

**CLEARJUMP™**

# **LiteWave™**

Command Line Tool User's Guide

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## Introduction

LiteWave is a compression technology designed specifically for audio. It is ideal for archiving digital audio recordings, e-mailing audio files, reducing media storage requirements for multimedia products and games, and many other uses that require true reproduction of audio.

Although there are many forms of audio compression available today including ADPCM, A-Law,  $\mu$ -Law, MP3 and others, the problem is that information is lost when using these forms of compression. As a result, the larger original files must still be retained and distributed for editing, mastering or archiving.

Alternatives to these lossy compression methods are lossless ones such as Zip (WinZip), LZH, Arc, Zoo and others. However, the drawback to using these is that since they're designed for general data and text, they don't do a particularly good job of compressing audio, in particular high-quality 16-bit or higher audio.

Thus was born LiteWave audio compression. LiteWave understands the nature of audio and is able to compress it without throwing anything away. The result is significant space savings combined with flawless reproduction of the original audio file. Of course, LiteWave also supports lossy compression when some data loss is an acceptable tradeoff for additional compression.

LiteWave compressed files can also be played back in real time with the optional LiteWave ACM Codec. This enables applications to use LiteWave files without having to decompress them first. With the LiteWave ACM Codec, LiteWave files play in Windows like standard wave files.

## System Requirements

- Windows 95 or higher
- 200 KB disk space

## Licensing

The LiteWave Command Line Tool is free for personal, non-commercial or academic use only. For commercial use, distribution and licensing of LiteWave, or to purchase the LiveWave ACM Codec, contact ClearJump at [sales@clearjump.com](mailto:sales@clearjump.com).

## Install & Uninstall

To install the LiteWave Command Line Tool,

1. Create a new folder named LiteWave
2. Unzip the contents of the zip file to the LiteWave folder

To uninstall the LiteWave Command Line Tool, simply delete the folder named LiteWave.

## Using LiteWave

The LiteWave Command Line Tool is a Windows utility that is used from the DOS box in Windows, in batch files, or called from other applications.

### Command Line Options

Syntax:

```
lw [ [-c [-qN]] | -d | -n | -tTarget ] src_file_names
```

| Option         | Purpose   |
|----------------|---|
| -c             | Compresses the file(s) in src_file_names. This is the default action if -c or -d is not specified.  |
| -qN            | Sets the audio quality for the compressed files. Higher values of N indicate higher quality. 100 = max. quality lossless compression (default) 0-99 = 0 (min.) to 99 (max.) quality lossy compression |
| -d             | Decompresses the file(s) in src_file_names  |
| -n             | No prompting when overwriting existing files  |
| -t             | Target (output) file or folder  |
| src_file_names | File(s) to be compressed or decompressed. ".wav" is the default extension for wave files ".lw" is the default extension for LiteWave files  |

### Compressing Files

To compress files, simply run LiteWave followed by the name of the file or files to be compressed.

```
lw song.wav
```

The example above compresses the file song.wav into song.lw with lossless compression. The -c option can also be used if desired with the same results. The ".wav" extension is optional because LiteWave will assume it if it doesn't exist. For example, to compress the files song1.wav, song2.wav and song3.wav enter

```
lw song1 song2 song3
```

An entire folder of files can be compressed by using wildcards. For example,

```
lw c:\songs\*.wav
```

will compress all files ending with “.wav” in the c:\songs folder.

To compress one or more files and put the resulting compressed files in a different location, use the `-t` option.

```
lw -tc:\songs\compressed song.wav
```

The example above compresses the file `song.wav` into `song.lw` and puts `song.lw` into the folder `c:\songs\compressed`.

## Setting Compression Quality

By default, LiteWave compresses all files at maximum quality so that no data is lost. This is the preferred setting for archiving original digital audio recordings because the compressed files can be decompressed to their original state. However, there may be times when some data loss is acceptable in order to achieve higher compression (smaller files).

LiteWave compression quality is expressed as a value from zero to 100 where 100 signifies the default lossless quality compression and zero through 99 signify increasing quality of lossy compression. Lower quality settings yield smaller files.

To set the quality of compression, use the `-q` option followed immediately—no spaces—by the quality value. For example, entering

```
lw -q99 song.wav
```

will compress `song.wav` with high quality lossy (some data loss) compression. On the other hand, entering

```
lw -q0 song.wav
```

will compress `song.wav` with the lowest quality lossy compression for the smallest possible file size.

## Decompressing Files

Decompressing a file is similar in operation to compressing a file except that the `-d` option is used. For example,

```
lw -d song.lw
```

decompresses `song.lw` into `song.wav`.

Note, however, that if `song.lw` was compressed at any quality setting below 100, `song.wav` will not be exactly the same as the original file that was used to make `song.lw` due to lossy compression. Only files that were compressed at a quality setting of 100 (lossless) will decompress with perfect reproduction.



## Compression Comparison

The tables below illustrate the benefit of using LiteWave compression for lossless compression of audio files over the general data compression tool WinZip. Two sample audio files were used, “Moonlight Sonata” by Beethoven and “Blowing in the Wind” by Bob Dylan. Both files were compressed with the LiteWave Command Line Tool at maximum quality (lossless; largest file size) and WinZip at maximum compression (smallest file size).

Moonlight Sonata (44.1 kHz; 16-bit; stereo)

|          | Original Size<br>(bytes) | Compressed<br>Size (bytes) | Ratio |
|----------|--------------------------|----------------------------|-------|
| LiteWave | 64,135,168               | 20,008,960                 | 69%   |
| WinZip   | 64,135,168               | 46,211,072                 | 28%   |

Blowing in the Wind (44.1 kHz; 16-bit; stereo)

|          | Original Size<br>(bytes) | Compressed<br>Size (bytes) | Ratio |
|----------|--------------------------|----------------------------|-------|
| LiteWave | 29,959,820               | 19,259,392                 | 36%   |
| WinZip   | 29,959,820               | 26,423,296                 | 12%   |

These tests show that compression can vary quite a bit depending upon the content of the audio. They also show that LiteWave produces significantly smaller files than WinZip without throwing away any data.