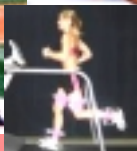
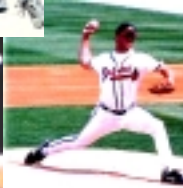
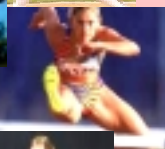
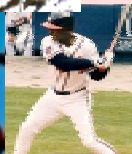
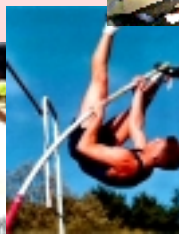




Sports Motion

for the *ultimate* in motion analysis



Pro Trainer DV Software

Quick Start User Guide

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Introduction

This quick-start guide is intended to provide a brief overview of the major functions within Pro-Trainer DV. It will show you how to play back a video, do simple motion analysis and capture video from a DV camcorder. As with any software product, the best way to learn is by doing. Practice opening and playing sample videos, experiment with the drawing functions and try the capture process. There are many options and settings which control the program operation. You should familiarize yourself with them and experiment with various settings until you find those that work best for you.

INSTALLATION—If you're installing the software yourself, you simply have to use our DVD or download from our website and double-click on the file to begin installation. The install program will lead you through. Refer to page 20 for detailed installation instructions.

HELP SYSTEM—The DVD versions of our program come with an extensive HELP system which can answer most any question. It also provides complete details on how to use each function and setting.

CUSTOMIZE—The software can be used for virtually any sport or activity involving motion. The software comes with most major sports and activities already pre-programmed. Once you choose a sport you can further customize your settings. There are data fields available within the software which can be assigned by the user to store important information for captured videos. This customize feature is controlled under the "tools", "customize" menu. See page 17 for further information.

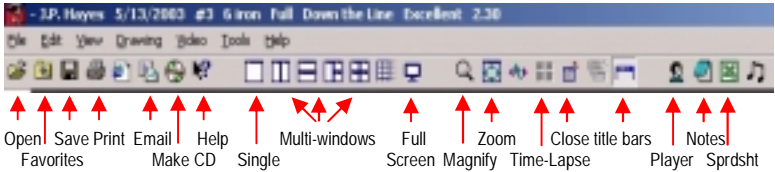
SPEED-KEYS—Most functions are available through either the menus or assigned speed-keys on the PC keyboard. If you also purchased one of our Pro-Trainer hardware systems you will note that our keyboards come with color-coded keys for major functions such as "capture", "play" and "rewind" for easy PC operation. See page 20 for speed-key assignments.

STARTUP—Pro-Trainer can selectively startup in the full-screen analyze mode (as shown on following pages) or with the startup selection window shown here.

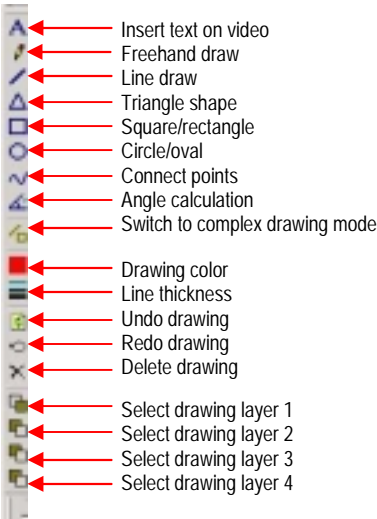


Toolbars

Top Toolbar



Drawing Toolbar (side)



These toolbar diagrams will help you locate various functions within the 3 major toolbars. As you move your mouse over each icon, a full description and instructions on how to use the function appear in the status bar at the bottom of your screen. Refer to these instructions to assist in using each function.

