entire books have been written about special FX in animation. For brevity’s sake, I will cover some of the elements in a cursory manner to give you a survey course in creating special FX in a Flash-animated cartoon. Like most things in life, and especially in Flash animation, there are many ways to achieve the same result. I will show you some of the methods and tricks that I know, as well as some things that have been passed along to me. My goal is to show you some of the principals of special FX in Flash so you can extrapolate and bend these principals into stunning FX of your own. Special FX that are basically camera moves were covered in Chapter 8.

Years ago, when animation was created using acetate cels, the FX animator was limited to the number of levels he or she could utilize. It was common to limit cel layers to four or five because as each cel layer was added, it diminished the background and other elements beneath it. Many of the FX created then were made with the skill of the cameraman. For example, if a character had a shadow underneath him or her, the special FX artist would draw the shadow as a round shape under the character. In turn, the cel painter would paint the shadow shape completely black. If this was photographed as it was, the shadow
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shape would've looked like a blob of black tar underneath the character. It was the cameraman who, following instructions from the special FX artists on the exposure sheet (dope sheet), would photograph the shadow at 50-percent exposure (or whatever percentage the FX artist deemed appropriate), thus finalizing the illusion of a shadow underneath a character. A special FX artist had to be well versed in the optical effects capabilities of the rostrum camera.

Welcome to Flash animation and its ability to create spectacular special FX. Many of the technical aspects of creating FX have changed since the age of the cel, but the basic principles of special FX animation haven’t changed at all. An artist creating FX for a Flash cartoon must follow the same physical laws for the FX being created, such as water, fire, smoke, and so on. Many of the FX demonstrated in this chapter are adapted from classical 2D principles and therefore are timed on a 24 frames per second (fps) rate. Many of the FX look better if they are timed on ones (in other words, there is a new drawing for every frame; 24 fps = 24 drawings for every second).

Unlike the old cel animation layer limitations, you can use as many layers as you need in Flash. Even the relatively new 2D ink-and-paint systems can’t match Flash’s ability to manipulate layers. An ink-and-paint system can utilize as many layers as needed, but Flash can have layers within layers by using animated symbols. No ink-and-paint system can come close to Flash’s layer tools.

Many other aspects of production have changed because of Flash (such as pipelines, departments, and schedules), and special FX are no exception. A traditional animation pipeline sets apart special FX from character animation. Traditionally, special FX is a totally different department with its own artists, supervisors, and coordinators. However, a typical Flash production doesn’t split the animation department into separate entities. The typical Flash setup has animation artists laying out special FX, animating the characters, and finishing the FX. There might be some animation artists who are more adept at special FX than others in the animation department, but the team as a whole takes the animation from soup to nuts. In addition to condensing the animation department, Flash has another unique ability—it can reuse all of the special FX over and over. Once an explosion, smoke, or other effect is created, you can save it as an animated symbol in the library. On a production such as a TV series, this saves a lot of time and keeps the FX consistent throughout the series.

No matter which special FX you need to create, there is one commonality with regard to creating them—you need to do some research (in other words, observation). The famed Disney artists didn’t just start drawing their FX without first doing some intense observation of the special FX they were trying to achieve. For one of their animated films, the artists needed to know how bubbling lava would look. To simulate the lava, the studio built a contraption filled with mud that had air bubbles pumped through it. The artists sat around the bubbling mud drawing the different stages of a lava bubble. They even filmed it in slow motion to capture all the details in movement that escape the eye but give the animation more believability. It’s not feasible to go to such lengths as the old Disney artists did, but given the vast amount of information just a mouse-click away on the Internet, you can do some research. If you need to animate water pouring out of an ornate fountain, arm yourself with a sketchpad and a digital camera and visit a local fountain in your city. The firsthand observation will produce far better results.

Without a doubt there are many types of special FX. I have chosen to break them into four groups according to their similarities—character, atmospheric, fire, and water FX. You might categorize them differently, but for clarity’s sake these four groups will suffice. Character FX have things like taggers and zips. Atmospheric FX covers things like steam, smoke, lightning, and bubbles. As you might have guessed, fire FX works with flames, large and small. Water FX is the last category because it is the most complex. Some of the FX are made up of combinations of the categories I have made (for example, characters in water). Use your imagination and experiment by mixing and reusing the different FX to create new ones—and above all, have fun doing it.
You can see some of the best examples of special FX for characters on the old cartoon shorts from the golden era of animation. Take the time to view an old Warner Bros. Looney Tunes cartoon or any cartoon directed by Tex Avery (especially Señor Droopy) to study how the masters manipulated the characters. The best method is to watch a cartoon straight through and then watch it frame by frame so you can see most of the little cheats and tricks. I learned many tricks for FX by taking advantage of single frame video playback. (If you’re going to borrow, borrow from the best!)

