

## **Lesson 8**

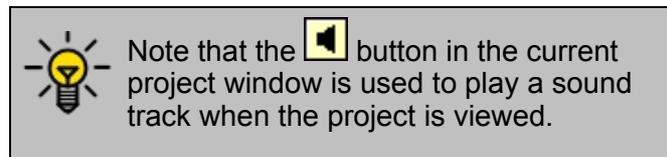
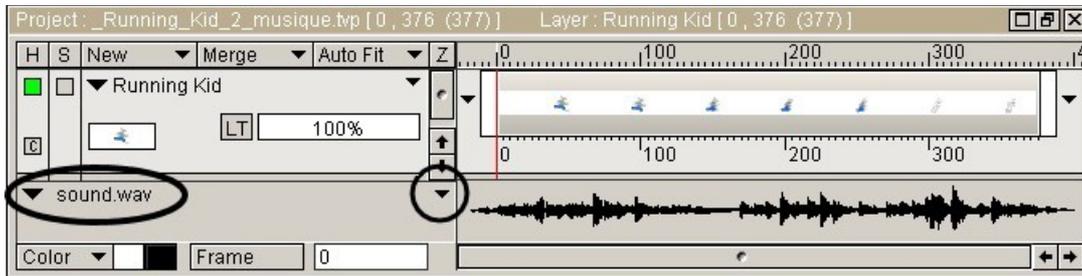
### **The XSheet panel and layers**

In this lesson you will :

- Add a sound track to your project
- Learn to use the XSheet layers
- Learn to use the Spreadsheet panel
- Make a lip-sync

## How to add an sound track to your project

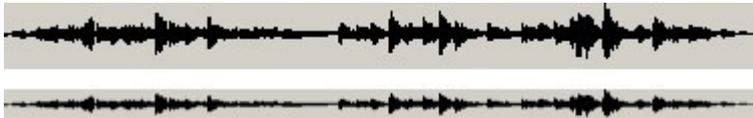
The audio options are available in the *Project* main menu or in the *Sounds* menu of the timeline (encircled cursor ▼ below on the right).



Here are the various functions proposed by TVPaint Animation Pro :

\* *Load* a sound track to be included in your project.

On the left of the timeline, the name of the loaded sound file will appear and an other cursor ▼ will allow you to change the size of the track display :



Optimised display

Reduced display

\* *Delete* a sound track from your current project

\* It is possible to move the audio track along the timeline with a click and slide on the latter. This function allows you to adjust synchronization of your animation and sound track.

\* The *Offset* option enables synchronization using a numeric value

\* The *Lock* option prevents all movement of your sound track with a click and slide. Once you have completed your settings, this option will allow you to avoid any risk of handling mistakes.

\* If the jog audio is in *None* position, no sounds will be emitted when you move along the timeline.

\* If the jog audio is in *Scrub* position, the sounds will only be emitted if your movements along the timeline is carried out with a mouse or stylus.

\* If the jog audio is in *Always* position, the sounds will always be emitted when you move along the timeline, regardless of whether you use the mouse, stylus or keyboard arrow keys.

\* If a sound is emitted each time you change the current image in the timeline, the option *Enter the scrub audio duration* allows you to define the duration of this sound.

### Annotations.

## The XSheet Layers and XSheet Panel

### • Introduction and principle

Maybe are you not familiar with *XSheet layers* and *Lip-Sync* notions. Here are some informations regarding their origin :

The word *XSheet* comes from *eXposure-Sheet* or *dope-Sheet*.

It comes from the days of traditional animation when the XSheet was a paper list that numbered all frames of a scene and in which the animator could write down his drawing numbers with the right timing. (see below)

It helped the animators to plan their animations and also fonctionned as a guide for the cameraman to know how to shoot the scene.

For instance, synchronising the lips of a character with a recorded audio soundtrack (in other words doing a *Lip-Sync*) was possible with the XSheet.

SQ	SCENE	The drawings						SHEET
ACTION	DIAL	A	B	C	D	E	F	CAMERA INSTRUCTIONS
	01							
Column where	02							Indications about camera
the actions	03							movements ( zooms,
are described	04							pannings, etc ... )
+ keys images,	05							
etc ...	06							
	07							
	08							
	09							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							

The *XSheet* panel, commonly called *XSheet tab* in TVPaint Animation Pro (see next pages) is the numeric transposition of the classical and paper XSheet.

The reason *XSheet panels* were included in TVPaint Animation Pro is to make easier to time and synchronise the animations, thanks to the *XSheet layers*.

It is also a very usefull tool for people who uses to scan their drawings. The main advantage of the *XSheet layer* is that a frame that is used multiple times in a scene need only to be adjusted or colored once and all instances of this image in the *XSheet layer* will change accordingly.

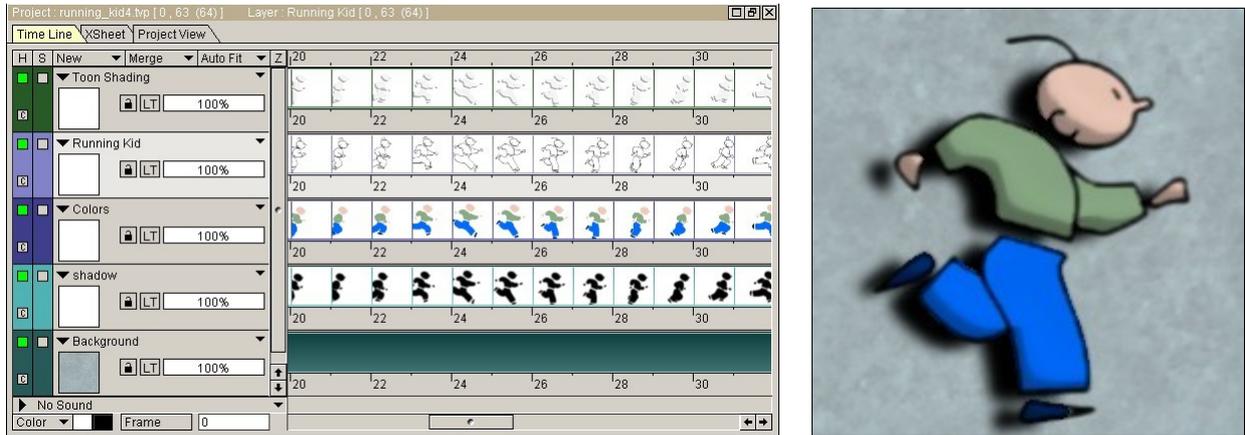
It use to save a lot of time since the process of copying and editing frames is much simpler and easier to control through the *XSheet panel*. (This is much simpler than the old way in which you'd have to manually copy and paste frames in the layers of the timeline.)

For example, let's assume that the coloring and the shadows of a character are on seperate layers: If you need to re-arrange your animation in time, it is always very tedious to edit a layer in the same way twice or more ... Fortunately, with the *XSheet* panel this can be done really easily and quickly.

All those notions may seem abstract at first, but you can relax. We will quickly study some concrete situations and examples.

