FIELD MANUAL ZERØ

COMMUNITY DEFENSE IN CONDITIONS OF ISOLATION, DENIAL, & AUSTERITY

LEE NAVY

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The author has made every attempt to use gender-neutral pronouns (“they/them”). Gendered language that is not part of a quote should be attributed to the author's carelessness, not malice. This project pulls together information from military manuals, academic papers, anonymous essays, and personal correspondence. The author has done everything in his power to verify the authenticity of any information included in this publication, but the possibility exists that, whether through carelessness or excessive credulity, the author has allowed errors to contaminate the text. **Everything you are about to read is for information purposes ONLY**. The reader performs any of the activities described herein at their own risks. **Be smart, be safe. We can't afford to lose you, not when there's so much work to be done.**

DEDICATION

This project would not have been possible without the work of countless comrades, too many to name, many of whom are dead. I dedicate this work to all of them. Choosing to invoke any specific names would invite justified criticism for my failure to include other figures, equally deserving, so I will say only that those who aided me know who they are. The dead, I will leave to their rest.

I will offer a word of thanks to the institutions who made valuable resources available to me: the Internet Archive, Sci-Hub, and the Anarchist Library allowed me to locate source documents without spending a fortune; Riseup.net and the Tor Project gave me the tools to stay secure while I conducted research on potentially volatile topics; and nobody played synthesiser.

RECOMMENDED READINGS

REQUIRED PUBLICATIONS

Bari, Judi. “Revolutionary Ecology” (1995)

Butler, Octavia. *Parable of the Sower* (1993)

Junger, Sebastian. *Tribe: On Homecoming and Belonging* (2016)

Shoatz, Russell Maroon. “Respect Our Mothers” (2010)

Solnit, Rebecca. *A Paradise Built In Hell: The Extraordinary Communities that Arise in Disaster* (2009)

Wallace-Wells, David. *The Uninhabitable Earth* (2019)

RELATED PUBLICATIONS

Bookchin, Murray. *The Ecology of Freedom: The Emergency and Dissolution of Hierarchy* (1982).

Federici, Sylvia. *Caliban and the Witch: Women, the Body and Primitive Accumulation* (2004)

Hickel, Jason. *Less is More: How Degrowth Will Save the World* (2020)

Illich, Ivan. *Tools for Conviviality* (1973)

-. *Toward a History of Needs* (1978)

Kadalie, Modibo. *Intimate Direct Democracy: Fort Mose, the Great Dismal Swamp, and the Human Quest for Freedom* (2022)

Moore, Jason. *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (2015)

Neel, Phil. *Hinterland: America's New Landscape of Class and Conflict* (2018)

Öcalan, Abdullah. *The Political Thought of Abdullah Öcalan* (2017)

Ostrom, Elinor. *Governing the Commons: The Evolution of Institutions for Collective Action* (1990)

TERMS

Community defense is a method by which the residents of a building, neighborhood, suburb, territory, or metropolitan area cooperate to protect, preserve, and provide the mechanisms, whether social or physical, required to meet their needs (broadly, Shelter, Supply, Safety, and Solidarity) and achieve their goals (values/legacy & self-actualization).

Isolated conditions are characterized by the extreme difficulty with which personnel or supplies within the isolated area can get out and personnel or supplies without the isolated area can get in. Conditions of isolation are not necessarily denied or austere, but austere and denied conditions are always made worse by isolation due to the length of time required to deploy aid and support. *Isolated communities cannot expect to receive external supplies or personnel.*

Denied conditions are characterized by the presence of a hostile force, within a community or without, that is actively working to prevent that community from effectively employing its resources by acts of sabotage or military strikes, covert or overt propaganda, and any other activity targeted to disrupt communal flourishing. Conditions of denial are not necessarily isolated or austere, but isolated and austere conditions are always made worse by denial due to the interference of hostile forces. *Denied communities cannot meet their objectives.*

Austere conditions are characterized by a lack or a severe restriction of Industrial or post-Industrial technologies, like electricity, wireless communication, motor vehicles, or sewer systems. Conditions of austerity are not necessarily isolated or denied, but isolated and denied conditions are made worse by austerity due to the absence of time- and labor-saving tools and techniques. *Austere communities cannot respond to acute emergencies.*

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PREFACE

> *It's never too early to learn and practice what less pacified, less predictable times might require of us... It's a question of knowing how to fight, to pick locks, to set broken bones and treat sicknesses; how to build a pirate radio transmitter; how to set up street kitchens; how to aim straight; how to gather together scattered knowledge and set up wartime agronomics; understand plankton biology [and] soil composition; study the way plants interact; get to know possible uses for and connections with our immediate environment as well as the limits we can't go beyond without exhausting it.* ***We must start today, in preparation for the days when we'll need more than just a symbolic portion of our nourishment and care.***
>
> -Comité Invisible[1]

Field Manual Zero is mainly written for motivated civilians without prior military training conducting **community defense** operations in **conditions of isolation**, **denial**, and/or **austerity** (**CIDA**); however, it can also serve as a reference for anyone with a general interest in disaster preparedness and personal protection. It covers how individuals and small teams conduct surveillance, reconnaissance, and combat operations during an acute or chronic absence of federal, tribal, state, or municipal law enforcement or emergency response services or personnel. It cites documents and publications that are, at the time of this publication, available for free through various outlets.

This handbook provides armed and unarmed individuals with the roles, tactics, knowledge, and operational requirements to employ basic fieldcraft, combat medicine, and small arms techniques in rural or periurban environments.

Send comments, recommendations, and other correspondence related to this manual to the following address:

Email: carbontempo@protonmail.com

1 "The Coming Insurrection" (2007). Emphasis added.

Chapter 1
DETECT

"A timely warning, if not unheeded, can help to prevent loss of life and general sufferings."

-Bhagat Singh[2]

Ignorance is not bliss, and what you don't know can hurt you very badly. CIDA operations will be characterized by volatility, unpredictability, and complexity. Whether alone or as part of a team, you will be the primary information-gathering tool for your community. Your life, and the lives of your comrades and neighbors, depend on quickly detecting any indication of a potential threat and acting decisively before any harm can be done. You must be alert, aware, and ready to act at all times. You can achieve this only by cultivating **situational awareness**, employing proper **observation** techniques, and honing your **tracking** skills into instruments of lethal precision.

Section I. SITUATIONAL AWARENESS

Situational awareness is not merely "the immediate *knowledge of* the conditions of the operation, constrained geographically and in time,"[3] but the *recognition of the implication of* those conditions in their context. Situational awareness is the knowledge of, in general terms, the positions and dispositions of the people and objects around you. The importance of situational awareness during all activities cannot be overstated. No skill you practice will have as many far-reaching implications than situational awareness. Your life, and the lives of your comrades and neighbors, may very well depend on the quality of your alertness and observation. Developing these abilities requires constant practice in real-world conditions, and proficiency can only be achieved through experience.

2 "Statement of S. Bhagat Singh and B.K. Dutt in the Assembly Bomb Case" (1929).
3 TC 3-22.69: *Advanced Situational Awareness* (2021). 1-1 (Emphasis added).

1-1. **BASELINES & ANOMALIES**. Every **operational area** (**OA**)[4], built or unbuilt, has a **baseline**, a set of predictable conditions and circumstances that prevail in that environment's usual context. You can think of a baseline as a natural state of equilibrium. A baseline is dynamic, changing based on season, weather, and time of day. It is critical to develop a solid understanding of the baseline for your OA; otherwise, you will be incapable of detecting **anomalies**, people or things whose presence or behavior does not conform with the expected baseline presence or behavior. Anomalies are characterized as being **above the baseline** (more energetic or numerous than normal) or **below the baseline** (less energetic or numerous than normal). A long traffic jam at a remote intersection is an anomaly above the baseline; a quiet hallway in a normally bustling elementary school is an anomaly below the baseline. Pay attention for a suddenly stiffening back, for an unbroken stare across a crowded room, or an increasingly loud conversation above the background volume. Behaviors and conditions to monitor for anomalous activity include **kinesics**, **proxemics**, **atmospherics**, and personal **intuition**.

a. ***Kinesics***. The way we hold ourselves and speak is as important, if not more so, than the words we say; the same words spoken through clenched teeth have a different meaning than when said with a laugh. **Kinesics**, or "body language," are the signals we send with our posture, the presence of absence of eye contact, and our tone of voice. It is possible to get a general idea of an individual's mood by studying their kinesic cues (for a non-exhaustive list of kinesic cues, see Table 1-1)[5].

Table 1-1. Kinesic Cues.

Emotion	***Expression***		
	Face	**Hands**	**Tone**
Happiness	Smile, raised eyebrows, heavy eye contact	Rubbing together, fingers spread, touching others	Loud, rapid, rhythmic
Sadness	Frown, eyelids droop, little eye contact	Holding head	Soft, slow, monotone
Fear	Lips stretched horizontally, eyebrows drawn together, eyes wide	Closed fists, shaking, trembling, chewing fingernail or fidgeting	Stuttering, rapid, short of breath, uneven pitch or volume
Surprise	Jaw dropped, mouth open, eyes wide	Arms up, restless, fidgeting	Rapid, loud, high pitch
Disgust	Lips pursed, upper lip raised, nose wrinkled	Arms crossed, limbs pulled away,	Low pitch
Contempt	Eyes flat, lips tightened	Entering personal space†	Low pitch, flat affect
Anger	Eyes narrowed, teeth clenched, nostrils flared	Clenched fists, entering personal space†	Loud
†See “Proxemics.”			

4 "Geographic areas in which military operations are conducted." ADRP 1-02: *Terms and Military Symbols* (2013). 1-42.

5 Do not attribute too much value to these cues; at best, they are a general guideline, as people express themselves in vastly different ways, frequently in ways that blend the indicators of several emotions.

b. ***Proxemics***. There are, broadly speaking, four "relative distances" of social contact: **intimate** (used with close friends, lovers, or doctors or groomers), **personal** (up to a meter away, used with friends), **social** (up to three meters away, used with acquaintances), and **public** (used when addressing groups of strangers). These sets of distances are called **proxemics**. The exact distances of each category are culturally-defined, and usually will differ based on age, gender identity, ethnicity, class, and any number of other local factors. Despite the vast differences in relative distances between cultures, within the culture, the distances are usually very firm; that is to say, with very few exceptions, every culture treats **proxemic violations** as anomalous.

I) **Proxemic Violations**. A **proxemic violation** is a breach of the local relative distance rules. These can be unavoidable, and are generally accepted as non-anomalous, as with elevators, buses, or in line at stores or shops. Regardless, practice vigilance during these circumstances, as you are seldom more vulnerable. Avoidable proxemic violations, in which a stranger deliberately moves closer than social distances, are much more rare and much more likely to be treated as anomalous.

i) *Proximity Negates Skill & "Time Is Distance"*. The closer a threat is to you, the fewer options you have to defend yourself and the less time you have to react; the opposite is also true (for an introduction to those options, see Chapter 4). Maintaining as much physical distance as practical while observing an anomaly gives you enough time to make a decision whether or not to engage, or, if engaging, what level of force is appropriate. If possible, keep obstacles or barriers between you an the anomaly you are observing, as relative distances alone are not enough protection; a sufficiently motivated attacker can clear the few meters of the public-speaking zone in one second. If it is not possible or practical to achieve adequate separation, time can be used as a substitute for distance; if you detect the anomaly before it detects you, regardless of its proximity, you can act faster and force the anomaly to react to you.

II) **Proxemic Push & Pull**. Under normal circumstances, people move away from people or things they perceive as dangerous or undesirable. This is known as **proxemic pushing**. The opposite is also true, as people tend to move toward safety or a desired outcome; this is **proxemic pulling**. If you see people keeping their distance from a specific individual, or see a crowd of people moving away from a certain location, you should treat that individual or location as an anomaly. Similarly, all things being equal, people travel along the path of least resistance, and do not deviate from habit unless they have reason to. If you see people taking the long way around to reach a given point, they could be trying to avoid something dangerous or undesirable; if you see two people walking together suddenly separate and start moving in different directions, they could be moving to cut off your exit routes.

c. ***Atmospherics***. **Atmospherics** include the demographics, culture, and temperament of the people who compose a given OA. Atmospherics are the quantifiable and unquantifiable data about a population and people, especially their habits, their routines, and their political, culinary, and leisure preferences, but also the distribution of ages and gender identities. Familiarity with baseline atmospherics is one of the most important survival skills you can practice (see Table 1-2 for examples of atmospheric anomalies).

I) Different kinesic and proxemic baselines exist in different scenarios. The atmospheric baseline will determine, to a large extent, what to expect from the kinesic and proxemic baselines. A baseball game will have different baselines than a bank, for example.

II) One of the most effective ways of assessing the atmospheric baseline is by observing the signs and symbols featured in the area. Every area has its own symbolic language that is intuitively comprehensible to its inhabitants, while strangers might never realize they are looking at a message at all. For a non-exhaustive list of symbols, and their associated meanings, see Table 1-3.

Table 1-2. Potentially-Anomalous Indicators[6]

<table>
<tr><th>LOOK FOR --</th><th>LISTEN FOR --</th><th>FEEL FOR --</th><th>SMELL FOR --</th></tr>
<tr><td rowspan="11">■ Enemy personnel, vehicles, and aircraft
■ Sudden or unusual movement
■ New local inhabitants
■ Smoke or dust
■ Unusual movement of farm or wild animals
■ Unusual activity--or lack of activity--by local inhabitants, especially at times or places that are normally inactive or active
■ Vehicle or personnel tracks
■ Movement of local inhabitants along uncleared routes, areas, or paths
■ Signs that the enemy has occupied the area
■ Evidence of changing trends in threats
■ Recently cut foliage
■ Muzzle flashes, lights, fires, or reflections
■ Unusual amount (too much or too little) of trash</td><td>■ Running engines or track sounds
■ Voices
■ Metallic sounds
■ Gunfire, by weapon type
■ Unusual calm or silence
■ Dismounted movement
■ Aircraft</td><td>■ Warm coals and other materials in a fire
■ Fresh tracks
■ Age of food or trash</td><td>■ Vehicle exhaust
■ Burning petroleum products
■ Food cooking
■ Aged food in trash
■ Human waste</td></tr>
<tr><td colspan="3">OTHER CONSIDERATIONS</td></tr>
<tr><td>Armed Elements</td><td colspan="2">Locations of factional forces, mine fields, and potential threats.</td></tr>
<tr><td>Homes and Buildings</td><td colspan="2">Condition of roofs, doors, windows, lights, power lines, water, sanitation, roads, bridges, crops, and livestock.</td></tr>
<tr><td>Infrastructure</td><td colspan="2">Functioning stores, service stations, and so on.</td></tr>
<tr><td>People</td><td colspan="2">Numbers, gender, age, residence or DPRE status, apparent health, clothing, daily activities, and leadership.</td></tr>
<tr><td>Contrast</td><td colspan="2">Has anything changed? For example, are there new locks on buildings? Are windows boarded up or previously boarded up windows now open, indicating a change in how a building is expected to be used? Have buildings been defaced with graffiti?</td></tr>
</table>

"Your intuition should give you a little warning bell when you are out of place. Trust it, and then look around. Most of the things that trigger it will be groups who stand at a different distance than you do (different ideas of personal space) who maintain eye contact differently (inmates and ex-cons have a tendency to avoid direct eye contact and instead look over each other's shoulder, mutually looking for danger) and who talk in different tones (some cultures are very loud when they are not angry; other cultures are very quiet, which can feel like everyone is whispering secrets)."

-Rory Miller[7]

6 TC 3-21.75: *The Warrior Ethos and Combat Skills* (2013). 9-2.
7 *Facing Violence* (2011). 54.

Table 1-3. Examples of Symbols and Their Usage

The Red Cross, Red Crescent, and Red Crystal, are recognized internationally as a symbol of humanitarian aid workers and volunteers.

The plow, the hammer, the sickle, gears, and other representations of agriculture and industry are used by labor activists, socialists, communists, and other advocates for the rights of workers.

The yoke & arrows, the *fasces*, and the flash & circle were appropriated by Fascist movements in the early- to mid-20th century.

The flag of Rhodesia, the battle flag of Confederate lieutenant general Nathan Bedford Forrest, and the “Thin Blue Line” flags are used by white supremacists attempting to claim the legitimacy of the State for their actions.

d. ***Intuition, Instinct, & "Gut Feelings."*** From the first time you opened your eyes to behold the world, you have been engaged in a process of cataloging and sorting your observations and experiences. Whether you know it or not, you have been creating a mental structure that assembles the totality of your interactions with others into a series of expectations and protocols that work below the level of your awareness to keep you alive. This can be thought of as your baseline of baselines. Whenever an individual behavior or event occurs that does not conform to this baseline of baselines, you are aware of it, even if you don't notice it on a conscious level. Your subconscious will recognize that something is *off*, and it will start to send danger signals to the brain. Since this process takes place on a subconscious level, it lacks the components of critical thinking that we use for formal problem-solving. The practical effect of this is that when you become subconsciously aware of an anomaly, it can be difficult to "translate" that awareness into the type of information you need to make a decision. Often, when we subconsciously detect anomalies, we will describe having a "bad feeling," or we will speak of our intuition or instinct. Since we cannot articulate *why* we feel this way, we often discard these feelings. Women and female-presenting people and children specifically are under extraordinary societal pressure to dismiss their intuition as being overly emotional, irrational, or rude, which results in them staying in dangerous situations longer than they otherwise would have. As Gavin De Becker writes, it is not rude to be concerned about our well-being: "Safety is the preeminent concern of all creatures and it clearly justifies a seemingly abrupt and rejecting response from time to time."[8]

It is critical that you learn to recognize these "bad feelings" as indicators of an anomaly that needs to be classified. This does not mean bolting for the exits or drawing a weapon as soon as you get an inkling of suspicion, but it does mean that if you get the sense that something is "wrong," there is a good chance that there is a reason for it. Find out what it is that has tripped your alarms, and do not expose yourself or your neighbors to danger because you were too polite to follow-up on a nagging doubt. It may be nothing, but it may be something, and if it is something, you might be the only person in a position to do anything about it.

1-2. **CLASSIFYING ANOMALIES**. Once you have detected an anomaly, you need to classify it according to its *capacity*, *opportunity*, and *intent* to harm you or your neighbors. Anomalies may be classified as **safe**, **hazards**, or **threats**. In many cases, you will need to make this assessment rapidly; the faster you are with your classifications, the faster you can act. However, you must not sacrifice clarity for speed. Do not hurry to arrive at the wrong decision. Training and discipline are required to develop the judgment to make the correct choice during stressful situations.

a. ***Safe***. An anomaly is **safe** if it lacks the capacity to harm anyone; likewise for anomalies that have *only* the capacity to harm someone, without the opportunity or intent. An intoxicated man in secure restraints threatening to murder you is an example of the former; a sharp knife locked in a drawer is an example of the latter. In general, when safe anomalies are approached or interacted with responsibly, they pose no danger. Safe anomalies can always transition into hazards and threats, based on their environments and circumstances, so you must never disregard an anomaly just because it is currently safe.

b. ***Hazard***. A **hazard** is an anomaly that has the capacity and opportunity to harm you or your neighbors, but lacks the intent to do so. A patch of ice on the road is indisputably dangerous, but there is no way to argue that the ice has any opinions about itself one way or the other. Hazards are more dangerous than safe anomalies because there is not generally a way to interact with them without getting hurt, but they are less dangerous than threats because the danger is usually limited to the area around the anomaly itself. Hazards are also more predictable than threats, allowing you to potentially mitigate some of their more damaging effects; the dangers posed by extreme weather events, for example, are well-known, and it is possible to develop plans to endure them with relatively little risk.

8 *The Gift of Fear* (1997). 65.

c. ***Threats***. If an anomaly has the capacity, the opportunity, *and* the intent to harm you or your neighbors, it is a **threat**. Threats, by definition, are the most dangerous form of anomaly, and methods to detect, evade, and neutralize threats make up the bulk of this publication. **Neutralizing** a threat means making it safe – that is, eliminating the threat's capacity, opportunity, *or* intent to cause harm – using the most effective appropriate measures. It does not imply lethal force in all or even most cases; see Chapter Four for considerations on what levels of force are appropriate.

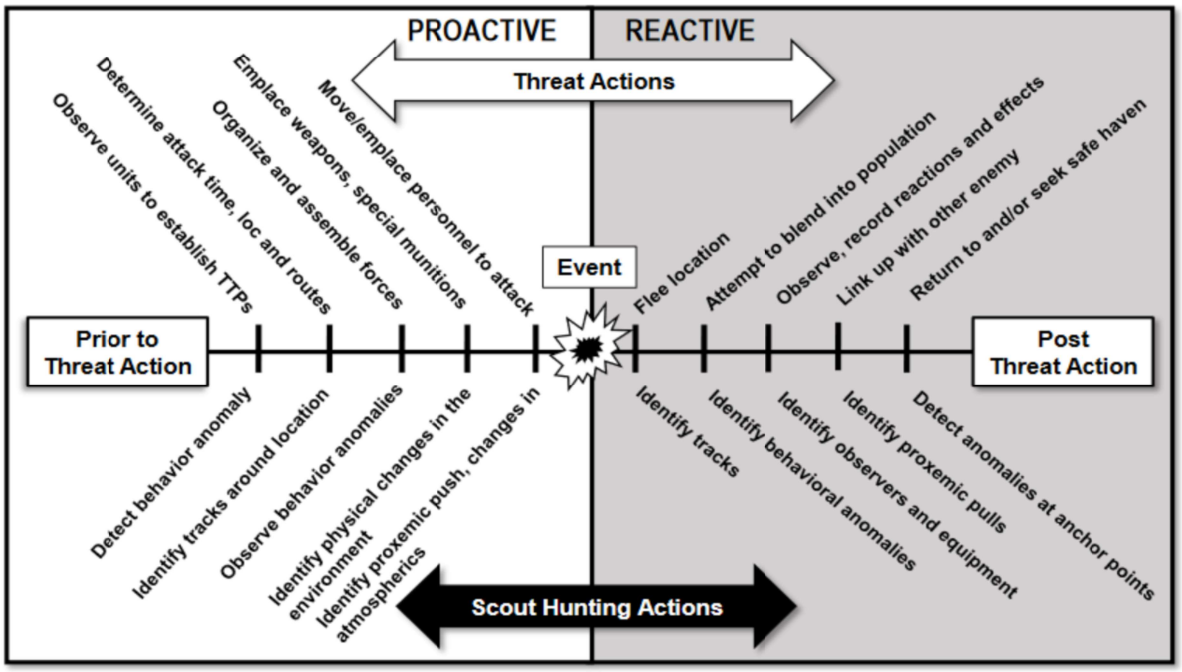
1-3. **ACTIONS ON DETECTING AN ANOMALY**. There are three broad categories of action you can take after you have detected and assessed an anomaly: you can **engage** the anomaly, **ignore** the anomaly, or **avoid** the anomaly.

a. ***Engage***. The most likely action is to **engage** the anomaly. This can take different forms based on the classification of the anomaly. Under most circumstances, engaging means making contact with the anomaly, investigating it in order to get more information. If the anomaly is a person, engaging means talking to them in order to develop an improved understanding of the situation. If you judge the anomaly to be a present threat to you, your comrades, or your neighbors, engaging means using the level of force required to render the threat safe (see Chapter 4). Figure 1-1 shows some of the forms engaging a threat can take.

b. ***Ignore***. Not all anomalies are dangerous or require your attention. If you come to the conclusion that an anomaly is safe and you do not need to engage it, you can choose to **ignore** it and not interfere with it. Remember, "ignore" does not mean "forget." Even a safe anomaly that can be ignored in one context may require engagement in another. Furthermore, always report an anomaly, even if you ignore it; your comrades or neighbors might have information that might be relevant.

c. ***Avoid***. If you determine that the anomaly is a threat, but judge that engaging it would expose you, your comrades, or your neighbors to unacceptable levels of risk, you should **avoid** it. Depending on the situation and the nature of the threat, avoiding can take the form of fleeing the area or sheltering in place. Even if you avoid an anomaly, you should call for help as soon as you are able; if you cannot neutralize the threat, you must warn others and try to get reinforcements.

Figure 1-1[9]



9 MCTP 3-01.A: *Scouting and Patrolling* (2020). 6-7.

"It is better to avoid than to run, better to run than to de-escalate, better to de-escalate than to fight, better to fight than to die."

-Rory Miller[10]

1-4. **LEVELS OF AWARENESS**. The "Awareness Color System," originally developed by Lt. Col. Jeff Cooper and modified numerous times (most notably by Lt. Col. Dave Grossman), describes six levels of awareness and assigns a color to each (Table 1-4). You, and the rest of your comrades, should strive to maintain Yellow-level alertness.

Table 1-4. Awareness Color Code

Condition	*Description*	*Heart Rate (BPM)*
White	You have no immediate knowledge of your surroundings. You are not aware of any local baselines. You are outside the action cycle.	70 or less
Yellow	You are relaxed, but you are practicing situational awareness. You have developed a baseline and are searching for anomalies, and you have not detected any. You are prepared to enter the action cycle.	85
Orange	You have detected an anomaly and are entering the action cycle.	95
Red	You are in the action cycle and operating at peak performance.	100-115
Gray	You are in the action cycle, but adrenaline (see Paragraph 1-5) may be causing you to experience tunnel vision or loss of fine muscle control.	115-145
Black	Stress, fear, and adrenaline have combined to induce a total collapse of higher functioning. You are outside the action cycle.	175 or more

1-5. **ADRENALINE.** The "Fight, Flight, or Freeze" response (also called the "Fight or Flight" response or the "acute stress response"), is the term given to the physiological response to a sudden perceived threat. During this response, the **sympathetic nervous system** floods the body with with **adrenaline** (also called **epinephrine**), a hormone that can causes significant changes to your bodily functions (see Table 1-5). It is important to understand the effect adrenaline will have on your body, because it can greatly impact your performance, especially delicate or precise tasks. In extreme cases, adrenaline can cause hearing loss and tunnel vision, severely restricted your situational awareness.

Table 1-5: Effects of Adrenaline on the Body

Increased	*Decreased*
■ Heart rate, pushing oxygenated blood to the bigger muscles; ■ Blood pressure, as the capillaries near the surface of your skin contract; ■ Pupil dilation to take in more light; ■ Gross motor skills, like pushing and pulling; and ■ Release of glucose stores for energy.	■ Digestion and gastrointestinal activity, including bowel control in extreme cases; ■ Saliva and tear production; ■ Fine motor skills, like tying or untying knots or manipulating keys; and ■ Pain or physical sensation.

10 *Facing Violence*. 42.

Section II. RECONNAISSANCE & OBSERVATION TECHNIQUES.

Post-industrial living, noise pollution, and global heating has robbed too many of us in the West of the simplest sensual pleasures; the call of a songbird, the blazing colors of wildflowers, or the smell of tea olive. We must recover these skills, not only as a balm for our spirits, but because what we see, hear, smell, and feel forms the foundation of the information we will use to develop our environmental baseline. The importance of attention to detail cannot be overstated. You must be comfortable with observation, whether drawing conclusions about your surroundings by using all of your senses or remaining motionless in a surveillance post. It will be your duty to provide warning of danger; the earlier the warning, the less harm the danger can cause.

1-6. **STOP, LOOK, LISTEN & SMELL (SLLS)**. The process of developing a sensory baseline is called **SLLS,** for **Stop**, **Look**, **Listen**, and **Smell**. During community defense patrols, you will conduct SLLS whenever the team halts, or whenever you or any member of the team observes an indicator that needs to be investigated. SLLS is normally discussed in the context of unbuilt environments, but performing SLLS should be a habitual part of your movement and operation, regardless of your surroundings.

a. ***Stop***. Freeze in place. Any movement, no matter how minute, can make enough noise to interfere with SLLS. If you are applying appropriate individual movement techniques, you will not have to shift your position to adjust your center of gravity. You will observe and mimic whoever called the SLLS; if they take a knee, you will take a knee; if they go prone, you will go prone, &c.

I) In the built environment, abruptly freezing in place is not practical and will draw the eye of an observer just as easily as sudden movement. When outdoors in cities or towns, stop your movement organically by pretending to check your cellular phone, tie your shoes, or look into a storefront window. While stopped, perform the rest or the SLLS check normally.

b. ***Look***. Your eyes are your primary information-gathering tool, and visual indicators will be the most common anomalies you discover. There are three primary anomalies you should look for: **disturbances**, **displacement**, and **deposits**.

I) **Disturbances**. **Disturbances** occur when an object in the environment has been moved from its original position, or has been bent, broken, or flattened. Disturbances sometimes occur without any human or animal involvement; strong winds will knock over trees, for example. But most disturbances are an indication of some other presence. A footprint or tire track that leaves an impression in mud, a broken window (or one that has been recently boarded up), a torn spider web, or vines that have been cut with a knife or machete are all disturbances. Ants swarming around a collapsed nest, or agitated bees flying around their hive are also potential indicators that someone or something has recently intruded on their space.

II) **Displacement**. **Displacement** (see Fig. 1-2) occurs when an object in the environment has been removed from the area. Often, objects will leave some trace of their presence, especially if the object has not been displaced for very long. Objects on a dusty shelf will leave an outline of dust when they are removed; a differently colored patch of soil inside an indentation is usually a sign that a rock has been removed.

III) **Deposit**. Any object that is not from the environment that has been left in the environment is a **deposit** (Fig. 1-3). Anything that could not exist in the environment without someone or something carrying it in is a deposit. Deposits can be bodily fluids, like blood, urine, or feces; oils and lubricants; mud or water from puddles; candy wrappers; cigarette butts; or ashes from a campfire.

Figure 1-2. Example of Displacement[11]

Figure 1-3. Example of a Deposit[12]

11 TC 31-34.4: *Special Forces Tracking and Countertracking* (2009). 1-9.
12 TC 3-22.69. 8-20.

c. ***Listen***. Auditory anomalies are perceived by the ears. Sound travels farther at night, when the air is cooler and there is less background noise, and in the open. Table 1-6 shows the distances at which common sounds are detectable. There are two types of auditory anomalies: **presences** and **absences**.

I) **Presences**. Sounds that are not part of the baseline are **present** auditory anomalies. The sound of a motor or a human voice might be anomalous in the deep woods; breaking glass is often an anomalous sound in most built environments. The sounds of metal-on-metal, idling engines, rustling leaves, or breaking twigs are signs that people are nearby.

II) **Absences**. An **absent** auditory anomaly occurs when you cannot hear a sound that is part of the environmental baseline. Birdsong, children laughing or crying, and traffic are very common elements of a baseline; their absence can indicate the presence of a hostile element. Insects and birds especially will fall silent at the approach of a predator, like a human.

Table 1-6. HEARING DISTANCES[13]

SOURCE	*DISTANCE*
Cannon Shot	up to 15 kilometers
Single shot from a Rifle	2 to 3 kilometers
Automatic Weapon Fire	3 to 4 kilometers
Tanks on a Dirt Road	up to 1.2 kilometers
Tanks on a Highway	3 to 4 kilometers
Cars on a Dirt Road	up to 500 meters
Cars on a Highway	up to 1 kilometer
Troops on Dirt Road	up to 300 meters
Troops on a Highway	up to 600 meters
Small arms Loading	up to 500 meters
Metal on Metal	up to 300 meters
Conversation of a Few Men	up to 300 meters
Steps of a Single Man	up to 40 meters
Axe Blow, Sound of a Saw	up to 500 meters
Blows of Shovels and Pickaxes	up to 1,000 meters
Screams	up to 1,500 meters
Oars on Water	up to 2,000 meters

13 FM 44-48: *Tactics, Techniques, and Procedures for the Sensor Platoon* (1993).

d. ***Smell***. Olfactory anomalies are perceived by the nose. Table 1-7 shows the distance at which common odors are detectable. To conduct a search for olfactory anomalies, face into the wind at a 45º angle, exhale normally, and sniff sharply, searching for the **F5**:

- **Fuel**, like petrol or natural gas (solvents and gun-cleaning chemicals also belong in this category);
- **Food**, cooked or uncooked, including spices; culturally-specific spices can indicate someone's nationality;
- **Feces**, as well as urine or vomit;
- **Fire**, including tobacco or cannabis smoke; and
- **Freshly-Turned Earth**, including the smell of fresh sap from broken limbs.

Not only is everyone familiar with these smells, but the objects that cause them are easy to acquire, making instruction easier. Their presence almost always indicates human activity.

Table 1-7: SMELLING DISTANCES[14]

SOURCE	*DISTANCE*
Diesel Fuel	up to 500 meters
Single Shot from a Rifle	up to 150 meters
Heat Tab	up to 300 meters

1-7. **WHY OBJECTS ARE SEEN**. Objects principally seen for four reasons. During SLLS checks or periods of observation, look carefully for any anomalous **shapes**, **shine**, **colors**, or **movement**.

a. ***Shape***. Regular patterns and angular **shapes** are not characteristic of the unbuilt environment. Hard edges, sharp corners, and uniformity are often signs of human activity. Familiarize yourself with the weapons, uniforms, and equipment of any hostile elements in your OA (if any); you should be able to identify, for example, the most commonly-deployed rifles by their silhouette alone.

b. ***Shine***. Shine refers to the reflection of light off of any surface, unbuilt or otherwise. Sunlight is more likely to be reflected from polished or hard objects, particularly metal or glass, and can indicate a human's presence.

c. ***Color***. Every environment, built or unbuilt, has a range of colors that occur organically. Colors that contrast with the organic colors draw the eye, with greater contrast and greater proximity between contrasts drawing the eye more. This is the reason hunters wear bright orange to guarantee other hunters will not be able to miss them – the fluorescent vests are a perfect contrast with the dark greens and browns.

d. ***Movement***. The human eye, like the eyes of most predators, is adapted to detecting movement. Small shifts in leaves and grasses are normal with a gentle breeze, but any sudden movement will naturally draw the eye.

1-8. **OBSERVATION POSTS**. Performing regular SLLS halts will be a part of all patrols and other civil defense operations in CIDA, but under some circumstances, you will be instructed to perform guard duty or sentry work, during which time you will keep a single area under observation. Sentry work is exhausting – most people, even when trained, cannot maintain a state of high alert for more than four hours. If possible, sentries should be rotated before this. Additionally, personnel permitting, every observation post and sentry point should be occupied by at least two scouts. This ensures 360º coverage and allows the scouts to take alternate breaks.

14 Ibid.

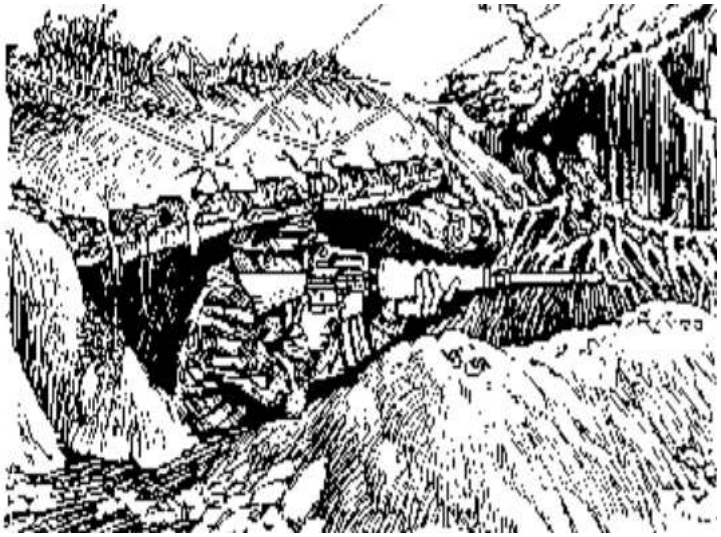
a. ***Observation Post Selection***. The **observation post** (**OP**) must have adequate **cover**, **concealment**, and **camouflage**. It must provide you with a clear, unobstructed view of all potential **avenues of approach**, and it must make use of any **obstacles** or **key terrain** that might be available.

l) **Cover**. **Cover** keeps you safe from bullets or fragments by providing a barrier that stops projectiles before they hit you. Cover can be artificial, like sandbags or body armor, or unbuilt, like fallen logs or rock formations. Cover can either be frontal (which protects you from direct fire from rifles and handguns), overhead (which protects from artillery fire and explosives), or flanking (which protects your sides and rear from friendly fire). A 5.56mm bullet can penetrate up to a quarter-inch of soft steel, meaning a vehicle body (with the exception of the engine block) offers inadequate protection. Larger and faster bullets than the 5.56, like the .308 or 7.62, can penetrate the above materials. Choosing appropriate cover means being aware of hostile capabilities. The following materials will stop a 5.56mm rifle bullet:

- One layer of well-packed sandbags;
- A 5 centimeter concrete wall (non-reinforced);
- A 55 gallon drum filled with water or sand;
- A small ammunition can or cinder block filled with sand (although the cinder block will likely explode, sending chips and fragments behind the block; these fragments can be as dangerous as the bullet itself);1
- A plate glass windowpane at a 45° angle (the glass will shatter, sending fragments behind the glass);
- A layer of books between 45 to 60 centimeters thick; and
- A brick veneer.

i) *Overhead Cover*. If you have the time, tools, and personnel, you should fortify your position with **overhead cover**. Overhead cover (see Fig.1-4) is essential if your opponent has access to indirect fire, like mortars, artillery, or air support, but is usually too time-consuming and resource-intensive for a field-expedient position. Adequate overhead cover is at least 45 centimeters thick, and usually consists of dirt spread over 10-15 centimeter logs or saplings bundled to an equivalent diameter. Other useful overhead cover materials include railroad ties, scrap metal, and any other material that can stop a bullet or deflect a mortar fragment.

Figure 1-4: A Position with Overhead Cover[15]



15 FM 5-103: *Survivability*. (1985).

II) **Concealment**. Unlike cover, **concealment** does not offer protection from enemy fire; instead, it prevents the enemy from effectively engaging with you by obscuring your exact position. If you are engaging a hostile element from concealment, they will be aware of your presence, but will be unable to direct accurate fire on your location because they cannot observe you. Like cover, concealment can be artificial or unbuilt. Unbuilt concealment includes shadows, fog or rain, or tall grass; artificial concealment includes the thick smoke from burning tires.

i) *Shadows*. **Shadows** are one of the most effective forms of unbuilt concealment. Every environment has some areas of shadow, whether cast by tall trees or buildings. Move in the shadows whenever possible.

ii) *Vegetation*. Use local **vegetation** to conceal your position, but do not pull weeds or vines up from the ground. Instead, harvest vegetation by cutting it close to the bottom of the stalk. Yanking up plants not only exposes dirt (which can be detected using SLLS), but the roots of plants are often a different color than the stalks, creating a contrast that draws the eye and stands out to **unoccupied aerial vehicle** (**UAV**) operators.

iii) *Movement*. When using concealment, always ensure that you disturb your unbuilt surroundings as little as possible; well-trained hostile personnel will be able to identify your presence based on changes to the environment. The easiest way to disturb your surroundings is by unnecessary **movement.** Not only does movement attract attention, every step crushes grass, breaks branches, and otherwise leaves signs of passage that can be tracked by hostile elements. If you have to move, move slowly, using the deliberate crawl technique. Ensure that the route has sufficient cover and concealment.

iv) *Overhead Concealment*. When concealing your position, do not neglect **overhead concealment**. Like overhead cover, overhead concealment is critical if hostile elements have air superiority or indirect-fire weapons. The best materials for overhead concealment are vegetation organic to your operating area. Make sure that your overhead concealment is not shiny or reflective; jute, which can be obtained from burlap sacks or from craft or gardening suppliers, is an effective material.

III) **Camouflage**. While cover protects you from projectiles and concealment prevents hostile elements from observing you, **camouflage** prevents hostile elements from perceiving you as a threat. In some cases, this means using colors and patterns to blend in with your surroundings, and in others, it means behaving in such a way that you do not arouse suspicion. Effective camouflage requires taking steps to address **shape**, **shine**, **color**, and **movement**.

i) *Shine*. **Shine** is any reflection or light that might give away your position. Preventing or obscuring shine requires not only adherence to light discipline (described in the section on Concealment in this chapter), but also careful management of reflective surfaces. Metal, jewelry, phone screens, and uncovered skin all reflect light. Metal should be covered with paint, mud, or strips of cloth or vegetation, especially rifle scopes or optics, which should be covered with nylon netting or a “killflash” device. Phones and other electronics should never be out during an operation; if their use is absolutely necessary, they should be used under concealment, like a blanket or tarp. Skin should be covered with face paint, burnt cork, or charcoal; the forehead, cheekbones, nose, ears, and chin are especially reflective and should be well-darkened (see Table 1-8 for more detailed guidelines on color use). Other exposed skin, like the backs of hands, should be darkened as well. Only use mud as a last resort, since it will fall off as it dries and can contain harmful bacteria. Darken yourself even if you have dark skin, because uncovered skin of any color will reflect light.

ii) *Shapes*. Certain **shapes** are immediately recognizable; the silhouette of a person, a helmet, or a rifle stands out in the unbuilt environment, so breaking up your outline is a critical element of effective camouflage. Commercially-available or military surplus camouflage patterns do an adequate job of disrupting the wearer's silhouette, but you can supplement camouflage patterns by attacking vegetation to your clothing. Leaves, twigs, grass, sticks, and vines can be incorporated into your outfit using rubber bands, bungee cord, or twine. Beware of overcamouflaging yourself – excessive use of natural camouflage can actually make your more conspicuous, as the odd agglomeration of detritus will stand out as unusual.

iii) *Color*. Do everything in your power to match the **colors** of your operating environment. Gear with contrasting colors should be dyed or painted to be less eye-catching. In snowy conditions and forests or areas with green vegetation, paint or cover the forehead, cheekbones, ears, nose, and chin with dark browns; paint the skin around the eyes and under the nose and chin with light greens (see Table 8 for guidelines in different environments).

