LEARNING OBJECTIVES

- Understand the basic components of crime scene documentation.
- Identify the three photographic ranges in crime scene photography.
- Understand the concept of "fair and accurate" standard of evidence photography.
- Identify the various types of and perspectives on crime scene sketches.
- Differentiate between sketching and mapping.
- Identify the necessary components of a final sketch.
- Identify the various methods of crime scene mapping and know which is best for different crime scenes.
- List the crime scene search patterns and when/where they are most effective.

CHAPTER 6

Methodical Approach to Processing the Crime Scene

It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.

Sherlock Holmes, in *A Scandal in Bohemia*
Sir Arthur Conan Doyle (1859–1930)

KEY TERMS

Close-up Photographs
Crime Scene Sketch
Final Sketch
Legend
Mapping
Mid-range Photographs
Overall Photographs
Photo Log
Photo Placard
Rough Sketch
Swath

Methodical Approach to Crime Scene Processing

The first step in crime scene processing is to establish a plan. However, it is not always a simple task to establish a plan as to how to approach crime scene processing efforts. Crime scenes are complex and confusing creatures. In Shakespeare's 1600 play, *Hamlet*, Polonius says, "Though this be madness, yet there is method in it" (Act 2, Scene 2). All steps of crime scene response should be calculated and methodical to ensure the most positive result. It is for this reason that investigative personnel should take the information garnered from their walk-through and develop a systematic plan for proceeding with the processing efforts. A systematic plan will ensure that nothing is overlooked and no pertinent evidence is lost in the course of the subsequent investigation.

All crime scenes are different, but there are guidelines that exist in all cases that serve as a framework for the processing efforts. The general crime scene processing structure is as follows:

- Initial scene assessment
- Search for and recognition of physical evidence
- Documentation of physical evidence
- Collection of physical evidence
- Packaging and preservation of physical evidence
- Crime scene reconstruction

These are guidelines for the overview of efforts involved with the processing of a crime scene. However, often these tasks are not separate from one another but may overlap, as will be discussed. In any case, investigative and processing efforts should start in the least intrusive and destructive manners and progress to the most intrusive and destructive. Processing the scene in this way will ensure evidence integrity for as long as possible. This section concentrates on the processing activities following the initial assessment. The first phase is documentation.

Documenting the Crime Scene

Documentation efforts at the crime scene begin the moment that an officer gets a call and continue until the case is closed. This is often the most time-consuming but also the most important step in crime scene investigation. It is the purpose of crime scene documentation to record and preserve the location and relationship of discovered evidence, as well as the condition of the crime scene as it was when the documenter was observing it. For the purposes of this text, there are four primary methods of documentation that are involved in CSI. These are:

1. Reports and note-taking (sometimes audio)
2. Photography
3. Videography
4. Crime scene sketching and mapping

The end purpose of documentation should be the successful notation of all observations made within the scene of the crime, which will ensure the individual engaged in the documentation efforts will best be able to recall the events in the future. This is particularly important as this information may be presented in court. As Sherlock Holmes explains in *The Five Orange Pips*, "The observer who has thoroughly understood one link in a series of incidents should be able accurately to state all the other ones, both before and after" (Doyle, 1892, p. 81).

Each of these methods is an integral part of crime scene documentation. None is a substitute for another. While some of the methods might appear to be redundant, this serves to corroborate the other methods, ensuring that nothing is overlooked and that all areas are accounted for. Notes and reports are not sufficient by themselves because they do not accurately portray the scene in detail the way photographs can. However, photographs are not sufficient by themselves, as they often need more explanation, which is the purpose of reports and notes. Sometimes notes are dictated into a tape or digital recording device, yet at some point are transcribed into a written format for court purposes. Here, therefore, notes and reports are defined as being both audio and written. While photographs are a good tool for documenting the visual aspect of a scene, nothing brings the scene to life as much as videotaping. However, video cannot be used in the same manner as photographs from a forensic analysis standpoint when documenting physical evidence.

Because each type of record has its place in documentation efforts, all must be considered and utilized when available and appropriate.

Written Documentation/Reports

There is an old adage in police work that sums up the importance of documentation: "If it's not written down, it didn't happen." To a large extent, this is true. It is important that each step of the process and every action taken be documented extensively by using notes, photographs, sketches, and reports. The written notes begin with the first responder and continue throughout the investigative process. At each step, those individuals involved in the process are responsible for documenting all observations that they made and all actions they performed. This includes documentation of efforts that resulted in negative findings as well. An example of a negative finding is a search for latent fingerprints that yielded nothing.

Each department typically has its own format and requirements for various levels of documentation within the investigative process. At the very basic level, written documentation consists of:

- Notification information
- Arrival information
- Scene description
- Victim description
- Crime scene team

Essentially there are two types of written documentation. The first are notes. *Notes* are brief, often in a bulletpoint format, documentation of efforts, observations, and actions. Notes are taken at the time of the incident and are informal. The second type of written documentation is a report. *Reports* can be either fill-in-the-blank forms that are utilized to record pertinent information relating to a case or they can be of narratives. These are formal and are typically unique to a particular department and specific to a certain type of scene or case. Narrative reports are formally written, usually in the first person, active voice, and past tense. They document all actions taken by the report's author, and all observations he or she made.

Taking Notes

Field notes are typically the first step of written documentation, and are typically conducted while at the scene or during the initial stages of the investigation. Note takers should record field notes while they are still under the stimuli that made something seem noteworthy, not later. Field notes constitute the most readily available and reliable record of the crime scene. They do

Elements of Field Notes

The Five Ws and an H

Who

- committed the crime?
- had a motive to commit the crime?
- was the victim?
- saw what happened?
- reported the crime?
- might know something?
- were the first people on the scene?

What

- was the relationship between victim and perpetrator?
- crime was committed?
- was said and by whom?
- evidence might there be?
- evidence has been discovered?
- is missing?
- was left?

not necessarily form a logical flow of events but rather make up a hodgepodge of information gleaned from numerous perceptions, observations, interviews and efforts. In complex investigations, the task of note-taking can seem overwhelming, but the basic principles remain the same.

Field notes are the building blocks that are used to develop hypotheses and, later, a theory of the crime. Field notes can also help to stimulate memory if and when the case goes to court. They provide the basic information for the official report, which is the foundation for trial testimony. The official report will contain numerous entries. Crime scene personnel will produce the initial report early in the investigative process; as the investigation develops and new information is discovered, personnel will add supplemental reports to the original. The compilation of these reports, in conjunction with the field notes, allows personnel to recollect the investigation in detail and thus form the backbone of the prosecution and the defense efforts.

All courtroom testimony is balanced against the documentation that personnel have accumulated, including field notes. At the time of trial, personnel may use the field notes to refresh their memory, however, doing so allows the defense an opportunity to examine the notes and conduct a cross-examination of the witness pertaining to the notes. With that in mind, personnel

- was moved?
- was touched?

Where

- did the crime occur?
- was evidence located?
- are all the witnesses now?
- were all the witnesses?
- do the witnesses live?
- is the suspect?
- was entry made?
- was exit made?

When

- was the crime committed?
- was the crime reported?
- was evidence discovered?
- did the first responder arrive?
- was the scene secured?
- was the scene released?

Why

- was the crime committed?
- was the victim chosen?
- was the location chosen?
- were the criminal implements chosen?

How

- did the perpetrator gain entry?
- was the crime committed?
- did the perpetrator depart?

Important Information

Field notes should also contain the following:

- *Identification of date and time* (the date and time of assignment to the case; the date and time of arrival on the scene).
- *Description of the location* (description of the scene on arrival, including weather, lighting, approaches, and geographic location). Information regarding the location can be useful in establishing lines of sight and the distance of visibility.
- *Description of the crime scene* (broad overview that narrows to specific noticeable details, such as forced entry, disarranged furniture, bloodstains, blood spatter, and the condition of doors and windows).
- *Listing of absent items*. What should be at the crime scene but is missing often reveals something about the perpetrator and the nature of the crime. A serial killer might

should put nothing in their notes that they would not be willing to share with the defense, the judge, or the jury. Also, all notes are available to the defense upon request, and personnel testifying from a field notebook are not permitted to remove anything from their notebook. Therefore, each notebook should contain notes about one investigation only, so that sensitive material from another investigation is not publicized inadvertently.

In some states, there is a rule of procedure with the legal process that allows the defense to inquire of the witness whether there are any other writings or statements taken or made by the witness that are not included within the official report. An affirmative answer allows the defense to request a recess and an order directing the witness to obtain the documentation and return immediately with it to the courtroom. Even if the witness is not using the notes to refresh his or her memory, the defense may still obtain them if they exist.

take a souvenir or trophy that features prominently in fantasies associated with the killings. Such a souvenir or trophy may be helpful in establishing a profile of the killer and figuring out the killer's signature (the pattern associated with his or her killings).

