So you want to be a technical writer? Part two

Before getting to the subject of Part two, I'd like to cover a writing basic that I omitted in Part One. Page numbering. For anything more than a page or two, page numbering is essential. This is yet another way of making your article editor-friendly. That is to say: easy to read, easy to edit, and easy to keep track of.

Part two will focus on photography, especially digital photography as it pertains to archiving safe information and submitting technical articles.

When I was a teenager in New York City in the 60's I lucked into a job as an assistant for a fashion photographer. I worked for him for two summers and occasionally on special jobs during the school year. My interest in photography continued and it led to yet another part-time job as a film processor and black and white print maker for a custom photo lab. Between these two jobs I picked up a lot of information, as well as some great tricks, mostly while listening to new photographers asking old pros every question they could think of.

The most common question I've been asked is: "***What features should I be looking for in a digital camera?***" Well, this isn't an easy question to answer. I am certain that with lots of time on your hands and an unlimited budget you could get just about anything you wanted. Determining what you want and also what you are willing to spend for it is the hard part. When I bought my first digital camera, the pickings were slim, that was three cameras and seven years ago. All of these cameras have served me well. You have many more choices now.

Here are some of the features I would be looking for in a new digital camera:

1. A good quality, glass lens with at least 3X optical zoom.
2. Commonly supported storage media: Floppy disks, Smart media, Compact flash and Mini-DV are all acceptable. These formats are not

likely to disappear soon. Avoid proprietary storage devices that may not be supported beyond your camera model or by third party vendors.

3. Close focus or Macro mode, allows you to shoot as close as one centimeter (0.39”) from your subject.
4. An optical as well as LCD viewfinder.
5. A good quality lens cover (preferably built-in and automatic). I hate forgetting to remove detachable lens covers. They also get lost.
6. A “hot” flash-shoe so that you can use off-camera flash units. Most digital cameras aimed at the consumer market come with only a built–in, dedicated flash with only limited features.
7. Automatic, as well as some degree of manual exposure control.
8. Auto and manual focusing capabilities.
9. Multiple recording modes and advanced compression.
10. Several resolution capabilities from e-mail size 320X240 up to at least UXVGA 1600X1200.
11. The ability to power the camera from both AC and an external, long-life, rechargeable, DC power pack, as well as standard throwaway batteries.
12. Small and lightweight is good. You’re more likely to carry and use it if it’s compact. Don’t expect to get all the bells and whistles on a compact model. There are compromises to be made regarding features Vs size.

Photopoint.com is an excellent source of information and reviews of the current crop of digital cameras. Just like Popular Photography and ShutterBug, there are also several magazines dedicated to the digital niche of the camera market. My best source for good deals on digital cameras and photo equipment in general is B&H Photo in New York. They have ads in all the popular photo magazines and they are also on the web. B&H Photo has an excellent reputation among professional

photographers and they've also been around for 40 years. Their quarterly catalog is considered the "Photo Equipment Bible". "Their web address is: http://www.bhphotovideo.com.

Film Vs Digital

In the days of chemical/film based photography, it was necessary to print at least a "contact sheet" of an entire roll of film before you knew if even one of your shots "came out". Think of the waste in time, film, processing and printing charges! In the digital age, it's no longer absolutely necessary to print any of your shots. Unwanted shots can be eliminated, right in the camera, with the push of a button. The savings from this feature alone, over a years time, can more than pay for a good digital camera.

You can archive and store digital images on your PC and view them on your monitor or TV anytime you like. You can make digital copies and send them to grandma on videotape or as a file attached to your e-mail. You can share them with your friends by making "slide show" videotapes or by posting them to any of a dozen free or low-cost photo-hosting websites.

Of course, you can certainly print your photos if you want, but a trip to the photo processor isn't required. You can print excellent images with today's color printers.

I could go on and on about the virtues of digital photography, but I won't. You'll discover the value soon enough. Getting a camera (whether film-based or digital) is only the first step. Learning how to use it to achieve the desired results is the next step.

Safe photo basics

Frequently the demands of technical photography require more than just setting your camera to "AUTO" and snapping away! The techniques used in safe photo archiving and for technical articles are very similar (if not identical) to those used by crime scene technicians, forensic photographers and forensic

locksmiths. It is possible to experiment and teach yourself what you need to know, but there are also several good books on the subject. Classes are also available at the annual ALOA convention and many state and local locksmith associations.

