

## “DROP VERSES NON-DROP TIME CODE”

or

## “TO DROP OR NOT TO DROP, THAT IS THE QUESTION”

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There are many options for editing shows now that Digital editing has come to dominate our craft. A show can be shot on video tape at 30 fps (frames per second) and then loaded into an editing system (as a 30 fps video project) using either drop or non-drop time code. A show shot on 24 fps (35mm film or 16mm film) can be loaded into a digital system as either a 30 fps video project or loaded into a digital system as a 24 fps film project. Whether your final product is a video online **or** a transfer of the cut negative to tape **does** make a difference as to how you should decide to load and edit your show.

However, for the purposes of this article, I'd like to simply examine the options of drop and non-drop time codes to take them out of the equation. If two shows were cut identically, one using drop frame time code and one using non-drop time code - both film cut lists (or both onlines) would be precisely the same. Many people, particularly “film” people, are under the false impression that non-drop is more accurate. They think that drop frame time code actually drops frames. This is absolutely false.

Drop and non-drop time codes are both methods of counting video frames. You would be correct to think of them like two languages. Just like “non” in French equals “no” in English. Each time code counts and keeps tracks of video frames - they do not alter or drop video frames. They only count video frames and they count differently. In fact, drop frame time code counts video frames accurately in relationship to real time. This is why all the networks and cable companies require that the final tape masters to be delivered are on drop frame time code.

In the old days, before the invention of SMPTE time code, editors could not get frame accurate control of both the playback and record VTRs. Time code provided a tremendous advantage over the older methods of editing electronically including; permitting multiple machines to run in sync (dubbers, switchers, etc.), permitting frame and field accurate edits, and allowing editors to calculate scene durations quickly and accurately. SMPTE code (originally referred to as SMPTE/EBU time code) is indexed in hours, minutes, seconds and frames (30 fps in NTSC and 25 fps in PAL).

Everyone refers to NTSC video as 30 fps, but in actual, factual, gorey details - it is really 29.97 frames per second. No human has dared create a time code that counts hundredths of frames (it would be too confusing,) - hence we have drop and non-drop. Clock time (electricity) operates at 60 Hz but the NTSC standard television operates at 59.94 Hz. If you double 29.97, you get 59.94 - hence - two fields per video frame. For now, that's all we'll say about “fields”. Because of this speed difference between 59.94 Hz and 60Hz, there is an expanding elapsed time difference between the clock and time code readings.

Drop frame time code counts each video frame but when that .03 finally adds up to a video frame - it *skips* (or drops) a number. It does not drop a film or video frame, it merely skips a

number and continues counting. This allows it to keep accurate time. So if you're cutting a scene using drop frame time code, and the duration reads as, say 30 minutes and 0 frames, then you can be assured the duration is really 30 minutes.

Non-drop time code counts every single video frame and does not make any allowances for the fact that it is really 29.97 fps. Therefore, if you cut a scene using non-drop time code and the time reads as, say 30 minutes and 0 frames, this is not the actual running time of the scene. The total time must be converted in order to know the true running time. This is why non-drop lengths are always longer than the real time (it's counting too many frames), and this is why the networks and cable companies require that their masters be delivered on drop frame time code.

The actual difference amounts to 108 frames per hour, or 86 seconds for each 24 hour period. This equals 54 video frames per 30 minutes. So if you are cutting a show using non-drop time code, at the end of a 30 minute program, you would need to subtract 1 second, 24 video frames to get the accurate time. It can be roughly calculated that a program using non-drop time code is two seconds longer per half hour than the non-drop time code displayed.

Remember, both time codes are merely counting methods and do not alter the visual picture in any way, shape or form. Therefore, choosing whether to edit in drop or non-drop normally is the editors' choice or may be determined by the preference of your post supervisor, tape house or editing system limitations. Drop and non-drop have one thing in common - hour 1:00:00:00. (The hour actually doesn't matter as long as it's 00:00:00.) This is why you can take an output (tape assembly) of a non-drop time code show and insert edit it onto a drop frame video master at 1:00:00:00 and it will lay across perfectly. It's the same reason you can take a non-drop show, and create a drop frame online list using 1:00:00:00 as the record in.

A tape image which is going to be *transferred to film* (such as a CGI - computer generated image) **must** be compressed (no 3/2 pull down) and put onto a non-drop time code master in order to properly transfer to film *but*, it still doesn't matter if you're cutting your show drop or non-drop. The film (from the tape) is then transferred to tape dailies (drop or non-drop) just like your regular dailies. To fully explain this, it is necessary to explain video fields in detail but I feel explaining "drop and non-drop time code" is enough technical information for one sitting. For the next newsletter, I will submit an article covering video fields and the options mentioned in paragraph one.

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Pam Malouf started as an assistant film editor in 1976. After a few years in Post Production management in the early 80's, she began cutting film & tape promos and trailers. Since 1985 she has been editing television series and TV movies. Besides film, Pam has edited on the Montage, Laser Edit, Ediflex tape, Ediflex Digital and the Avid. She has cut shows using non-drop and drop frame time code, that both onlined and/or cut negative.