



# Personal Archer Version 1.0 USER'S MANUAL

# CONTENTS

## i. Introduction

## ii. Creating a new scene

- a. The database structure.
- b. The scene manager
- c. Scene operations : new scene - open scene - scene settings

## ii. Getting sources for the scene : The scene assets

- a. The Asset Manager.
- b. Getting sound assets.
- c. Getting cel assets.
- d. Getting picture assets.

## iii. Editing Cel/Picture Assets

- a. The Cel Editor
- b. Cel Editing Tools
- c. The Picture Editor
- d. Picture Editing Tools

## iv. Composing the Xsheet with the Assets

- a. Putting assets on the xsheet
- b. Editing locations of assets on the Xsheet
- c. Editing Cel Data and Picture Data : Animating with Xsheet
- d. Using the camera view with Xsheet

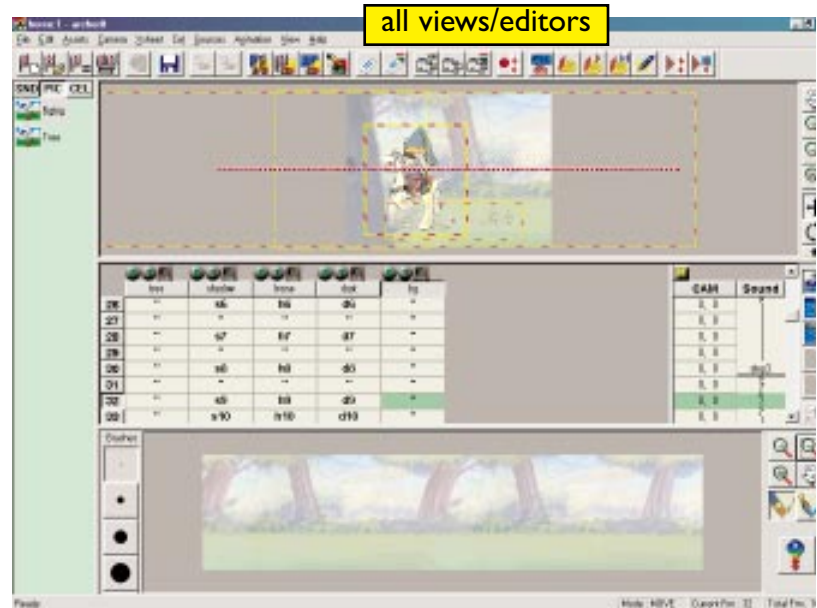
## v. Getting results: making flipbooks, previewing sound, rendering

- a. Generating flipbooks
- b. Rendering output

## i. Introduction

Personal Archer aims at solving all the needs of an animator towards making linetest, painting cels, creating exposure sheets with sound information, creating flipbooks with the sound info on the exposure sheet, creating camera and level movements and finally producing a production quality output of the created scene. It has all the necessary tools for creating a production quality cartoon or animation or presentation from scratch to the final result, including sound.

The system is designed to be easy to use and intuitive in its user interface. The interface is divided into four different parts: the asset manager which handles the sources of the scene which includes sounds, pictures, and cels in folders; the cel/picture editor which lets the user to paint cels and to paint masks of pictures with all the necessary tools; the exposure sheet where the composition of the scene is done; the camera view where each movement specific information on the exposure sheet is changed and the final output is viewed.

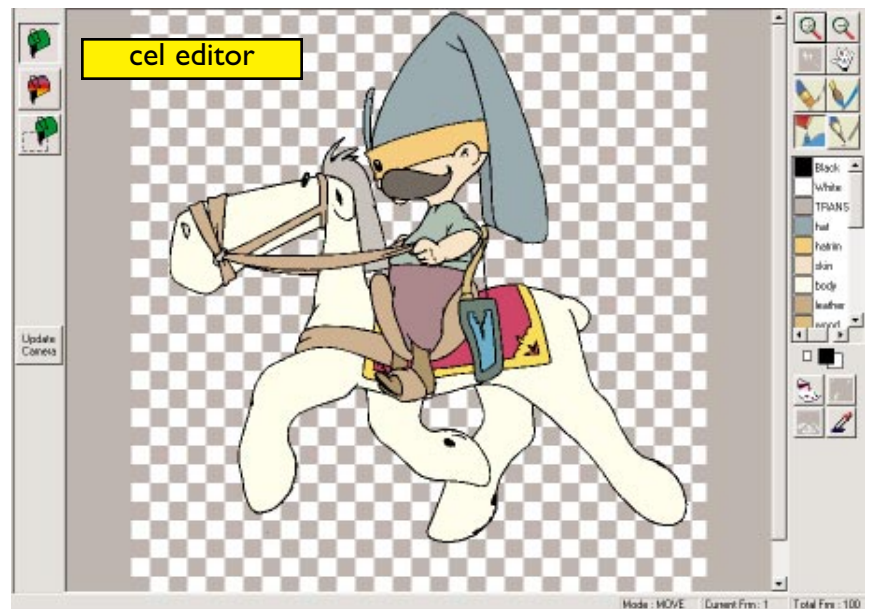


The system handles all file system dependent functionality in itself. It provides the user a coherent and easy to use database architecture to handle all the image and sound data that creates the scene. The user does not have to know anything about the underlying windows file system. All the data is stored in a database that is structured into scenes, which are divided into sound, picture and cel folders, and all of the interaction to these information is handled inside the program which makes the understanding and usage of the program very easy. Also a scene manager tool provides easy maintenance of scene information and the transfer of assets such as color palettes, cels, sounds, pictures from one scene to another. The user can merge palettes of one cel folder with another, copy palette of one cel folder to another very easily with the scene manager.

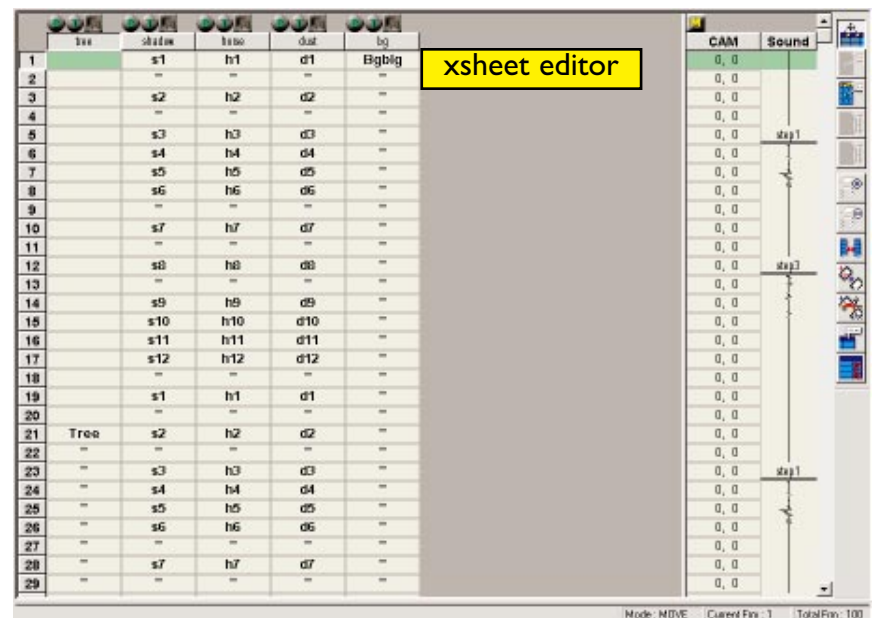
In the asset manager, the sound, picture, cel assets of the scene can be given to the system in a variety of ways. Sound can be recorded in the program with a sound recorder tool, or they can be imported from windows wave format files. Pictures can be scanned using any twain compatible scanner, or they can be

grabbed from any windows compliant capture device (i.e cameras), or they can be imported from different external file formats. Cels also can be scanned using any twain compatible scanner, or they can be grabbed from cameras like pictures, or they can be imported from different external file formats.

Cel/Picture editor lets the user paint cels, paint lines, fix lines, or even draw the whole cel inside the editor. It also provides an easy to use palette editor embedded into it. A different palette is maintained for each cel folder. Tools such as solid fill, gradient fill, box fill, pen, brush, eraser provide all the necessary tools to create the perfectly painted cels. It also provides an area for editing picture assets. The user can paint or erase masks of pictures very easily. It also has a very powerful colorkeyer for automatically generating masks of pictures.

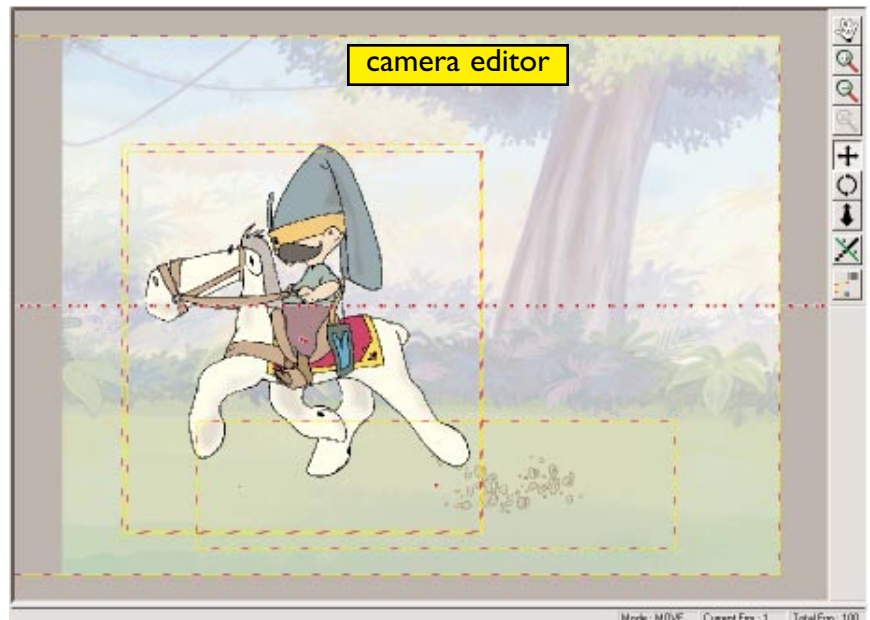


Xsheet Editor provides a very simple but powerful area for generating digital exposure sheets with sound. It has infinite number of levels which can hold either cels or pictures with no constraints on their placement on the xsheet. It has a sound level for making scenes with sound, and also a camera level for manipulating the digital camera of the xsheet. Inbetween tools for levels and camera allow digital inbetweening of level position, rotation, zoom, blur, transparency and camera pan, zoom, tilt, in a variety of key types such as slow-in/slow-out, linear, constant, etc.