Bottom Toolbar

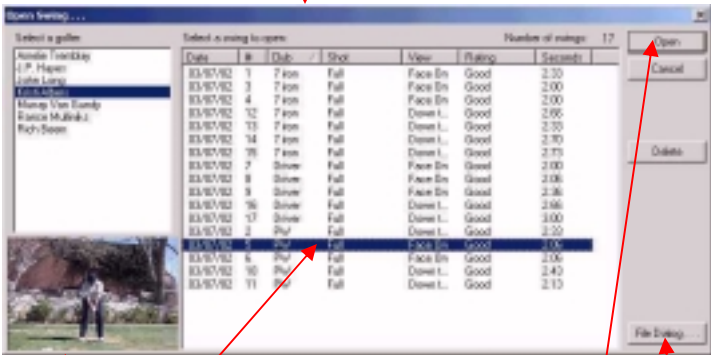


Status bar—displays detailed instructions for each function

Opening a Video File



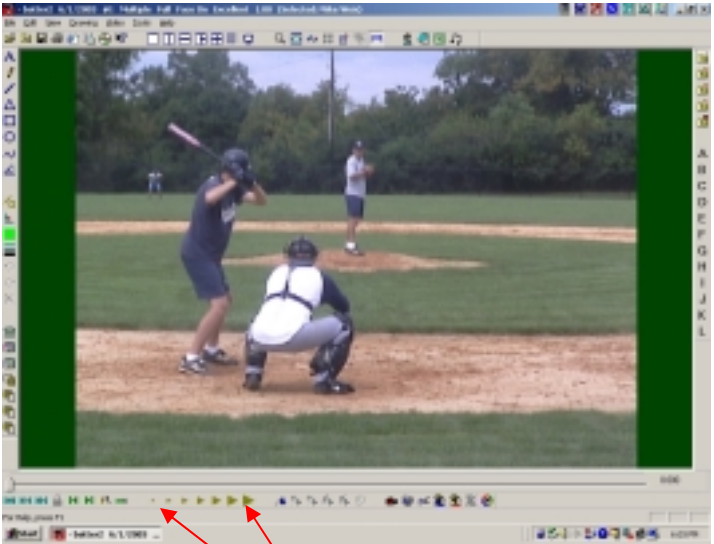
Click on “open” folder to bring up the player selection menu shown below.



Select a player and a video clip. A preview of the clip shows in the lower-left panel. Click on “open” to open the video in a window.

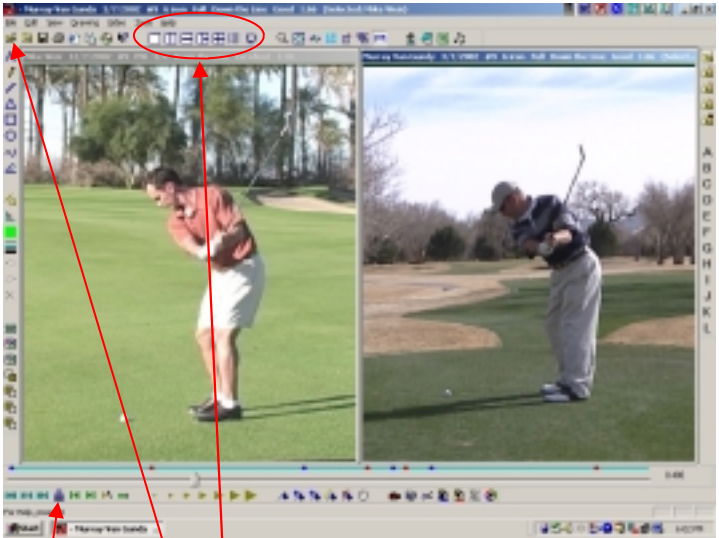
You may also choose to use a standard Windows “open file” dialog by clicking on the “File Dialog” (“Browse”) button and then locating video files in other folders.

Playing a Video



Use the speed-keys or the arrow buttons to play the video. The largest arrow plays at full speed while each of the smaller arrows plays in varying degrees of slow-motion.

