

QWAV Documentation

Overview QWAV is a C-based command-line utility that encodes text-based musical scores into uncompressed 8-bit PCM WAV audio files. It uses a unique syntax where the standard QWERTY keyboard layout is mapped to piano keys, allowing users to "type" melodies and harmonies across different octaves.

Compilation To compile the program, you will need a standard C compiler (like GCC) and must link the math library.

Bash

```
gcc qwav.c -o qwav -lm
```

Usage Run the executable and pass your text score file as an argument:

Bash

```
./qwav my_score.txt
```

This will parse the text and output a file named `my_score.txt.wav` in the same directory.

Score Syntax & Rules

- **Tempo:** The very first line of the text file must be an integer representing the Beats Per Minute (BPM). For example, 120 or 60. The BPM is clamped between 15 and 240.
- **Comments:** Any line or section starting with % is treated as a comment and ignored by the parser.
- **Voices (Polyphony):** You can write up to 5 simultaneous voices. Voices are grouped in blocks, where each consecutive line in a block represents a different voice playing at the same time.
- **Silences:** A period (.) is used to denote a rest/silence for that specific beat.
- **Structure constraints:** You can have a maximum of 120 lines and 120 notes per line. All voices within a single block must have the exact same number of beats/characters; otherwise, the parser will throw an inconsistency error.

Keyboard to Pitch Mapping The system maps physical columns of the keyboard to diatonic scale degrees (1 through 7) and the physical rows to octaves.

- **Tones (Columns):** * Degree 1: q, a, z, 1
 - o Degree 2: w, s, x, 2
 - o Degree 3: e, d, c, 3
 - o Degree 4: r, f, v, 4
 - o Degree 5: t, g, b, 5
 - o Degree 6: y, h, n, 6
 - o Degree 7: u, j, m, 7
- **Octaves (Rows):**

- o Octave 5: Number row (1-7)
- o Octave 4: Top letter row (q-u)
- o Octave 3: Home row (a-j)
- o Octave 2: Bottom row (z-m)

Example 1

```
120

%%%%%%%%% TITLE: TEST1
%%%%%%%%% Composer: Erick

qweq jqwj t13t u12u
AAAA GGGG AAAA GGGG
.... .... .... ....

qeqe wqjw
AADD GGJJ
ZZZZ BBBB

qeqe wqjw
AADD GGJJ
ZZZZ BBBB
```

Example 2

```
60

%% Test 2

zxcvbnm asdfgh jqwertyu 1234567
```