



***George W. Jopling***  
***ICT Training & Consultancy***

***Stop Motion Animation***

# Contents

Document Information.....	<u>1</u>
Author.....	<u>1</u>
Publication Date.....	<u>1</u>
Category and Level.....	<u>1</u>
Getting Started.....	<u>2</u>
Stop Motion Explained.....	<u>2</u>
Tutorial Outline and Outcome.....	<u>2</u>
Tutorial Requirements.....	<u>2</u>
MonkeyJam.....	<u>2</u>
Installing MonkeyJam.....	<u>3</u>
Additional Requirements.....	<u>3</u>
Let's Animate.....	<u>3</u>
Create a Basic Animation using MonkeyJam.....	<u>3</u>
Basic Animation Terminology and Techniques.....	<u>10</u>
Top Tips.....	<u>11</u>
Working with MonkeyJam.....	<u>11</u>
Shortcuts.....	<u>11</u>
Adding and Deleting Frames .....	<u>12</u>
Adding Sounds to the Animation.....	<u>16</u>
Movie Editing.....	<u>19</u>
Conclusion.....	<u>19</u>

# *Stop Motion Animation*

## **Document Information**

This document is released under a Creative Commons Attribution-Share Alike 4.0 Unported license.

<http://creativecommons.org/licenses/by-sa/4.0/>



## **Author**

George W. Jopling

Web: [www.georgejopling.com](http://www.georgejopling.com)

Email: [george@georgejopling.com](mailto:george@georgejopling.com)

## **Publication Date**

Published on 05 June 2014, version 2.1

## **Category and Level**

Audio & Visual (Stop Motion Animation).

Introduction. Some prior knowledge of using computers is required.

This training will take approximately 2 hours to complete.

# Stop Motion Animation

## Getting Started

### Stop Motion Explained

Stop motion (also known as stop frame) is an animation technique to make a physically manipulated object appear to move on its own. The object is moved in small increments between individually photographed frames, creating the illusion of movement when the series of frames is played as a continuous sequence.

### Tutorial Outline and Outcome

To provide a basic understanding of stop motion animation production at little or no cost by using a free software program called MonkeyJam and equipment usually readily available within school. It covers downloading and installing MonkeyJam and then straight away shows how to create a basic stop motion animation movie using default settings. Having had a bit of fun and a first go at animation there is an explanation of the MonkeyJam main screen followed by the basic terminology and techniques used in stop motion animation. Some top tips are also given to build upon later in the tutorial. By the end of this tutorial the new animator will have the knowledge and confidence to become the next Oscar winner; or failing this, at least the expert within your own school.

### Tutorial Requirements

#### MonkeyJam



MonkeyJam is a free digital Pencil Test and Stop Motion animation program. It is designed to let you capture images from a webcam, camcorder, or scanner and assemble them as separate frames of an animation. You can also import images and sound files already on your computer. Animations created in MonkeyJam can be exported as AVI format movie files which can be viewed using Windows Media Player.

#### Notes

Only the stop motion animation features of MonkeyJam are used in this tutorial.

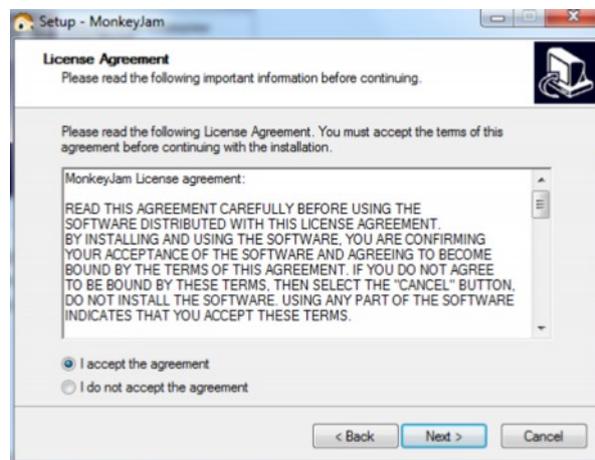
The MonkeyJam program hardware requirements are...

- Processor: Pentium III or higher
- Operating System: Windows 2000, XP, Vista, 7
- Video: DirectX 8 or higher

# Stop Motion Animation

## Installing MonkeyJam

Go to the website [www.monkeyjam.org](http://www.monkeyjam.org) and click on the Download link. Scroll to the bottom of the page and then click on the Download button to download MonkeyJamSetup.exe. Click on Run when prompted.



The MonkeyJam installer will launch. The default installation settings are fine for most purposes. Click on the Next button, read and accept the Licence Agreement to complete the installation.

## Additional Requirements

A video image device. This can be a suitably configured video camera, internal webcam, external webcam, scanner or visualiser connected to your computer.

## Let's Animate

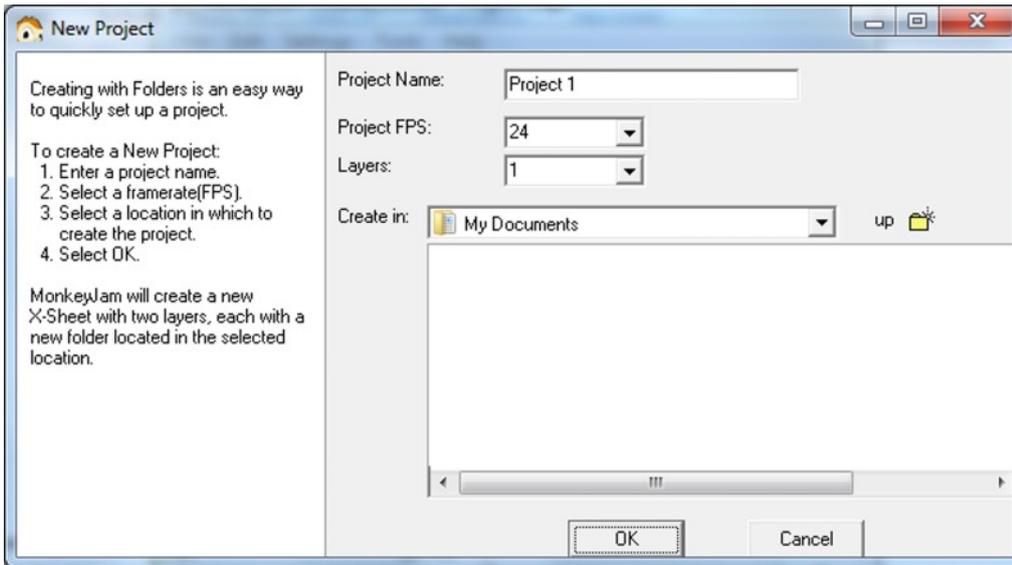
### Create a Basic Animation using MonkeyJam

