

Video Capture and Vision script operation for AVED project as of 10/31/05

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Digital Video Capture in MBARI Video Lab

First, reserve digital lab time through the Microsoft Outlook system. Got to the "Public Folders > All Public Folders > Video Lab Calendars > Digital Lab Reservations". Choose an empty time slot and request Video Capture equipment usage and user name. Next, check out a video tape with desired dive footage from the Video lab repository. NOTE: these tapes should be returned nightly to the repository.

The current Video Lab system for digital video capture is called PERE. Log on to PERE with the following:

Login: Videouser

Password: video1user

This logs the user (you) in to the system with preset settings for video capturing. On the desktop, double-click the shortcut for Adobe Premier 6.5. This should take just under a 1 minute to load.

Once Adobe Premier has opened, the system should then open a window entitled "Load Project Setting". Make sure the project is set with the following items highlighted before continuing:

8 Matrox MPEG-2-NTSC
8 MPEG-2 Highest

This selection will apply the following settings to the project:

Compressor: *Matrox MPEG-2 1-frame*
Frame Size: *720x480*
Pixel Aspect Ratio: *D1/DV NTSC (0.9)*
Frame Rate: *29.97 fps*
Audio: *48000 Hz, 16-bit, Stereo*

From the Adobe Premier menu click "File > Open", navigate to the desktop and open the Edgington-Salamy Folder. This is the folder where the current project (edgington-salamy.ppj) for AVED video capturing is located. If the project was opened recently, click "File > Open Recent Projects > C:\Documents and Settings\Videouser\Desktop\Edgington-Salamy\edgington-salamy.ppj" as this will also open the project.

Once the project has opened, open and edit one of the *.pbl files in the Edgington-Salamy desktop Folder. The *.pbl file gives instructions to the digital deck on when to start and end video capturing. It is very important to enter data correctly in this file. NOTE: If you perform an edit on an existing *.pbl file, please perform a "save as" and rename it so as to not overwrite the original file. Information to enter in the *.pbl file include: Reel Name, File Name for output file, Log Comment, In Time (tape start time), Out Time (tape end time), Frame Rate (30 fps), Format (Non-Drop Frame). Of these options, it is important to make sure the Frame Rate is **30 fps** and the Format is **Non-Drop Frame** for all clips. Current Filename conventions are to list the Dive number and START time of the clip. For example, if the user wants to name a clip from Dive 1529 that began at tape time 04:07:16:04 then they should name the clip: 1529_04_07_16_04.

Since the current Vision processing script (called ***runclip***) requires an average of 10 frames to begin processing, it is good practice to add 10 frames to the front and end of a desired clip length. Example: for a 20 second clip from Dive 1529 to be processed through the mbarivision Vision script from 04:07:10:00 to 04:07:30:00, label the In Time (*and filename*) of the clip as 04:07:09:20 (*filename: 1529_04_07_09_20*) and the Out Time as 04:07:30:10.

Next, in the left hand column of each row of the *.pbl file, make sure that a black diamond (◆) is shown to the left of the clip data entry on the *.pbl file. This symbol indicates that the clip is to be created during recording to the Adobe Premier software. A check mark (➤) indicates that the clip has already been made and is to be skipped. This item can be toggled by simply left-clicking on it with a mouse.

Captured video will be digitally recorded in an *.avi file. Make sure the newly created *.avi files will be saved in the Edgington-Salamy desktop Folder through the settings option.

****One note of caution regarding file size and space**.** Video capture files are quite large with 20 second clips equating to ~650 MB of storage space. Before video capturing can begin, first verify that the Hard Drive on PERE is large enough to handle all of the clips that are to be made. Due to the large disk space required, video clips should only be stored on PERE's hard drive temporarily and should be moved off the computer for long term storage.

Next, turn on the digital deck and monitor and insert the video tape into the deck. Push the top white button labeled remote on the far right side of the deck. The deck should now be able to take command information from Adobe Premier.