• **The projects used in this chapter**

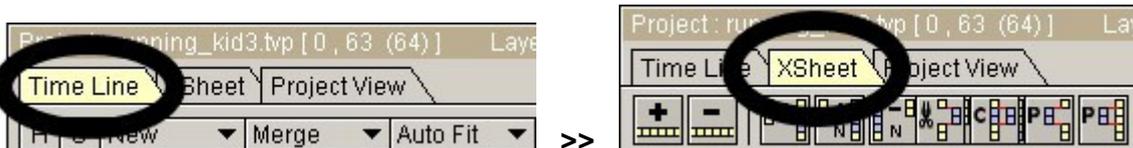
To make the XSheet layers easier to understand, we will need to load the project file (Running-Kid 3.tvp) from your TVPaint Animation Pro CD-Rom. Those who have downloaded the (30 days trial) demo version of the software will find this file in the *content sharing* section of the TVPaint forum ([www.TVPaint.com/forum/](http://www.TVPaint.com/forum/)). Once the project is loaded, you should obtain the following animation and timeline.



Five layers are visible: an image layer called « background » and four animation layers called « shadow », « colours », « Running Kid » and « Toonshading ». Each layer has its own assigned colour. Please note that your project does not have any XSheet layer at this time.

• **First approach of the XSheet panel**

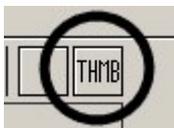
to swap between the Timeline and the XSheet panels, you only have to click on the corresponding tab (see below)



Let's study firstly the left part of the XSheet panel. (the right part will be the subject of a further chapter).

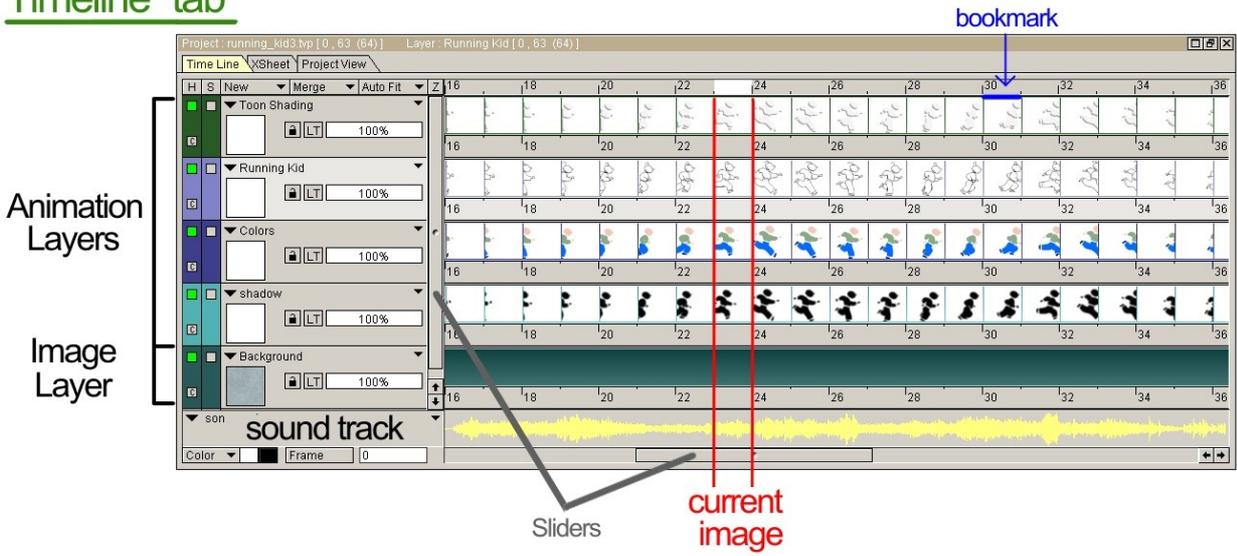
The left part of the *XSheet panel* is in a way the mirror of the *Timeline*. (see next page for the screenshots) :

- \* Each column of the *XSheet Panel* corresponds to a layer of the *Timeline*, with its colour. The title of a column is the name of the corresponding layer.
- \* Each line of the *XSheet panel* is numbered. This numbering is the same as the one you can find on the top of the corresponding timeline (see below)
- \* The image layers contain an unique image repeated through the time, so they are not subdivided in the XSheet panel.
- \* As the animation layers contain different images, they are subdivided.
- \* The bookmark located here and there on your timeline are also visible and modifiable in the XSheet panel.



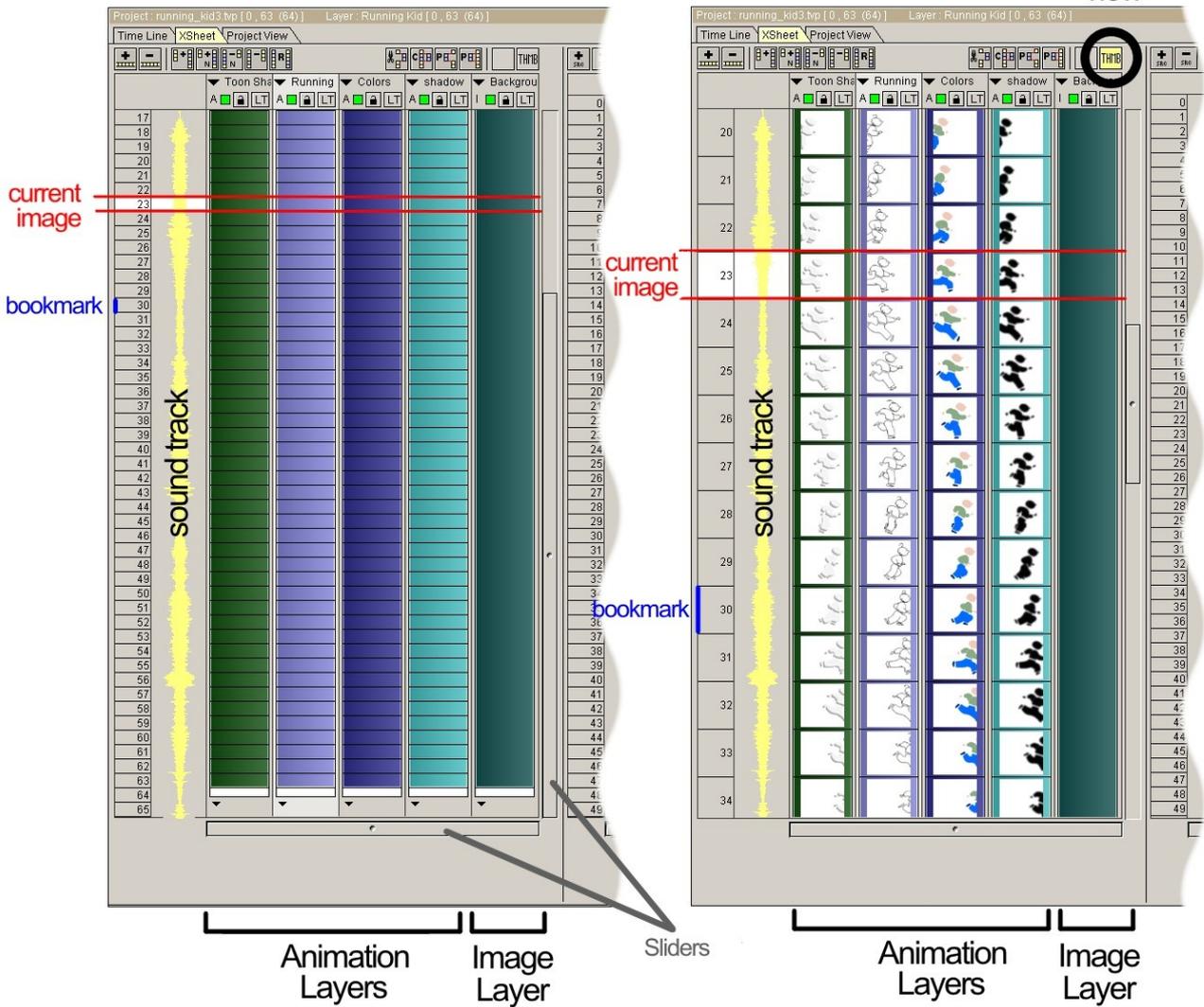
 The thumb button allows to swap between the classical XSheet display and the thumbnails display. (see next page on the right) You can also use the sliders or the arrow keys of your keyboard to navigate through the XSheet panel.