MonkeyJam has default program settings to enable the user to get started straight away. Assuming a suitably equipped computer is used, only a few steps are required and the animation can begin. A detailed explanation of the MonkeyJam main screen, features and settings are covered later, along with some top tips for creating good stop motion animations.

Click on the Start button, then All Programs. Scroll down the sub-menu and click on MonkeyJam.



# Stop Motion Animation

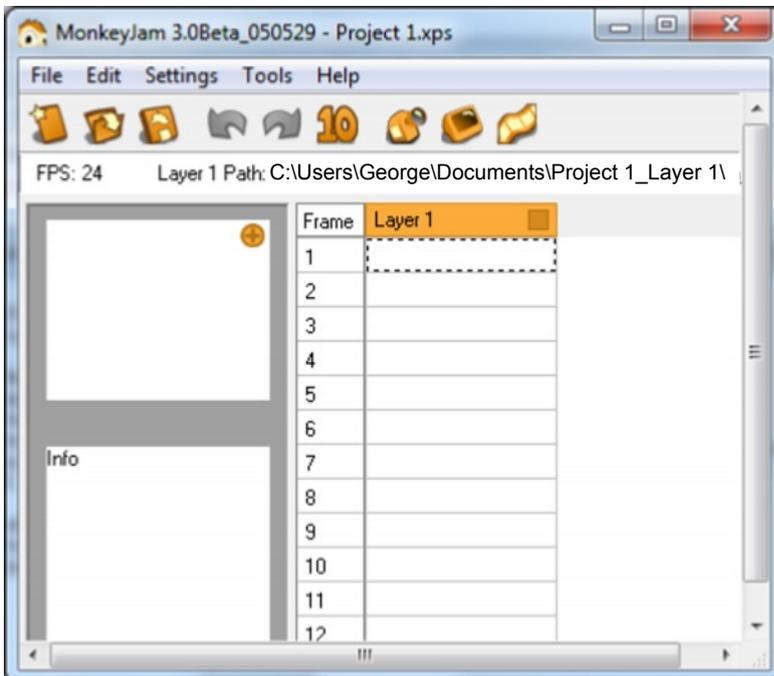


On the New Project dialog box, type Project 1 in the Project Name field and click on the OK button. A new animation project file called Project 1.xps and a new folder called Project 1\_Layer 1 will be created in the default My Documents folder.



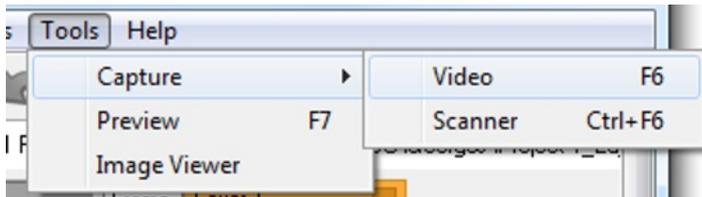
## Notes

The default file and folder location may be different on your computer, especially if it is connected to a network. The Path to the file is shown on the MonkeyJam main screen.



A Layer is created in the project. The default name is Layer 1 and is orange in colour.

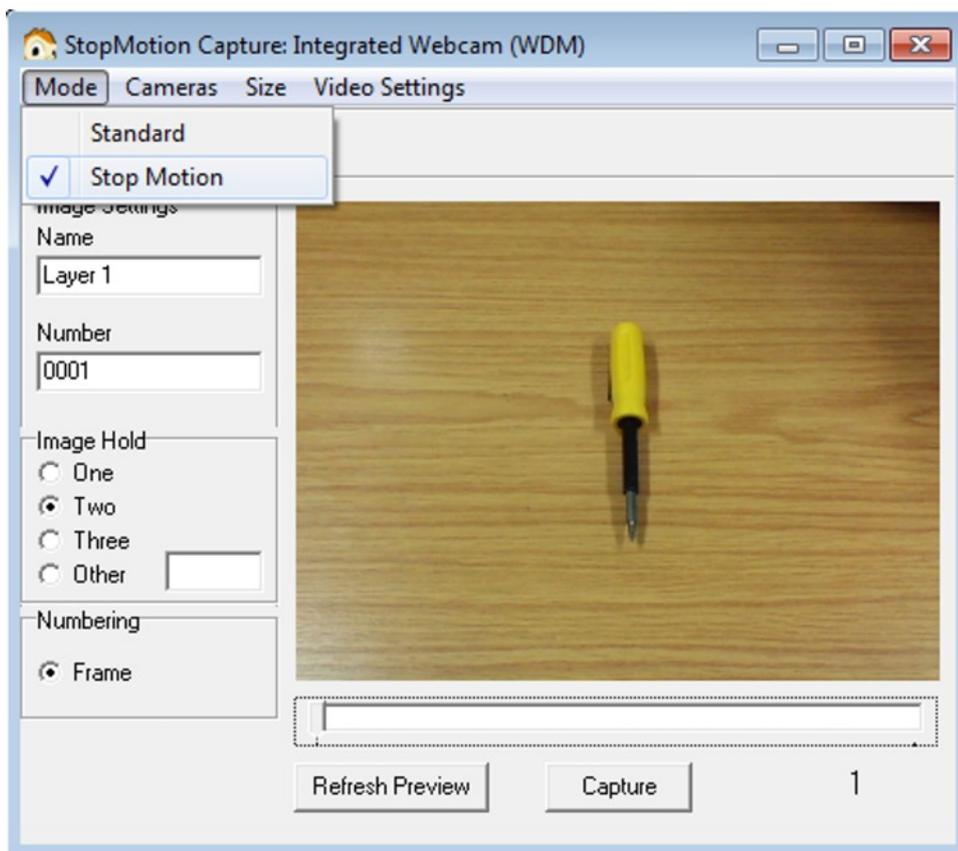
## Stop Motion Animation



Select Tools, then Capture. Click on Video to open the StopMotion Capture dialog box.