To begin recording video clips, navigate to the *.pbl file that was recently created/edited in Adobe Premier. In the bottom right hand corner of the file click the red circle (●). This begins the video capturing process. The system will create all clips listed in the *.pbl file and will place a check mark (➤) next to each as it completes them.

Once the system has completed capturing all clips, look under the "Project Window" in Adobe Premier. There should be a folder named "Bin1" which should contain all of the captured *.avi files. Double click on each separate *.avi file in the Bin1 folder to open and view them. Save each into the Edgington-Salamy desktop folder (if it was not already set-up to do so when the clips were taken).

Now, create a Quicktime Movie for each *.avi clip. To do this first open one *.avi file at a time by double-clicking on it in the Bin1 folder. Next, navigate: "File > Export Clip > Movie".

Set-up the output as follows:

Make: *Entire Clip as Quicktime*

Video: *720x480 at 29.97 fps*

Compression: *'Planar RGB' @ 100%*

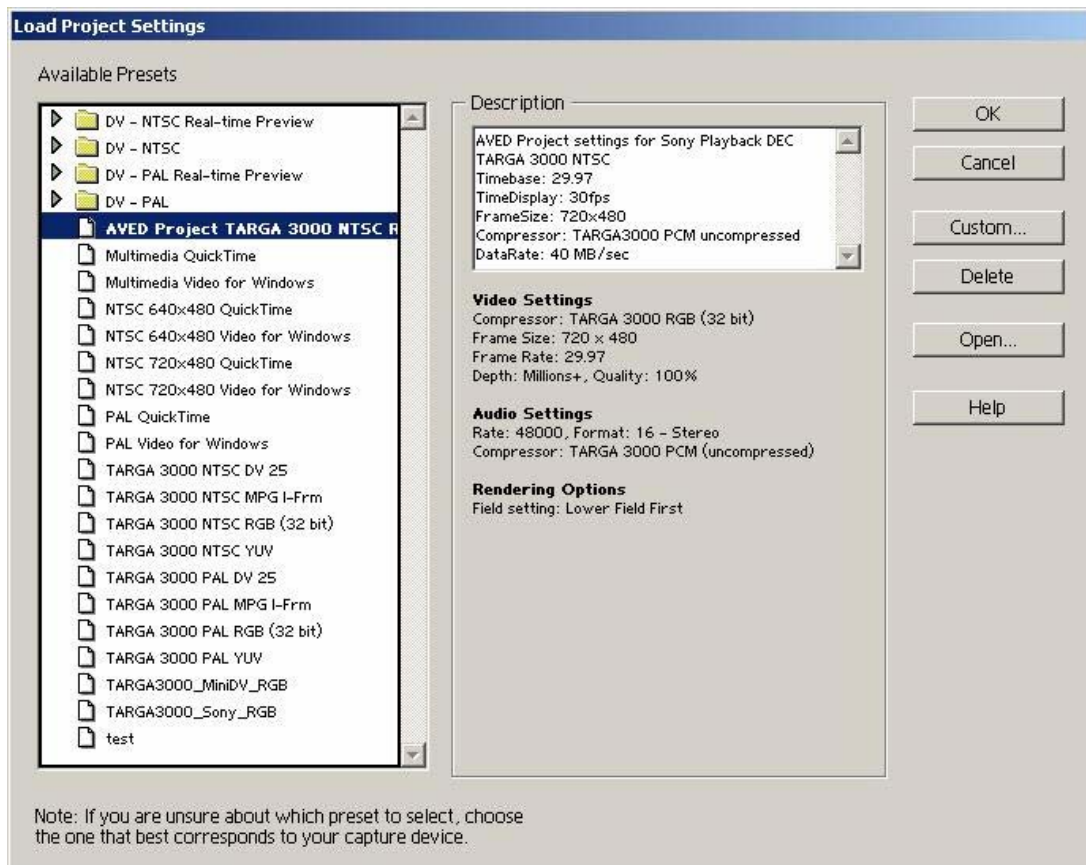
Audio: *Disabled*

This information should be listed in the bottom part of the save filename section. If it is different, change the setting to reflect this information. Also, name the Quicktime (*.mov) output file the SAME as the *.avi input file for conventional purposes and save it in the Edgington-Salamy folder as well. Repeat this process until there is a *.mov file for every *.avi file.