What should you be taking photographs of? It is essential to take detailed shots of:

1. Exterior of the whole container from an angle which shows the height, width and depth.
2. The exterior of the full door.
3. Close-ups of identifying and/or distinguishing details such as:
    a) Bolt control handle
    b) Dial and ring
    c) Hinges
    d) Keyholes and any available keys
    e) Escutcheons fascia plates and trim
    f) The relative position of all of the above
    g) Any rating or makers' labels and other important markings

4. The full interior of the door, with the back panel both installed and removed. Bolt-works should be shown both fully extended and fully retracted.
5. The edge of the door showing door thickness and the position of door bolts fully extended.
6. Detailed close-ups of locks, time locks, external re-lock devices, glass, cable runs, triggers, bolt-work detent mechanisms etc.
7. Penetration points.
8. Any other details that make your opening or servicing methods and the details of your article easily understood.

Basic photographic techniques

A thorough understanding of your camera's features, capabilities and limitations is essential. Take the time to read the manual thoroughly and keep it in your camera bag for quick reference. Take lots of pictures and be critical of them. Fortunately, the only expenses involved in experimenting with a digital camera are batteries and your own time. Unfortunately, this can run into a small fortune. You might want to invest in some long-life, rechargeable batteries.

Your photos of safes, parts, and interior layouts should be sharp and clear. They should be well exposed (with good contrast) so that the details you are trying to preserve will stand out. Pay attention to composition, depth of field and shooting angles so that the features you are trying to highlight are obvious.

Try shooting from different angles. This adds depth and relational information to your images. Straight-on angles may be sufficient for some shots, but they tend to flatten-out the details.

Experiment with the exposure settings of your camera to learn its range. "Bracketing" is a technique used by professional photographers. This means taking several shots of the same subject while varying your exposure settings over a predetermined range (usually 2-3 f-stops). This helps you to learn the exposure range and peculiarities of your camera. Shadows and glare should be avoided. Try to eliminate any bright spots from surrounding reflections and unintentional light sources. These can fool your camera's exposure system into thinking it has more light than it needs.

Flash should be used only when absolutely necessary to provide the correct exposure. An off-camera flash can make all the difference in dealing with distracting glare and detail-eliminating shadows. Multiple flashes from different angles may also be required for very difficult lighting situations.

Flash has a tendency to wash out all of the detail when in close-up or macro mode. Some flash units have varying output. If yours doesn't, try using a piece of translucent paper or tape over the flash tube. This can reduce the output substantially. Experiment with materials of different density and color. Keep an assortment of your favorites in your camera bag. I've found that a POST-IT works very well.

Blur-producing camera shake should be avoided by using a steadying device. Tripods come in many different sizes and designs. Some will even fit in your camera bag. There are a variety of other methods and fixtures for holding your camera steady. These include the walking-stick-type mono-pods, clamp-on devices, and magnetic or suction type tool holders. Experiment with the ready-made kind or make your own. You'll see a big difference in the quality of your shots.

When a hand held shot is all that's possible, you can minimize camera movement by: a) using a light touch for shutter release, breathing control and resting your camera hand against or on a fixed object, the same way you do when shooting a pistol.

Although it's a nice feature for snapshots, auto focus can sometimes cause problems, especially on close-ups. Auto focus is less effective and accurate at close range. If your camera allows manual focus, use this feature in close-up mode. Owing to their smallness, LCD displays tend to hide focusing errors. Even if you don't normally need reading glasses, I guarantee that your focusing accuracy will improve if you wear them while looking at your LCD.

Photos of individual components, especially small parts, can be improved by using a light box or a copy stand. A light box allows positioning and shooting an object with adjustable light sources that come from different directions, including below the subject. A copy stand uses variable lighting as well as a

camera mount that can be easily positioned, and then rigidly fixed to eliminate camera movement during exposure times of any length.

These are available from photography stores, on the web, and also at photo flea markets. You can also make your own versions of these useful tools. Custom-built devices can incorporate the features of a both light box and a copy stand. This is ideally suited to photos for identification and acquisition purposes, as well as gathering evidence.

In summary, don’t settle for less than you want. Don’t be afraid to delete sub-standard images and take them over with different settings. I hope I’m not over-stating the obvious, but this is how we learn and get better.

Photos intended for web posting

Many of you have expressed an interest in posting safe photos to the SafeTech Forum or to the Safe Photo Archives on ClearStar. Using a digital camera is the easiest way to accomplish this.

Digital photos that will be used for this purpose don't have to be very large. VGA (640 X 480 pixels) will usually show the necessary detail because in most cases it will only be viewed on a computer monitor. On the other hand, if your intent is to print your photos as well as post them, use a larger JPEG. Although it may require scrolling to view the entire image (depending on the size of your monitor) 1280 X 960 will provide at least a 4" X 6" print with very good detail when printed at 300+ plus dots per inch.

