

Notes From The Mastering Department:

Preparing Audio Masters for Replication or Duplication

Thank you for considering EMG, Inc. to manufacture your Audio CD project. Here are some guidelines and information that will be helpful as you prepare your master tape for duplication.

Masters for Audio CDs

At Edge Media Group, Inc., quality and accuracy are paramount. We will always strive to make your CD bit-for-bit accurate to your digital source.

Terminology:

Note that there are two parts of the process that are both called mastering. **Glass mastering** is the process of using a laser and photochemical processes to physically etch glass from which ultimately a stamper is made, which sits in a mold to physically press a CD. [Note that this is an entirely different process from CD-Rs, which use changes in colors of light sensitive inks to record the CD-R.] **Pre-mastering** is the process of formatting the audio properly, and adding “P/Q codes” to indicate the starts and stops of tracks, which is then recorded to a CD-R, Exabyte/DDP, or 1630 tape to go to glass mastering.

CD-Rs received as masters will be assumed to be formatted in the exact final format the customer wants the pressed discs, unless the customer requests pre-mastering. What you give us is what you get – bit for bit. CD-Rs are tested for error rates and conformity to CD “Red-book” standards. If there are problems, we will always consult the customer before doing anything to fix the disc, which would cause even subtle changes, or result in a master that is not “bit-accurate” with the original.

Here are a few suggestions for the best possible results when using CD-R's as masters:

- ✓ Always use the best possible media. It does not pay to save a few cents per disc if it costs you time, and you must use more discs. As of this writing, we see the fewest problems on discs from Mitsui and Taiyo Yuden. We see the most problems with discs using blue dye. However different media may work best in different burners.
- ✓ Use the best drives. Go with name brands. There is a wide difference in capabilities and error rates between the best and worst drives.
- ✓ Use the proper software. Consumer-oriented software, such as may come bundled with the purchase of a drive, may allow you to burn audio discs, but often limit the users control over things such as levels and track spacing. Also, some of these

Mastering with Bundled Software

The software that came bundled with your CD-Recorder for your computer (such as *Easy CD Creator* for the PC or *Toast* for the Mac) can create proper masters for replication, but have several inherent limitations. If you use such programs, you should pay attention to several things.

- ✓ Make sure you are creating an audio CD. Most of these programs allow you to create an audio CD by dragging your audio files into the program, but will also allow you to create a data CD containing the raw audio files by a very similar method. Make sure you are in audio mode before you start.
- ✓ Burn Disc-At-Once! Burning Disc-At-Once is like writing a novel in cursive without ever picking up your pen. The disc is burned from the beginning of the Table of Contents to the end of the Lead-Out without ever turning off the laser. Track-At-Once burns the disc in sections, with link blocks between the sections. Such discs cannot be glass mastered for replication, and must be remastered before replication. You must set your program to burn in Disc-At-Once mode. Note that versions of Toast before 4.0 cannot burn Disc-At-Once.
- ✓ Prep your audio files. Always add a short fade in and fade out to each track when creating your audio files. This will avoid pops caused by any DC Offset in your audio.
- ✓ These programs will add a fixed length break between tracks. This is usually 2 seconds. Some programs will allow you to vary this. You can create longer silence between tracks by adding silence to the end of the track before the break.
- ✓ Continuous programs, such as live performances, with no breaks between tracks may have problems. Some of these programs, even if they allow a “zero length” break between tracks, will actually add a short break of a few milliseconds, which may be audible. Double check any such track transitions.

programs may introduce pops or clicks at the starts and/or ends of songs. It is best to us a program oriented specifically toward professional digital audio.