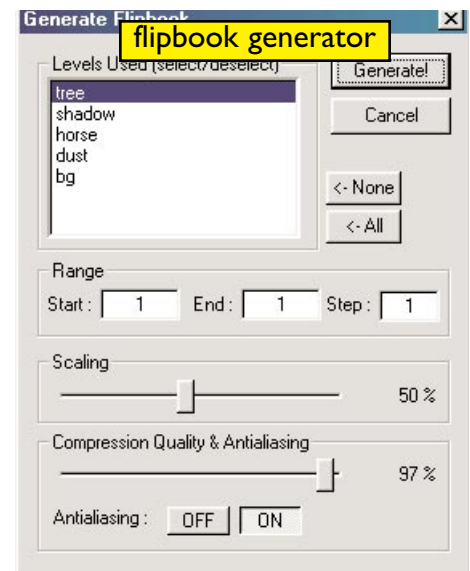


The Camera Editor is the place where the final rendering of the camera is done at the current frame at all times. It also handles all movement specific input.

Multiprocessing allows the camera view to calculate the view of the current frame at all times while the user is working with the xsheet or cel editing. It lets the user to work freely with no interruption while it always renders the current frame. It also shows motion paths with a variety of options. A line checker tool allows the user to check the scene action without making a flipbook. The renderer has a special antialiasing feature which makes the black and white cel lines perfectly smooth. It also has antialiasing for sub-pixel rendering which handles the zoomed levels perfectly.



A fast flipbook generator makes a preview of the scene with any level selected, at any frame rate. It uses the Microsoft AVI video technology for generating long and big flipbooks of the scene. Flipbooks can be saved for later viewing or they can be sent over the internet which will require no additional tool for the receiver to view them, as the system video player can play them.



Flipbook player has a special frame rate check facility which makes its output very reliable. If the system somehow can not display at the correct frame rate, a variety of options are available for the user to make the system play at the correct frame rate.

The renderer is a fast renderer which can output in a variety of formats, including Microsoft AVI using any codec (video compressor) installed in the system. This allows the system to write directly to output boards by selecting their video compressor at the output options. Renderer also includes the edited scene sound inside the video for generating the final animation at one step.



The system always saves the current work to the database. This means that the user does not have to fear of losing data at any stage due to crashes or power failures. So, there is no need for any autosave features. Backup of finished materials is as easy as copying a folder to some other medium such as a removable drive. Restoring is also as easy as copying the folder back to the database location from the backup medium. All the scene data including cels, xsheet, pictures, color palettes, everything that makes up the scene can be backed up as easy as copying a folder.

Overall, Personal Archer Animation Production system is perfect solution for all the need of an animator, and as well as anyone who can express their ideas by drawing, to generate production quality animation and presentations.

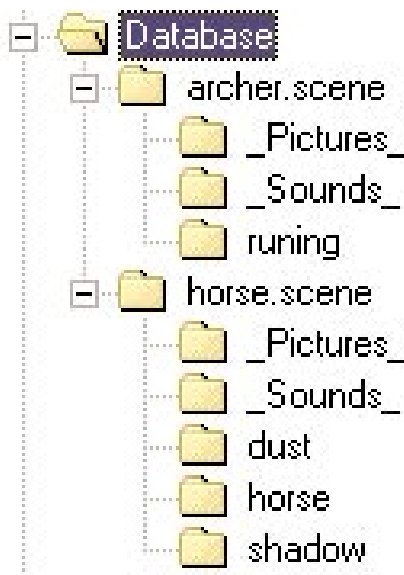
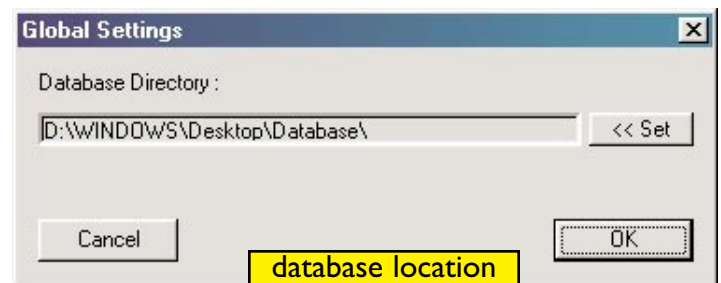


## ii. Creating a new scene

### a. The database structure.

Personal Archer stores its documents and scene related resources in a fixed location on the hard disk. If a database root folder is not given to it explicitly by using file/settings option, it uses a directory called database located at the directory it was first installed to. This database root folder later can be changed using the settings dialog:

Everything related to the scene and its sub-elements are stored starting from this directory. The sub-elements include the scene folders, and the cel folders, sound folders, picture folders, color palettes inside the cel folders, the xsheet data inside the scene folder. A working structure of the database looks like this:



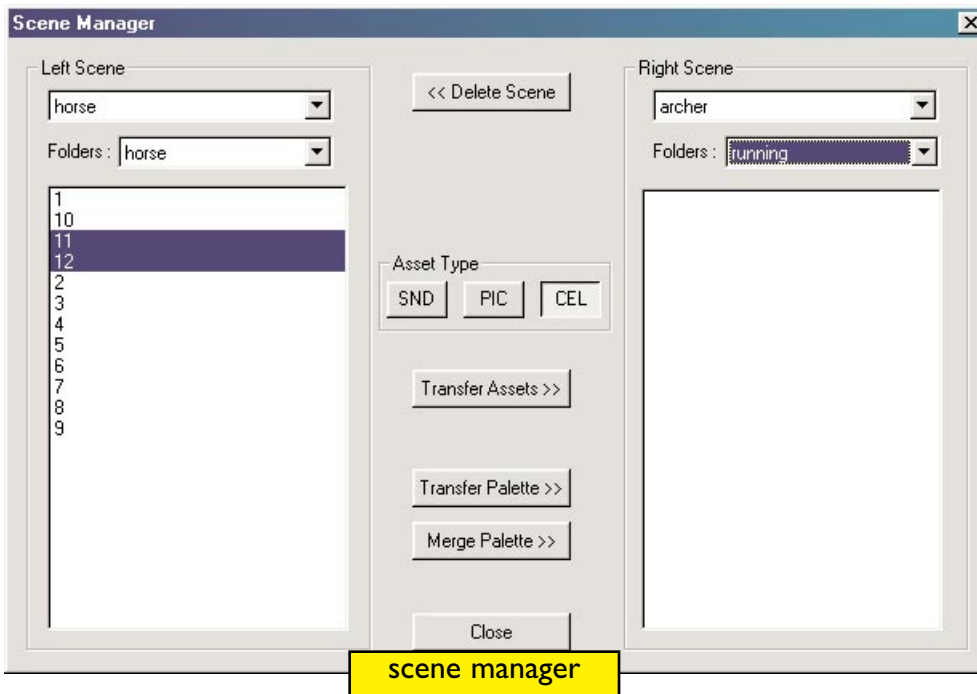
The database folder also holds the last rendered flipbook. In each scene there are the cel folders and the picture and sound folder.

Although the user never has to deal with the disk structure of the database directly, since Personal Archer has all the tools to manage a scene inside its user interface, it is a good thing to know how it stores the database on the disk.

You might want to change the database location for several reasons. One might be to share databases over a network, by network mounting drives from another computer. See the documentation of the Windows operating system on how to do it. Or, you might want to keep a separate database for a separate set of scenes. If you change the database directory you won't be

able to open sources in the previous database directory. So, each database works on its own.

## b. The scene manager



Using scene manager is very simple. The scene manager works when you have at least one scene created. After you have created a scene it allows you delete it, or exchange palette information between cel folders.

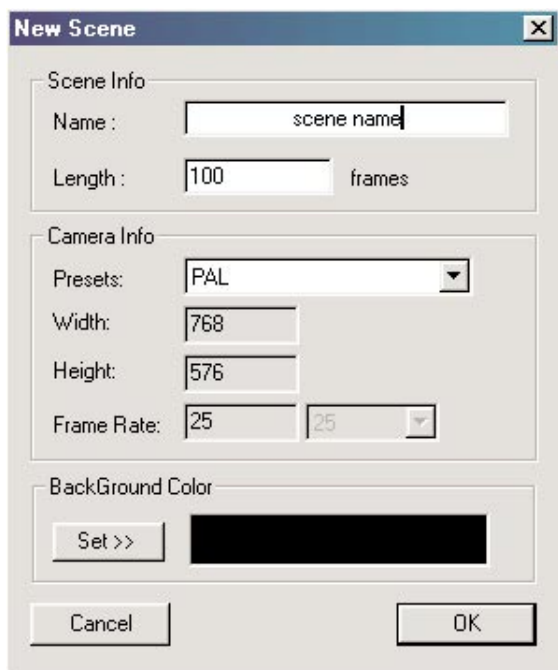
When you have more than one scene created, it allows you exchange cel/picture/sound assets between scenes.