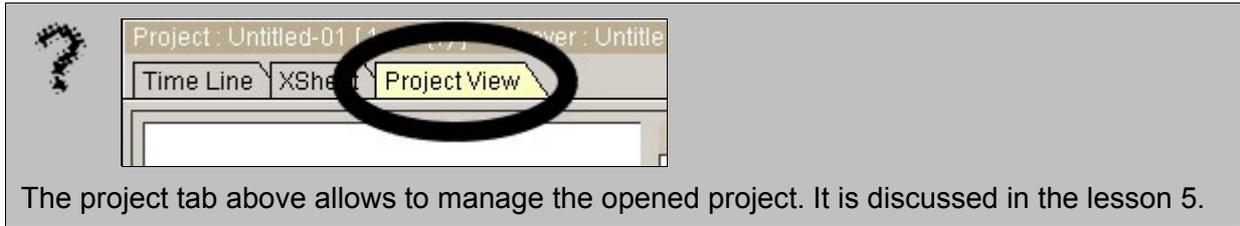
## Timeline tab



## XSheet tab (left part)

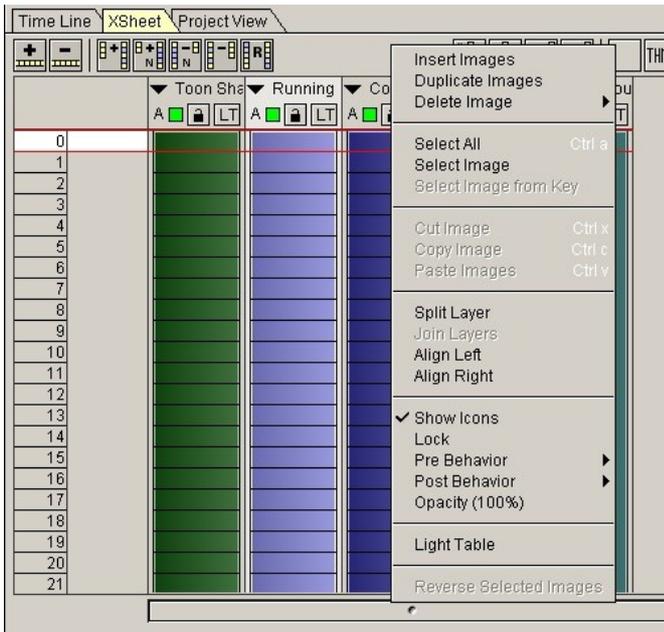
thumbnails view





The project tab above allows to manage the opened project. It is discussed in the lesson 5.

• A few simple options of the XSheet panel

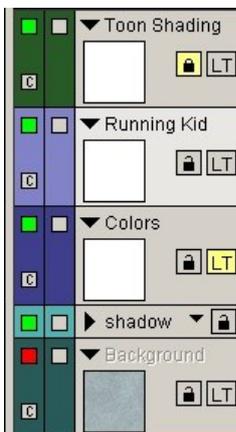


A lot of option regarding the layers are both available in the Timeline tab and the XSheet tab.

A right click with your mouse button on a layer inside the XSheet panel opens a contextual menu comparable to the one encountered via the timeline.

You will find in this menu some options already encountered in the lessons 3 and 4:

- \* Insert, Duplicate, Delete, Rename, Copy, Paste...one or more images.
- \* Set Post or Pre behavior.
- \* Set Opacity, etc ...



Timeline tab

- \* The (green or red) coloured square, once you click on it, allows to display or hide the corresponding layer.
- \* The small lock button allows to manage the locking of a layer.
- \* The (LT) button manage the activation of the light table.
- \* The black triangles allows to reduce or increase the size of the columns in the Xheet panel.
- \* The current layer is lighter than the other layers.

Opposite and below :

- The layer « background » is hidden
- The layer « Toonshading » is locked
- The Lighttable of the layer « Colors » is activated
- The layer « Shadow » is reduced
- The layer « Running-Kid » is the current layer



XSheet tab

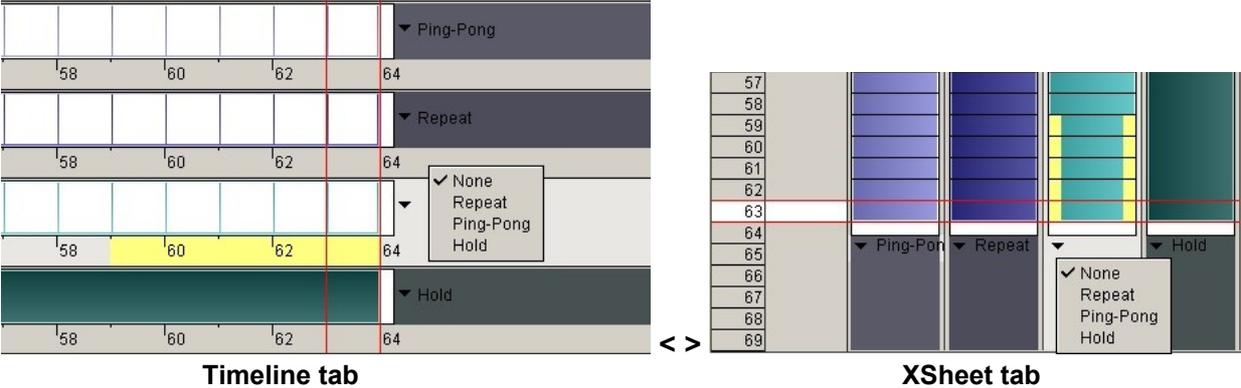
In the XSheet tab opposite :

- \* The letter « A » indicates that the column represents an animation layer.
- \* The letter « I » indicates that the column represents an image layer.

