Animation Notes #9

Lip Sync (lip synchronization animation)

DIALOGUE

Although much in animation can be communicated entirely via action - Mr Bean's pantomime based performances for example, there are times when dialogue is the most efficient means of expressing the desires, needs and thoughts of a character in order to progress the storyline. Dialogue can be as profound as a speech that changes the lives of other characters in the plot, or as mundane as a character muttering to itself in a manner that fleshes out its personality making it more believable to the audience.

VOICE CHARACTERISATION

Choosing the right voice is vital. Much of a character and its personality traits can be quickly established by the performance of the actor behind the drawings thereby taking a huge load off the animator. If the real-life actor who is supplying the voice to your drawings understands the part, they can very often make significant contributions to a scene through ad libs and asides that are always 'in character'. If you have given your character something to do during the delivery of their dialogue, you must inform the voice talent. If your character is doing some action that requires effort, for example, that physical strain should be reflected in the delivery of the line.

Just as the designs for any ensemble of animated characters should look distinctive, so should their voices. Heavy, lightweight, male, female, husky, smooth or accented voices are some of the dialogue textures that need to be considered when thinking about animated characters. Using professional talent who can tune and time their performance to the animator's requirements usually pays dividends. It is immensely inspiring to animate to a well acted and delivered dialogue. It is interesting that if you ask practicing animators about what they actually do, most will describe themselves as actors whose on-camera performance is realized through their drawings.

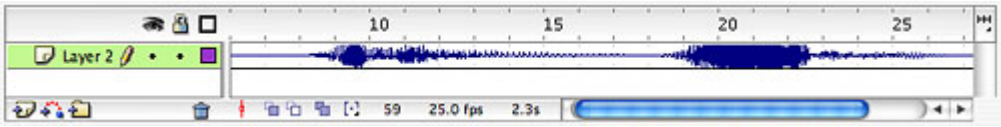
Unfortunately drawings and computer meshes don't talk, so when our synthesized characters are required to say something, their dialogue has to be recorded and analyzed first before we can begin to animate them speaking. Lip synchronization or 'lip-sync' is the technique of moving a mouth on an animated character in such a way that it appears to speak in synchronism with the sound track. So how is this done?

TRACK READING

Still in use today is a method of analyzing sound frame by frame which dates from the genesis of sound cartoons themselves during the late 1920's. Traditionally, this involved transferring the dialogue tracks for animated films onto sprocketed optical sound film, and later from the 1950s, sprocketed magnetic film. The sprocket holes on this sound film exactly match with those of motion picture film enabling sound and image to be mechanically locked together on editing and sound mixing machines.

A 'gang synchronizer' was used to locate individual components of the dialogue track with great precision. This device consists of a large sprocketed wheel over which the magnetic film can be threaded. The sound film is driven by hand back and forth over a magnetic pick-up head until each part of a word can be identified. This process is called 'track reading'. The dialogue track is analyzed and the information is charted up onto camera *exposure sheets*, sometimes called 'dope sheets' or 'camera charts', as a guide for the animator.

Dialogue can now be accurately analyzed using digital sound tools such as SoundEdit16 which allows you to 'scrub' back and forth over a graphical depiction of a sound wave. When using a digital tool to do your track-reading, its vital that the frame-rate or tempo is set to 25 fps (frames per second), otherwise your soundtrack may not synchronize with your animation.



The timeline of 'Flash' showing a sound waveform, individual frames and the 25 frames per second setting.

THE DOPE SHEET

Dialogue is charted up in the sound column of the *dope sheet*. Each dope sheet represents 100 frames of animation or 4 seconds of screen time. Exposure sheets have frame numbers printed down one side making it possible to locate any sound, piece of dialogue, music beat or drawing against a frame number. This means that when the animation is eventually photographed onto motion picture film, it will exactly synchronize with the soundtrack.

Dope sheets and the information charted up on them provide an exact means of communicating the animator's intent to those further down the production chain so that everyone in the studio understands how all the hundreds or thousands of drawings are to come together and how they are to be photographed under the camera. (See your 'Exposure Sheet' notes for an example of a typical dope sheet). Dope sheets employ a kind of standardized language and symbology which is universally understood by animators around the world. Even computer animators use dope sheets! Get to know and love them.