- *Description of wounds on the victim*. The types and locations of wounds should be recorded. If discoloration is present, its location and color should be included.
- *Photograph log*. The photographer should keep a separate photo log; if the investigator takes the pictures, he or she should place an entry in the field notes for each entry. The entry should include a description of the content of the photo, the speed of the film, the shutter speed, the distance from the object photographed, the location and direction from which the photo was taken, and the date, time, and case number or name.
- *Video log*. If the investigator is taking the video, then the following information should be recorded: the type of recording device, the type of film (if not using digital), the type of lens or lenses, and whether artificial light was used.
- *Identification of the evidence recovered and its location*. All evidence must be geographically and temporally located. It is the investigator's job to record sufficient information to adequately place each piece of evidence. All measurements should be recorded, as well as the identity of the person who discovered the evidence. To identify evidence, the investigator should provide a description of the evidence and note its location, the time discovered, who discovered it, the type of container used to store it, the method of sealing the container, the markings used on tags and evidence, and where the evidence is being kept (maintenance log).

Courtesy of Ronald Becker, JD, Professor, Chaminade Institute.

Memory is always suspect and subject to extrapolation and interpolation, the grist of cross-examination. Memory corroborated by reports and notes takes on a believability not possessed by unaided memory.

Crime Scene Photography

Entire texts have been written solely on this topic. Photographers are urged to seek out books and courses that will help them to continually refine their skills. This introduction comprises a succinct but thorough overview of the purpose and skills involved in crime scene photography.

The purpose of crime scene photography is to capture adequate images for the best possible documentation and reproduction of the reality present at the moment in time when the scene

was photographed. When attempting to shoot precisely, one must remember that photography is a mechanical means of retaining vision. When properly taken, a photograph is one of the only ways to capture an instant of time. However, the camera was never intended to replace vision, and it certainly cannot (Weiss, 2009). Crime scene photography is visual storytelling, and as such, the photographs should be a fair and accurate representation of the scene about which the story is being told.

Photographs are almost universally accepted by the courts and allowed into evidence irrespective of their image quality as long as the images contained within them are not

VIEW **FROM AN EXPERT**

Fair and Accurate

Photographic images of evidence have been presented in court for over a century. The admissibility of the images is decided by the judge. The judge may use the credibility and competency of the witness presenting the images, plus other important factors, as parameters for the decision. Opposition counsel has the right to challenge the images and to try to demonstrate that they are not, in fact, accurate representations of the evidence.

Photographs are usually allowed into court regardless of their quality. The actual photographer is rarely asked to testify about image accuracy, because the photographs are not considered as evidence but simply representations of the physical evidence.

Photographic images, whether captured on film or digital sensors, may be questioned regarding their degree of accuracy as representations of the imaged subject. In the courtroom, photographs must provide the best possible illustration of a very specific reality. In order to promote an industry-acceptable degree of quality and credibility in evidentiary photographs, professional organizations, including the Evidence Photographers International Council (EPIC), have published standards for evidence photographs.

A *standard* is an established norm or requirement. It is a formal, peer-accepted document that establishes uniform engineering or technical criteria, methods, processes, and practices. All standards for evidence photographs define *admissibility* essentially as a matter of a *fair and accurate representation of the subject portrayed*.

How are photographers and the court to interpret *fair and accurate*? *Fair* is a relative term. The judge is tasked with making the determination of what is fair, and often this call will be based on the credibility of the witness. Even poor photographic quality will not necessarily cause an image to be inadmissible if the judge believes the image is fair and relevant to the proceedings. It should be noted that there is not a standard definition or set of parameters for the term "*accurate*" Judge John Panos, a state court judge in DeKalb County, Georgia, stated, "I would like to see a standard definition of 'accurate' made and published. This can then be referred to as the standard of the industry." Why is this definition necessary? The broad definition of accurate includes some of the subtler and more technical aspects of photography, including, perspective, angle of view, and dimensionality. It is conceivable that any photographic image could be questioned.

inflammatory or prejudicial in nature (Weiss, 2009). Although it used to be necessary for a person to also be able to testify as to how a photo was developed or processed, today this is rarely the case, as the images themselves are not the evidence but rather what they represent.

Photographers often may attempt to create photographs of objects or scenes "as seen" by someone else. Undoubtedly this is an impossible undertaking, as no one can accurately document an item or moment as someone else saw it. Instead, it is an appropriate step to document the image or scene from the perspective of the viewer in approximately the same position, although not at the same moment in time (Weiss, 2009).

Terms such as color management, dynamic range, resolution, perspective, angle of view, or dimensionality may not be fully understood by the professional photographer or the attorney, let alone the juror. How many people can properly explain the difference between vision and perception, and articulate how this correlates to the accuracy of a photographic representation? It cannot be taken for granted that anyone in the courtroom understands photography on that level.

Photographers may attempt to create photographs of objects or scenes "as seen" by someone at the moment in question. Of all the purposes or goals that apply to photography, probably the most impossible is to create an image of anything exactly as another person would have seen it. It is, however, possible and much easier to take images and then use those images to help explain how it looked to you.

Thus in the real world, the definition of fair and accurate might be what the image is intended to show. In most cases, in order for an image to be a fair and accurate representation, it should show the questioned area or object in its most natural state. For example, if an attorney wishes to show the approximate physical or general area of involvement, then the judge may not be too strict in interpreting the term fair and accurate. In this case, a photograph of the scene would suffice for the purpose of identifying a location. On the other hand, if the primary purpose of the image is to illustrate exact details of a scene or object, such as the measured distance between two objects or the details of a latent print, then determining whether the image is fair and accurate will require much closer scrutiny.

If an attorney wants to show the exact distance between a crosswalk and a traffic signal, photographic experience and expertise becomes very important. If that photo, submitted as evidence was created by someone lacking a high level of experience and expertise, a judge may not allow a witness to testify that, based on the photograph, the distance between the crosswalk and the traffic signal is 25 feet.

Fair and accurate may amount to different things at different trials. It will always be a measure of the competence and credibility of the person presenting the photographs, rather than the sophistication of the camera and equipment used to create the images.

Sanford Weiss, EPIC Crime Scene Photographer
Author, *Forensic Photography: The Importance of Accuracy*

Courtesy of Sanford Weiss, EPIC Crime Scene Photographer
Author, *Forensic Photography: The Importance of Accuracy*.

Photographic Ranges and Perspectives

In keeping with the storytelling theme, the first photos taken at a scene should not be of gore or an item of physical evidence. Instead, they should be of the overall crime scene. They should set the stage for the beginning of the story. As such, there are three important ranges of photographs that are taken at the scene of a crime: overall photographs, midrange/evidence-establishing photographs, and close-up/comparison/examination photographs.

Also, it is important to remember to take a photograph of a photo placard as the first photo taken at the crime scene. A **photo placard** is a handwritten or agency-developed sheet (**Figure 6–1**) that lists pertinent case information for the photographs to follow. Taking a photo of this as the first photo on a roll of film or as the first digital photo of a case will ensure that personnel are familiar with which photographs pertain to which case, and the name of the photographer. Only one case should be photographed on a roll of film; however, with today's digital media, often several (if not more) cases are photographed on a single digital media card prior to downloading onto a computer. Photographing a photo placard will serve as a separator between the cases, so that case photos will not become commingled.

Overall Photographs (**Figure 6–2**)

Overall photographs are exposed with a wide-angle lens or in such a fashion that allows the viewer to see a large area in the scene at eye level. Their function is to document the condition and layout of the scene as found. They help eliminate issues of subsequent contamination (e.g., tracked blood, movement of items). Typically, these are shot from the four corners of the crime scene. If indoors, usually they are taken from the corners of the room, shooting toward the center. If outdoors, they are often shot from the direction of a cardinal heading (North, South, East, and West). These four photographs most likely will capture the entire scene. If not, then additional photographs from an appropriate vantage point can be taken. These overall photographs set the scene and should include street signs and addresses if possible. Also, it may be necessary to not only take overall photos facing the building or scene in question, but also overall photos facing away from the scene to show the surrounding area.

City-ville Police Department

Case #:

Date:

Location:

Photographer Name:

Photographer ID:

FIGURE 6–1 Example of a photo placard

Mid-range/Evidence-Establishing Photographs (**Figure 6–3**)

The function of **mid-range photographs** is to frame the item of evidence with an easily recognized landmark. This visually establishes the position of the evidence in the scene, with its relationship to the item's surroundings. These types of photographs are

FIGURE 6–2 Example of an overall photograph

FIGURE 6–3 Example of a mid-range photograph

the most overlooked in crime scene work. They are taken of the evidence prior to movement or manipulation and should never include a scale of reference in the photo. The evidence-establishing photograph is not intended to show details, but simply to frame the item with a known landmark in the scene. The close-up and the evidence-establishing photograph go hand-in-hand.