To exchange palette information between cel folders of the same scene or between cel folders of different scenes, you have to select the scenes from the 'left scene' and 'right scene' combo boxes. Then you select the source folder from the 'folders' combo box of the left scene and select the destination folder from the 'folders' combo box of the right scene. The 'transfer palette' or 'merge palette' options become available. 'Transfer Palette' copies the palette information of the source folder to the destination folder, overwriting destination folders palette information, and the 'merge palette' option adds the palette of the source folder to the palette of the destination folder. The 'Cel' options of the asset type must be selected for this operation.

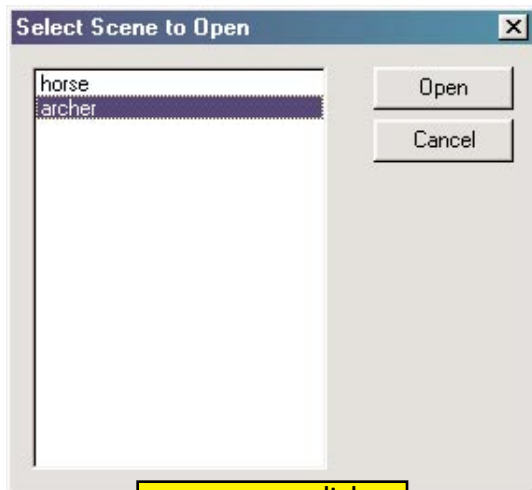
When you select different scenes from the 'left scene' and 'right scene' combo boxes, you can transfer the sound/picture/cel assets between scenes. Again, select the source scene from the 'left scene' combo box, and the destination scene from the 'right scene' combo box. Then select the type of asset you want to transfer. If you select the 'Cel' asset type you must also select a source and destination folder. Then make a selection on the source assets by clicking on them with the mouse button, shift clicking selects a range of items, and CTRL clicking selects multiple items. After the selection is complete press the 'Transfer Assets' button, which will transfer assets to the destination. If there is an asset with the same name, the scene manager will alert you that it can not overwrite the destination asset, as it might be used in the xsheet of the destination scene. Then you must close the scene manager, and delete the assets you want to overwrite from the asset manager, which will delete the asset from the xsheet too if it is used.



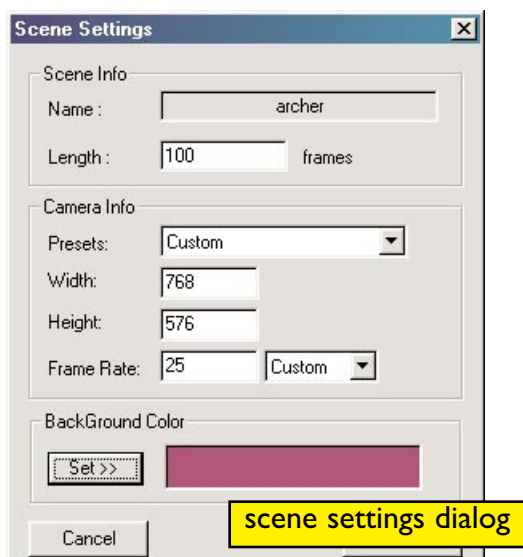
### c. Scene operations : new scene - open scene - scene settings



new scene dialog



open scene dialog



scene settings dialog

The basic scene operations are the new scene, open scene and scene settings commands.

The new scene command brings up the new scene settings dialog box:

Here you have to give the system a new scene name.

The scene name can only consist of letters, spaces and numbers.

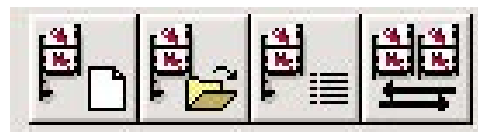
The other scene information is scene length in frames which you can later change at xsheet editor, or scene settings, and the camera specific information.

Camera information includes the camera size which is dependent on the output media (PAL, D1 PAL, NTSC, FILM, D1 NTSC, and custom). At the custom settings you can choose any width, height and frame rate for the media, and this is good for multimedia or internet media. Also you should give a background color for the camera rendering.

The open scene dialog lists the created scenes and you should select a scene different from the currently opened one. The system remembers which scene was open last time it was used and opens that scene when it is started, so you need not use 'open scene' every time you start the system.

The scene settings dialog is the same as the new scene dialog. It allows you to change the scene camera, and length information after you created the scene. The only thing you can not change after you create a scene is the scene name.

All three of these commands can be reached from the menus or the corresponding toolbar icons:



## ii. Getting sources for the scene : The scene assets

### a. The Asset Manager.



The asset manager holds all the needed assets for the scene. Assets are grouped into three categories : sound, picture and cel assets. Each relevant type can be viewed by clicking the corresponding button at the top of the asset manager. In order to view the cel assets you must select a folder. If there are no folders in the scene you must use the '<new folder>' item at the bottom of the folder combo box. This will bring up a dialog for the new folder name, which can consist of letters, spaces and numbers.

Selections on the assets can be made by dragging a rectangle over them, or by selecting them with mouse click. Shift clicking selects a range of assets, and CTRL clicking makes multiple selections.

The asset manager makes use of context sensitive menus. To use them select a number of assets and right click on them with the mouse. This will bring up a menu of operations available on them.

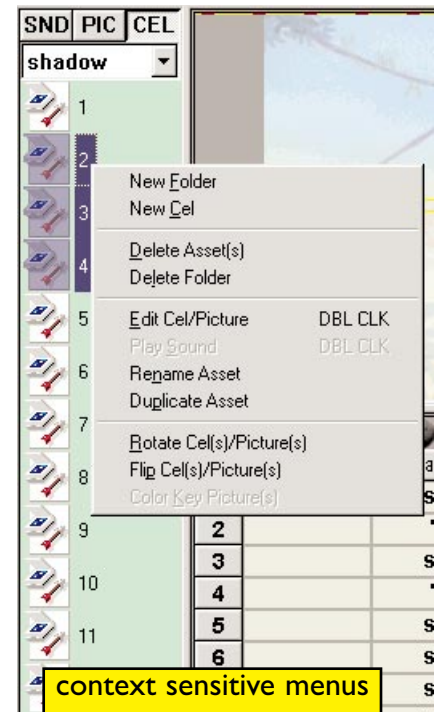
The 'New Folder' creates a new cel folder, and the 'New Cel' creates a new cel, and they can only be used in the 'Cel' mode of the asset manager. The 'New Cel' command can only be used when there is a cel folder selected.

The 'Delete Asset(s)' deletes the selected assets both from the xsheet and the asset manager. The 'Delete Folder' command deletes a cel folder, and also its used content from the xsheet.

'Rename Asset' can be used on all types of assets, and it will rename them from the xsheet too. It only operates on the first selected asset.

'Edit Cel/Picture' opens the first selected cel or picture asset at the cel editor window. Double clicking will also do the same for the asset.

'Play Sound' is only available when sound type of assets are selected, and it will play the first selected sound asset. Double clicking on the sound asset is a shortcut for this command.



'Duplicate Asset' works on all types of assets and will ask a new name for the duplicated asset. It can not be the same name as the originally selected asset's name.

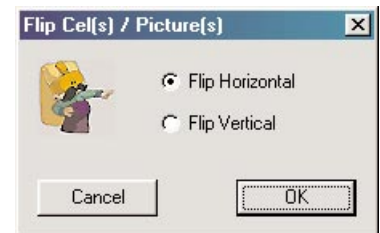
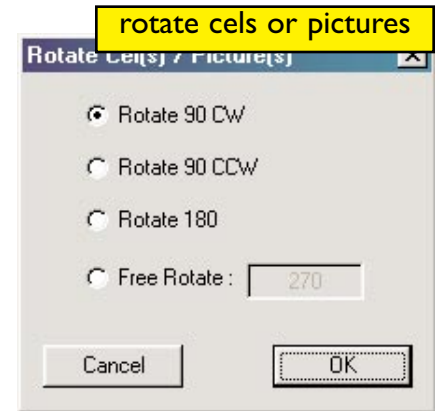
'Rotate Cel(s)/Picture(s)' command works on cel and picture type assets. It will bring up a dialog for rotation input. It works on multiple assets. Cels and Picture can be rotating at their source level through this command. Rotation options are Rotate 90 Clockwise, Rotate 90 Counterclockwise, Rotate 180, and 'Free Rotate' which will rotate the assets at any given rotation angle. The angle is given in degree units.

'Flip Cel(s)/Picture(s)' command is very similar to the rotate command. It will flip the selected cel or picture assets horizontally or vertically.

'Colorkey Picture(s)' command works on a range of picture type assets. It brings up a colorkey dialog, and processes the selected pictures. It is very handy for making color line tests. Normally cel assets are used in B/W mode (i.e black and white colors only). But, for making line tests of cels that are not yet cleaned up, this mode is not convenient. So scanning or grabbing of these type of cels are made in color. To stack them on top of each other a transparency mask should be used. So, this tool with the colorkey selected as 'white' is convenient to generate the transparency mask of a range of picture assets.

The tolerance is the value at which +/- difference the colors will be picked up from the picture for transparency evaluations. The 'Add' option will add the generated mask to the mask of the picture. The 'Subtract' option will subtract the generated mask from the mask of the picture, and the 'replace' option will replace the mask of the processed picture with the generated mask.

These commands can also be reached from the 'Assets' menu, or for some of them there are corresponding toolbar icons:



Colorkey Pictures

## b. Getting sound assets.

Sound assets can be input to the system in two ways: by importing them from external file formats or by using the sound recorder tool inside the system.