ANALYSING DIALOGUE

There is an art to analysing dialogue. Sentences are like a continuous river of various sounds with few obvious breaks. More often than not, the end of one word sound flows directly into the next. It is our understanding of the rules of language that gives us the key to unlock the puzzle and to resolve each individual word.

English is not a phonetic language and part of the art of good lip-sync is the ability to interpret the sounds (phonetics) you are hearing rather than attempting to animate each letter of a word. For example, the word 'there' consists of five letters yet requires only two mouth shapes to animate, the 'th' sound and the 'air' sound. The word 'I' is a single letter in its written form but also requires two mouth positions, 'Ah' and 'ee'. Accents can also determine which mouth shapes you choose. Its actually easier to chart up dialogue in foreign language even though we can't understand it.

The simplest lip-sync involves correctly timing the 'mouth-open' and 'mouth-closed' positions. Think of the way the Muppets are forced to talk. Their lips can't deform to make all of the complex mouth shapes required for true dialogue, but the simple contrast of open and shut makes for effective lip-sync if reasonably timed. More convincing lip-sync requires about 8 to 10 mouths of various shapes. (See the attached sheet for some typical mouth positions).

IN PRACTICE

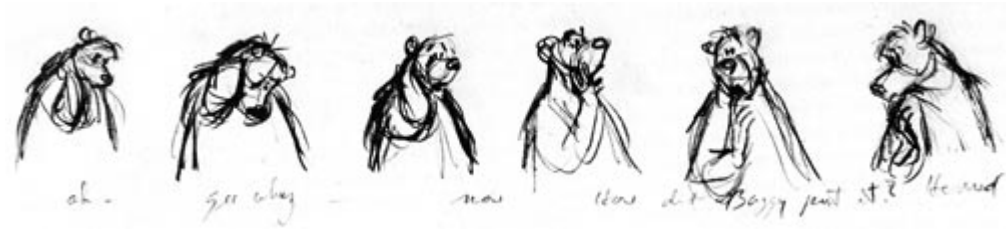
As you work through a dialogue passage, it quickly becomes apparent that the key mouth shapes can be re-cycled in different combinations over and over again so that we could keep our character talking for as long as we like. We can use this to advantage to save ourselves work. If a character's head remains static during a passage of dialogue, we can simply draw a series of mouths onto a separate cell level and place these over a drawing of a face without a mouth. Special care should be taken to design a mouth so that it looks as though it belongs to the character. Retain the same sort of perspective view in the mouth as you have chosen for the face to avoid mouths that look as though they are merely stuck on over the top of the face. Remember too, that the top set of teeth are fixed to the skull and its the bottom teeth and jaw that do the moving.

Sometimes the whole head can be treated as the animating 'lip-sync' component. This enables you to have a bottom jaw that actually opens and drops lower and also allows you to work stretch and squash distortions into the entire face. Rarely does any one mouth position have to be on screen for less than two frames. Single frame animating for lip-sync usually looks too busy. In-betweens from one mouth shape to the next are mostly unnecessary in 'limited' animation unless the character speaks particularly slowly. Therefore the mouth can snap directly from one of the recognized key mouth shape positions to the next.

BODY LANGUAGE

Talking heads can be boring and, without the richness of detail and texture found in real-life faces, animated ones are even more so. Gestures can tell us something about the personality of a particular character and the way it is feeling. Give your character something to do during the dialogue sequence. The use of hand, arm, body gestures and facial expressions, in fact involving the whole body in the delivery of dialogue, makes for something far richer to look at than just watching the mouth itself move. These gestures may wild and extravagant, a jump for joy, large sweeps of the arms, or as small and subtle as the raising of an eyebrow.

Pointing, banging the table, a shrug of the shoulders, anything may be useful to emphasize a word in the dialogue or to pick up a sound accent which helps gives the audience a clue as to what the character is feeling and absolutely gives the animated character ownership of the words. The delivery of the dialogue during recording will often dictate where these accents should fall. Mannerisms help establish character too. A scowl, a scratch of the ear, or some uncontrollable twitch or other idiosyncratic behavior.



Disney animator, Frank Thomas, uses rough thumbnail sketches to work out key poses for a dialogue sequence for Baloo in Jungle Book.

THE ANIMATOR AS ACTOR

Character animators often refer to themselves as actors. All actors must understand what motivates their characters and what kind of emotional context is required for any given scene. More on this later, but suffice to say that you must try and animate from the inside out. That is, to know the inner thoughts and feelings of your character, and to try and express these externally.