Table 1-8:Application of Camouflage Face Paint to Skin

Camouflage Material	***Skin Color***	***Shine Areas***	***Shadow Areas***
	Light or Dark	Forehead, Cheekbones, Ears, Nose, and Chin	Around Eyes, Under Nose, and Under Chin
Camouflage Face Paint	All personnel use in areas with green vegetation	Loam	Light Green
	All personnel use in areas lacking green vegetation.	Light Green	Sand
	All personnel use only in snow-covered terrain.	Loam	White
Burnt Cork, Bark Charcoal, or Lampblack	All personnel, if camouflage sticks are not available.	Use	Do Not Use
Light-Colored Mud	All personnel, if camouflage sticks are not available.	Do Not Use	Use

iv) *Movement*. The best way to avoid detection is to remain motionless. When you are determining the location of your fighting position, make sure it does not have any hazards that would prevent you from staying still (anthills, wasp nests, poison ivy, &c). While comfort should not be a priority for siting the fighting position, there is a fine line between nuisances (puddles, insects, &c) and those that reduce your effectiveness (a fighting position that is too wet carries the risk of hypothermia; one that is too cramped will cause the muscles to seize and knot). The former must be endured with stoicism and good humor; the latter, avoided to the extent possible.

v) *Urban Camouflage*. **Urban camouflage** frequently refers to the blacks, whites, and grays used in certain camouflage patterns, but can also describe the techniques used to avoid scrutiny in the built environment. Effective camouflage does not prevent you from being seen, it prevents hostile elements from perceiving you as a threat. The easiest and most effective form of urban camouflage is behaving according to the local baseline. If people around you are moving quickly, move quickly; if they are acting casual, act casual; if they are talking loudly, talk loudly. Pay attention to the people who most easily move through the built environment. Certain people, especially mail or food delivery personnel or maintenance workers, are assumed to have a reason for being where they are, and can usually travel about unchallenged. Disguise techniques are outside the scope of this manual, but as long as you pay attention and act naturally, they should not be necessary.

IV) **Avenues of Approach**. An **avenue of approach** is a route that a hostile element might use to reach its objective. The avenue of approach will change depending on the nature of the element; mechanized unit will need to move the bulk of its forces on roads, for example, so a fighting position should be sited where it can best observe the roads. On the other hand, a light infantry unit has fewer requirements, and can travel over a much wider variety of terrain (see Table 9). When determining the location of your fighting position, take advantage of terrain restrictions. By positioning your fighting position in unrestricted terrain between two pieces of severely restricted terrain, you can canalize hostile elements into your sector of fire. At the same time, try and plan your withdrawal plan through terrain that will not delay your escape.

i) Avenues of approach also include air and sea routes that a hostile element might use to travel. Recognize that making a hostile element behave as though terrain is restricted or severely restricted is just as valuable as forcing them onto terrain with those characteristics. It might not be possible to defend against air or littoral attack, but area denial techniques, like using laser dazzlers near airfields or burning oil slicks at ports, can make those routes less appealing.

Table 1-9. Terrain Restrictions on Vehicles and Dismounted Personnel

Unrestricted	***Restricted***	***Severely Restricted***
■ No obstacles to either foot or mechanized travel ■ Flat, level ground with adequate turnaround space	■ Surmountable obstacles that will delay an element's progress ■ Muddy or thick vegetation slows vehicles ■ Steep or narrow terrain slows dismounted personnel	■ Impassable to vehicles ■ Significantly delays dismounted personnel ■ Requires extra equipment or personnel to traverse ■ Wide rivers, steep ravines, minefields

V) **Obstacles**. An **obstacle** is any obstruction meant to interfere with the effective operation of a hostile element by forcing the element to disperse or mass their personnel, slow or halt their movement, or move along a route that exposes them to your field of fire ("**canalize**"). Regardless of their nature and purpose, all obstacles should be covered by observation and fields of fire so they can be better defended; the longer an obstacle remains on the field, the longer hostile elements will be restricted. Conversely, an obstacle that is not under observation is not really an obstacle, it is an inconvenience, and offers minimal benefit. Obstacles can be classified as **existing** or **reinforcing**.

i) *Existing Obstacles*. **Existing obstacles** are obstacles that exist prior to an engagement or operation. They were not intended to be used to restrict movement, but they have that effect, whether the obstacles are built, like culturally-significant sites, or unbuilt, like rivers or ditches. A steep barrier at least 1 ½ meters tall, a ditch at least 5 meters wide and 2 meters deep, or trees at least 20 centimeters in diameter will stop most vehicles and slow treaded or tracked machines. As the incline increases, it becomes easier for smaller obstacles to stop vehicles; trees as small as 10 centimeters in diameter will stop treaded vehicles on a 10° slope. Any existing obstacle significant enough to meaningfully impact personnel movement will likely be indicated on your map.

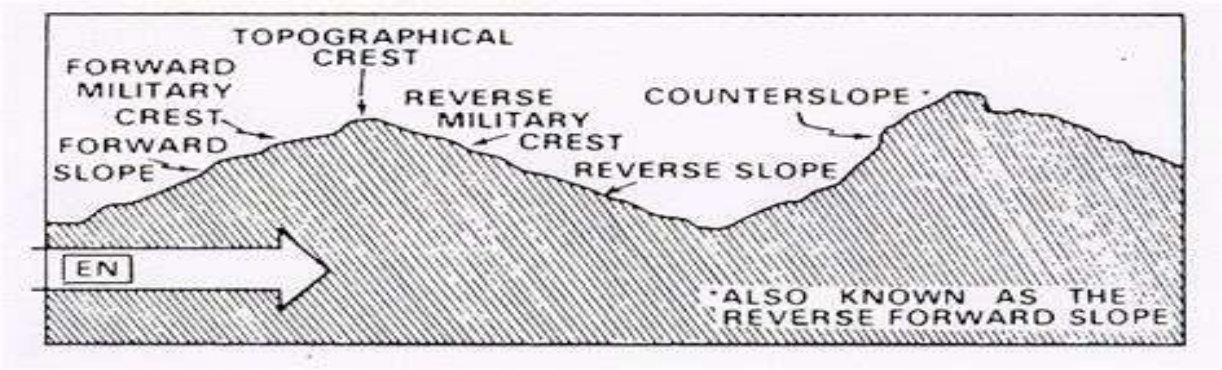
a) Weather. **Weather** should also be considered an existing obstacle. The five military aspects of weather are **visibility**, **windspeed**, **temperature**, **cloud cover**, and **precipitation**. Each aspect impacts the battlefield in a different way. Heavy rains can transform fields into impassable swamps and flood roads and bridges. Cold weather can impact equipment, especially radios. Wind speed and direction can affect smoke or other obscurants (see paragraphs 1-11 and 1-12), and thick fog can make their deployment unnecessary. Light conditions, like whether or not the sun will be at a defender's back, is also a major weather consideration.

ii) *Reinforcing Obstacles*. **Reinforcing obstacles**, unlike existing obstacles, are those introduced by one or more belligerents during an engagement or operation. The nature and position of these obstacles should be concealed and camouflaged as much as possible. Reinforcing obstacles can be expedient and relatively crude, like blocking a narrow road with a burning vehicle (or one filled with sand or water barrels) or flaming tires, or involved and elaborate, like barbed wire barriers, trenches, or tire spikes. Reinforcing obstacles should be placed at choke points to prevent hostile elements from easily bypassing them.

VI) **Key Terrain**. **Key terrain** is any point or area which, if controlled, offers the controlling element a tactical advantage by improving some component of their fighting position. Key terrain often includes high ground. In the built environment, key terrain includes tall buildings with clear views of avenues of approach, but also intersections and choke points like bridges.

i) *The Military Crest.* One of the most important pieces of key terrain is the **military crest**. The military crest (see Fig. 1-5) is the highest point you can be on a hill or other elevated position before you will silhouette yourself against the skyline. It is the optimal defensive position, because it provides maximum observation and fields of fire without exposing defenders to return fire.

Figure 1-5: The Military Crest[16]



16 Center for Army Lessons Learned. *Light Infantry In Action* No. 1-88. "Reverse Slope Defense."

b. ***Occupation Post Construction***. There are two types of OP: **hasty** and **deliberate.** A hasty OP makes use of local cover, concealment, and camouflage to provide you with more protection than you would have standing in the open, but does not offer the level of security that a deliberate OP does. At its most basic, a hasty fighting position is a natural or hand-dug depression in the ground that offers you some protection when prone; a hasty OP, especially when enhanced by natural cover, concealment, and camouflage, can offer effective protection from hostile fire, but is always inferior to a deliberate OP.

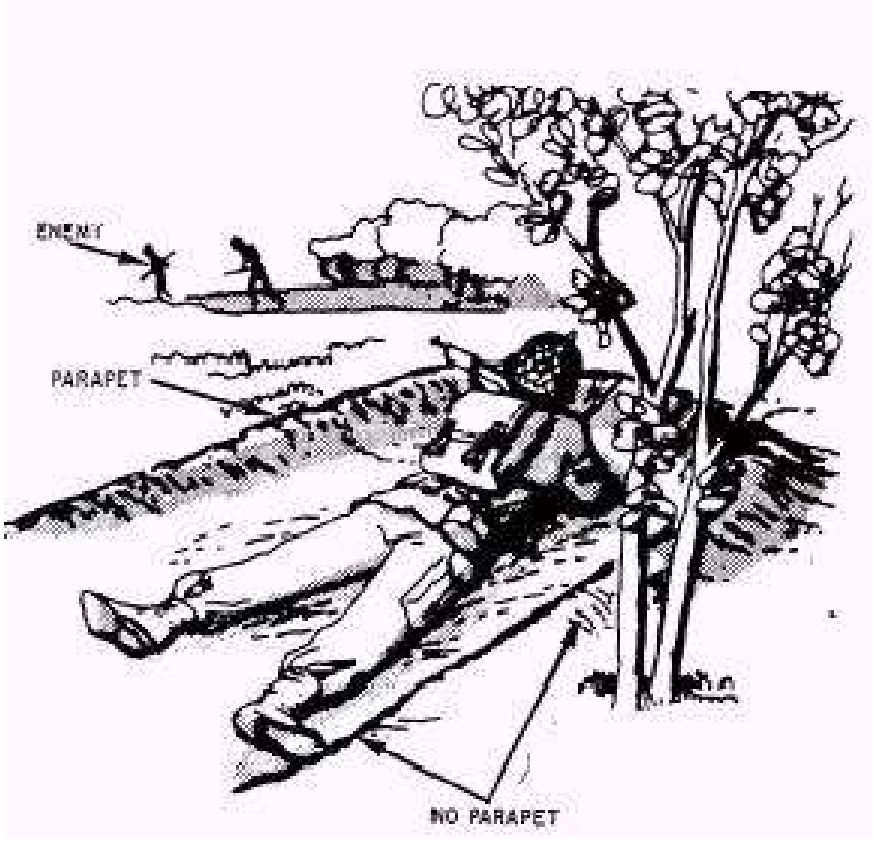
l) **Hasty OP**. To construct a hasty OP, first identify a spot that meets the minimum criteria for a OP: natural cover, concealment, and camouflage, and a clear field of observation. It should not be in the most obvious position where a hostile element would expect to find it. Avoid proximity to terrain features or bends in roads or trails. In addition, the OP should be close enough to another friendly OP, if present, that you can see your comrade's hand signals, but not be close enough that hostile elements will spot both positions if they see one.

i) If a ditch, ravine, or gully is available, use this as the base of your hasty fighting position.

ii) If there are no natural depressions, or if the natural depression is too small to assume the prone position, use a shovel, a collapsible entrenching tool, or even a fixed blade knife to dig out more space. Lie prone and scrape the dirt away from your sides and feet.

iii) Push the dirt you have excavated to the front and side of the hasty fighting position to act as defensive parapets. The parapet should be at least 45 centimeters wide to provide maximum ballistic protection, and high enough to hide your head (see Fig. 6).

Figure 1-6: Hasty Observation Position[17]



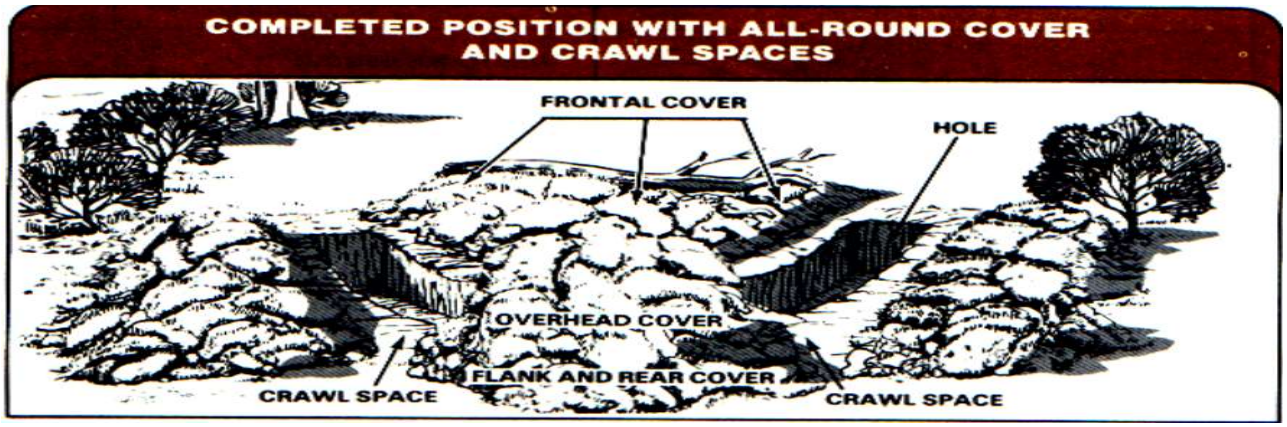
17 *Seabee Combat Handbook*, Vol. 1 (1993). 7-2.

II) **Deliberate OP**. A deliberate OP is a modified hasty fighting position constructed only if there is adequate time. To construct a deliberate fighting position, you will need an actual digging tool; a knife is insufficient. The deliberate fighting position should be at least the width of the your shoulders, should be long enough that the you can crouch or kneel, and deep enough that your head will not be exposed when you do so. To protect yourself from tanks, there should be at least 60 centimeters of dirt above your head when you are sitting or kneeling (see Fig. 7).

i) Use dirt excavated from the hole to construct a frontal parapet at least one meter wide and 30 centimeters tall. This parapet permits you to fire to the oblique without exposing yourself to hostile fire. After completing the parapet, spread a layer of topsoil or foliage to make it appear more natural and to break up the outline of the parapet. If possible, try to dig your hole lower instead of raising the parapet; the higher the parapet, the longer the shadow it will cast, making it more noticeable to UAV.

ii) Build overhead concealment that appears natural and organic. Do not leave piles of dirt out in the open; this will make it easy for hostile elements to identify your position. If you cannot use the soil to build parapets, dispose of it in an inconspicuous location by dragging it with a tarp or poncho. Stake or lash a ghillie blanket or a foliage-covered tarp or blanket over the OP. To avoid detection from thermal cameras, layer an emergency heat-reflecting blanket beneath the camouflage layer.

Figure 1-7: Deliberate Observation Position[18]



III) **Urban OP**. In the built environment, hasty and deliberate fighting positions take different forms. As with the unbuilt environment, you will assume a hasty OP by taking advantage of already-existing cover, concealment, and camouflage. In an unbuilt environment, this can be the corner of a building, a wall, a window, a roof, or a **loophole**. A **loophole** is a hole or breach in a wall resulting from gunfire or by hand tools like sledgehammers and prybars.

i) Whenever a window can be fortified by barricading the window using materials obtained from the building, like planks of wood or pieces of furniture, or with sandbags or even ammunition cans filled with sand or water. Barricade all windows, not just the one you behind. If possible, spread netting or lace curtains in front of the window; this will allow you to see out, but will prevent hostile elements from seeing in.

ii) OP in the built environment must be checked for fire hazards. The immediate area around the OP should be wetted down, if possible. If water is not available, try to spread a layer of sand on the ground. If fire extinguishers are available, every team member needs to know where they are, and there must be a plan for who will act in the event of a fire. If fire extinguishers are not available, place thick blankets or buckets of sand on each floor. Ensure all power and gas has been shut off.

18 FM 21-75: *Combat Skills of the Soldier* (1984). 2-4.

c. ***Noise, Emission, Light, & Litter (NELL) Discipline***. While occupying an OP, you must adhere to strict restrictions on the way you interact with your surroundings. Any action that can reveal your position is forbidden. These restrictions can be on illumination, noise, radio transmissions, or waste, and are collectively referred to as **noise**, **emission**, **light**, and **litter** (**NELL**) **discipline**. NELL discipline is not optional. Complacency that causes NELL discipline to slip must not be tolerated.

I) **Noise Discipline**. The human ear is sensitive enough to respond to sounds that cause the eardrum to move less than one-tenth of the width of a hydrogen atom. At night, when hearing is sharper, a motionless sentry can hear the rustle of clothing like it was being blasted out of a speaker. Noise discipline involves staying as quiet as possible, both while moving and while stationary. Do not carry loose items that might rattle, like coins; secure loose pieces of gear (like rifle slings or backpack straps) with tape to keep them from making noise. Do not use verbal commands unless absolutely unavoidable; instead, communicate using visual signals. Do not operate noisy machinery, and pay close attention to your environment to ensure you do not disturb animals or vegetation that might make noise and alert hostile elements to your presence. If you are carrying a phone or radio, ensure it is silenced. Do not carry half-full canteens or water bottles, which slosh; all canteens should be either full or empty.

II) **Emissions Discipline**. In the following chapter, you will learn that radio signals can easily be traced. The techniques you will learn in Chapter 2 to aid in message brevity, clarity, and security comprise emissions discipline, which is the set of practices used to reduce the quantity of transmissions that can be detected by hostile elements. Aside from radios, emissions discipline applies to cellular phones (treat every communication you send through a cellular network as being monitored) and to content uploaded to social media. Never post any pictures of yourself or any members of your team online. If you must be photographed, ensure that all identifying features, included faces and tattoos, are covered or obscured.

III) **Light Discipline**. Light discipline refers to actions taken to prevent hostile elements from detecting your use of lights for navigation or signaling. The human eye can detect the light from a single match from up to a mile away under the right atmospheric conditions, which means it is easy to inadvertently reveal your position by not exercising light discipline. Effective light discipline involves only using lights when absolutely unavoidable, and then only for the amount of time necessary. Never use matches or lighters in the open; if you must use a flashlight to navigate, tape over the head until no light can escape and then cut a small slit in the tape. This will give you adequate light for navigation purposes but will eliminate ambient spill.

IV) **Litter Discipline**. Litter discipline means not leaving behind any signs of a human presence. Food packaging, cigarette butts, campfires, or gun-cleaning chemicals are not present in the unbuilt environment, and will indicate to hostile elements that someone is active in the area. Moreover, litter has the unique capacity to reveal more information about a subject than almost any other kind of sign. Litter does not merely indicate that a person passed through a space, but depending on the nature of the litter, can provide clues to the subject's nationality, group affiliation, or even age. A cigarette butt can alert the tracker that they should be scanning for the smell of smoke or tobacco. When in the field, observe “leave no trace” camping principles: anything that you take with you must leave with you as well. Anything you carry with you should always be carried with you until it can be disposed of safely.

i) Litter discipline also requires proper latrine practices. When disposing of urine or feces in the field, construct a “cat hole” by digging a 15 centimeter-deep hole at least 50 meters from a trail or water source, deposit your waste in the hole, and cover with soil.

1-9. **SEARCH TECHNIQUES**. Once you have occupied the OP, you will observe the area using two techniques: the **hasty search** and the **deliberate search**.

a. ***Hasty Search***. Use the **hasty search** during the initial observation of an area. The hasty search focuses primarily on a few points of interest, particularly key terrain and avenues of approach which could conceal hostile elements. To perform a hasty search:

I) Start by looking at the nearest areas of interest, then move to areas farther away.

II) Do not sweep your eyes across the area. Regard each point carefully, checking for movement and any anomalies off of the baseline.

III) Conduct the hasty search from right to left, as opposed to left to right; our brains are more accustomed to moving from left to right, as when we read, and moving from right to left forces the brain not to skip any details.

IV) If binoculars are available, they should be used because their increased magnification and relatively wide field of view can pick up details that the naked eye might miss.

i) You can use binoculars to "burn" through bushes or leaves that are blocking your vision by focusing the lenses past the vegetation in front of you. In this manner, you can maintain observation while remaining concealed.

V) During observation, keep movement, especially movement of the head, to an absolute minimum.

i) There is a temptation to raise the head when searching; resist this temptation. Not only will raising your head present a better target for snipers, but keeping your eyes low to the ground actually aids in noticing anomalies, because they are silhouetted against the horizon.

b. ***Deliberate Search***. After you have performed a hasty search, perform a **deliberate search** (see Fig. 1-9). To perform a deliberate search:

I) Starting from either the far left or far right boundary of the area, slowly scan in a 50-meter band from one boundary to the next, focusing primarily on **negative space** (see Fig. 1-8).

i) **Negative space** is the space between positive spaces; **positive space** is space occupied by solid objects.

ii) **Dead space** is a space that cannot be observed because of obstacles or the nature of terrain. Dead space is dangerous because it gives hostile elements a place to conceal themselves. To minimize the danger posed by dead space, search teams should observe points from multiple angles.

II) After reaching the boundary, scan another 50-meter band while returning to the first boundary, continuing until the entire area has been searched. Each band should overlap the previous band by at least 10 meters.

III) When performing a deliberate search, memorize as much of the area as possible so you can compare it to future searches, whether hasty or deliberate.

IV) After conducting a deliberate search, you will maintain passive observation of the area, with special attention paid to any areas of interest noted during the deliberate search.

Figure 1-8. Negative Space, Positive Space, and Dead Space[19]

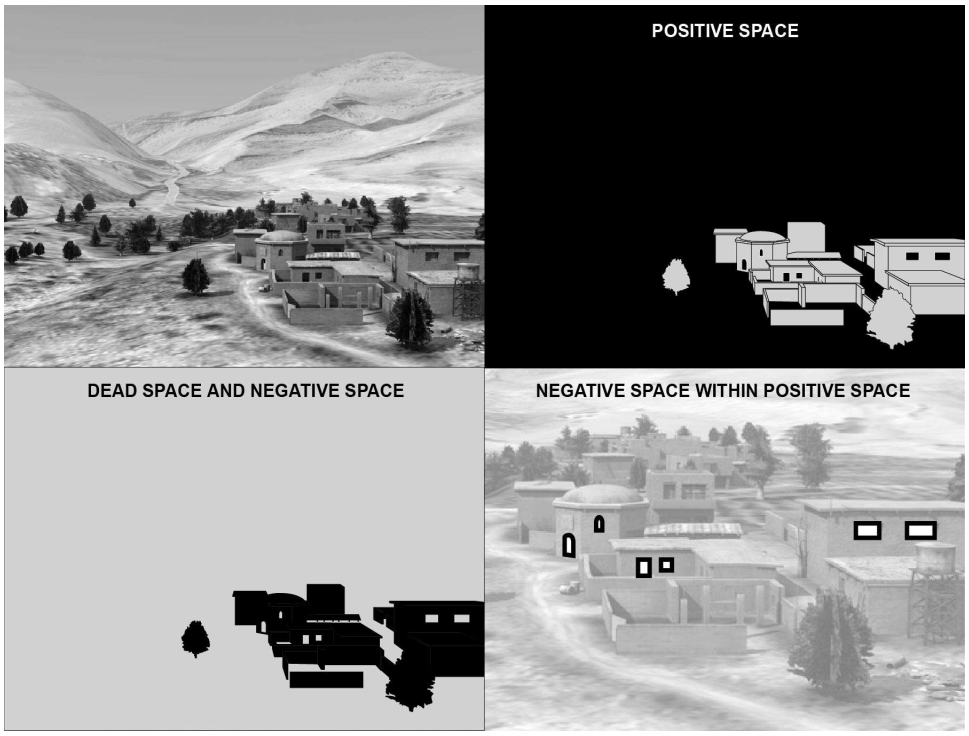
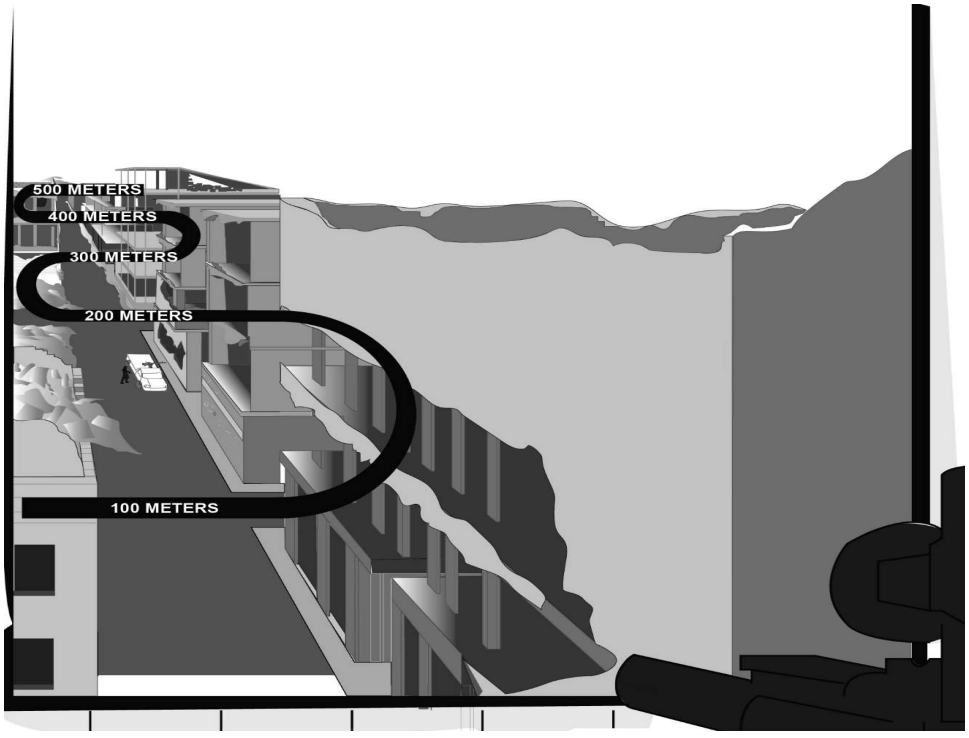


Figure 1-9. Deliberate Search[20]



19 TC 3-22.69. 3-10.
20 Ibid. 3-12.

1-10. **RANGE ESTIMATION**. The easiest way to estimate distance is to determine your position on a map, then using the included scale to determine the distance from your destination. Without a map, there are two field-expedient methods of estimating distance: the **lighting-and-thunder** method and the **"cheat sheet"** method. When using either of these methods, be mindful of the different ways objects can appear closer or farther away than they actually are (see Table 1-10)

Table 1-10. Factors Affecting Range Estimation

Objects Appear Closer	*Objects Appear Farther Away*
■ When contrasting with their background; ■ When observed over smooth terrain; ■ When observed from above; or ■ In the presence of illumination.	■ When blending with their background; ■ When observed over rough terrain; ■ When observed from below; ■ In the presence of smoke, fog, rain; or ■ When observed at dawn or dusk.

a. ***Lightning-and-Thunder Method***. The lightning-and-thunder method (also called the "**flash-to-bang**" method) takes advantage of the different speeds of light and sound to estimate distance based on the time it takes for you to hear an action (a firework explosion, a hand clapping at a concert, a lightning bolt) after seeing it. Divide the amount of time between seeing the action and hearing it by 350. The result will be the approximate distance in meters. This technique may not be effective in mountainous or urban areas, where the vertical surfaces can cause echoes.

b. ***"Cheat Sheet" Method***. The "cheat sheet" method of estimating distance is frequently used by snipers and other scouts who have the time to collect some information about their operational areas. To construct your own cheat sheet, measure the size of some common objects you can use as reference points. These objects can include:

- Vehicles, including rims and freight trailers;
- Fire Hydrants, Water Towers, Power Lines, or Telephone Poles;
- Doorways, Windows, Streets, and Sidewalks; and
- Billboards, Road Signs, Local Landmarks or Statues.

Once these data have been collected, they can be used with the **mil-relation formula** to determine ranges. To use the mil-relation formula, you will need a scope or binoculars with mil dots (included on most military or shooting optics).

$$\frac{Estimated\ Height\,(meters)}{Height\ of\ Target\,(mils)}\ x\ 1{,}000\ =\ Estimated\ Range\,(meters)$$

Section III. LIMITED-VISIBILITY OBSERVATION.

You will infrequently, if ever, have perfect observation conditions. Poor weather, thick foliage, and smoke will all interfere with your ability to detect anomalies, to say nothing of nighttime. Learning how to operate in low- to no-visibility conditions without flashlights or night vision devices is an indispensable skill, and like all skills, can only be improved with constant practice.

1-11. **SMOKE & BATTLEFIELD OBSCURATION (SBO)**. Smoke, whether from burning tires or cigarettes, is not actually a gas; rather, it is a collection of very small, lighter-than-air solid particles. These particles scatter and reflect light, effectively screening objects behind the smoke from any observers. Under most circumstances, there are four primary uses for **smoke and battlefield obscuration** (SBO): **obscuring**, **screening**, **deception**, and **marking**.

a. ***Obscure***. **Obscuring smoke** is deployed on an enemy position. Obscuring smoke prevents the enemy from clearly seeing what is happening outside of the smoke. and the enemy usually is employed on enemy forces to degrade their vision both within and beyond their location. Obscuring smoke can also be used for target identification purposes, as enemy personnel who leave the smoke will be silhouetted against it; obviously, this will only work if the color of the smoke contrasts the enemy's uniforms.

b. ***Screen***. **Screening smoke** is deployed between your position and enemy observers. Screening smoke prevents the enemy from clearly seeing what is happening inside of the smoke.

c. ***Deceive***. **Deception smoke** is deployed on decoy positions to disguise your actual position and avenue of approach.

d. ***Mark***. **Marking smoke** is used as a multi-purpose communications device for personnel to send pre-arranged signals (see Chapter 2)

1-12. **CHARACTERISTICS OF SMOKE**. The **diffusion**, or spread, of smoke is highly dependent on local **wind conditions**, the **terrain**, and the availability of **light**.

a. ***Sources of Smoke***. There are four categories of smoke **diffusers,** or sources of smoke: **point**, **instant**, **line**, and **area**.

I) **Point Sources**. Point sources continuously generate smoke in a single spot. Burning tires or Army smoke pots are examples of point sources.

II) **Instant Sources**. Instant sources generate smoke in a single spot, but do not continually produce smoke. A bursting smoke grenade is an example of an instant source.

III) **Line Sources**. Line sources are linear arrangements of multiple point sources.

IV) **Area Sources**. Area sources are multiple point sources distributed across a wide area.

b. ***Wind***. When deploying smoke, pay careful attention to the **speed** and **direction** of the wind. Smoke and vapors will always travel **downwind**; that is, they will be carried in the same direction the wind is blowing.

I) **Wind Direction**. Wind directions are determined relative to your position. They can be defined as **head winds**, **tail winds**, **quartering winds**, or **flank winds** (see Fig. 1-10)

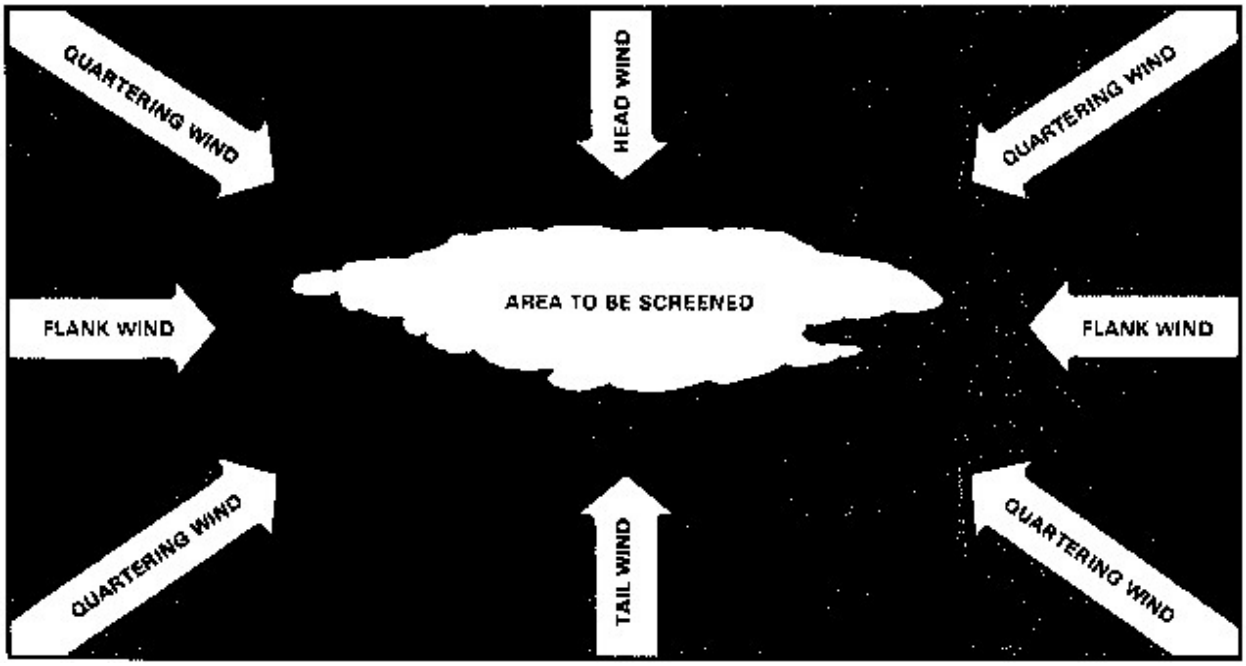
i) *Head Winds*. Head winds are winds that are blowing towards you from ahead of your position.

ii) *Tail Winds*. Tail winds are winds that are blowing towards you from behind your position.

iii) Quartering Winds. Quartering winds are winds that are blowing at diagonal angles towards your position. There are four quartering directions.

iv) *Flank Winds*. Flank winds are winds that are blowing towards your position from left-to-right or right-to-left. There are two flank winds.

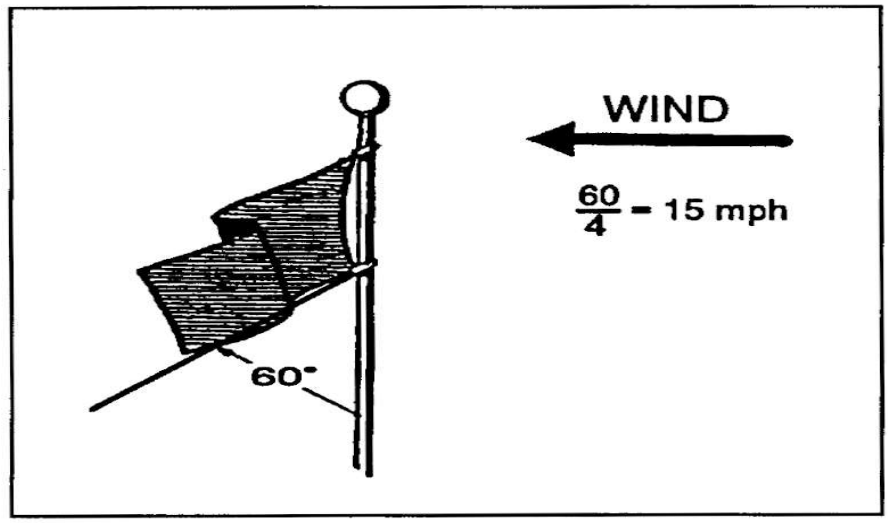
Figure 1-10. Prevailing wind directions.[21]



II) **Wind Speed**. Smoke is not effective at wind speeds lower than 3 knots or higher than 20 knots. The easiest way to estimate wind speed in the field is with the Beaufort Wind Scale (see Table 1-11), which was developed by Francis Beaufort to determine wind speed based on conditions at sea or on land. There are also a pair of field-expedient methods you can use to estimate wind speed: the **flag method** and the **debris method**.

i) *Flag Method*. By observing the angle at which a flag is hanging, you can estimate the wind speed at the flag's position. To use this method, estimate the angle between the flag and the flagpole to within 15º, then divide by 4 (see Fig. 1-11). The result is the wind speed in miles per hour (to convert from miles to kilometers, see the Table of Conversions in Appendix I).

Figure 1-11. Windspeed Estimation Using the Flag Method[22]



21 FM 3-6: *Field Behavior of NBC Agents* (1986).
22 FM 23-10: *Sniper Training* (1994). 3-31.

ii) *Debris Method*. The flag method can be adapted to determine wind speed at your location using the debris method. Hold a handful of lightweight debris (grass, pocket lint, receipt paper, &c) at shoulder height and release it. Without changing your position, point at the ground where the debris landed. Estimate the angle between your pointing arm and your body to within 15º, then divide by 4. The result is the wind speed in miles per hour.

1-13. **CONSIDERATIONS FOR EMPLOYMENT**. SBO can be a definite advantage, but its misuse can cause even greater harm. Only employ SBO if you are confident you can extinguish the source at will. Additionally, when using SBO, be mindful of the following considerations:

- Deploy line sources with even spacing at a right angle to the prevailing winds.
- White smoke is more efficient than black smoke; while black smoke works by absorbing light, white smoke reflects light, producing a glare. Consequently, less white smoke is required to achieve the same effect as black smoke.
- Deploy smoke before the sun has risen and hot air has started to rise. Not only will smoke deployed early stay closer to the ground, it will block sunlight from reaching the ground, preventing the convection currents that would cause the smoke to dissipate.
- Always be prepared to extinguish or move smoke sources if the prevailing winds change.

Table 1-11. Beaufort wind scale

Beaufort Number	***Wind Speed (mph)***	***Description of Wind***	***Specifications for Use on Land***
0	0-1	Calm	Calm; Smoke rises vertically
1	1-3	Light Air	Direction of wind shown by smoke drift, but not by wind vanes.
2	4-7	Light Breeze	Wind felt on face; leaves rustle; ordinary weathervanes are moved by wind.
3	7-12	Gentle Breeze	Leaves and small twigs in constant motion; Wind extends light flag
4	13-18	Moderate Breeze	Raises dust and loose paper; Small branches are moved
5	19-24	Fresh Breeze	Small trees in leaf begin to sway; Crested wavelets form on inland waters
6	25-31	Strong Breeze	Large branches in motion; whistling heard in telephone wires; Umbrellas used with difficulty
7	32-38	Moderate Gale	Whole trees in motion; Inconvenience felt when walking against wind
8	39-46	Gale	Breaks twigs off trees; Generally impedes progress
9	47-54	Strong Gale	Slight structural damage occurs (chimney pots and slate removed)
10	55-63	Storm	Seldom experienced inland; Trees uprooted; Considerable structural damage occurs
11	64-72	Violent Storm	Very rarely experienced; accompanied by widespread damage
12	>72	Hurricane	Devastation occurs

1-14. **LOW- TO NO-LIGHT OBSERVATION**. No challenge is greater, and more important to surmount, than low- to no-light observation. During periods of low- to no-light:

- Your ability to distinguish color and detail is reduced;
- Your depth perception is reduced;
- The cells in your eye responsible for night vision (the cones) quickly become exhausted, causing a "bleach out" effect if you stare at an object too long;
- The natural blind spot at the center of your vision is more pronounced;
- You are vulnerable to optical illusions; and
- You are vulnerable to anxiety, stress, or panic.

a. ***The Eye and Darkness Adaptation***. At least 30 minutes are required for the eyes to fully adjust to dark conditions. After this period of adjustment, you will find that there is sufficient ambient light, especially during full moons, to observe your surroundings. Use the following techniques to preserve your night vision:

I) During periods of night observation, refrain from using any artificial lights, including any **personal electronic devices** (**PED**). Bright light will reset the adjustment timer.

II) If you must use artificial light, use red light, which has less of an effect on night vision, and only for brief moments.

b. ***Psychological Effects of Low- and No-Light Observation***. Darkness can have a significant impact on your confidence, and therefore your competence. At night, there is a natural tendency to assume any unfamiliar sound or smell is a threat; even a short period of exposure to this level of stress can critically degrade your performance. It is above all, the uncertainty; the knowledge that there might be a threat, but the inability to engage that threat, is intolerable. The solution is to develop a comprehensive sensory baseline for your OA. Knowledge of your local wildlife is vital; it may be a matter of life and death to know when snapping twigs and rustling branches are the work of a squirrel or rabbit and when they are the result of actual threats. By familiarizing yourself with the natural rhythm of the unbuilt world, you will eliminate much of the uncertainty that is the cause of stress and anxiety during low- and no-visibility operations.

"Having seen a thing with my own eyes, I can form my judgment concerning it; by knowing that there is no danger to my own body, I will be calm. On account of my being calm, there will be no uncertainty; on account of there being no uncertainty, all things, necessarily, will be clear. In order that there may be that clearness, a broad field of view and a clear understanding of facts are necessary. However,t nighttime, a person is not able to see his surroundings; accordingly it is only natural that there should be uncertainty. One cannot know when there will be danger in the darkness just a little ways ahead. In such cases there is a feeling of apprehension, of doubt and uncertainty, and finally there is extremely cautious watchfulness and fear. In short, at nighttime, the mind is agitated and excited."

-Charles Burnett, Trans.[23]

23 *Training in Night Movements Based on Actual Experiences in War* (1917). 15.

1-15. **LOW- TO NO-LIGHT OBSERVATION TECHNIQUES**. As you become more accustomed to operating in darkness, start to incorporate the following techniques into your observations.