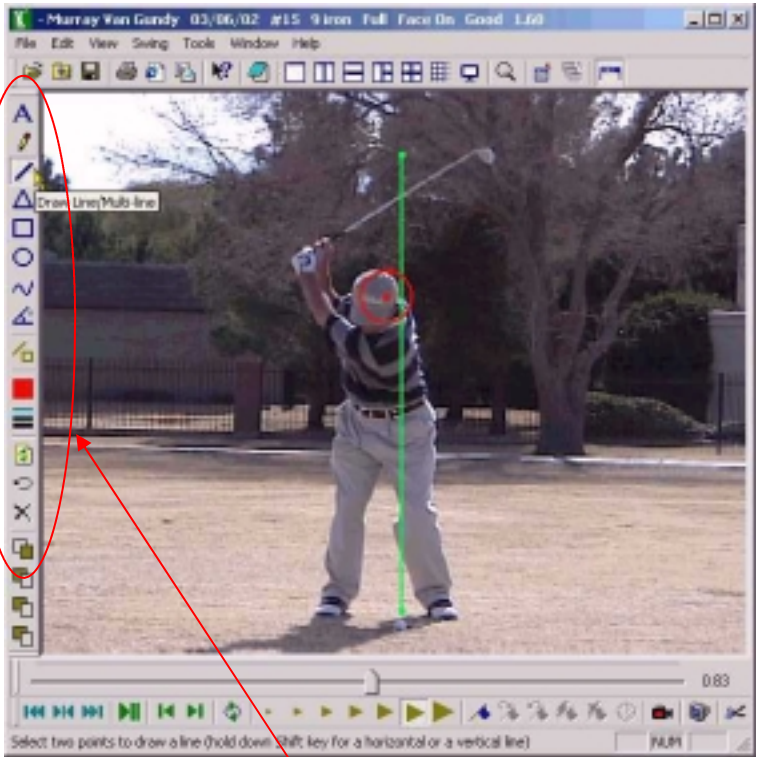
Multiple Video Windows



To open two or more videos click on the appropriate multi-window button above and then use the “open” button to select and open another video.

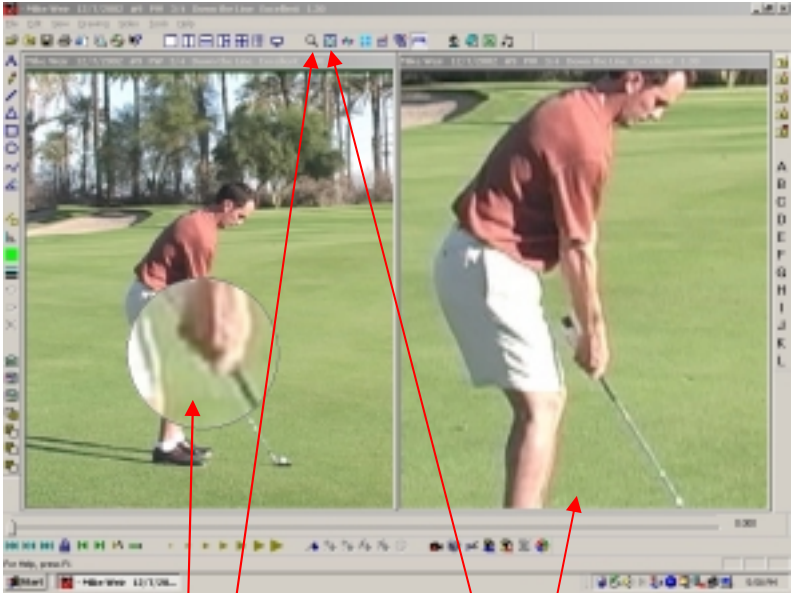
Once opened, you can also synchronize videos to play together by first positioning each video to the same point in the motion and then clicking on the “sync” icon.

Electronic Chalkboard



Choose graphic and drawing tools on the left side toolbar. Use your right and left mouse buttons to place and lock drawing points.

