows settingts, System » Sound » properties and change the dropdown box after “audio enhancements” to “off”.




## Intellectual Property Notice and Credits

PangoBeats is a product of Pangolin Laser Systems, Inc.

The PangoBeats software was developed by Suhas Holla Karkada Chandrashekar, and William R. Benner, Jr.

## Third-Party Component Information

PangoBeats 1.0.0.27 is a free, standalone Windows companion utility distributed by Pangolin Laser Systems, LLC. It was first released in 2024 and was last updated in January 2025.

Pangolin's retained engineering records found no modifications to the identified upstream third-party components.

| Component | Version | Use in PangoBeats | License |
|---|---|---|---|
| CPython | 3.10.5 | Embedded Python runtime | Python Software Foundation License and incorporated terms |
| aubio | 0.4.9 | Tempo and beat detection | GNU GPL v3 or later |
| ttkthemes | 3.2.2 | Tk user-interface themes, including Equilux | GNU GPL v3 and theme-specific terms |
| pystray | 0.19.5 | Windows notification-area integration | GNU LGPL v3 or later |
| chardet | 4.0.0 | Character-encoding detection | GNU LGPL v2.1 |
| certifi | 2022.9.24 | Certificate-authority bundle | Mozilla Public License 2.0 |
| Pillow | 9.3.0 | Image and icon handling | HPND/MIT-CMU-style terms and incorporated terms |
| PyAudio | 0.2.12 | Python audio-input interface | MIT License |
| PortAudio | 19.7.0 | Live audio capture used through PyAudio | PortAudio MIT-style License |
| NumPy | 1.23.4 | Arrays, FFT, and numerical audio processing | BSD 3-Clause License and incorporated terms |
| psutil | 5.9.2 | Process and system information | BSD 3-Clause License |
| Requests | 2.28.1 | Software-update networking | Apache License 2.0 |
| Tcl/Tk | 8.6.12 | Graphical user-interface runtime | Tcl/Tk BSD-like terms |

PangoBeats uses aubio to analyze audio and calculate beat and tempo information. Additional information is available from the https://aubio.org/.

The historical beatfinder.py - Beat Detection Module for PangoBeats remains available for reference.

## Source and License Materials

Pangolin Laser Systems, LLC has preserved the PangoBeats application source, corresponding third-party source materials, license texts, copyright notices, checksums, and available build information for PangoBeats 1.0.0.27.

Every recipient or possessor of PangoBeats 1.0.0.27 may request these materials without charge by emailing Pangolin Support. Upon request, Support will provide a download link to the preserved source-material archive.

## Product Boundary

PangoBeats runs as a separate Windows process and communicates with separately running BEYOND or QuickShow software through standard Windows messaging.

The preserved PangoBeats source materials include the complete PangoBeats-side messaging implementation. They do not contain BEYOND or QuickShow implementation source and do not apply an open-source license to BEYOND or QuickShow.

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