Image size

Most currently produced digital cameras are capable of recording images of at least one megapixel. What’s a megapixel? To understand the meaning of this term we need to answer two other questions first. What’s a pixel and what’s a dot? These terms describe the smallest elements of visual

information found in a digital image file, on a computer screen, and on the printed page. Photos, illustrations, backgrounds, screens and text are composed of these.

Pixels are the basic elements of digital images as recorded by digital cameras, scanned or displayed on computer monitors and TVs. Depending on the color depth of the equipment used to capture and display the image, each pixel can have as much as 36 bits of information packed into it.

For example, one square inch of a 24-bit color image can contain more than 64 kilobytes of digital information. That's equivalent to the RAM that was available to the first personal computers or full a page of formatted text. This information describes: brightness, contrast, shading, color and hue for each pixel in your image.

It also contains all the data that is required for your printer to interpret these elements and print the image. This data is required to combine most printer's four available ink colors (CMYK = cyan, magenta, yellow and black) to create a printable representation of the three channel (RGB = Red, Green and Blue) of your monitor display.

Dots are the basic elements of the printed page. If look at the printed page with a microscope, you would see these dots in pictures, line screens, and even (depending on the printing method) the text of a sentence. It may appear solid to the naked eye, but it isn't when magnified 20 times.

Computer monitors display images and text at a resolution of 72 PPI (pixels per inch). Paper printing methods vary in resolution and can range from 150 to 1200 DPI (dots per inch) or more, depending on the printing process.

What's a megapixel? A megapixel is 1024 pixels X 1024 pixels. Here are some examples of common computer graphics standards to help you understand image and file sizes.

The table below represents some relationships for typical 256-shade grayscale images. I use grayscale to simplify matters. The human eye is capable of discerning 256 levels of gray and millions of colors. Of course some of us are deficient in this area. Approximately 40% of all males suffer from some degree of color blindness. Color image values will be higher and will result in larger files and subsequently larger download times. Use this table as a general guide.

Grayscale uncompressed image size comparison chart

Format (@ 72 ppi)	Screen size (inches)	Image size (pixels)	Image size (megapixels)	Printed Yield (inches @ 220 dpi)	File size (uncompressed)
E-Mail 320 X 240 pixels	4 3/8" X 3 1/4"	76,800	0.07	1 7/16" X 1 1/16"	72 KB
VGA 640 X 480 pixels	8 3/4" X 6 1/2"	307,200	0.31	2 7/8" X 2 1/8"	288 KB
SVGA 1024 X 768 pixels	14" X 10 1/2"	786,432	0.78	4 9/16" X 3 1/2"	745 KB
XVGA 1280 X 960 pixels	17 1/2" X 13"	1228,800	1.29	5 3/4" X 4 1/4"	1.14 MB

There are larger formats, 1600 X 1200 (1.9 megapixels), 2048 X 1536 (3.34 megapixels), and even larger. These are primarily digital camera image formats. The digital world is changing and growing as fast as new technology allows and lately it is allowing quite a bit of change. At this writing, there are professional grade cameras on the horizon that will sell for as little as $1500, that will boast CCDs with resolutions of 5+ megapixels, interchangeable lenses, and a host of other features that were previously available only on high-end, film-based, professional camera systems.

After reading the above, you might well ask: “Why don’t I just get the camera that will provide the biggest images?” Well, you could do that, but aside from being the most expensive option, there are other tradeoffs. Larger images create bigger files that take up more real estate on your storage media. Larger images also take longer to download, print and send as e-mail attachments. They are harder to manipulate, both inside and outside of your computer.

Thirty sixty-megabyte file sizes are not that unusual. I'm dating myself but I remember when the largest hard disk I could buy was 30MB? Imagine needing a CD-ROM disk or a "JAZ" cartridge to transport the equivalent of a 36-exposure roll of 35mm film. On the other hand, larger files allow you to print quality enlargements of the finer details of an obsolete safe lock ***or*** your newborn's dazzling eyes.

I know what you're thinking now: "***OK, so what you're telling me is that large image files are both good and bad?***"

BINGO! Your next thought might be, "***So what's so cool about digital photography if it's going to create more logistical problems than film based photography?***" Well, how about dollar savings, utility, flexibility, and convenience, to mention a few?