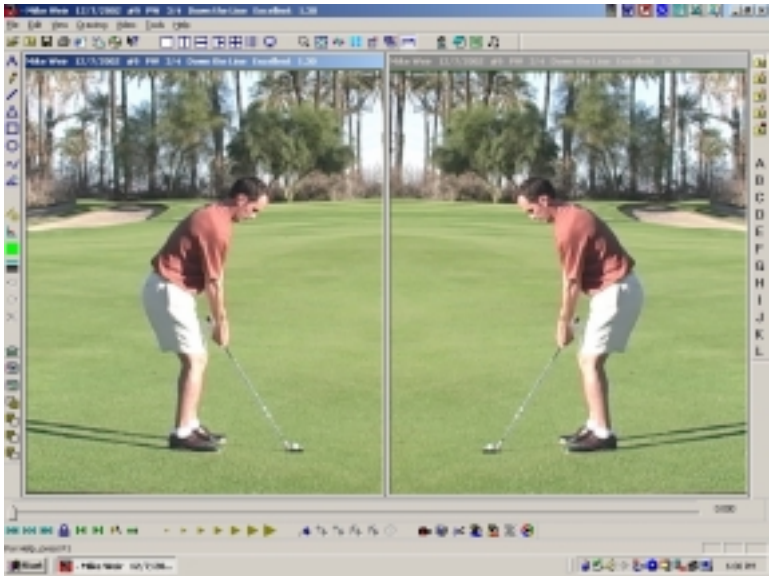
Pan, Zoom and Magnify



To zoom, click on the pan/zoom icon on the top toolbar. Then use the keyboard (* and / keys) or mouse to control the zoom. Follow the instructions on-screen. You can pan by simply holding the right mouse button down while dragging the video.

To magnify an area, click on the magnifier, then left-click and hold while dragging the magnifying glass over the area to be examined.

Flip Image Horizontal



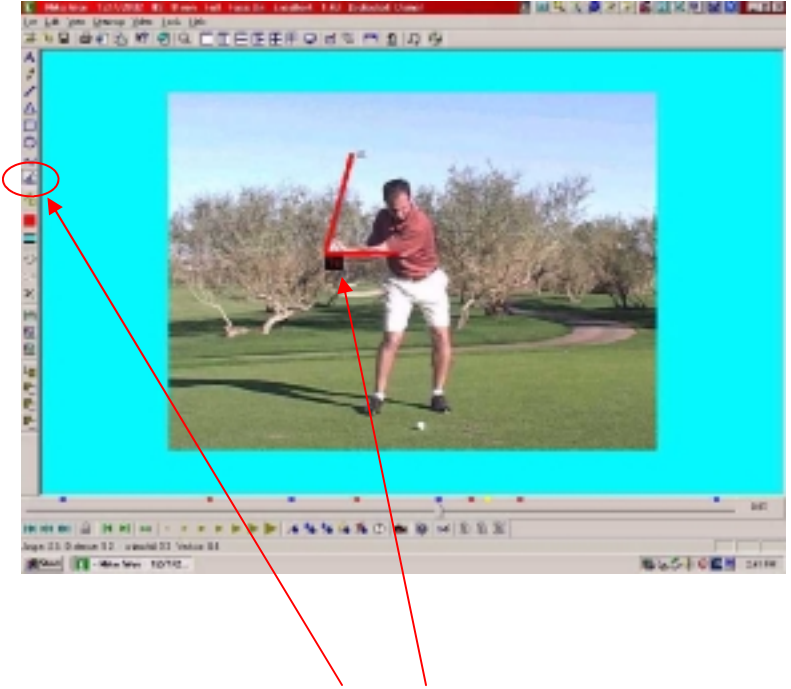
To flip an image from right-handed to left-handed, right-click on the video and select “flip” from the drop-down menu. You can flip an image either horizontally or vertically.