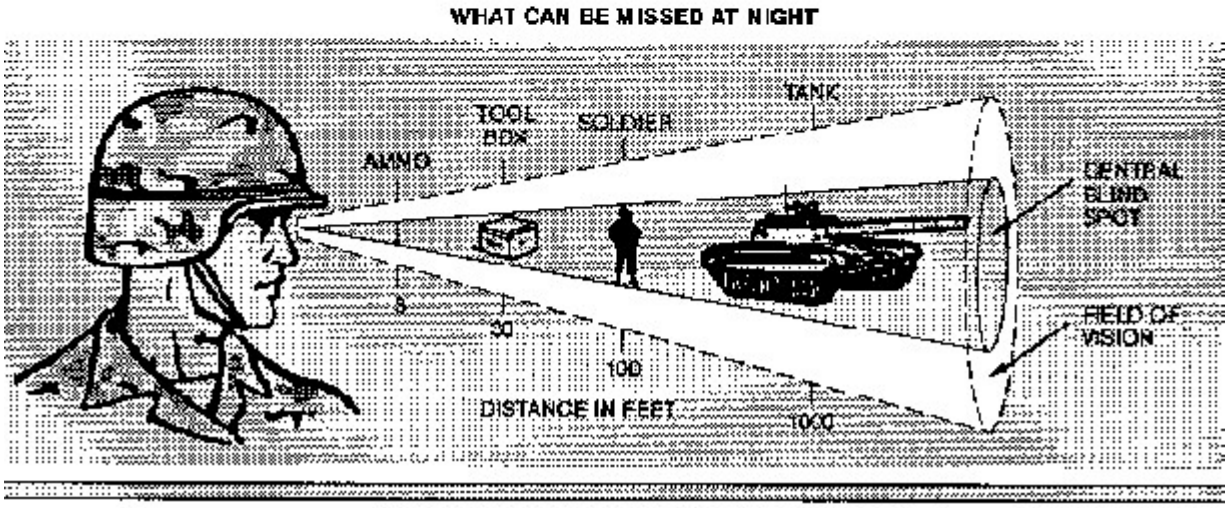
a. ***Use of the Horizon***. When performing night observation, stay low to keep objects outlined against the sky. On cloudless nights, the silhouette of a human is easy to spot against the horizon; this process is sometimes called “roofing."

b ***Night Blind Spots and Viewing Techniques***. The human eye has a "blind spot" where the optic nerve connects the eyeball to the brain. Under normal circumstances, you do not perceive this blind spot; since both of your eyes see slightly different angles of the same object, your brain combines the two inputs into one seamless image. At night, however, when both eyes are focused on the same spot in an attempt to make the most of the available light, the blind spot is much more prominent. Since the blind spot is at the center of your field of view, its relative size increases as distance increases; the blind spot is the size of a cigarette at 2 meters, but the size of a person at 30 (see Fig. 1-12).

"One accustomed to night movements, compared to one not so accustomed, is much more able to form correct judgments by sight; for experience sharpens the nerves and increases the faculty of attention. From indications, from methods of comparison, together with other assisting factors, one's judgment soon becomes accurate."

-Burnett[24]

Figure 1-12. Effect of Night Blind Spot.[25]

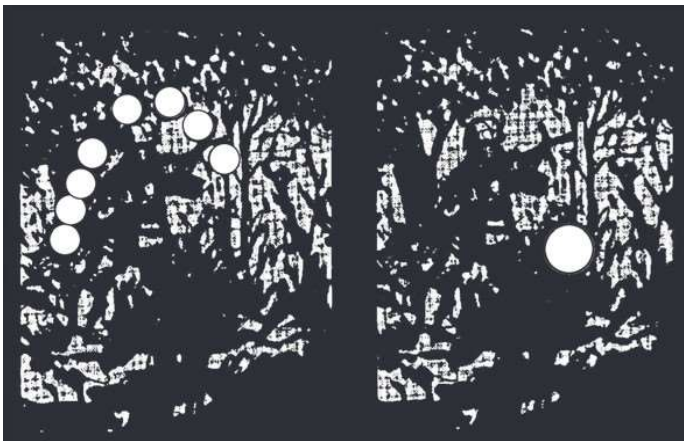


Use the following techniques to overcome the night blind spot:

l) **Off-Center Viewing**. Because the blind spot makes viewing an object by central vision ineffective, the **off-center viewing technique** (Fig. 13) is a common method for observing during periods of limited visibility. Since the eye has a higher concentration of rods (cells better-suited for low-light vision) around the edges of the pupil, objects are easier to perceive if you look at them out of the corner of your eye. To employ off-center viewing, scan above, below, and to the sides of the object or area you are observing.

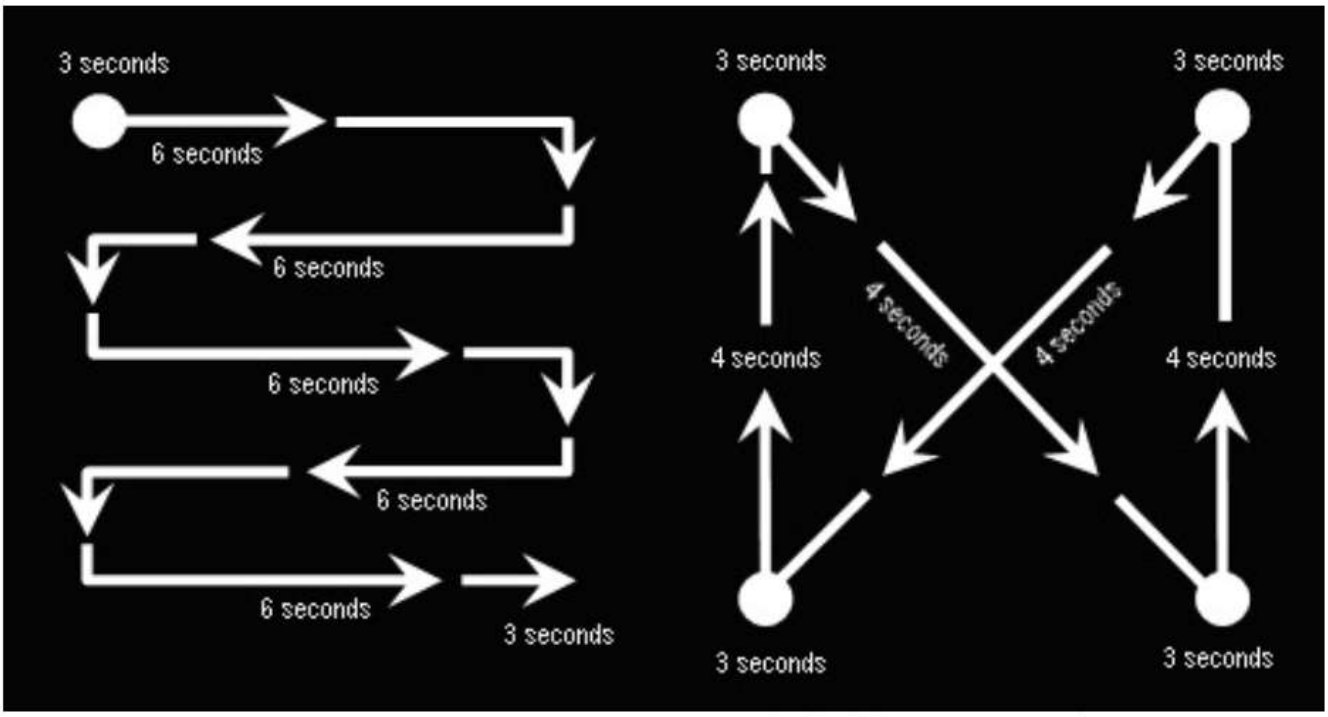
24 Ibid. 25.
25 FM 44-48.

Figure 1-13. The Off-Center Viewing Technique[26]



II) **Scanning**. Scanning, as in normal deliberate searches, takes on a greater importance during periods of low- to no-light observation. The rods in your eye quickly become exhausted at night, even when using off-center vision, and looking at any one spot for longer than a few seconds will cause your vision to "bleach out" into a single smear of color. To avoid the bleach out effect, avoid staring. Instead, continuously move your eyes in a regular scanning pattern (Fig. 14).

Figure 1-14. Scanning Patterns[27]



26 TC 3-21.75. 9-11.
27 FM 44-48.

c. ***Light Sources and Distances***. At night, the distance at which light can be detected is vastly increased. Table 12 shows the distance at which common light sources can be detected at night on level ground. Be mindful of these distances when using light sources in the field, and remember that a relatively small increase in elevation can greatly improve an observer's range.

Table 1-12. LIGHT DISTANCES[28]

SOURCE	*DISTANCE*
Vehicle Headlights	4 to 8 kilometers
Muzzle Flashes from Single Cannons	4 to 5 kilometers
Muzzle Flashes from Small Arms	1.5 to 3 kilometers
Bonfire	6 to 8 kilometers
Flashlight	up to 2 kilometers
Lighted Match	up to 1.5 kilometers
Lighted Cigarette	0.5 to 0.8 kilometers

Section IV. TRACKING.

Perhaps no scouting skill has been romanticized as much as tracking. **Tracking** refers to the application of observation techniques to find evidence of the passage of people, animals, or machines and follow those pieces of evidence to their source. It is used by hunters to follow game animals and by search-and-rescue personnel to locate lost hikers or children. Tracking is demanding, exacting work, and requires extensive training and practice. The following information is intended to give you a grounding in the foundations of the subject; tracking, no less than any other skill, cannot be acquired on the page, but only through practice.

1-16. **FUNDAMENTALS OF TRACKING**. When tracking, adhere to the following fundamentals:

a. Maintain security at all times. Never allow yourself to get lost; conduct frequent location checks.

b. While tracking, you should be continuously searching for **track traps**. A **track trap** is an object or area like a mud puddle or a dusty shelf; if there is no way to interact with it without leaving some evidence, it is a track trap.

c. Never contaminate **sign**. Sign can be contaminated by being physically interfered with (such as scuffing a footprint) or by bringing a preconception to the sign.

l) **Sign**. Sign (sometimes called “spoor” in other literature), is any bit of evidence which indicates the path of the **subject**, who is the individual being tracked. There are two types of sign: **ground sign** and **top sign**.

"[Sign] can be defined as any evidence of change from the natural state that is inflicted on an area by a person's passage."

-Jack Kearney[29]

28 FM 44-48.
29 *Tracking: A Blueprint for Learning How* (1980 [1978]). 55.

i) *Ground Sign*. Ground sign refers to the indicators on the ground left by the subject's feet or equipment. There are five primary categories of ground sign: **regularity**, **flattening**, **transference**, **color change**, and **displacement**.

a) Regularity. Consistent, uniform, and repeating patterns, especially sign spaced out regular intervals. are not characteristic of the unbuilt world. Their presence is often a result of footprints.

b) Flattening. Areas on the ground that have been pressed down are an indication that something or someone has moved through the area, or that something been placed there.

c) Transference. When people or animals move through their environment, they carry material, like mud or dirt, from one area to the other. Transference is especially likely at track traps; if you come across a track trap during your search, search the area immediately around to see if the subject carried any material from the track trap with them. Transference can also occur at track traps that interrupted the subject's movement. If the subject had to vault a fence or cross barbed wire, they might have torn some of their clothing or left a shoe scuff mark.

d) Color Change. When vegetation is broken, it can change colors as the plant cells die. Soil from one layer of the ground is a different color from the soil at the surface. Water is a useful track trap for detecting color change; wet materials appear darker than dry ones, and anyone exiting a river or stream would have splashed water around themselves.

e) Displacement. The movement of an object from one location to another creates displacement, and can include rocks being turned upside down or roots being pulled from the ground, is an indicator that a person or animal has passed through the area.

ii) *Top Sign*. Any indicator above the level of the subject's knees is known as top sign. There are only two primary categories of top sign: **transference** and **displacement**.

a) Transference. Top sign transference is less common than ground sign transference, but the tracker should look for it anyway. Just like with ground sign transference, focus your efforts around track traps, which for top sign include dusty shelves or thorny branches.

b) Displacement. As with ground sign, displacement occurs when objects are moved from their original position. Top sign displacement can take the form of broken limbs or twigs; torn spiderwebs are also a very common top sign.

d. The best way to detect sign is by keeping the sign between the tracker and a light source; this will throw shadows toward the tracker. This method is most effective during dawn and dusk, and loses its effectiveness completely leading up to and just after noon.

1-17. **FOOTPRINTS**. The most common form of ground sign are footprints. Even if a subject maintains perfect litter discipline, they will still always leave footprints to mark their passage.

a. ***Components of a Footprint***. A footprint is composed of three elements: the **primary impact point**, the **roll**, and the **terminal point** (see Fig. 1-15).

I) **Primary Impact Point**. The primary impact point is the first part of the subject's foot that touches the ground. When walking forward, the primary impact point is normally the heel; when walking backward, the primary impact point is usually the toe.

II) **Roll**. The roll is the portion of the footprint formed when the sole of the foot touches the ground as the subject's weight shifts from front to back during their stride.

III) **Terminal Point**. The terminal point is the final part of the subject's foot to leave the ground. When walking forward, the terminal point is the toe; when walking backward, the terminal point is usually the heel.

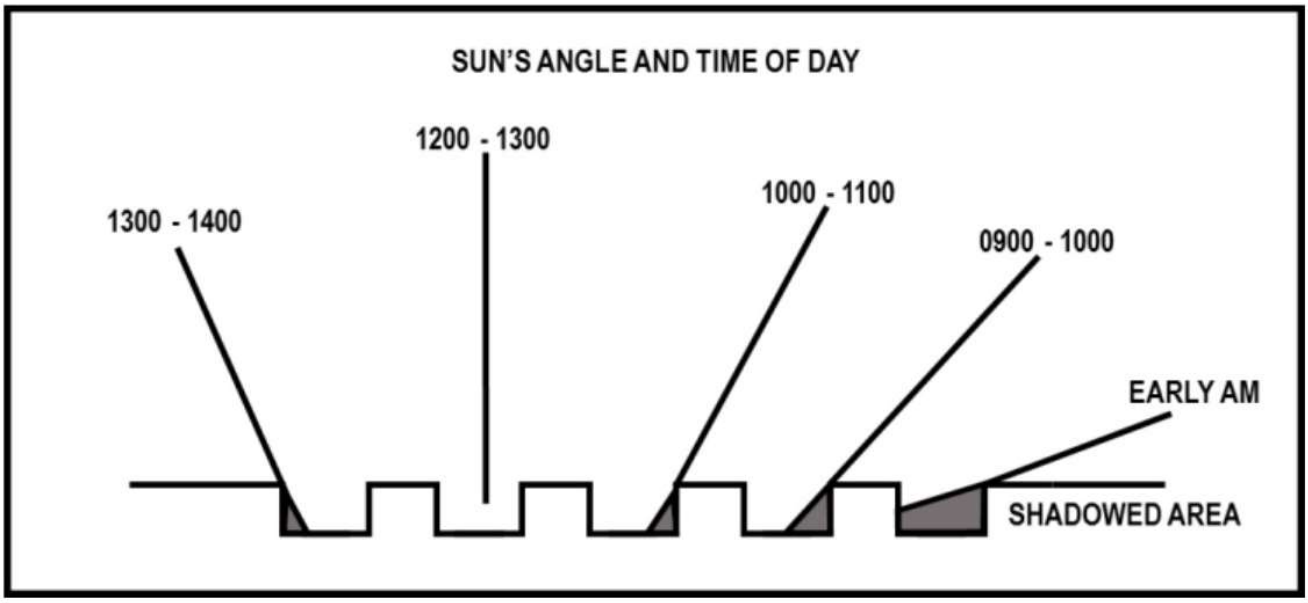
Figure 1-15. Components of Footprints[30]

"The single most important thing to learn about tracking at the outset is to utilize the sun. Try to always position yourself so that the track for which you are looking will appear directly between you and the sun."

-Jack Kearney[31]

b. To effectively track footprints, you must always face the sun. From this position, shadows cast into the impression left by the footprint will be easier to see (see Fig. 1-16). The best time to track is at dawn and at dusk, when the angle of the sun is low on the horizon and the shadows cast inside the footprint will be greater.

Figure 1-16. Effect of the Sun on Observing Footprints[32]



30 MCTP 3-01A. 9-9.
31 *Tracking: A Blueprint for Learning How.* .27
32 TC 3-22.69. 8-23.

c. When you find a footprint, try to locate the point of the toe and the edge of the heel. If the track is clear, take a picture or a detailed sketch so as to compare it with footprints found later. This track is designated the **lead track** (or "key print").

l) When you find the lead track, search around the area in front and behind the print for another print. Two prints in a row indicate the **step interval**, or the distance between footprints. Use the step interval to construct a **tracking stick** (see Fig. 1-17). The tracking stick can be a wooden dowel, a length of pipe, a ski pole, or even a rifle.

i) Lay the stick on the ground, with the front end of the stick even with the heel of the forward track.

ii) Using a rubber band, duct tape, or cord, make a mark on your tracking stick even with the tip of the toe of the rear track. The distance between the front end of the stick and your marker is the step interval.

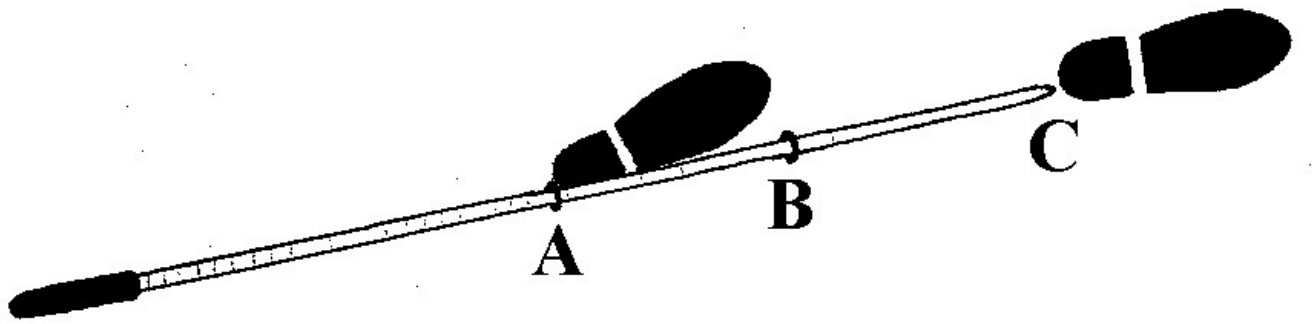
iii) Shift your stick so that the toe marker is directly over the centerline of the rear track. With the toe marker in position over the tip of the toe, place a second marker directly over the rear edge of the heel. The distance between the toe and heel marker is the length of the footprint.

iv) To use the tracking stick, place the toe marker in position over the toe of an intact footprint and, using the toe marker as the pivot point, rotate your stick. Since the distance between the point of the stick and the toe marker is the average step interval, there should be another step along the arc of the tracking stick as it makes its sweep. The initial arc should be small, growing only if you are unable to find the step (see Fig. 1-17).

v) It is possible to utilize the tracking stick at night. By tying or taping a flashlight toward the bottom of the tracking stick (15 to 30 centimeters off of the ground), you can take advantage of the stick's measurement capabilities and serves to duplicate the low angle of the sun at dawn and dusk.

vi) Never skip a track.

Figure 1-17. Tracking Stick.



"By going one step at a time you can know positively that you are still on your [subject]'s trail. If you skip tracks you cannot be sure that subtle sign such as a broken twig was not caused by an animal, so doubts arise and your confidence in the trail you are following tapers off dramatically [...] *Innumerable times I have seen learners give up and admit defeat when they were still right on their quarry's trail, but they had skipped so many tracks that they didn't KNOW it."*

-Jack Kearney[33]

33 *Tracking: A Blueprint for Learning How*. 78

Chapter 2
REPORT

"The revolution is over. We've won. How do we share information with each other over long distances? Do we use the same data silos designed to spy on every single person on earth and sell them shit they don't need? Do we use the same software designed with the same captivating logic as a casino slot machine? Do we make use of the same structures we have today, or do we build a new world in the shell of the old?"

-Anonymous[34]

In the previous chapter, you learned how to practice observation techniques and remain alert for danger. In this chapter, you will learn how to share the information you have collected during your period of observation as quickly and clearly as possible, without the message's interception. The easiest way to make your reports fast, clear, and secure is to adhere to standardized message formats and protocols, familiarize yourself with communication security techniques, and have as many redundant communication methods as possible.

Section I. SIGNAL METHODS AND REPORT FORMATS.

Modern digital communications have allowed us to connect to one another in a way that would have been inconceivable mere decades ago. With such speed and convenience at our disposal, our communications are faster than ever, but more vulnerable to surveillance and interception. Having multiple methods to send a message or prearranged signal increases the likelihood that those who need to receive your report will receive it, while reducing the chances that those who do not will not.

34 "For An Anarchist Radio Relay League" (2021).

2-1. **SIGNAL METHODS**. The ways in which a signal can be sent are limited only by your imagination, but, broadly speaking, most of your communications will be via one of two methods: **radio** (which in this context means any electronic voice communications, to include VHF radio, VOIP, and cellular networks) and **visual, auditory & tactile signals** (or **VATS**). Each method has its own advantages and disadvantages, and you should familiarize yourself with all techniques at your disposal.

a. ***Radio***. The fastest and most convenient method of communication is two-way radio. Radio signals can be transmitted over the airwaves (as with **handheld radios**, like walkie-talkies, or larger **base stations** for amateur "ham" operators), over **cellular networks**, or via **satellite** or **Wi-Fi**. All radio transmissions, regardless of platform, are inherently insecure. Anyone tuned to your frequency, comrade or otherwise, will be able to listen to your transmissions. You must always assume radio transmissions are being monitored. Effective radio employment depends on adhering to proper radio protocol, described in Section II.

I) **Cellular Networks**. While they have become our ubiquitous companions, cellular phones are not a reliable method of emergency communication, to say nothing of their potential to be used to surveil us without our knowledge these fears are not theoretical; during the uprisings in the summer of 2020, the Department of Justice likely used tools[35] to obtain identifying information from protesters' phones). Cellular networks are designed to handle a certain call volume, and in moments of crisis, cell towers will fail, both because of power outages and because the sheer number of calls will overwhelm the system, preventing any messages from getting through. Cell networks can also be shut off remotely to prevent individuals or groups from coordinating and communicating.[36] In emergencies, SMS messages are more reliable. Their small size means they put less strain on the network, and they can be held in reserve by the network until it has the capacity to send it.

Ham radio is more than just talking to truckers with a walkie-talkie. Actually, it's barely even that. There are so many different things you can do, and different aspects of the hobby (that's how most people think of it) that hams can focus on:

- *There are modes of communication that allow you to talk with people on the opposite side of the planet using less power than a half-dead AA battery. (FT8, JS8call, Fldigi)*
- *Hams were sending e-mail over ham radio networks before the Internet even existed. There still exist BBSes (Bulletin Board Systems, aka forums, before forums existed) on various parts of the amateur bands.*
- *Slow Scan Television (SSTV) allows you to transmit a full color image as a series of tones, and decode them on the receiving end using software on a computer or smartphone simply using a microphone.*
- *You can track the positions of airplanes and other vehicles using APRS (Automated Packet Reporting System)*
- *You can talk to people on the International Space Station.*
- *You can talk to people on Earth using the repeater on board the ISS and other amateur radio Low Earth Orbit satellites. (AMSAT)*

Aside from simply being cool as hell, these are long distance communication systems that are **decentralized and resilient**.

-Anonymous[37]

35 Zetter, Kim. “How Cops Can Secretly Track Your Phone.” *The Intercept* (2020).
36 Ungerleider, Neal. “Why Your Phone Doesn't Work During Disasters – And How to Fix It.” *Fast Company* (2013).
37 (2020). 8. Emphasis in original.

b. ***Visual, Auditory, & Tactile Signals (VATS)***. You can and should use **visual** (hand-and-arm, posture, strobe/flash, smoke & pyrotechnic, and marker panel), **auditory** (whistle, password), and **tactile** (tugline) signals (**VATS**) whenever possible in order to reduce the volume of radio transmissions. While VATS can be vulnerable to detection, enemy personnel must be in actual proximity to the signal in order to perceive it, unlike radio signals which can be detected kilometers away.

2-2. **PRIMARY, ALTERNATE, CONTINGENCY, & EMERGENCY (PACE) SIGNAL PLANS**. If you have any important signals, you need more than one way to send them. One of the most common methods of assigning multiple methods to the same signal is by implementing a **primary**, **alternate**, **contingency**, and **emergency** (or **PACE**) **plan**. The sample PACE plan on Table 2-1 shows how to use different signal methods to send important reports and signals in four different circumstances.

Table 2-1: Sample PACE Plan

Event	***Method***			
	Primary	**Alternate**	**Contingency**	**Emergency**
Transmitting SPOTREP	VHF	VOIP	Chat	Phone
Calling EMS	Phone	VOIP	VHF	Whistle
Intra-OP Communication	Strobe	Tugline	Hand-and-Arm	Voice
Directing Traffic	Hand-and-Arm	Signal Panels	Flashlight	Pyrotechnics
Legend				
VHF Very High Frequency (Handheld Radio)	**VOIP** Voice Over Internet Protocol		**Chat** Encrypted Messaging	

2-3. **REPORT COMPONENTS**.

a. ***Callsigns***. A **callsign** (or "call sign") is usually a combination of letters, numbers, or words used to identify a **station**, a specific individual or facility operating on a radio network. A full callsign conventionally includes a word to indicate a unit and a number to indicate the individual within the unit (BRAVO-11, for example, or ECHO-34); the abbreviated callsign omits the unit identifier. If used, the numeric identifier should not correlate to seniority (the leader of SIGMA team should not be identified as SIGMA-01, for example); this is to prevent hostile personnel from determining the identity of key personnel. You should use your callsign when establishing contact with another station or when transmitting on a previously established network. Unless their omission would cause confusion, full callsigns should not be used after the initial transmission, and callsigns should be dropped altogether after the first response (see Table 2-2).

The voice callsign system seeks to conceal from an enemy who is talking to whom, hence the level of command, composition and purpose of the net. Callsign systems are devised to make all nets sound the same to an intercepting operator or analyst. Unless considerable time is spent in monitoring and searching for telltale traffic, the nature, composition and purpose of an insecure net should not be obvious.

-ACP 125(G)[38]

38 1-2.

Table 2-2: Callsign Use

Callsign Use	*Notes*
"KAPPA-13, THIS IS LAMBDA-27. In position, OVER.	LAMBDA-27 radios KAPPA-13 using full callsigns.
"27, 13. ROGER."	KAPPA-13 responds to LAMBDA-27 using abbreviated callsigns.

b. ***Message***. Uses the line-by-line format established in paragraph 2-4.

c. ***Authentication***. Authentication is "a security aid designed to prevent [friendly] communicators being deceived by fraudulent transmissions[39]" from hostile personnel. Since radio is an insecure medium, you must assume all of your transmissions are being monitored. With careful study of your radio transmissions, opposition forces can develop a sophisticated understanding of you and your comrades' operation and use that to attempt to deceive you. Hostile personnel might attempt to solicit transmissions from you in order to locate your signal, or they might attempt to transmit false information in an attempt to disrupt friendly movements.

I) **Authentication Protocol**. Authenticate transmissions whenever any of the following occurs:

- You receive the proword "AUTHENTICATE;"
- When joining an encrypted network;
- When imposing, lifting, or breaking radio silence; and
- When transmitting any unencoded critical information.

If you are requesting authentication from another station:

- Provide the station with no more than 30 seconds to respond.
- If the station responds with the incorrect authentication, request their authentication again.
- Ignore any station which fails back-to-back authentications.

II) **Authentication Techniques**. Authentication requires some method of confirming the identity of the transmitting station. This method will only work if the method of confirmation is known only to you and your comrades. Since passwords and challenge phrases are no longer secure once they are spoken over the airwaves, a method that is more resistant to hostile analysis is necessary. Developing and using codes is outside the scope of this book; the following example is a very quick system and will suffice for illustrative purposes, but more robust methods should be used in the field.

i) The following authentication table (see Fig. 1) was developed by using a random number generator to choose a set of 50 numbers with values between 1 and 26. These numbers were converted into letters, and pairs of the letters were placed in each cell. Assume, for the purposes of this example, that each number was truly random, that every person who needs a copy of the table has one, and every person who has a copy of the table understands how to use it. Assume further that no copies of the table have fallen into hostile possession.[40]

39 Ibid. 2-8.

40 In practice, constructing codes that are both usable and secure is much more difficult than this example. See Claude Shannon's 1949 paper "Communication Theory of Secrecy Systems" for the criteria a truly unbreakable code must meet.

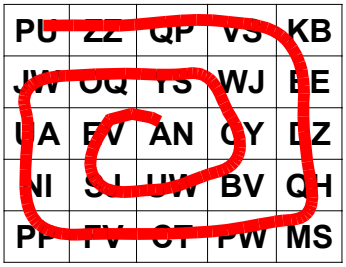
Figure 2-1. Sample Authentication Table.

PU	ZZ	QP	VS	KB
JW	OQ	YS	WJ	EE
UA	EV	AN	CY	DZ
NI	SJ	UW	BV	QH
PP	FV	CT	PW	MS

ii) To issue an authentication challenge, the issuing station will pick two cells from the authentication table and read the first letter in each cell.

iii) The receiving station will consult their own copy of the authentication table according to a prearranged method. In this case, the table should be read in a clockwise spiral, starting from the top left corner (see Fig. 2). When the receiving station comes to the first letter read by the issuing station, the receiving station will read the second letter in that cell. They will do the same for the second letter read by the issuing station (an example of this process is in Table 3).

Figure 2-2. Using the Authentication Table.



iv) After the challenge has been complete, all stations should strike through those two cells. Never re-use authentication codes. Always assume hostile elements are listening, and always treat an attempt to reuse an authentication code as a failed authentication challenge.

"An enemy will rarely attempt deception during peacetime, but almost exclusively reserve its use for time of war to ensure maximum impact. Unsuspecting stations preoccupied with urgent tactical matters are particularly prone to this method of attack. Special care must also be taken to identify and ignore counterfeit transmissions made solely to solicit answering calls, normally for DF purposes, particularly when radio silence is in force. Whenever deception is recognized, or suspected, it should be reported immediately by secure means in accordance with national reporting procedures."

-ACP 125(G)[41]

In the United States, it is illegal on the amateur spectrum to "transmit messages encoded to conceal their meaning". Of course, this only applies to poor people and people who don't run large tech corporations. But you know, c'est la vie *under Capitalism.*

-Anonymous[42]

41 (2016). 2-5.

42 (2020). 14. Original cites “Encryption is Already Legal, It's the Intention That's Not,” by Anthony K3NG for *Amateur Radio* (2013).

Table 2-3. Example Authentication Challenge and Reply.

Challenge and Reply	*Notes*
"BETA-57, THIS IS GAMMA-41. Move to position TENPIN, OVER."	GAMMA-41 transmits an instruction to BETA-57.
"41, THIS IS 57. AUTHENTICATE Bravo Yankee, OVER.	57, unsure of the authenticity of 41's transmission, consults their authentication table and issues the challenge.
	41 tells 57 to wait while they consult their authentication table (having already established contact, the callsigns are omitted).
“WAIT, OUT.”	41 consults their authentication table. Starting from the top left and moving in a clockwise spiral, the first "B" is in the fourth row of the fourth column. The second character in that cell is "V," so the first half of the authentication is "Victor."
	41 starts back at the beginning, looking for "Y". The first "Y" is in the second row of the third column. The other character in that cell is “S,” so the second half of the authentication is “Sierra.”
"I AUTHENTICATE Victor Sierra, OVER.	
"ROGER, OUT.”	Everyone on the network marks through those cells on the authentication table. They are not to be used again.

Table 2-4. Transmission Authentication Example.

Transmission Authentication	*Notes*
"THETA-77 THIS IS EPSILON-23. Move now. AUTHENTICATION Uniform Alfa IS Alfa November, OVER.”	EPSILON-23 transmits an instruction to THETA-77 and authenticates their transmission by reading the results of their authentication table.
"23, 77. ROGER, OUT.	Everyone on the network marks through those cells on the authentication table. They are not to be used again.

2-4. **REPORT FORMATS**. One of the easiest ways to increase understanding between stations and minimize the amount of transmission time is to adhere to standardized report formats. By using standardized formats, you can quickly share the information you need to, without wasting time on unnecessary details. Two of the most useful formats are the the **spot report** (or **SPOTREP**), and request for **medical evacuation** (or **MEDEVAC**).

a. ***Spot Reports (SPOTREP)***. The **spot report** (**SPOTREP**) is used whenever you see something unusual (see Table 2-5. There are two mnemonics you can use when delivering a SPOTREP: the SALUTE format (for **Size**, **Activity**, **Location**, **Unit**, **Time**, and **Equipment**) and the SALT format (for **Size**, **Activity**, **Location**, and **Time**). Use the former when time or space is not an issue, the latter when speed is a priority.

Table 2-5. SPOTREP Format.

Line 1	**Date and Time**	Provide the date and time (if not using local time, indicate the time zone used) that the report is being made.
Line 2	**Identification**	Identify yourself.
Line 3	**Size**	Provide the number of personnel or vehicles you detected at the time indicated. Be as specific as possible.
Line 4	**Activity**	Describe the activity of the detected personnel or vehicles at the time indicated.
Line 5	**Location**	Indicate the location of the observed activity. Use grid coordinates, street numbers, or prominent landmarks.
Line 6	**Unit**	Indicate to the best of your ability the affiliation of the personnel or vehicles observed. Describe any distinguishing markers or symbols. This line is sometimes written as "Uniform."
Line 7	**Time**	Indicate the date and time that the personnel or vehicles were observed.
Line 8	**Equipment**	Describe the weapons, communications gear, and other important materiel that the personnel or vehicles are carrying.
Line 9	**Assessment**	If you can determine the reason for the observed activity, indicate it here. Use your best judgment; do not assume facts that you cannot observe.
Line 10	**Narrative**	If any additional information is required for clarity, include it here. This line is sometimes written as "Notes."
Line 11	**Authentication**	Authenticate your report.

Table 2-6. Example SPOTREP.

SALUTE Format	***Notes***
"OMICRON-22, THIS IS OMICRON-17. SPOTREP. Four technicals passed under Checkpoint 1516 with militia banners at TIME 1001. Machine gunner in each bed. AUTHENTICATION Foxtrot Uniform IS Victor Hotel, OVER." "17, 22. ROGER, OUT."	OMICRON-17 calls in a SPOTREP by speaking in complete sentences. If there is information that OMICRON-17 does not have, it is omitted; they do not say "LINE ONE IS," "BLANK," or "SKIP."
SALT Format	***Notes***
0900: Six militia personnel standing in a circle in front of Murphy's Mart at 0857.	This quick text message indicates the bare essentials of a SPOTREP.

b. ***MEDEVAC Reports***. **Medical evacuation** (**MEDEVAC**) reports (see Table 2-20) are used to get a casualty to **definitive care** (that is, a facility with the appropriate personnel and equipment to treat and, hopefully, resolve the casualty's underlying illness or injury). The faster the casualty gets to a definitive care facility, the greater their odds of survival. Whatever form they take, civilian or otherwise, being able to call **emergency medical services** (**EMS**) is a critical priority.

Table 2-7. MEDEVAC Format.

Line 1	**Location**	Indicate the location of the **pickup zone** (**PZ**). Use grid coordinates, street numbers, or prominent landmarks. Be as specific as possible.
Line 2	**Callsign / Callback**	If you are operating on a radio network, give your callsign and the frequency you are operating on. If you are using a cell phone, give your name and a callback number in case you are disconnected.
Line 3	**Number of Casualties**	Indicate the number of casualties in order of precedence: *Urgent, Surgery Required*: The casualty needs immediate evacuation and will require surgical intervention en route to a definite care facility. Urgent: The casualty needs immediate evacuation. If the casualty does not receive medical attention, they will die. *Priority*: When evacuation occurs, the casualty needs to be among the first evacuated, but the evacuation itself does not need to be accelerated. The casualty is stable, but their condition might deteriorate. *Routine*: The casualty will be among those evacuated during normal evacuation procedures. The casualty has injuries that might require medical treatment, but are not life-threatening. *Convenience*: The casualty will be evacuated whenever resources are not required elsewhere; the casualty's wounds are insignificant.
Line 4	**Special Equipment Required**	If any special equipment (a hoist or pulley to lift a casualty out of a vehicle or basement, saws or cutting materials, oxygen or ventilators) is required, note it here.
Line 5	**Patient Type**	List the total number of casualties. Separate those that can walk under their own power from those who need to be carried.
Line 6	**Security of PZ**	During combat operations, indicate the security of the PZ. A. No hostile personnel present. B. Possibly hostile personnel present, approach with caution. C. Hostile personnel present, approach with caution. X. Enemy troops present, armed escort required.
	MIST	In noncombat situations, use this line to describe the **mechanism of injury** (vehicle collision, gunshot wound, &c), the **type of injury** (cardiac arrest, massive hemorrhage, &c), **signs and symptoms** present (heart rate or blood pressure, if known), and any **treatment** already given to the casualty, including any medications.
Line 7	**Method of Marking PZ**	Use this line to indicate to EMS how you will mark the PZ. Be as specific as possible.
Line 8	**Casualty Status**	Use this line to indicate the status (comrade, hostile, &c) and nationality, if known, of the casualty(ies). A: Friendly combatant B: Friendly non-combatant C: Enemy Defector or Deserter (EDD) D: Hostile Personnel
Line 9	**CBRN Status**	During combat, use this line to indicate the presence or absence of Chemical, Biological, Radiological, or Nuclear agents or materials: C: Chemical agents or materials are present. B: Biological agents or materials are present. R: Radiological agents or materials are present. N: Nuclear materials are present. A: All clear.
	Terrain Description	In noncombat situations, use this line to describe the terrain and other characteristics of the PZ.

Table 2-8: Example MEDEVAC Requests

Combat MEDEVAC Request	***Notes***
"RHINO-43, THIS IS RHINO-36, MEDEVAC, OVER. "36, 43, ROGER." "Grid 122571. Frequency 462.550. Three urgent, two routine. Three litter, two walking. Security is Alfa, marker is a signal panel, casualty status is Alfa, CBRN is Alfa. OVER." "ROGER OUT."	In this example, RHINO-36 needs to evacuate five injured members of their team, three of whom are hurt quite badly. They share the relevant information, skipping over information they do not know, bundling the last three lines together to save time. For security, RHINO-36 does not transmit the color of the signal panel they will use to mark the PZ; when the medevac arrives, it will identify the color and RHINO-36 will confirm it.
Noncombat MEDEVAC Request	***Notes***
"911, what's your emergency?" "I am at the corner of 2nd Street and Arch Street in downtown Anarchopolis. My callback number is (555) 478-6831. There are two injured people here who need an ambulance. They were involved in a hit-and-run. They are disoriented with possible concussions and possible spinal injuries. I am parked next to them in a white pickup truck with my flashers on. Their car is hard to see from the road, you will need to get to the shoulder." "Stay on the line, EMS are being dispatched."	In this example, you have called local EMS after witnessing a vehicle collision. Since this is not a combat scenario, you do not need to share the security of the PZ or indicate the presence or absence of CBRN agents or materials. Instead, you will provide the dispatcher information about the casualties and details about the area around the PZ.

Security is another basic difference between wartime and peacetime requesting procedures. Under all nonwar conditions, the safety of US military and civilian personnel outweighs the need for security, and clear text transmissions of medical evacuation requests are authorized. During wartime, the rapid evacuation of patients must be weighed against the importance of unit survivability. Accordingly, wartime medical evacuation requests are transmitted by secure means only.

-FM 8-10-6: *Medical Evacuation in a Theater of Operations*[43]

Disaster Relief efforts may require communication and coordination between cities, neighborhoods, households, caravans bringing relief supplies, or caravans leaving an effected area. Your disabled and elderly or injured comrades should be able to contact you and/or emergency services in case they are unable to leave their homes, so that you can figure out a way to either help them or find someone who can.

-Anonymous[44]

43 (2000). 7-3.
44 (2020). 21.

2-5. **FIELD SKETCHING**. If a picture is worth a thousand words, a sketch, even a rough one, is worth at least a few dozen SPOTREPs and can convey information that a detailed description cannot. There are two types of sketches: **hasty sketches** and **panoramic sketches**.

a. ***Hasty Sketches***. A hasty sketch (also called a "simple" or "topographic" sketch) is not an attempt to capture a perfect representation of objects on the ground; rather, it is a way to provide the recipient of your message with a point of reference with which to identify your position or plot your coordinates on a map. Hasty sketches can also be used to provide reliable, accurate descriptions of roads, railways, and rivers. To prepare a hasty sketch (Fig 2-3):

- Identify a recognizable, prominent reference point; a church, a distinctive rock formation, &c. Determine the azimuth from your position to the reference point. Determine the distance, as best you are able, to the reference point.
- Indicate your position, using grid coordinates if possible, and the reference point. Then draw the azimuth. Label the reading and the distance.
- Repeat this process, identifying another reference point. Draw and label the new reference point, azimuth, and distance.
- Sign and date the sketch.