Fortunately, digital camera makers have devised ways of addressing the file size dilemma. Features such as multiple recording modes and new compression schemes have eliminated most of the problems associated with digital photography. You can now shoot the image at pretty much whatever resolution is needed for your purposes.

Multiple Recording Modes

Today's digital cameras can record pictures in several different ways. Photos can be recorded as uncompressed TIFF files, which produce the largest file sizes and also the most detailed images. A TIFF image is suitable for any other use where high resolution, large size and detail is called for, such as magazine cover art, portraits, full door vault shots, etc.

At the other end of the scale, the same subject can be recorded in a low resolution; JPEG compressed format produces a very small file, which downloads and e-mails much faster and is perfect for posting photos on the web. The main point is that TIFF files of 32+ megabytes and JPEG files of less than 96 kilobytes, as well as several midrange sizes, can be created by the same digital camera.

Compression

Besides recording in different uncompressed sizes, some cameras can record images in high compression and low compression formats. This gives a high degree of flexibility. High and low compression is relatively new. For now it's available only on 3-plus megapixel cameras.

Fortunately, new technology eventually filters down to low-end models, so don't be surprised to find economy models with what are now high-end features in the near future.

File formats

Photo editing programs are often included free with scanners or digital cameras. When using any of the photo editing programs, you will notice several choices under the "save" and "save as" menu options.

These allow saving your new digital file according to your needs, even if you used a different mode to record the image. Different formats allow different file uses. They include information that allows e-mail, webserver, editing and page layout applications to read the file and display the image. Here are a few of the more useful formats:

BMP (Bitmap) These are square pixel images and are (for the most part) limited to the resolution of your monitor screen (72 dpi). They do not print well at higher resolutions. A good example of these is low-resolution clip art files. They are characterized by jaggies (the jagged lines that make up the image) which are very obvious when enlarged or printed. An exception to this is TIFF (described below).

EPS (Encapsulated Postscript) is an object based, vector image file. It includes data that describes the file and includes information necessary for

printing the file and manipulation of its attributes from within desktop publishing applications and some object-based drawing programs.

This makes resizing images (without loss of resolution) very easy to do when laying out the page in which the image will be used. These files are primarily used for sending files to pre-press facilities and printing companies that use Postscript driven imagesetters and printing devices. These files can take up a lot of electronic real estate so their use is usually limited to professionals in the publishing and printing industry.

TIFF (Tagged Image File Format) This is not just another bitmap format. It is a universal format used by scanners and digital cameras, and also for exchanging image files between different computer platforms and image-editing applications. TIFF images can be imported directly from digital cameras and scanners into image editing software. They can be saved or printed at the original resolution of the device that created them.

TIFF is an excellent format for sending high-resolution images to S&VT via regular old "snail mail" on removable media such as a Zip disk.

JPEG (Joint Photographic Expert Group) This is another universal graphic image format. It is used for storing standard resolution images on webservers and for sending images attached to e-mail. When saving an image as a JPEG a 900k image can be compressed to as little as 48k without major resolution loss or image deterioration. JPEG is also a standard file format used by many digital cameras.

Anyone with web browser software has the built-in capability of viewing JPEG images. It is the preferred format when sending photos to Mike Oehlert for SAVTA articles and technical bulletins.

There is one annoying aspect of JPEG that needs mentioning. Unlike what happens when you save an uncompressed image file, each time you save a JPEG file the compression scheme saves it with small changes, even if you haven't changed the image by retouching, enhancing or filtering it. The process of saving the image is what triggers these changes. No other action is required on your part.

These changes are actually lost pixels in your original image, and they occur because every time you save the image, you're telling the compression algorithm to decide how to compress it and what information is important and what is not. You don't get to make that decision, the algorithm does.

The more "saves," the more the compression algorithm will change the image. We've all been taught to save frequently. We save automatically and semi-consciously on most documents, but frequent saves in compressed formats can have a degrading effect on our digital photography efforts.

To minimize these unwanted effects, I suggest saving it first as an uncompressed TIFF image. You can then fiddle and futz with it until you're completely satisfied with what you see. Then resave it as a JPEG image and send it over the Internet without any further loss of integrity.

Sending digital images

Now that we know what they are, how do we place our images on the Internet? If you're like me, you don't make your living from posting on the SafeTech Forum. It's hard to remember things that you don't do every day. Luckily, these tasks aren't as difficult as opening an unfamiliar X6.

The easiest way to post a digital image on the SafeTech Forum is to send it as a JPEG file, attached to an e-mail and addressed to the "Great and Powerful Oz", AKA Jay Long (jay@clearstar.com). This is the preferred method if your image is intended for the online SAVTA Safe Photo Archive.