Capturing Video On Ephyra

Before loading Adobe Premiere 6.5 the **Sony BetaCam Deck** should be turned on. Once the BetaCam Deck is turned on a cassette could be loaded. Rewind the cassette to the beginning. Once the BetaCam has been turned on **Adobe Premiere 6.5** can be loaded.

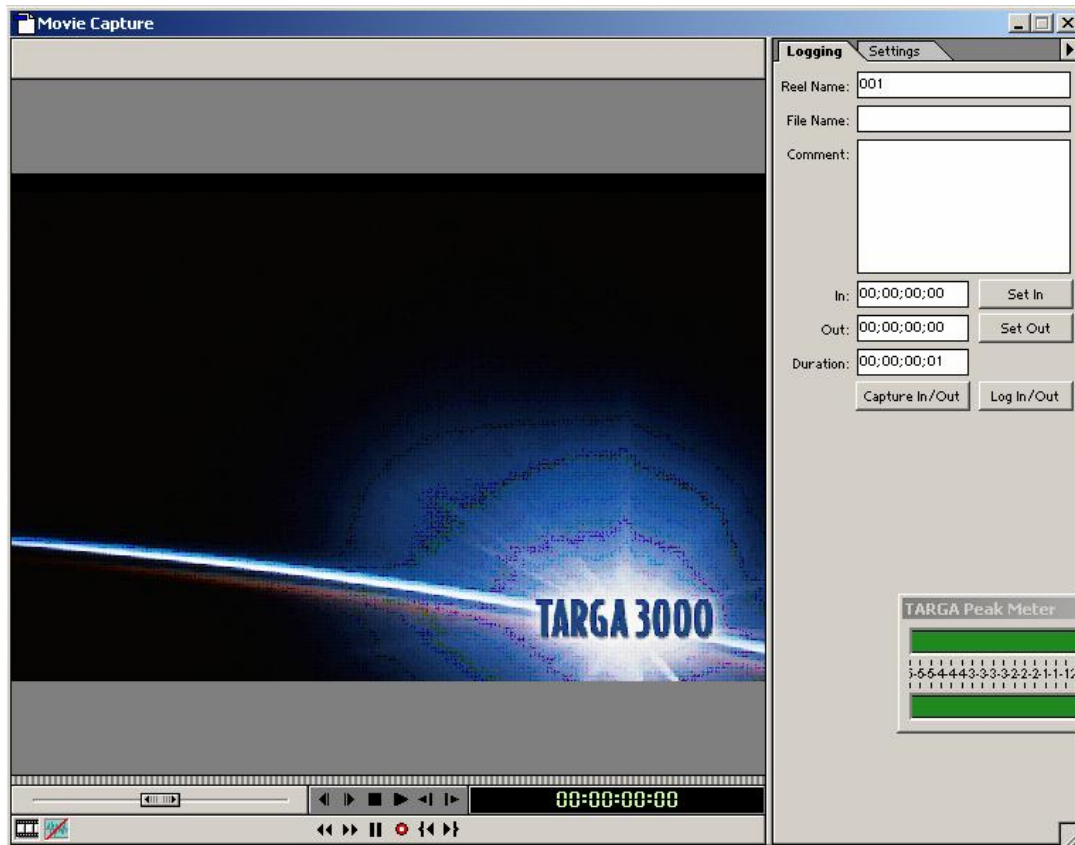
Under the Start Menu select Programs -> Adobe -> Premiere 6.5 -> **Premiere 6.5**. This will start up Adobe Premiere. Upon loading user should see the **Load Project Settings** window. From the Load Project Settings window highlight **AVED Project TARGA 3000 NTSC R...** and select **OK**. This brings you into Adobe Premiere. Before capture always make sure there is enough space in the drive saving to. A clip that is 10 seconds long and typically have a size of 200 MBs.



