Timecode

Timecode is an important part of editing and is discussed more thoroughly in Chapter 13. Most DV formats automatically record *DV timecode* on the tape, although higher-end formats, such as DVCAM offer more options as to how the timecode is recorded on the tape.

For example, your camera might allow you to set the hour at which the timecode starts. If so, it might be useful in post-production to have your timecode start at different hours on different tapes. You might have tape 4 start at hour 4 which will help you and your editor stay organized later on.

When shooting, every time you turn the camera on and off there will be a break in the timecode. These *timecode breaks* can make capturing footage difficult later when you are preparing to edit. Pausing the camera or leaving it in standby mode will not result in a timecode break unless you are *using time of day timecode* (see below), in which case timecode breaks are unavoidable.

Most DV cameras include special controls (usually in the form of buttons on the camera) that will search forward or backward for the last piece of stable timecode. The camera will then cue the tape to the last frame of stable timecode and begin recording from there. If your camera doesn't have such a feature, you can protect your tape from timecode breaks by always letting the tape run for a few seconds after the end of your shot. Then, before you begin taping again, back the tape up so that recording begins on top of your extra footage. *Note that if you have to switch your camera into VCR mode to do this, you might lose your manual white balance setting! Be sure to set it back when you switch back to record mode.*

Some cameras automatically use *time-of-day timecode.* The camera uses its internal clock to record timecode that corresponds to the actual time of day. A shot that has a starting timecode of 11:07:40:15 was shot at about seven minutes after 11 A.M. This can be useful information for time-sensitive material, such as news footage and certain types of documentaries, but it can make editing difficult later on if the camera is paused frequently between shots. Unless having a timestamp on your tape is crucial, time-of-day timecode is best avoided.

One of the most common questions about video editing is, "why is timecode so important?"

If you've ever scrolled through a six-hour VHS tape looking for that TV show you missed a couple of weeks ago, you can appreciate the value of timecode. As you might have noticed, every time you remove the tape or turn the power off on your

home VHS deck, the time counter resets itself to zero. As you scroll forward through a few hours' worth of tape, the counter advances as expected. However, if you eject the tape and then put it back in, the counter will read zero, even though the tape was wound forward past the two-hour mark.

With timecode, if you're two hours into the tape when you insert it, the counter on the deck will read two hours. If you're 1 hour, 10 minutes, 3 seconds and 20 frames into the tape, the counter will read 01:10:03:20. Whenever the counter displays that number, you'll see the exact same frame on the tape. Not only does this make it easier for you and your editing system to find stuff on your tapes, it also makes it possible for the video deck to access any individual frame on the tape automatically, thanks to device control commands sent from your computer.

This fine level of control means that, with the right deck, you can accurately insert scenes or capture footage from any point on the tape. This allows you to reconstruct your edited sequence at any time. For moving a project from workstation to workstation, recreating a project after media has been lost or damaged, or recapturing media at a higher resolution, timecode is essential. (We'll talk more about low- and high-capture resolutions later in this chapter.)

Drop Frame and Non-Drop Frame Timecode

Because the frame rate of analog NTSC video is an odd 29.97 frames per second, *drop frame timecode* was developed to help round off the fractional frames to less awkward whole numbers. With drop frame timecode, the frame itself is not dropped, just that frame's number in the timecode counter. In other words, the frame rate is still 29.97 fps, but the counter is counting at 30 fps and making up for it by skipping a frame number every now and then.

Drop frame timecode is usually indicated with semicolons separating the hours, minutes, seconds, and frames—01;00;00;00. *Non-drop frame timecode* is indicated by colons—01:00:00:00. Unfortunately, this is not a standardized feature outside the realm of professional editing equipment, and not all VTRs display timecode in this manner.

Drop frame timecode is the standard for analog and digital 29.97 fps video for broadcast television in America, but if your project somehow ends up with non-drop frame timecode, don’t panic—just make a note on the tape's label. Whether you choose to work in drop frame or non-drop frame doesn't matter, as long as others know which one you're using.

Timecode Standards

Just as there are different standards for video, there are several standards for timecode:

- **SMPTE timecode** is the professional industry standard in the United States, set up by the Society of Motion Picture and Television Engineers (SMPTE). All professional NTSC and HD equipment uses SMPTE timecode.
- **EBU timecode** is the European cousin of SMPTE timecode, used by all professional PAL equipment and set up by the European Broadcasters Union (EBU).
- **DV timecode (DVTC)** is the format developed by Sony for DV tapes, and only the DV format uses DVTC—not the DVCAM and DVCPro formats. If you plan on using only DV equipment, DVTC will be an acceptable alternative to SMPTE or EBU timecode. As the popularity of the DV format increases, DVTC is becoming more integrated into the realm of professional post-production.
- **RC timecode** is a format Sony developed for use with consumer Hi8 equipment. For all practical purposes, it is obsolete, but if you're planning to remain in an RCTC environment, it will do the job.

Types of Timecode

Timecode can be stored in a number of physical locations on the videotape:

- **Address track timecode (a.k.a. VITC)** is encoded as a separate signal, in addition to the video and audio signals on a tape. It's the best of the three types of timecode listed here because it's invisible, accurate, doesn't interfere with the video image, and leaves all of the audio tracks available for audio.
- **Audio track timecode (a.k.a. LTC)** is stored on one of the audio channels on a videotape. If you're working with a videotape format that doesn't support SMPTE or EBU timecode, such as VHS or DV, you can use one of the tape's audio channels to store SMPTE or EBU timecode. Of course, that means you can't store audio on that channel and you'll need an editing system that can understand audio track timecode.
- **Window burn timecode (a.k.a. BITC)** is usually reserved for work copies of master tapes because it's burned into the video image itself and isn't removable. Window burn timecode is commonly used for editing projects shot and finished on film or for low-res worktapes of HD footage.