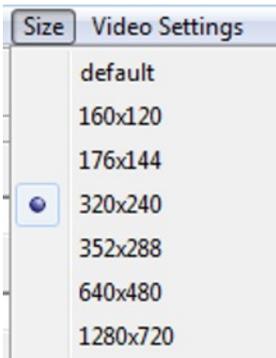
### Notes

If you have more than one image capture device connected to the computer select the one you wish to use. If only one device is connected this is automatically used.



The video image is displayed on the StopMotion Capture dialog box along with the name of the image capture device being used. Select Mode, Stop Motion. MonkeyJam is now ready to capture the images.

# Stop Motion Animation



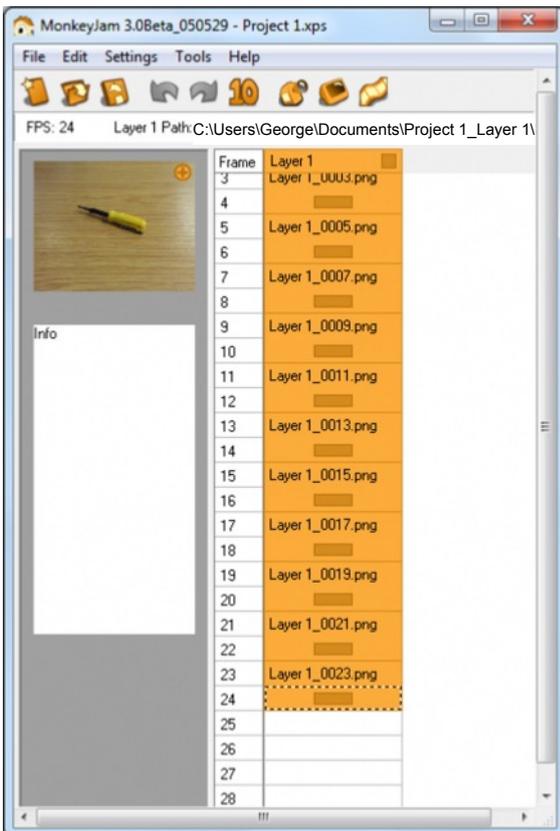
A default image size is automatically selected (320x240 pixels in this case) and this will be fine.

Place the item to be animated in the view. Any item can be used. I simply used a screwdriver that was already on my desk.

Click on the Capture button.

Move the item slightly. About several millimetres will be fine for now.

Repeat the steps of clicking on the Capture button and moving the item eleven more times to obtain a useful amount of images to work with.

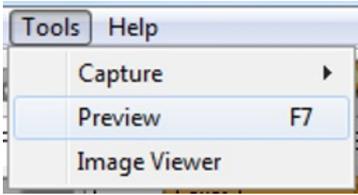


The project should now look similar to the screen display above.

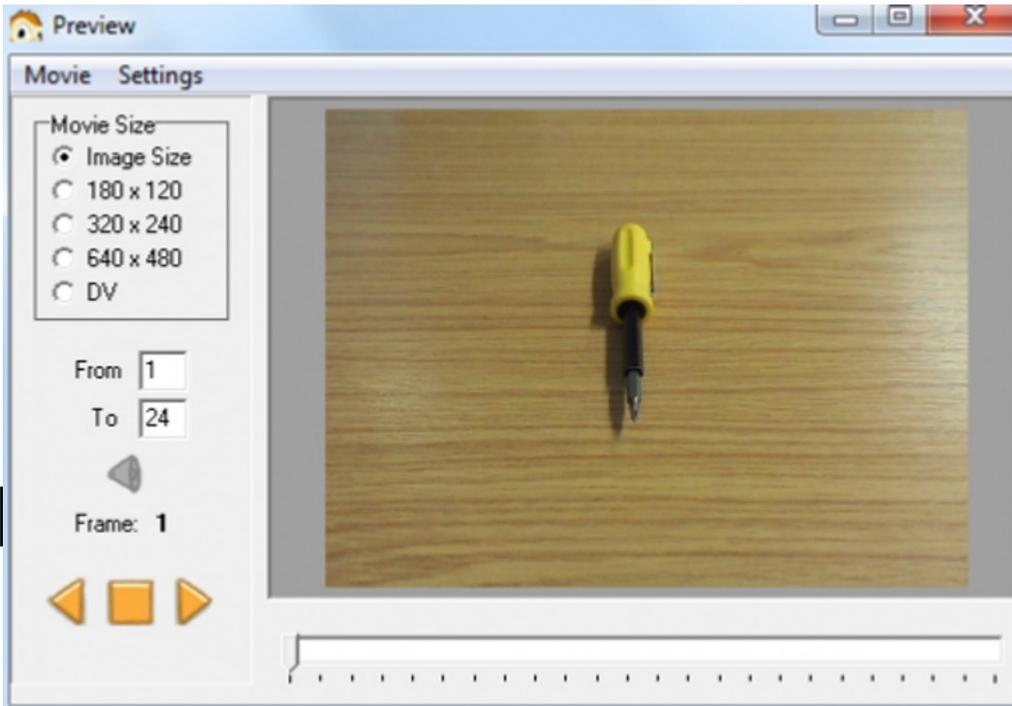
# Stop Motion Animation



Close the Capture dialog box by clicking on Close.