**Motion with Zips, Blurs, and Multi-Image**

The type of motion blur you use on a character depends on the style of animation you have chosen for the film. You must maintain consistency in FX or the film might look like it was directed by several people. Animation doesn’t necessarily need to be constrained to the three types of motion blurs we will address (zip, blur, and multi-image); you can use many of these techniques successfully in combination. If a director has a particular style of blur FX in mind, then the animators should mimic that style unless there are instances in which another style can be used.

I have chosen to demonstrate three types of motion FX on a character—zips, blurs, and multi-image. As you can see in Figure 9.1, the same character is shown in motion using the three basic FX. Each is as valid as the next, but they do offer a different viewing experience. When you create a motion effect for a character, experiment with these three and try combinations.
There are other versions of motion FX, such as ghosting a character. Ghosting is really a variation of a blurring effect, but in its simplest form. The trick to ghosting is to take the previous frame of the character and turn down its alpha level. This can be progressed to zero alpha after three levels. Ghosting is used more for replicating a cheap slow-motion effect. The Beatles’ animated feature, *Yellow Submarine*, effectively used ghosting. Figure 9.2 shows an example of ghosting.

**Zip Motion**

Motion FX are used after a character first makes an antic. If you are not familiar with animation slang, an *antic* is the anticipation of a movement usually made with a movement in the opposite direction. The rule is, before you go one way, first go the opposite way. Go back before you go forward, go up before you go down, and so on. A good example of an antic is a pitcher on a mound in a baseball game. The pitcher doesn’t just shoot the ball out of his hand like a shotgun; he winds up slowly. The spectators anticipate his next move, the throwing of the ball.

The zip motion effect, like its name implies, is a quick illusion of motion that usually only lasts a frame or two (on a frame rate of 24 fps). You can use the zip motion effect to show a character exiting the screen very quickly, thus saving time animating walk cycles. Hanna-Barbera Studio used this technique effectively. You
can also use it for less dramatic movement, such as a bat swing, quick arm or leg movement, or a vehicle moving quickly.

The zip effect is demonstrated in Figures 9.3 through 9.7. Figure 9.4 shows the antic where the character moves his body and limbs in the opposite direction of where he’ll ultimately exit. Figure 9.5 shows the beginning of the zip. This pose is timed to be very close to the antic pose that precedes it because it builds the energy with which the character will zip off screen in the next frame. This beginning zip pose has elements of a zip and a blur. Figure 9.6 is the actual zip effect, which lasts one frame—any longer and the illusion of movement is lost. I created this effect by making the running pose, stretching it, and breaking it up into raw vectors. You then slice the raw vectors into horizontal lines using either the Eraser tool or the Lasso tool. Figure 9.7 shows the finishing touch of adding a cloud of curling wind to highlight the quickness of the movement.

**Blur Motion**

The blur effect is essentially stretching an image toward the direction of the movement. You can create much of this effect very quickly in Flash by using the Free Transform tool directly on a symbol or by breaking apart the symbol and using it on the raw vectors. It’s a very fast way of creating the illusion of
movement. Warner Bros. used the blur effect extensively in their classic, *The Dover Boys*, directed by Chuck Jones in 1942. Today, the blur effect is used extensively in *Johnny Bravo* on the Cartoon Network.

Figures 9.8 and 9.9 demonstrate the blur effect. You can make this effect in one or two frames. I chose to stretch out the character's symbols in the running pose. If you look at many of these effects in a single frame they sometimes look strange, but if you see them as a whole animated sequence the motion effect looks great. There have been many instances in productions when a person with an untrained eye has looked over a piece of animation frame by frame and incorrectly stated that the character was off model or that the drawings weren't made correctly in a single frame. Animation should be looked at and judged as a fluid piece of work. What appears weird in a single frame that lasts 1/24th of a second might look spectacular in motion.

**Multi-Image Motion**

Multi-image is another great effect to show quick movement. You can easily do this in Flash by inserting extra arms, legs, or other elements during frantic motion. As you can see in Figure 9.10, I used extra legs to create the illusion of quick movement. You can also achieve this by using a blurry cyclonic cloud and adding multiple feet and legs, as shown in Figure 9.11. Chuck Jones used many multi-image effects in the Coyote and Roadrunner series of Warner Bros. shorts.
Staggers, Strains, and Vibrations

There are instances (especially in squash and stretch) when a character is hit by something big and vibrates from the impact or strains to lift something very heavy. A character might make a classic take (shaking in mid-air with eyes bulging). You can use relatively few drawings along with a particular timing sequence to create a stagger or vibration effect on a character. Flash makes these character FX very easy to create by copying and pasting frames and varying their timing accordingly. I have broken this category up into two categories (staggers and strains and vibrations) because even though they use the same technique of drawing and frame manipulation, they go about it differently.

For those of you who are new to animation and its lingo, a take is an anticipation of an accent in the animation, such as shock, which is followed by a settled character pose. The master of takes is the famed animation director, Tex Avery. For reference, please watch Tex’s wolf in MGM’s *Northwest Hounded Police.*