TIPS

When charting up 'dope sheets', always use a soft pencil and keep an eraser at hand. You'll be making plenty of mistakes to start with. The best way to begin mapping out a dialogue sequence is to divide the dialogue into its natural phraseology. Draw a whole lot of thumb-nail sketches in various expressive poses and decide which ones best relate to what is being said and which might usefully underpin the way a line of dialogue, or a word, is delivered. Animate gestures and body language first, then, when you are happy with the action test, go back and add in the mouth afterwards.

Having arrived at several expressive gestural poses, don't throw this effort away by having them appear on the screen for too short a time. Save yourself work by wringing out as much value from these strategic poses as you can before moving on. Disney rarely stopped anything moving for too long exploiting a technique his studio developed called the 'moving hold' in which the characters almost, but never quite stopped moving when they fell into a pose. Loose appendages come to a stop after the main mass of the character had reached its final position, and before any part of the character stops entirely, other parts begin to move off again. That's great if you have a vast studio to back up the production where each animator had an assistant and an in-between to do a lot of the hack work. You are a one person band, so learn the value of the 'hold'.

Unless your character is a particularly loud and overbearing soul, most lip-sync is best underplayed, except for important accents and vowel sounds. This is especially true where a film's style has moved

character design closer to realistic human proportions. In this case minimal mouth movement is usually more successful. Much lip-sync animation is spoiled not so much by inaccurate interpretation of the mouth shapes required, but by undue emphasis on the size and mechanics of the mouth. Been there done that to my embarrassment.

The audience often watches the eyes, particularly during close-ups, so emphasis and accents and can be initiated here even before the rest of the face and mouth is considered. Speak to me with thine eyes - its a powerful way of getting a character to communicate inner feelings without actually saying anything. Even the act of thinking of words to speak can be expressed in the eyes.

Animated characters need to breath too, especially where indicated on the sound track. Its also a good idea to anticipate dialogue with an open mouth shape that lets the character suck in some air before forming the first word.

STYLE

Approaches to lip-sync can be just as varied as the different stylistic approaches to character design - simple, elaborate, restrained, exaggerated - busy with teeth and tongue, or just a plain slit. Every individual animator's approach to lip-sync is different too. In large studios where more than one animator is in charge of the same character, extensive notes and drawings will instruct the team how to work the mouth to keep it looking the same throughout. The way a mouth might work is very often determined by the design of the head in character model sheets. Think of five o'clock shadow on the faces of Homer Simpson or Fred Flintstone and the way this bit of design can pulled off to make the mouth move. Sometimes mouths are simply hidden behind a wiggling mustache.

The Simpson’s, South Park, Reboot, UPA stuff (Mr McGoo), Charlie Brown (you never see teeth), the distinctive lip-sync of Nick Park's Creature Comforts and Wallace and Gromit (since parodied by one of our graduates, Nick Donkin, in a Yogo commercial) are all based on a stylistic solution than fits their characters' designs. I'm always amused by the Japanese approach to lip-sync. A petite young lady will have a tiny mouth which occupies about .01% of her face, but sometimes it can open up to become a gross 60% when she gets agitated!

Along with the application of computer technology to nearly every aspect of animated film production, not only 3D but also in tools for 2D animation, has come an increasing effort to automate the process of lip-sync. "Why", software designers and producers are asking, "can't the computer analyze a sound wave form automatically and then determine which mouth shapes to use?" There are lip-sync plug-ins for 3D animation that create a muscle-like structure in the mouth area of a 3D character which can be made to deform according to a predetermined library of shapes or 'morph targets'. The children's animated series, ***'Reboot'*** uses this technique. There are also tools which allow the animator to quickly try out mouth shapes against a piece of dialogue. Check out 'Magpie' at URL:

http://www.thirdwishsoftware.com/magpie.html

Well blow me down and shut my mouth! Now there is a piece of software which will do the analysis for you and chart up the phonetic breakdown into an electronic dope sheet. You can throw away that old gang synchronizer. Its called dubAnimation

dubAnimation

www.dubstudio.com/ english/dubAnimation.htm

Look at the way **dubAnimation** writes up its electronic exposure sheet. Some letters of the cursive writing are extended to indicate the length of that particular phonetic. This is just the way animators used to write up their exposure sheets. What a clever little tool!