- ✓ “Don’t try this at home.” If you are attempting to create a CD on your home computer, there are many pitfalls. The quality of converters in consumer-grade sound cards is poor compared to professional equipment. Your hard-drive or data bus may not be able to handle continuous transfer of audio without interruption. Unless you have designed your system around digital audio, and spent the time, effort, and money required to be sure it is working properly, it is better to take it to a professional studio.
- ✓ Always burn your disc “Disc-at-Once”, never “Track at Once”. Track-At-Once discs are unusable for glass mastering, and will have to be pre-mastered to create an acceptable master. There is a \$79.00 charges if EMG needs to convert masters to disc-at-once.
- ✓ Never use stand-alone CD-Recorders. Consumer units use special discs, which cannot be used for glass mastering. Professional units cannot write their Table Of Contents at the beginning of the disc until it has recorded the entirety of the audio, causing them to be not truly “Disc-At-Once.” In addition, the method of detection of track starts may cause track IDs to be written after the start of audio.
- ✓ Check your discs. Listen to your disc 100% to make sure that there are no errors. EMG does not make any changes to your master. We duplicate exactly what is sent to us. All discs are checked for errors before duplication. If we find any errors, we may not be able to duplicate your order and may need a new master, or if we can correct the errors, we will notify you ahead of time. A minimum of \$79-\$150 will be charged to bring your master up to specifications.
- ✓ When burning your master disc, always make several copies. Burn them at the slowest speed possible. This prevents many errors by copying your data at a slower rate. DO NOT send us your only copy. We are not responsible for your master tape, cd or dat. On occasion things can happen and we would need you to send us another master. We recommend making at least 4 copies of your master cd burned a lowest speed. Keep one at home in sleeve, one at work, one at someone's home or a safety deposit box, just in case you have a disaster at you home.

DAT

We gladly accept DATs (Digital Audio Tape) for CDs. However, note that we must pre-master CDs to encode track IDs onto the disc. Proper documentation of your DAT is absolutely necessary in order that we can properly place Track Start IDs. Here are some guidelines for avoiding problems with DAT. Always send us a copy of your master, never the only copy you have on hand, as we are not responsible for your master while it is in our possession.

- ✓ Always record at least one minute (preferably two) before the beginning of the program. If a DAT Tape is going to stretch or break, it will usually be at the beginning of the tape.
- ✓ Always use A-Time. A-Time, or Absolute-Time, is an accurate time code that is recorded onto DAT tape by all currently made DAT recorders. It must be recorded from the beginning of the tape without fast-forwarding over any unrecorded sections of tape. Use quality tape. Many of the inexpensive brands of tape are also the tapes we discover the most problems with in the mastering room. Use new tapes. Used tapes are more prone to digital errors Clean your DAT recorder regularly.
- ✓ Use cleaning tapes frequently, and have a professional service tech. clean your DAT

recorder approximately once a year, depending on use. Remember that "0" on your DAT recorder's meters is the absolute maximum level recordable. Average levels should be approximately -12 to -18dB_{fs} (decibels below full-scale) Please indicate the make and model of the DAT recorder on which the tape was recorded. There are slight alignment differences between various DAT decks, and this will allow us to replay it on the same brand deck it was recorded on.

✓ Please record indexes at the beginning of each cut. Also include a log of start times, or the cue sheet from the digital editing session with the DAT master. Note that due to variations between DAT decks, start ID's are not a frame-accurate means of communicating start times, and the exact position will be at the discretion of the mastering engineer.

✓ When assembling directly to DAT, be careful not to clip off the beginning of the songs when the machine is put into record. Note that if assembling directly to DAT, some machines may cause digital errors at the pause points, and may require additional mastering before glass mastering.

Other Formats

Edge Media Group accepts most professional formats as masters. However many formats may require pre-mastering or transfer before production. Please consult your Customer Service Representative about other formats. All analog sources should have test tones at 0VU for level, and tones at various frequencies for EQ calibration. There should also be an indication of whether and what type of Noise Reduction has been used.

Additional Notes

Masters that are unsequenced or need to be assembled from multiple sources, either analog or digital, can be edited entirely in the digital domain. An edited DAT is generated at 44.1K which is then used to make the 1630 for CD manufacturing. Studio time for digital editing is \$79/hr minimum one hour, plus materials.

All masters are transferred "As Is". The mastering engineer will contact the client if there are any obvious discrepancies. Otherwise, a master tape is considered ready for production.

Any tape that is not "ready to master" and requires editing, resequencing, tightening of space between songs, assembly from different masters, or any processing will be mastered at an hourly rate of \$79.00/hr minimum one hour plus materials. A master tape that requires no extra treatment is considered "ready to master" and will only be billed the standard mastering charges. Re-mastering to correct or to make additional changes in level, EQ, etc. will be billed as an additional mastering charge.

Any master tape that is being prepared for mastering should have a **safety copy** made that is stored at your facility. This guards against loss in transit or damage to the master sent in for production. EMG will exercise every bit of care in the handling and storage of your master, but **we are not responsible for any loss, theft, or damage of a client's master**. Master tapes should always be sent overnight express to our facility, never mailed. A DAT safety copy can be made at EMG for a cost of \$65.00 each.

If you have any questions or need further assistance in preparing your master tapes, feel free to contact us here at EMG, and we will be glad to help.