Sound Assets can be imported from Windows wave or '.wav' file format. This is an intrinsic media format of Windows. Windows Sound Recorder tool can be used to record this format sound. It can be found at Programs/Accessories/Entertainment part of the start menu of windows98 or at Program/Accessories part of the start menu of windows95 or NT. Please refer to its help documentation for using it. The format of the wave file supported is '8bit PCM encoded 16bit' or the 'Radio Quality' preset of the sound recorder tool of Windows.

Sound Assets can also be recorded inside the System with the 'Record Sound' command found in the Source menu.

To record a sound select the input source from the system tool. This can be the microphone, the cd-player or the line-in of the soundcard. Please refer to the Windows documentation for selecting the recording input of the sound system.



Press the 'record' button to start recording the sound, then press the stop button to end it. When you end the recording you can press the 'play' button to review it.

After importing the sound or pressing the 'Save' button, the system asks for a sound source name. This name can consist of only letter, spaces and numbers.

### c. Getting cel assets.

Cel assets can be input to the system in four ways: with 'Assets/New Cel' command, by importing them from external file formats, by grabbing them from a camera or by scanning them from a scanner.

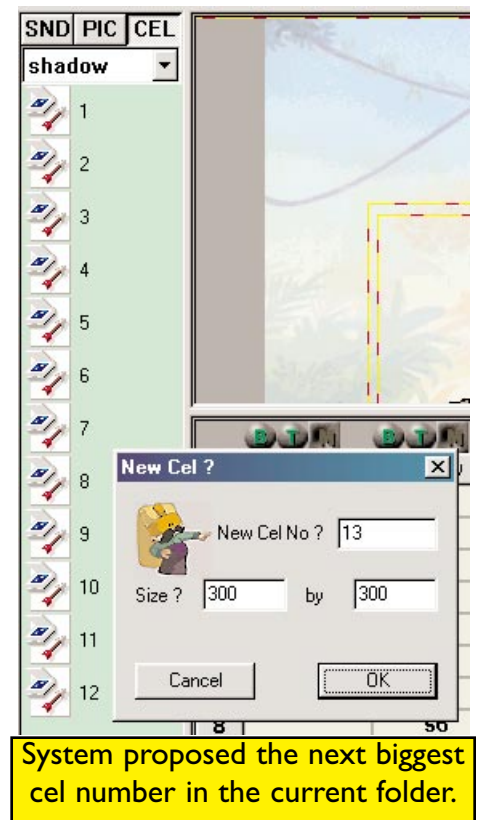
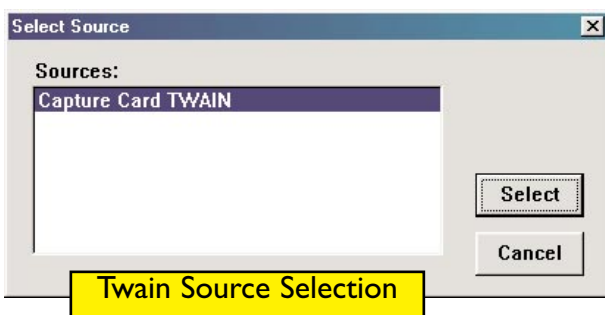
In order to input cel assets to the system, a scene must be open and a cel folder inside the scene must be selected.

Cel assets currently can be imported from Archer '.arw' file format, Windows '.bmp' file format, and Targa '.tga' 24 bit or 32 bit uncompressed file formats. Multiple cel assets can be imported at one go by multiple selecting them from the import dialog of the 'Sources/Import Cels' command.

Each time a cel is imported or grabbed or scanned into the system, it will ask for a name for the imported cel. The cel name must be in the form '[number][abcdefghijklmnopqrstuvwxyz]', that is a number followed by a letter. The letter part can be omitted of course. The system will propose a cel name as the next biggest number in the current cel folder.

At the new cel dialog the system asks for the dimensions of the new cel. This unit is in pixels.

Before the system can scan cels, a valid twain scanner source must be selected. This is done through the 'Sources/Select Source' command, which will bring up the twain source select dialog. If this dialog does not show up, then this means there are no scanner drivers installed on the system.

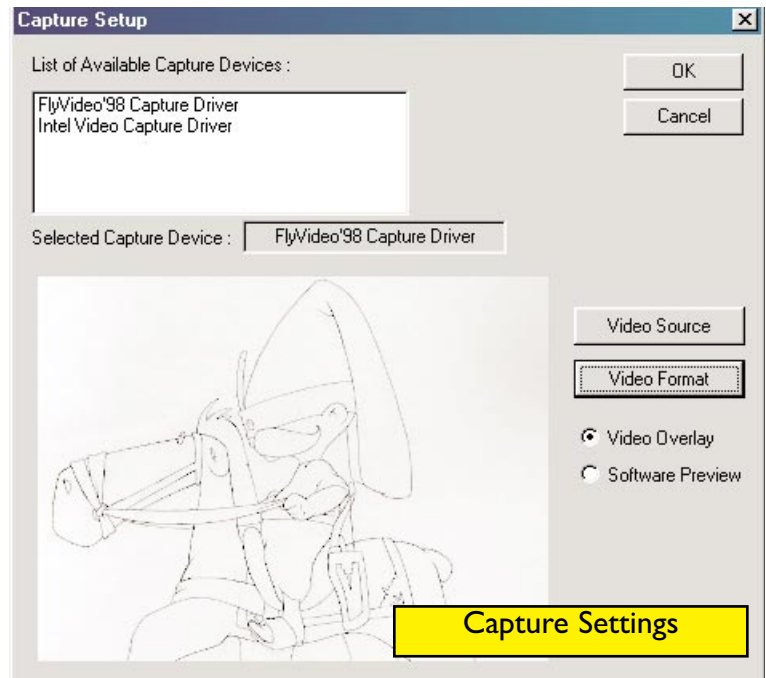


To scan the cel, use the 'Sources/Scan Cels' command. This will bring up the scanning dialog of the corresponding twain source. This dialog is not part of the Personal Archer system. It is the scanning program of the scanner. So, it changed from scanner to scanner. In this interface, select the image type to 'Black and White' or 'Black and White Drawing' which means 1-bit pixel depth. If you do not do so, the system will reject the scanned cel. After you start the scanning interface, you can scan as many frames you want. The Personal Archer interface will not respond to you until you close the scanner's interface. It



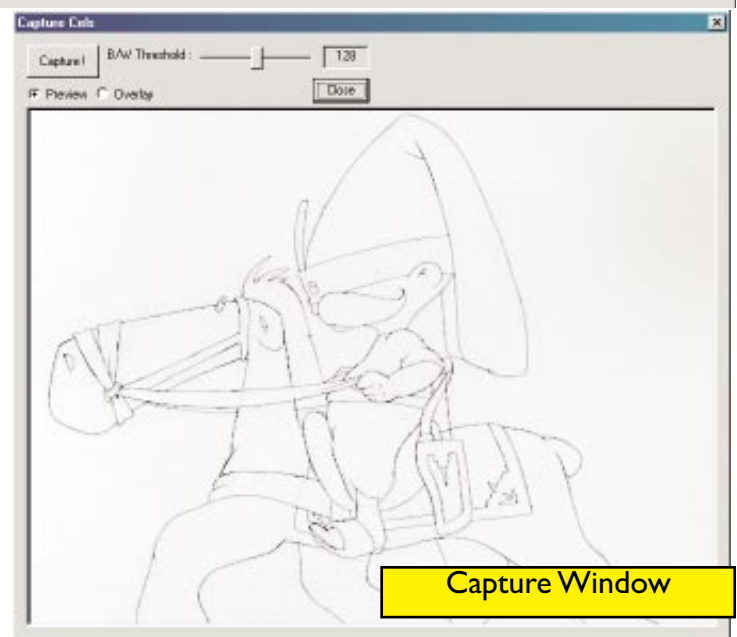
will only ask you for new cel names, as described above. So, to finish scanning cels and return to Archer you must close the scanners interface.

Capturing cels also need the setup of the capture driver. To do so, select 'Sources/Capture Settings' command, which will bring up the capture setup dialog. Here you can select the capture driver from the list of drivers in the system, and make video source and video format selections of the selected capture driver. Please refer to the capture cards documentation for the descriptions of these dialogs and for the availability of the video overlay feature, as they differ from card to card.



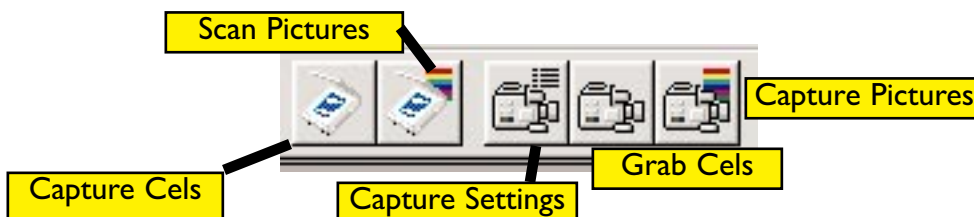
After you select the video source and the video format from the capture settings. You can use the 'Sources/Capture Cels' command to capture cels. This will bring up the capture windows.

The threshold value is the value at which the 'Black and White' conversion will be done. Values above this threshold will be white and values below this value will be black. A generic threshold value is 128, but you will have to try different settings depending on the light conditions of the camera attached to the capture card and capture image brightness and contrast setting which should show itself at the 'Video Source' dialog of the Capture Settings window.



Use the capture command to capture the current image as cel. Again the system will ask you a name for the cel as described above.

There are toolbar shortcuts for the most used of the above commands:





#### **d. Getting picture assets.**

Picture assets can be input to the system in three ways: by importing them from external file formats, by grabbing them through a capture card, and by scanning them.

In order to be able to get picture assets you must have a scene open and have the 'picture' type selected in the asset manager (See asset manager above).