Close-up/Comparison/Examination Photographs (Figure 6–4)

The function of **close-up photographs** (also called *comparison*, *examination*, or *macro* photographs) is to allow the viewer to see all evident details on the item of evidence. This photo should be close and fill the frame with the evidence itself. They are taken with and without a scale. It is extremely important that photographs of this type are first taken without a scale of reference, and then with a scale of reference. The first photo shows the scene prior to contamination or manipulation by the photographer or crime scene personnel. The second includes a scale of reference with which the viewer is able to gauge the size of the item presented within the photograph. This scale will allow for a 1:1 ratio reproduction of the photograph (i.e., 1 inch equals 1 inch). Failure to photograph the close-up without a scale prior to incorporating a scale in the photo could result in the photo being inadmissible because of the allegation of scene tampering.

The preceding photographic ranges are used any time there is an item of evidence that is important and will have a bearing on the investigation. While there might be a variety of perspectives photographed, any photograph taken at a crime scene will fall under one of the preceding ranges. For instance, photographs taken from the reported position of a witness would fall into the overall range category. Those taken to show the address of a residence would fall into the mid-range category if they showed more than simply the numbers/letters and included the façade of the house or entry to the home. However, if it was only of the letters/numbers this photograph would fall into the close-up range.

Photo Logs

Regardless of the perspective or range taken, each photograph taken at a crime scene should be documented on a **photo log**. A photo log is a permanent record of all information pertaining

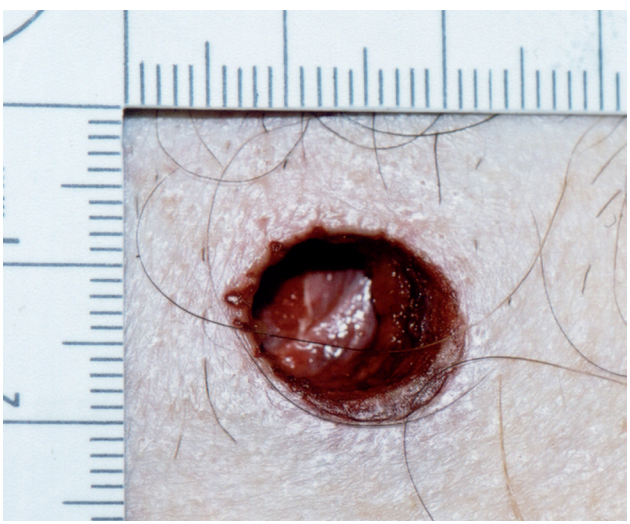

FIGURE 6–4 Example of a close-up/comparison/examination photograph

to documentation by photographs. Department policy often dictates what is found within a photo log; however, if no policy exists, the following suggestions are offered (**Figure 6–5**). Information that should be included in a photo log includes:

- Title and information block consisting of date/time/case number/agency name
- Photo equipment used
- Numerical ordering of each photo taken
- Brief description of each photo taken
- Direction facing for each photo taken
- Approximate distance from subject matter in each photo taken
- Shutter speed, aperture setting, and ISO for each photo. If photographed with conventional photography, then pertinent photographic information should be included for

Case Number:	Month	Day	Year	Page of
Location of Incident		City		Time
Victim's Name	DOB		CDL	
Photographer/ID #	Scribe/ID #			
Camera, Lenses, and Flash Used				

#	Description of Photo	Polarizing Filter (Y or N)	Tripod (Y or N)	Lens Used (if zoom, length set on)	Flash (yes/no & normal, bounce, or off camera)	Direction Facing	F-Stop	SS	Distance from subject
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

FIGURE 6–5 Example of a photo log

each. If photographs are taken in a digital format, documenting such information is not as imperative, because it will be digitally recorded when each photo is taken as part of the digital file for each photo.

The photo log should be a documentation of visual storytelling that flows from the general to the specific. The log itself is not always constructed at the crime scene, but rather the foregoing information will sometimes be included on a rough copy of a photo log or within the field notebook of the photographer and transferred onto a photo sheet at a later time, to include information pertaining to the digital properties of each photo, retrieved from the camera or computer at the time of download. Most agencies use pre-printed log sheets divided into categories for ease of recording efforts.

Order of Taking Photographs

While this manner of documentation is listed near the beginning, obviously taking overall photos is much less intrusive to a crime scene than taking close-up photos (due to movement of items and the addition of scales of reference). It therefore is important that you realize that although these are listed together, not all ranges of photographs are taken together or at the same time during a scene investigation. After the initial scene survey has been conducted, but before a detailed search or examination is undertaken, the crime scene should be photographed. However, usually this only includes the overall photographs, but if items of evidence have been located, then mid-ranges can be taken from a safe position. Close-ups are not typically taken until a thorough search of the scene has been conducted, unless the item is of a transient nature.

Guidelines for Crime Scene Photography

The following strategies have proven useful in crime scene investigations.

- Always use a photo placard on the first shot of each roll to demonstrate administrative data (see Figure 6–1).
- Always use a crime scene photo log (see Figure 6–5).
- Document the entire scene in situ as soon as possible using overall photographs.
- Photograph all fragile evidence as soon as possible.
- In the documentation stage, photograph all known evidence using close-up photos.
- As items are discovered in later stages, return and document them fully, including additional overall photographs if needed.
- Create photographs that fully demonstrate the results of additional examinations (e.g., latent prints, bloodstain pattern analysis, trajectory analysis).
- Try not to include the photographer or other people in the photographs, if possible.
- Shoot all close-up photographs with the use of a tripod.

- Close-up photos should be taken with and without a scale of reference.
- Be sure that the scale is on the same plane as the item of evidence being photographed.
- The subject matter should be parallel to the film plane/camera to eliminate distortion caused by skewed angle photographs (**Figure 6–6**).
- If in doubt, photograph it!

Crime Scene Videography

As a result of digital media gaining widespread acceptance within U.S. courts, in the last few years videography has become a routine method of documenting major crime scenes. While this is an obvious and useful method of providing visual documentation of the conditions and items encountered at the crime scene, it must be remembered that doing so is not a substitute for still photography. Each has its merits.

Video is taken to record the scene in as close to its original condition as possible, as this is an easy method to employ and is relatively quick in its application. Oftentimes, video is shot while conducting the initial walk-through as a way of recording the layout and conditions of the scene. This documentation is useful to supervisors and investigative personnel in determining logistic and equipment needs, as well as reducing official visitors by giving them the opportunity to look at the crime scene without actually entering into it themselves. It also

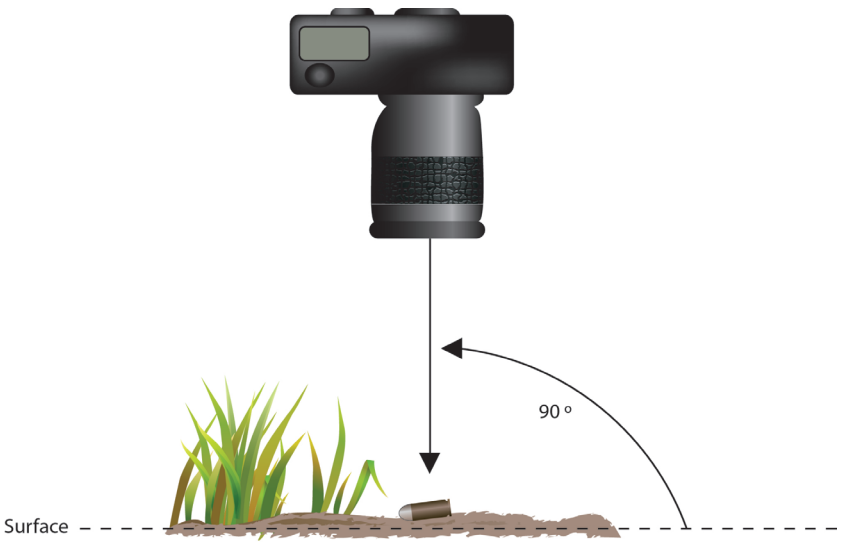

FIGURE 6–6 Example of correct camera angle for close-up photographs
Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

enables investigative personnel to later "enter" the scene as often as necessary through viewing the video without the need for a search warrant. This is especially useful if the crime scene is no longer available to personnel.

