

Video Frames

Like a motion picture, video is a succession of still images. The frame rate determines how many of these images are displayed every second. For video cameras designed to work with television sets, the frame rate will be 30 frames per second (NTSC) or 25 frames per second (PAL).

Video Fields

The majority of video cameras use a process called *interlaced scanning*, which splits each video frame into two fields - called the odd and even field. During the period of each frame, the video camera samples the scene twice, once for the odd field and once for the even field. This causes each frame to have two images. The double image is not normally visible because the low shutter speed used will blur any motion in the frame. If a high shutter speed is used, any high speed motion in the frame will show two distinct images. This frame shows two distinct golf clubs.



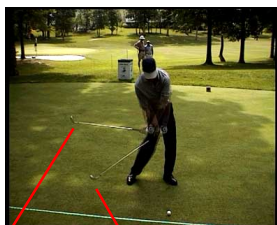
The usual method of obtaining a single image is to remove one field. Video cameras do this when displaying video in the viewfinder or outputting analog video to a TV set. This field removal technique degrades the image somewhat because half the video information is discarded. Many analog capture cards only capture one field. When capturing DV with Firewire (DV from a digital video camera) both fields are always captured. In addition to using the field removal technique to eliminate the double image, (called *Set DV Half Size*) Swinger has a *Double Frame Rate* function. This function not only removes the double image effect; it also doubles the frame rate so that information from both fields is used.

Double Frame Rate

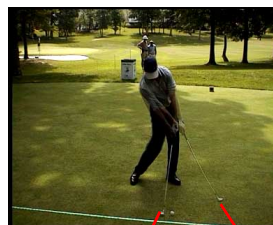
The *Double Frame Rate function* splits the frame into its two field images and presents them successively. This doubles the effective frame rate whilst maintaining image quality. This function is invoked by right mouse clicking on the image, and selecting *Double Frame Rate* from the list of options. The following set of images shows how two interlaced frames, each with a double image, is split apart by the *Double Frame Rate* function to form four images.



Frame 1 Interlaced



Frame 2 Interlaced



25 Interlaced frames per second (PAL)



50 frames per second (PAL)

Frame 1 Odd Field

Frame 1 Even Field

Frame 2 Odd Field

Frame 2 Even Field

Set DV image half size

This method of eliminating the double image effect removes one of the fields but degrades the image. *Half size* is selected from the options displayed when right mouse clicking on the image. Half size can be permanently set by selecting *Half Size* from the *Direct Show* tab of *Configuration* in the *File* menu.

Progressive scan cameras

Some video cameras can operate in a *progressive scan* mode. This mode has no field concept and for a PAL camera there are 25 single image frames per second. Progressive scan mode gives the best image quality but the frame rate cannot be doubled.