Hence, online and offline editing both involve different kinds of attention to detail. Whereas in offline, the focus is on the *content*: story, structure, pacing, *etc*., online editing focuses on more *technical* attributes like video and audio quality.

Is Film Editing "Offline" or "Online"?

In the film world, the closest parallel to online/offline is editing workprint and cutting negative. The film editor traditionally made creative decisions and built an edited reel from positive duplicates of the original negative. The reason for this has little to do with cost, but rather the fact that you don't want to handle your priceless yet fragile negative—film editing being a sort of destructive-then-constructive process. Besides, you need a positive image to view material.

Once "offline-types" of creative decisions are finalized on workprint, that film is given to a negative cutter, who performs the rough equivalent of "online." The negative cutter does not have a paper list (like an EDL), but rather the cut duplicate print from the negative. Using that duplicate print as a guide, the negative cutter reads the numbers off the edges of the film to locate and assemble the original negative. It is a slow and dangerous process. Any mistake in the negative cutting can be disastrous. Negative cutters, like online editors, are not concerned with creative decisions about the edit, only in the faithful re-creation of the editor's decisions.

Since nonlinear systems themselves do not create a cut film workprint, but do create instructions for cutting the original negative, the only way to inform the negative cutter of what to assemble is a printed list—a film-version of an EDL—called a "negative assembly list" or "cut list." This list has entries for each shot's in-points and out-points, in a format very similar to the video-style EDL. Videotape dubs of the final offline cut are also commonly given to the negative cutter to provide a visual reference. A special electronic controller (*e.g*., the LokBox) allows that videotape to be viewed in sync with the film negative as the latter is being pieced together.

TIMECODE

In the early 1970s, videotape editing changed from control track editing to using timecode. An 8-digit timecode defined and electronically identified each video frame with a unique "code" number broken down into:

HOURS : MINUTES : SECONDS : FRAMES

01:00:00:00

Timecode made videotape editing more efficient than it had been before. In addition to speeding up the editing process, it was considerably more "frame accurate" than the earlier and cruder control track editing. It also allowed any edit to be previewed and repeated.

Later, computer-controlled editing systems were introduced that could read timecodes, identify edit points, and store lists of these edit decisions.

"Drop Frame" vs "Non-Drop Frame" Timecode

For our current discussion, videotape plays at 30 frames per second (30fps). Videotape timecodes, therefore, count from frame :00 to frame :29 before rolling over to the next second—

Unfortunately, for a variety of electronic and technical reasons, videotape doesn't really run at precisely 30fps; in reality it runs at 29.97 frames per second. So, even though timecode will accurately identify every single video frame with a unique number, it isn't precisely measuring REAL TIME.

Say you've edited an infomercial, and began recording it on a piece of timecoded videotape, starting at 01:00:00:00 (called "one hour, straight up"*). If the show ends exactly at 01:29:00:00 you might be led to believe

* Video people never start counting from time zero, but rather start at one hour. This allows machines to pre-roll (back up) ahead of the first edit, without getting confused—or running into a spot on the tape with no timecode.

that your show was precisely 29 minutes long. **THIS IS NOT CORRECT**. Since your videotape is actually playing slightly slower (0.1% slower, to be exact), your actual program duration is almost **two full seconds longer**!

The people who work with videotape often want timecode to do two things: (1) to uniquely identify each frame *and (*2) to give accurate indications of running time (duration). Clearly, regular old timecode doesn't do the latter very well.

REGULAR OLD TIMECODE that has a single number for every frame, that counts from frame :00 to frame :29 and then rolls over—but is temporally inaccurate (by 0.1%)—is called **NON-DROP FRAME TIMECODE (NDF)**—because it never drops any numbers while it is counting.

DFTC
01;03;59;25
01;03;59;26
01;03;59;27
01;03;59;28
01;03;59;29
01;04;00;02
01;04;00;03
01;04;00;04
01;04;00;05
01;04;00;06

The only way to make timecode keep anywhere close to REAL TIME is to leave out certain numbers. If you skip some numbers (remember that this doesn't affect the video pictures at all; it is only a numbering scheme), your calculations can be extremely close to the actual elapsed time of a segment.

Timecode that skips certain timecode numbers is called **DROP FRAME TIMECODE (DF)**. The way in which it skips is very precise:

Drop the :00 and :01 frame number every minute, except for every 10th minute.

This way, source and record times DO reflect real time, and thus can be used to determine length. (To calculate the length using timecodes, subtract the "in" timecode from the "out" timecode. It can be difficult; you might want to use a special calculator. Editing systems do this automatically.) For many reasons, source material (dailies) tend to be transferred from film to videotape using NON-DROP FRAME TIMECODE—this way, every frame has a number that is one greater than the preceding frame, and the algorithms that convert timecodes into film key (or code) numbers are "safer." In actuality, it makes no difference. Record times for almost all broadcast television, however, are in DROP FRAME because this way you can easily see if your program is running long or short—you know how long it will play on the air.

▸▸ EDLs: p. 92 ▸▸ Tape formatting: p. 366

Remember—

☞ **You MUST know whether you are using DF or NDF timecode. It makes a *big* difference.**

☞ ***Almost* all nonlinear editing systems deal equally well with Drop or Non-Drop Frame timecode.**

FACTOID, Part I • The logic behind Drop and Non-Drop is similar to what we follow in our calendars for leap years. We pretend that a year is 365 days long. In reality, a year is 365.24 days long. Because of this, we drop a day (February 29th) three out of every four years to "keep in sync" with real (astronomical) time. Like with videotape, dropping a day out of our 366-day year prevents a "cumulative temporal error" in our calendar. If we didn't correct for it, eventually (in less than a thousand years), we would be celebrating Christmas in the middle of the heat waves of summer.

In this sense, our calendar is DROP-FRAME . . .

What About Audio?

When ¼" audio tape is synced with film and transferred to videotape (in a telecine session), it is also being slowed down 0.1% to keep it in sync with the picture. The speed change is virtually imperceptible, but if you ever want to resync the audio from a videotape back to the film (either the cut film or even the original film dailies), it must be sped back up—this is called **resolving**.

With nonlinear editing systems, final cuts are created electronically, and lists for cutting film negative or print can be provided. Assuming your nonlinear editing system did not change the timings of your edited sequence, the videotape you have created in offline can often be SYNCED to the film cut.

But it will not sync directly (remember, the videotape runs a tiny bit slow—even if it is "accurate"). The audio portion of the offline videotape master is often **"resolved to mag"** to bring it up to the correct speed and record it onto sprocketed MAGnetic film.

FACTOID, Part II • . . . just as "dropping" a day from the calendar doesn't leave each of us with 24 hours mysteriously missing from our lives, "dropping" a frame **number** from the timecode count doesn't affect the actual CONTENT of video material in any way. (In addition, this is NOT the same as dropping frames when streaming web video.)