It's becoming a familiar sight in most recording studios around the world: the DAW, or digital audio workstation. I often find it hard to explain what the role of a DAW operator exactly is in audio production, due to the tremendous range of tasks he or she is regularly performing.

This new reality requires the DAW operator to have a basic understanding of many different elements in the production process. Since many of us are coming from a musical, rather than a technical, background, in this series of articles we'll be discussing the varied palette of tasks DAW operators can (and often need to) perform on the material they're working on. To get things rolling, let's run through what some of those tasks might include.

**BASIC AUDIO ENGINEERING TASKS**

* **Session setup:** Choosing the sampling rate of the session (traditionally 44.1 or 48 kHz, but potentially up to 192 kHz or even higher), and the session's bit rate (16, 24, or sometimes even 32 bits).

* **Signal routing and interfacing:** Setting inputs and outputs to and from the audio and MIDI hardware, connecting instruments and microphones into the DAW, connecting the DAW to an external mixer and monitors, all-digital interfacing, etc.

* **Basic recording techniques:** Microphones selection, direct-injection interfacing (DI), preamp setting, wiring and cabling, etc.

* **Recording and playback:** Punching (drop-in), setting pre- and post-roll times, click track setup, destructive and non-destructive, recordings, loop recording, multiple takes, position markers, track labeling, playlists and vertical recording, multiple versions, etc.

* **Mixing:** Blending multiple audio and MIDI streams into a mono, stereo, or multi-channel master, creating rough mixes, creating mix stems, etc.

* **Signal processing:** Using software plug-ins, understanding and applying dynamic processors such as compressor/limiters and gate/expanders, equalizers, and filters, delay-based effects such as echo and reverb, amplitude and frequency modulators, pitch shifters, time based effects such as flanging and phasing, choosing, modifying, and creating effects presets, automation, compensating for latency and DSP delays, etc.

* **Synchronization:** Choosing timecode format (24, 25, 29.97, 30 frames per second, drop or non-drop frame), working with a synchronizer, clocking the DAW, locking with tape machines, video decks, video sync, MIDI Beat Clock, etc.

* **Basic mastering:** Choosing the final delivery format, whether analog or digital, basic mix-bus signal processing, etc.

* **Control surfaces and automation:** Working a dedicated control surface, understanding the basics modes of fader and switch automation (write, snap-back, trim), etc.
BASIC COMPUTER AND DATA MANAGEMENT TASKS

* Computer troubleshooting: Operating system-related problems, audio and MIDI software and hardware problems, etc.

* Hard disks types and configurations: Dealing with SCSI drives and cards, FireWire, USB, RAID systems, multiple users, fibre-channel, removable and fixed media, etc.

* Hard disks maintenance: Formatting (quick and low-level), drivers and updating, tuning (defragmenting and optimizing), etc.

* Data backup: Choosing the backup media (tape, CD, DVD, drives), choosing the backup software, backup frequency, performing multiple backups, storage and archiving, etc.

MUSICAL AND EDITORIAL TASKS

DAWs are very powerful tools, finally bridging the gap between MIDI and live instrumentation based productions. In conversations with industry veterans, I've learned that many successful engineers in the analog era made their fame not only by getting great sounds (recording or mixing), but also by having excellent audio editing chops, which at that time were performed by cutting analog tape. Recording and editing on a DAW is a simple, fast, and powerful process, where sometimes the seemingly impossible can be achieved. The key to successful editing is a good understanding of the timeline and its various formats (bars and beats, timecode, absolute time, frames, samples). Some of the more common tasks include:

* Comping takes: This process involves listening to multiple takes of the same source (such as a vocal or an instrument), and by choosing and editing together the best performances moments on each, creating a final track.

* Basic editing: Taking out, adding, moving, and replacing sections.

* Tempo mapping: Creating tempo maps, fixed or moving, mapping performances recorded without click, etc.

* Looping: Setting in and out points, fitting to tempo, looping rhythmic and non-rhythmic sources, etc.

* Drums and other instruments timing and quantizing: Using a tempo grid to improve or alter the timing of musical performances, nudging performances to change their feel (more on-top, behind, laid-back), quantizing using swing percentage, etc.

* Vocal tuning and timing: Improving the vocal performance by using pitch correction tools and fixing their timing. This process is becoming more and more common.

* Sampling: Creating designated audio bits that are trimmed and sorted, ready to be loaded into a sampler (and then assigned to MIDI controllers), sample looping, etc.

* MIDI: Understanding the basics of MIDI recording and playback, including notes, event lists, velocity, tempo, continuous controllers, sysex, patch changes, quantizing, groove templates, MIDI instruments (both software and hardware synths and samplers), MIDI drivers and systems (OMS, FreeMID1), arpeggiators, etc.

* Crossfading: A science of its own, this is where the final morphing between edited pieces is done, masking the switch between comped takes and audio segments.

* Spotting to picture and sound effects: Although mainly used in the postproduction industry, it's useful to know some the basics of spotting and sound design, dialog and music editing, etc.
Whew, an extensive - but by no means exhaustive or comprehensive - list of the technical and musical elements you'll deal with as a DAW operator and user. And that's not to mention all the inter-personal skills you'll need to deal with musicians, producers, and nonmusical clients. While it may seem like a daunting task to learn how to perform all of these tasks, taken individually, broken down one step at a time, the learning process is much easier to handle.

I hope that you'll join me in future articles as we dive in, discussing specific tasks in depth, with the help of guest experts. Look for a new section to premier on EQ’s Web site (www.egmag.com), which will contain audio files, sessions, and sequences with live examples related to specific articles. You'll be able to download and use these files to follow what's discussed, and to gain a more real-world understanding of what we're covering. In no time you'll have gained the required skills to optimize the sound of your productions, improve the efficiency of your sessions, and ultimately to better your position and opportunities in the audio production field. See you next month!

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