Videography is a useful method for documenting a crime scene. It can provide a perspective that is more easily understood and perceived by the viewer than those offered by notes, sketches, or still photographs. However, it must be remembered that this is a supplemental method and not a replacement for still photography or other documentation methods.

Guidelines for Videotaping a Crime Scene

While some of these points are similar to those for photography, a few key points are important to remember when shooting a moving data stream:

- Begin with an introductory placard that states case number, date, time, location, and other pertinent case and chain of custody information.
- This video should be a storytelling event. Start with a general view of the area surrounding the crime scene. Following this should be an overview of the crime scene itself. It is suggested to take overalls from the cardinal compass directions (North, South, East, West) for orientation purposes.
- Turn off the audio on the video recorder unless you intend to narrate.
- Do not move the camera too quickly by panning (moving side to side), or zooming (moving in for a close-up view) as this results in abrupt motion and bad focus.
- Unless in sunlight, always use a video strobe. Never use a flashlight to illuminate the scene.
- Do not use the zoom unless it is necessary because of an inability to get physically closer to the subject matter, or if it is unsafe to do so. The human eye cannot zoom. If the video is to be a fair and accurate representation of how the videographer observed the scene, no zoom should be used.
- Video never should be edited or altered in any manner following the initial taping. The original copy should be kept as evidence, and duplicate copies should be made for viewing purposes.

Sketching and Mapping the Scene

Sketching

A **crime scene sketch** is a permanent record of the size and distance relationship of the crime scene and the physical evidence within it. The sketch serves to clarify the special information present within the photographs and video documentation, because the other methods do not allow the viewer to easily gauge distances and dimensions. A sketch is the most simplistic manner in which to present crime scene layout and measurements. Often photographer/camera positions may be noted within a sketch also.

Why is a sketch important to crime scene documentation?

- It accurately portrays the physical facts.
- It relates to the sequence of events at the scene.
- It establishes the precise location and relationship of objects and evidence at the scene.
- It helps to create a mental picture of the scene for those not present.
- It is a permanent record of the scene.
- It usually is admissible in court.
- It assists in interviewing and interrogating.
- It assists in preparing the written investigative report.
- It assists in presenting the case in court. Well-prepared sketches and drawings help judges, juries, witnesses, and others to visualize the crime scene.

When should sketches be made?

- Sketch all serious crimes and accident scenes after photographs have been taken and before anything is moved.
- Sketch the entire scene, the objects, and the evidence.

Two types of sketches are produced with regard to crime scene documentation: rough sketches and final/finished sketches. **Rough sketches** (**Figure 6–7**) are developed while on-scene, typically during the crime scene assessment/preliminary scene evaluation phase to assist with development of a strategic plan for processing. The sketch is not done to scale, can be drawn with any implement (crayon, chalk, pencil, pen, etc.), and is very rough artistically. As work progresses at the crime scene, the sketch will include not only the crude crime scene layout, but also will be used to record measurements of items and structures and distances between items.

A **final sketch** (**Figures 6–8** and **6–9**) is a finished rendition of the rough sketch. They are usually prepared for courtroom presentation and often will not show all measurements and distances originally recorded on the rough sketch. Only significant items and structures are typically present within a final sketch. A final sketch is produced in either ink or on a computer, in a way that cannot be modified (i.e., not in pencil or erasable ink). The sketch should be clutter-free and should accurately depict all pertinent items of evidence, typically through the use of an accompanying legend. A **legend** is a note of explanation, outside of the sketch area, which relates to a specific item, symbol, or information contained within the graphical representation of a sketch. A final sketch should include:

- Title (What does the sketch represent? e.g., Sketch of Bank ABC Robbery)
- Legend (What do symbols within the sketch mean?)
- Case information. (i.e., date, time, place, case number)
- Initials/name (person who drew the sketch)
- Indication of direction (e.g., North)
- Scale (e.g., 1" = 1')

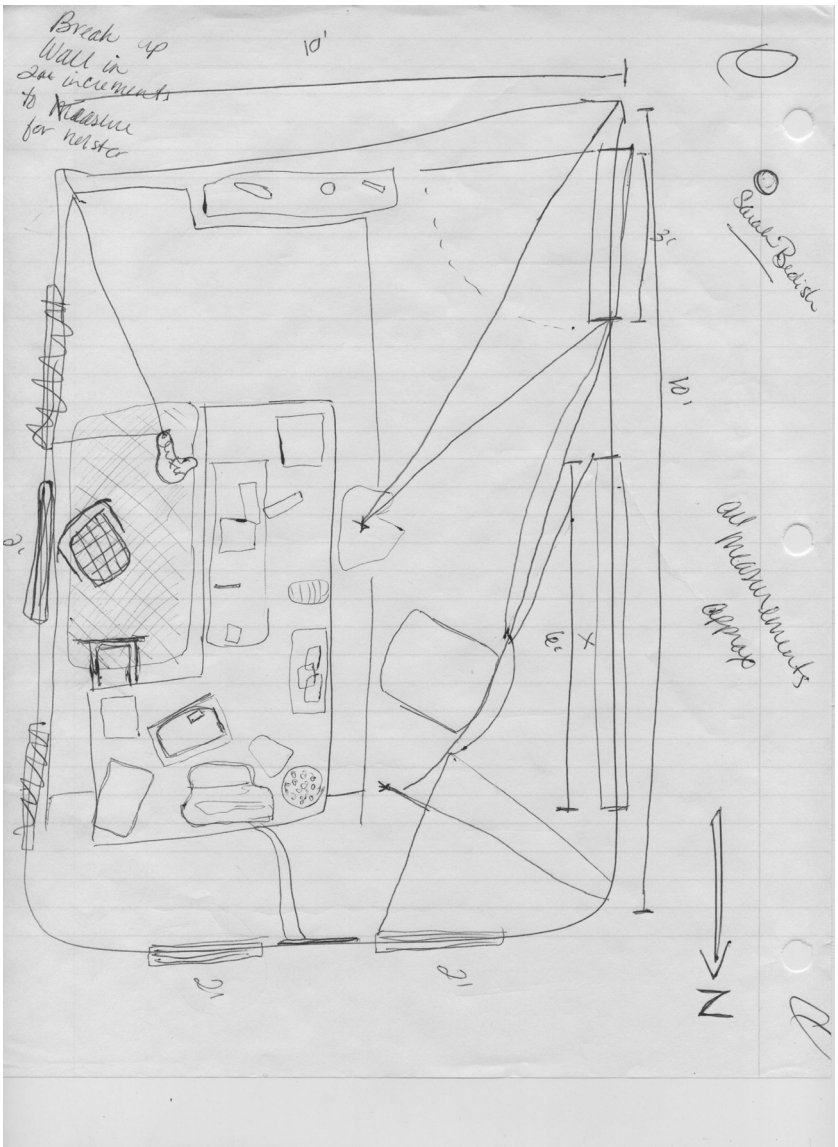

FIGURE 6–7 Example of a rough sketch
Courtesy of Sarah Bedish, University of Wisconsin-Platteville.

- Measurement table (If measurements are not represented within the confines of the sketch, an accompanying measurement table should be included to explain the distances and measurements associated with it.)
- There should also be a notation following the scale or measurement table stating: "All measurements are approximate." This will ensure that the sketch's author does not get

into a credibility argument in court that a measurement is documented as the listed measurement, but could in fact be greater or lesser due to rounding errors or other factors.

Three different crime scene perspectives can be represented within a sketch: (a) the bird's eye or overhead view (**Figure 6–10**), (b) the elevation or side view (**Figure 6–11**), and (c) the three-dimensional (3D) view (**Figure 6–12**). Sometimes personnel choose to incorporate several perspectives within a sketch (e.g., using both elevation and overhead sketches to draw an exploded or cross-sectional view of a scene) (**Figure 6–13**).

An overhead or bird's eye view is the most common form of crime scene sketching. It is prepared with the perspective being as though the author was looking down upon the scene from above. This type shows the floor layout but cannot represent heights of items or show associated evidence on walls. In order to show such information, a person must sketch an elevation or side-view sketch to show evidence located on a building façade, interior wall, or any item of which height is an important aspect (e.g., death involving a hanging). A 3D crime scene perspective is created with the aid of computers, and has its primary function as being crime scene activity reconstruction to help explain what happened and in what order.

