

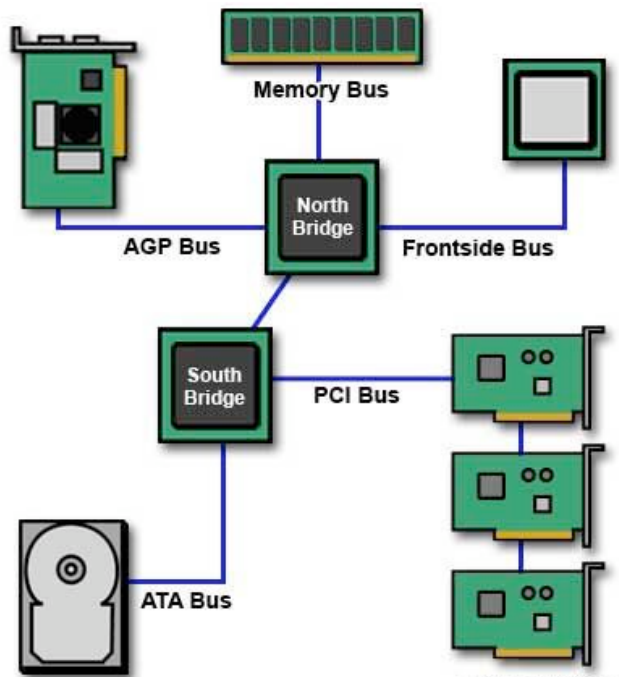
The System

Multi-processor CPUs help keeping up with multi-tracking.

Pro Tools sells add-on hardware with additional CPUs coordinated by the application software.

A fast bus to/from CPU is important.

Today's fast = 1600 MHz (1.6 GHz) 64-bit



2 GB RAM+

Hard Drives

SATA drives with larger buffer size probably best.

7200 rpm. (SATA is *Serial* ATA)

Put in two for easy backup.

Studios like to use 40/80 gig "removable" hard drives, one for each project.

Fast I/O option.

Firewire has a slight edge over *USB 2* in that it doesn't have to pause occasionally on big chunks of data.

Our little USB mixer system is technically typical.

Efficient use of computer bandwidth and CPU

- Keep the computer off-line during recording.
- Record to a second hard drive.
Let the first hard drive serve the application software.
- Do not have any other software running. (Have minimal other software on the machine!)
- Reboot your computer before starting a session.
- Mute unnecessary tracks when recording new tracks.
- Some plugins have more demand on the CPU.
Rather than reverb (etc.) on every channel,
You might use a final reverb,
Or a “aux send-return” arrangement.

Rendering Multitrack Sessions

- Options to render at 1:1 speed allow software synthesizers and other plugins to work without glitches.
- Generally allow the highest order math calculations (program preferences), if your CPU can handle it.

This takes advantage of having used higher sampling rates when recording.

Mastering

What is involved in mastering?

Creating cohesion from song to song, file to file

Creating a consistent style or feel.

Making it warm, punchy, highlighting details

Making it sound good on all types of playback systems

Experienced ears and practice. Sometimes fresh ears.

Mastering tactics

Listen to successful mixes and notice details.

Listen on many types of playback systems until you calibrate your ears to one or two monitor systems.

Compare your mixes to commercial mixes regularly.

Normalize levels, EQ, balance across the whole album / or set of albums / or set of files.

Adjusting overall compression and EQ

Remixing individual tracks if necessary

Adjusting the spacing on the CD

Bringing your files to be mastered elsewhere?

Have a good mix to start with.

-Play your mix at home, in car, everywhere

Don't do lots of compression. Let them.

Bring an example of a project you like.

If unsure, bring two versions.

Files

Projects have many files:

Tracks, edits, imported files, projects

Keep them together always.

Backup by burning DVD is probably the smart option.

Audio File Types

Basic uncompressed formats:

PCM Pulse code modulation.

Stored as **AIFF** (Mac) or **WAV** (Win) or **AU** (Unix).

Flexible as to sampling rates.

A compressed version WAV ignores silence.

TTA and FLAC

Lossless compressed, about ½ size as PCM.

TTA is a *free* codec, but

FLAC is supported by more hardware makers (DVDs)

FLAC is also copy-protection free.

Great for archiving.

Has Vorbis and Ogg support.

WMP needs a plug-in to play FLAC.

Not in Mac QT yet. Need Cog to play.

MP3 and Ogg Vorbis

- Both based on psychoacoustic models that leave out many bits of sound that humans can hardly notice anyway.

- Careful listeners often like Ogg Vorbis over MP3.

MP3 used the MPEG-1 audio layer 3 codec developed for movies. About 1/10 the size of PCM.

MP3 requires a license fee for the software that creates the files. Ogg Vorbis is *free*.

OGG has a number of separate codecs for audio, video, and text subtitles. **Vorbis** is the audio part.

WMA

Windows Media Audio

Compressed, and proprietary.

Meant to be a competitor of ACC at the Microsoft store.

AAC

Apple's Advanced Audio Coding that is open source, but they use a closed source version for iTunes music.

ALE or ALAC

Apple Lossless. About 50% file reduction.

Has extension .AAC but is different.

Developed in 2004 for iTunes and iPods.

RealAudio

Compressed format suitable for **streaming**

Lossy with different codecs for music or spoken word.

(Many options designed for 5, 6.5, 6, 8.5, 11, 12, 15.2, 16, 20, 32, 40, 44, 64, 80 and 96 Kbps transfer rates. Options for Dolby also.)

RealSystem encoding tools from Real in Seattle.

Can also stream AIFF, AU, WAVE with their software.

ATRAC Sony's Minidisk

Popular as a quick inexpensive live recording medium.

Compression with very little loss.

Recorders start at \$200, can be tiny.

Disks are handy to use.

Optical connection to PC-Mac.

Surround Sound Options

Dolby Digital or AC-3, requires a license fee.

DTS aka Digital Theater Systems for commercial systems.

Very different technology, with a higher bit rate than Dolby.

Apple has Advanced Audio Coding AAC – license fee.

Vorbis and MP3-Surround are newcomers.

5.1 Most common.

6.1 with center rear speaker is Dolby Digital EX.

Mixing Surround Sound

Editors such as Pro-Tools (industry standard)

or Logic Pro,

or Final Cut

have 5.1 and 6.1 mixing.

Requires lots of processing power.

The tracks are still created and edited much like we have done, just at high sampling rates that would slow down our machines.

Better definition, less masking, less effects needed.

File Favorites for Animation

Put them in the native OS format, WAV or AIFF.
Rendering software will encode as necessary.

File Favorites for CD Recording

WAV probably. AIFF or AU usually fine.
Don't use lossy options. Red Book uses full PCM files.
Perhaps FLAC a good choice for archiving.

File Favorites for Web

MP3 for longer files
WAV and AIFF and AU for short all-purpose.

Flash (SWF) is becoming popular.

- Compresses as MP3

- Flash plug-in can integrate into the web page.
 - No need for WMP or QT to appear.

- Flash accepts either WAV or MP3,
 - Use WAV because of higher quality.
 - Flash will make MP3 anyway if you wish.