Before enabling the lighttable for the layer of your choice, Don't forget to enable the global lighttable by clicking on the button :

At the ends of the column, it is still possible to set the pre and post behaviour of your layers. (see below)

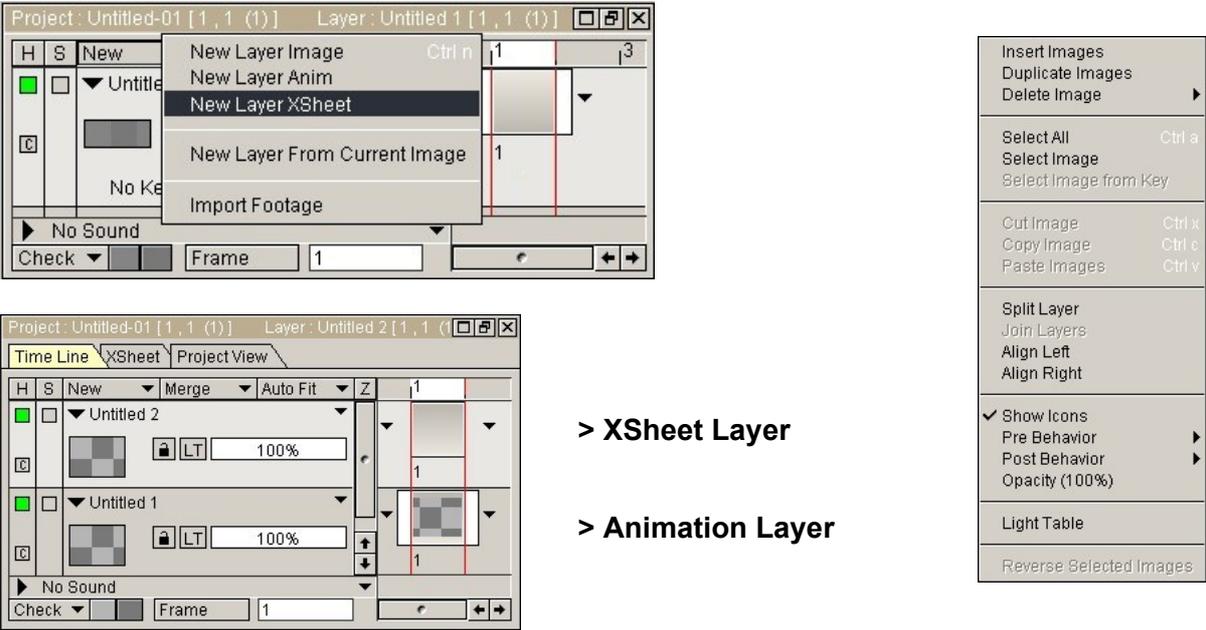
In the example below, a few pictures from the thrid layer are selected. They are enlighthed in yellow in the Timeline and also in the XSheet tab.



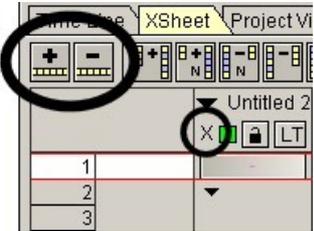
 After selecting several layers, the option *Align left* and the option *Align right* allows to align your layers on either side of the current image in each tab (Timeline or XSheet)

• How to create a XSheet layer

Let's now open a new project and come back to the Timeline tab : You already know how to create an *Image* or an *Amination* layer. Creating an *XSheet* layer can be done using the same way, using the *New* popup menu of your Timeline or using the *Layer* main menu.



At this state, the *Rename*, *Duplicate*, *Delete*, *Copy*, *Hide* and other classic options of the software are still available. But you certainly noticed that you can't shrink or stretch this new layer. There are no thumbnail icons too.



The + and - buttons of the XSheet tab can also be used to create or delete a XSheet layer.

The letter « X » indicates that the column represents an XSheet layer.

Managing the content of an image of the XSheet layer or managing the position in time of its images have to be done in the *XSheet* panel.

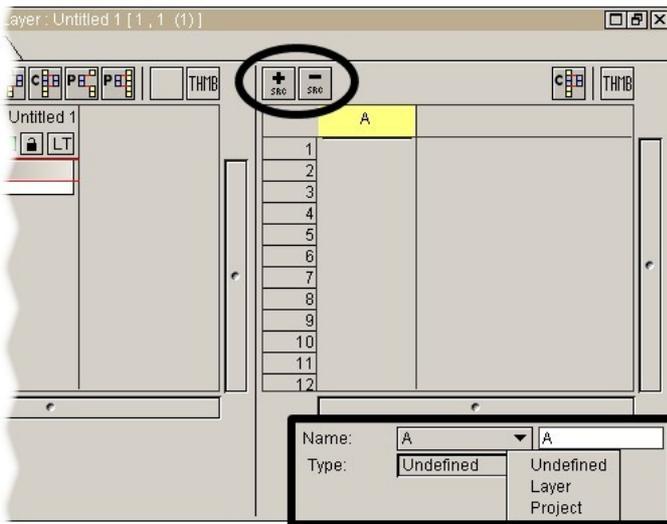
Once your XSheet layer is created, you have to specify in the XSheet tab one or more sources. Otherwise, it will be not possible to use it, because you can't draw on a XSheet layer. The images of the chosen sources will constitute the elements of the XSheet layer.

• **How to create and manage the sources**

The source management can be done in the right part of the *XSheet* panel.

In order to add a source column, you have to use the “+ src” button encircled below.

The “- src” button allows to remove a source column from the right part of the XSheet tab)

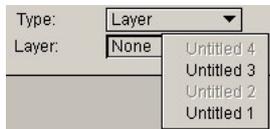


The choice of a source for your column can be easily done thanks to the popup menu located at the bottom right of the XSheet table.

Your source can be :

- \* an animation layer in the current project
- \* an other opened project

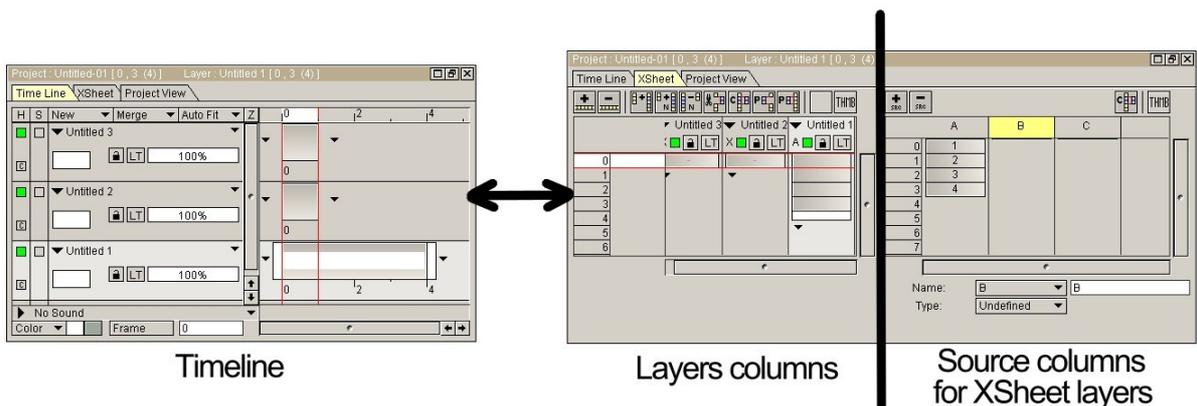
It's also possible to change the names of your source layers, for a better readability. You only have to use the popup menu *name* opposite.



