

# The Digital Audio Workstation – Part 1

AET 2050 Basic Training: Intro to the DAW

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The history of digital audio recording is constantly changing incorporating the latest CPU processor speeds, bigger and faster hard drives, improved motherboard capabilities, LCD monitor technology, along with faster DVD & Blu-ray burners, and more and faster RAM. Did I mention more RAM?

All of these components require a consistent, regulated power supply which taxed what once were 200 watt power supplies to upwards of over and above 1000 watts. Power generates heat and the challenge with many desktops and laptops will always be how well does this box of goodies manage the buildup and dissipate heat.

Early DAWs have their roots in the analog electronic synthesizer age from the late 1970's to the mid 1990's. The appearance of microprocessors and eventually memory started to appear in these early synths to help remember patches and settings. Disk drives were included to store patches externally. Inputs were included for triggering. Drum machines manufactured by Yamaha, Oberheim, Sequential Circuits, and others incorporated RAM that contained samples of recorded drums. Did I mention RAM?

Long gone synthesizer manufacturer, Synclavier pioneered such a feat by creating and incredible and costly keyboard that incorporated Winchester drives that stored actual 44.1/16 bit samples of real instruments with a digital sequencer allowing artists, producers, and engineers the ability to record in the box back then for a meager \$100,00-300,000.

As the digital revolution hit the market with the advent of first, DAT, then MDM's, the average laymen's computer hardware and software eventually began to show signs of catching up to digital recording. I can remember my first PC I purchased in 1983 – a PC Jr... 256K of memory, no hard drive, a 5.25" floppy drive that stored 512K, a color monitor, a mouse, and believe it or not a wireless keyboard. I thought I was in heaven being able to save, recall, and edit any document I wrote.

Interestingly, I took apart that old PC as years rolled on and learned what was inside. Huh, this is interesting. Having worked a MAC SE 30 in the studio running Digital Performer, I thought to myself eventually the day will come where I will be able to do the same only with audio. Sure, midi sequencing/recording/editing was here. But to be able to edit a track, make a performance even better, adjust a timing of a snare, copy and paste BGV's, I'd be in heaven; at least I thought...

So what has it all meant? The DAW has offered us several distinct advantages.

- Advanced multi-track audio recording, editing and mixdown capabilities

- MIDI sequencing, edit and score capabilities
- Integrated video and audio with sync issues removed
- Plug-in DSP
- Virtual instruments and library's of sounds
- Support for other integrated programs and software; Rewire or, Soundtrack Pro, WaveBurner, etc.

The DAW has quickly become the go to production tool for both audio and video. Hardware has driven the software changes we now are experiencing and the heart of it is the computer used. The key word is integration. Job description boundaries have disappeared because software programs have combined functions and new features are being added more than ever before. What used to be strictly done by an audio engineer is now being done by a video editor. What used to be done in a post production facility is done by a recording engineer in their home studio. Mastering engineers are given completed projects "pre-mastered" by those that believe they have the experience to effectively master their own material. It's a crazy time out there in the real world and each of you need to gain skill sets that allow you to be part of the hunt.

*From an audio standpoint*, simple integration provides the ability to provide centralized control over digital audio recording, editing, processing, and signal routing functions within a system. There is a direct need for hardware and software to communicate directly and efficiently as well as allow transport and sync control from external devices.

*From a communication standpoint*, the DAW is now able to communicate and distribute audio, midi and automation data through a connected network system. Digital timing, (Wordclock) and synchronization, (SMPTE) or (MTC) is supported.

As "Maverick" Pete Mitchell (Tom Cruise) and "Goose", Andrew Edwards stated in the movie, "Top Gun", "I feel the need for speed...", the DAWs biggest asset or hinderance is based on what is ultimately produced by the sum of its parts. More on this subject later....

*From a recall standpoint*, being able to save and instantly recall all functions in the digital domain has spoiled all of us to the point that documentation of important session data has fallen off. Why is this so important? Because being able to a total recall needs every ounce of information. With software revisions causing sessions not being able to be opened, plugin settings being lost because of updates, or files being corrupted and deemed unusable, session documentation in a recording software's program project info folder is more important than ever before despite what appears to be an easy recall.

*A DAWs true power comes in its ability to be expanded*, whether it be through hardware or software. "I need more HD space, I need that plugin, golly I need to

order more RAM, I'd like a second monitor...”, the computer's motherboard must be able to handle the hardware and the OPS certainly must be able to support the software changes.... Duh!

Finally, what has been the downfall of many operating systems and software programs is their ability to be user-friendly. It simply must work and be intuitive.

#### DAW Hardware Primer

- Speed = CPU processor; single, dual, quad, 8 core, etc
- Speed = HD disk rotational speed; min 7200rpm
- Speed = internal HD controller; SATA, SCSI, ATA, EIDE
- Speed = fastest RAM supported by motherboard, 240 pin SDRAM3 DDR1600, SDRAM2, DDR 1066, DDR 800, Cas Latency, voltage and capacity 4GB, 2GB, 1GB – 128MB
- Speed = OPS; how much ram does it support? The computer may contain it, but the OPS only supports up to 4GB internal which may translate into less.

So what determines what one buys? *Your preference, your needs, the software you like and own, the platform and software your business or industry requires.*

If I don't currently own, what should I buy? *The fastest, most powerful computer that you can afford. Why? Technology has already replaced it as we speak...*

I encourage you to visit [newegg.com](http://newegg.com) or [zipzoomfly.com](http://zipzoomfly.com) and begin educating yourself on what computer hardware is available today. From burners, cases, CPUs, fans, heatsinks, flash memory, hard drives, input devices, keyboard & mice, memory, monitors, motherboards, power protection, power supplies, to video cards and devices, you're guaranteed to see more than you'll understand, but it's only a tip of the iceberg...

Stay tuned. There's more to come...

Desktops vs. laptops, Characteristics of USB & Firewire specs, Networking, The audio interface, Audio driver protocols, Latency, Soundfile formats, Format interchange and compatibility, Sample and bit rates, DSP, Plugin types, Accelerator cards, Hard Drive Management.