Grabbing picture sources and scanning picture sources is exactly same as grabbing cels, and scanning cels. Their setup is the same too. The only difference in scanning them is that you should select 'Color image' or 'Color' bit type in the scanner's user interface for 24bit color images. To scan a color image use the 'Sources/Scan Picture' command, and to grab pictures from the capture card use 'Sources/Capture Picture' command or their corresponding toolbar icon.

Importing picture assets can be done through the 'Sources/Import Pictures' command. Again, multiple pictures can be imported by making multiple selections in this dialog. For each picture scanned, grabbed or imported, the system will assign an asset name. This name can consist of letters, spaces and numbers.

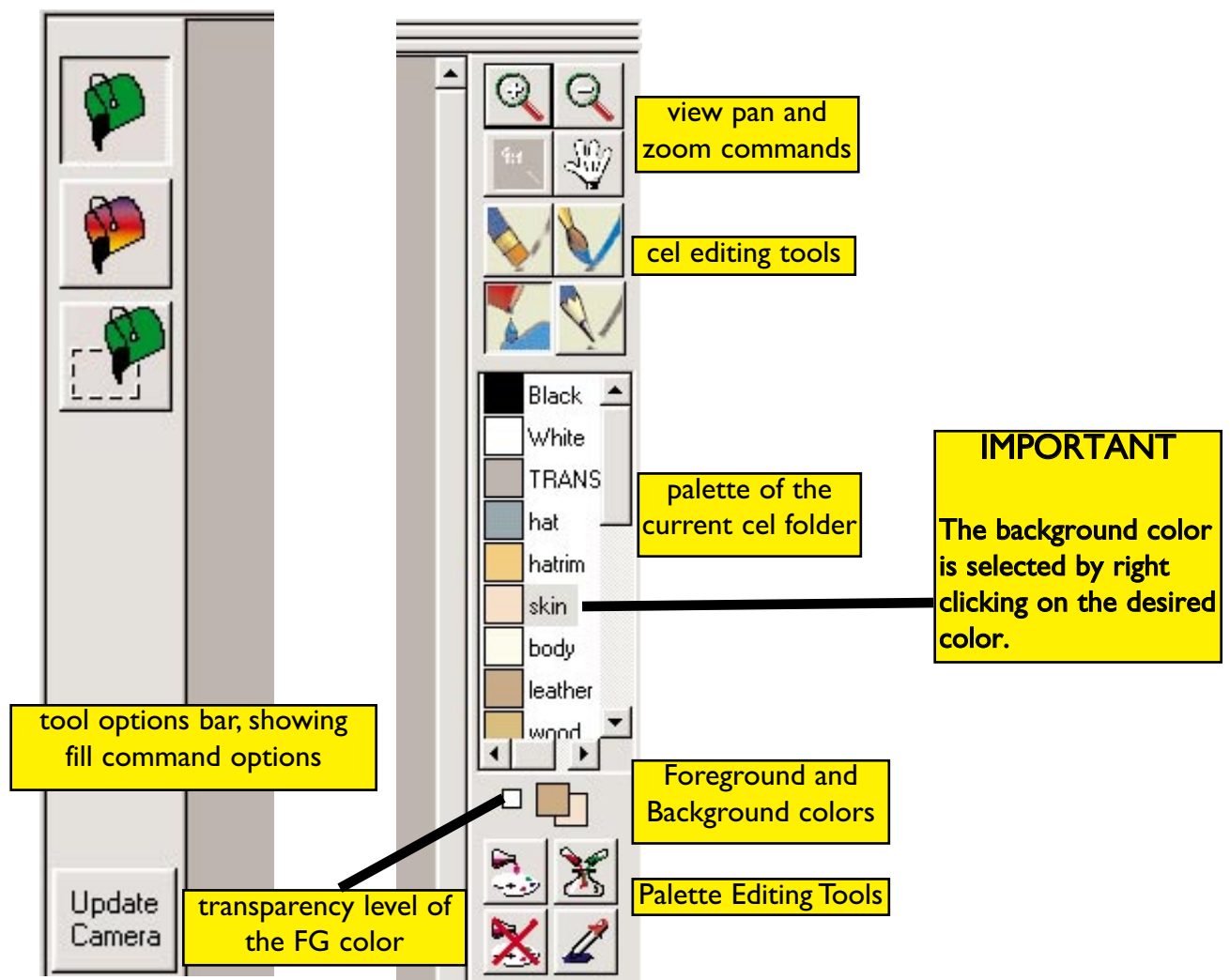
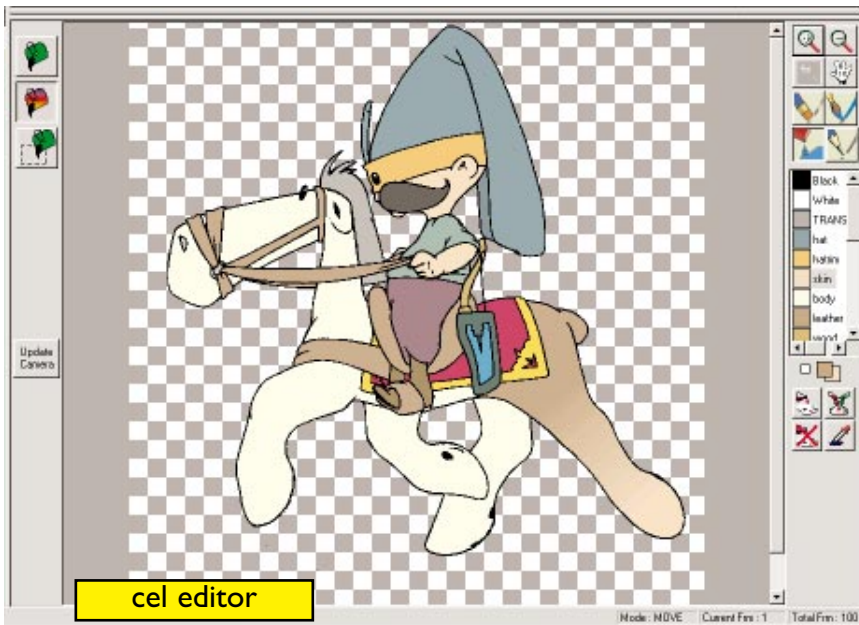
The currently available external import file formats are Windows '.bmp' file format, and Targa '.tga' 24 bit or 32 bit uncompressed file formats.

### iii. Editing Cel/Picture Assets

#### a. The Cel Editor

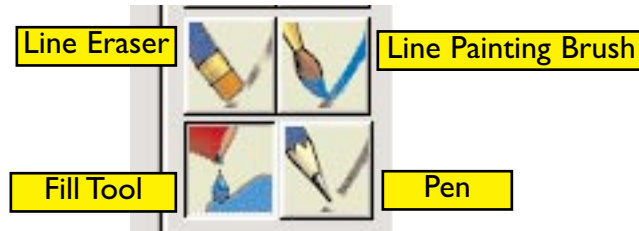
The cel editor can be invoked with the desired cel in two ways. Either you can double click on the cel with left mouse button, or you can select the cel and use the command 'Assets/Edit Cel/Picture' which can be used for both cel and picture type assets as implied by its name.

The cel editor has two command bars: one for commands and palette editor, and one for tool options:

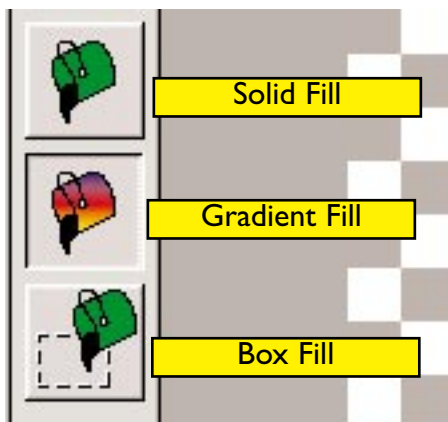


## b. Cel Editing Tools

The cel image is manipulated with the cel editing tools. They are the eraser which erases the animators line, the line brush which is used to paint the animators line, the fill tool to fill regions that are bounded by animators lines, and the pen tool which is used to draw the animators line.

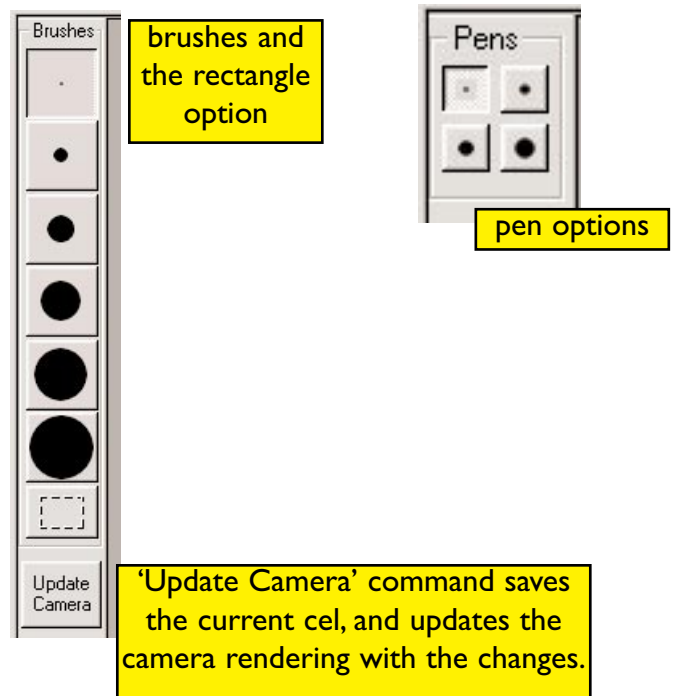


Each tool has its own options at the left option bar. The brush options for the eraser, and the line painting brush are the same as they work very similarly. They are 6 different brushes and a rectangle option. The options of the fill tool are solid fill, box fill, and gradient fill. And, the options of the pen tool are 4 different pen styles.