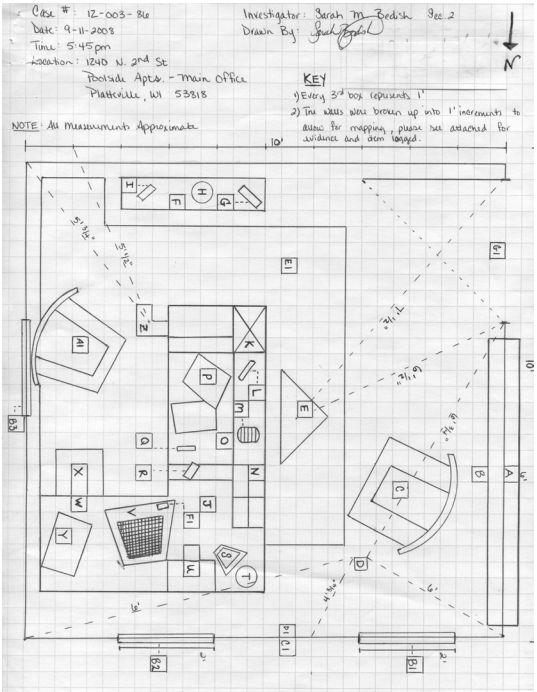

FIGURE 6–8 Example of a final hand-drawn sketch
Courtesy of Sarah Bedish, University of Wisconsin-Platteville.

Crime Scene Mapping

Mapping is the term associated with crime scene measurements. Sometimes a person may sketch but not map, meaning that he or she draws a sketch of an area but does not apply measurements to the sketch produced and items represented. Rarely, however, will one map without sketching (i.e., record measurements with no graphical representation for what the measurements represent). Sometimes this step is referred to as *measuring*. There are a variety of methods for mapping a crime scene, depending upon whether the crime scene is an interior or exterior scene. As this is an introductory text, only the most basic and most often used methods are covered here. The basic types of mapping methods utilized for crime scene sketching and mapping are: (a) baseline, (b) rectangular coordinates, (c) triangulation, and (d) polar/grid coordinates.

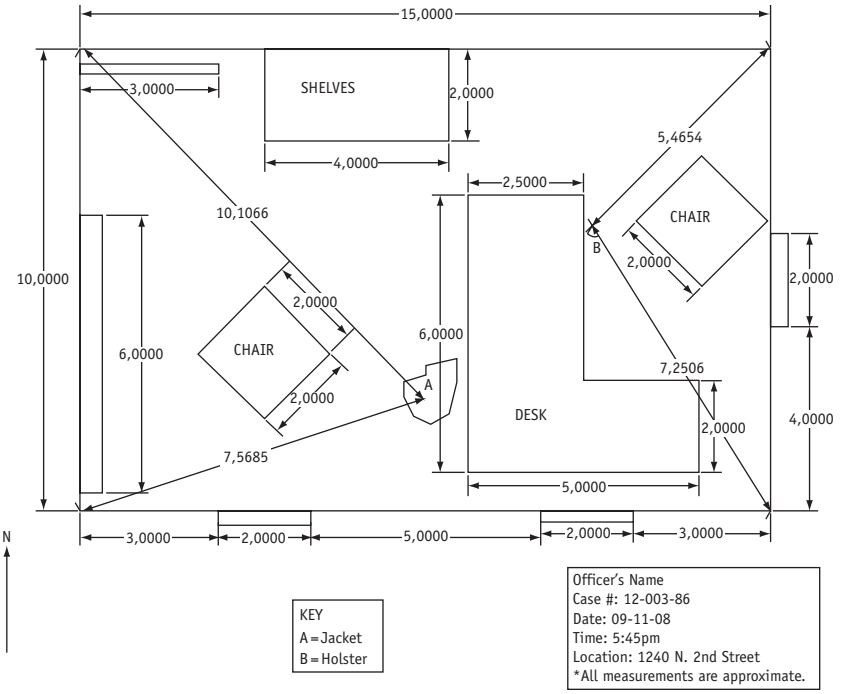

FIGURE 6–9 Example of a final computer-generated sketch

Adapted from an original illustration by Alex Albright, University of Wisconsin-Platteville.

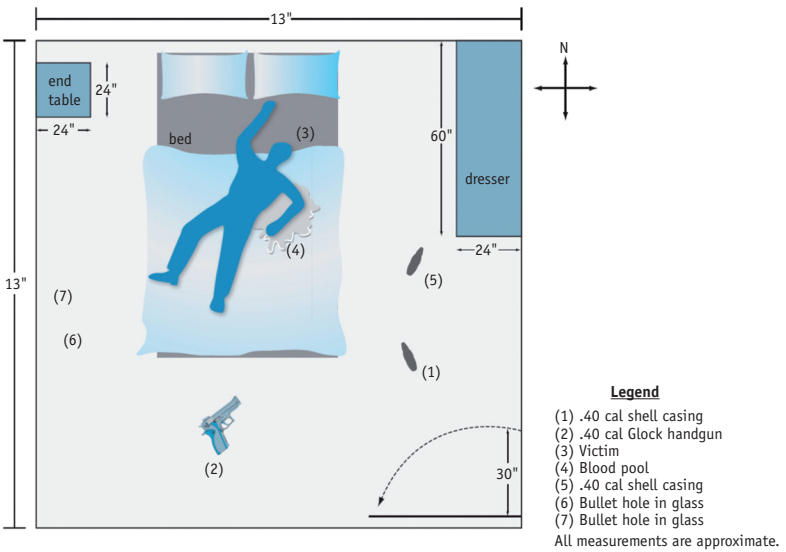

FIGURE 6–10 Example of an overhead/bird's-eye view sketch

Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

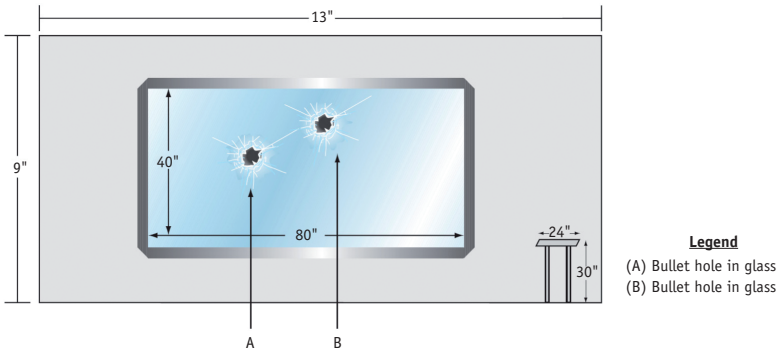

FIGURE 6–11 Example of an elevation/side-view sketch
Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

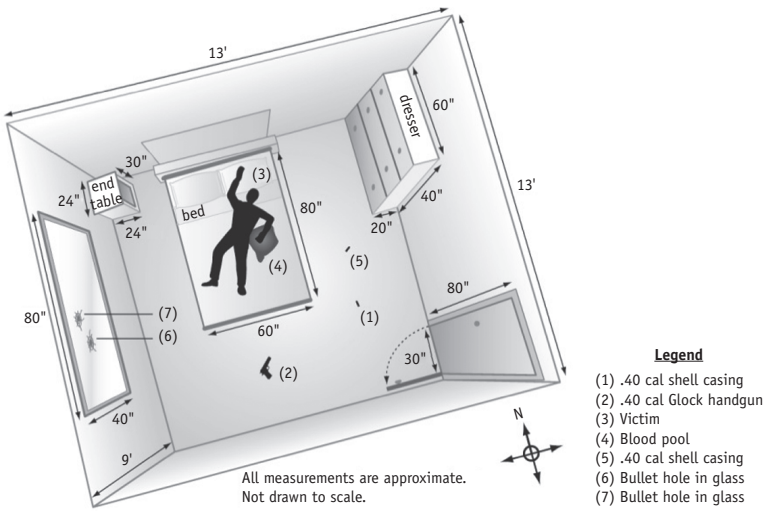

FIGURE 6–12 Example of a three-dimensional crime scene sketch

Baseline Mapping

This is the most basic—and least accurate—form of crime scene mapping. For this method, a baseline is developed or identified from which to conduct measurements. This can be an existing area, such as the edge of a roadway, a wall, fence, etc., or it can be developed by personnel, such as by placing a string or tape measure through the scene and conducting measurements from there. In the case of the latter, the line should be run between two known fixed points, such as trees or other identifiable points, so that the points can be found in the future and the scene reconstructed if necessary (**Figure 6–14**). Once the baseline is established, measurements are taken from the baseline at an approximate 90-degree angle from the baseline to a point on the identified item or area of the crime scene. Typically, most measurements are made