Full Screen Mode



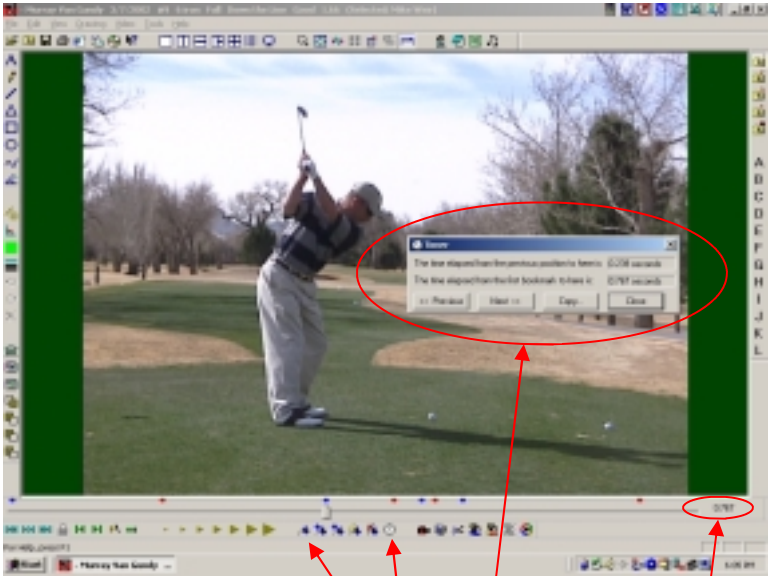
To enlarge a video to full-screen, simply hit the “full-screen” speed key, the “f” key or the full-screen icon on the top toolbar. Hit the “full-screen” key once more to return to normal mode.

Angle Measurement



To calculate an angle, use the “angle” icon on the left toolbar then use your right and left mouse buttons to draw and lock the two lines for the angle.

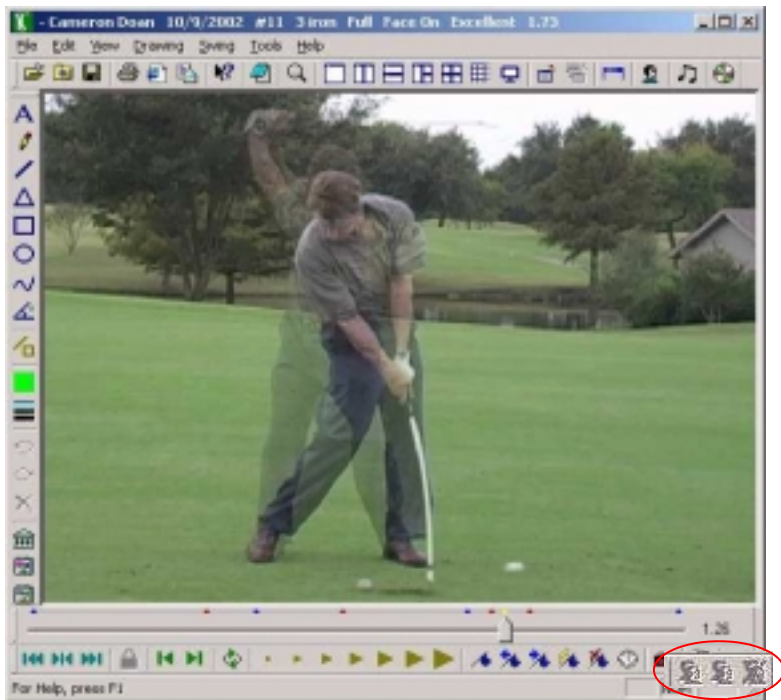
Stopwatch Timer Function



To calculate time intervals you must first set bookmarks by using the bookmark icon (flag) and then clicking on the stopwatch icon to calculate the timing between bookmarks.