Figure 2-3. Making A Hasty Sketch[45]

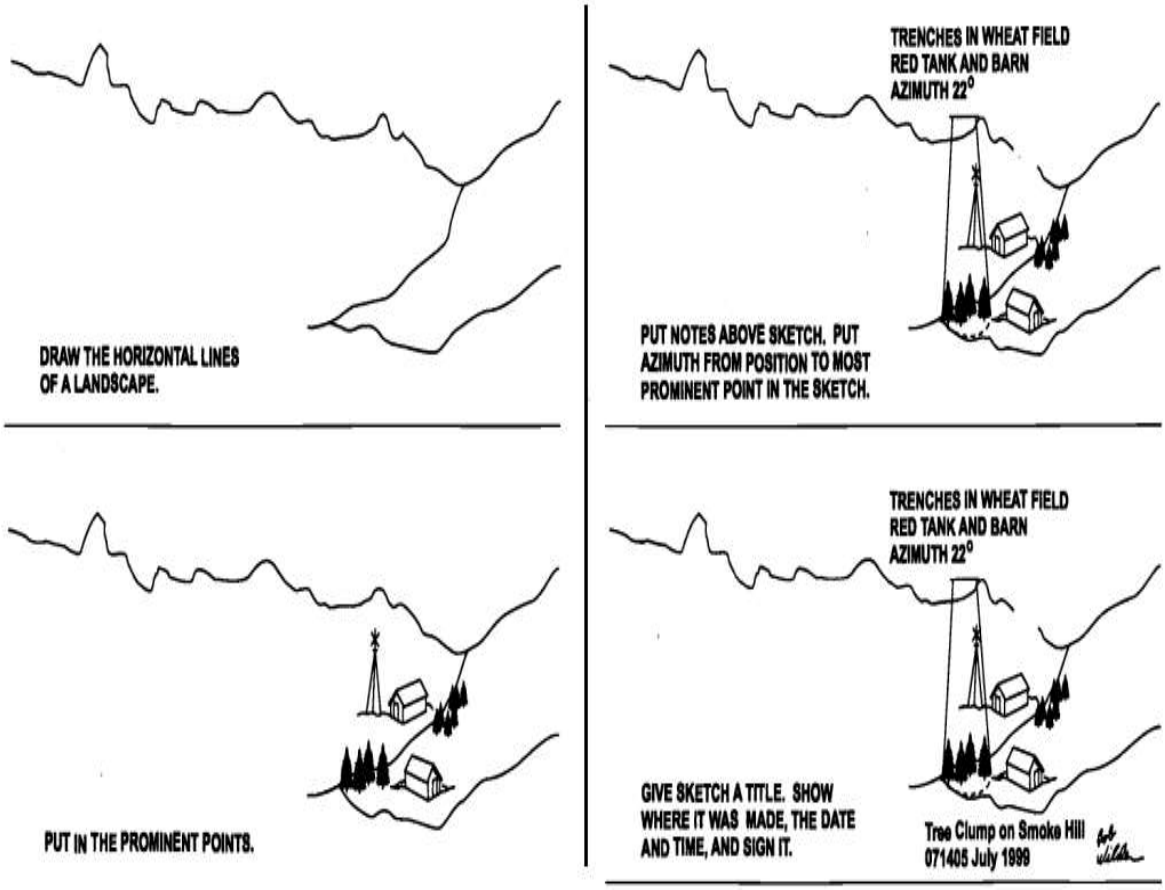
Figure 6-4. Making a Simple Sketch.

45 MCWP 3-11.3: *Scouting and Patrolling* (2000). 6-3.

b. ***Panoramic Sketches***. A panoramic sketch is an accurate scale representation of the terrain and elevation of a particular point from one particular perspective (see Fig. 2-4). A panoramic sketch is meant to convey specific information about a point under observation that would be difficult to convey verbally, like the shape of terrain features, arrangement of fences or obstacles, or visual designs or patterns. Do not include personnel, hostile or otherwise, in panoramic sketches. To prepare a panoramic sketch:

- As with a hasty sketch, identify a recognizable, prominent reference point. Draw the horizon in reference to this reference point.
- Draw the key points, as much to scale as possible, omitting unnecessary and extraneous details. Identify your position and the position of the reference point with grid coordinates.
- Use arrows above the sketch to identify any features that require further explanation. Note the date, time, and weather at the time the sketch was prepared.

Figure 2-4: Panoramic Sketch[46]



46 Ibid. 6-4.

Section II. RADIO PROTOCOLS.

In the absence of mobile phone service, the most reliable form of communication is two-way radio. The fundamentals of radio waves and radio technology, as well as the construction, installation, and operation of radio stations, is fascinating, but unfortunately beyond the scope of this publication. It will suffice to know that radios work by converting sound waves into electrical impulses and then transmitting those signals through the air at very specific frequencies. If an antenna within range is tuned to the same frequency, it will convert the electrical signals back into sound waves. The practical implication of all this is that anybody, whether friendly, neutral, or hostile, with a radio tuned to your frequency can hear your transmission. What's more, with special equipment, they can trace the signal back to its point of origin, potentially compromising your position. This means that radio is an inherently insecure medium. Since the platform itself is vulnerable to interception, the scout uses the appropriate techniques to minimize risks. These techniques are collectively referred to as **radio protocols**, and consist of transmitting **clearly**, **securely**, and **briefly**.

2-6. **RADIO FUNDAMENTALS**. When an electric current causes electrons to travel back and forth across a conductor, they send out waves in the same manner as a pebble dropped into a pond. These waves are called radio waves. Radio waves utilize alternating current, which switches direction from positive to negative at regular intervals. The rate at which the current switches direction is called the frequency. Frequency measures how long it takes for a system to complete a single cycle. It is measured in hertz. One hertz is equivalent to one complete cycle in one second. If an electric current with a frequency between 30 Hz and 300 GHz (one gigahertz is equal to one billion hertz) is applied to a conductor, the particles moving across the conductor will emit radio waves. The frequency range at which particles will emit radio waves are called radio frequencies (RF). All radio waves travel at the same speed: the speed of light, usually written as c, equal to 299.79 x 106 m/s. Since their speed remains constant, the **wavelength** (the distance from one peak to the next) must be inversely proportional to the frequency (that is, as the distance between the waves gets shorter, the frequency increases, and vice versa), as expressed by the following formula:

$$\lambda = \frac{c}{f}$$

Where:
λ = wavelength, in meters;
c = the speed of light in a vacuum (299.79 x 10^6 m/s); and
f = frequency, in hertz.

Using this formula, we can see that a 30 MHz (30 x 10^6 Hz) radio wave has a wavelength of 9.99 meters and a radio wave with a wavelength of 1 meter has a frequency of almost 300 MHz). Radio frequencies can be grouped into categories called **bands.** Each band contains a range of frequencies and exhibits different characteristics. Table 2-9 lists some of the more commonly-encountered frequency bands and some of their applications.

l) **Radio Propagation**. Radio waves exhibit different behaviors and characteristics as they **propagate** (travel) through the air. As a general principle, a lower-frequency wave will penetrate barriers, like stone, earth, and water better than a higher-frequency wave. As radio frequencies increase, the waves are absorbed more easily by other materials; most of us will be familiar with this phenomenon from our microwaves (microwave frequencies are at the highest end of the RF spectrum). Waves propagate differently depending on their frequency (see Fig. 2-5).

i) *Ground Wave Propagation*. As radio frequencies get lower, their ability to penetrate objects and travel long distances increases. Radio waves in the Medium, Low, and Very Low bands, ranging in frequency from three to 3,000 kHz (one kilohertz is equal to one thousand hertz) can follow the contour of the earth, even over areas of high elevation, like hills, while even lower frequencies can penetrate earth and water. This type of propagation is called **ground wave** (or **surface wave**) propagation.

ii) *Skywave Propagation*. From 3,000 kHz to 30 MHz (one megahertz equals one million hertz), radio waves propagate by **skywaves**. In skywave propagation (also called **skipping**), radio waves reflect off of the earth's **ionosphere** and bounce back to earth at potentially great distances. The **ionosphere** is a portion of the atmosphere that is filled with charged particles that begins 60 kilometers above the earth and extends for over 400 kilometers. The ionosphere is very important for international radio communication, because radio waves can bounce off of the ionosphere to reach receivers potentially thousands of kilometers away. There are four layers to the ionosphere, each with its own characteristics and **critical frequency**, or the highest frequency that will reflect off of the layer and back to earth. Radio waves with a frequency higher than the critical frequency will pass through the layer without being reflected, and based on different conditions, like the time of day, annual sunspot activity, and unpredictable solar storms, the critical frequency will change.

iii) *Line-of-Sight Propagation*. As radio frequencies get in the VHF and UHF range, the distance radio waves can travel and their ability to travel around obstacles decreases. High-frequency radio communication is limited to **line-of-sight** propagation, in which radio waves travel in a straight line from on antenna to another. This form of propagation is widely used in cellular phones, television broadcasts, and satellite communications.

II) **Antennas**. Radio wave propagation requires an appropriate conductor called an **antenna**. Radio waves propagate horizontally, vertically, or some mixture of the two, depending on the orientation of the antenna. If the radio waves strike another antenna that is tuned to the same frequency as the original antenna, that antenna will convert the radio waves into alternating electrical impulses identical to the impulses from the transmitter.

i) *Antenna Height*. Antenna height is critical for line-of-sight communications. If you know the distance you need to transmit, you can determine the required height for the antenna using the following formula:

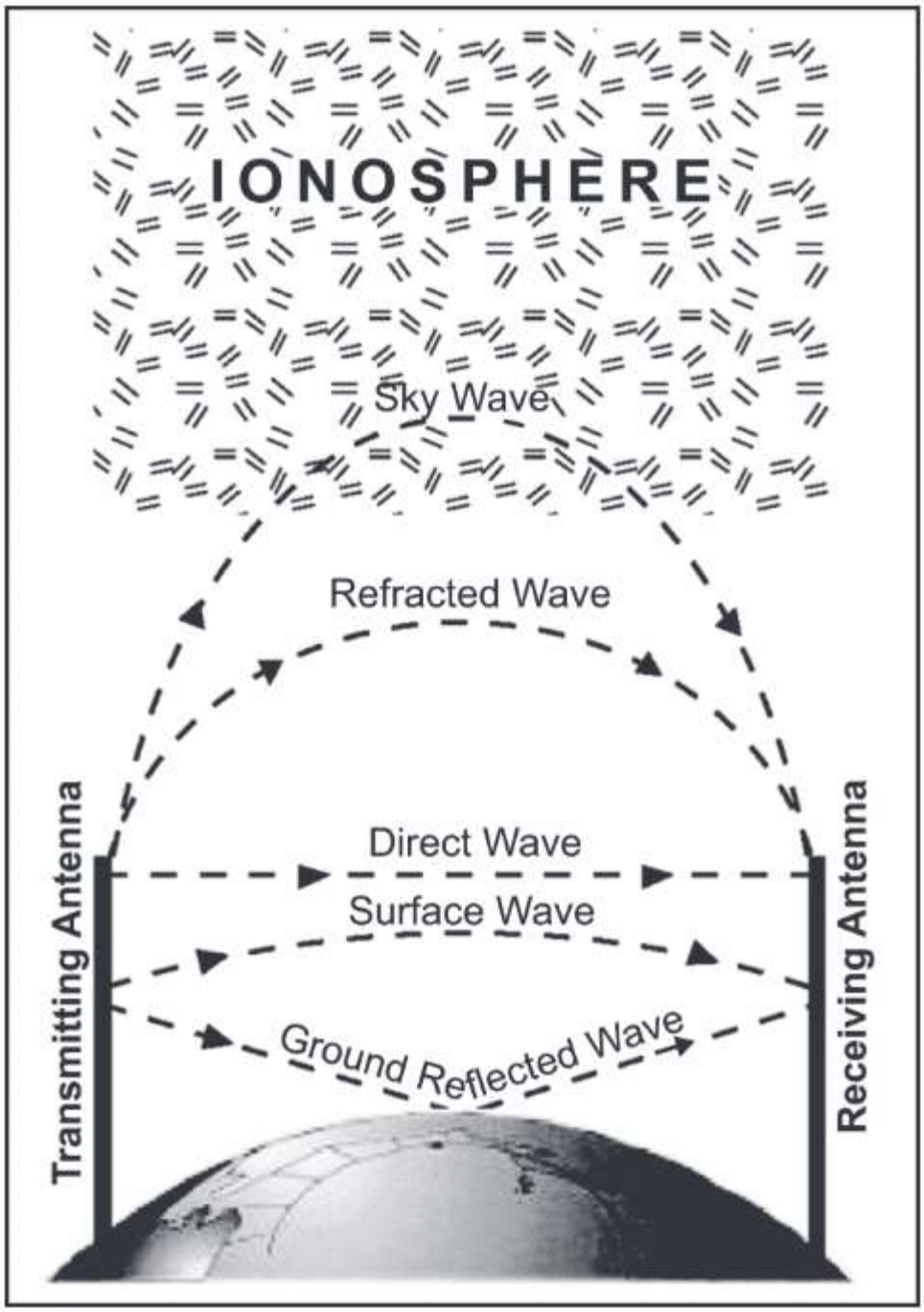
$$D = \sqrt{12.7 \; x \; A}$$

Where:
D = the distance, in kilometers; and
A = the height of the antenna, in meters
If the antenna's height is known, the range to the visible horizon can be determined using the following formula (the variables are the same):

$$A = 0.07874 \; x \; (D)^2$$

By applying these formulas, we can see that to transmit 10 kilometers away, the antenna needs to be 7.87 meters off of the ground ($0.07874 \times (10)^2 = 7.874$), and that if an antenna is 12 meters off of the ground, it has a range of 12.34 kilometers ($12.7 \times 12 = 152.4$, and the square root of 152.4 is 12.34).

Figure 2-5. Ground Wave & Sky Wave Propagation[47]



47 ATP 6-02.72: *TAC RADIOS* (2013). 11.

Table 2-9. Radio Frequencies & Primary Mode of Propagation

Band	*Frequency*	*Wavelength*	*Propagation*	*Usage*
VLF	3-30 kHz	100-10 km	Skywave.	Saltwater-penetrating; used to communicate with submarines.
LF	30-300 kHz	10-1 km	Skywave and Groundwave.	Can travel up to 2,000 km over land.
HF	3-30 MHz	100-10 m	Skywave.	Also called “shortwave.” Used in Citizen's Band (CB) radios.
VHF	30-300 MHz	10-1 m	Line-of-sight.	First band with wavelength short enough to make portable antennas practical.
UHF	300-3,000 MHz	100-10 cm	Line-of-sight	Used in Wi-Fi and Bluetooth.

2-7. **CLARITY**. Radios are marvelous pieces of technology, but they have their limitations. The range and clarity of a transmission depends on the power of the radio, the prevailing weather conditions, the terrain, the time or day, and even sunspot activity. Since a scout must provide accurate and timely information, it is critical that they understand how to overcome weak signals or interference. The scout has two methods of improving the clarity of their transmissions: proper vocal technique and standardized pronunciation guides.

a. ***Vocal Technique***. When speaking into the microphone, use short sentences. Pause between each sentence and enunciate each word clearly. Speak slightly slower than usual, and speak at a normal volume. If stealth is required, speaking in very low tones is easier to understand and harder to detect than whispers. Do not position the microphone closer than five centimeters to your mouth; the rush of air when you say certain consonants will generate loud pops and hisses. Finally, depress the push-to-talk (PTT) button on your radio half a second before you start to speak, and release it after you stop. This will ensure that you transmit your entire message.

b. ***Pronunciation***. Over radios, especially when the signal strength is tenuous, certain sounds are difficult to distinguish. The letters B, C, D, E, G, P, T, V, and Z sound very similar, even when the signal is clear; so do F and S and M and N. To address this problem, radio operators use a standardized pronunciation guide to spell out words. The most commonly-used pronunciation guide in English is the NATO Phonetic Alphabet (see Table 2-2). Whenever words are spelled over the radio, the word is preceded by the proword I SPELL, and the NATO Phonetic Alphabet is used to spell the word. Numbers are given one at a time, and are preceded by the proword FIGURES. Phonetic pronunciation of numbers is used when giving the time, which is always rendered in 24-hour format. The time zone must follow the time (usually either “local” or “ZULU,” referring the Greenwich Mean Time). Time is never given as a relative value, but only as an absolute; “ONE FIFE minutes ago” is improper protocol, while “ZERO ONE TREE ZERO hours local” is correct.

"Even without following any procedures, it is easy to effectively communicate using radios if the operators remember to be accurate, brief, and clear. Following procedures becomes more necessary during larger actions. Remember to say who you are addressing, who you are, and use short transmissions. Lastly, do not forget that the State or fascists may be snooping on your transmissions. Use caution."

-Håkan Geijer[48]

48 *Riot Medicine* (2020). 414.

Table 2-10. NATO Phonetic Alphabet.

Letter	*Phonetic*	*Spoken as*	*Letter*	*Phonetic*	*Spoken as*
A	ALFA	AL-fah	**T**	TANGO	TANG-go
B	BRAVO	BRAH-voh	**U**	UNIFORM	YOO-nee-form
C	CHARLIE	CHAR-lee	**V**	VICTOR	VIK-tah
D	DELTA	DELL-tah	**W**	WHISKEY	WISS-kee
E	ECHO	ECK-oh	**X**	XRAY	ECKS-ray
F	FOXTROT	FOKS-trot	**Y**	YANKEE	YANG-kee
G	GOLF	GOLF	**Z**	ZULU	ZOO-loo
H	HOTEL	HOH-tell	**1**	ONE	WUN
I	INDIA	IN-dee-ah	**2**	TWO	TOO
J	JULIET	JOO-lee-ett	**3**	THREE	TREE
K	KILO	KEE-loh	**4**	FOUR	FOW-er
L	LIMA	LEE-mah	**5**	FIVE	FIFE
M	MIKE	MIKE	**6**	SIX	SICKS
N	NOVEMBER	NO-vem-ber	**7**	SEVEN	SEV-en
O	OSCAR	OSS-cah	**8**	EIGHT	AIT
P	PAPA	PAH-pah	**9**	NINE	NINE-er
Q	QUEBEC	KEH-beck	**0**	ZERO	ZEE-roh
R	ROMEO	ROW-me-oh	**.**	DECIMAL†	DEH-simm-ahl
S	SIERRA	SEE-air-ah	**.**	FULL STOP‡	FULL STAHP

†When spoken as component of number
‡When spoken as a part of a sentence

c. ***Radio Check Procedures***. A **radio check** is a test of the **strength** and **readability** of radio transmissions in the field (see Table 2-11). Only use radio checks if you think there is a problem with your radio. If you need to perform a radio check, keep it brief, and only perform a radio check if you have reason to believe something is wrong with your radio.

Table 2-11. Radio Check Prowords.

Strength	***Meaning***	***Readability***	***Meaning***
Loud	Your signal is very strong.	**Clear**	The quality of your transmission is excellent
Good	Your signal strength is acceptable.	**Readable**	The quality of your transmission is adequate.
Weak	Your signal strength is weak.	**Distorted**	Signal distortion is making it difficult to hear your transmission.
Very Weak	Your signal strength is very weak.	**Intermittent/ Interference**	Your signal is intermittent or interference is making it difficult to hear you.
Fading	At times, your signal is so weak that it cannot be detected.	**Unreadable**	I cannot understand your transmission.

"Those who enjoyed the video game StarCraft *or the movie* Aliens *will recall the prowords Five-By-Five when describing a transmission. This corresponds to the prowords Loud And Clear."*

-Håkan Geijer[49]

2-8. **COMMUNICATION SECURITY**. **Communications security** (**COMSEC**) "consists of measures and controls to deny unauthorized persons information from telecommunications and ensure authenticity of such telecommunication."[50] COMSEC is the umbrella term for all methods used to protect genuine transmissions from being intercepted and prevent fraudulent transmissions from being treated as genuine.

a. ***Risks***. There are three primary risks COMSEC is intended to protect against: **interception**, **analysis**, and **deception**.

I) **Interception**. Interception is "the act of searching for, listening to and recording radio communications and electronic transmissions for the purpose of obtaining information[51]." It is possible, with the right equipment, to determine the origin of an intercepted radio signal; this is called **direction finding** (or **DF**). Assume all unsecured transmissions have been intercepted.

II) **Analysis**. Analysis is "the examination and interpretation of intercepted radio communications traffic and electronic transmissions for the purpose of obtaining information[52]." Hostile elements will analyze all intercepted traffic in an attempt to determine the following information, collectively known by the mnemonic **SELDOMUP**. If anyone transmits SELDOMUP information in the clear during an operation, do not draw attention to it. It is possible that the transmission was not being monitored, or that the hostile eavesdropper was not paying attention. If anyone transmits SELDOMUP information in the clear during training, rehearsal, or non-combat operations, whomever team member notices the breach will use the “BEADWINDOW” proword and the category (size, equipment, location, &c) of sensitive information transmitted.

49 *Riot Medicine* (2020). 411.
50 ACP-125(G). 2-2.
51 ACP 125(G). 2-3.
52 ACP 125(G). 2-3.

i) *Size.* The number of personnel in the scout's unit, either general (“a small crowd”) or specific (“twenty-seven”). This is sometimes written as “Strength.”

ii) *Equipment.* The type, quality, and condition of the unit's weapons, vehicles, and communication devices.

iii) *Logistics.* How the unit is resupplying itself, including locations of caches and stockpiles. Never identify the source of the unit's equipment or intelligence or the methods used to acquire them.

iv) *Disposition.* The location, whether general or specific, and overall mood, whether good or bad. Do not attempt to mislead eavesdroppers by hinting conditions are better or worse than they actually are.

v) *Organization.* Any type of rank or information that would imply seniority. Any indication of the way the unit is set up, and how it coordinates with other units.

vi) *Movement.* Under no circumstances should you transmit routes, speeds, and destinations in the clear. Almost nothing is more important than maintaining the element of surprise than keeping positions and locations secret.

vii) *Uniforms.* Any identifying physical characteristics or notes on appearance that can be used to identify a specific partisan or the unit as a whole. Never describe any of your team members in the clear.

viii) *Personalities.* Any identifying behavioral qualities and traits that can be used to identify a specific partisan or the unit as a whole. As much as you are able, never use slang terms or colloquialisms that might be used to identify your regional or cultural background.

II) **Deception**. Deception is "the introduction of a false transmission into a communications system, by imitating an authentic transmission, with the intention to deceive or create confusion[53]." By using information gained from earlier interception and evaluation, hostile elements can attempt to imitate friendly stations. Local vernacular and and veiled speech are not sufficient protection against deception. Use rigorous authentication processes (see paragraph 2-3) if there is any possibility of hostile deception.

b. ***COMSEC Guidelines***. COMSEC is not optional, but fortunately, its implementation is not complicated. Effective **emissions control** is primarily a matter of scheduling periods when emitters can and cannot be used and being mindful of which emitters are currently being employed.

I) **Transmission Windows**. An effective way to minimize radio emissions is to establish transmission windows, which are prearranged times where the unit is allowed to use their radios. When transmission windows are open, the unit transmits any important information or updates while adhering to the principles of brevity and clarity. Transmission windows should be open for no longer than five minutes at a time. When the transmission windows are closed, no one should use the radio except in emergency (see Brevity, following). Transmission windows should not be established according to a discernible pattern, unless the transmission window is being used for establishing contact with friendly personnel. Regardless of the configuration, transmission windows depend on accurate timekeeping. All scouts should synchronize their watches or timepieces before moving into the field. If you need to check your time in the field, AM radio stations and public broadcasting stations will identify their call letters at the top and bottom of every hour.

53 ACP 125(G). 2-3.

II) **Emissions Discipline**. Many consumer electronics are constantly transmitting information over cellular and Wi-Fi networks. These signals, like radio transmissions, can be intercepted and traced. Emissions discipline refers to the set of practices used to reduce the quantity of transmissions that can bee intercepted by hostile elements. Beyond the normal techniques of transmission security, effective emissions discipline demands:

- Treat all information sent over cellular or Wi-Fi networks as being unsecured.
- All personal electronic devices (PED) that can communicate with other PED (cellular phones, tablets, E-readers, fitness trackers, smart watches, Bluetooth speakers or headphones, &c) will have their batteries removed when in the field. If their batteries cannot be removed, they are not be taken into the field.
- No data storage devices (thumb drives, external hard drives, &c) are to be taken into the field without full and comprehensive data encryption.

IV) **Emissions Control (EMCON)**. **Emissions control** (**EMCON**) refers to the set of restrictions and limitations on all PED and any other device which can be detected by hostile scanners. These limitations could be based on a schedule (the PED can only be used during a certain transmission window), power level restrictions on radios, or both. Once in place, EMCON conditions should be maintained except in cases of emergencies (SPOTREP or MEDEVAC requests). Table 2-12 shows a sample EMCON plan for an American military unit, and Table 2-13 shows a list of an example list of authorized emitters for each EMCON level.

III) **Mobility**. Once you transmit, move the transmitter. If you are carrying the transmitter, that means you need to move. Hostile DF attempts will be able to determine where you have been, but not where you are or will be. Never transmit, unless in an emergency, from a location from which you cannot easily escape. Never transmit, unless in an emergency, from a location in which you intend to stay.

2-9. **BREVITY**. The only guaranteed way to prevent hostile elements from intercepting your transmissions is to not transmit. Before transmitting, ask yourself if the transmission is important enough to risk exposure. Unscheduled, unsecured transmissions should be limited to giving orders, asking questions, or reporting information. Explanations, clarifications, corrections, repetition, and reminders are not to be transmitted. If transmission is unavoidable, the most effective way to prevent hostile elements from intercepting your transmission is to keep it short. Transmissions should not be longer than ten seconds, with five seconds being ideal. Eliminate unnecessary words, like “THIS IS” and “OVER.” Never use a long word when a short word will do; “NEGATIVE,” “AFFIRMATIVE,” and “PROCEED AT THIS TIME” are always inferior to “NO,” “YES,” and “GO NOW.”

2-10. **PROWORDS**. Radio operators have their own vocabulary words which they use to communicate complex concepts in a very short period of time. These words are called prowords. Their use is an integral part of effective radio employment. Table 2-14 has a non-exhaustive list of some of the most useful prowords.

Table 2-12: Sample EMCON Guidelines[54]

EMCON Guidelines	
1 Radio Routine	**Transmissions:** Any and all radio calls are authorized. **Emitters:** Any and all comm emitters are authorized. All non-comm emitters are authorized: PED, vehicles, generators, radars. **Adversary:** IMPROBABLE (45%) ES collection or EA. REMOTE (5%) threat of receiving indirect fire (IDF). **Scenario:** Garrison or friendly country. Training, evaluations, administrative movements. **Note:** Even during training, leaders should limit radio calls to mission-critical information.
2 Radio Essential	**Transmissions:** Mission-critical and emergency calls ONLY. **Emitters:** Any and all comm emitters authorized. All non-comm emitters are authorized. Emitters are SHUT OFF except when in use. Constant emitters are restricted or OFF. Non-essential PED is OFF. **Adversary:** PROBABLE (80%) ES collections or EA. IMPROBABLE threat of effective IDF. **Scenario:** Friendly, neutral, or hostile country. Contingency operations or pre-hostilities. **Note:** EMCON 2 is the desired standard for all operations.
3 Radio Silence	**Transmissions:** NO voice radio calls. Text and burst data only. HF ideal. Wire. **Emitters:** Selected bands are restricted, receive-only, or OFF. Constant emitters are OFF. Unencrypted UHF black gear is OFF. Non-comm emitters are restricted or OFF. Passive receivers – GPS, GBS – are restricted or OFF. **Adversary:** HIGHLY PROBABLE (95%) ES collections or EA. PROBABLE threat of IDF. **Scenario:** Conflict. Enemy is collecting and targeting. Precision IDF weapons are in range.
4 Blackout	**Transmissions:** NO radio calls – voice or data – are authorized. **Emitters:** ALL emitters are OFF. ALL radios, ALL PED are OFF. Batteries are OUT, generator power is OFF. ALL non-comm emitters are OFF. Vehicles are OFF. Lights are OFF. **Adversary:** NEAR CERTAIN (99%) ES collections or EA. HIGHLY PROBABLE threat of IDF. **Scenario:** Conflict. Enemy is collecting and targeting. Precision IDF weapons are activated. **Note:** When missiles are inbound, units avoid being located, but cannot operate long at EMCON 4.

Table 2-13: Example Authorized Emitters at Each EMCON Level

Device	*EMCON Level*			
	1	*2*	*3*	*4*
VHF	ON	ON	OFF	OFF
HF	ON	ON	ON	OFF
GPS	ON	ON	ON	OFF
Phone	ON	ON	OFF	OFF
Chat	AUTHORIZED	AUTHORIZED	EMERGENCY	EMERGENCY
Voice Commands	AUTHORIZED	AUTHORIZED	AUTHORIZED	EMERGENCY

54 SIGMAN. 1-1.

Table 2-14. List of Prowords

LIST OF PROWORDS	*PROWORD EXPLANATION*
AUTHENTICATE / AUTHENTICATION IS	The station called is to reply to the authentication challenge which follows / The transmission authentication of this message is
BEADWINDOW	The last station transmitted SELDOMUP information in the clear. This proword should not be used during operations.
BREAK	The following message is addressed to a different individual or group.
CORRECTION	I have made a mistake. I will continue my transmission with the correct word.
FIGURES	The message that follows includes numbers.
I SPELL	I am about to spell the following word
OUT	I am done with my transmission. I neither expect nor require a response.
OUT TO YOU	I am done with my transmission to you. I am about to contact another station.
OVER	This is the end of my transmission to you and a response is necessary. I am waiting for your transmission.
RADIO CHECK	I want to know my signal strength and readability.
READ BACK	Repeat a portion of my transmission back to me exactly as received (used with ALL AFTER, ALL BEFORE, WORD AFTER, WORD BEFORE, FROM or TO) / I am about to repeat the portion indicated of your transmission
ROGER	I have received your last transmission and will comply. I do not expect or require a response.
SAY AGAIN / I SAY AGAIN	Repeat a portion of your last transmission (used with ALL AFTER, ALL BEFORE, WORD AFTER, WORD BEFORE , FROM or TO) / I am about to repeat a portion of my last transmission
SILENCE	Cease transmissions on this net immediately. Maintain silence until canceled with the SILENCE LIFTED proword. Both prowords must be authenticated unless operating on secure nets.
THIS IS	I am identifying my transmitting station.
TIME / TIME CHECK	The time which follows is exact as of the moment I said "TIME" / I am requesting the exact time
WAIT	I must pause for up to five seconds before continuing/responding, no other station is to transmit during this period.
WAIT OUT	I must pause for longer than five seconds before continuing/responding, in the meantime other stations can transmit as normal
WRONG	Your last transmission was incorrect. I am about to transmit the correct version.

Section III. VISUAL, AUDITORY, & TACTILE SIGNALS (VATS).

Whenever possible, you should use alternatives to radio to prevent hostile interception or tracking. **Visual, auditory, and tactile signals** (or **VATS**) cannot be detected by hostile DF equipment, but they have their own downsides, chiefly their inherent insecurity. Anyone who can hear will potentially detect your auditory signal; anyone who can see will potentially detect your visual signal. As always, the benefits of any signal must be weighed against the potential for hostile interception.

2-11. **VATS EMPLOYMENT CONVENTIONS**. Develop standard conventions for number and color combinations. For example, one of any signal (whether a flash of a strobe, a pull on a tugline, or a blast of a whistle), might mean "no" and two of any combination might mean "yes." In the same fashion, any green signal can mean "GO" and any red signal can mean "STOP." Make sure there is sufficient difference between each signal; do not assume that everyone will be able to immediately tell the difference between, say, an orange signal versus a yellow one. These simple conventions, provided they are universally known by your comrades, can simplify the development of PACE plans (see Table 2-6 for some examples).

Table 2-15. VATS Convention Examples

Signal	*Meaning*
Any Single Green Mark	Yes/Go/Safe to Proceed
Any Single Yellow Mark	Wait/Proceed With Caution
Any Single Red Mark	No/Stop/Unsafe to Proceed
Any “O” or Circle	Friendly Unit
Any "X" or Cross Mark	Hostile Unit
One of any Visual or Auditory Signal	Message Not Understood
Two of any Visual or Auditory Signal	Message Understood
Five or More of any Visual or Auditory Signal	Hostile Contact/Send Reinforcements

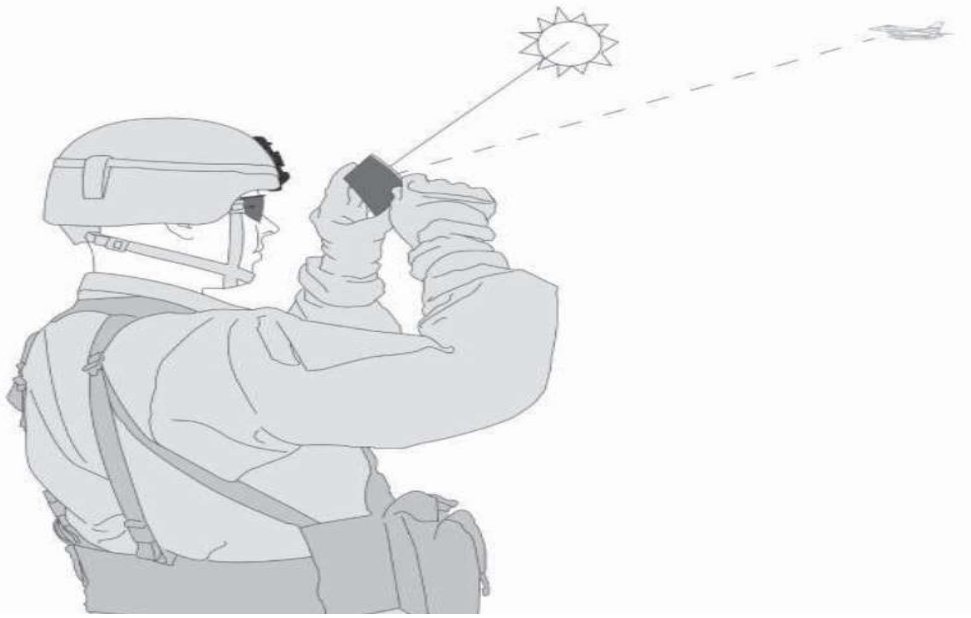
2-12. **VISUAL SIGNALS**. Since time immemorial spies and secret agents have used visual signals to communicate with one another by leaving innocuous objects, like a bit of cloth or a piece of colored paper, in a public location. This technique is subtle and effective, but poorly-suited to dynamic and rapidly-changing operations in CIDA. For our purposes, there are two primary types of visual signals: **hand-and-arm** signals and **flash/strobe** signals.

a. ***Hand-and-Arm Signals***. Hand-and-arm signals are fast and effective, and can be used to control the movement and actions of large groups of personnel or vehicles without using radio transmissions. Table 2-10 shows a non-exhaustive illustrated list of hand-and-arm signals, but each team is encouraged to develop their own.

b. ***Flash / Strobe Signals***. Flash and strobe signals are visual signals that use mirrors, flashlights, matches, glow sticks, or any other reflective or shiny material to send a pulse of bright light. Prearranged signals can be sent by varying the frequency and length of light pulses.

I) **Mirrors**. Mirrors send very bright, easily spotted signals over many miles during the day. They require clear lines of sight and favorable weather conditions. Some mirrors are specifically designed to be used to transmit messages from lost hikers to pilots; to use these mirrors, hold the mirror in your support hand, and make a "V" with the fingers of your other hand. Look through the hole in the center of the mirror and shift the mirror back and forth, shifting the light over your fingers (see Fig. 2-6).

Figure 2-6. Signal Mirror



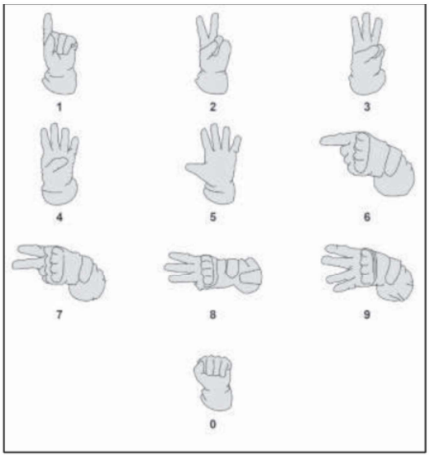
II) **Strobes**. "Strobe" is the general term to refer to any flashlight used to send individual bursts of light, and does not necessarily refer only to strobe lights, such as those used in marine distress kits. A continuous light source, like a glowstick or candle, can be used as a strobe by selectively covering and uncovering the light source. If you are familiar with Morse code (see Table 2-16), you can use it to send more complex messages.

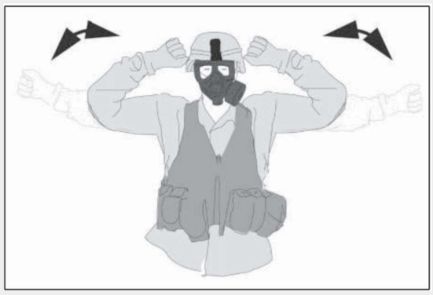
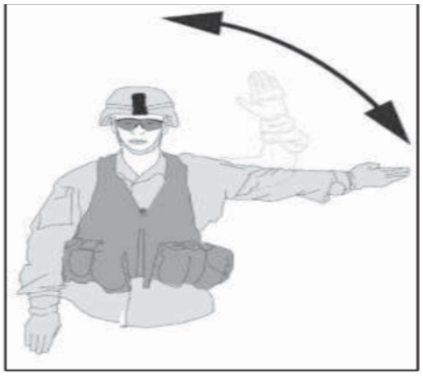
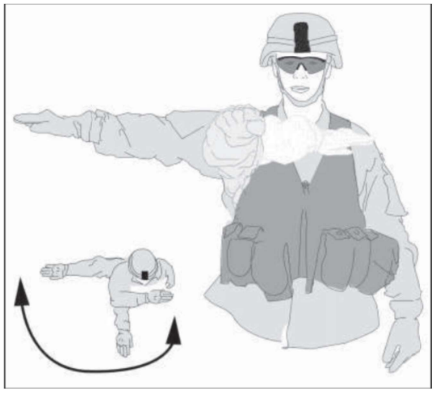
i) *Morse Code Considerations*. When using Morse code, proceed slowly and steadily. Never send messages faster than you are receiving them. If possible, have your message written down beforehand. If you are receiving a message in Morse code, write down each letter as you receive it; if you miss a letter, skip it and move on.

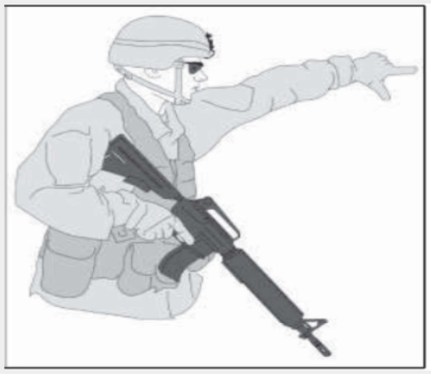
Table 2-16: Morse Code

Character	*Code*	*Character*	*Code*	*Character*	*Code*
A	• —	**M**	— —	**Y**	— • — —
B	— • • •	**N**	— •	**Z**	— — • •
C	— • — •	**O**	— — —	**0**	— — — — —
D	— • •	**P**	• — — •	**1**	• — — — —
E	•	**Q**	— — • —	**2**	• • — — —
F	• • — •	**R**	• — •	**3**	• • • — —
G	— — •	**S**	• • •	**4**	• • • • —
H	• • • •	**T**	—	**5**	• • • • •
I	• •	**U**	• • —	**6**	— • • • •
J	• — — —	**V**	• • • —	**7**	— — • • •
K	— • —	**W**	• — —	**8**	— — — • •
L	• — • •	**X**	— • • —	**9**	— — — — •

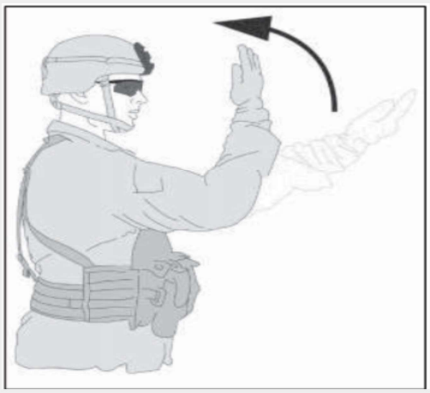
Table 2-17: Hand-and-Arm Signals

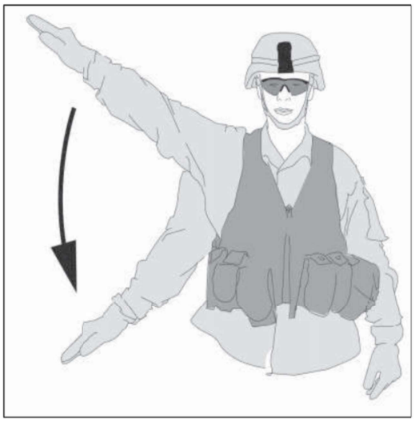
Instruction	*Signal*	*Example*
[Numbers]	All **numbers** will be given with the support hand. For numbers greater than nine, the signal will be given as individual digits in the number. For example, the number 15 will be represented by the signal for the number 1, followed the signal for the number 5.	
Air Contact	Cross your forearms above your head at a 45º angle. Repeat.	
Assemble	Raise your support arm vertically from the shoulder, palm forward, and wave in large, horizontal circles, then point to the assembly site.	

CBRN Attack	Make fists with both hands and raise both arms to make a "V." Bring your fists to your shoulders. Repeat.	
Contact Left / Right	Extend your left or right (as appropriate) arm parallel to the ground and bend your elbow until your forearm is perpendicular to your arm. Repeat.	
Danger Area	Draw the index finger of your firing hand across your throat.	
Disperse	Extend your support arm horizontally to the side, palm down, and wave to the front and to the side in sweeping motions.	

Enemy In Sight	Point toward the enemy with the index finger of your support hand, thumb down, all other fingers curled.	
Fire	Raise your support arm, palm out, and bring it sharply down to your side. If controlling individual weapons, point to that weapon first.	
Freeze	Make a fist with your support hand. Raise it to head level.	