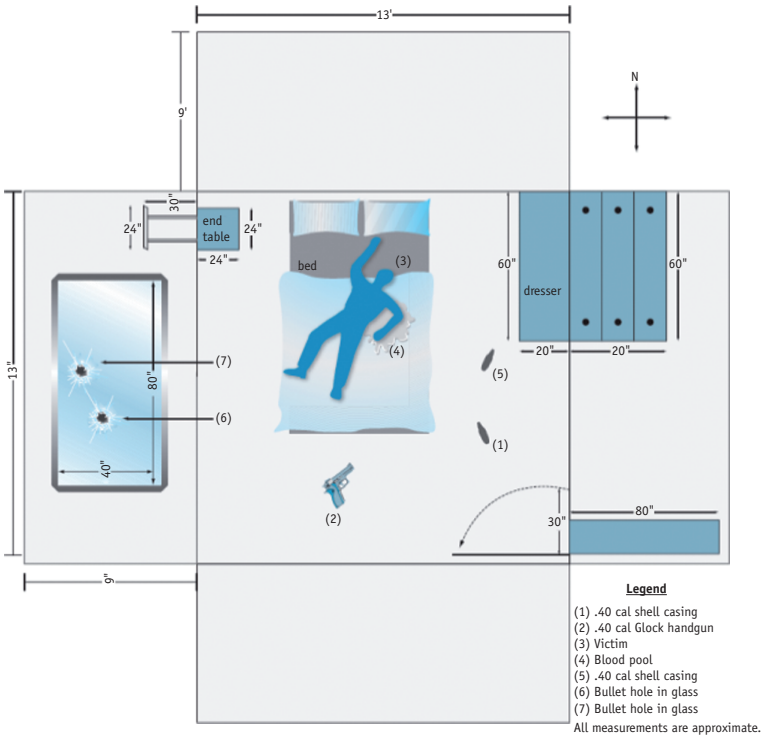

FIGURE 6–13 Example of a cross-sectional/exploded sketch
Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

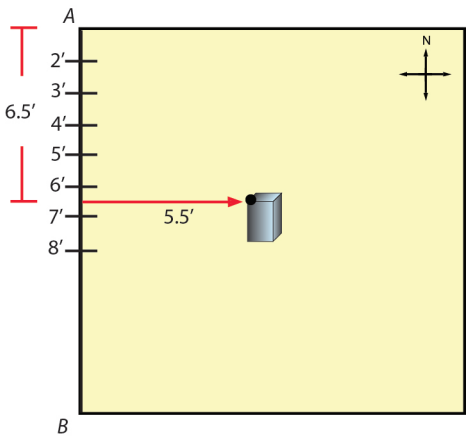

FIGURE 6–14 Example of a baseline map
Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

either to the center mass of the item or to the nearest point of the item to the baseline. Because it is impossible to ensure that the measurement was taken at 90 degrees, the possibility exists that the measurement will be longer if the measurement was over 90 degrees from the baseline, or if it was less than 90 degrees from the baseline. For this reason, this method is not as accurate as some of the other methods; however, it is quick and extremely easy to use.

Rectangular Coordinate Mapping

The rectangular coordinate mapping method is a slightly more accurate variation of the baseline method because it utilizes two such baselines instead of one. Two measurements are taken to a

point on an item or location at the scene, one from each identified baseline. Some personnel choose to measure to two or more points on an item, using multiple rectangular measurements as a way of increasing accuracy, while others simply choose to measure to an arbitrarily identified center mass of the object in question or point to which the measurements are being taken. As with the baseline method, it cannot be determined that such measurements are taken precisely at 90-degree angles from the baseline, so there exists a greater possibility of errors than with some of the other methods. However, due to this method having two measurements, it has much greater accuracy than with the single line baseline method. This method is especially useful in confined spaces and smaller interior scenes (**Figure 6–15**).

Triangulation Mapping

This is the most accurate method of mapping that does not make use of advanced technology. While it is quite a bit more laborious and time consuming, it is sufficiently more accurate than the aforementioned methods of mapping to be worth the effort. The accuracy of this method lies in its foundation: two fixed points. From these two fixed points, measurements are taken to specified points on an item or within the crime scene. There is no need to worry about whether or not measurements have been made at a right angle because the points derive from a known fixed point, such as the corner of a room, or edge of a door frame. From these fixed points, a minimum of two measurements are made to each identified point. If the object is of a fixed or constant shape (e.g., a firearm or item of furniture), then the object is measured to two points, from the two fixed points, for a total of four measurements. If the object is of a variable shape or size (e.g., a puddle of water, pool of blood, or pile of clothes), then the object is measured to an approximate center of mass (**Figure 6–16**).

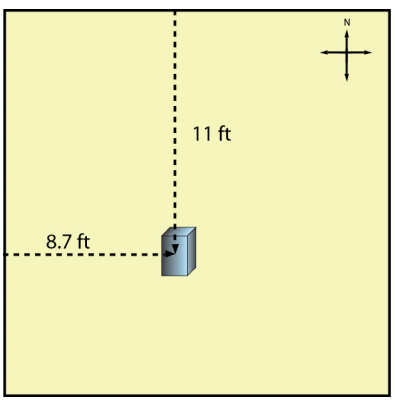

FIGURE 6–15 Example of a rectangular coordinate map

Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

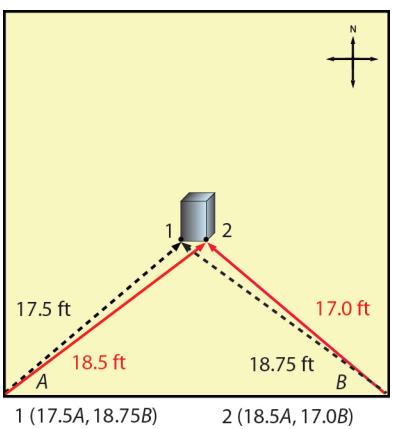

FIGURE 6–16 Example of a triangulation map

Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

Polar/Grid Coordinate Mapping

Utilizing polar coordinates is the third method of crime scene mapping used to document evidence location at a crime scene. Like those previously mentioned, this is a two-dimensional (2D) system that indicates the location of an object by providing the angle and distance from the fixed or known point. Obviously, in order to conduct measurements by this method a transit or compass is necessary to measure the angles and polar directions. This method is best utilized in large outdoor scenes with very few landmarks (e.g., a plane crash in forest or large field (**Figure 6–17**).

Advanced Mapping Techniques

Some departments may have the ability to better utilize modern technology, such as global positioning systems (GPS), Total Stations, and 3D crime scene mapping systems, which are mapping systems that can take measurements in polar coordinates and then convert the measurements into grid coordinates. The benefit of this technology is that it is able to provide precise electronic distance measurements and is extremely useful in mapping large-scale scenes and events.

GPS is a satellite-based navigation system comprising a network of 24 satellites that have been placed in the earth's orbit by the U.S. Department of Defense (Garmin, 2009). GPS was originally used by and intended for the military; however, in the 1980s the government made the technology available for civilian use. The benefit of GPS is that it works in any weather condition, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to utilize GPS. These satellites complete two very precise orbits of the earth a day, during which they transmit signal information. It is these signals that GPS receivers gather and then use triangulation to calculate a user's location. A GPS receiver must be locked on to the position signal of at least three satellites in order to calculate a 2D position (latitude and longitude) as well as track movements of an object. If the GPS receiver is able to lock on to four or more satellites, the receiver can determine the user's 3D location (latitude, longitude, and altitude), along with object movement. The more satellites that the GPS is locked onto, the greater the accuracy of the position. Once the user's position has been determined, an additional service is that calculation of movement can provide GPS users the ability to record information such as speed, bearing, track, trip distance, distance to destination, sunrise, sunset, time, and many more possibilities (Garmin, 2009).

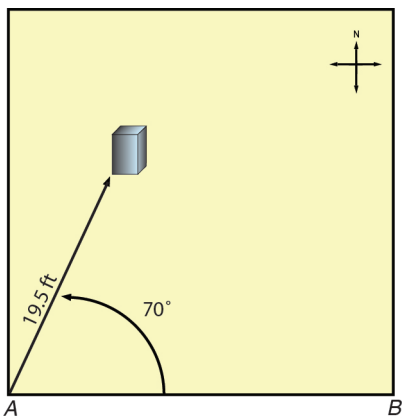

FIGURE 6–17 Example of a polar/grid coordinate map
Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

How accurate is GPS? In most cases, commercially available GPS receivers are accurate to approximately 12 meters, with higher end units capable of accuracy in the 3- to 5-meter range. This is sufficiently accurate for large scenes that have no known/fixed landmarks. A GPS reading is typically used to "mark" a known point and then measurements are made from that location, thereby ensuring that any measurements taken will all be "off" by the same amount because they all originate from the same location.

A Total Station is an electronic surveying instrument that has an integrated computer and can measure angles in the horizontal and vertical planes, utilizing a laser rangefinder instead of the more archaic method of a manual tape measure. This is especially useful because changes in elevation are very difficult to both measure and depict on a crime scene sketch. The Total Station is capable of recording evidence positions in three dimensions, thus simplifying this otherwise complicated situation.