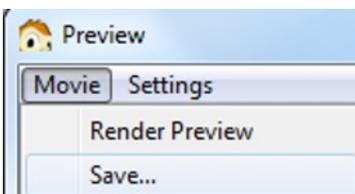


Select Tools, Preview or press the F7 key on the keyboard to display the Preview dialog box.



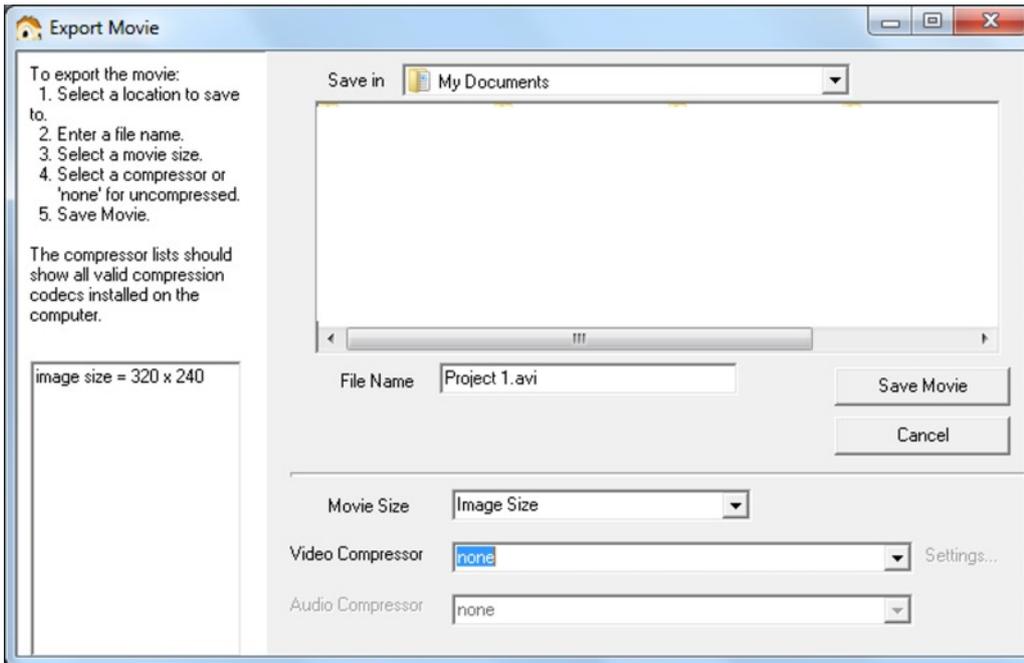
Click the right arrow to preview the animation. Click the square button to stop the animation. Click on the left arrow to preview the animation in reverse. To view individual frames, place the cursor over the slider bar pointer, click and hold down the left mouse button and move the mouse right and left.

Having previewed the animation it is now time to save it to a movie file.



On the Preview dialog box, select Movie, Save. A movie file can also be created from the main screen by selecting File, Export Avi, or by clicking on the Export as AVI toolbar icon. This will display MonkeyJam's Export Movie dialog box.

# Stop Motion Animation

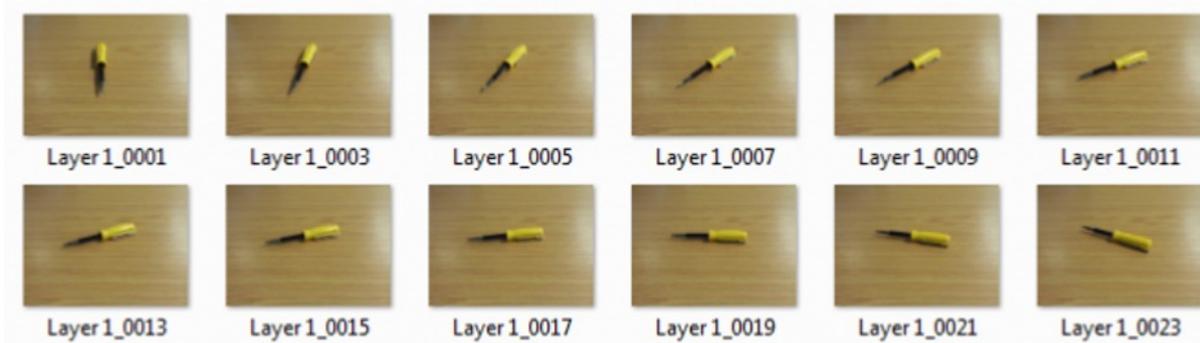


The movie File Name is automatically given the same name as your project. MonkeyJam saves movies in the AVI format. This is a common type of movie file format that can be viewed using all movie players. Click on the Save Movie button.

MonkeyJam can now be closed. If you have not already done so, select File, Save or click on the Toolbar icon to save your project and then select File, Exit.

The newly created movie file, Project 1.avi is stored in the My Documents folder. This can be viewed using Windows Media Player and edited using Windows Movie Maker.

Congratulations! You have just created your first stop motion animation movie.



These are the images captured by MonkeyJam and used to create the movie file.

# Stop Motion Animation

## Basic Animation Terminology and Techniques

With the warm glow of creating a basic animation movie still shining, we now need to learn a few basic facts and figures and production techniques to progress further.

So far the key default settings of MonkeyJam have been used...

FPS (Frames Per Second)	24
Image Format	PNG
Capture Colour	Colour
Image Size	320 x 240 pixels
Image Hold	2

The default settings have been chosen wisely and will suffice for most general stop motion animation work, apart from the image size. It is recommended that the image size is increased to 800 x 600 pixels, if supported by the image capture device being used. If it is not supported, use the nearest available, for example 640 x 480 pixels. To view and change image sizes, select Tools, Capture and then click on Video, or click on the toolbar icon to display the Capture dialog box. Choose Size and select the size option from the drop down list. A pixel is the smallest addressable element in a display device.

For the basic animation created earlier the Capture button was clicked 12 times. The observant will have noticed that 24 frames were actually captured by MonkeyJam and not 12 as expected. The number of frames captured on each Capture button click is controlled by the Image Hold setting. The default setting is to capture in two's, meaning each image being on screen for two frames. The 24 frames make 1 second of video movie when rendered. The 24 FPS frame rate is used by the film industry and is the worldwide standard for movie theatre film projectors.