Go Prone	From the Halt or the Take a Knee hand signal, lower your arm past your waist, palm down, and then raise and lower your forearm.	
Halt	Raise your support hand, palm forward, fingers joined and raised.	
Increase Speed	Make a fist with your support hand. Raise your fist to your shoulder and thrust up and down.	

Message Acknowledged	Make a fist with your support hand and raise it to shoulder level with your thumb extended.	
Message Not Understood	Raise both arms, palms out, elbows out to the horizontal. Place your hands over your face.	
Move Up	Point toward the element with your support arm. Keep your support arm straight in front, palm up, and bring the palm up by bending your elbow.	

SLLS Check	Raise the open palm of your support hand to your ear.	
Take a Knee	From the Halt hand signal, lower your hand to waist level, palm down.	
Take Cover	Raise your support arm to the side at a 45º angle above the horizontal, palm down, and bring your arm to your side.	
NOTE: Signals with one arrow are performed once. Signals with an arrow on each end of the line are repeated continuously until acknowledged or the instruction has been carried out.		

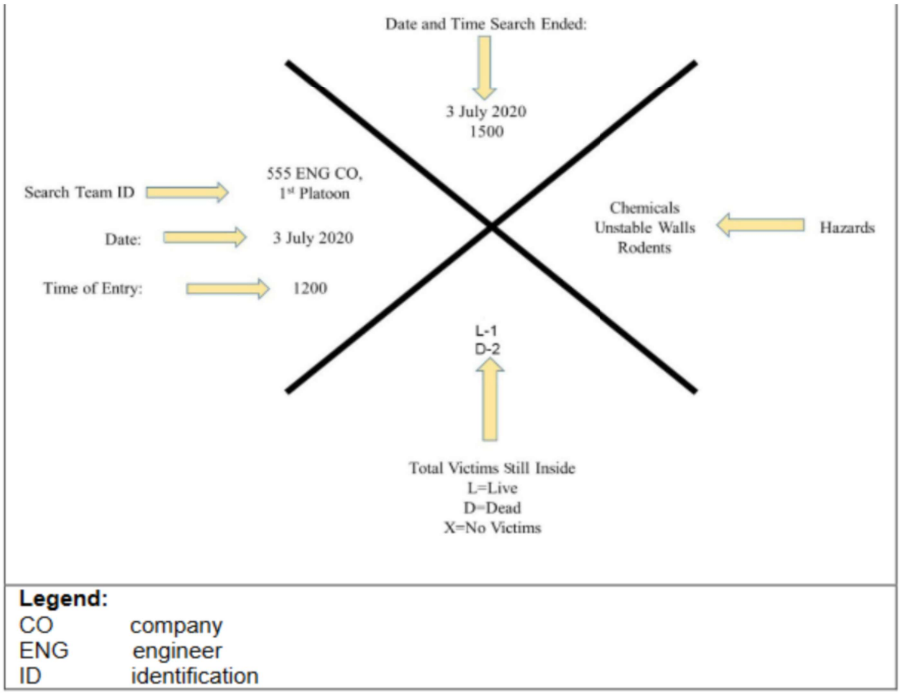
III) **Buzzsaw**. A "buzzsaw" is a type of field-expedient signal that uses a glowstick, chemlight, or beacon and a short length of rope or cord. The light is tied to the end of the rope and spun in a circle, creating the illusion of an unbroken ring of light, akin to the spinning blade of a buzzsaw (see Fig. 2-7).

Figure 2-7: Buzzsaw

c. ***Visual Markers***. Visual markers include colored cloth panels or banners, glow sticks, or colored or glow-in-the-dark tape. The distinction between visual markers and flashes and strobes is subtle and largely academic, but broadly, you can think of markers as being more permanent, and flashes and strobes as more immediate-use. As with all signals, the applications for markers are limited only by your creativity; in general, though, you will use markers to **designate**, **identify**, and **tag**.

- **Designate**: Use visual markers, like flags or signal panels, to **designate** vehicle routes, checkpoints, assembly areas, rally points, parking spots, or any other area set aside for a specific activity.
- **Identify**: Use visual markers like standardized color codes or patterns to **identify** specific personnel, vehicles, or structures, like medics, ambulances, or hospitals. Markers can also be used with equipment to indicate unit ownership. Remember that at night, colors fade; use glowsticks, glow-in-the-dark tape, or IR beacons to identify personnel and equipment at night.
- **Tag**. Use visual markers, like strips of tape, to indicate the security or danger of a specific area, like rooms that have been cleared versus those which remain unchecked. You can also use pre-determined signals, like the famous FEMA "X," a cross used in search-and-rescue operations to indicate when a building or room was searched, by whom, and if any survivors were found (Fig. 2-8).

Figure 2-8. FEMA "X"[55]



2-13. **AUDITORY SIGNALS**. An auditory signal is one that depends on sound. Whistles, voice instructions, bird calls, or even knocking two sticks together are all types of auditory signals. As with visual signals, there is a risk that hostile personnel might overhear auditory signals.

a. ***Whistle***. Whistles (or bagpipes, bugles, air horns, vuvuzelas, or any other loud instrument) can be used to send simple signals: one blast of the whistle is one signal, two blasts is another, &c. Care must be taken to ensure that the sounds are not muddled or confused; make sure there is no ambiguity between sending one blast twice and sending one two-blast signal.

b. ***Voice Instructions***. More nuance and detail is possible with voice signals than any other VATS. Voice instructions are familiar enough with anyone who has ever been in a Western school; the instruction "Go here" or "Do this" is as straightforward in CIDA as it was when we first uttered our first grunts.[56]

2-14. **TACTILE SIGNALS**. A tactile signal is any signal that depends on touch. A tap or squeeze on the shoulder is a common tactile signal. In the field, on patrol, or during observation, the most common form of tactile signal is the **tugline**.

a. ***Tuglines***. A **tugline** (or "**tug rope**") is a piece of rope or cord (such as paracord or "550" cord) tied from one person or position to another person or position. Signals are transmitted down the line by tugging a predetermined number of times (one tug for "Enemy spotted," for example). Tuglines are totally silent, and potentially virtually invisible, but they can get tangled in brush or other equipment, which can prevent the tugs from traveling down the full length of the line. Care must be taken to ensure the line is not severed. Furthermore, the level of nuance that can be transmitted up a tugline is minimal, usually limited to binary yes-or-no/on-or-off events.

55 TC 3-37.51. *Urban Search and Rescue* (2020). 1-9.
56 Don't know what to tell you here. It's talking.

Chapter 3
MOVE

*"I had thought earlier in the night that you can't run when you are sodden from head to foot and weighted down with a rifle and cartridges; I learned now you can **always** run when you think you have fifty or a hundred armed men after you."*

-George Orwell[57]

Being slow, being stationary, and being predictable all have the potential to be lethal mistakes. Your ability to respond to a threat is directly correlated with your mobility; so is your survival. If you detect a threat, you will likely need to move to their position to engage them. If you receive reports of a threat, you might need to move to reinforce your comrades or to flee. In any case, you must be able to move quickly, silently, and without the slightest hesitation. You must be confident enough with all methods of land navigation that you can travel without ever being lost, and must be able to do so without leaving a trace.

Section I. LAND NAVIGATION.

Navigation is the process of moving through unfamiliar terrain or around obstacles to reach your destination. Modern technology has all-but eliminated the need to be proficient in map reading and land navigation, but we cannot afford to take these wonders for granted. The global positioning satellite network is not some inevitability; they are subject the same laws of entropy as everything else, requiring the cooperation of individuals, governments, and corporations to hang above us. We must not assume that cooperation and coordination will last forever. Even if the satellites never fall, for those engaged in this line of work, carrying a cell phone is a liability. Learning how to navigate using a map, compass, and terrain association will make you more effective than those dependent on the latest gadget.

57 *Homage to Catalonia* (2015 [1952]). 81. Emphasis in original.

3-1. **MAPS**. The most crucial tool you will use for land navigation is a map. To effectively use a map, you need to understand the way it presents information. Maps use **contour lines** to depict terrain symbols, which indicate elevations and depressions, and different **colors** to indicate different features in the terrain. Furthermore, data present in the margins of the map provide instructions on how to utilize the map, either by itself or in combination with other sheets.

a. ***Contour Lines***. Contour lines indicate **elevation** and **slope**. There are three types of contour lines: **index lines**, **intermediate lines**, and **supplementary lines**.

- **Index Lines**. Index lines are counted at every fifth line starting from zero elevation and drawn thicker than other contour lines. Index lines are numbered to indicate the elevation at the line.
- **Intermediate Lines**. Intermediate lines are the lines between index lines and are thinner than index lines.
- **Supplementary Lines**. Supplementary lines, resembling dashes, show changes in elevation of at least one-half the **contour interval**. The contour interval, found in the map marginalia, indicates the vertical distance between adjacent contour lines.

I) **Elevation.** Elevation is the vertical distance above mean sea level (the point halfway between high and low tide) of a point indicated on a map. Increases in elevation are known as **hills**, and are indicated on the map by concentric contour lines, with the center closed circle representing the hilltop. Decreases in elevation are known as **depressions**, and are indicated on the map by concentric circles with tick marks pointing toward the direction of lower elevation (Labeled “3” on Fig. 3). To determine elevation:

- Find the index line closest to the point you are trying to examine and count up or down to that line, adding or subtracting the contour interval as necessary.
- If the point you are trying to examine is less than one-quarter the distance between contour lines, the elevation will be the same as the last contour line.
- If the point is between one- and three-quarters from the nearest contour line, add one-half the contour interval to the last contour line for an approximate elevation.
- Points of interest will have their precise elevation indicated by a **bench mark**, indicated with a black “X.” The number beside the “X” is the elevation in the appropriate unit of measurement indicated by the map's marginalia (Labeled “4” on Fig. 3-3).

II) **Slope.** Slope is the relative steepness of a terrain feature's increase or decrease in elevation. Slope can be determined by observing the contour lines; the closer together the contour lines, the steeper the slope. The exact percentage of slope can be determined by using the following formula:

$$\frac{(V \times 100)}{H}$$

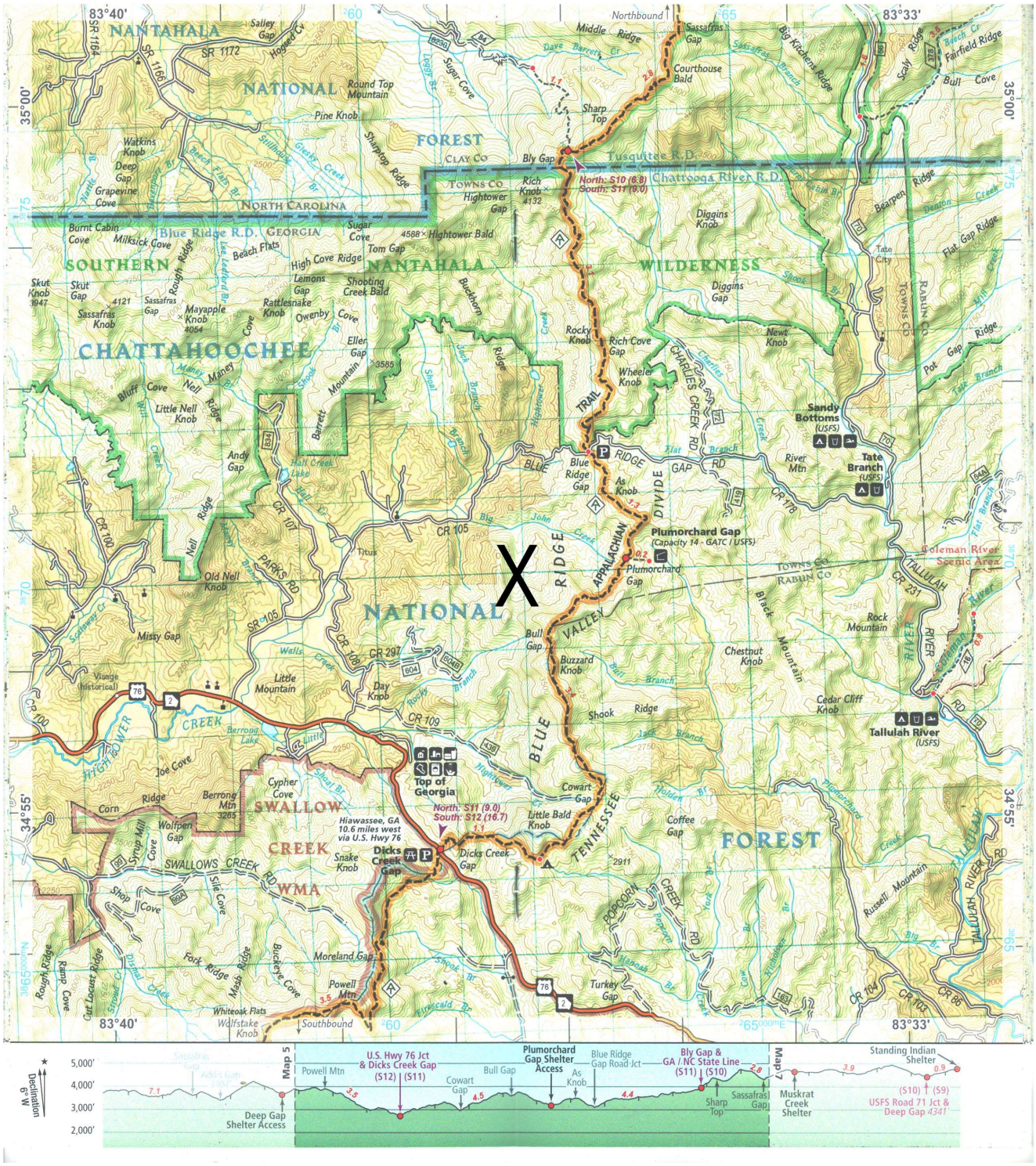
Where:

V = the difference in elevation between the two points on the slope; and

H = the horizontal distance between the two points.

b. ***Colors***. Landscape features are represented on topographical maps by different colors. **Green** indicates locations of vegetation, **blue** represents bodies of water, and **gray** or **red** indicate population centers. Topographic contours are drawn in **brown**, rivers, streams, and ditches are drawn in **blue**, land grids and major roads are drawn in **red**, and trails, railroads, and political boundaries (county or state lines) are drawn in **black**.

Figure 3-1: Map



c. ***Scale***. The **scale** (see Fig. 3-2) given on a map indicates the ratio between distance shown on the map and the distance in reality. The scale is given as a ratio with the map always being "1." A scale of 1:50,000 means that one unit of measurement on the map corresponds to 50,000 units of measurement on the ground, a scale of 1:24,000 means that one unit of measurement on the map corresponds to 24,000 units of measurement on the ground, and so on. The distance between two points can be determined by measuring the distance between points on a map and then multiplying the result by the appropriate amount.

l) To measure the distance between two points along a curve (a road, for instance, or a river), align the edge of a strip of paper with the beginning point and make a tick mark. Then, using the tick mark as a pivot, rotate the paper until the edge of the paper aligns with the next straight portion of the curve. Make another tick mark, and use that as the new pivot point. Continue this process until you reach the end point. Only use the first and last tick marks to determine the distance (see Fig. 3-3.

Figure 3-2. Scale.

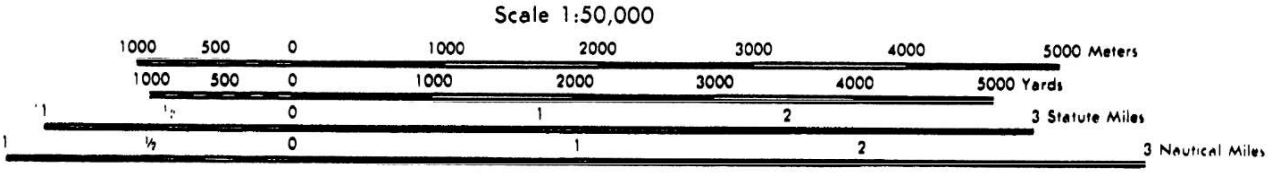
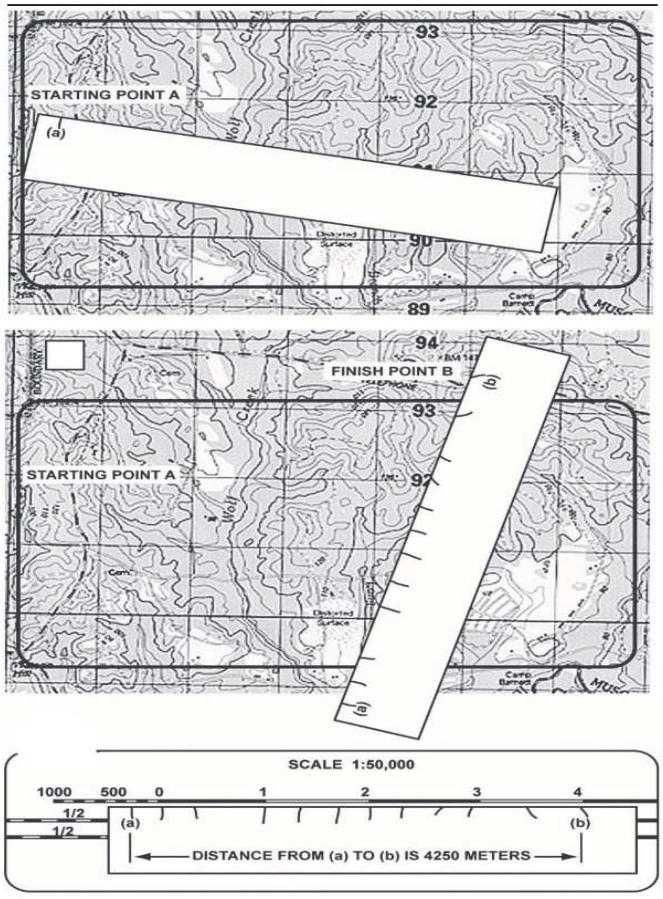


Figure 3-3. Measuring Curved Distances Using a Map Scale.



3-2. **GEOGRAPHIC COORDINATES**. Geographic coordinates use the **latitude** (lines running east-to-west) and **longitude** (lines running north-to-south) to create a system of reference points. Geographic coordinates appear on most maps; on some they may be the only method of locating and referencing a specific point. Geographic coordinates are expressed in degrees. Each degree can be divided into 60 minutes, and each minute into 60 seconds. The degree is symbolized by **°**, the minute by **′**, and the second by **″**.

I) **Latitude**. Starting with 0° at the equator, the parallels of latitude are numbered to 90° both north and south. The extremities are the north pole at 90° north latitude and the south pole at 90° south latitude. Latitude can have the same numerical value north or south of the equator (the line of latitude in the center of the globe), so the direction N or S must always be given.

II) **Longitude**. Starting with 0° at the prime meridian (the line of longitude at the center of the globe), longitude is measured both east and west around the world. Lines east of the prime meridian are numbered to 180° and identified as east longitude; lines west of the prime meridian are numbered to 180° and identified as west longitude. The direction E or W must always be given. The line directly opposite the prime meridian, 180°, may be referred to as either east or west longitude.

III) **Neatlines**. The four lines that enclose the body of the map are called **neatlines**. Neatlines are latitude and longitude lines. Their values are given in degrees and minutes at each of the four corners, with the latitude being aligned with the upper or lower boundary and the longitude aligned with the left or right boundary (the neatlines in the upper left-hand corner of Fig. 3-1 show that the latitude is 35° N and the longitude is 83°40' W).

i) *Tick Marks*. In addition to the latitude and longitude given for the four corners, there are, at regularly spaced intervals (usually at one- and two-thirds of the distance), small marks that extend into the body of the map (the map in Fig. 3-1 features tick marks every minute). If there is a value indicated at that tick mark, it is the longitudinal or latitudinal value at that minute. Not all maps will have these extra tick marks.

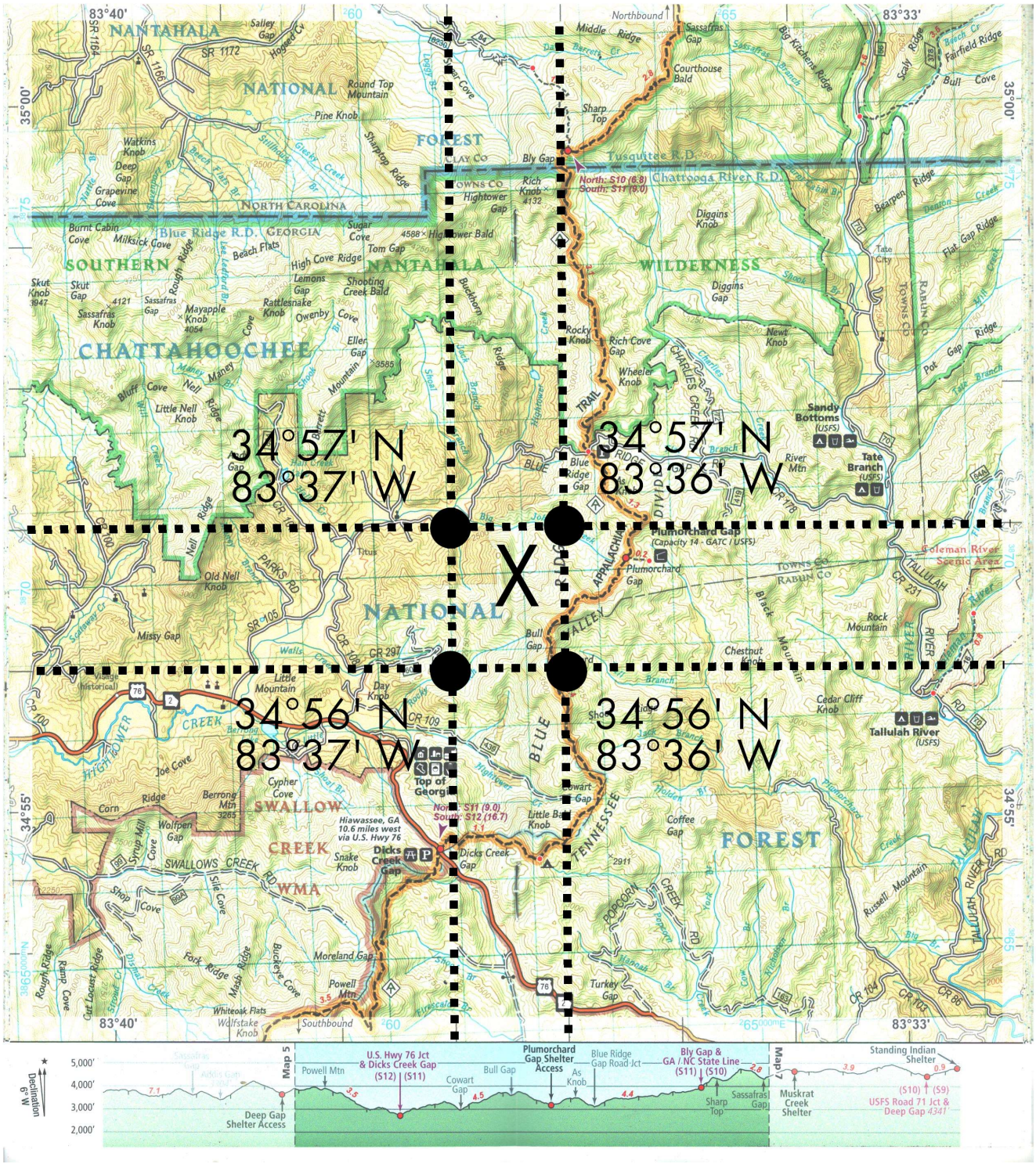
3-3. **USING GEOGRAPHIC COORDINATES**. You can use geographic coordinates to precisely identify the location of a point on a map (for this example, use the box labeled “X” on Fig. 3-1).

a. First, if your map has latitudinal and longitudinal tick marks, use them to narrow the location to be searched. If your map does not have these tick marks, determine the interval between neatlines according to Step II, then proceed.

I) Draw straight lines across the map to connect the tick marks, creating new lines of longitude and latitude. You will use these new lines to create finer neatlines for increased precision when determining your coordinates. In the example shown in Figure 3-4, the new neatlines have been drawn, and the latitude and longitude at each point has been indicated.

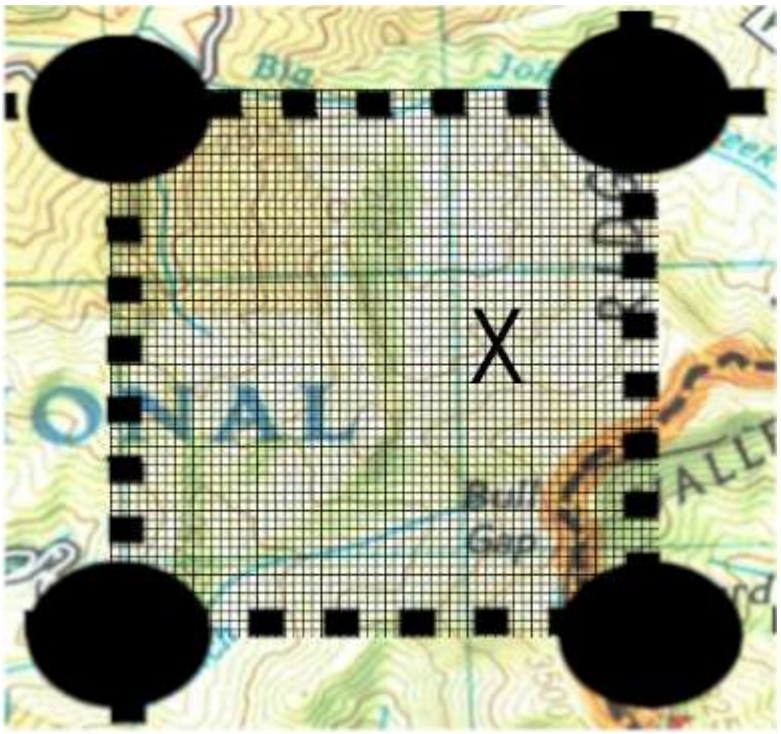
II) Now that our point is bounded by new neatlines, you must determine the interval between the new lines you have drawn. This is determined by subtracting the lower value from the higher value. In Figure 3-4, we know that the lines are one minute apart. We can determine the approximate location of point X. Being roughly halfway between our neatlines, we can estimate that its coordinates are latitude 34°56'30” N and longitude 83°36'30” W. However, it is possible to determine our location with greater precision. To determine our coordinates to the nearest second, we need to multiply the interval (in this case, 1') by 60 (yielding 60”).

Figure 3-4. Bounding a Point With New Neatlines



III) Now, divide the newly-bounded section into equal portions. The number of portions should equal the interval, in seconds, that you determined in the previous step. In Figure 3-5, we can use the 60x60 grid to show that point X is located at latitude 34°565'31" N and longitude 83°36'18" W.

Figure 3-5. Determining Precise Coordinates



3-4. **THE UNIVERSAL TRANSVERSE MERCATOR (UTM) GRID**. Another method of determining coordinates is the **military grid reference system** (**MGRS**), which superimposes quadrangles over the area of the map to be examined. The military grid reference system is designated for use with the **Universal Transverse Mercator** (**UTM**) grid. The MGRS divides the globe into 60 grid zones, each of which is given a unique identification called the **grid zone designation**. These are read RIGHT and UP so the number is always written before the letter. This combination of zone number and row letter constitutes the grid zone designation. Each grid is subdivided into 100,000-meter squares. The map shows a portion of this 100,000-meter square. The portion being shown is indicated by the numbers along the edge of the map. Each grid zone is divided by a horizontal line (a **median**) given a value of 500,000; all values to the east of this meridian are greater than 500,000, and all values to the west are less than 500,000. The **easting** value starts at 500,000 and counts DOWN. The **northing** value starts at zero at the equator and counts UP. In Figure 3-1, the northing value (given in the bottom left-hand corner) is given as 3,865,000m N, the easting value, in the bottom right-hand corner, is given as 265,000m. Note that two numbers are written larger than the rest; these numbers are the ones used when determining your location using the grid system.

a. ***Determining Your Location With the Grid Coordinate System***. A point can be located using the grid coordinate system with or without a tool known as a **coordinate scale**. A coordinate scale is a map-reading tool that divides grids more precisely than is possible using estimation.

I) **Without a Coordinate Scale**. To locate a point without a coordinate scale, start by finding the bottom left-hand corner of the map, then read RIGHT until you find the to the north-south

grid line that precedes the desired point (see Fig.3-6). Next, locate the point to the nearest 100 meters using estimation. Mentally divide the grid square in tenths, estimate the distance from the grid line to the point in the same order (see Fig. 3-7).

Figure 3-6. Determining Your Position Using the Military Grid.

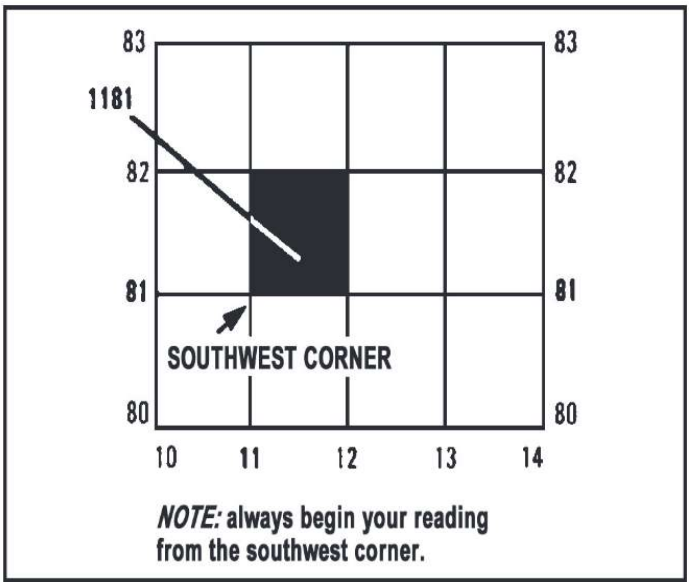
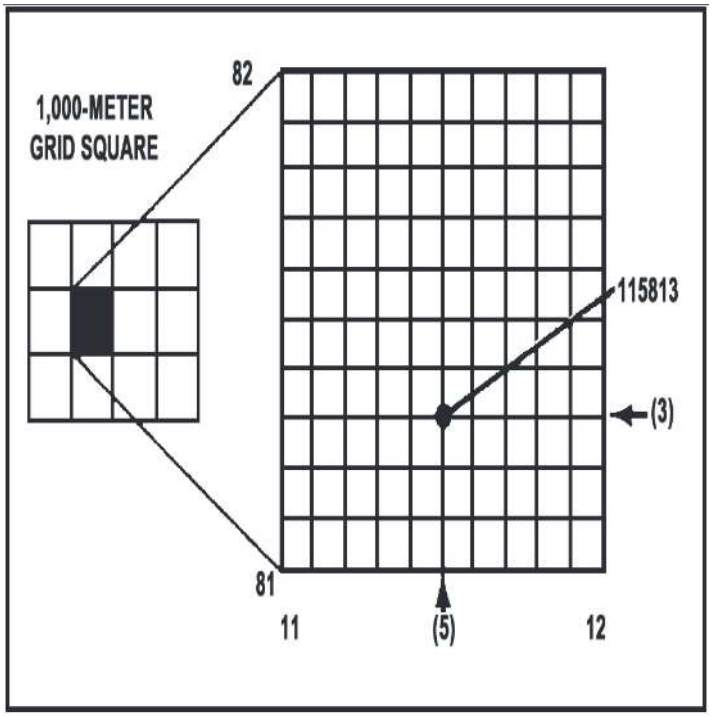
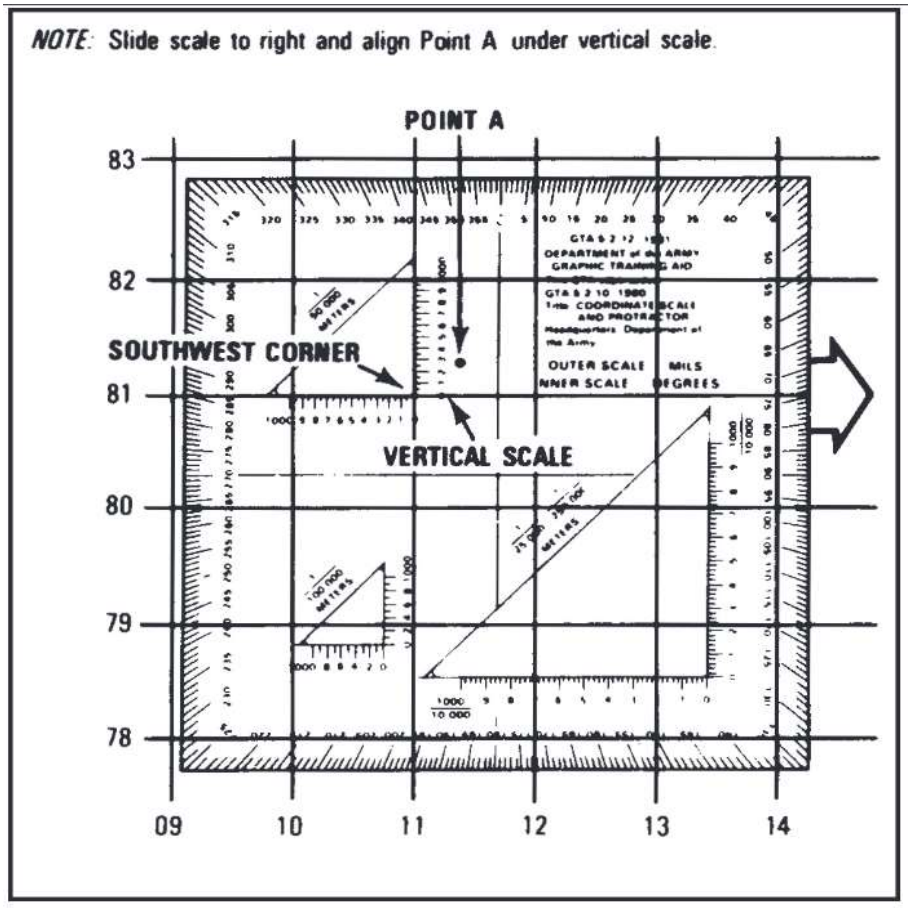


Figure 3-7. Determining Your Position Using the Military Grid, Continued.



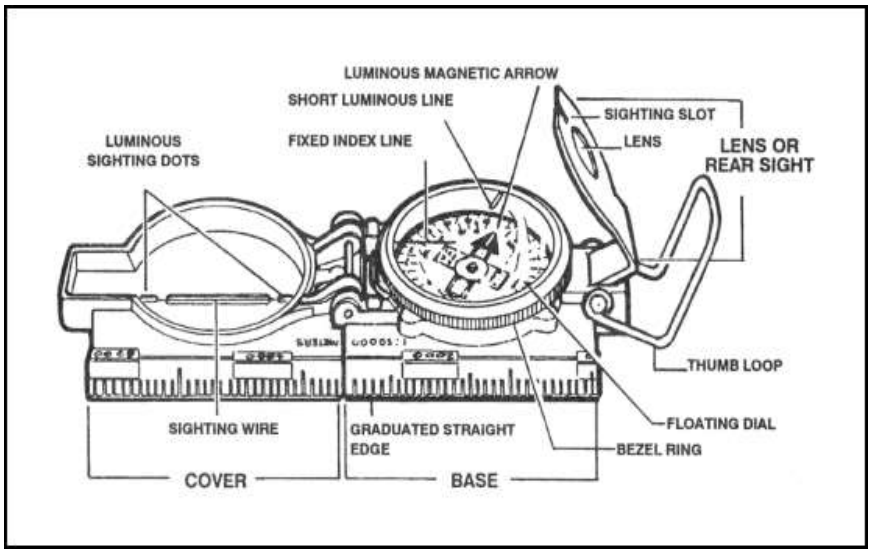
II) **With a Coordinate Scale**. To determine a point with a coordinate scale, first ensure that the appropriate scale is being used on the corresponding map, and that the scale is right side up. To ensure the scale is correctly aligned, place it with the zero-zero point at the lower left corner of the grid square. Keeping the horizontal line of the scale directly on top of the east-west grid line (the line will be the first two digits of the UP segment of the coordinates), slide it to the right until the vertical line of the scale touches the point for which the coordinates are desired (the last line the scale passes before it touches the point will be the first two digits of the RIGHT segment of the coordinates). When reading coordinates, examine the two sides of the coordinate scale to ensure that the horizontal line of the scale is aligned with the east-west grid line, and the vertical line of the scale is parallel with the north-south grid line. Use the scale when precision of more than 100 meters is required. Care should be exercised by the map reader using the coordinate scale when the desired point is located within the zero-zero point and the number 1 on the scale. Always prefix a zero if the hundredths reading is less than 10.

Figure 3-8. Using a Coordinate Scale



3-5. **COMPASSES.** Now that you have a basic understanding of maps and the information they communicate, you can begin to learn the essentials of navigation. Navigation is fundamentally about orienting yourself in relation to what are called **base lines**. A base line is a starting point for measuring direction. There are three base lines: **True north** (a line from any point on the earth's surface to the North Pole), **magnetic north** (a line from any point on the earth's surface to the northern magnetic pole), and **grid north** (the north established using map gridlines). The easiest way to determine direction is to use a compass, a tool that indicates the direction of magnetic north. There are three primary types of compasses: small **button compasses**, **baseplate compasses**, and **military lensatic compasses** (Fig. 3-9). Regardless of their design, all compasses feature a needle that points in the direction of magnetic north. Baseplate and lensatic compasses include additional features, including a rotating bezel (a ratcheting dial that is used to set reference angles), a straight-edge baseplate (used to draw straight lines on a paper map), and a direction-of-travel arrow that is distinct from the north-indicating arrow.

Figure 3-9. Military Lensatic Compass.



Caution

Nearby metallic objects can interfere with your compass's reading. When using your compass, try to maintain at least 55 meters between you and any power lines, at least 20 meters between you and large vehicles, at least 10 meters between you and barbed wire or chain link fences, and one meter from rifles or steel belt buckles.

3-6. **FIELD-EXPEDIENT NAVIGATION**. If you do not have a compass, you can determine directions using one of the following field-expedient techniques:

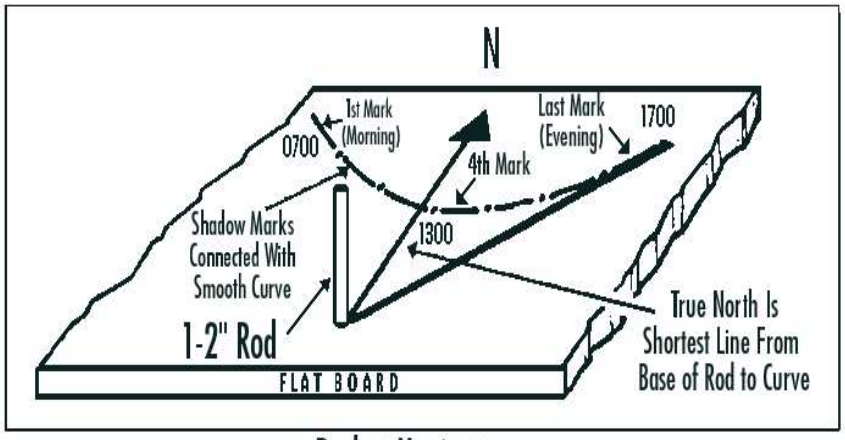
a. ***Pocket Navigator***. Gather the following materials:

- Flat writing material, such as a sheet of cardboard or a writing slate
- Watch or reliable timepiece
- 1-2 inch shadow tip device, such as a nail or pencil
- Pen, pencil, or marker

Start construction of the pocket navigator at sunup and end at sundown. Attach the shadow tip in the center of the sheet and then secure the sheet to a flat surface. Do not move the navigator during

setup. At regular intervals (15 or 30 minutes), mark the tip of the shadow and note the time on the sheet. Connect the marks to form an arc. The shortest line between the base of the shadow tip device and the arc is the North-South line. Draw an arrow to indicate North. To use the pocket navigator, hold the constructed navigator up so that the shadow aligns with the mark you made for the given time. The drawn arrow will indicate true North. The pocket navigator will remain useful for one week, at which point a new navigator will have to be constructed (see Fig. 3-10).

Figure 3-10. Pocket Navigator



b. ***Watch Technique***. An analog watch can be used to determine the approximate true north and true south. In the north temperate zone only, the hour hand is pointed toward the sun. A south line can be found midway between the hour hand and 1200 hours, standard time. If on daylight savings time, the north-south line is found between the hour hand and 1300 hours. If there is any doubt as to which end of the line is north, remember that the sun is in the east before noon and in the west after noon.

- The watch may also be used to determine direction in the south temperate zone; however, the method is different. The 1200-hour dial is pointed toward the sun, and halfway between 1200 hours and the hour hand will be a north line. If on daylight savings time, the north line lies midway between the hour hand and 1300 hours.

c. ***Celestial Navigation***. If you are traveling at night, you can use the stars to navigate, provided the sky is clear enough. Although the position of the constellations changes with the seasons, two stars are stable enough to be used to field-expedient direction finding. In the Northern Hemisphere, this star is Polaris, also called the North Star (see Fig. 3-11), and in the Southern Hemisphere, it is a cluster of four stars known as Crux, or the Southern Cross (see Fig. 3-12)

Figure 3-11. Celestial Navigation in the Northern Hemisphere.