The solid fill option fills the pointed area with the foreground color. The Gradient works by dragging a line inside a region, and it paints inside the region with a gradient from the foreground color to the background color. The background color is selected by right clicking on the color list. The Box fill is used by dragging a rectangle enclosing the regions, and the regions that are inside the box are painted with the foreground color.

When using these tools it is important to understand the structure of the image held inside the computer. For each pixel of the image there are three color channels and one black and white line channel, and the image is viewed as a composition of the two over each other: In the eraser tool when you erase the animators line, the background color is used in place of the erased line. You can use the fill tool to paint all of the erased parts to one color at one go, after erasing them.



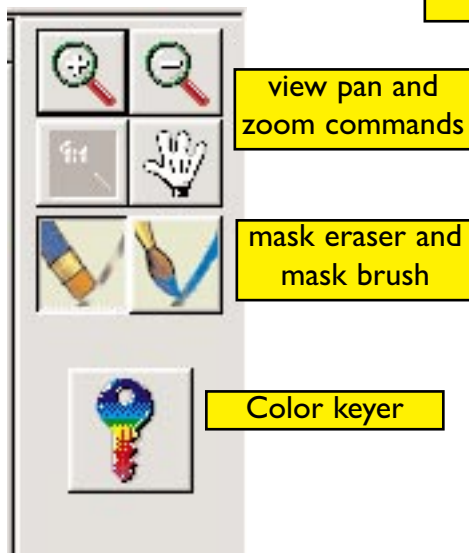
### c. The Picture Editor



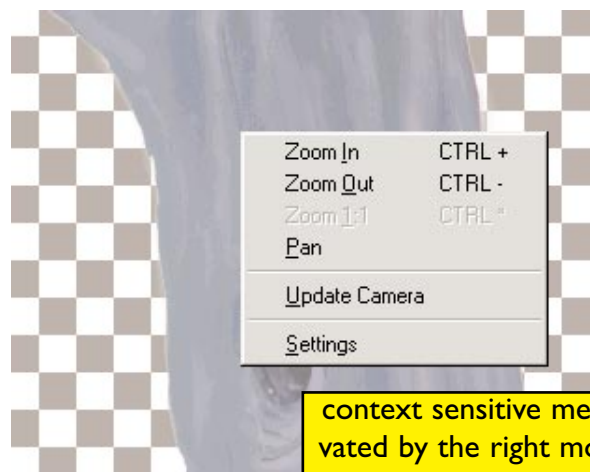
picture editor has tools to edit the transparency mask of the picture

A picture is different from a cel by its missing the animator line part. It only consists of the four channels: red, green, blue and mask. The picture editor gives you tools to edit the alpha channel, i.e. the transparency mask of the picture.

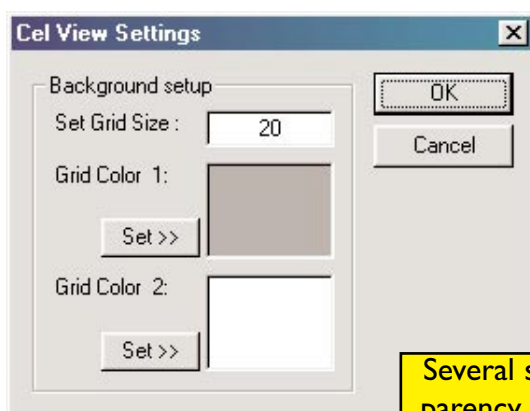
The picture editor can be invoked by either double clicking on the picture asset or by selecting it and using the menu command : 'Assets-Edit Cel/Picture'.



The view settings of the cel editor allow you to change several settings of the view related to transparency viewing. You can reach this command either by the context sensitive menu using the right mouse button on the view or through the 'Cel' menu command:



context sensitive menu are activated by the right mouse button for all views in Personal Archer



Several setting related to transparency viewing can be changed using the Cel View Settings Dialog

## d. Picture Editing Tools

Picture editing tools are the used for editing the transparency mask of the picture asset. These tools are the mask brush and eraser with same options as their cel editor counterparts and the colorkeyer.

The Colorkeyer generated automatic transparency masks based on the color information of the picture asset. It is a very easy to use tool and yet very powerful.



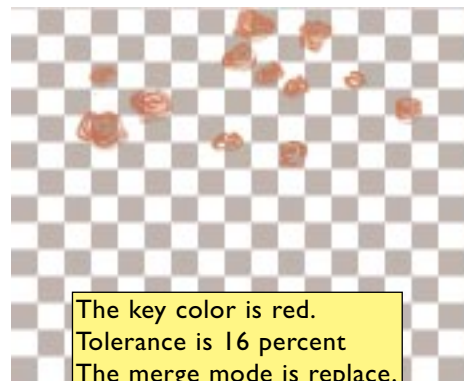
Color Key Dialog

When you select the color keyer, the cursor changes to a color picker cursor, and then you should select a color from the image. Then the keying settings window appears. This window has several options about how to use this color in generating the transparency mask. The 'Add' option adds the generated mask to the current mask of the image with the given tolerance. The 'subtract' option subtracts the given color from the mask with the tolerance, and the 'Replace' option totally replaces the mask of the image with the generated mask. The following images illustrate various examples of color keying. You can learn it very easily by playing with different

values on the sample images.



The original image.



The key color is red.  
Tolerance is 16 percent  
The merge mode is replace.



The key color is green.  
Tolerance is 30 percent  
The mask is added to the previous one.



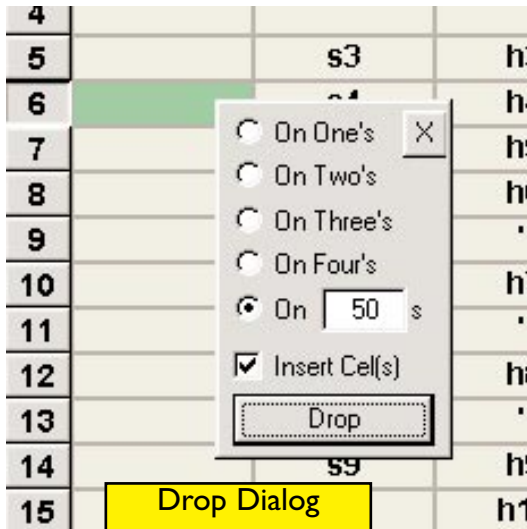
The key color is white.  
Tolerance is 9 percent  
The mask is first filled. The merge mode is subtract.



## iv. Composing the Xsheet with the Assets

### a. Putting assets on the xsheet

All three types of assets are put on the xsheet by selecting them and dragging them to the location where you want to put them on the xsheet. If the selection is cel or picture type of asset then a dialog will appear at the xsheet asking how to put the assets on the xsheet:

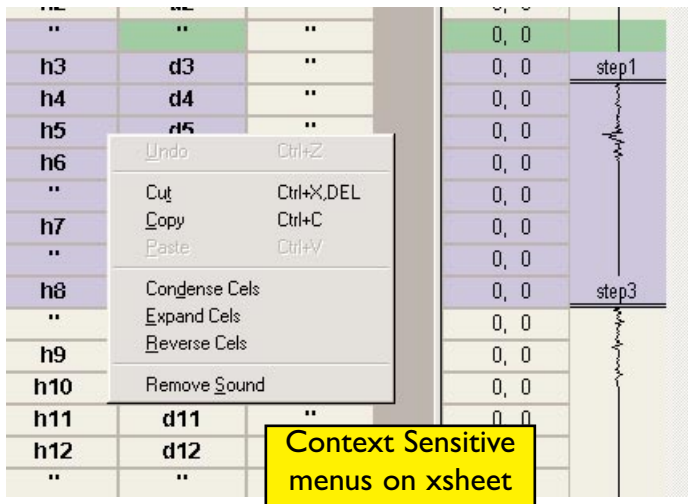


You can put the selected assets on one's, on two's, on three's, on four's or on any number of repetition you enter at the edit area. You can also select to overwrite the xsheet with the dropped cels, or to insert the dropped cels.

You can cancel the drop operation by pressing the 'X' button to close the drop dialog.

Sound assets are also put on the xsheet by dragging them to any location on the xsheet. They will put at the current frame on the cel level. If there is a sound already starting at the dropped frame then you should first remove that sound by either using the context sensitive menu or the menu command 'edit/remove sound'. But, your selection on the

xsheet must include the at least one sound starting point.



Context sensitive menus also work on the xsheet view by clicking the right mouse button on the xsheet area. If you press on the level area, the edit menu will appear, and if you press on the blank area the xsheet menu will appear.

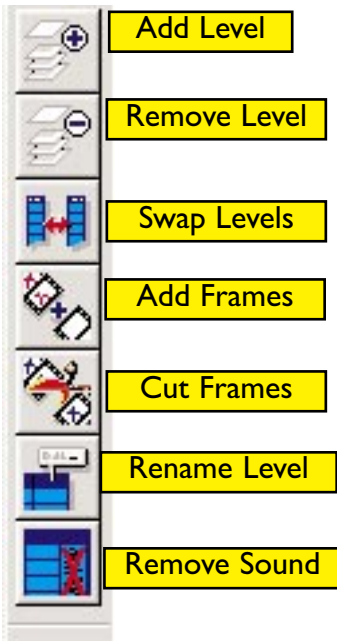
The xsheet has one level of undo on all kind of operations which can be reached from the toolbar or the 'edit/undo' command.

### b. Editing locations of assets on the Xsheet

There are several tools to manipulate the locations of the cels on the xsheet. The most frequently used on the is the cut, copy and paste, which works exactly the same way as other Windows programs. You select a source region and either cut (delete) or copy the selection there and select a different location and paste the copied part to there.