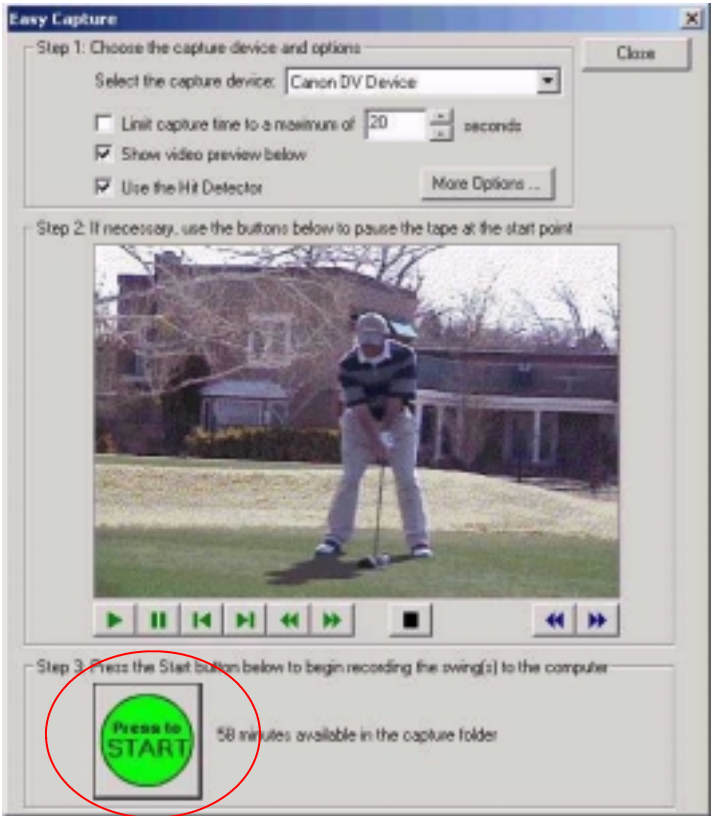
For simple timing you can also use the stopwatch at the right side of the slider bar which measures in 1/1000th of a second. Clicking on the timer resets it to zero at any point in the video.

Overlay Function



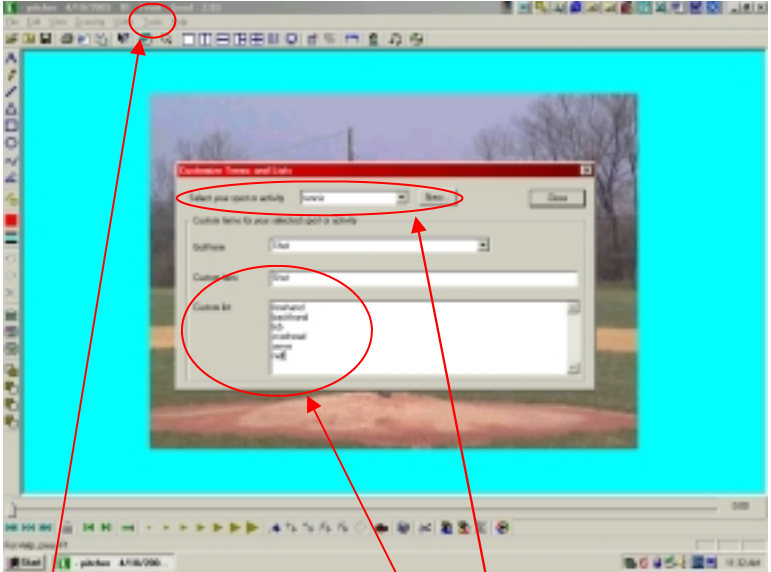
To select the overlay function, click on the overlay icons on the lower toolbar. You can also use your right mouse button to open and set overlay parameters. This feature requires some amount of experimenting and practice to master. Refer to the HELP system for detailed instructions on how to setup and position overlay frames.