Within the past several years, several vendors (i.e., Panoscan and Leica) have developed 3D, panoramic crime scene photography and mapping systems. (**Figure 6–18**) "This results in a 3D representation of the scene from which any measurement can be made even after the scene has been released" (Leica, 2012). This enables such technology to be utilized for pre-event planning, crime scene documentation, and post-event analysis. Another benefit of this new technology is that it is capable of accurate crime scene documentation efforts in both bright sunshine or total darkness, often at a distance of up to 900 feet.

As with all other crime scene measurements, all measurements are approximate, and they are never documented as or testified to as being 100% accurate. Crime scene mapping is about doing the best possible documentation with the resources available, realizing that rounding and other factors inhibit the ability to be completely accurate.

FIGURE 6–18 Example of a three-dimensional crime scene mapping and photography device
Courtesy of Leica Geosystems.

Searching the Crime Scene

Searching the crime scene for related evidence is a potentially damaging event and should be undertaken only after overall photographs of the scene have been taken. As evidence is located, personnel should mark the location of the evidence and mid-range photos should then be taken.

Important things to remember when conducting a search are:

- Do not touch, handle, or move evidence.
- Mark or designate found items without altering them.
- Found evidence must be documented before any evidence can be moved or collected.

Factors Impacting Search Methods

A variety of factors can affect a search method and these will determine the best, most accurate way to approach the scene.

Environment

Environmental conditions such as wind, rain, snow, heat, cold, etc., will have an impact on the method chosen due to how they affect the scene and the personnel involved.

Object Being Searched For

Obviously, a larger item will not entail the same level of searching detail as a smaller item (e.g., a handgun versus a bullet).

Number of Available Personnel

Some search methods are designed to incorporate a greater number of searchers in order to be most effective. If such personnel are not available, a method that utilizes fewer personnel needs to be considered.

Terrain

Obstructions (trees, buildings), ground cover (asphalt, grass), and grade (steep, flat) will all impact the type of method employed, as they will have a bearing on the ability of searchers to perform the task, and the ability to properly locate the necessary items of evidence.

Exigency

In cases of lost children, search for a loaded handgun (public safety issue); in this and certain other events, often there is the need for exigency that trumps the more detailed search patterns that would be preferable. Therefore, a quick and efficient method should be chosen, making use of the maximum number of resources available in the quickest manner possible.

Swath Size

A **swath** is the effective area that a searcher can cover while conducting a search. Swath is affected by all of the aforementioned matters and is itself a consideration in the determination of a proper search method to employ. If looking for a firearm, a larger swath would be possible in a parking lot than in high grass for instance. Also, a search conducted at night or in low light would have an impacted swath due to the ability of a flashlight to illuminate the area of responsibility.

Types of Crime Scene Search Patterns

Depending on the aforementioned factors, a variety of crime scene search patterns exist that can be employed at a crime scene. Regardless of the search pattern chosen, the crime scene investigator must be sure that the search is conducted in a systematic and thorough manner. This will ensure that all evidence is properly located, documented, and collected.

Lane/Strip Search

This type of search pattern breaks the scene up into manageable lanes in which the searcher(s) proceed back and forth, in a slightly overlapping fashion. This is similar to mowing one's lawn. This method is typically conducted by only one person (**Figure 6–19**).

Line Search

This method is incorporated when there is a large number of personnel available, often volunteers. In this method, searchers assemble in a line that runs along a chosen edge of the crime scene. Searchers stand side by side and spread apart, incorporating a manageable swath distance between each person. A search coordinator should place her or himself in the middle of this line to make certain that everyone walks forward in as straight as possible a line. If one end begins to lag, then the other end is requested to slow down. At no point should anyone be encouraged to search faster! Keeping all searchers in a straight line reduces the possibility of missing an area and thus not discovering potential evidence. This method is the most commonly employed type during an exigent search for an item or person, especially when a large number of people are available (**Figure 6–20**).

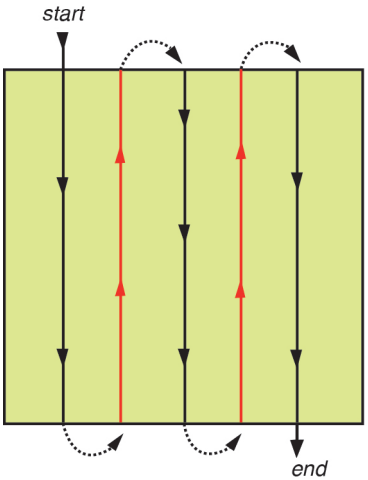

FIGURE 6–19 Example of a lane/strip search

Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

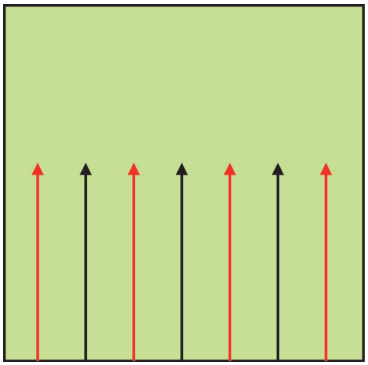

FIGURE 6–20 Example of a line search

Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

Grid Search

This sometimes is referred to as a *double strip* or *double lane* method. In this method, a lane is searched in one direction, similar to the line search method. However, as the lane terminates, a 90-degree direction change is made and another lane is searched. This can either occur through the use of two searchers (one responsible for one direction, and the other for the perpendicular direction), or else it can utilize a large number of searchers incorporating the line method as described earlier, and then turning 90 degrees and performing a second line search perpendicular to the original lane. While quite time consuming, this method

allows the same area to be searched two separate times, and at different angles. This redundancy will reduce searcher boredom, and will change the lighting and obstruction conditions present, thus increasing the ability of the searcher to locate evidence (**Figure 6–21**).

Zone Search

This method is typically utilized in an area that is already broken up into defined or manageable zones (e.g., a house or car). It is typically used indoors, but may be used outdoors if the areas are broken down into defined zones. Zones can be searched independently and later researched by different search personnel to ensure that no evidence has been overlooked. This method also can be used as a way to break up a larger crime scene, so the search coordinator then can choose from any of the search methods to cover a zone area (**Figure 6–22**).

Circle/Spiral Search

This is a very specialized search pattern method that is seldom utilized; however, it does have its usefulness and merit. In this method, searchers can either start at a defined outer boundary and circle or spiral in toward the defined critical point, or else they can begin at the critical point and circle or spiral outward toward the crime scene perimeter. Physical obstructions and barriers within the scene will present problems with this method. This method is typically employed in bomb or explosive scenes with a defined seat of explosion. It may be used in underwater or open water searches where there was a last known location for an item, vessel, or victim. If using a circling rather than a spiraling pattern, to ensure thoroughness it is suggested that a central point and an effective swath width be determined. Once this is done, searchers should move out in concentric circles, often through the use of a lanyard affixed to a point at the center of the scene (especially true for underwater searches). The searcher proceeds to search in a 360-degree manner, around the central point, and once they reach the end of their circuit, they

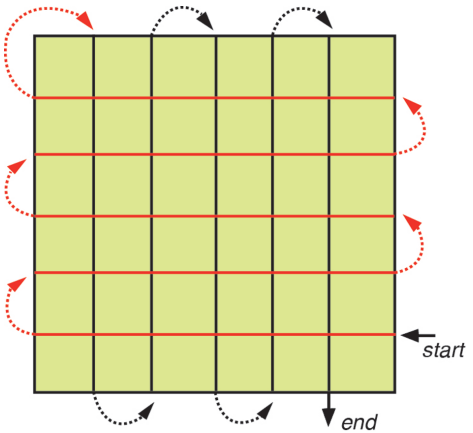

FIGURE 6–21 Example of a grid search
Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

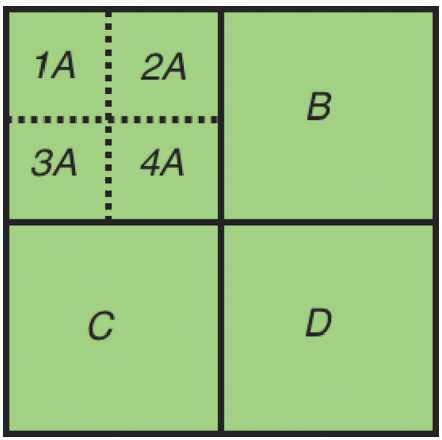

FIGURE 6–22 Example of a zone/quadrant search
Courtesy of Ellie Bruchez, University of Wisconsin-Platteville.

let out the lanyard a pre-determined amount, incorporating manageable swath width, and then proceed to conduct another 360-degree circuit of the scene. It is suggested that this new circuit be in the opposite direction of the previous circuit to both reduce the possibility of entanglement, and also to reduce the searcher's vertigo issues from walking in a continuous circle (**Figure 6–23**).