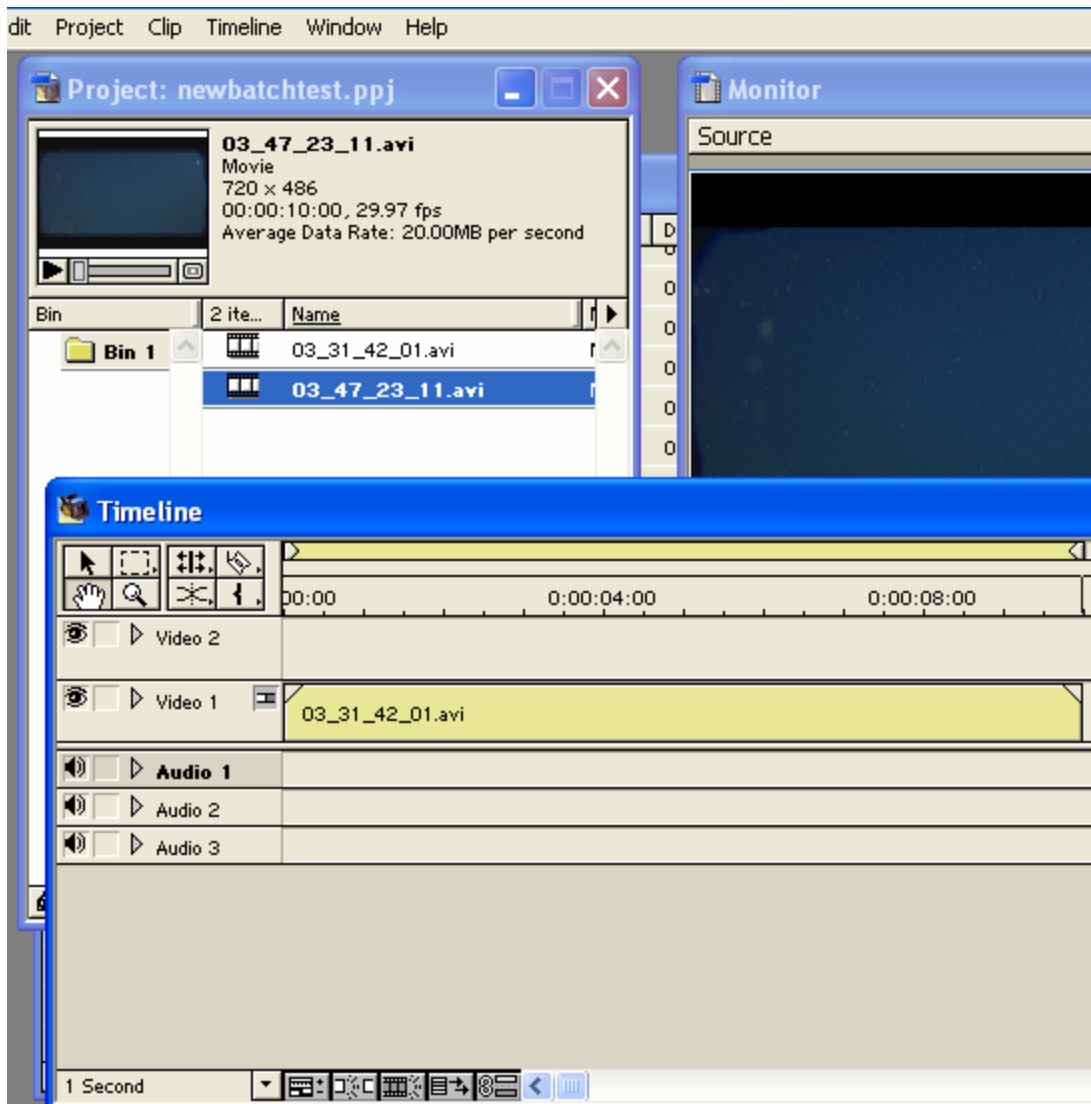
Note: Once in Adobe Premiere the user could select to load a batch file created by **p_vims.exe** or setup **video capture** manually or modify an existing pbl file. The file created by p_vims can be used by Adobe Premiere to make multiple captures at one time. Under the File tab select **Open** and navigate to your batch file, <batchFileName>.pbl, and select **OK**. This will open a **Batch Capture** window. In the window there are two symbols worth noting; the **star**, ♦, on the left of each selection and **red circle**, ●, on the bottom near right. The star represents the selected track to be recorded and can be on or off by clicking on them. Once all the tracks are selected click on the **red circle**, ●, to begin the capture process. Other than using a batch .pbl file capturing the video can be done manually.