For most intended purposes of showing your animation on TV or DVD the frame rate of 24 FPS and capturing in two's should be sufficient. Experiment with different settings to suite your purposes.

### Notes

Increasing the FPS rate and captured image sizes will significantly increase the resulting movie file size. Using too low a FPS rate can make your images flicker on screen.

Increasing the image capture size allows a higher resolution movie file to be produced. This gives a much better result when it is shown on large screen, such as a whiteboard.

MonkeyJam defaults to capturing images and saving them in the PNG (Portable Network Graphics) format. JPEG and BMP can also be used. Leave this at the default setting.

The animated object can be anything from a drawing to a clay figure. Lego or similar building block figures are good choices. Preparation is the key to success when creating a stop motion animation movie and here are some top tips.

# Stop Motion Animation

## Top Tips

- Plan ahead by checking the equipment is working prior to use; gather together all materials needed and consider creating a storyboard of what is going to happen in the animation.
- Good lighting is essential. A firmly positioned light or lights will give consistent results for the duration of the animation session.
- Check the camera settings and batteries prior to starting. Do not adjust settings once the animation session has started.
- Fix the image source on a tripod or other firm base for rock steady results.
- Try not to nudge or bump into the camera, lighting or animation scene as it will be noticeable on the finished result.
- Put clay or plasticine figures over a thin wire frame for stability and to make them easier to animate.
- Insert 12 identical frames at the start and finish of the animation and 6 identical frames in between changes of direction for a smoother animation.
- Move the figure or object bit by bit. Small movements will give a smooth animation result; too large movements will give a jerky effect.
- Patience is a good quality to have when making stop motion animation movies. Consider breaking the animation into different scenes for each session and then joining them together later using a movie editing program.
- Check the animation view just prior to clicking the Capture button. This may save time later from having to make unnecessary corrections.
- Most important of all, have some fun doing your animations. I have really enjoyed creating this tutorial.

## Working with MonkeyJam

MonkeyJam has a range of additional features and shortcuts to assist the animator. This section shows you how to use some of the features to correct common errors and use shortcuts to work more efficiently.

## Shortcuts

Select File on the Menu bar. On the sub-menu of file options some have keyboard key combinations to the right hand side with a plus sign between them, for example Save (Ctrl + S).

So far we have used the Menu bar options, Function keys or Toolbar icons for creating the animations. The same results can be achieved by using a keyboard shortcut. Taking the example above, saving your work can be achieved by holding down the Ctrl key on the keyboard and then pressing the S key. Frames can be captured (on the Capture screen) by Ctrl + Insert.

## Notes

Look out for the shortcut key combinations next to other menu options.

Use the program options that you are more comfortable with.

# Stop Motion Animation

## Adding and Deleting Frames

There are many reasons why you may need to add or delete frames, an animators hand captured in the image is something that readily springs to mind.

The Project 1 created previously will be used for demonstrating these techniques.

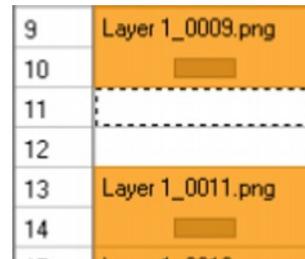
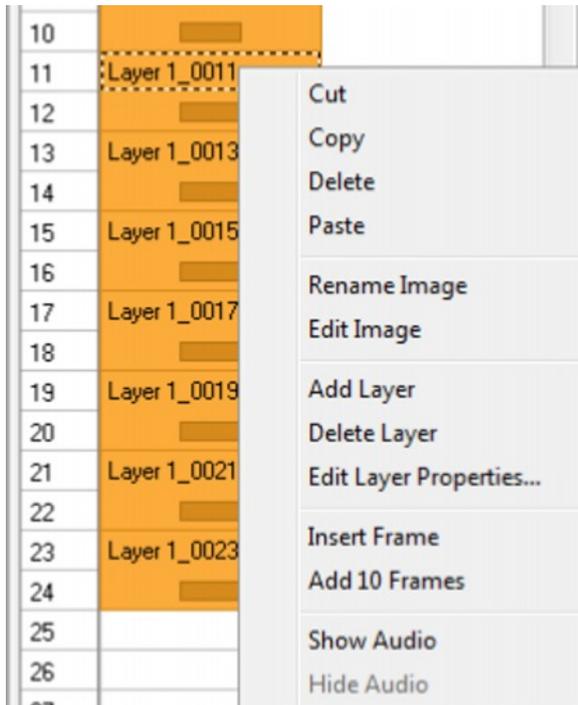
Start MonkeyJam.

Select File. If Project 1 was a recent project used it may be in the Open Recent list. Select it from this list or if not, click on Open. On the Open dialog box navigate to the folder where your project was stored . My Documents is the default folder. Click on the Project 1.xps file name to select it and then the Open button. There are 24 frames in Project 1.

A single frame or number of frames can be added or deleted anywhere within the animation.

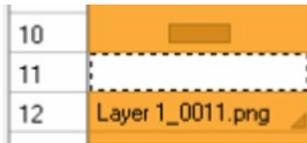


Adding a frame at the end of the current animation is quite easy, click on the blank frame number 25. Select Tools, Capture, and Video, press F6 or use the Toolbar icon and then Capture images as previously explained.



To add two frames in the middle of the animation, for example, between frames 10 and 11, move the cursor over frame 11 and then right click the mouse button. Select Insert Frame from the drop down menu to insert 1 frame. Repeat to add a second frame.