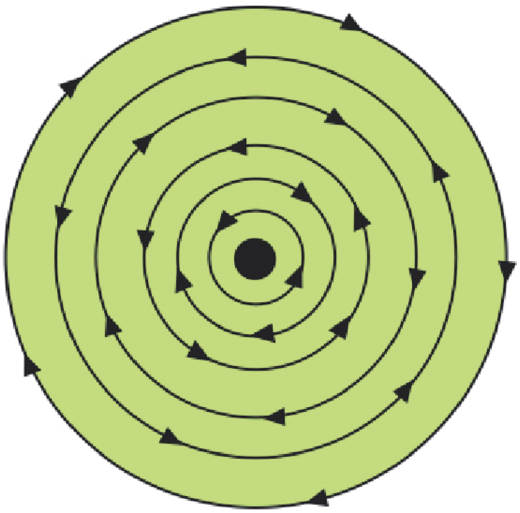

FIGURE 6–23 Example of a circle/spiral search
Courtesy of Dana Gevelinger, University of Wisconsin-Platteville.

The physical nature of a crime scene will suggest what type of search is best to employ, but the characteristics of the scene should have no effect on the quality of the search. Obviously, there will be exceptions. Large-area searches in mass-disaster investigations may have to sacrifice some quality for expedience, but in the average investigation, there is no excuse for haphazard searches. Proceed slowly, for evidence not only can be contaminated by being stepped on but can be destroyed easily or overlooked entirely by the unwary. An experienced investigator will have completed the walk-thru before beginning the search, and the walk-thru must be conducted with trace evidence foremost in the mind of crime scene personnel.

Collecting, Packaging, and Preserving Physical Evidence

After intensive crime scene search and documentation, collection and preservation of evidence should begin. The remainder of this text will be devoted to the different manners of collection and preservation specific to the type of evidence presented. At this point in the process, the following strategies should be done to ensure the most thorough and accurate investigation:

- Designate one person as the evidence collector/custodian (this ensures that nothing is missed).
- Document, collect, package, mark, seal, and preserve.
- Transient, fragile, or easily lost evidence should be collected first.
- Paper is the preferred packaging.
- Package items separately.
- Properly mark containers.
- Properly seal containers.
- Seals should be marked with initials and date/time.

VIEW FROM AN EXPERT

Remember the Fundamentals

Success is neither magical nor mysterious. Success is the natural consequence of consistently applying the basic fundamentals. – Alice Glynn

Success as a criminal investigator is experienced at a time and location that most would have never anticipated. Recruit officers are initially trained in the academy to believe that success is synonymous with the clicking of the handcuffs on a suspect. And many officers go through their career thinking this is success. But that is only the illusion of success.

True success is experienced in a solitary moment in the back of a cavernous courtroom, sitting dressed in an uncomfortable business suit on a hard wooden bench, watching prosecutors show jurors boxes of exhibits you have provided for them…full of photographs, sketches, diagrams, interviews, and other items of evidence. Taken cumulatively, that evidence representing months of hard work and attention to detail, overwhelmingly proves the defendant's guilt beyond a reasonable doubt. At that moment in time, you realize that success does not happen by accident, it happens when you consistently apply basic crime scene fundamentals.

Searching, photographing, sketching, and collecting evidence at a crime scene are, at their essence, simple processes. Yet day after day, we read news reports of investigations gone awry because basic fundamentals were not applied or adhered to. Like a basketball team that needs all five players to properly execute the basic fundamentals for a play to be successful, so too do patrol officers and investigators need to perform the basic fundamentals at a crime scene in order to ensure success in the coming months, and sometimes years, down the road. Inattention to the fundamentals results in missed physical evidence, undocumented evidence, and worse, suppressed evidence.

First, master the fundamentals. – Larry Bird

Searching the crime scene. The most frequent fundamental mistake in searching the crime scene is the lack of a systematic search method. Due to the chaotic method in which witnesses, EMS personnel, and first responding officers discover and arrive at the crime scene, the crime scene is oftentimes searched in a haphazard fashion, thus contaminating the scene for a more systematic and thorough search of the scene utilizing a grid or sector search. Patrol officers must be cognizant that this is their primary responsibility and must think of the crime scene as a flowing river…once you put your foot in that river, you have forever altered that river and will never be able to put your foot in that same river again. Securing the crime scene and then organizing a grid or sector search where every officer knows his or her responsibility on every crime scene ensures that irrevocable mistakes are not made.

Also, consistently using the practice of secondary searches of the crime scene places an extra amount of due diligence on the officers performing the primary search. There is probably no better teaching lesson for a young patrol officer than to have another officer discover a critical piece of evidence during a secondary search. Consistently adhering to these basic crime scene search fundamentals makes it possible to enjoy that success in the back of the courtroom.

I discovered early on that the player who learned the fundamentals of basketball is going to have a much better chance of succeeding and rising through the levels of competition than the player who was content to do things his own way. – John Wooden

Photographing the crime scene. Common fundamental mistakes in crime scene photography include the failure to take overall, mid-range, and close-up photographs of every piece of evidence; failing to include a scale of reference in photographs; and failure to produce a photo log to accompany the photographs. Many times these are not fatal mistakes to the case, but hinder the prosecution by not consistently providing the information we are expected to provide. It may seem redundant to have to photograph a single piece of evidence four times, but it ensures that the jury will see the photograph that most accurately and fairly represents the facts of the case. Including a scale of reference is oftentimes overlooked or deemed not necessary at the crime scene, only to provide a moment of regret at trial preparation when we wish to document size or relationship. Photo logs are also an interesting dilemma, in that officers find it cumbersome to write down a description of every photograph as they take it. However, they prove absolutely critical six months later at trial as an officer or investigator tries to explain to the prosecutor the meaning or purpose of a particular photograph, especially if it is a close-up photograph of a critical piece of evidence.

Learn the fundamentals of the game and stick to them. Band-Aid remedies never last. – Jack Nicholas

Sketches. Sketches are specifically designed to supplement photographs by denoting size and dimension, yet many officers feel uncomfortable sketching a crime scene because of a perceived obligation to produce a highly technical final sketch for court purposes. At the minimum, completing a rough sketch at the scene ensures you have size and dimension information recorded that can later be transposed into a more technical final sketch, if needed. Officers and investigators alike must be well-versed in the use of both baseline and triangulation measurement techniques, depending on the location of the crime scene, to complete that rough sketch. Without that training, we find that officers routinely fail to use fixed points to reference their measurements, instead choosing points of reference that are not fixed. Today, officers have the benefit of having investigative units that can transform that initial rough sketch into a final sketch rather easily utilizing GPS technology and computer-aided software. However, those final sketches are only as good as the information that is collected at the scene.

Many criminal investigators have similar personal attributes to athletes and coaches… desire, will, competiveness, and a work ethic. Those attributes bring them success in both their personal and professional lives. But the truly successful investigators have something else, just like the truly successful athletes and coaches…an unrelenting will to learn, master, and apply the fundamentals.

Special Agent Mike Krapfl
Iowa Division of Criminal Investigation

Courtesy of Special Agent Mike Krapfl, Iowa Division of Criminal Investigation.

WRAP UP

Chapter Summary

Scientific crime scene investigation is the best methodology to ensure that an investigation is properly conducted and that justice is served. Use of this methodology will prevent the abrupt end of an incomplete investigation and allow for the best use of the physical evidence found at crime scenes. The general rule relating to crime scene documentation is "if it isn't written down, it didn't happen." This is important to remember when conducting the various steps of crime scene documentation. It reminds the individual to be as thorough and precise as possible to correctly retain and be able to recall the events, items, and locations involved with a crime scene.

Review Questions

1. _____ is a note of explanation, outside of the sketch area, that helps to relate or give information on a specific item or area within a sketch.
2. _____ is a drawing or graphical representation that forms a permanent record of the size and distance relationship of the crime scene.
3. _____ is the term associated with crime scene measurements.
4. In order to ensure all photographs, information contained within them, and equipment that was used to capture them are properly documented, an investigator should make use of a _____.
5. What factors can affect the choice of search method at a crime scene?
6. What is the difference between a strip/lane search pattern and a line search pattern?
7. When conducting a search of a crime scene, _____refers to the effective area that a searcher can cover.
8. Regardless of the search pattern chosen, the crime scene investigator must be sure that the search is conducted in a _____ and _____ manner.

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