Batch Capture: 10_16_2000.pbl						
Reel Name	In Point	Out Point	Duration	File Name	Log Comment	Settings
♦ Tape 0	03:18:46:11	03:18:51:11	00:00:05:01	03_18_48_26	nanomia	
♦ Tape 0	03:18:56:12	03:19:01:12	00:00:05:01	03_18_58_27	nanomia	
♦ Tape 0	03:18:59:28	03:19:04:28	00:00:05:01	03_19_02_13	nanomia	
♦ Tape 0	03:19:23:21	03:19:28:21	00:00:05:01	03_19_26_06	nanomia	
♦ Tape 0	03:19:50:20	03:19:55:20	00:00:05:01	03_19_53_05	nanomia	
♦ Tape 0	03:20:08:12	03:20:13:12	00:00:05:01	03_20_10_27	nanomia	
♦ Tape 0	03:20:15:17	03:20:20:17	00:00:05:01	03_20_18_02	nanomia	
♦ Tape 0	03:20:44:09	03:20:49:09	00:00:05:01	03_20_46_24	nanomia	
♦ Tape 0	03:21:14:24	03:21:19:24	00:00:05:01	03_21_17_09	nanomia	
♦ Tape 0	03:22:00:01	03:22:05:01	00:00:05:01	03_22_02_16	nanomia	
♦ Tape 0	03:23:26:18	03:23:31:18	00:00:05:01	03_23_29_03	nanomia	
♦ Tape 0	03:23:52:17	03:23:57:17	00:00:05:01	03_23_55_02	nanomia	
♦ Tape 0	03:24:21:17	03:24:26:17	00:00:05:01	03_24_24_02	nanomia	
♦ Tape 0	03:26:41:09	03:26:46:09	00:00:05:01	03_26_43_24	nanomia	
♦ Tape 0	03:26:59:18	03:27:04:18	00:00:05:01	03_27_02_03	nanomia	
♦ Tape 0	03:28:04:14	03:28:09:14	00:00:05:01	03_28_06_29	nanomia	
Total Duration: 00:14:50:27			Uncaptured Duration: 00:14:50:27			

To manually capture video once in Adobe Premiere open file tab and select -> Capture -> **Movie Capture**. This will open the **Movie Capture** window. There are three fields that need to be filled before the capture can begin; **File Name**, **In**, and **Out**. Next to **File Name**: type in the name of the desired output file. Next to the **In**: follow the same format, hh:mm:ss:ff, to designate the beginning of the capture. Next to the **Out**: follow the same format, hh:mm:ss:ff, to designate the end of the capture. To determine a good start and end time for a 10 second clip subtract 5 seconds from the annotator's time code for the **In** field and add to seconds to that for the **Out** field. Once the selection has been made select the **Capture In/Out** button. This will open up a separate window with the clip just captured. At this point the film needs to be converted into a Quick Time movie.