Other handy operations include the condense, expand and reverse tools. Condense tool condenses the selected cels by removing duplicates in them but not removing the unique sources. The expand tool works by putting duplicates in the selected part, i.e. it makes one's cels on two's, on two's on three's etc. Reverse cels reverses the selection regarding to the frame numbers.

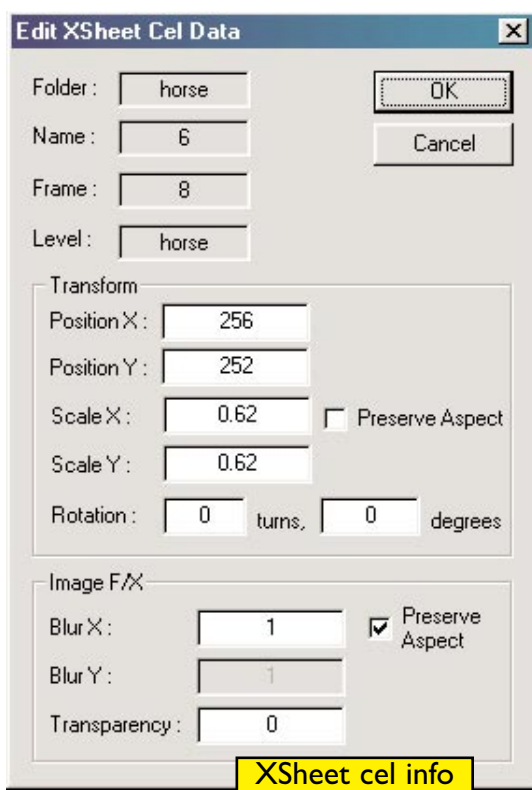


Other xsheet operations include adding levels, removing levels, swapping two levels, adding frames to the end of the xsheet, cutting frames from the end of the xsheet, renaming levels, and removing sound from the selected part of the xsheet.

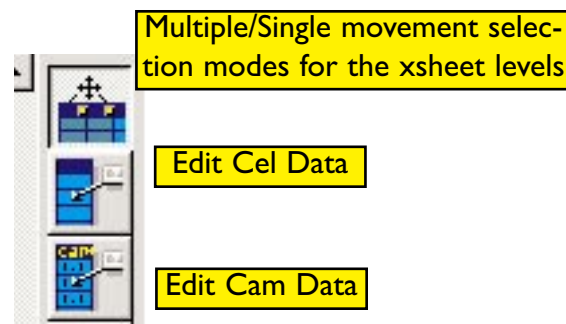
All of these commands present a simple dialog to ask the details of the operation. Swap levels requires two levels to swap, and add level puts the new level to the top of the level stack. The leftmost level is the top level, and the rightmost level is the bottom level.

### c. Editing Cel Data and Picture Data : Animating with Xsheet

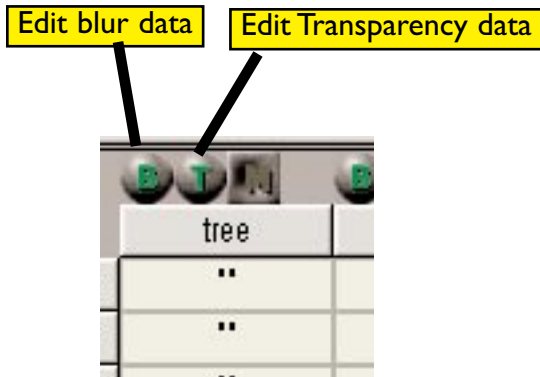
Each cel on the xsheet holds several extra information about the position, zoom, rotation, blur amount, transparency of the current asset placed at the xsheet cel.



This data can be edited in a variety of ways. The simplest way of editing is just by double clicking a cel with an asset on it. This will bring up the 'XSheet Cel Data' dialog. Here you can edit the transformation and image f/x parameters of the current cel. You can also choose the xsheet tool bar icons:

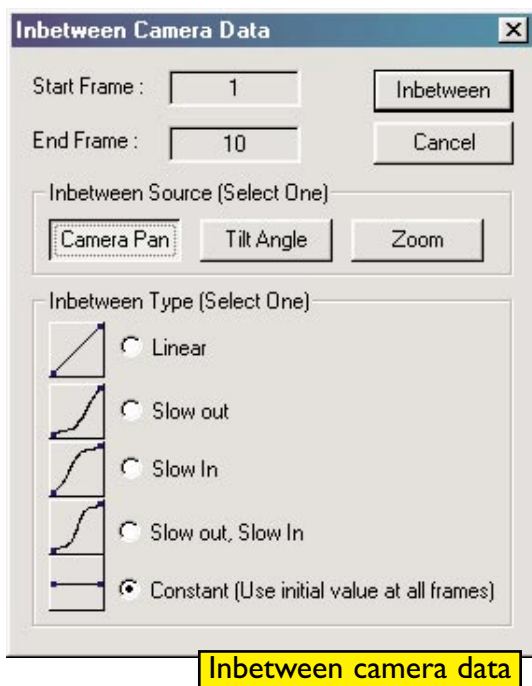
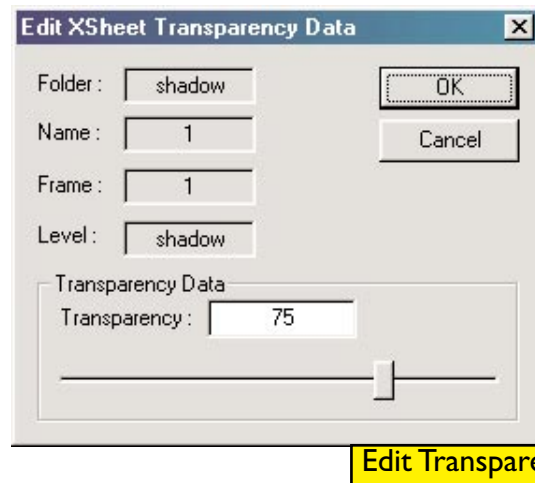


The blur and transparency data of the xsheet cels can also be reached at conveniently with the 'B' and 'T' buttons at the top of every level quite conveniently:



These buttons will bring up the blur and transparency editing dialog for the level that it is on top and for the current frame showed with a sunken frame number button.

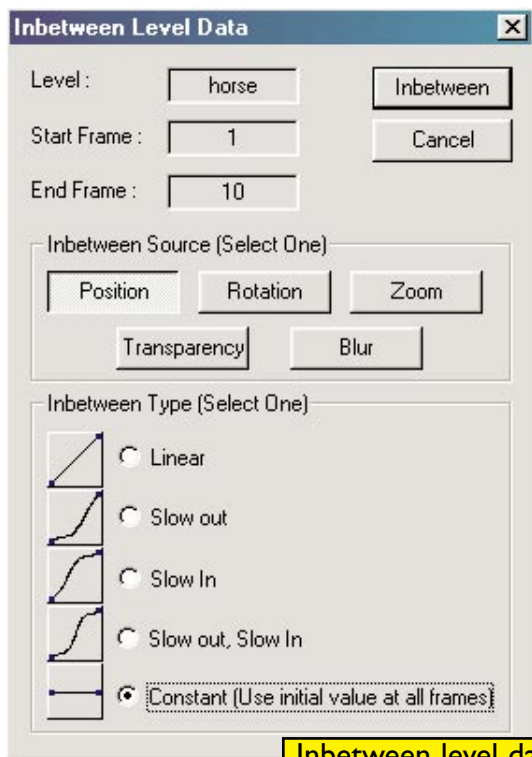
Although the blur dialogs has a slider bar with a maximum value, larger blur amounts can be entered at the edit boxes if it is the desired effect.



It would be very inconvenient if we had to enter values for every cel to make animation with these xsheet cel transformation and effect data. There are inbetween tools for making animation automatic and easier. There are two inbetween dialogs : one for the selected level cels, and one for the selected camera cels.

Both of these dialogs work in a similar manner. You first have to make a selection on the xsheet for the range and levels that you want to inbetween the values for.

**TIP:**  
Pressing on the level names levels the whole level. Pressing and dragging on the level names selects several whole levels together.



Inbetween level data

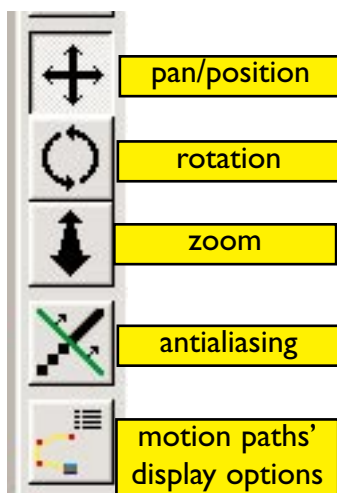
For the level inbetween dialog, you can inbetween the position, rotation, zoom, transparency and blur values of the selected cels of the level. The first value in the range is selected as the first key value and the last value in the range is selected as the last key value. The inbetween values are interpolated according to the 'Inbetween type'. The graphs near the inbetween type options show the interpolation with respect to time. So a linear inbetween is a constant speed motion, a slow out accelerates towards the next key, etc.

The different type is the constant (use initial value at all frames) type, which is constant interpolation. This is very convenient to propagate changes that you have done to the first frame to all the others without any change. You will use this option very frequently for making all the cels the same position, size, rotation, transparency or blur as your first frames.

These inbetween options are the same for the camera inbetween dialog, except that you can inbetween the camera pan, zoom, and tilt angle values there.