# Stop Motion Animation

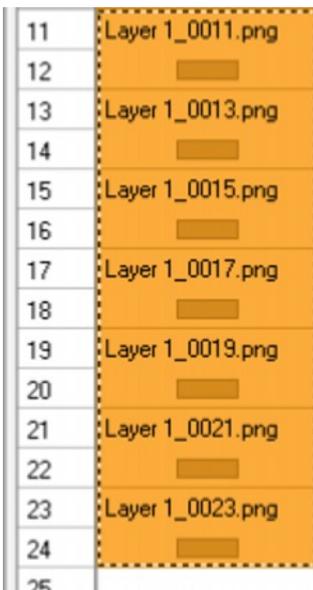


Deleting a frame is also straightforward, click on the frame to be deleted and press the Delete key. Unfortunately though, MonkeyJam does not delete the space the image took and the end result will be a flash of white in your animation movie file. This is quickly and easily corrected using multiple-selection and drag and drop techniques.

## Notes

Multi-selection and drag and drop techniques are common to most other Windows based programs. The key point to remember is that you need to select the item or items prior to dragging and dropping. The items could be images or a block of text in a Word document. Spending a little time to learn and practice these techniques will prove beneficial and save you time. They are illustrated in the below example within the brackets [ ].

This is perhaps best illustrated by a practical example. We are going to add 4 frames after frame 10 and then delete frames 9 and 10. The resulting 6 blank frames will then be removed from the animation. All of this will be done using multiple-selection and drag and drop techniques to make it quick and easy.



Click on frame number 11. Press and hold down the shift key on the keyboard and click on frame number 24 [Multi-selection]. You will note that the block of frames from number 11 to number 24 have been highlighted by a dotted lined border. Release the shift key.

Place the mouse cursor on the frame image number at the top of the highlighted block, Layer 1\_0011.png in this case. Click and hold down the left mouse button and then move the mouse cursor down the screen and observe that the block is moving downwards as you move the mouse [Drag]. When the top of the block is on frame number 15, release the mouse button [Drop].

# Stop Motion Animation

## Notes

To successfully use drag and drop techniques with MonkeyJam, place the mouse cursor on the frame image number at the top of the highlighted block prior to dragging.

Cut and Paste can also be used to move the highlighted block.

9	Layer 1_0009.png
10	
11	
12	
13	
14	
15	Layer 1_0011.png
16	
17	Layer 1_0013.png
18	
19	Layer 1_0015.png
20	
21	Layer 1_0017.png
22	
23	Layer 1_0019.png
24	
25	Layer 1_0021.png
26	
27	Layer 1_0023.png
28	
--	

Four empty frames have been created.

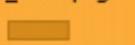
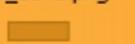
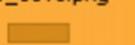
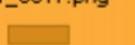
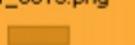
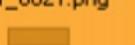
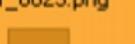
8	
9	Layer 1_0009.png
10	
11	
12	
13	
14	
15	Layer 1_0011.png
16	

Click on frame 9 and press and hold down the Shift button on the keyboard; now click on frame 10[Multi-select]. Release the shift key and press the Delete key [Multi-delete].

## Stop Motion Animation

8	
9	
10	
11	
12	
13	
14	
15	Layer 1_0011.png

There are now 6 blank frames. Captured images could be added to the blank frames at this point, but just to finish off we are going to now remove the 6 blank frames from the animation.

Frame	Layer 1 <input type="checkbox"/>
1	Layer 1_0001.png
2	
3	Layer 1_0003.png
4	
5	Layer 1_0005.png
6	
7	Layer 1_0007.png
8	
9	Layer 1_0011.png
10	
11	Layer 1_0013.png
12	
13	Layer 1_0015.png
14	
15	Layer 1_0017.png
16	
17	Layer 1_0019.png
18	
19	Layer 1_0021.png
20	
21	Layer 1_0023.png
22	
23	

Highlight the bottom block of frame images [Multi-select] by clicking on frame 15, press the shift key and then click frame 28. As shown previously, move [Drag] the block of frames; this time upwards on the screen to frame 9 and release the mouse button [Drop]. The above image shows all operations completed.

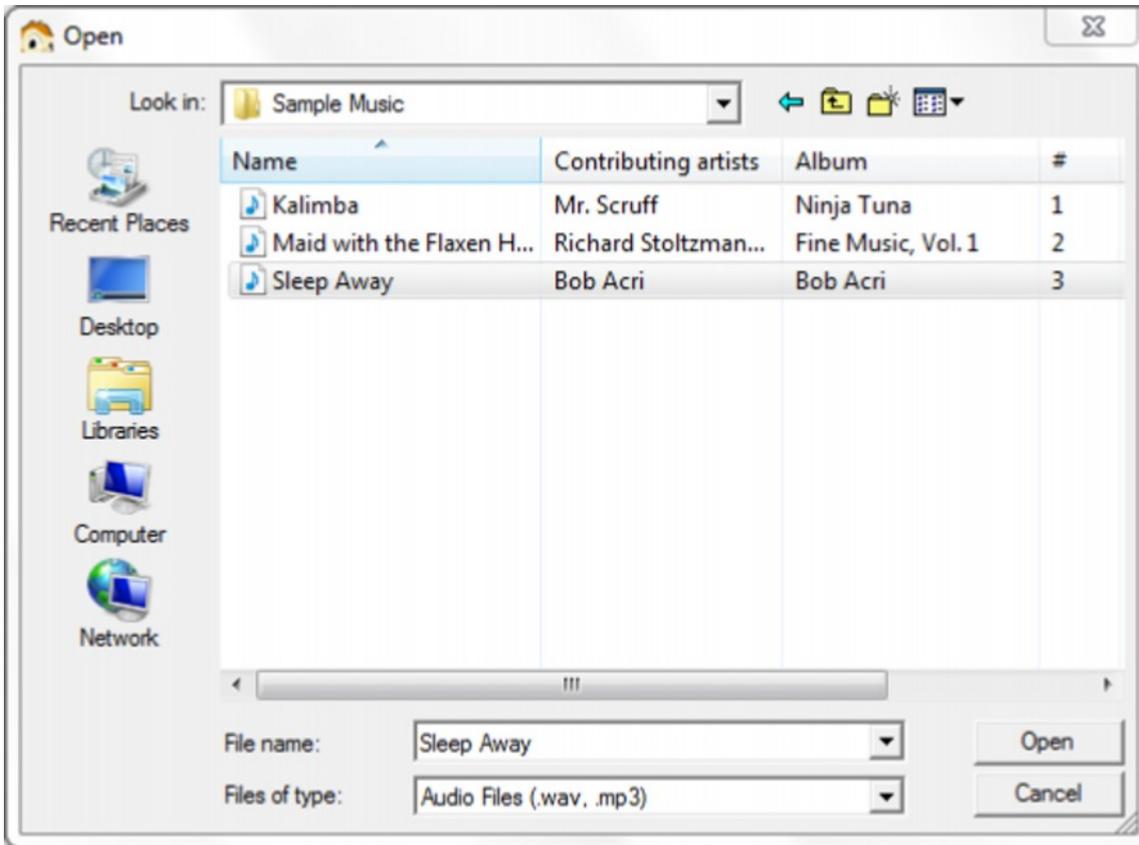
The animation can now be previewed and exported as normal.