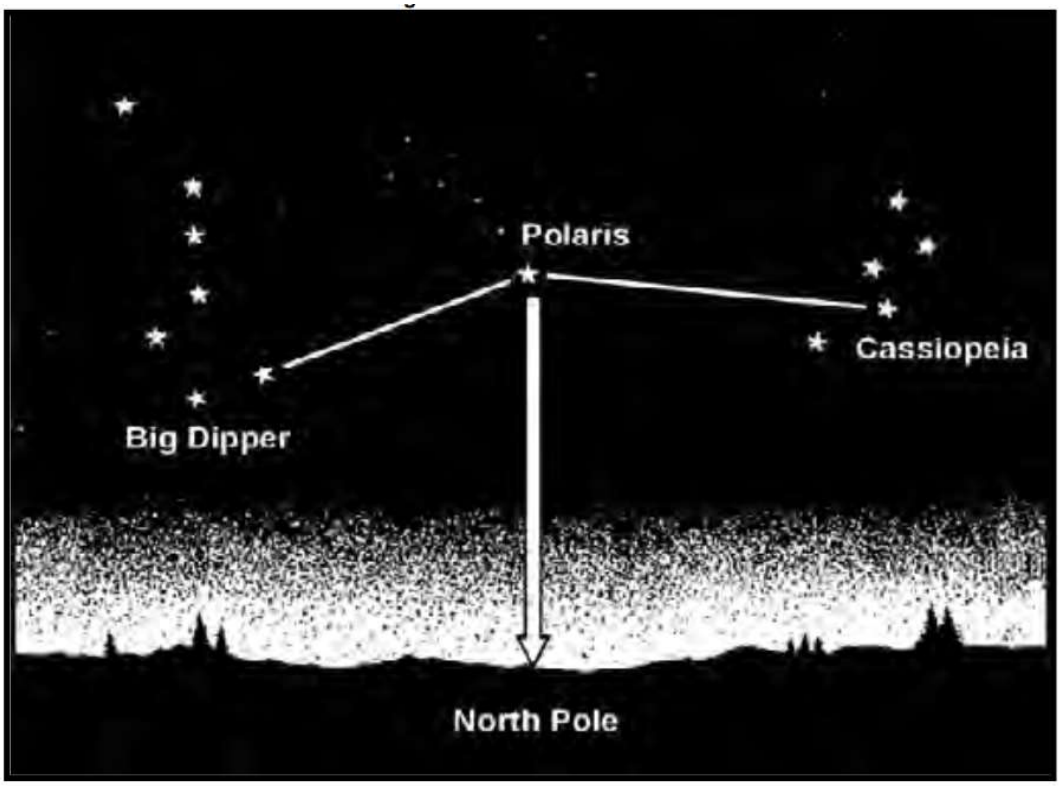
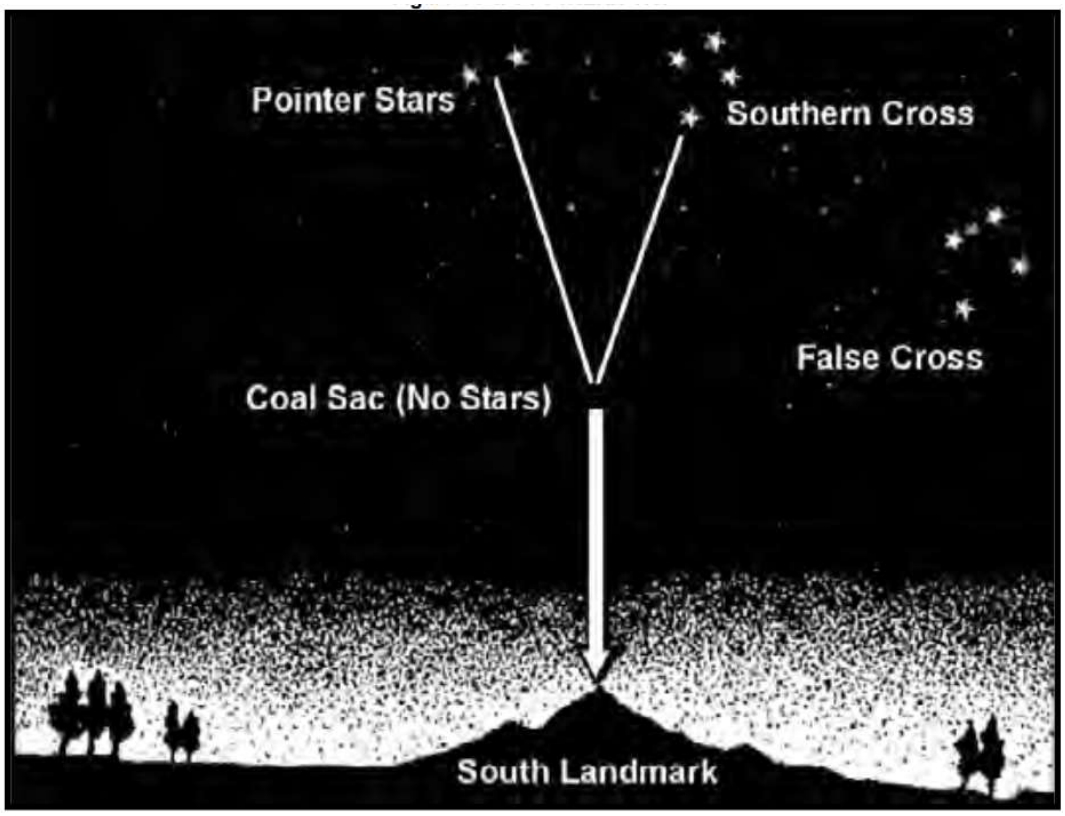


Figure 3-12. Celestial Navigation in the Southern Hemisphere.



I) **The North Star**. The North Star is less than one degree offset from true north and can be used for navigation year-round. To find the North Star, identify a constellation called Ursa Minor, or the Little Dipper. The North Star is the last star in the handle of the dipper. If you cannot locate the Little Dipper, find a constellation called Ursa Major, or the Big Dipper. There is a pair of stars in the cup of the dipper. The North Star lies along a line drawn through those two stars (see Fig. 3-11).

II) **The Southern Cross**. The Southern Cross is a constellation composed of four stars, and is visible year-round in the Southern Hemisphere. The Southern Cross is the brightest constellation in the Southern Hemisphere. The Southern Cross is not directly over the South Pole. To find true south, draw a line between the two stars on the long end of the cross. Continue the line until it is four-and-a-half times longer than the line between the two stars (see Fig. 3-12. The point at which the line ends is directly over the South Pole.

3-7. **AZIMUTHS**. Once you have determined your directions, you can plan your movements. In navigation, routes are expressed as units of angular movement called **azimuths**. An **azimuth** is the angle measured clockwise from from a north base line, either true north, magnetic north, or grid north.

a. ***Magnetic Azimuth***. To measure your magnetic azimuth, you will need a compass, ideally one with a rotating bezel.

- Locate a landmark you can use as a steering mark (a distant feature visible along your route that you can use as an aiming point toward which you will travel).
- Hold the compass as flat as possible using both hands, and draw your elbows tightly to your sides. Turn your whole body until you and the direction-of-travel arrow are facing the steering mark.
- Then turn the bezel ring of your compass until the NORTH indicator aligns with the north-seeking arrow. The angle aligned with the direction-of-travel arrow is your magnetic azimuth.
- To use the magnetic azimuth when traveling, pull out your compass and hold it in the manner described above. Turn your body until the north-seeking arrow aligns with the NORTH indicator on your compass, then proceed in the direction indicated by the direction-of-travel arrow, which will be aligned with your azimuth.

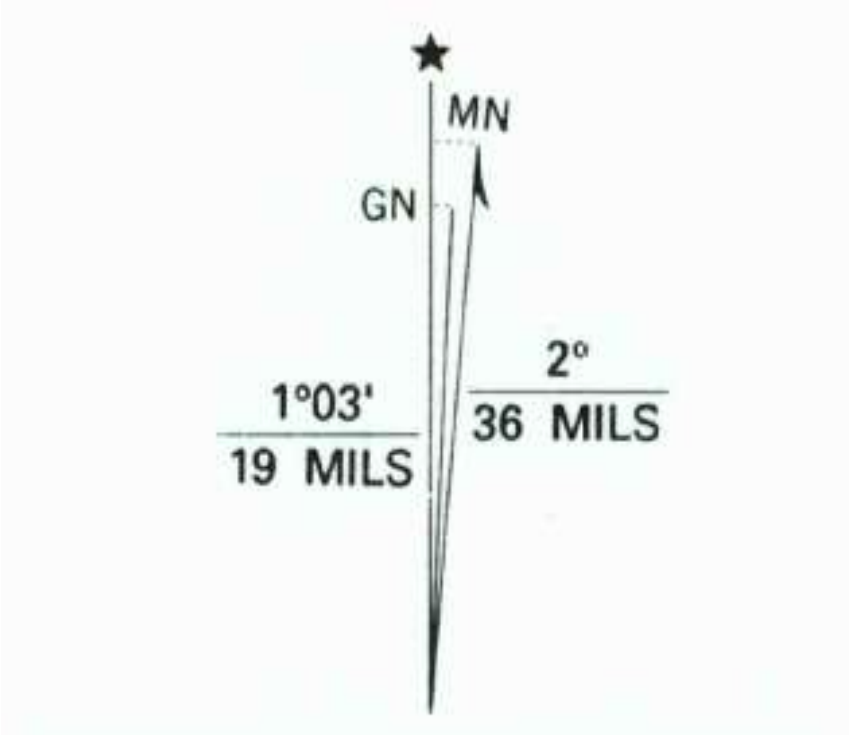
b. ***Grid Azimuth***. The azimuth as measured by your compass represents a direction of travel over a curved surface. As such, it has to be slightly modified for it to be useful on a flat plane, like your map. The **grid azimuth** is the modification of the azimuth so it can be used on a map. To obtain the grid azimuth, you must first **orient** your map. Orientation is the process in which the map is turned in such a way that the north/south lines on the map correspond with the actual north and south on the ground. There are two methods of orientation: **terrain association** and **magnetic orientation**.

I) **Terrain Association**. The first way to orient your map is by using terrain association. Terrain association is the technique of matching features of the landscape detailed on your map with features of the landscape on the ground. Locate notable features, like hills, ridges, valleys, or bodies of water, and find them on the map. Turn the map in such a way that the true north base line on the map corresponds with true north on the ground.

II) **Magnetic Orientation**. You can also orient a map by using your compass. To do this, lay the baseplate of the compass on the map alongside the magnetic north arrow on the **declination diagram** (see Fig. 3-13). Declination is the difference, represented in degrees, between two base lines. You can find the declination on the declination diagram, located in the margins of your map. The declination diagram includes at least two base lines: grid north, which is a plain line marked with the letters “GN” and magnetic north, a line with one-half of an arrow at the tip, marked with the letters “MN.” If your declination diagram includes true north, that line will be

indicated by a star. Slowly turn the map (with the compass still on it) until the north-indicating arrow is aligned with the index line on the compass. After your map is oriented, you can use the declination diagram to convert the magnetic azimuth to the grid azimuth.

Figure 3-13. Declination Diagram.



i) *Converting from Magnetic to Grid Azimuth*. To use the declination diagram to convert from magnetic azimuth to grid azimuth, you will need to use the **grid-magnetic**, or **GM angle**. The GM angle is the declination between grid north and magnetic north. To calculate the GM angle, you will either need to subtract (if the magnetic north base line is to the right of the grid north line) or add (if the magnetic north base line is to the left of the grid north line) the angle indicated in the declination diagram. Using the declination diagram in Fig. 3-13, we can see that grid north is 1°03' from true north, and magnetic north is 2° from true north. The magnetic north base line is 57' (or 17 mils) from the grid north base line. Therefore, we would subtract 57' from our magnetic azimuth to obtain our grid azimuth.

ii) *Plotting a Grid Azimuth*. Once we have our grid azimuth, we need to plot it on our map. We can do this by using a **protractor**. A protractor is a tool used to determine the angle of a line drawn between two points. There are several different types of protractors, but all of them will have an index mark at 0° and scale that divides a circle into units of angular measurement. To use a protractor to plot a grid azimuth from your location, place the index mark over your location. Ensure that the protractor is oriented such that its base line is parallel to the grid north line on the map. Mark the map at the spot where the protractor indicates the angle you calculated. Remove the protractor and draw a straight line between your location and the mark your made. This line is your grid azimuth.

iii) *Converting from Grid Azimuth to Magnetic Azimuth*. You can also convert the grid azimuth to the magnetic azimuth. If you know your location on the map and the location of your destination, you can plot the grid azimuth between the two points using a

protractor. Then, using the declination diagram, convert the grid azimuth to magnetic azimuth and set your compass accordingly.

c. ***Back Azimuth***. The last type of azimuth is the back azimuth. The back azimuth is the exact opposite of the azimuth. To find the back azimuth, add (if the azimuth is less than 180°) or subtract (if the azimuth is greater than 180°) 180°. Remember, azimuths are measured from 0-360°. They can never be negative. If you have a negative azimuth, you've made a mistake in your math.

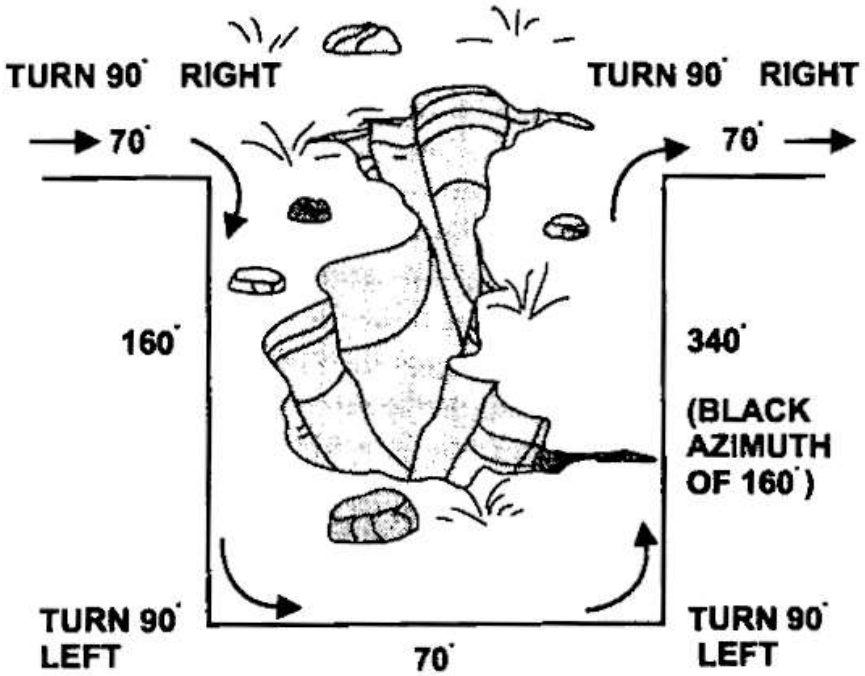
d. ***Following Azimuths***. The following techniques will allow you to follow an azimuth with more confidence.

I) **Handrails**. Staying in straight line is easier when using **handrails**. A handrail is a built feature, like a railroad or power line, that run parallel to your direction of travel. Make sure you check your azimuth regularly, and break off from the handrail when it diverges from your route. Use a prominent landmark as a catching feature to help you know when to change direction, or to know if you have gone too far.

II) **Circumventing Obstacles**. If you encounter an obstacle while following an azimuth, you will need to circumvent the obstacle in such a way that you can return to your original course. If you come across an obstacle that you cannot go over, use the **90º offset technique**.

i) *The 90º Offset Technique*. To use this technique, follow your azimuth until you are as close as possible to the obstacle. Make a 90° turn and walk until you reach the edge of the obstacle, keeping track of the distance by counting paces. When you reach the end of the obstacle, make a 90° turn in the opposite direction to return to your original direction of travel. Walk until you are past the obstacle, then make a third 90° turn in the same direction as the second 90° turn. Walk up the other side of the obstacle for the same number of paces you previously measured. When you have traveled the same number of paces, you can now take a compass reading and return to following your original azimuth (see Fig.).

Figure 3-14. The 90º Offset Technique



3-8. **RESECTION & INTERSECTION**. **Resection** is the method of locating your position on a map by determining the grid azimuth to at least two well-defined locations (although using three locations provides a more accurate reading) that can be pinpointed on your map. **Intersection** is the method of locating an unknown position on a map by occupying at least two positions (although occupying three locations provides a more accurate reading) and plotting the magnetic azimuth from your location to the unknown point.

a. ***Resection***. To use a map and compass to perform resection, first orient the map using your compass. Identify at least two locations on the ground and mark them on the map. Next, measure the magnetic azimuth from your location to one of the known locations. Convert the magnetic azimuth to a grid azimuth, and convert the grid azimuth to a back azimuth. Using a protractor, draw the back azimuth from the known position back toward your unknown position. Repeat the process for your second (and third, if applicable) location. The intersection of the back azimuths is your location. You can now determine the coordinates of your location using either the geographic coordinate system or the UTM grid.

b. ***Intersection***. To use a map and compass to perform intersection, first orient the map using your compass. Locate and mark your position on the map, using resection or terrain association if necessary. Determine the magnetic azimuth from your location to the unknown point. Convert the magnetic azimuth to a grid azimuth, and then draw a line along that azimuth between your position and the unknown point. Next, move to a different known location on your map and repeat the process. The intersection between the two (or three) lines marks the location of the unidentified point. You can now determine the coordinates using either the geographic coordinate system or the UTM grid.

3-9. **TERRAIN ASSOCIATION & DEAD RECKONING**. If you cannot use resection to determine your location, there are two less-accurate methods that are nonetheless faster and will usually suffice for rough estimation: **terrain association** and **dead reckoning**.

a. ***Terrain Association***. Just as when using terrain association when orienting your map, you will identify prominent features of the landscape that you can see both on the map and on the ground, then determine your relative distance from them. In this way, you can create a rough idea of your position.

b. ***Dead Reckoning***. The other way to determine your location is called dead reckoning. Dead reckoning is a technique that allows you to stay constantly updated as to your approximate position, but it is less forgiving than terrain association. Dead reckoning makes use of the following principle: if I know where I am, and I know how fast I am going and in what direction, I will know where I am at any point. To use dead reckoning, you will need to have the ability to draw an azimuth, so you will need a compass, a map, and a protractor. You will need some way to determine how quickly you are moving. Unfortunately, this is not a skill that is easily taught, as everyone has a different pace. Track your pace in different conditions (indoors, outdoors, uphill, downhill, with and without gear) to get an idea of how far you can travel in one hour. If you can do that, you can make use of the scale on your map to keep track of the distance you have traveled and maintain a general idea of your position. When using dead reckoning, small mistakes can compound into massive errors. Any divergence from your azimuth will complicate your efforts to determine your rate of travel. Try to incorporate handrails into your route.

Section II. INDIVIDUAL MOVEMENT.

In the absence of threats, moving from place to place is as simple as putting one foot in front of the other; in CIDA, when the situation is more complicated, ambiguous, and dangerous, moving becomes both a survival technique and a moment of extreme vulnerability. It is vital that you never move without knowing where you are going next, and that while moving you maintain awareness of your surroundings at all times.

3-10. **INDIVIDUAL MOVEMENT FUNDAMENTALS**. Certain practices and behaviors will allow you to move faster and stay undetected. Adhere to these practices at all times to ensure your survival and combat effectiveness.

- Before moving, conduct a **Stop**, **Look**, **Listen**, and **Smell** (**SLLS**) check. Confirm that your next position is secure, is not occupied by hostile elements, and offers sufficient **cover** and **concealment**.
- After confirming that the destination is secure, confirm that your route does not expose you to any fire, friendly or otherwise. Ensure that you and every member of your team is familiar with the route. Communicate your movement intent to your buddy and teammates. If you are returning to your base camp after an operation, do not use the same route that you used to reach your objective.
- If you are operating as part of a buddy pair or a fire team, ensure that every team member has clear fields of fire to suppress hostile elements. Do not move from one fighting position to another if hostile elements are unsuppressed.
- While moving, disguise your movement by taking advantage of diversions and distractions. Distant explosions or gunfire, or even an airplane passing overhead, can draw hostile attention away from your activity. In the same way, use fog or smoke as concealment. If no natural concealment is available, try to manufacture concealment using smoke grenades or burning tires. When smoke is used as concealment, be mindful of how the wind can change.
- Follow handrails like streams, railroad tracks, and highways from a distance. Stay as far away from them as possible while still keeping them in sight. Keep close to the dune line when moving along a beach. If you have to cross a feature like a highway or river, choose crossing sites where the enemy's observation is restricted (an area in shadows or near a bend) and cross rapidly.
- Never move in a straight line. When moving through tall grass or similar growth, move when the wind blows, changing direction frequently.
- Stay low. Objects viewed from below stand out against the sky, day or night. The higher you are, the more visible you will be, so keep close to the ground. If it does become necessary to get vertical, do so quickly and carefully so as to get it over with as fast as possible.
- Avoid areas of soft ground so as not to leave tracks and avoid slopes and places with loose dirt or stones.
- Only carry what you need for the operation. Not only is extra gear noisy, potentially alerting hostile elements to your presence, you will get tired quicker due to the additional weight. Furthermore, a bulky and unwieldy kit can interfere with crawling, dropping prone, or crawling through open windows, into foxholes, or under barbed wire.
- When possible, avoiding disturbing birds or animals whose flight would betray your presence, or guard animals, like dogs, who can alert hostile elements with their barking. If birds or animals are alerted, remain motionless under cover for a few minutes, as the enemy's attention may also be attracted.

3-11 **INDIVIDUAL MOVEMENT TECHNIQUES**. Movement from one fighting position to another exposes you to hostile fire. When you move, take advantage of local sources of cover and concealment. A gully, ravine, ditch, or patch of tall grass at a slight angle to your direction of travel may provide cover and concealment, but not when standing. To effectively utilize microterrain, use the **low** or **hasty crawl**. In the absence of adequate cover and concealment, use the **rush** to move between positions.

a. ***Low Crawl***. The **low** (sometimes "**stomach**") **crawl** gives you the lowest silhouette. It is used to cross places where the cover and/or concealment are very low and enemy fire or observation prevents you from getting up. To execute the low crawl, lie facedown on the ground, keeping your body as flat as possible. Keep your legs together, insteps flat against the ground. Grasp the sling of your rifle at the upper sling swivel with your firing hand and let the rifle rest on your forearm. Keep the muzzle off the ground. Move forward by pushing both arms forward while pulling your right leg forward, then pull on the ground with both arms while pushing with your right leg. Repeat this process until you reach your next position (see Fig. 3-15).

b. ***Hasty Crawl***. The **hasty crawl** (sometimes called the "**leopard crawl**") lets you move faster than the low crawl and still gives you a low silhouette. Use this crawl when there is good cover and concealment but enemy fire prevents you from getting up. Keep your body off of the ground. Rest your weight on your forearms and shins. Cradle your rifle in your arms with the muzzle off the ground. Keep your knees well behind your buttocks so it stays low and keep your heels in contact with the ground. Move forward by alternately advancing your right elbow and left knee, and left elbow and right knee (Fig. 3-15).

Figure 3-15. Low and Hasty Crawl.

c. ***Rush***. During assaults or when crossing open areas, move using short **rushes** composed of three- to five-second bursts of movement followed by assuming a prone position. To perform a rush:

I) **Identify the route**. Verify that it is clear of any rubble or obstacles that could cause you to trip.

II) If you are under fire, wait until there is a pause in hostile fire, there is temporary visual or auditory concealment, or the hostile element is suppressed, then **run** as fast as you can for **no more than five seconds**.

III) When you reach your new position, **fall prone** by planting both feet just before hitting the ground, fall forward to drop to your knees, and catch yourself with your arms before you land on your face.

3-12. **MOVEMENT WITH STEALTH**. Moving with stealth means being able to move without anyone being alerted to your presence. To achieve stealth, apply effective camouflage, conduct frequent SLLS halts, and by moving slowly, cautiously, and only when necessary. There are two primary movement techniques for use when stealth is required: **stalking** and **creeping**.

a. ***Stalking***. To use the **stalking** technique (analogous to what Tom Brown, Jr. calls the “weasel walk”):

I) Crouch low to avoid silhouetting yourself against the horizon.

i) Walk slowly, lifting one leg at a time, and lift the leg high enough to clear any tall grass or vegetation, and step down very slowly onto the outside of the ball of your foot.

ii) Keep your weight on your rear foot while you roll your foot down, exploring for any objects that might make noise. If the spot is clear, slowly lower your heel, then your toes, before shifting your weight onto your front foot by leaning forward.

iii) Lean forward until your back heel has left the ground, then bring your rear leg up for the next step.

iv) Do not step on logs or fallen branches; step over them.

v) If you are walking over rocks or rubble, place your foot down flat after testing that the surface will not crumble or shift.

vi) When you have found a secure spot, lower your foot. Do not shift your weight off of your rear foot until your front foot is stable.

vii) Keep your steps short to preserve balance.

II) As you move, breath steadily; do not hold your breath. Holding your breath while moving can cause you to gasp loudly if you lose your balance, potentially alerting others to your presence.

III) At night, keep your rifle close against your body with your firing hand and use your support hand to feel for obstacles in front of you. Always tighten the sling to prevent it from snagging on a branch; if you get caught, carefully untangle yourself or cut yourself free. Never yank the stuck piece of gear free.

IV) To go to prone while stalking:

i) Stop, tuck your rifle under your arm, and slowly crouch.

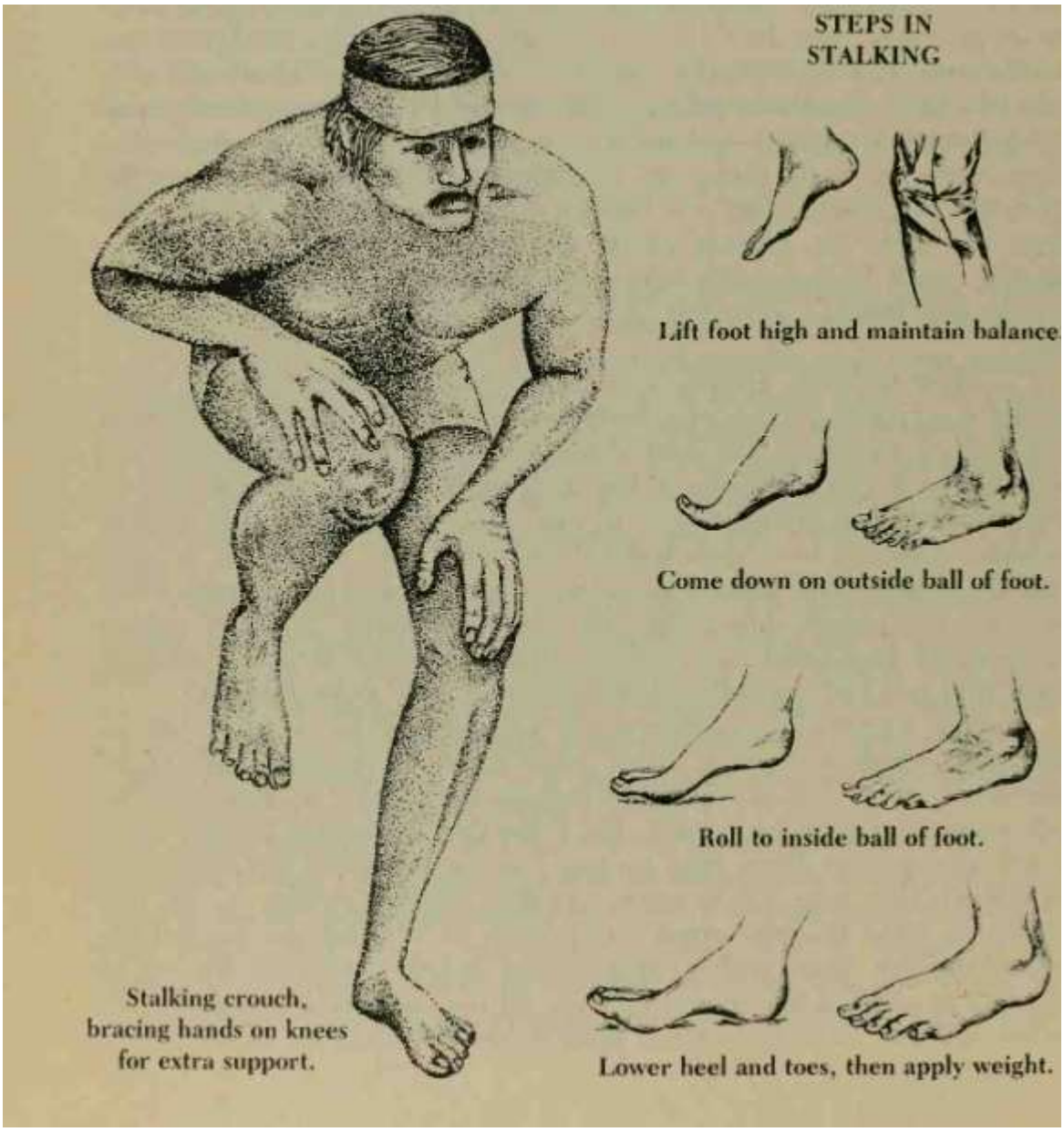
ii) Use your support hand to feel the ground in front of you. Ensure that it is clear of obstructions or materials that might make noise.

iii) Lower your knees to the ground one at a time.

iv) Shift your weight to one knee and extend the alternate leg behind you, feeling for any obstructions or noisy brush.

v) When you have found a clear spot, roll onto that side and stretch out your other leg before rolling into the prone position.

Figure 16. The Stalking Technique.[58]



b. ***Creeping***. The hasty and low crawl techniques may not be suitable for stealth because they can be noisy if used in vegetation or other unbuilt areas. If you need to maintain stealth while keeping a low profile, crawl on your hands and knees with the **creeping** technique (termed in some contexts "the kitten crawl"). This technique is exceedingly slow, but valuable for keeping your presence hidden. To execute the creeping technique (Figure 17):

- Hold your rifle in one hand at its natural point of balance, close against your chest.
- Identify a clear area in front of you and plant your free hand there. Slowly bring your knee up to touch that hand. Repeat the process with the same hand, alternating the knee each time.
- In conditions of low visibility, use your hands to feel for twigs, dried leaves, or other objects that might make noise.

58 Brown, Jr., Tom. *Tom Brown's Field Guide to Nature Observation and Tracking* (1983). 98.

Figure 17. Creeping.

3-13. **URBAN MOVEMENT**. Moving through urban environments as an individual or as part of a team is essentially the same as moving in any other environment. You must be aware of any features of the terrain that you can use for cover or concealment in the event of an encounter with hostile elements, while at the same time being mindful of features of the urban landscape that can conceal threats. Compared to the unbuilt environment, urban terrain offers hostile elements nearly limitless options for choosing a fighting position. Every window and doorway can conceal a sniper. There could be a bomb around every corner.

However, moving in urban terrain presents challenges not present when moving through the unbuilt environment. The presence of civilians, especially children, can make it difficult to move without being noticed. Hostile civilians might attempt to distract you or create cover for hostile elements, or they might report your movements. Friendly civilians, on the other hand, can provide the same services to you and your team. Interacting with non-combatant populations is outside the scope of this manual, but always remember that you are a member of the people's army. Never take any action that could result in the loss of civilian life or an erosion of trust between you and the civilian population.

a. ***Fundamentals of Urban Movement***. 90% of casualties in urban combat occur outside of buildings,[59] so minimize the amount of time you are outside and exposed. If you have the capability to do so, use hand tools or explosives to make new entrances in exterior or interior walls of structures. By knocking holes in walls between buildings, you can move without exposing yourself to hostile fire. When outside, take advantage of all concealment available. Smoke from munitions and burning tires can block hostile observation, but as with every time smoke is used as concealment, be mindful of how the wind can change. Other methods of concealment, including suppressive fire, can and should be employed.

b. ***Windows***. Never walk past windows. Step or vault over basement windows and crouch or crawl over aboveground windows (see Fig. 3-18). Treat passing by a full-length window as you would any movement between fighting positions: identify your next position, confirm the route is clear, and move quickly to minimize your exposure to hostile fire.

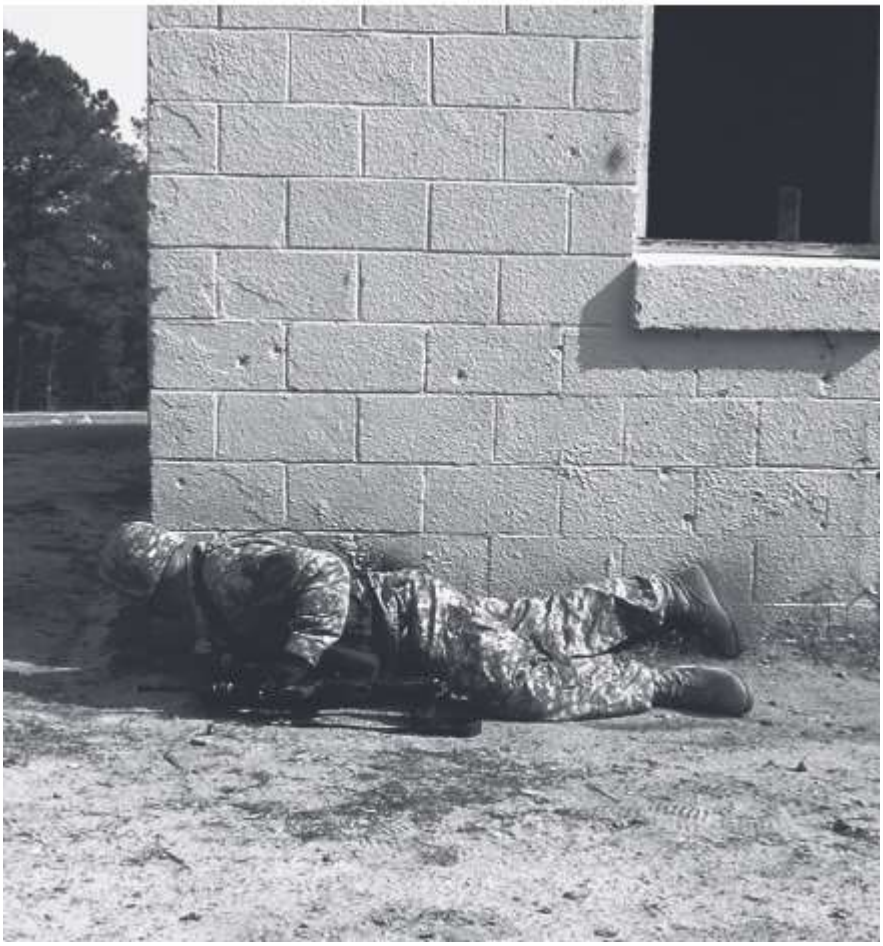
59 Glaze, George A., Maj. “The Urban Warrior: What are the Dismounted Infantry Skills Necessary to Survive in Today's Urban Fighting?” (2000). 13-4.

Figure 3-18. Moving Past Aboveground Windows

c. ***Corners***. Corners present another challenge, as there could be a hostile element waiting to surprise you. Like full length windows, moving around a corner is the same as moving from one fighting position to another. You must first verify that your next position (around the corner) is secure. To correctly check around a corner, you must peek around the corner without exposing your body to hostile fire. There are two techniques for checking corners, one **deliberate**, for when speed is not required, and one **hasty**, for when speed is critical.

(l) **Deliberate Corner Check**. To conduct a **deliberate corner check**, lie flat on the ground with your rifle at your side. Do not allow your rifle to protrude out beyond cover where it might alert hostile elements to your presence. Poke your head around the corner only enough to observe your next position. Never look around a corner at your normal height, which hostile elements might expect (see Fig. 3-19).

Figure 3-19. Deliberate Corner Check.



(II) **Hasty Corner Check**. When speed is required, conduct a **hasty corner check**, also called “pie-ing” or the “slicing-the-pie.” To perform a hasty corner check, aim your rifle beyond the corner (without flagging) into the direction of travel, then side-step around the corner in a semi-circular fashion with the muzzle as the pivot point. If the other side of the corner is clear, move to your next position (see Fig. 3-20).

Figure 3-20. Hasty Corner Check

d. ***Walls***. Walls present similar challenges as corners in that it is difficult to observe your next position without exposing yourself to hostile fire. The crossing point must be clear of debris or long drops on the other side that might cause injury. To scale a wall by yourself, crouch by the side of the wall. Sling your rifle, or hold it in one hand if you do not have a sling. Grab the top of the wall and pull yourself up while swinging your legs over the top of the wall. Roll over the wall to the other side. Do this smoothly, but as quickly as you can, as you will be silhouetted against the sky while on top of the wall (see Fig. 3-21).

Figure 3-21. Crossing a Wall.

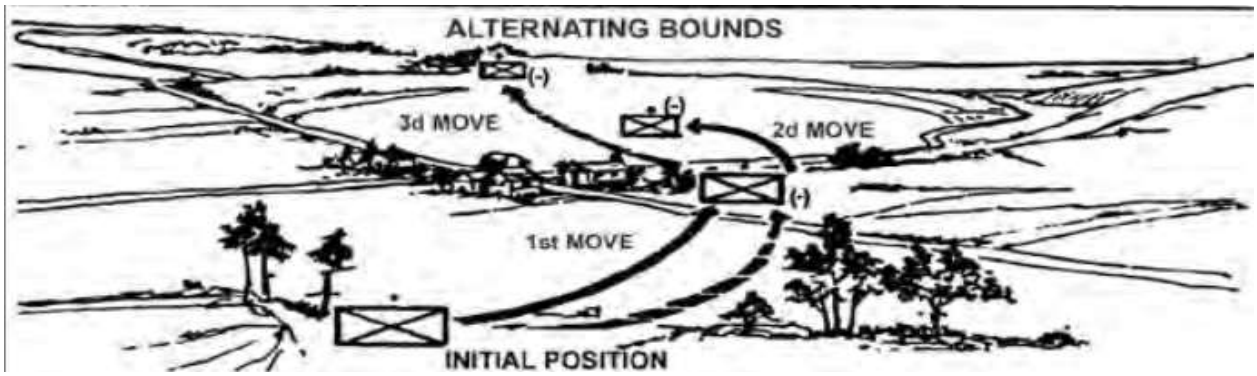
Section III. TEAM MOVEMENT.

Battles are won based on the application of movement and effective fire. Since it is very difficult to shoot accurately while moving, modern combat emphasizes the importance of **maneuver**, or movement supported by fire. Successful maneuver requires at least two elements, either of which can be as small as a single individual; one element moves while the other delivers suppressing fire at any hostile elements. No element of any size should ever move without having another element remain stationary and deliver suppressing fire; to put it another way, every member of a team should be prepared to deliver suppressing fire at any time to allow their teammates to move safely.

3-14. **BOUNDING**. **Bounding** is a movement technique in which one half of an element moves while the other half of the element provides observation and overwatch from a stationary position. Teams should bound whenever there is not enough cover for the whole patrol to move safely, especially when crossing open areas. There are two forms of bounding: **alternative bounding** and **successive bounding**.

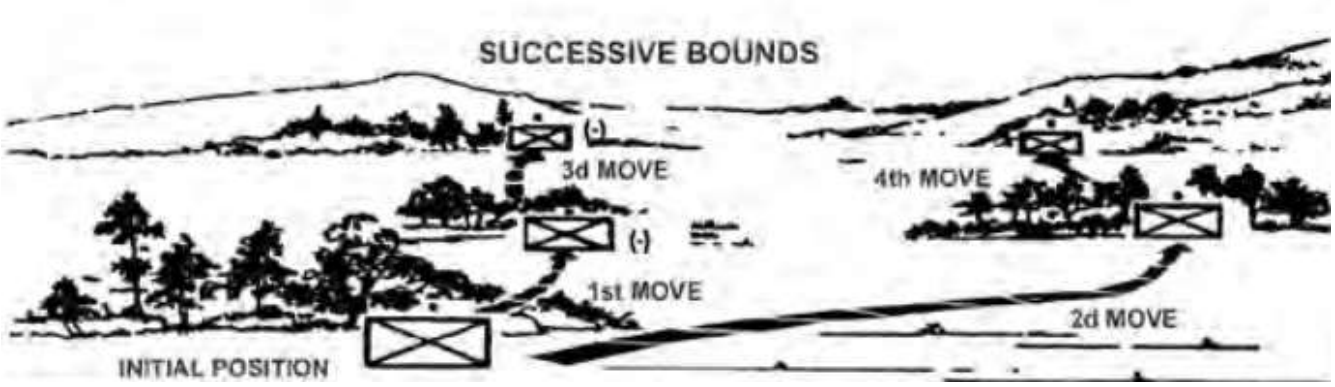
a. ***Alternative Bounding***. In alternative bounding (see Fig. 3-22), the forward element enters the best fighting position available and aims down the most likely hostile avenue of approach (see “Initial Position” in Fig. 3-22) while the forward element gets into position ("1st Move" in Fig. 3-22) When the forward element is in position, the rear element moves past the forward element to the next position with adequate cover and concealment ("2nd Move” in Fig. 3-22). When the rear element is in position, the forward element moves, passing the rear element to get to the next available position ("3rd Move” in Fig. 3-22). Alternative bounding is the fastest form of bounding, but not as secure as successive bounding. Alternative bounding should be used when speed is a priority.

Figure 3-22. Alternative Bounds.



b. ***Successive Bounding***. In successive bounding (see Fig. 3-23), the forward element enters the best fighting position available and aims down the most likely hostile avenue of approach (see “Initial Position” in Fig. 3-23). When the forward element settles into position ("1st Move" in Fig. 3-23), the rear element moves up until they are on line with the forward element ("2nd Move" in Fig. 3-23). When the rear element is in position, the forward element moves again ("3rd Move” in Fig. 3-23). This process repeats until both elements have made it across the open area.

Figure 3-23. Successive Bounds.