Capturing Video



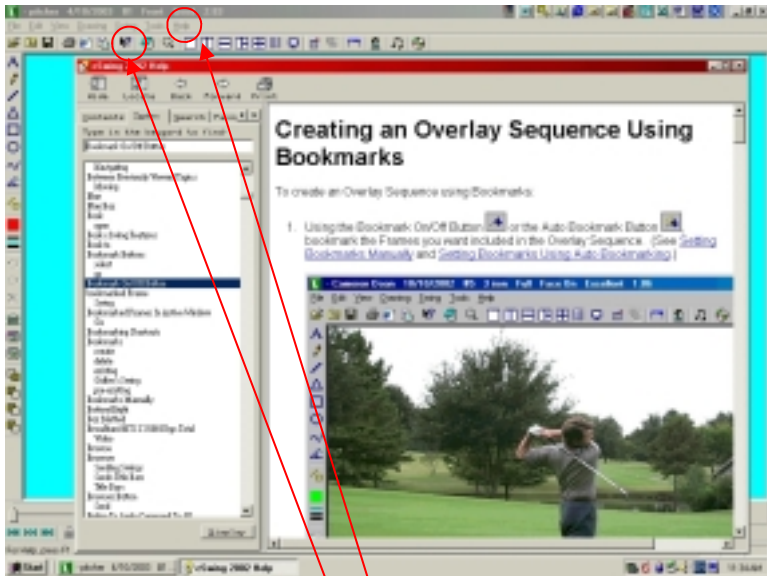
To capture video from a camcorder, you must first have the camcorder turned on and plugged into your PC's firewire port. Then click on the "camera" icon located on the lower toolbar or use the corresponding speed-key to open the capture screen (shown above). Follow the selections in this window to perform the capture. For instructions on multi-camera capture operation (for multi-camera licenses only) click on the HELP menu for full details.

Customizing Pro-Trainer



Pro-Trainer can be customized for any sport or other application such as physical therapy. Simply click on “tools” menu and select “customize”. Then, using the window shown above, select the sport or activity you want (most major sports are already pre-programmed for you). You can further customize the terms or even create a new sport or activity. For certain data fields, you may also assign user-defined values as shown in the tennis example above.

The HELP System



Get help and detailed instructions at any time by simply clicking on the HELP menu button, selective HELP icon or the F1 key. The selective HELP icon gives you instant instructions on any other icon that you click on. First click on the selective HELP icon, then click on another icon to see detailed instructions about that specific function.

Performance Tips

Capturing Video:

Only capture short video clips to your PC (a few seconds per clip). Capturing long videos will use up valuable hard disk space and will be cumbersome when playing back and trying to locate a place in the video to analyze. A good rule-of-thumb is that every second of uncompressed video uses approximately 3 megabytes of hard disk space.

When outdoors, try to capture video with the sun at your back or side to avoid glare in the camera.

Always try to use a contrasting background so the subject will stand out in the video.

Be sure to have your camcorder shutter speed set on 1/1000 or faster if possible. If your camcorder does not have adjustable shutter speed, use the "sports" setting which most camcorders have. For indoor shooting, you may have to use a slower setting due to lower light conditions. The higher the shutter speed the less blurring you will encounter so use the fastest setting you can without sacrificing picture quality.

PC Performance:

If you encounter sluggish PC performance there are several things you will need to try. This is especially true if your PC had been performing satisfactorily and then begins to degrade over time.

- * Be sure no other applications are running when using Pro-Trainer. If unsure, always reboot and restart Pro-Trainer to see if performance improves.
- * Turn off all background processes like anti-virus programs and screen savers.
- * Defragment your hard drive. Also, be sure you are not at or near the hard drive's maximum capacity.
- * Remove any recently installed software. Sometimes new software can over-write critical Windows modules or change PC settings which can have a negative effect on video and/or display performance.
- * Consider upgrading the PC with additional memory or faster/larger hard drive.

Software Installation

SOFTWARE INSTALLATION:

First insert the Pro-Trainer software DVD and follow on-screen instructions to install the Pro-Trainer software, Microsoft DirectX, Windows Media Player and Windows Encoder updates. Also install the demo videos which are helpful for learning the software.

Start the software and copy the activation code from the startup screen into an email to "activate@sportsmotion.com" along with your name and serial number (on DVD jacket or invoice). You will receive your license code by return email. You have the entire length of the trial period to get your license code. The software will be fully functional during that period. Once the trial period expires, the software will still be usable but in a "viewer" or display-only mode only.

SPEED-KEYS:

Below are some of the more frequently used speed key assignments for Pro-Trainer.