# Stop Motion Animation

## Adding Sounds to the Animation

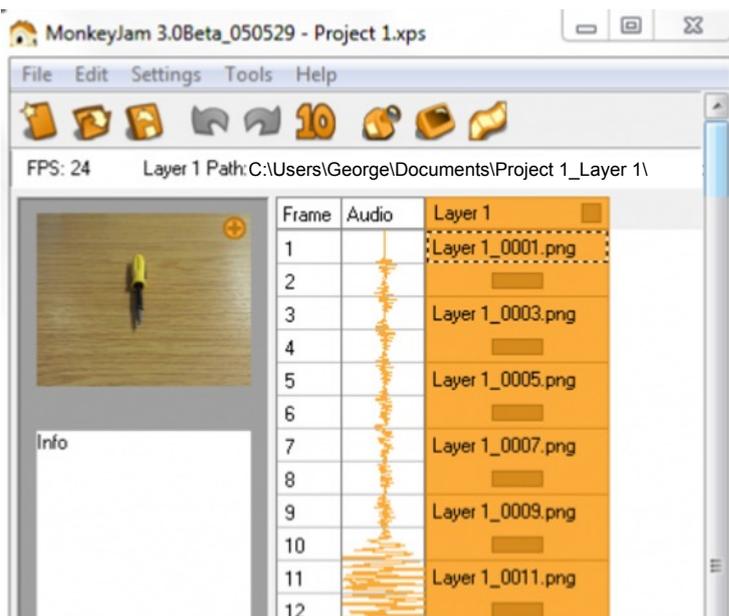
### Notes

MonkeyJam supports WAV and MP3 sound file formats.



Select File, Import, then Audio.

Navigate to the sound file you wish to use and click to highlight it. Click on Open to import it into your animation. The audio column is shown on the main screen.



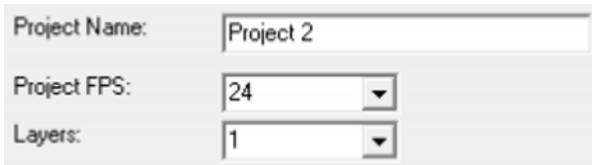
# Stop Motion Animation

## Creating an Animation from Digital Photographs

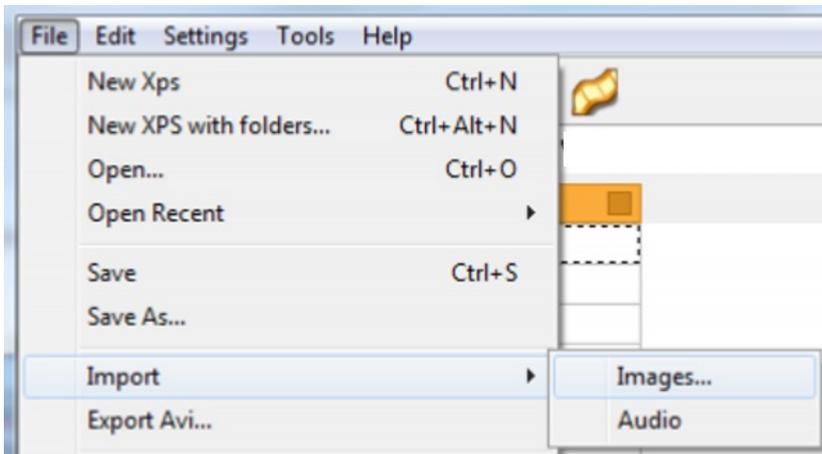
So far we have used a live video source to capture images. MonkeyJam can also be used to create a movie from a series of previously saved digital images. An example could be a set of photographs taken outside of a flower opening up in the sunshine. Some video cameras and digital cameras have a stop motion mode which makes it very easy to produce a series of images. However, the same effect can also be achieved on any digital camera by manually taking images at fixed time intervals. A remote shutter trigger is recommended to avoid any camera movement when the button is pressed, although if this is not available, setting the camera to take the photograph on a short timer delay will achieve the same result.

Start MonkeyJam.

Select File, New XPS with folders.



Name the project, Project 2, in the Project Name field and click on the OK button.