If more than one project or layer is open, a new menu will allow you to choose which one you want as source. (see opposite)  
Image layers are not available as source

 The width of both sides of the XSheet tab can be adjusted by dragging the middle separator. The thumbnails options and the position of the separator are also saved with your project.

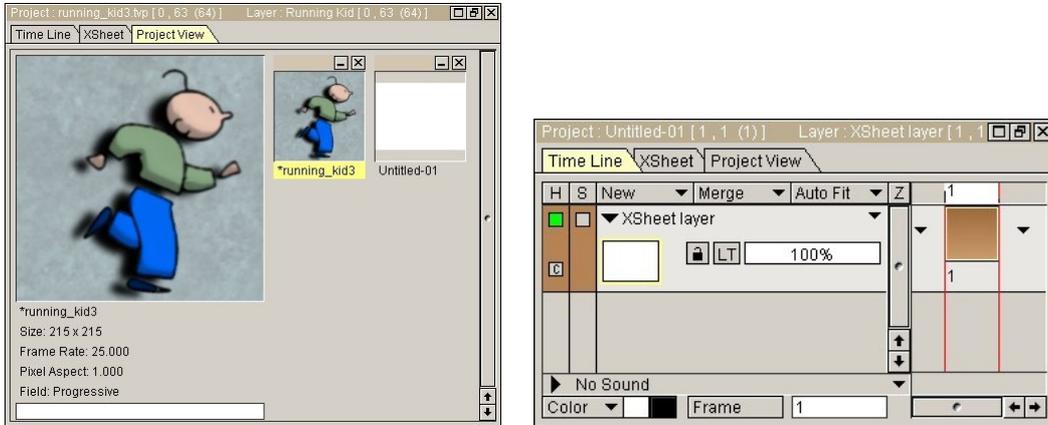
 Do not confuse the source columns on the right part of the XSheet tab and the layers columns on the left part of the XSheet tab. The source columns are used to manage the content of the XSheet layers and are not visible in the timeline whereas the layers columns are also visible in the timeline. (see below)



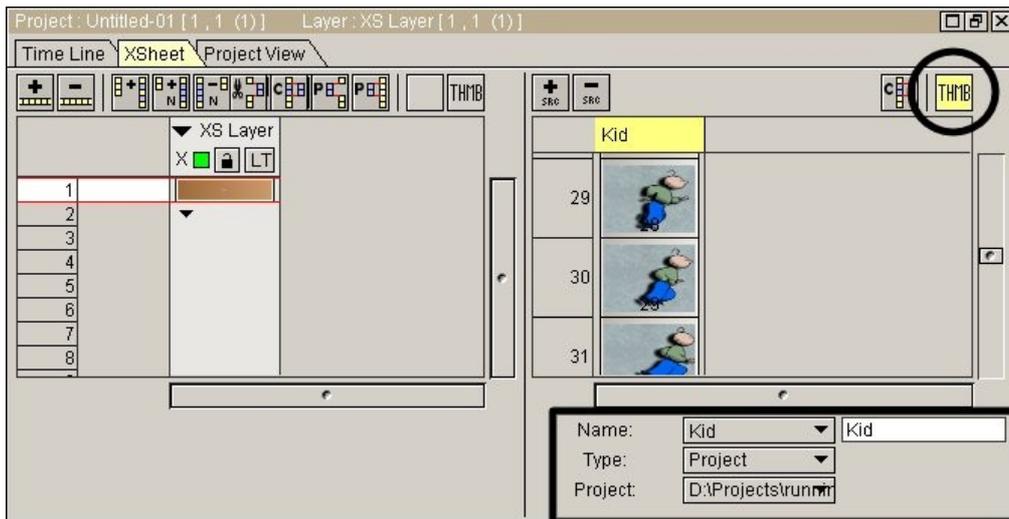
● **A concrete example**

If you have followed this lesson from the beginning, you should have two projects on the TVPaint Animation Pro screen. The project *Running-Kid3.tvp* and a new project called *Untitled-01* containing an XSheet layer.

You can take a look at the *Project tab* to check it. The project *Untitled-01* has an XSheet layer. (see below)



In the project called *Untitled-01* we added the project *Running-Kid03.tvp* as source, as shown below. Now we only have to add some images from our source into the XSheet layer.



Here again, the thumb button allows to swap between the XSheet display and the thumbnails display.



If you selected a project as source, its layers are considered as if they were merged.

● **How to manage the content of a XSheet layer**

We are now going to modify the content of our XSheet layer.

\*Before beginning, you must know that it is possible to stretch a XSheet layer by doing a drag'n drop at one of its extremities. So you can obtain several cells, as shown next page.

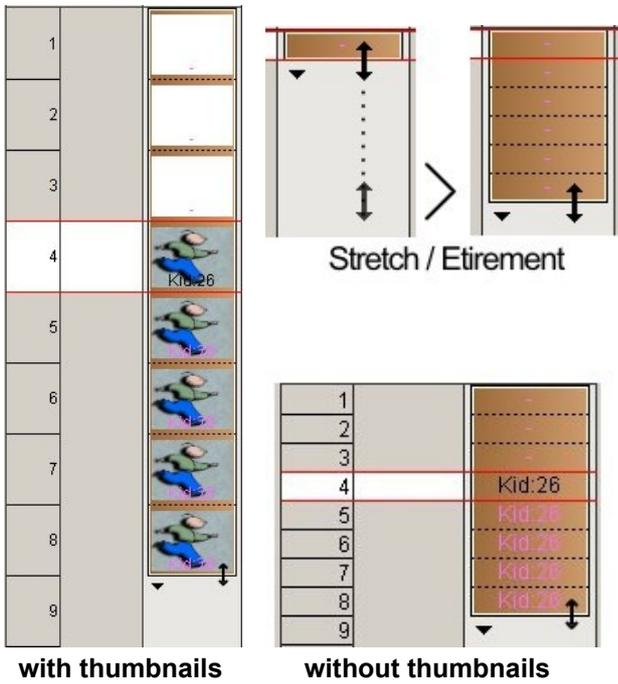
\*After this operation, you have to enter in the cells the references from a source image.

To do so, you have to use the following syntax : **Source Column : Source Line**

(The cells containing the character « - » doesn't have any reference.)

