



# *BitroSynth1515*

## *User Manual*

# BitroSynth1515 — User Manual

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**License:** MIT

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## Contents

1. Introduction
  2. Quick Start
  3. Main Window (Main UI) — overview
  4. Create Note With GUI (separate window)
  5. Note format & rules
  6. File menu — Examples, Open, Save As, Export Audio
  7. Controls — buttons, SeekBar and status bar (behavior clarifications)
  8. Examples — sample note sequences
  9. Known limitations & warnings
  10. License & contact
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## 1. Introduction

BitroSynth1515 is an open-source synthesizer (MIT) for creating audio via simple textual note definitions. It is aimed at anyone who wants to make music or explore sound — from curious beginners to creative practitioners. Inputs are provided via the main UI text boxes; a separate window (**Create Note With GUI**) helps build notes visually.

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## 2. Quick Start

1. Launch BitroSynth1515.
  2. To try a supplied example, open a file from the **Examples** folder via **File** → **Open**.
  3. Edit or paste your note sequences into the channel text boxes.
  4. Use **Play** (main window) to play the full sequence.
  5. Save your work with **File** → **Save As**.
  6. Export rendered audio with **File** → **Export Audio**.
  7. For easy note entry and previewing, open **Tools** → **Create Note With GUI**.
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## 3. Main Window (Main UI) — overview

The main window is the application's primary workspace. Important areas:

- **Top menu:**
    - *File*: Open, Save As, Export Audio.
    - *Tools*: Create Note With GUI (this opens a separate window).
    - *Settings / Help*.
  - **Top control bar**: Play, Stop, SeekBar launcher (opens the seek offset control).
  - **Timer label**: displays elapsed / position time in hh:mm:ss:ms format.
  - **Gain bar**: visual meter for current output level.
  - **Channels area**: four multi-line text boxes (Channel-1 ... Channel-4). These are the main input areas where you place full note sequences.
  - **Status bar (bottom)**: shows messages and (in normal playback) indicates which note is playing.
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#### 4. Create Note With GUI (separate window)

This is a separate dialog/window (not the main window) designed to make individual note creation easier.

- Fields: **Note** selector, **Milliseconds** (duration), **Gain**, **Waveform** selector, **Channel** radio buttons (Channel-1..4).
  - Buttons: **Add Note** (append the created note to the selected channel in the main window), **Delete Note**, **Play Sound** (preview), **Stop Sound**, **Draw** (visualize waveform on the canvas).
  - **Behavioral clarification:** the **Play Sound** button inside the Create Note With GUI window **plays only the currently previewed/constructed note** (single note preview). It does **not** play the whole sequence from the channel fields.
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#### 5. Note format & rules

Each note must use this pattern:

`<Note>_<Duration_ms>_<Amplitude>_<Waveform>`

- **Note** — pitch token (e.g. A4, C#3) — standard note names.
- **Duration\_ms** — duration in milliseconds (e.g. 2000 = 2 seconds).
- **Amplitude** — numeric gain value (recommended 0.0–1.0).
- **Waveform** — one of: SINE, TRI, SAW, SQ, NOISE, PINK, VOID.

**Separators:** notes are separated by the > character. Example:

`A4_1000_1_SINE>A4_1000_1_NOISE>A4_1000_1_PINK>A4_1000_1_TRI`

#### **VOID behavior (important):**

- VOID is allowed **only** as a waveform type (i.e., the waveform field).
- When a note uses VOID as its waveform, the pitch/frequency component is **ignored** — the engine treats that entry as silence (a

gap) of the specified duration and amplitude is irrelevant. Example of a 500 ms silence:

A4\_500\_0\_VOID

(Here A4 is present syntactically but its pitch is ignored when VOID is used.)

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## 6. File menu — Examples, Open, Save As, Export Audio

- **Examples folder:** the application root contains an `Examples` directory with ready-made note files. Use **File** → **Open** to load them.
  - **File** → **Save As:** save the current channel contents to a file (JSON or the app's supported project format).
  - **File** → **Export Audio:** render and export the current composition to an audio file (e.g. WAV). The export dialog will display relevant settings (sample rate, bit depth) if available.
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## 7. Controls — buttons, SeekBar and status bar (clarifications)

### Play / Stop

- **Main window Play** (`playButton`): starts playback of the **full** sequence(s) loaded into the channel text boxes.
- **Stop:** halts playback.

### Create Note GUI — Play

- **Create Note With GUI** → **Play Sound:** plays **only** the currently constructed/previewed note (single-note preview). It does **not** play the entire channel sequence.

### SeekBar

- The SeekBar controls a millisecond offset for playback start. When you want to audition a specific part of a long sequence, open the

SeekBar window, set the millisecond offset (for example, 15000 for 15 s) and start playback from that time.

- **Behavior:** when playback begins from a SeekBar offset, the status bar may **not** show per-note progress (because playback jumped to a time offset); general status messages still appear.

### Status bar

- During normal linear playback the status bar shows which note (or which channel) is currently playing.
  - When playback is started from a SeekBar offset, the status bar may not update with exact per-note position — this is expected.
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## 8. Examples — sample note sequences

### Single note (2 s sine):

A4\_2000\_1.0\_SINE

### Silence (VOID) example — 500 ms gap, then a saw:

A4\_500\_0\_VOID>A4\_500\_0.8\_SAW

### Multiple waveforms:

C4\_800\_0.8\_SAW>D4\_800\_0.8\_TRI>E4\_800\_0.8\_SQ>F4\_800\_0.8\_NOISE

Place any of the above sequences into a channel box and press **Play** (main window) to hear the full sequence, or use **Create Note With GUI** to build and preview single notes.

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## 9. Known limitations & warnings

- Very short durations (e.g.  $< \sim 10$  ms) may produce clicks or artifacts.

- On some platforms, audio driver differences can affect timing or export. Test playback and export on the target OS.
  - Using SeekBar offsets may prevent the status bar from showing per-note progress — this is normal behavior.
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## **10. License & contact**

This project is distributed under the **MIT license**.

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