Calibrating Timecode

If you're using a deck that uses serial device control (as opposed to Firewire), then some editing systems such as Apple's Final Cut Pro recommend that you "calibrate" the timecode before you start logging, and every time you change to a different video deck. Refer to your user manual for more information.

Timecode for Film Sources

The film equivalent of timecode is called *keycode*. Each frame of film has a keycode number that is embedded on the film negative by the lab where the film stock originated (e.g., Kodak, Fuji, etc.). After the shoot, the negative is processed at a lab, and a film-to-video transfer is made, known as a *telecine transfer*. If you are planning to finish on film, the keycode numbers are very important—you'll need them in order to generate a *cut list* that will be used to by a negative cutter to edit the film negative prior to creating a final film print. The standard procedure is to add the keycode numbers to your videotapes in the form of window burn, along with window burn of the address track timecode that's been recorded on the telecine master. With both the keycode numbers and the source tape timecode numbers visible as window burn, it will be easier to check the accuracy of your cut list later on. Cut lists and film finishing are discussed in more detail in Chapter 19, "Output." Since the keycode is permanently superimposed over the video, this option is only viable if you are planning on eventually going back to film. If possible, you can have the window burned keycode and timecode placed outside of the image in the black letterboxed portion of the frame so that it isn't distracting during rough cut screenings. If you're not planning to go back to film, it isn't necessary to keep track of keycode numbers.

24 fps Editing and 3:2 Pulldown

3:2 pull-down refers to the way in which 24 fps film or HD footage is transferred to 29.97 fps analog NTSC videotape. The first frame of film is "pulled down" to the first *two* fields of video, the second frame of film is pulled down to the next *three* fields of video, and so on (Figure 13.3). Unfortunately, in the resulting video a clean edit can only be made at every fifth video frame. Editing applications that support 24-fps editing use a *reverse telecine* process to provide an environment where edits can be made at each film frame.

Just to make things even more complicated, to achieve the 29.97 native frame rate of analog NTSC video, the film picture is slowed down .1% during the telecine process, to 23.976 fps. If you have synched audio transferred with your film to videotape, the audio will also be slowed down .1%, but if you have your film transferred to video without sound and capture the sound separately, you'll have to slow it down by .1% yourself in order for it to sync up with your telecined film.

If you're editing with PAL video, there usually is no pull-down process. The standard method is to transfer each frame of 24-fps film or HD video to one frame of 25-fps PAL video and accept the fact that it will play slightly faster at 25 fps during the editing process. Later, when you go back to film or 24-fps HD, the speed will return

to normal. Many people consider the speed difference between 24 fps and 25 fps unnoticeable.

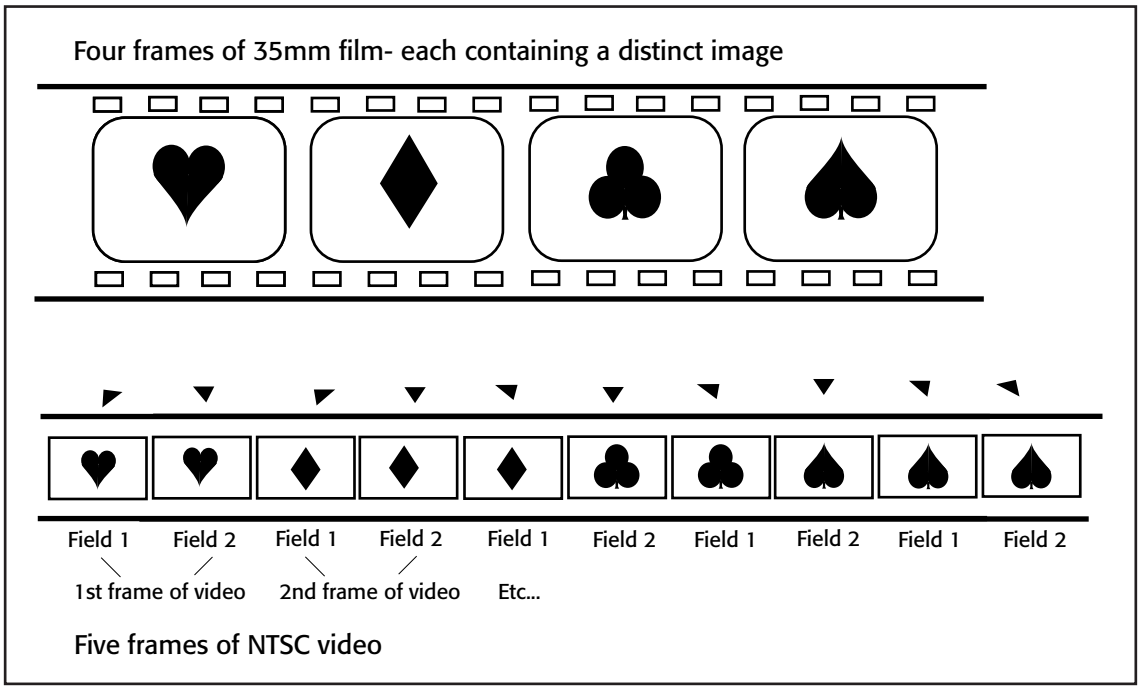

fig 12.02

Figure 13.3 3:2 pull-down.