Section IV. COUNTERTRACKING & EVASION

There are any number of reasons why you might want to move through the environment without anyone taking note of your passage. One should not expect to be able to evade detection indefinitely; even those exceptionally skilled in bushcraft, like domestic terrorist Eric Rudolph, will eventually be apprehended. However, there are certain techniques and practices that can delay, distract, or deceive trackers.

3-15. **HABITUAL COUNTERTRACKING**. If you make it a habit to avoid track traps, never move in a straight line, and practice litter discipline, your trail will be more difficult to follow, even when you are not actively trying to elude pursuit.

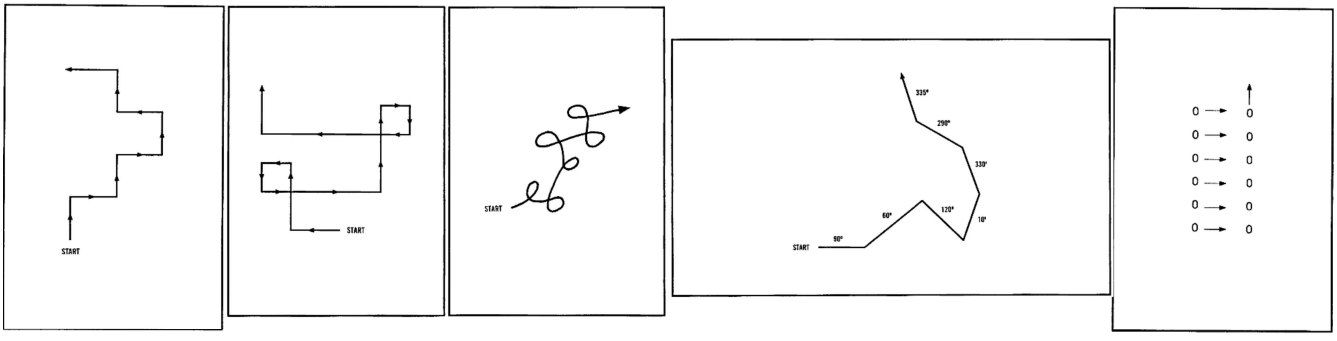
a. ***Avoid Track Traps***. A **track trap** is a spot that is likely to create sign, whether through disturbance or transference. Any area that will deposit any kind of material on you while you move through it, like puddles of mud or wet paint, is a track trap; likewise, any area that cannot be moved through without leaving some indicator, like fresh snow, is a track trap. It is not always possible to avoid track traps, but whenever it is practical, bypass them.

- Be conscious of objects in your path. A weed or a spider's web will not impede your progress, but will be bent or broken; a skilled tracker will recognize this as evidence of your activity. Make an effort to be aware of where you step and how you walk. Practice disturbing nothing.
- Water is often a track trap. Just as touching wet paint will cause a visible smear, disturbing wet surfaces often leaves observable sign. Do not walk along wet surfaces, especially wet earth, which will create a visible impression of your footprint and cling to your boots after you change directions. The same rule applies to sand and fresh snow.
- As much as practical, do not interact with chemicals or substances with strong odors, such as fuel, cleaning agents, or animal carcasses. These smells will linger on your skin and clothing. After working with oils and solvents, such as gun cleaning chemicals, thoroughly wash your hands; use unscented soaps, detergents, and deodorants whenever possible.
- The weather is a factor in avoiding track traps. Under most circumstances, wind and rain decrease the risk by degrading tracks and dispersing odors, meaning traveling during the rain is safer than traveling after the rain stops.

b. ***Never Travel In a Straight Line***. When traveling alone, especially in an urban environment, **never travel in a straight line**. Instead, take at least one or two extra turns. Do not repeat any pattern of movement frequently enough to develop it into a predictable habit.

- When traveling through the unbuilt environment, whether alone or with a buddy or team, **vary your movement route**. If you know your azimuth, you can use the 90º-offset technique to change your direction of movement while still staying on course. The three turns of the 90º-offset introduce three points where a tracker can be delayed as they attempt to find sign in the wrong location. Making this a habit also develops land navigation and orienteering skills.

Figure 3-24. Movement Techniques



c. ***Litter Discipline***. The “pack in/pack out” principle is not merely good environmental stewardship; it is sound tactical advice. Litter discipline is a critical element of camouflage and countertracking because of litter's unique capacity to reveal more information about a subject than almost any other kind of sign. Litter does not merely indicate that a person passed through a space, but depending on the nature of the litter, can provide clues to the subject's nationality, group affiliation, or even age. A cigarette butt can alert the tracker that they should be scanning for the smell of smoke or tobacco. Anything you carry with you should always be carried with you until it can be disposed of safely.

(I) Litter discipline also covers excrement management. When disposing of urine or feces in the field, construct a “cat hole” by digging a 15 centimeter-deep hole at least 50 meters from a trail or water source, deposit your waste in the hole, and cover with soil. Never urinate or defecate in the same spot twice. Never urinate or defecate directly on the ground, but always in a hole.

3-16. **ACTIVE COUNTERTRACKING**. In addition to the habitual countertracking techniques that will obscure your trail, there are techniques that you can employ if you are making a deliberate effort to evade detection. There are two main methods of active countertracking: **camouflage** and **evasive maneuvers**.

a. ***Camouflage***. In the context of countertracking, camouflage means disguising your trail so a tracker does not recognize any of the sign. Three common methods of camouflage include **boot wrapping**, **trail brushing**, and **backward walking**.

(I) **Boot Wrapping**. One common method of camouflage is to wrap your boots in cloth, like burlap or even triangle bandages. This obscures the exact outline of your footprint, preventing your boot from making easily-recognizable prints (see Fig. 3-25). Note that the purpose of the cloth is not to erase your footprint, but to make it impossible to use the tread of your sole to confirm your identity.

Figure 3-25. Boot Wrapping.

(II) **Trail Brushing**. You can also try to camouflage your sign by brushing out sign behind you using a leafy branch or cloth. However, this is not recommended, as the signs of brushing are as distinctive as a footprint. Like wrapping your boots, this is less of a device for moving unnoticed than it is obscuring your identity. Both foot wrapping and track brushing are useful techniques to employ after executing an evasion maneuver. If you wrap your feet after cutting a corner, the tracker will lose more time trying to locate your sole pattern after recovering your trail than they would if you had started with your boots wrapped.

(III) **Backward Walking**. One of the simplest methods of camouflaging your trail is to walk backward. Backward walking should not used extensively absent other techniques; the footprints of a person walking backward are distinct from the footprint of someone walking forward. The difference is illustrated in Fig. 3-26, in which the deeper toe and shallower heel of the backward print distinguish it from the forward print. A skilled tracker will recognize the attempt at deception.

Figure 3-26. Footprint of a Subject Walking Backward.

It is better to use backward walking in conjunction with other evasion techniques, especially the “Big Tree” technique (see the following section). By walking past the point where you plan to leave the trail, then walking backward in your own footprints until you can leave the trail, which will cause the tracker to overshoot your exit point.

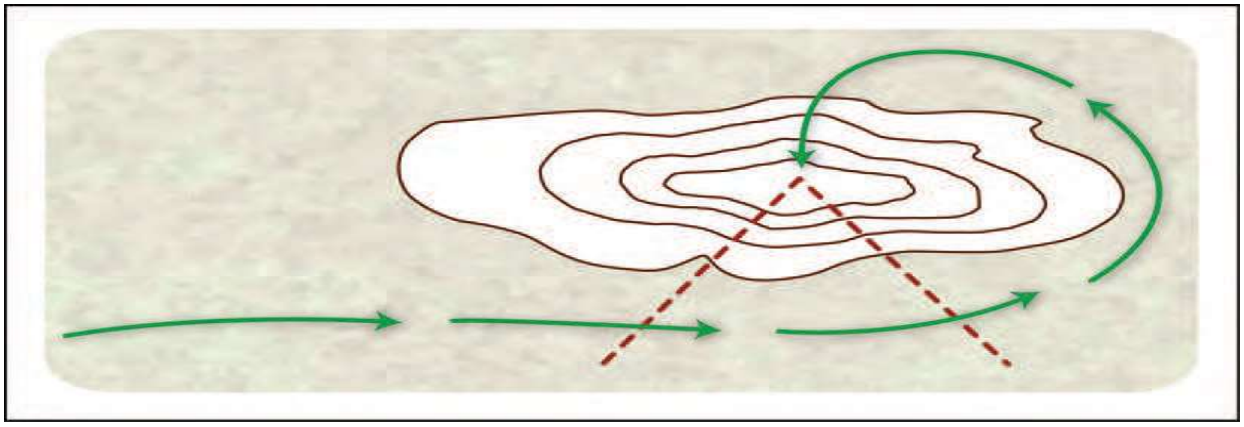
3-17. **EVASIVE MANEUVERS**. Evasive maneuvers, unlike camouflage, seek to deceive a tracker into following a false trail. Evasive maneuvers take time and skill to properly accomplish. The most effective are the **Bombshell Technique**, the **J-Hook**, the **Big Tree**, and **Cutting the Corner**.

a. ***Bomb Shelling***. The bombshell technique is a team-based evasive maneuver. It is frequently used to escape after making contact with a hostile element). The bombshell technique is simple; every member of the team leaves the contact site along a different azimuth. This forces any pursuing elements to divide their forces to follow each path.

(l) A variant of the bombshell technique is the **clusterbomb technique**. In this method, the team separates along different azimuths, as with the bombshell technique, but in groups of two or more. At predetermined points, each group breaks off into its own azimuths. This process can continue as long as there are at least two team members together. Both the bombshell and cluster bomb techniques can be improved by pre-staging camouflage materials, like changes of clothes, around the area where the team expects to use the technique.

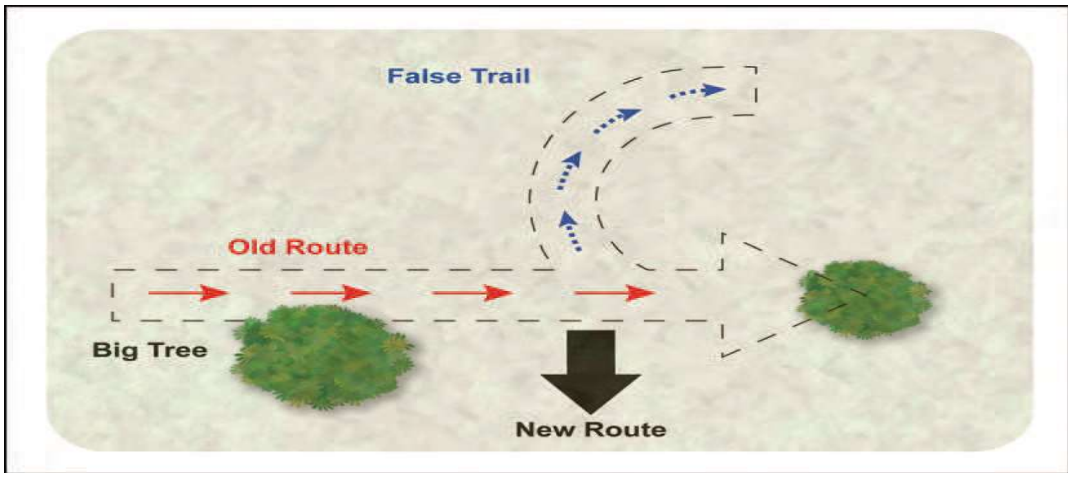
b. ***The J-Hook***. The **J-Hook** (also called the "Fishhook") is an exceedingly simple and effective evasive maneuver, especially against an inexperienced tracker. To use this technique, the subject doubles back on their own trail to an observation point where they can ambush the tracker (see Fig.3-27). Effective use of the J-Hook technique requires the subject to be aware that they are being tracked. In addition, the subject should be reasonably certain they can prevail in an ambush against the tracking element; otherwise, waiting by the trail is too risky.

Figure 3-27. J-Hook.



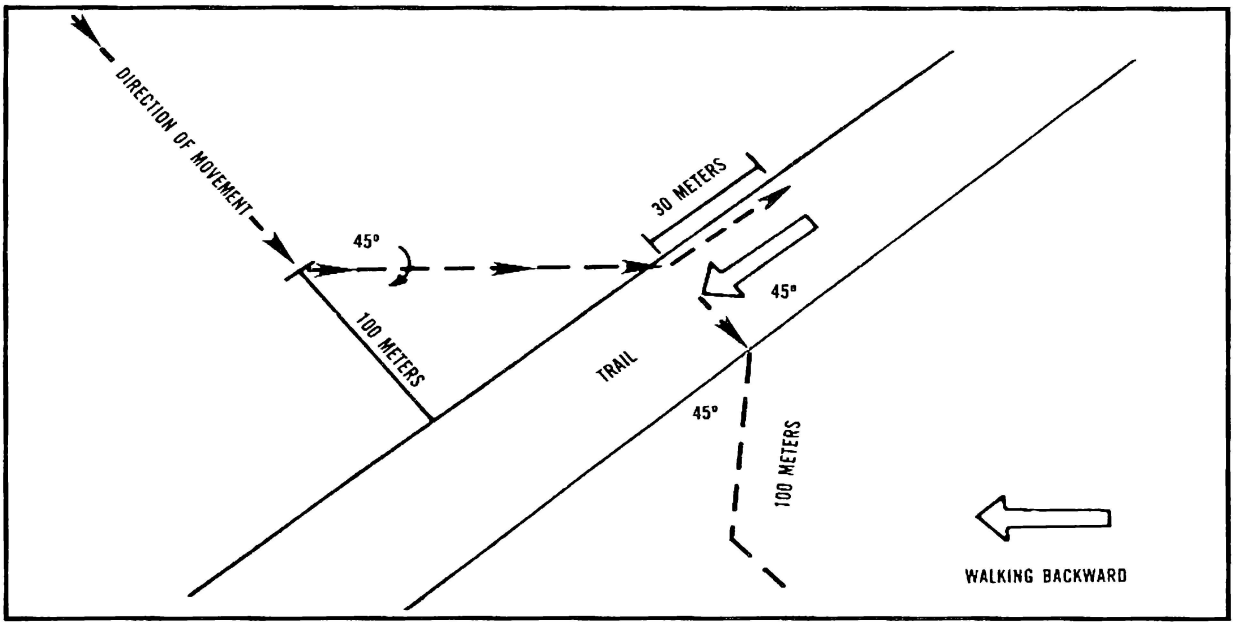
c. ***Big Tree***. In the Big Tree technique, the subject or team uses a tree alongside the trail to conceal a change in direction. To execute the Big Tree technique, the subject or team must identify a suitable tree, one at least 30 centimeters in diameter. They walk between 5 and 10 paces past the tree, then walk backward the same number of paces in their own footsteps until they are just ahead of the tree (see "A" in Fig. 3-28). From here, the subject or team makes a 90º turn past the tree (see "B" in Fig. 3-28). The tree will conceal the exit point from any tracking element coming up the trail. Keep in mind that, as with any evasion maneuver that relies on backward walking, a professional tracker will not be deceived by this technique.

Figure 3-28. Big Tree.



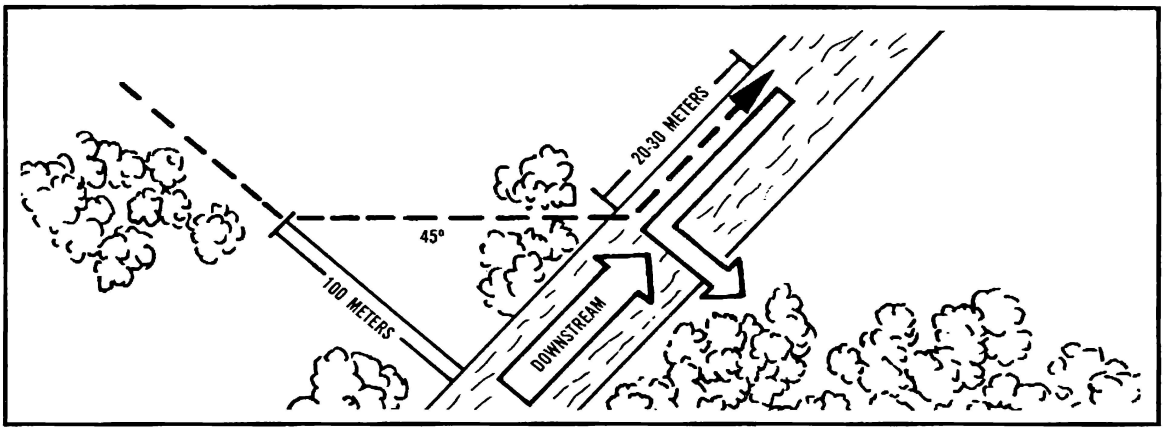
d. ***Cut the Corner***. If the subject or team is approaching a known road or trail, they can use the cut the corner technique (see Fig. 3-29). To execute this maneuver, the subject or team makes a 45º adjustment, either left or right, in their direction of travel about 100 meters from the road or trail. After reaching the road, they create a false trail by moving a sufficient distance down the path to convince a tracker that the subject or team simply cut across their travel to get to the road faster. After traveling a appropriate distance, they backtrack, using backward walking or by staying on hard surfaces, back to their azimuth, at which point the leave the road in their original direction of travel. Combining the cut the corner technique with the Big Tree technique improves the effectiveness of both.

Figure 3-29. Cut the Corner.



(l) The cut the corner technique can be used with streams and rivers instead of roads (in which case it is called Slipping the Stream; see Fig. 3-30). To slip the stream, the subject or team makes a 45º adjustment in their direction of travel about 100 meters from the stream, as if they were cutting the corner. The subject or team then enters the water, traveling upstream. After traveling a sufficient distance, the team moves back downstream and exits the water. Use caution when executing the slip the stream technique. Bodies of water are track traps, especially if the banks are muddy.

Figure 3-30. Slip the Stream.



Section V. DOGS.

It is deeply unfortunate that some dogs have been turned into weapons, more so that they are so effective.[60] Trained dogs and their handlers are incredibly dangerous. There is no way to disguise your trail from an experienced, motivated dog-handler team. Your only effective strategy will be to attempt to exhaust the dog. Following a scent trail is strenuous work for the dog, and it can only work for 20-30 minutes before requiring a 10-20 minute rest. If you can keep moving, especially in weather or over terrain that will not leave tracks for the handler to follow, you stand a chance of escape.

3-18. **FUNDAMENTALS OF SCENT**. All organic matter, including the human body, is constantly shedding materials like hair and skin cells. These cells are lighter than air, and float around in **scent plumes**, driven by warming air creating convection currents. A person's body temperature is sufficient to create updrafts that will push scent plumes into the air. Scent plumes act like smoke, and can be categorized based on their behavior as either **fumigating**, **lofting**, **fanning**, **coning**, or **looping**. In the morning, dogs will stay near the ground and at the base of hills as fumigating plumes push smells down; in the evening, dogs will take the top of ridgelines seeking lofting plumes. Severe wind or rain will disperse scents, but mild rains will trap the scents on the ground, especially on soft earth.

a. ***Fumigating Plumes***. Fumigating occurs when air near the surface, heated by the sun, rises to meet cool air floating above the ground. The cooler air sinks closer to the ground as the warmer air rises, bringing scents nearer to the ground. Fumigating plumes are especially common in the early morning hours after sunrise.

b. ***Lofting Plumes***. Lofting plumes are the opposite of fumigating plumes, and occur in the evening, as cool air near the surface mixes with warmer air above the ground. Scents near the ground rise, bringing scents up slopes and out of valleys.

c. ***Fanning Plumes***. When the sun goes down, air temperatures stabilize and convection currents subside. Scents floating in the air will stay floating at that elevation, although they can fan out horizontally with the breeze, hence their name, fanning plumes.

d. ***Coning Plumes***. On cloudy and still days, scent plumes will rise straight into the air with little horizontal movement. These cone-shaped plumes are called coning plumes.

e. ***Looping Plumes***. In a looping plume, the warmed scent cloud rises, then cools and falls back to the ground, where it warms up again and restarts the cycle. Looping plumes are common on clear days and at noon, when convection currents are strongest.

f. ***Effects of Wind on Scent***. When evading dogs, try to stay upwind. If the wind or breeze is moving dust and small branches, it is strong enough to overcome convection currents, potentially carrying your scent for miles. Stay away from lone, tall objects like telephone poles or lone trees; these act like chimneys, creating a vortex that traps scents.

3-19. **EVADING DOG-HANDLER TEAMS**. Dog-handler teams are usually lightly equipped to facilitate fast movement, meaning you might be carrying more firepower than the handler. However, engaging the handler should almost always be a choice of last resort. Dog-handler teams are only dispatched into areas of suspected activity; by engaging the handler, you are confirming your presence.

a. ***Dog Attacks***. If the dog attacks you, kill it with whatever weapons are available, including firearms. A trained dog is very dangerous, and you should not allow fear of discovery to prevent you from acting quickly. If you do not have a firearm, wrap a coat or towel around your support arm and keep it in front of you. When the dog bites, stab upward into the dog's neck while it is latched on to your support arm. After killing the dog, you need to flee as quickly as possible. If the dog found you, the handler will be nearby, and the dog will be missed very quickly.

60 This was a hard section to write, because I like dogs more than most people. And by that I mean I like dogs more than most people do. But by that I also mean I like dogs more than I like most people.

Section VI. UNOCCUPIED AERIAL SYSTEMS (UAS).

Little is more chilling to revolutionaries everywhere than the thought of the State's arsenal of remote-controlled assassins patrolling endlessly above the skies, watching everyone. The reality is, as usual, more practical. **Unoccupied Aerial Systems** (**UAS**) are a formidable threat, but they are not the hand of God; like dogs, they are a tool that has strengths and weaknesses.

3-20. **UAS GROUPS**. UAS are divided into five groups which separate UAS platforms by weight and capability (see Table 3-1).

Table 3-1. UAS Groups.[61]

Group	*Category*	*Specifications*	*Description*
1	Micro/Mini	20 pounds or less. Operates <1,200 ft above ground level (AGL) at <100kts.	Hand-launched, these also include hobby-type UAS. They offer real-time video and control, and have small payload capabilities. Operated within line of sight (LOS) of user.
2	Small Tactical	Weighs 21-55 lbs and operates <3,500 ft AGL at <250 kts.	Small airframes, low radar cross-sections, and provide medium range and endurance. Requires LOS to the ground control station.
3	Tactical	55-1,320 lbs, operates <18,000 ft mean sea level (MSL) at <250 kts	Range and endurance varies significantly among platforms. Requires a larger logistics footprint than Groups 1 and 2.
4	Persistent	>1,320 lbs. Operates <18,000 ft MSL at any speed	Relatively large systems operated at medium to high altitudes This group has extended range and endurance capabilities (may require runway for launch and recovery).
5	Penetrating	>1,320 lbs. Operates >18,000 ft MSL at any speed	Operates at medium to high altitudes having the greatest range, endurance, and airspeed. Requires large logistical footprint similar to that of manned aircraft.

3-21. **ANTI-UAS FUNDAMENTALS**. Anti-UAS techniques are the same as all other types of camouflage, which means minimizing movement and shine and utilize effective concealment. Anti-UAS techniques differ only in the extra emphasis placed on overhead concealment and **dirt discipline**, which refers to properly disposing of dirt excavated during the construction of fighting positions (the different colors of the dirt are easily visible to UAS cameras). Ensure that there are no vehicle tracks visible from the air leading to your position, and make sure all vehicles are covered to prevent light from reflecting off of their metal surfaces.

b. ***Detecting UAS***. Drones are primarily detectable by sound. Take the time to learn the sounds of the drones employed by hostile elements in your area of operation. Memorize their silhouettes as well. Learn what drones are used for what purpose, so if you spot them in the field you can predict your adversary's intentions. For example, if certain drones are used exclusively for artillery spotting, you can expect shelling.

c. ***Responding to UAS***. When you hear a drone, or receive the signal that a drone has been spotted, you should first try to hide. Only as a last resort should you attack a drone; high-flying drones are difficult to hit with small arms fire, and attacking a drone just verifies your presence.

l) **Hide**. The most effective counter-drone technique is to get something solid between you and the drone. If you are in a wooded area, stay behind and under trees and thick brush; if you are in the built environment, get inside and stay away from windows. If you are moving when a

61 ATP 3-01.81: *Counter-Unmanned Aircraft System Techniques*;

drone is spotted:

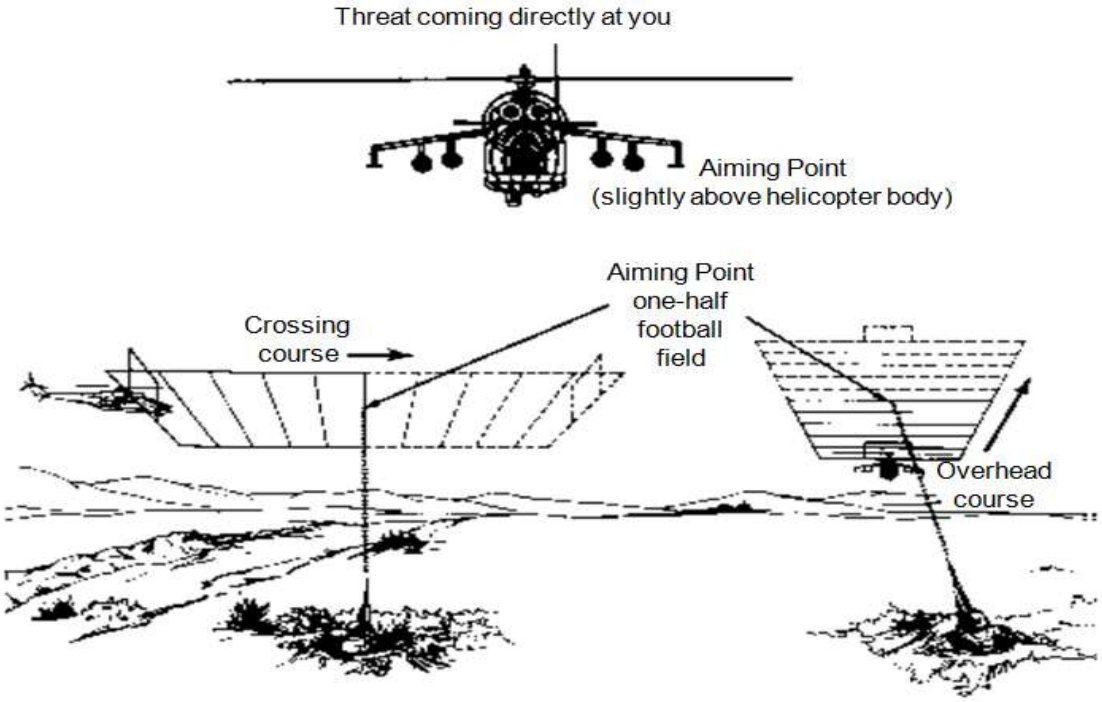
- Drop prone in order to reduce the length of your shadow.
- Cover yourself as best you can with a poncho or camouflage netting. If there is no camouflage nearby, move to the best camouflage available.
- Do not run. Rapid movements are easier to detect.
- Resist the temptation to look to the skies. Faces are shiny, especially if you are wearing ballistic glasses or prescription lenses, and the glare could give away your location. Furthermore, the cameras on drones are very sophisticated, and by pointed your face toward it you are risking identification.

II) **Engage**. If you must engage a drone, engage it with the highest volume of fire possible. Hitting moving targets requires estimating a lead distance and firing at that point until the target has passed that point. The most straightforward way to estimate lead distance is with the football field technique.

i) *The Football Field Technique*. The football field technique gets its name from the assumption that in America, most people have an intuitive familiarity with the length of a football field (adjust accordingly based on the popular sport in your region). The assumption is that if a group of people are told to aim at a point “one football field” in front of a moving target, most of them will get it mostly right most of the time. When combined with a sufficient volume of fire, “mostly right” is adequate for low-flying craft like drones.

a) Point of Aim. When engaging drones, your point of aim will depend on the drone's orientation in relation to you. These points are summarized in Table 2.

Figure 3-31. Football Field Technique.



Firing at slow aircraft with M16, M60, and 50 Caliber Machine Gun

Table 3-2. UAS Aiming Points.

COURSE	*AIMING POINT*
Crossing	(UAS Group 1) half a football field in front
	(UAS Groups 2 and 3) one and a half football fields in front
Directly At You	Slightly above UAS body
Hovering	Slightly above UAS body

"'Does he see me?' is NOT the question. The unit leader needs to assess "What will he do with this information?" Has he been sighted by an enemy squad or an enemy battalion? A fire network? Does the adversary use UAS to recon for a ground attack, call for fire, or solely for BDA [Battle Damage Assessment]*?*

[…]

"Every separate unit POSTS an air guard—at all times, day and night—for all operations. If two or more air guard teams are posted then sectors are assigned.

The air guard WATCHES and LISTENS for adversary UAS. The air guard KNOWS the alert process...

The air guard may or may NOT be trained in UAS recognition.

The air guard does NOT attack UAS.

C-UAS actions are a separate action...

The air guard duty rotates, like any other duty. It is NOT a sleeping post. Air guard may be an additional duty for the existing security watch.

LP/OP should be assigned the air guard mission to listen for UAS."

-Brendan McBreen, Ed.[62]

62 *SIGMAN Camouflage SOP: A Guide to Reduce Physical Signature Under UAS* (2020) 1-10-13.

Chapter 4
FIGHT

"It is too dangerous a world to be ignorant of the ways to defend ourselves so that we can continue our revolutionary work. Being acquainted with a weapon and its uses does not mean that you must immediately go out and use that weapon, but that if you need to use it, you can use it well."

-Lorenzo Kom'boa Ervin[63]

Force is always the worst option for resolving conflicts, but occasionally it is the only option. If you have to engage a threat, it is your responsibility to do so immediately, with the maximum amount of appropriate force, as precisely as possible. The tools and methods you will use to engage threats will change depending on your circumstances and the nature of the threat, which means you should familiarize yourself with as many of those tools and methods as possible. This chapter introduces some of the basic techniques for employing different levels of force.

63 *Anarchism and the Black Revolution* (2021 [1993]). 63.

Section I. FORCE.

In Chapter 1, you learned that a **threat** was any human or nonhuman person with the *intent*, *opportunity*, and *capacity* to harm you or your neighbors. You also learned some of the methods and techniques for detecting threats. If you detect a threat, it is your responsibility to **neutralize** it – that is, remove *any one* of the threat's intent, opportunity, or capacity to harm you or your neighbors. The act of "neutralizing" a threat is not always or even necessarily violent, but it is always an expression of **force**, or the imposition of your will over another without their consent or consideration of their autonomy. While force is acceptable in self-defense, violence is not. In this context, **violence** is anti-solidarity, or the process by which people are dehumanized, that is, stripped of their autonomy and reduced to the category of objects or commodities. Most people have an aversion to killing because they are able to recognize themselves in their victims; for this reason, every conflict in human history has featured concerted campaigns to transform men, women, and children into "the enemy." Once a person has been sufficiently objectified, it is easier to hate them, fear them, and ultimately, kill them.[64] Force is not the same as violence, because it is possible to employ force without losing awareness of the threat as a subject. Always be mindful that the ability to employ force against others is a tremendous responsibility, and if you choose to take on that responsibility, you must allow yourself to be held accountable by the community.

4-1. **APPROPRIATE FORCE**. If you detect a threat, it is your responsibility to neutralize it with the **appropriate** level of force. Since force is only ever justified as a method to prevent greater harm, what is appropriate will change based on the consequences of inaction or failure; however, all things being equal, appropriate force can be defined as the least level of force (see Paragraph 4-2) that you reasonably believe will *immediately* and *effectively* neutralize the threat. Insufficient levels of force can result in a threat harming you or your neighbors; excessive force will have significant legal and ethical consequences. Unfortunately, there is no uniform method to determine what level of force is appropriate in all circumstances. Even if your body's acute stress response (see Chapter 1) did not literally change the information that your brain chooses to prioritize, it is impossible to have perfect information about the threat, the environment, or even yourself. That is not to say that it is impossible to develop the good judgment and discernment necessary to make the right decisions under stress. By training and developing proficiency in these techniques, you will come to understand the factors that that reduce or increase the level of appropriate force (for a non-exhaustive list of these factors, see Fig. 4-1).

4-2. **LEVELS OF FORCE**. Broadly speaking, there are three levels of force. From the lowest level to the highest level, these are **presence**, **dialogue**, and **damage**. You do not need to exhaust a lower option before moving to a higher one, but you need to start with the lowest level you reasonably believe will neutralize the threat.

a. ***Presence***. Sometimes, your **presence**, or the presence of one of your comrades or neighbors, is sufficient to neutralize a threat. A bouncer checking IDs and searching for weapons at a club entrance is a common example of this level of force. By demonstrating that you are comfortable and aware in a space, even if you do not engage any anomalies, you signal to potential threats that they cannot act without scrutiny. This level of force can be sufficient to protect against opportunistic threats who are searching for easy targets, but is inadequate for more motivated threats.

b. ***Dialogue***. If you know that a potential threat has seen you, and you still believe they are a threat, it is reasonable to assume that your presence was not sufficient to remove the threat's opportunity to inflict harm; in these situations, dialogue is the minimum level of force appropriate. **Dialogue**, or talking to and with the threat, is the lowest level of force at which you interact directly with a threat. There are two purposes to engaging in dialogue: you will **interrogate** the threat to learn

64 Smith, David Livingstone. *Less Than Human: Why We Demean, Enslave, and Exterminate Others* (2011). 130 &c.

what you can about them, and you will **inform** the threat of your willingness to use increased levels of force if they do not comply with your instructions.

I) **Interrogation**. Interrogation is the least forceful form of dialogue, and involves questioning the threat to gain information about them. You will use this information to make a judgment about the nature of the threat and the level of force that is appropriate to the situation. You will also share this information with your comrades in the event that you disengage from the threat or the threat is able to evade you. When interrogating a threat, keep your body language and tone neutral (see Chapter 1). Maintain assertiveness without being rude. In a level voice, request for the threat to identify themselves ("May I help you?" for example). Then ask direct questions to determine the relevant *Who*, *What*, *When*, *Where*, *Why*, and *How*. Pay attention not just to the threat's answers but the way they answer. Interrogation can neutralize threats on its own in much the same way as presence can, but serves mainly as a method to acquire information you can exploit to neutralize the threat if you have to employ greater force.

II) **Inform**. If interrogation fails or does not appear likely to neutralize the threat, **inform** the threat that their behavior indicates to you that they are a danger to you and to others. Inform the threat that you are prepared to escalate your level of force. Be as specific as possible. There are two reasons why to use this technique; the first is ethical, the second, practical. If neutralize a threat without harming them, you should do so, and a firm warning might convince a less-motivated threat to stand down. The practical reason has to do with your neighbors and comrades. By announcing your intent and your reasoning, you are communicating to all those around you that there is about to be trouble, which provides them with enough warning to either flee or come to your assistance; and in the aftermath, it is easier to explain your actions if there is a crowd of people who heard you articulating your thought process. While it should not need to be said, informing a threat about your intentions will ruin any possibility of surprise; you must balance the risk of revealing your plans with the possibility that communicating your intent, capacity, and opportunity to harm the threat will effectively neutralize them.

c. ***Damage***. If you have tried and failed to engage the threat with dialogue, or if you do not believe that dialogue will be effective, you can move to **damage**. For our purposes, damage refers to any physical, mental, or emotional disturbances that interfere with a threat's intent, opportunity, or capacity to harm you or your neighbors. Damage can be classified according to the severity of its effects. The classifications, from least severe to most severe, are **disruption**, **mechanical damage**, **hydraulic damage**, and **circuit damage**. Damage is infrequently isolated to a single type.

I) **Disruption**. **Disruption**, in this context, refers to feelings of physical or psychological discomfort, stress, or pain that interfere with your desire to achieve your objectives without actually causing effective mechanical damage that would interfere with your capacity to do so. Anything that will distract or dissuade you away from your goal is disruption. A slap to the face causes disruption; so does a bullet that passes through tissue without striking any vital organs. Fear is also a potent form of disruption. Disruption is the easiest form of damage to inflict, and the least effective. It is impossible to predict how a threat will respond to pain or discomfort, especially if alcohol or drugs are involved, so it is not prudent to assume that the threat will flee or surrender if you merely wound them or threaten to wound them. Since all weapons cause pain, all weapons can disrupt a threat.

II) **Mechanical**. **Mechanical damage** refers to harm inflicted on the body's physical structure, especially the muscles or bones, that interfere with the threat's capacity for violence, regardless of their opportunity or intent. If the bones in your leg are damaged beyond a certain point, that limb will not support you, even if you wanted it to. Mechanical damage to one area of the body does not necessarily impact the rest of your body; you can still shoot with your support arm if your primary arm is wounded, for example. Mechanical damage is more effective than focus damage, but mechanically compromising your opponent's ability to fight can be time- and effort-intensive, especially without a weapon. Depending on the weapon, it

might be harder to inflict mechanical damage than hydraulic or circuit damage (striking the threat with the buttstock of your rifle, for example).

III) **Hydraulic**. All of your organs and tissues receive oxygenated blood through a network of blood vessels. When that flow of oxygenated blood is obstructed you are taking **hydraulic damage**. Hydraulic damage can result from losing blood, as with a gunshot or knife wound, or from an interruption, like drowning or choking, in the supply of fresh oxygen. On average, people have between 5 and 6 liters of blood in their body. During blood donation, 8 to 10% of the body's blood is removed. Losing more 20% of the body's total blood will lead to shock, more than 30% to unconsciousness, and more than 40% to death. Hydraulic damage is a very reliable method of neutralizing your opponent, but depending on the location of the damage, the time it takes will vary; a gunshot wound to the pelvis will lead to enormous blood loss and rapid incapacitation; the same bullet, impacting in the meat of the thigh, will require minutes to achieve the same effect.

IV) **Circuit**. In the same way your tissues receive oxygen through your blood, all of your organs receive electrical impulses generated by the brain and transmitted down your spine. **Circuit damage** refers to the interruption of those signals, either by destroying or damaging the brain or severing the spine. Circuit damage is the fastest, most reliable way to neutralize your opponent, because sufficient damage to the nervous system will immediately, and in most cases, permanently, remove your opponent's ability to hurt you. Gunshots to the head (especially the palm-sized region of the face centered on the nose) and spine are the most reliable way to cause circuit damage.

4-3. **WEAPON SELECTION**. Your capacity to scale force is limited by your ability to use the weapons available to you. Any given weapon is best-suited for inflicting a particular type of damage (see Table 4-1). You need to know how to employ different weapons when different levels of damage are required. While it is unreasonable to believe the reader can gain competence in the martial arts and mortal combat simply from reading this chapter, they are expected to have some basic familiarity with **unarmed combatives** (grapples and strikes), **riot control agents** (**RCA**), **impact weapons**, **edged weapons**, and **firearms**. Other weapons, like air guns, bows and arrows, thrown weapons, and explosives are outside the scope of this manual.

Table 4-1.

Weapon	***Type of Damage***			
	Disruption	**Mechanical**	**Hydraulic**	**Circuit**
Unarmed	Effective	Ineffective	Ineffective†	Ineffective
RCA	Effective	Ineffective	Ineffective	Ineffective
Baton	Effective	Effective	Ineffective†	Ineffective
Knife	Effective	Effective	Effective	Ineffective
Gun	Effective	Effective	Effective	Effective

†By the most rigid definition, chokeholds are technically a method of inflicting hydraulic damage, but this is not in the spirit of the thing.

Table 4-2: Factors Affecting Appropriate Force

Factors	*Explanation*
Age	While relatively little strength or coordination is necessary to inflict massive damage with knives or guns, children and the elderly generally do not have the power, reflexes, or stamina to be dangerous in close quarters. All else being equal, the very young and very old, require less force All else being equal, children and the elderly, especially the very young and very old, require less force than adults.
Sex	Biological males tend to have more muscle mass, than biological females, meaning that all else being equal, males are more dangerous in close quarters than females. Under most circumstances, greater force is therefore appropriate to neutralize males in close quarters than females.
Numbers	Lower levels of force tend to be less effective if the threat outnumbers you and your neighbors and more effective if you and your neighbors outnumber the threat. Greater levels of force are appropriate when the threat can harm involved bystanders, with the level of appropriate force increasing as the number of bystanders grows.
Weapons/Skill	Armed threats are more dangerous than unarmed threats, but threats holding weapons are more dangerous than threats who merely have weapons on their person. Given how easy it is to conceal knives or blades, you must assume until you learn otherwise that every threat is in the latter category. Likewise, if you know that the threat is a trained fighter, more force is appropriate to neutralize them.
Fitness/Disability	All else being equal, greater force is appropriate against an non-disabled and lucid threat than a threat with an obvious physical or mental disability, like crutches or a wheelchair. Likewise, a threat who is obviously exhausted, malnourished, or ill requires less force than one who is outwardly healthy. This applies to you as well: if you and your neighbors are exhausted, malnourished, or ill, greater levels of force are appropriate to neutralize a threat who is outwardly healthy.
Motivation	Ideologically-driven threats, like fascists, might not be amenable to lower levels of force; a sufficiently motivated threat cannot be stopped except with lethal force. On the other hand, higher levels of force are usually not appropriate against threats whose motivations are unclear or irrational, like children or **emotionally-disturbed persons** (**EDP**).
Hazards	The presence of **hazards** (see Chapter 1) can make the scene dangerous. Under most circumstances, the need to minimize the interaction with the hazards justifies greater levels force to quickly neutralize the threat.
Damage	Greater levels of force are appropriate against a threat who has already done or is currently doing damage to you or your neighbors.
Escape	Greater levels of force are appropriate to neutralize a threat when you or your neighbors have no way of disengaging from the threat or when the threat has taken steps to prevent you from disengaging.

Section II. UNARMED COMBATIVES.