To deinterlace the movie, open the **Windows** tab and choose **Timeline**. A Timeline window should appear. Move the mouse over the film icon of the new movie in the **Project** window or over the movie clip in the **Monitor** window. A hand should appear. Left click and drag the movie into the timeline window in the Video 1 or Video 2 box at time = 0 to the far left.



Right click on the movie in the **Timeline** window and choose **Video Options -> Field Options**. Check always deinterlace. In order to convert this clip to a QuickTime movie, open **File** tab and select **Export Timeline -> Movie**. Next to **File name:** type in the name of the clip without the extension and save the file in the appropriate directory. If not in the correct directory navigate to the appropriate directory. Click **Save** when done. To deinterlace another video, right click on the clip in the **Timeline** window, choose **Clear** then add the next movie to be deinterlaced into the **Timeline** window. Each movie must be done separately by clearing the last movie out of the **Timeline** window.

To convert the captured Premiere AVI into a Quick Time movie without deinterlacing, make sure the clip window is active (up front). Open **File** tab and select **Export Clip -> Movie**. This will open the **Export Movie** window. Next to **File name:** type in just the name of the clip and not the extension. If the **Save in:** is not the directory of choice Navigate to the appropriate directory. Click **Save** and when done converting make sure the movie is viewable. Converting after capturing with a batch file is the same and have to be done one by one.

Adding QT TimeCode to *.mov files

This step inserts the correct video time code into each clip. Adding the correct timecode is important when comparing processed data results with video annotator notes. From the desktop, open QT TimeCode by double-clicking the shortcut labeled "QT TimeCode". Next, open a *.mov file in the Edgington-Salamy desktop Folder. Navigate on the menu: "Test > Add Timecode Track". A new window should pop up with the following items*:

Source Name: List the name of the opened *.mov file.

Display TimeCode: Click this to ON.

Below Video: Click this to ON.

Time Scale: Do Not Change.

Frame Duration: Do Not Change.

Num Frames: Do Not Change.

TimeCode: ONLY click 24 Hour Max. DO NOT click Drop Frame!!!

Counter: Do Not Change.

Start Time (HH:MM:SS:FF): Type in the original start time of the clip (i.e., the filename without the Dive number). Keeping with the original example (1529_04_07_16_04) this would be 04:07:16:04. This information MUST be entered for the timecode to be embedded.

* Follow the instructions listed for each setting to properly add time code information to the clip.

Click Okay.

Next, click "File > Save". Do NOT rename the output *.mov file with another name as it creates a separate linked file with the timecode information. Also, renaming the file takes up additional space on the hard drive that is unwarranted. Repeat these steps and add the timecode to all of the *.mov files in the Edgington-Salamy Desktop Folder.

Transferring files to storage for processing

All of the *.avi and *.mov files should be moved off of the PERE system as soon as possible to a more longterm storage area. Currently, these files are stored on the system MAKO on its firewire drive. **NOTE:** all *.wav audio files created in the video capture process can be deleted as they are not used. Through the windows folder system move all of the newly created clips from the Edgington-Salamy desktop Folder to MAKO which is NFS mounted. As the user (you) is logged in as Videouser on PERE, a separate user ID and password on MAKO will be required to open its subdirectories. To log on to MAKO, it is also best to navigate from "My Network Places > Entire Network > Microsoft Windows Network > LAGOON > MAKO" as this brings up a log on window. At this point, enter a valid user ID (LAGOON/userid) and password for MAKO. Once logged in, open the "firewire" folder and create a new folder for the tape Dive number (e.g., Dive 1529). It is also a good idea to create an "AVI" subfolder to store all of the *.avi files separately from the *.mov files. Next, move all of the newly created *.avi and *.mov files from PERE to the MAKO firewire through windows explorer for storage before processing. It is always a good thing to check whether there is enough space remaining on the firewire to properly transfer all newly created files to before starting the moving process.