If you just want to have your image appear on the forum, you can post it directly to your own Website if you have one. If you don't, you can use photo-hosting Websites like www.photopoint.com. Go to that site and follow the steps and instructions that will help you set up your membership account and to create your own web-photo album.

You can also use ClearStar's built-in Photo uploading and crunching/ optimization applications. You can get there from the "Member Services" page. Just click on any ClearStar banner where it reads "Member Services". From there, click on "Uploading Photos to ClearStar". Follow the instructions to browse your hard disk and upload your photos to the application.

Make sure your photo files are no more than 100 Kilobytes and that you use traditional, PC-type file and directory names. No spaces can be in your file or directory names.

If your photo files are too large, follow the instructions (on the same page) to use the "JPEG-Cruncher and "GIF-Cruncher" applications to reduce your image file for web publishing.

On my Mac I use a separate folder on my desktop to store photos and other items I plan to e-mail or upload. I just copy the files to that folder. This makes them a lot easier to find and send. It also insures that all the requirements for directory and file names are met.

If you have been successful, you have your image located somewhere on the Internet. Next, copy the URL (universal resource locator, i.e. web address) from that location and then fill out the other fields of your post. Next, paste the copied URL into the CSN posting form, just below the "subject field", where it reads: "***Optional Image URL".*** Be careful not to duplicate the "http://www." prefix.

Once the above steps are completed, check the preview option box and hit the “Submit” button. Within a few seconds you will see exactly what your post will look like, including the image(s) you have linked. You can then make last minute changes or hit the “Submit” button again. Your post and your image(s) will appear on the forum.

Work, Work, Work! I’m sure this all sounds like a lot of work, but it really isn’t. It’s much easier and faster than sending them to Jay via the U.S. Mail. It’s also easier than doing your taxes, reprogramming the correct time on your VCR, or replacing a faucet washer. So, time’s a wasting, no more whining, roll up your virtual sleeves and get to it.

Now that we know about JPEGs and sending and uploading them, let’s delve into the subject of photos intended for paper publishing.

Sending photos to Safe & Vault Technology

Taking and sending quality photographs to include with your S&VT articles or technical bulletins isn’t difficult. In the digital age, there’s no reason to send your article and photos via the U.S. Mail when you can send them as E-mail. Write the article as you would write a letter or anything else on your computer. You can use a word processing application (highly recommended) that has spell checking and grammar modules, or you can just cut and paste the text right into your e-mail message.

Be sure to take or save your photos in JPEG format. This is the preferred format for submissions to S&VT.

Use the image and file size guidelines (that I gave you earlier) to determine your needs. A good jpeg file size that can be uploaded and downloaded quickly and that still shows a lot of detail is approximately 100-200KB. This size results from a JPEG compression of an SVGA image of 1024 X 768 or 0.78 megapixels. This will yield a published image that will fit in the typical S&VT

column of about 2 1/4 - 2 1/2" wide at sufficient resolution. If you intend the photo to be shown larger than that, use a larger format andJPEG file size, like XVGA or larger. No more than 230 dpi is recommended for larger images.

Remember that published photo sizes are an issue for the editor to deal with. You can certainly make suggestions, but the editor is not obliged to comply with your wishes. There are many concerns that influence published photo size.

One concern, that you have a great deal of control over, is the quality of the original photos. A photo that is well composed (shows the necessary detail and perspective), is sharply focused, and properly exposed is a lot easier to work with. It can also be enlarged, to a certain degree, without a great deal of image degradation.

Although most photos and illustrations that are published in S&VT are grayscale images, you do not have to concern yourself with converting them. A color JPEG image is perfectly acceptable. The editor can easily convert it to whatever is needed.

When you have your photos and article copy just the way you want it, take the plunge and send it to Safe and Vault Technology's editor Mike Oehlert (dialcenter@aol.com) and then get started on your next submission. The address for submissions via regular U.S. mail SAVTA 3003 Live Oak Street Dallas Texas 75204. Attention: Mike Oehlert - Editor.

By the way, you do know that you get paid for each and every one of your articles that get published, don't you?

I am looking forward to seeing a flood of fresh, interesting, well-written, well-illustrated safe articles in the next few months. Since there is currently a year-

long contest (with cool prizes) being offered for the “Best of Series”, “Best Article” and “Best Tech Tip”, I hope that there will be some serious competition.

Your questions and comments concerning this article are welcome. E-mail Ken Doyle at sfhitman@pacbell.net