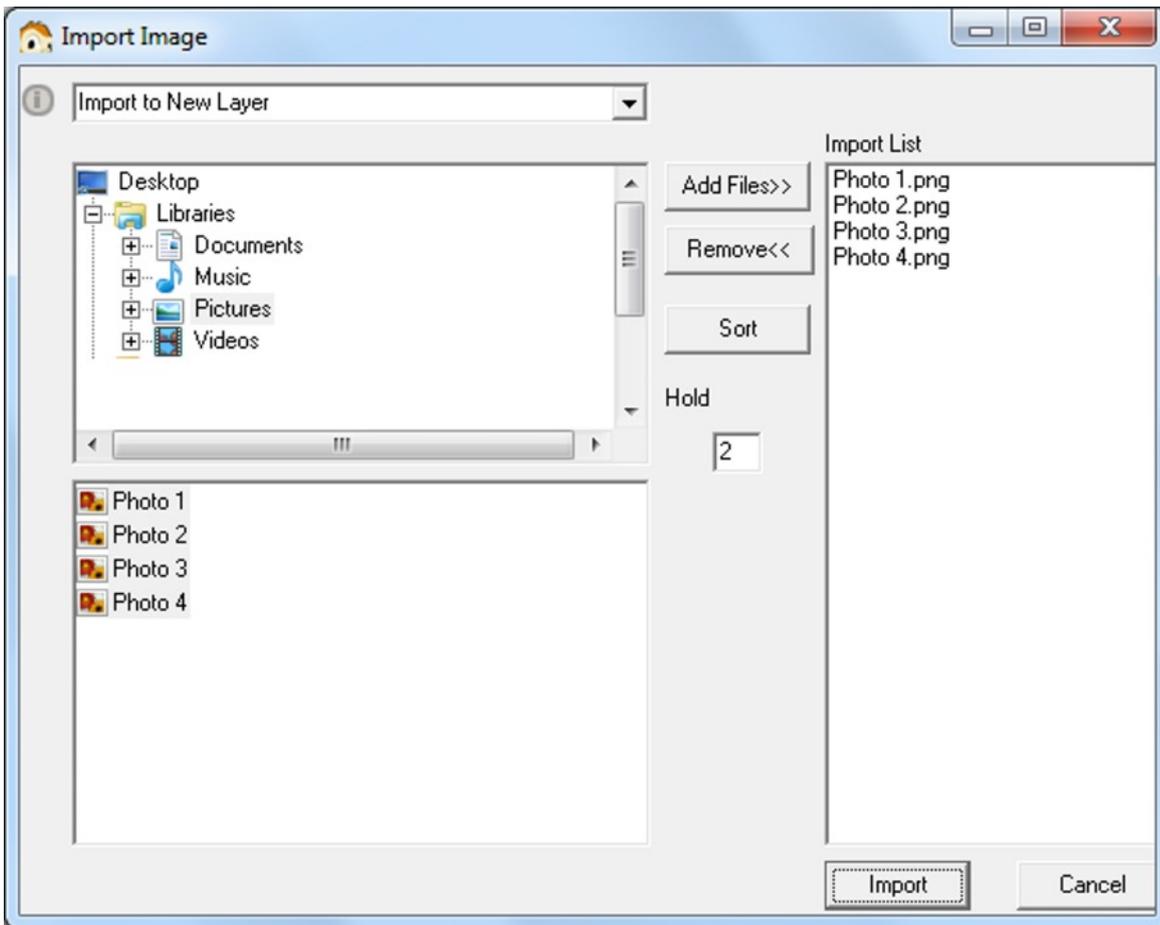


Select File, Import, then Images...

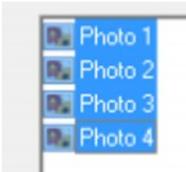
### Notes

MonkeyJam can import the following image types: PNG, JPEG, and BMP.

## Stop Motion Animation



On the Image Import dialog box, navigate to the directory where your photographs are stored. Select the photographs you wish to import. If you wish to select all the photographs, click on the first



photograph to highlight it and then press and hold down the Shift Key. Click on the last photograph and all will be highlighted. Click on the Add Files button.

The default Hold setting is 2, do not change this. As explained previously, two identical frames will be created for each photograph.

Click on the Import button to finish importing the photographs.

Select Tools, Preview. You can now preview the animation and export it as a movie file as shown earlier in the tutorial.

# *Stop Motion Animation*

## **Movie Editing**

Although MonkeyJam does have some basic features such as adding sound to an animation, for advanced editing the free Microsoft Video Editor Live program is recommended.

## **Conclusion**

MonkeyJam offers a good range of features for creating basic stop motion animations. The fact that it is available free of charge and easy to get started makes it an ideal choice for trying animation work and may suffice for most purposes.

Having mastered the basics though, you may wish to progress further and create more complex animations. To assist you, there is a range of commercial animation products available that boast a fantastic range of features to give the professional touch to animations. All now offer features such as Chroma Key (green screen), allowing the animator to use any image background to their work and Onion Skinning, so the animator can view translucent previous frames projected on top of each other to assist positioning and movement. I have purchased Animate It! from Kudlian Software.

I attended the 2012 and 2013 BETT exhibitions in London and saw three demonstrations by companies exhibiting animation software. I have included links to a few animation products below for further consideration and a link to a buyer's guide to animation software.

<http://www.zu3d.com/>

<http://www.kudlian.net/>

<http://www.hueanimation.com/>

<http://www.stopmotionpro.com/>

<http://www.pcpro.co.uk/features/375205/buyers-guide-to-animation-software>

I hope this tutorial has been useful to you. I enjoyed writing this tutorial and I have tried to make it as interesting and useful as possible. I welcome your comments and feedback along with suggestions for improving it.

Please contact me if you would like me to deliver this training. My email address and website details are on page 1. Best wishes in computing.

George  
(05 June 2014)

# Stop Motion Animation

## Index

<b>A</b>		<b>P</b>	
Adding and Deleting Frames.....	12	Preview Animation.....	8
Additional Requirements.....	3		
Author.....	1		
<b>C</b>		<b>S</b>	
Conclusion.....	19	Shortcuts.....	11
Contents.....		Sound.....	16
Create a Basic Animation.....	3	Stop Motion.....	2
<b>D</b>		<b>T</b>	
Digital Photographs.....	17	Top Tips.....	11
Drag and Drop.....	13	Tutorial Outline.....	2
		Tutorial Requirements.....	2
<b>E</b>		<b>V</b>	
Exposure Sheet.....	4	Video image device.....	3
<b>F</b>			
Frames Per Second.....	10		
<b>H</b>			
hardware requirements.....	2		
<b>I</b>			
Image Format.....	10		
Image Hold.....	10		
Image Import.....	18		
Image Size.....	10		
Import Audio.....	16		
Installing MonkeyJam.....	3		
<b>M</b>			
Movie Editing.....	19		
Movie File.....	8		
Multi-Selection.....	13		