Function	Key assignment
Capture mode	backspace key
Record/Stop	\ backslash key
Open video for analysis	PgDn key
Play/Pause	END key (or Spacebar)
Full Screen (toggles on/off)	~ key
Rewind (to beginning)	HOME key
Frame Fwd	Right-arrow key
Frame Back	Left-arrow key

Camera Troubleshooting

TROUBLESHOOTING CAMERA CONNECTIONS:

(This page only applies to Firewire DV camcorders)

Before diagnosing capture problems under Windows, be sure you have the latest Microsoft updates installed for Windows Media, Windows Encoder and Windows DirectX. You must also be sure you have the latest Microsoft Service Packs installed.

If you encounter capture problems, you first must determine if your camera is working properly with Windows BEFORE you start Pro-Trainer and attempt to capture video from the camera. Here are methods for checking to see if your camera and Windows are functioning properly:

Connect and turn on the camera and boot the PC. Click on "control panel", "system", "hardware" tab, and "device manager" button. If the camera is working, there must be an item called "imaging devices". Double-clicking on it should show something like "Generic DV camera". If you do not see the "imaging devices" item then Windows is not recognizing your camera. You must resolve this Windows problem before starting Pro-Trainer software and attempting to capture video.

Here are some things to check if you cannot get Windows to see your camera:

- * Firewire cable connection is loose or disconnected.
- * Firewire cable or connectors are bad.
- * Camera is off or not switched to "camera" mode.
- * Camera battery is low.
- * Camera has an auto-shutoff mode.
- * Other software product(s) have corrupted Windows modules.

Video Tutorial

The following is a brief discussion on the various factors relating to video camcorders and videotaping.

DV (digital video) format:

This is an industry standard which consists of video taken at 30 frames per second and at a resolution of 720 x 480 (North American standard). Each frame of the video actually contains two images, called fields, which are separated by $1/60$ of a second. In effect, the camera shutter opens twice during every frame. These two fields are then “interlaced” or superimposed over each other for normal playback which is what gives the viewer that smooth visual playback effect. Computer software is able to take advantage of this “interlacing” process by separating or deinterlacing the two fields in order to achieve a higher effective frame rate for frame-by-frame analysis. The result is an effective frame rate of 60 frames per second (2 images taken every $1/30$ of a second = 60 images per second).

Shutter Speed:

Shutter speed is the duration which the camera shutter remains open when capturing a single image.

Shutter speed is the most critical factor when dealing with high-speed motion. If an object is moving quickly in front of a camera lens and the shutter speed is slow (say $1/100$ of a second) the captured image will appear blurred or streaked because it was in motion while the shutter was still open. This can often be mistaken for poor resolution or out-of-focus when it really is neither. As you increase the shutter speed to, say $1/2000$, the shutter is now opening and closing so rapidly that the object moves only a short, imperceptible distance while the shutter is in the open position. Therefore little or no blurring occurs. As you reach shutter speeds of $1/15000$ you effectively “stop” or “freeze” the object’s motion in the frame.

Video Tutorial (continued)

Lighting:

Unfortunately, there is an inverse relationship between shutter speed and light. As you speed up the shutter it is now not remaining open as long and therefore cannot take in as much light from the object being taped. This means that your captured video is going to appear much darker. Darker videos tend to lose color and become very “grainy”. The normal way to compensate for this problem is to increase lighting by videotaping in sunlight or using more powerful indoor lighting. The other option is to use more expensive cameras that have better light sensitivity and faster shutter speeds.

General Rules for High Speed Motion Capture:

- * If an image appears blurred, increase shutter speed to the fastest possible speed under the available lighting conditions. Set your camera to manual mode for adjusting shutter speeds. For cameras without manual shutter speed control, use a “sports” or other similar setting.
- * If an image becomes too dark when increasing shutter speed, increase room light or bring lighting closer to the subject. Also move the camera closer to the subject if possible.
- * Always try to have the background behind a videotaped subject be of a contrasting color. This will help the image stand out when playing back the video.
- * Try to position the camera close enough to the subject such that the subject fills the viewfinder. Moving too far away effectively reduces image resolution and detail.
- * When videotaping in bright sunlight, try to keep the sun behind the camera.
- * Use a tripod whenever possible. This stabilizes the video as well as helps protect the camera from damage.

Sports Motion, Inc.

888-265-6226

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