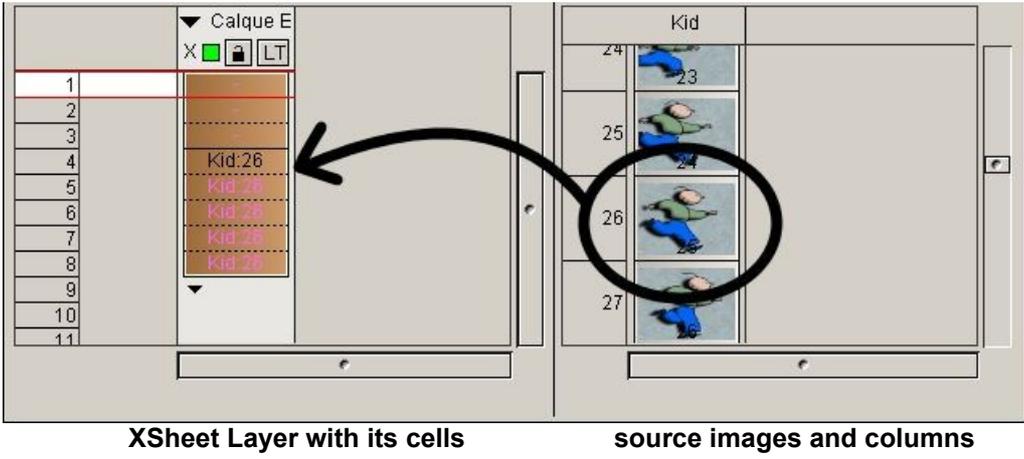
\* The cells manually filled have their reference image written in black.

- \* By default, all the cells following a manually filled cell are written in pink color and have the same reference image. Those images are also called keyframes.
- \* Once finished, each cell from the XSheet layer correspond to an image chosen into the Source columns. (For a better readability, you can use the thumbnail view in order to replace each cells by its corresponding image)



Opposite :

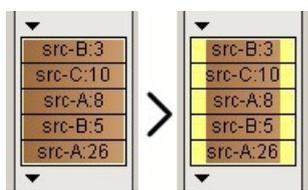
- \* The first three cells of the exposition layer are empty.
- \* The fourth cell of the XSheet layer is the 26<sup>th</sup> image from the source column called *Kid*.
- \* The four last cells have the same reference as the fourth cell.



 If you selected an opened project as source, the source project will be stretched to fit the XSheet layer.

 In order to fill in the cells of an XSheet layer (in other words, to add images in a XSheet layer), you can also drag'n drog thumbnails and cells from the source columns into a XSheet layer.

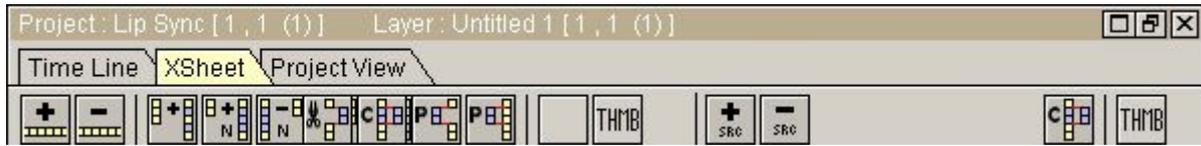
● **Select several images in a XSheet layer.**



If you want to select several images in a XSheet layer, hold the [shift] key pressed and do a drag'n drop with the LMB on the cells or thumbnails of the XSheet layer. Hold the [Shift] key and use the a mouse button to cancel the selection.

## • The icons of the XSheet tab

Each icons below has a specific action regarding the XSheet layer or the XSheet tab. We will now explain each of them separately in the next page.



This button allows to create a new XSheet Layer.



This button delete the current XSheet Layer.



This button toggle the thumbnails / cells view.



For a better readability, the icon opposite allows to display / hide the columns of the image and animation layers in the XSheet panel. This option is only working with the XSheet tab and does not interact with the timeline or the project display.



This button allows to add a source into the XSheet tab.



This button allows to delete a source into the XSheet tab.



This button allows to add one tween to each selected frames.



This button allows to delete one tween for each selected frames.



This button allows to add multiple tweens to each selected frames. A popup panel will appear to set the number of tweens to add.



This button allows to delete multiple tweens for each selected frame. A popup panel will appear to set the number of tweens to delete.



This button allows to invert the order of the selected frames.



This button allows to copy the selected images / cells. It can be either source images or images / cells from a XSheet layer.



This button allows to cut the selected images / cells from a XSheet layer.



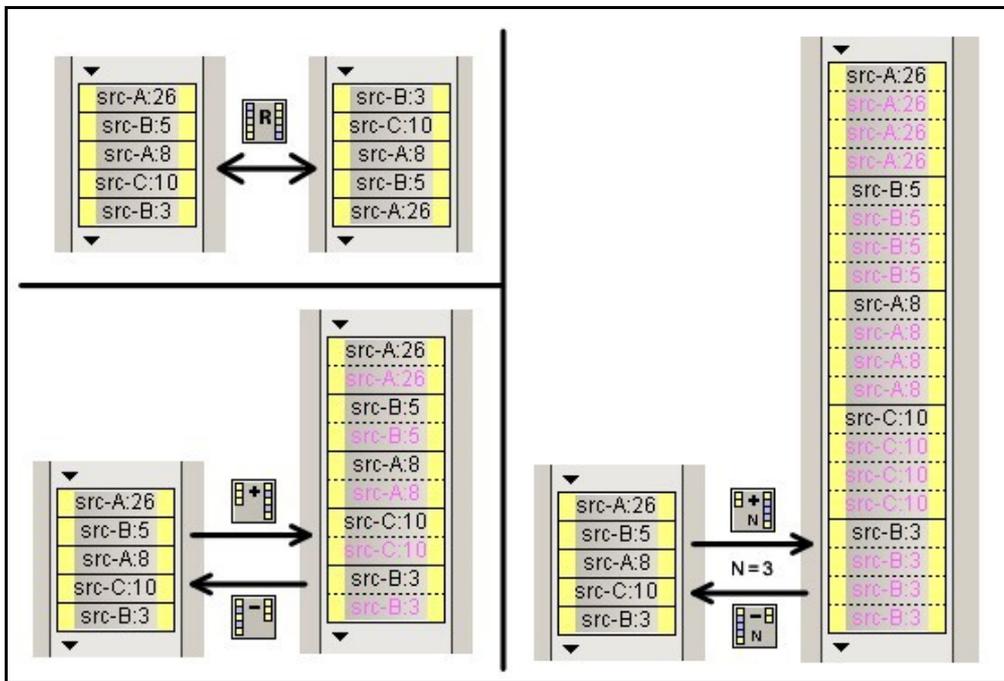
This button allows to paste the cut or copied images / cells from a XSheet layer before the current one.



This button allows to paste the cut or copied images / cells from a XSheet layer into existing images / cells. This action delete the selected images and insert the new ones.

