

AudioClipstream™ Content

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Encoding Audio Content

The Clipstream Encoder is designed to accept a wide variety of digital audio formats including:

- CD Audio – input from your computer's CD-Rom
- .WAV – standard Windows PCM WAV format
- .MP3 – Standard MP3 format
- .AIFF – Mac Clipstream Compressor only.
- Alaw – Using the Clipstream API in Windows DLL or Linux format.
- VOX – Available on request.

The following section will assist you with getting the best encoded results with the Clipstream encoder by making sure that the input files are of the best quality prior to encoding.

Output Specifications

The Clipstream Encoder will take your input and convert it to the following 2 specifications:

- 20 kbit/sec
- 8 Bit
- 8 kHz
- Mono

and,

- 32 kbit/sec
- 8 Bit
- 8 kHz
- Mono

It is frequently questioned why the output is limited to this quality. We can assure you that this limitation is not set by the Clipstream Encoder, but is the limitation of the Java format as set by Sun Systems. Java 2 is expected to allow full 44.1 Stereo encoding.

In addition, we have found that there is no real benefit to quality to be streaming above 32 kBit/sec, and as such this is our maximum streaming rate supported. As we move towards Java 2 support and the possibility of higher quality, the streaming rate will be increased to match.

Audio Recording / Mastering Issues

This section is designed to help you refine your audio recording and mastering skill to get the best possible quality from Clipstream audio. Following these steps requires that you have an audio manipulation program such as Cool Edit Pro from Syntrillium Software Corporation (<http://www.syntrillium.com/>).

Only As Good As Your Ingredients.

Source material should be clean; low noise, no jitter. Also, it should be as loud as possible without distorting. Source should be as high or higher than the highest quality you expect to use (as close to normalized without normalizing). We suggest a minimum setting of 44.1 kHz, 16 bit. If you're taking material from a CD, rip it digitally at the highest quality.

You'll step it down later, but it's pretty much impossible to step it back up to a higher quality.

Convert the sample to the desired format.

If your audio content is primarily voice, you'll want to down sample to 8kHz, mono, 16 bit. At music quality: 22kHz, mono, 16 bit. The Clipstream compressor will do this for you, but is very limited in the quality such a small application can provide, although for most applications the encoder will downsample just fine. We would recommend using a professional level tool for down sampling prior to running samples through the Clipstream compressor for optimal quality. Cool Edit Pro has a very high quality conversion available in their free demo version. It takes time but is worthwhile.

Normalize.

Once you've converted your sample into the desired format, check again to see if its signal is still loud (close to normalized). The conversion will eliminate high frequencies, and if your source had a lot of high frequency content you could find your signal too low now. If it is peaking at less than -6 dB (1/2 of normalized value or less), normalize it.

Analyze.

If you have the ability to analyze your sample, do so (the free *Cool Edit Pro* demo allows you to analyze the sample). Our goal here is to make a professional, broadcast quality sample. Commercial CDs typically have an average level of -12 dB. You will want to try to get your signal close to this level. If you are already at this level, your file is ready! If your average level is much louder than this (say -6 dB or louder), it is probably distorted and you should check your source material to see if it is distorted itself.

Compress and master.

In order to bring your average level up to something reasonable (ideally -12 dB or so), you may have to compress it. Not "compress" as in data compression, but rather in terms of dynamic audio compression. Typically, settings such as 2:1 above -20 dB, with a short (or instantaneous) attack and release will yield good results. You will have to boost your signal slightly to compensate for the "softening" effect of the compression. Again, try to make your signal as loud as possible without going over 0 dB. Recent commercial CDs have used limiting instead of compression to attain the desired average level. This can work very well, and is easy to do. For example, if analysis revealed that your average level was -16.7 dB, amplifying the sample by 4.7 dB would achieve the desired level of -12 dB. But make sure to listen carefully! This sort of limiting can create harsh distortion in some signals. The best way to do the compression stage, if possible, is to use a mastering program or plug-in such as *Waves L1 Ultramaximizer*. This product allows you to increase your level to the desired -12 dB without introducing distortion or drastically altering the dynamics of the sample. It also includes a final pass of a 16-bit dither, which will "smooth out" any "digital roughness" of your signal. The end result will be a loud, clear version of your original file, without distortion or other unwanted artifacts.

Save.

Save your new file as a different file name, keeping the original version intact in case you have a problem with the mastered version you just created. Save your work as a regular PCM type .WAV. Do not use data compression (such as mu-law or MP3), as it will undo some of the lovely work you've done by following the first 5 steps.

Process.

When creating master content to encode into Clipstream's .20 or .32 file, use the appropriate conversion program. Make sure to use the mastered file, and not the original version.

Recording Gear Recommendations

Sound Card

- **Guillemot Maxi Studio ISIS.** (there are TONS of others)
The most important thing is high quality **EXTERNAL D/A.**

Microphone

- **Shure SM57** (this is an older but great model - you can find it second hand almost everywhere)
- **Shure Beta 58** (same as SM57, older and available)
- **Shure SM94** (good quality budget pro model)
- **Audiotechnica** (almost anything they made will be good)

NOTE: For voice work, if you can afford to, get a condenser or capacitor mike instead of a dynamic mike. This can be pricey but it is well worth it. Condenser/capacitor mikes tend to look different from dynamic mikes - dynamics generally look like the kind of mike you see singers using on stage, where condenser/capacitor mikes look like studio microphones, and usually require a special stand.

Mixer

- **Mackie 1202** - You CANNOT find better bang for buck.

Compressor

- **Alesis** Nanocompressor
- Lots of good software solutions too.
- **CoolEdit Pro**
- **Waves** makes a series of DirectX plug ins

Headphones

- Again, **Audiotechnica** is awesome.
- **Sony** also makes some good phones
- **STAY AWAY** from consumer models.

Monitors

- **Yorkville** YSM1's
Flat response from 30 Hz to 24 kHz
Inexpensive and highly recommended.
About \$200US

NOTE: In all things, you want FLAT frequency response. For Clipstream, it should be +/- 3 db from 20 (even as high as 35 is okay) Hz to 4 kHz with high S/N (signal to noise) - hopefully above 90 db - and low THD (total Harmonic Distortion).