VISION processing of clips with the Runclip-Remote Script (note – this is currently not working)

All clips are currently being processed on the Beowulf Cluster (aka. beowulffish). To process clips, **ssh** into beowulffish. The easiest way to do this is to first telnet into another Linux system that allows telnet access (e.g., abalone). Note: Unless the system is on NIS, a local user id account and password will be required to login (koi is not on NIS). Once telneted into a system, type the following at the prompt:

```
# ssh -X beowulffish -l username
```

A local account on beowulffish will also be needed to login as it is not on NIS. See the beowulffish administrator (K. Salamy; salamy@mbari.org) to set up an account.

Once logged in to beowulffish, run the Vision processing script currently entitled "runclip-remote". This script is designed to work from any directory on beowulffish including the user's /home/user or /scratch/user directories. To run the script specify the directory where to find the clip to run as well as the directory where the finished clip directory is to be placed. MAKO is NFS mounted onto beowulffish for file transfer ease. For example, the script could be run with the following command for clip 1529_04_07_16_04:

```
# runclip-remote /mako/mnt/firewire/Dive_1529_clips/1529_04_07_16_04.mov /mako/mnt/disk2/Dive_1529 &
```

This command will copy the clip from the MAKO firewire, transfer it to one of the six nodes on beowulffish, run each clip through the Vision script **mbarivision**, create a new Quicktime movie of the output and then save all files in a folder with the clip name on disk2 of the MAKO hard drives. Using the "&" allows the user to open another window and process more clips if another one is already running. The script will determine whether a process is already running on node1 and move the clip to be processed to node2, or node3, etc.

All completed files are currently store on MAKO at /mnt/disk2/Dive_1529.

VISION processing of clips with the runclip Script

Clips can also be processed with the runclip script on any machine where the script is installed.

Usage: **runclip** <clip.mov or clip.avi>

Examples:

```
> runclip 1529_04_16_36_04.mov
> runclip /mako/mnt/firewire/Dive_1529_clips/1529_04_16_36_04.mov
```

There are two environment variables that are referenced in runclip:

\$SCRATCH_DIR

This defines a separate directory on your machine to store processed results. This is optional, *except* on the Beowulf cluster. DON'T override SCRATCH_DIR on the cluster.

Set this in your ~/.bashrc file, for example: **export SCRATCH_DIR=/mnt/sparedisk**

If you define **SCRATCH_DIR**, put all your clips in the root SCRATCH directory before executing runclip.

Please note that if **SCRATCH_DIR** is *not* defined, **runclip** will place the processed results in the same directory as the clip.

\$MBARIVISION_OPTIONS

This defines any additional options to pass to the mbarivision during processing. Define this in your ~/.bashrc file, for example **export MBARIVISION_OPTIONS=--vc-type=O**. For a list of options:

```
> mbarivision --help
```

Generating ppms from a mov file – how to extract ppms frames from clips processed with runclip or runclip-remote

To save space, clips processed with runclip or runclip-remote no longer store individual ppms. Instead, results are stored in a quicktime .mov file or mpeg file – usually a file named *.results.mov or *.results.mpeg.

To extract individual frames from a .mov file, do the following:

First check how much disk space you have with the df command.

For example:

```
# df . -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda1       230G   25G   196G  12% /mnt/maxtor_fw
```

Total space needed for generated ppms will be approximately as large as the .mov file you start with. If the available space is larger than your .mov file, you have enough space to regenerate ppms

Next, use the mov2ppm command to extract the ppms.

Usage: **mov2ppm <filename.mov>**

Examples:

```
> mov2ppm 1529_04_16_36_04.results.mov
> mov2ppm /mako/mnt/firewire/Dive_1529_clips/1529_04_16_36_04.results.mov
```

This command will create a series of ppm frames in your working directory, eg:

```
f000000.ppm
f000001.ppm
f000002.ppm
```