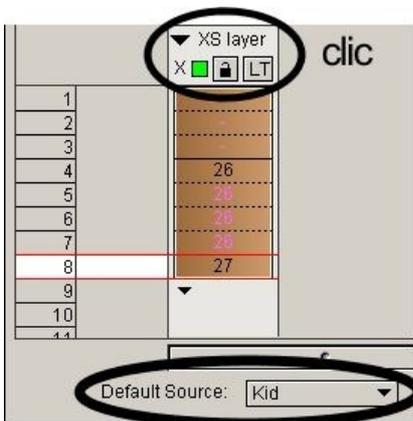
 You can also use :  
 the LMB and drag to « move » (cut and paste) a selected range of frame.  
 Ctrl + LMB to « move » (copy and paste) a selected range of frame

Here is a small recapitulative diagram :



 The options that allows to copy cut or paste the cells can be applied from an XSheet layer into itself or into another one. (however, it is not possible to cut source images)

• **Select a default source.**



When you click on the name of your XSheet layer, a popup menu called *default source* appears at the bottom of the XSheet tab.  
 It is then possible to assign a source column by default to your XSheet layer : all the references of the cells will only need a number of picture in order to be taken into account.

This is very convenient to create new XSheet layers synchronised with the current one.

You only have to duplicate the current XSheet layer and change the default source of the duplicated XSheet layers.

• **About the projects**

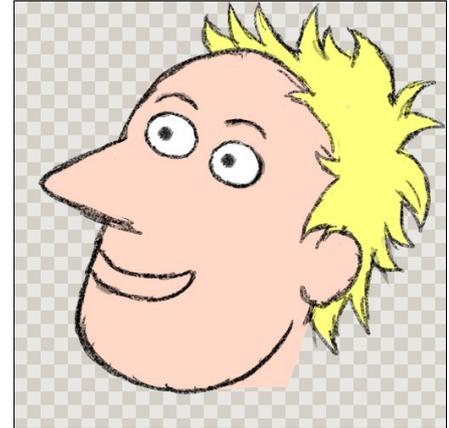
When a project needs some images to be repeated several times, it's advised to use XSheet layers. It allows to decrease the size of the project when you save it on your harddrive, because each repeated image is saved only one time.

 When you save a project in TVPaint Animation Pro, the related XSheet tab and layers are saved too. (Your project will still be available / usable with previous softwares from TVPaint. But, the XSheet and sound quotes layers will not be viewable nor usable.)

## The steps to create a lip-sync

In this section, we will learn how to synchronize the facial movements of a character (especially his mouth) with a preloaded audio track.

The main idea is of course to give the impression that the words come from our animated character and not from a recording that have been added over an animated sequence.



### • The files used in this chapter

The project *Lipsync.tvp* and the audio track *voice.mp3* will be taken as a basis to study the lipsync steps. You can find them on the software CD rom. Those who downloaded the evaluation version of TVPaint Animation Pro can find those files in the “content sharing” section of our online forum. (<http://www.tvpaint.com/forum>)

Here is the timeline of the project Lipsync.tvp

Layer “eyes”

Layer “pupils”

Layer “brows”

Layer “face and hairs”

Layer “hair colour”

Layer “mouth 1”

Layer “mouth 2”

Layer “mouth 3”

Layer “mouth 4”

Layer “jaw”

Layer “head-colour”

We have chosen the following colours to have a better readability through the timeline:

- the layers relative to the mouth movements are in red color
- the layers relative to the jaw and face are in blue color
- the layers relative to the eyes movements are in purple color

If you play now this project, the result will not be really interesting. But we will quickly remedy this situation.

### • Calibrate the options relative to the audio track

Now that the project is loaded in TVPaint Animation Pro, let's import the audio track called voice.mp3.

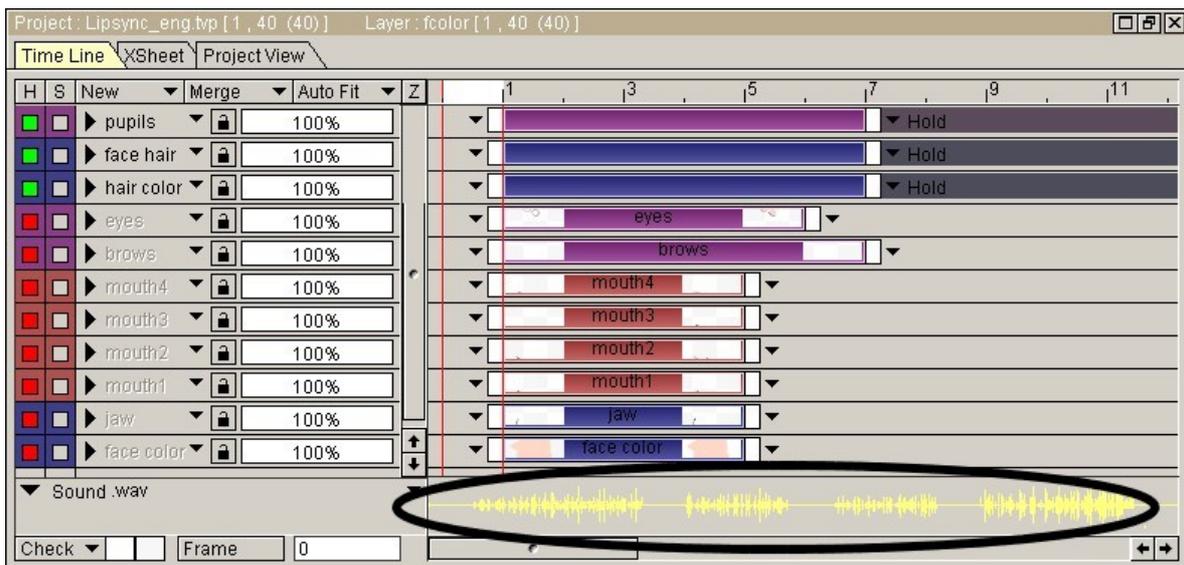
Once your audio track is loaded:

- \* Begin by setting the offset parameter with accuracy
- \* Lock your audio track in order to prevent unwanted changes
- \* Select "movement" or "always" as parameter for the audio jog, with a duration of 2 or 3 seconds. (see first chapter for more details)



The option called: "Enter audio scrub duration" allows to specify the duration of the sound that you will hear after each movement throughout the timeline. (This option is functional only if the "jog audio" parameter is not in "none" mode.)

At this state of the process, your movements throughout the timeline should be followed by one or several sounds.