#### d. Using the camera view with Xsheet

The camera view is much more convenient to make the transformation changes, but here you can manipulate only one transformation attribute at one time: either the position of the level cel or the pan of the camera, or the zoom of the cel or camera, or the rotation of the camera or the xsheet cel.



movement selection buttons of cel and camera levels for camera editing

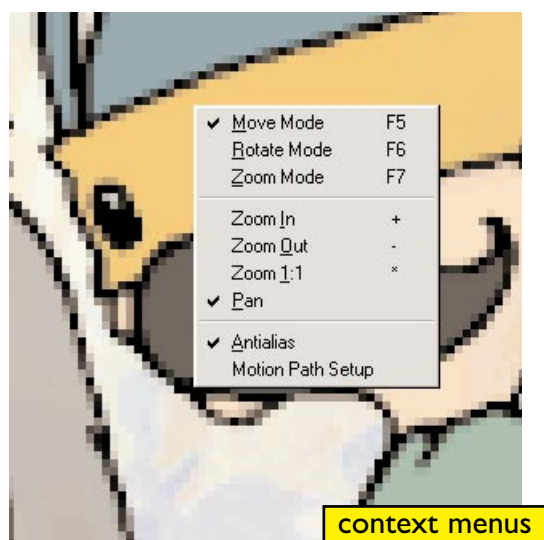
	B T M	B T M	
	dust	bg	CAM
	d1	Bgblg	0, 0
	"	"	0, 0
	d2	"	0, 0
	"	"	0, 0
	d3	"	0, 0
	"	"	0, 0

In order to move, rotate, zoom a level or the camera you must have its movement select option at the top of the levels 'on'. You can turn multiple cel levels on for movement selection by clicking more than one level. Or, you can turn on multiple level movement selection with the command 'xsheet/multiple level move selections' command or its xsheet toolbar counterpart shown above. When you drag the mouse at the camera view the corresponding values of the xsheet cel data or the camera data will change and the view will be re-rendered at the background.

You can turn on/off antialiasing option for this camera rendering. Antialiasing is a mechanism which smooths out the black and white animators line, and eliminates the pixelization of the zoomed cels.

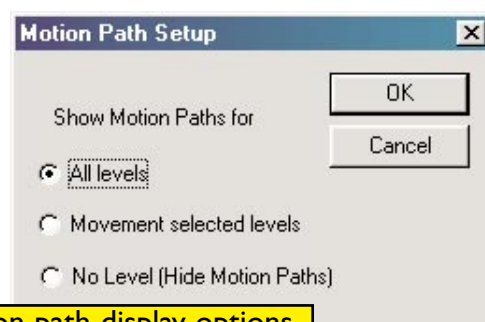


The context sensitive menus for the camera view also work with the click of a right mouse button anywhere on the view area:



The camera view can show the motion path in a combination of levels. You can either want to see the motion path for all the cel levels, or if this is too mixed up, then you can see the motion path for only the movement selected levels. You can also set to hide them totally.

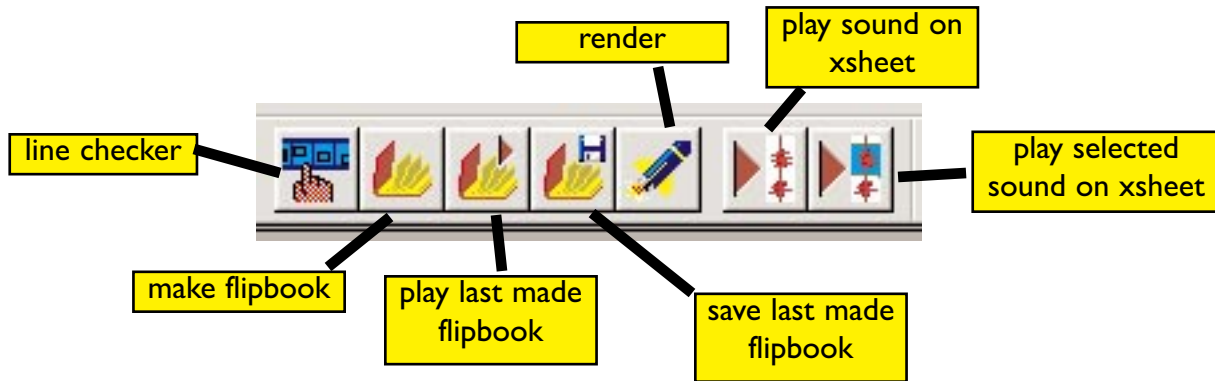
The motion path points are displayed for only the frames that contain a cel/picture source.



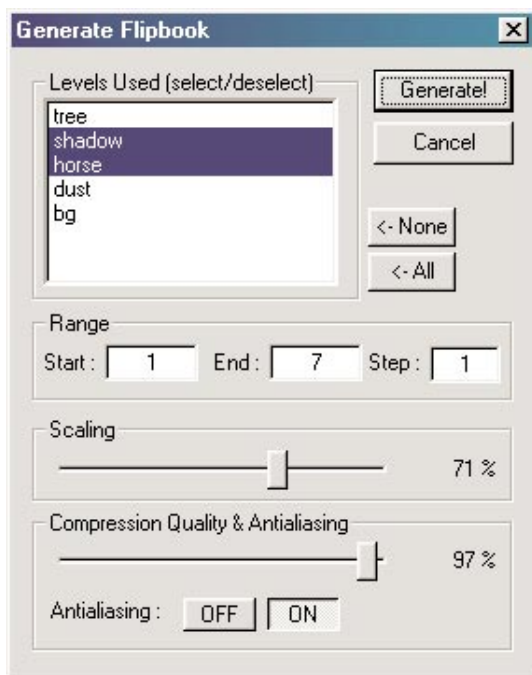
## v. Getting results: making flipbooks, previewing sound, rendering

### a. Generating flipbooks

In order to generate a flipbook, you should select a range of cels on the xsheet which contain some assets. Then use the menu commands under flipbook or their toolbar counterparts:



When you use the generate flipbook command the generate flipbook dialog appears:

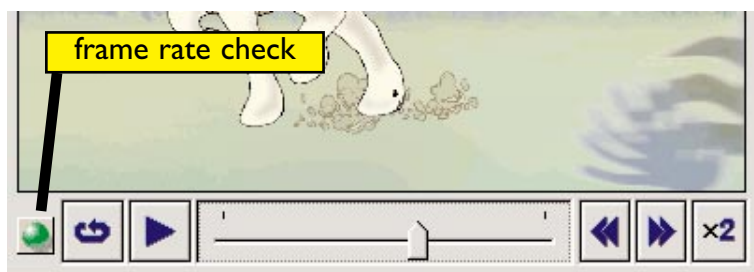


Here you should select the levels that you want to appear on the flipbook by clicking on them. You should select at least one level to generate a flipbook. You should also select a frame range for rendering. The scaling percentage is in regard to the actual camera size entered in the scene settings dialog. You can also choose the video compressors compression quality.

If you have any frame rate problems at the player then you should choose smaller scaling and quality values for better video performance.

You can also choose to use antialiasing when generating flipbook.

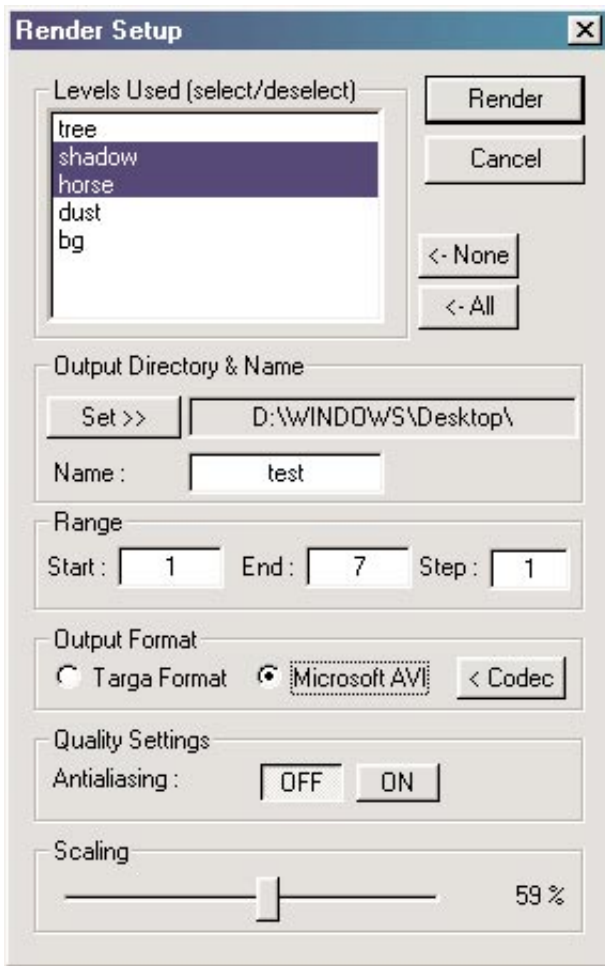
When the flipbook generator finishes the player will open the generated flipbook. It is a simple player with a feature unique to it. It will check the frame rate at all times. If the frame rate



is not the rate specified at the scene settings then the green light bulb will turn red, and if it stays red too long, it will stop and make you suggestions for better flipbook performance.



## b. Rendering output



When you select the render command, the render setup dialog appears. The level selection, range selection, scaling, antialiasing options are the same as the flipbook dialog. In the render dialog there is the additional output directory and name settings, and the output format settings.

Currently Personal Archer can output in Targa, and Microsoft AVI file formats. You can use any codec (video compressors installed at Windows) to generate the Microsoft AVI rendering. This rendering will also include the xsheet sound in it. There are different settings for different codecs installed in the system. Please refer to their online help for using them.

You can choose to render in uncompressed Targa format full frames, and then make an AVI codec rendering in a very small size to get the sound data to the output medium. Or you can directly choose the codec of the output card directly with the codec command, and Personal Archer will render

directly to video. Most of the output cards support this option. Please refer to your output cards documentation for their specialized codec for direct rendering.