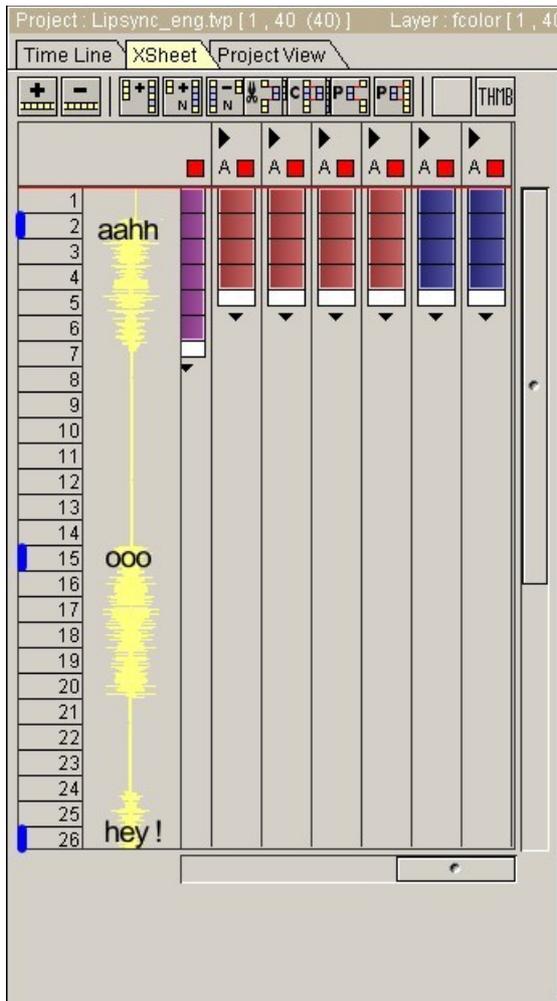
### • Positioning syllables and phonemes

It is now advised to display the XSheet panel in order to continue our work. (Although all the next coming steps can be done directly in the timeline.)

When you move your cursor (ie: change the current image) through the timeline, try to find syllables and phonemes.

Then, add an annotation on the corresponding place. To do so, use the option "add a text" which appears in the audio track contextual menu or in the *Images* main menu.

You should obtain a XSheet panel like the one below:



If the text that you want to synchronize with our character is long, try to add bookmarks to the images from which a syllable or phoneme starts. It will be easier to find again those images later.

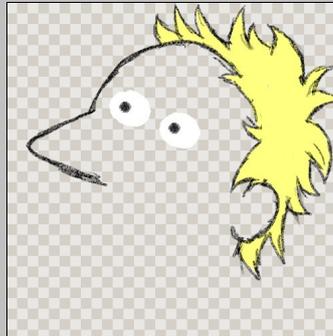


You can already hide the animation layers. Those layers will not be visible when the project will be finished.

They are only here in order to be selected as source for the XSheet layers.

However, you can set *hold* as post-behavior for the Image layers. (they will stay visible until the end of the lip sync process)

You should obtain the image below :



• Create some source columns

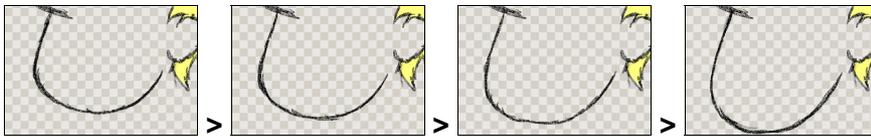
As explained in the page number 8, you have now to set your sources images and columns in the right part of the XSheet tab. Here below, the source columns are created from the existing animation layers of our project. (the column *fcolor* is linked to the layer *face color*)

	mouth1	mouth2	mouth3	mouth4	jaw	fcolor	eyes	brows
1								
2								
3								
4								
5								
6								

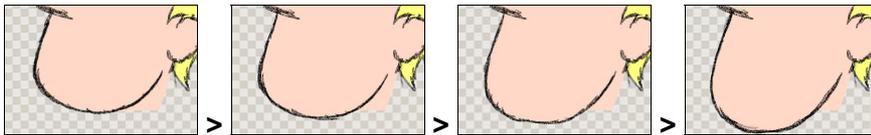
• **Create some XSheet layers**

Now, let's create some XSheet layers.

For each sound of the audio track, the jaw and the face skin should move accordingly, as our character is talking. (see below)



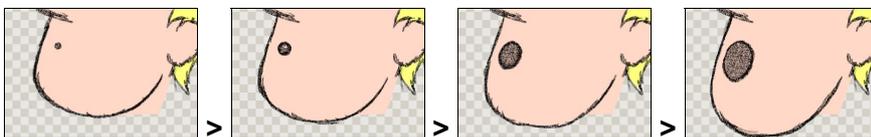
The movement of the character's jaw



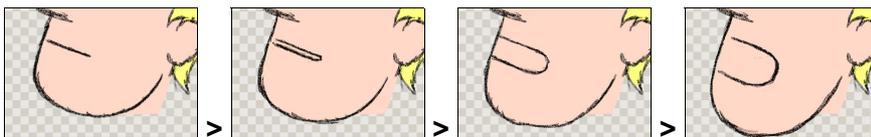
The movement of the face's skin

Two synchronised XSheet layers will be needed here to do the job. Only their default source column will be different. (fcolor and jaw)

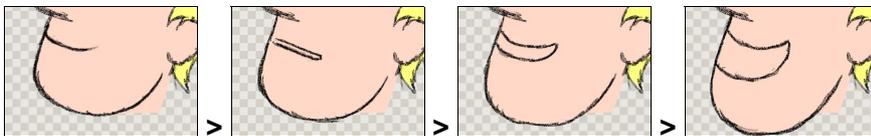
Each sound of the audio track can be broken down into separated sequences :



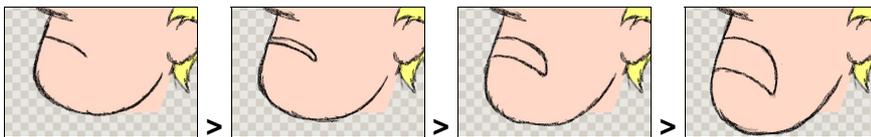
opposite, the sound « O »



Here the « A » sound



the « I » sound



the « E » sound

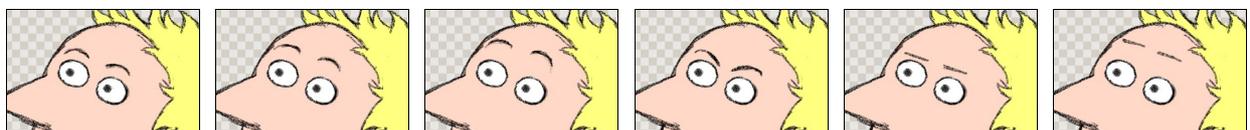
Each time that the « O » « A » « I » or « E » sound will be encountered on the timeline, you will then have to reproduce the corresponding configuration.

A XSheet layer derivated from the two last described XSheet layers will be used here. However, it will not have a default source, because it will use the four source columns (mouth1 mouth2 mouth3 mouth4)

Finally, you will have to make the character blink periodically in an other XSheet Layer.



The movement of the brows will depend on the context of the scene. It can express astonishment, neutrality, fatigue, etc ... It will also need an XSheet layer.



Here is the result with the XSheet tab :

The screenshot displays the XSheet interface for an animation project. The main area is a grid with rows numbered 1 to 43 and columns for different facial features: brows, eyes, Mouth, Jaw, and fcolor. Each column has a header with a dropdown arrow and a set of icons (X, lock, LT). The 'Mouth' column contains entries like 'mouth1:1', 'mouth1:2', etc., up to 'mouth4:4'. A yellow waveform is overlaid on the left side of the grid. On the right side, a vertical strip shows character face images with frame numbers 2, 13, 19, 25, 31, and 40.

 Let's assume that our character comes from an animated TV serie. It will be possible to re use the same images for the face, XSheet layers constructed with the method,...etc...