While valuable as a tool for physical conditioning and building the fighting spirit, unarmed combat is the most dangerous and least effective method of neutralizing a threat. It is very difficult for an amateur to generate the necessary level of force or execute techniques with the necessary level of skill required to inflict sufficient mechanical or (in the case of chokes) hydraulic damage. That said, there will be times when your hands and feet are the only weapons you have, and in those circumstances, you need to know how to protect yourself and fight effectively. Unfortunately, proficiency in unarmed combat is not something that can be learned from the pages of a book. More so than any other skill described in this manual, striking, grappling, and ground fighting must be learned in person, from a reputable trainer. This section focuses exclusively on generating enough space to employ a more effective weapon, like a knife or a firearm.

4-4. **FIGHTING STANCE**. The **basic fighting stance** is the position from which you will launch attacks and mount defenses. To be effective, the basic fighting stance (see Fig. 4-1) should conform to the natural response to a threat: the feet are shoulder-width apart and slightly staggered, so the support leg is slightly in front of the action leg. The knees are bent and weight is evenly distributed, since balance is necessary for generating the force required to push a threat away. The hands are held up to just below the line of sight to protect your abdomen, chest, neck, and face, and to deliver strikes, present weapons, and employ the Post, the Frame, or the Hook. Keep yourself flexible, not rigid, so as to better evade your threat's attacks and redirect their momentum. The basic fighting stance is the foundation of all weapon employment.

a. ***Fighting Stance Terms***. The rest of this chapter will discuss specific techniques and maneuvers, and it is important that the reader is clear on the vocabulary. When in the basic fighting stance and when employing a weapon, you must know which side of the body needs to move and how to best grip weapons and other objects.

I) **Sides**. Instead of using terms like “right” or “left” to refer to directions, this manual uses the term “action side” (what other manuals call the “strong” or “dominant” side) and “support side” (what other manuals call the “weak” side). If you are right-handed, your right side is your action side, and your left side is your support side, and vice versa.

II) **Grip**. Every weapon will be held in some variation of the **hammer** grip, the **ice pick** grip, or the **overhand** grip.

i) *Hammer / Ice Pick Grip*. The **hammer grip** is used with one-handed batons or improvised weapons. To employ the hammer grip, make a fist by wrapping the fingers of your action hand around the object, thumb over your fingers, with the tip of the object pointing up. If the tip of the object is pointing down, this grip is more properly called the **ice pick grip** (see Fig. 4-2).

ii) *Overhand Grip*. The **overhand grip** is used for two-handed batons and for any weapon or tool that requires a firm grasp from both hands. To employ the overhand grip, wrap both hands around the object, palms down, thumbs pointing to each other (see Fig. 4-3).

Figure 4-1. Basic Fighting Stance.

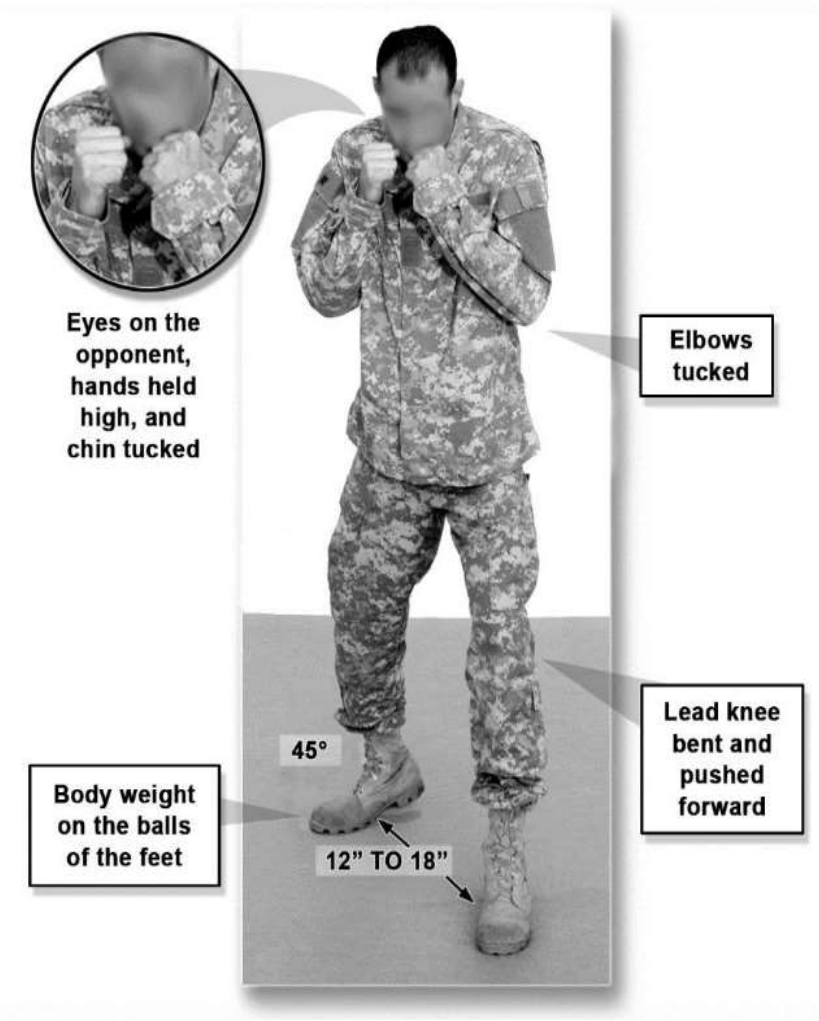


Figure 4-2. Hammer / Ice Pick Grip

Figure 4-3. Overhand Grip

4-5. **UNARMED COMBATIVES**. Under all but the most extreme circumstances, you are better served by keeping your distance and not getting too close to a threat. Proximity negates skill, and the closer a threat is to you, the easier they can hurt you. Furthermore, any weapon, whether RCA spray, a baton, a knife, or a firearm, is superior to your empty hands for neutralizing a threat. If a threat is within striking distance, your priority should be **creating** and **maintaining space** so you can employ your weapon, not grappling or trying to inflict mechanical damage with strikes. There are three primary unarmed techniques you can use to control a threat: the **Post**, the **Frame**, and the **Hook**.

a. ***Post***. The **Post** (or **check**) is a way to keep a threat at arm's length. To execute the Post, start from the basic fighting position. Keep your weapon on your action side and orient your support-side hip toward the threat to keep your weapon out of their reach. Tuck your chin into your chest and place the palm of your support hand onto the threat's chest. Raise your support-side shoulder to protect your face and brace your hips (see Fig. 4-4).

b. ***Frame***. Use the Frame technique if the threat pushes through the Post or if they are too close to employ the Post. From the Post position, with your support-side hip forward and your chin tucked, place your support-side forearm across the threat's chest. From here, cup the palm of your support-side hand on the threat's shoulder or neck. Keep your shoulder high and brace your hips (see Fig. 4-4).

c. ***Hook***. Use the Hook technique if the threat moves through the Frame of if they are too close to employ the Frame. From the Frame position, bring your support-side arm under the threat's same-side arm (that is, if you are facing the threat, you will bring your left arm under their right arm or your right arm under their left arm) and pull down on their shoulder. Use your action-side hand to control the threat's other hand or to keep your primary weapon away from them. Tuck your head underneath the threat's chin and push up and out. Finally, step with your support-side leg to bring your body perpendicular to the threat (see Fig. 4-5).

Figure 4-4. The Post (L), The Frame (R)

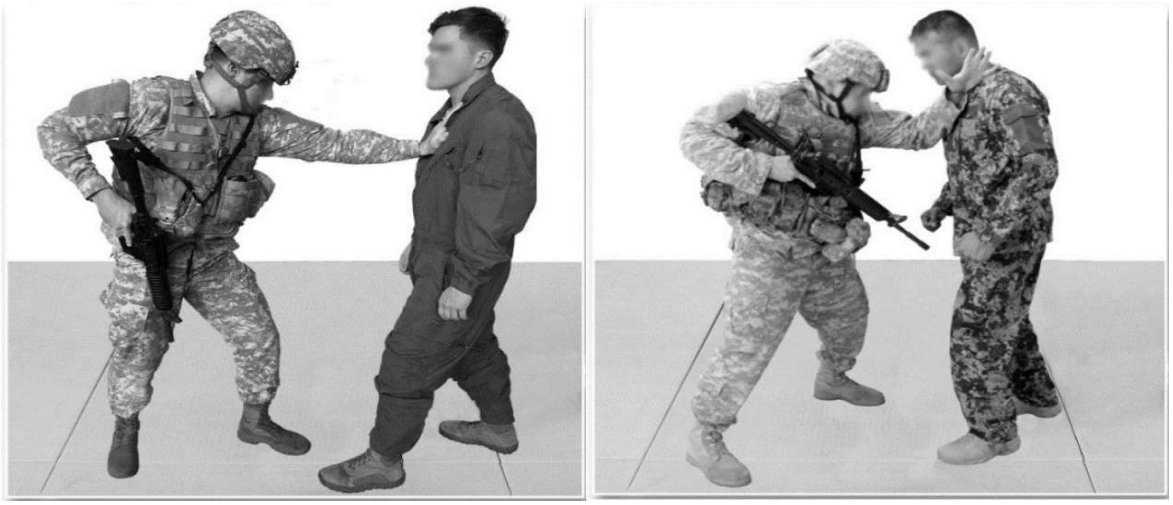


Figure 4-5: The Hook.

d. ***Creating Space***. After achieving control with the Post, the Frame, or the Hook, your priority needs to be exploiting that control to put yourself in the most advantageous possible to neutralize the threat. Most of the time, that means **creating space**, that is, pushing the threat away, so you can effectively use your primary weapon, or the weapon capable of causing the most damage (this is usually your firearm). To create space from the Post or the Frame, push off with your rear foot and firmly thrust forward, pushing with your support arm. If the threat is smaller than you or off-balance, they will go backward; if they are bigger than you, or well-positioned, you will. Either way, use the extra space to deploy your primary weapon (see Fig. 4-6). To create space from the Hook, place both hands into the threat's near-side armpit and push off with your trail foot, thrusting with both arms. It may be necessary to use strikes to create the opportunity to get both hands into position (see Fig. 4-6). Once you have created space, employ your primary weapon as necessary.

Figure 4-6. Employ Primary Weapon from the Post (L), Employ Primary Weapon from the Frame (C), Employ Primary Weapon from the Hook (R)

l) **Rifle Combatives**. You can use your rifle as an impact weapon to inflict focus and mechanical damage to a threat without resorting to lethal force. While not as effective or efficient as using the rifle as designed, combatives with a rifle can be a useful tool if you do not have a non-lethal weapon.

i) *Butt Stroke*. Step forward with your firing-side foot and pivot into the step with your hips. At the same time, bring the rifle up to horizontal and drive the edge of the rifle butt into the threat. Follow through with the strike and return to a shooting stance (see Fig. 4-8).

ii) *Butt Smash*. Raise your the muzzle until it is over your shoulder, pointing behind and above you. Step forward and bring your arms down and forward, driving the butt into the threat. Follow through with the strike and return to a shooting stance (see Fig. 4-9).

iii) *Muzzle Thrust*. From a shooting stance, thrust forward with both hands, as though jabbing with a spear, into the threat's abdomen, chest, neck, face, or groin (see Fig. 4-10).

iv) *Weapon Retention*. If the threat grabs the barrel of your rifle, pull the buttstock back and under your armpit by drawing your elbows rearward. Wrap your support hand over the top of the rifle's handguard, palm down. From here, abruptly drop your body weight straight down into a squat. At the bottom of the squat, twist your hips to align the muzzle at the threat's center of mass. From here, you can either fire or execute a muzzle thrust. If you cannot move backward, fight off the threat by kicking with either foot at the threat's lower leg, thigh, or groin (see Fig. 4-12). If you are too close to effectively kick, torque your hips to drive the point of your elbow into the threat's head. If possible, grab the back of the threat's head to force them into the blow (see Fig.4-12).

e. ***Maintaining Space***. If you cannot employ your firearm (because of appropriate force considerations or any other reason), you can create space from the Post, the Frame, and the Hook to employ a blade or a baton. Using RCA spray in such close quarters is not recommended because of the risk of inadvertent cross contamination. In these situations, you are not creating space, you are **maintaining space**, because of the short range of secondary weapons and the necessity of keeping control over the threat. To maintain space from the Post or the Frame, engage the muscles in your posted arm to prevent the threat from approaching and deploy your secondary weapon. To maintain space from the Hook, pull down with your hooking arm and push forward with your head to expose the threat's abdomen (see Fig. 4-7). Take advantage of any terrain, like walls, fences, or parked cars, into which you can force the threat. Once you have control over the threat, employ your baton or knife as necessary.

Figure 4-7. Employ Secondary Weapon from Post (L), Employ Secondary Weapon from Frame (C), Employ Secondary Weapon from Hook & Head Control (R)

Figure 4-8: Butt Stroke

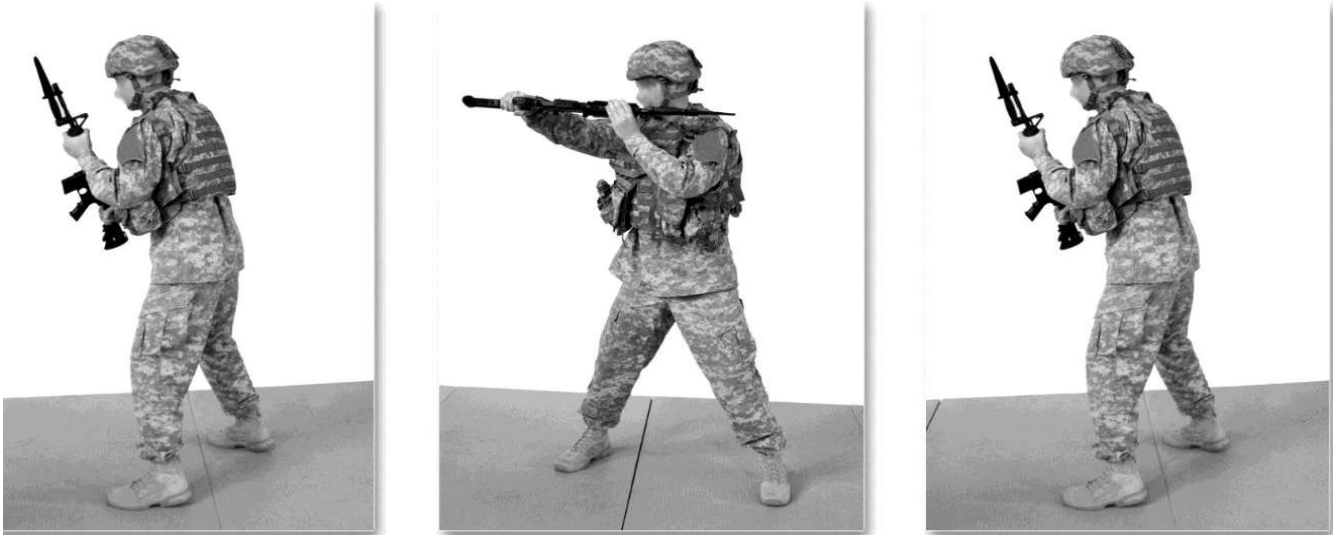


Figure 4-9. Butt Smash.

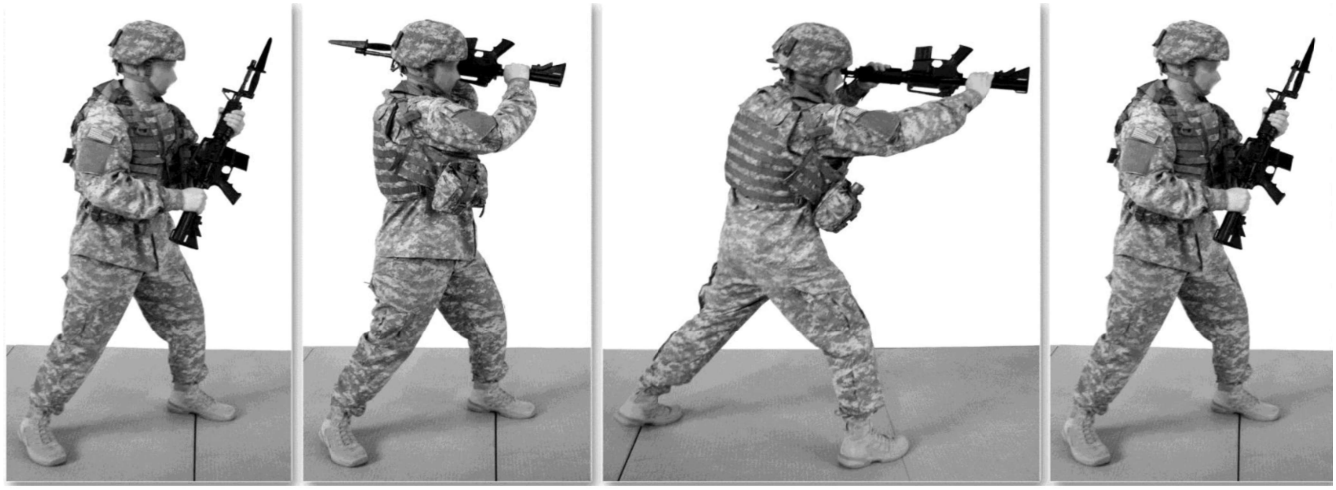


Figure 4-10. Muzzle Thrust

Figure 4-11. Tug-of-War

Figure 4-12. Kick

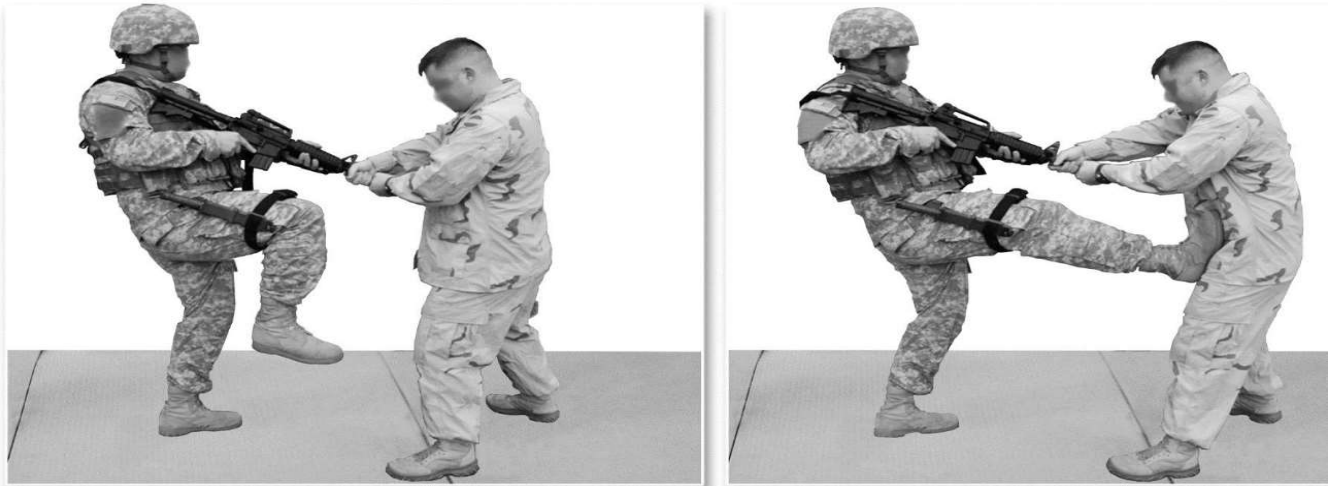
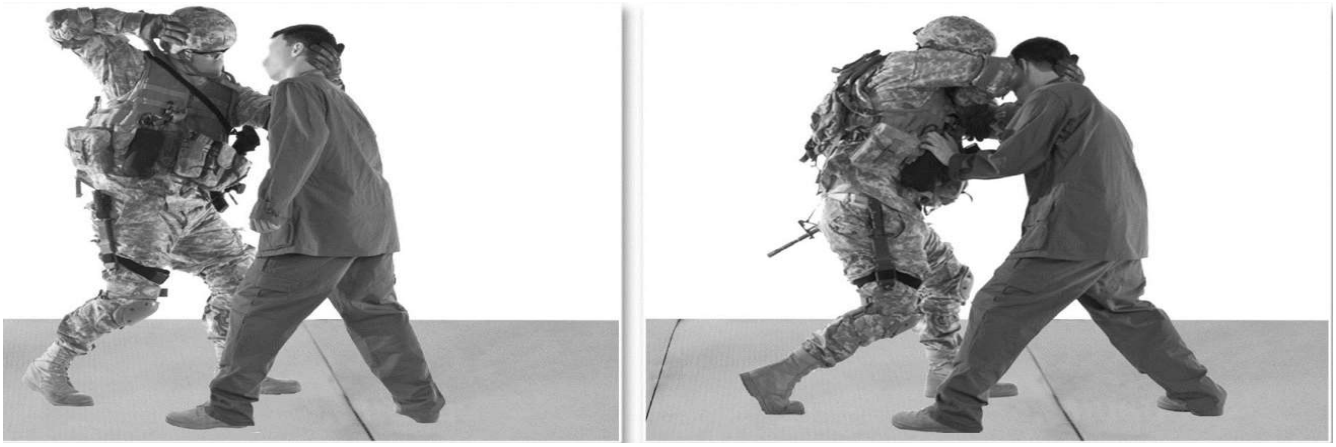


Figure 4-13. Elbow Strike



Section III. RIOT CONTROL AGENTS (RCA).

4-6. **RIOT CONTROL AGENTS (RCA)**. The ideal nonlethal self-defense weapon would eliminate a threat's capacity to harm you without causing any lasting damage to their health and well-being[65]. While we wait for that weapon to be developed, **riot control agents** (or **RCA**) will continue to remain a commonly-employed solution. RCA, also called **pepper spray**, **bear spray**, **OC spray**, or **mace**, consist of a cloud or stream of burning or irritating particles, usually dispensed from a hand-held canister. RCA are frequently employed by hikers and joggers as defense against bears or dogs, or by agents of the State seeking to disperse the working class. During CIDA, RCA can be an effective method of neutralizing a threat when lethal force is inappropriate.

a. ***Types of RCA***. There are two primary forms of RCA: **pepper spray** and **tear gas**. Other chemical sprays, like insect repellent or oven cleaner, are sometimes used as improvised RCA, but these are not recommended. Some RCA formulations feature a dye to mark the subject of the RCA spray for apprehension by law enforcement.

I) **Pepper Spray**. Most RCA is primarily capsaicin-based. **Capsaicin** is the chemical compound present in peppers that makes them "hot." RCA based on capsaicin are called **pepper spray** or **OC spray**, for **Oleoresin Capsicum**, the oily resin that contains capsaicin. Pepper spray stings the eyes, the respiratory tract, and any exposed skin. It inflames the mucus membranes, causing them to swell; this will make it difficult or impossible to take deep breaths or to hold the eyes open.

II) **Tear Gas**. The other main form of RCA is based on **tear gas**, a chemical weapon developed during the Second World War. While there are different formulations of tear gas, the most common is called **CS** (from its creators Ben Corson and Roger Stoughton)[66]. Tear gas works by stringing and irritating the tear ducts, causing the eyes to water; it also irritates the lungs and nasal passages, causing painful coughing, difficulty breathing, blisters on the skin, and elevated mucus production. Unlike pepper spray, tear gas does not lead to inflammation of the mucus membranes.

III) **Other RCA**. There exists anecdotal evidence of individuals using wasp repellent or foaming oven cleaners as improvised RCA. This is a bad idea. Pepper spray and tear gas are specially-formulated to be nonlethal, and their reckless use still leads to innocent deaths year after year[67]. The effects of improvised RCA are completely unpredictable, and have a much higher chance in leading to permanent disfigurement or death, which defeats the purpose of RCA in the first place.

b. ***Components of RCA Sprayer***. The most common method of RCA delivery is a small, hand-held canister. The canisters can be small models meant to be carried on keychains, larger "duty" models meant for police, or "magnum" models with separate firing handles. While the ergonomics of each sprayer might differ, all will have a **nozzle**, a **safety catch**, a **canister body**, and a **trigger** (see Table 4-3). While there are some RCA sprayers that double as impact or electroshock ("Taser") weapons, increasing the complexity of the sprayer can potentially complicate manipulation of the safety catch or trigger. If it is necessary to employ RCA, fractions of seconds matter, and you cannot afford to waste time fumbling with multiple modes or configurations.

65 I'm thinking specifically of those bubble guns from Neal Stephenson's *The Diamond Age*, or the Hold Person spell from *Dungeons & Dragons*.

66 And also because 2-chlorobenzalmalononitrile is too hard to spell.

67 Most of these are, in fact, attributed to "excited delirium," a pseudoscientific condition used to justify lethal force after the fact.

Table 4-3. RCA Sprayer Components.

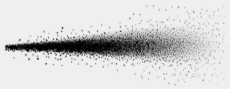
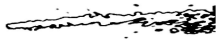
I) **Nozzle**. The **nozzle** of the RCA sprayer is where the RCA will be dispensed according to a given **spray pattern**. There are three main spray patterns present in commercially-available RCA sprayers: **fogs**, **streams**, and **foams** (see Table 4-4). Each pattern is suited to different conditions.

II) **Safety Catch**. The **safety catch** prevents the trigger from being depressed and accidentally discharging the RCA. The exact location of, and the method to defeat, the safety catch will depend on the exact model of your RCA sprayer. While a safety catch is necessary, ensure that you can manipulate it properly when you are under stress (that is to say, under the conditions in which you are likely to deploy it).

III) **Canister**. The **canister** contains the aerosolized RCA. Canisters range in size from keychain-mounted models to canisters the size of small fire extinguishers used by riot police. Your circumstances will dictate the size of the canister that is appropriate for your purposes.

IV) **Trigger**. The **trigger**, or actuator, is the mechanism for dispensing the RCA. Most RCA sprayers have a trigger designed either for the thumb or the forefinger; if possible, take some time to experiment with different configurations until you find one that works best for you and your grip (see Paragraph 4-3).

Table 4-4. RCA Spray Patterns.

	Spray Pattern	*RCA Particle Size*	*Range*	*Conditions*
Fog		Very Fine	Minimum: 1 m Maximum: 4 m	For rapid target acquisition
Stream		Large	Minimum: 1 m Maximum: 5 m	For targeting specific individuals with decreased risk of contaminating others
Foam		Very Large	Minimum: 1 m Maximum: 3 m	For use in facilities where aerosolized RCA would enter ventilation system

c. ***Safety & Storage***. Inspect RCA sprayers regularly for cracks, rust, or other damage that might cause the agent to leak out. Do not use an RCA sprayer that does not have a functioning safety catch; test the sprayer outdoors by pointing the nozzle in a safe direction, away from any individuals or any surface that other individuals might touch. With the safety catch enabled, try to manipulate the trigger. If you are able to use the sprayer while the safety catch is applied, discard the sprayer.

I) **Safety**. Threats contaminated with RCA can spread the RCA to other individuals they touch, including you. Do not employ RCA on threats closer than 1 m, under which conditions the RCA can effect you as well. In enclosed spaces, or for individuals with certain respiratory conditions, high concentrations of RCA can be fatal. Never use alcohol-based RCA around flames, sparks, or live electrical equipment. Be mindful that different commercial manufacturers can make their RCA with differing levels of potency; do not assume that just because one brand has been shown to be successful, all others will be.

II) **Storage**. Always store RCA sprayers according to the manufacturer's instructions. As best as you are able, do not store RCA sprayers where they will be exposed to temperatures below 0°C or in excess of 50°C. Inspect the nozzle daily the ensure it is clear of debris.

d. ***RCA Effects***. RCA exposure is extremely painful, and can cause enough disruption to override a threat's desire to harm you. It causes intense irritation of the skin, especially around the mouth, nose, and eyes, which will water and burn; it also cause coughing fits, a runny nose, and difficulty breathing. The totality of the experience is of blindly choking, which is intensely distressing. It is for this reason that you are recommended to experience RCA exposure during training, so as to not employ it carelessly. The combination of burning, difficulty breathing, and obscured vision is usually sufficient to neutralize a vulnerable threat, but RCA is not effective against individuals equipped with the appropriate countermeasures, like gas masks or protective eyewear.

e. ***Selecting an RCA***. RCA from reputable manufacturers will likely behave very similarly, so it is not necessary to compare formulations. Get the largest size that you believe you can carry comfortably, and whatever RCA you choose, make sure you know how to use it; most manufacturers

offer inert test versions of their RCA sprayers so you can familiarize yourself with their operation. Finally, you should allow yourself to be exposed to the RCA you are carrying so you can better understand how it will disrupt a threat. If you are able to “power through” your own RCA, it is likely a threat can as well, and you should select a more powerful formulation. Be responsible when exposing yourself with RCA; controlled exposure is possible by contaminating a rag with RCA and then rubbing some of the RCA on the cheekbones.

4-7. **RCA CARRIES, PRESENTATON, GRIP, & STANCES**. Due to their size and shape, RCA sprayers are easy to carry and deploy, although practice is necessary to develop the necessary muscle memory.

a. ***Carry***. The size of your RCA canister will determine, to a large extent, the method of carry you will use. Larger RCA sprayers must be carried in belt-mounted pouches, while smaller sprayers can be carried in trouser pockets. If an RCA sprayer is your primary weapon, its size will preclude deep concealment carry. Ensure that the sprayer cannot be snatched off of your waistline if you choose to employ action- or support-side carry.

I) **Action-Side Carry**. In **action-side carry**, you will carry the RCA on your action-side hip, either clipped to your belt or in a pouch. Deploying the RCA from this position will be faster than any other carry technique, but you must take care to ensure the placement of the RCA canister does not interfere with drawing your pistol or fighting knife, should you carry one.

II) **Support-Side Carry**. In **support-side carry**, you will carry the RCA clipped to your belt on your support-side hip. Deploying RCA from this position is not as fast as from the action side, but this position is a convenient way to make room on your action side for a pistol.

III) **Deep Concealment**. In **deep concealment**, you will carry the RCA in a trouser pocket on either your action side or support side. This method of carry is the least conspicuous, making it useful for situations where you do not want to advertise your possession of a weapon, but deploying the RCA from deep concealment will take longer than any other carry method. Although some RCA sprayers are meant to be carried on a key ring, fumbling with keys takes far too much time for this carry method to be practical.

b. ***Presentation***. Deploying an RCA sprayer is a task composed of several processes that must be executed as one action. You must **gain control** of the sprayer, **defeat the retention** keeping the sprayer secure, **draw** the sprayer, and **orient** the nozzle. Under most circumstances, you will use your action hand to deploy RCA, even when it is on your support side, but as always, do not allow a rigid adherence to technique prevent you from making the improvisations necessary to succeed in exigent circumstances. Specifically, do not reach across your body with your action hand when you are close to a threat; the threat can pin your arm, interfering with your ability to deploy a weapon.

I) **Deploy RCA from Strong Side**. To deploy an RCA sprayer from strong-side carry, gain control of the sprayer with your action hand. Using that hand, defeat the retention and draw the sprayer. Orient the sprayer and assume the proper stance.

II) **Deploy RCA from Support Side**. To deploy an RCA sprayer from support-side carry, gain control of the sprayer with your support hand (do not attempt to reach across your body with your action hand, as this leaves you vulnerable to being pinned). Defeat the retention, draw the sprayer, and orient the sprayer while assuming the proper stance.

III) **Deploy RCA from Deep Concealment**. To deploy an RCA sprayer from deep concealment on the action side or support side, use the same techniques for deploying RCA from either action- or support-side carry.

c. ***Grip***. As with all weapons, the best grip for a canister of RCA is one that allows you to keep possession of the weapon and employ it effectively with the minimum amount of effort. Differences in hand size and shape make prescribing a single grip style impossible, but for most individuals, the best grip will be a variant of the hammer grip, with the fingers wrapped around the canister and the thumb on the safety catch (see Fig. 4-14).

d. ***Stance***. The proper stance for RCA employment is similar to the basic fighting stance. Keep your action-side foot forward, with the RCA pushed out no further than 10 cm in front of you, maintaining a slight bend in your elbow. Keep your support hand either palm down over your strong wrist, or else held back away from nozzle to be free to Post or Frame (see Fig. 4-14). Do not allow your support hand to cross in front of the nozzle.

Figure 4-14. RCA Grip & Stance.

4-8. **RCA EMPLOYMENT**. RCA is the weapon of choice for neutralizing threats quickly and without lethal force. As with all weapons, it is most effective when used in conjunction with the element of surprise. Well-trained or well-equipped threats will likely have personal protective equipment that will shield them from the worst effects of RCA, which means it is most useful when deployed before such equipment can be donned.

a. ***RCA Targets***. The main RCA targets are the threat's eyes, nose, and mouth. The eyes are the main target, even if the threat is wearing goggles, as the RCA will obscure their vision and some of the RCA might make it past the protection. Spray a sufficient quantity at the threat to ensure saturation of the exposed tissues.

b. ***RCA Employment Techniques***. There are three primary employment techniques for RCA: **vertical dispersal**, **horizontal dispersal**, and **spiral dispersal**. Each technique is ideal for a different spray pattern. All have the threat's eyes as their primary target. Spray your RCA in half-second to one-second bursts.

I) **Vertical Dispersal**. The vertical dispersal technique is best-suited for RCA sprayers with a fog-pattern nozzle. To employ this technique, spray the RCA in an up-and-down sweep over the threat's eyes.

II) **Horizontal Dispersal**. The horizontal dispersal technique is best-suited for RCA sprayers with a stream-pattern nozzle. To employ this technique, spray the RCA in a side-to-side pattern over the target's eyes.

III) **Spiral Dispersal**. The spiral dispersal technique is best-suited for RCA sprayers with a foam-pattern nozzle or if you do not know what pattern your RCA sprayer uses. To employ this technique, spray the RCA in a tight circle over the target's eyes.

c. ***RCA Employment Considerations***. RCA will contaminate whoever it comes into contact with. Do not attempt to grapple with a threat contaminated with RCA; to the best of your ability, do not utilize RCA in confined spaces or close quarters. RCA is affected by wind in the same way that smoke and fog are; see Chapter 1, and do not employ RCA in any conditions where it would not be practical to employ smoke. Do not employ RCA around children, the elderly, or any individuals with respiratory or cardiovascular problems.

d. ***Defense Against RCA***. The best defense against RCA is adequate **personal protective equipment** (**PPE**), like goggles and respirators; see “CBRN Agents” in Chapter 5. If you are exposed to RCA, do not panic. The combination of blindness, pain, and choking can contribute to feelings of fear, but remember that the effects are temporary. Get upwind from the source of the RCA as fast as you are safely able to do so, and decontaminate yourself when you are safe.

I) **Treatment for RCA Exposure**. The main method of treatment for RCA contamination is to flush the affected area with large amounts of clean water or saline. Do *not* use milk, vinegar, hydrogen peroxide, lidocaine, citrus juice, onions, baby shampoo, or any homemade mixtures of oils, alcohols, or antacids. These remedies do *not* provide measurable relief, and in some cases can exacerbate the irritating effects of RCA. Avoid contaminating other parts of the casualty's body during the flushing; if the RCA is in the casualty's eyes, have them tilt their head forward to stop contaminated runoff from affecting the nose or mouth. If the RCA is a granular solid, try to brush off as much as you can.

i) Before treating a casualty who has been exposed to RCA contamination, make sure you are wearing gloves, and never touch your bare skin, especially the skin around your eyes, with your hands while wearing gloves. If RCA is present at the scene, you may need to evacuate the casualty before administering treatment (see Chapter 5).

ii) Direct the casualty to remove any clothing that has been contaminated with RCA (if the casualty is unresponsive, remove the casualty's clothing for them). Be mindful of the risk of hypothermia; a casualty's core temperature can drop dangerously, even during mild weather, if their skin is wet.

iii) If the casualty is wearing contact lenses, direct them to remove them prior to decontamination. If the casualty is unresponsive, remove them yourself. Do not allow the casualty to put the contacts back in their eyes after decontamination until they have been thoroughly flushed with clean water. Do not allow the casualty to rub the site of the injury, which will spread the RCA to their hands or other body parts.

iv) If the RCA is in the casualty's eyes, manually hold each eye open with your thumb and forefinger while you flush their eyes with water. Always remember to communicate what you are doing to the casualty at all times in order keep them calm.

Section IV. BATONS & IMPACT WEAPONS.

4-9. **BATONS & IMPACT WEAPONS**. Above RCA on the force continuum are impact weapons like nightsticks, clubs, and sticks (hereafter collectively referred to as **batons**). Batons can be used to employ varying degrees of lethal and nonlethal force, although their lethal damage is usually limited to mechanical. This gives them a greater degree of versatility than RCA; with training, a baton can be used to employ various non-lethal "pain compliance" holds for use in crowd control. Such techniques are outside the scope of this chapter, which will focus exclusively on the baton as a striking weapon. During CIDA, a baton is an effective alternative to RCA as a nonlethal option, provided its wielder is sufficiently trained.

a. ***Types of Impact Weapons***. For the purposes of this chapter, impact weapons can be sorted into three categories: **one-handed** batons, **tactical** batons, and **two-handed** batons. Each has different methods and techniques for employment, and each is appropriate for different circumstances.

I) **One-Handed Batons**. A **one-handed baton** is a striking tool no more than approximately 20 centimeters long, meant to be employed with one hand. This category includes blackjacks or saps (leather pouches, some with a coiled spring in the grip, weighted with lead shot or discs), Kubotans or yawara sticks, or "tactical" pens or flashlights. One-handed batons can be used to add power to strikes or apply painful joint locks, but they lack the range of larger batons.

II) **Tactical Batons**. The **tactical baton** (also called **collapsible** or **expandable batons** or the "**ASP**," after a popular brand), is a low-profile impact weapon that, when stored in its collapsed configuration, is no larger than a small flashlight or RCA sprayer, but can extend to its full length, usually between 40 and 60 centimeters, with the flick of a wrist or a press of a button. These batons offer a good mix between range, power, control, and concealability. Any rigid object of similar size, like C- and D-cell flashlights or bicycle U-locks, can be employed using collapsible baton techniques.

III) **Two-Handed Batons**. A non-collapsible baton made from wood or synthetic materials lacks the portability and concealability of a collapsible or one-handed baton, but it can be employed with equal or greater potency. The ideal two-handed baton is no shorter than 65 cm and no longer than 100 centimeters, with a 3 centimeter diameter, but in practice, any sturdy stick or pipe can be pressed into service as a two-handed baton. In addition, baseball bats, umbrellas, pool cues, walking sticks, and tire irons can be employed as two-handed batons. Two-handed batons are slower than collapsible batons, but can be useful for keeping a threat at a distance.

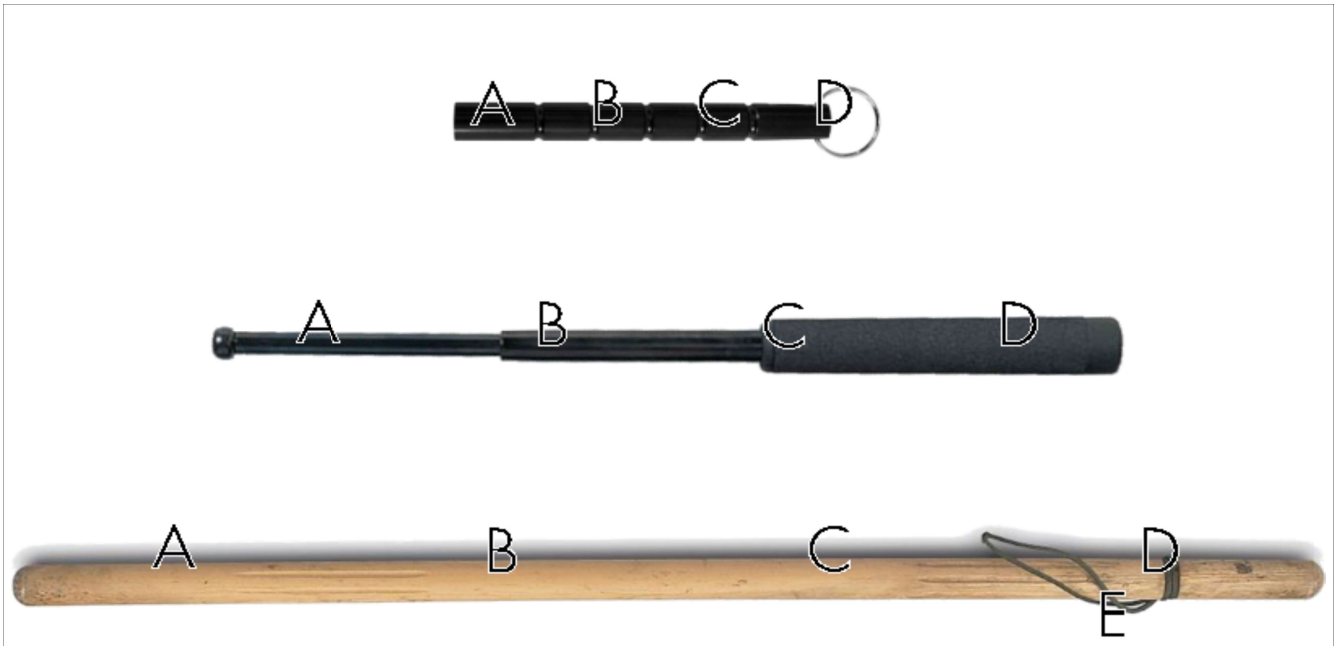
The long riot baton is a two-handed weapon. Armed with it, trained men will have no hesitancy in carrying out control tactics, engaging, if necessary, in physical contact with mob members; almost all of the thrusts, blows, and strokes learned in bayonet drill can be similarly executed. The long riot baton enables much greater flexibility and it can be tactically employed in many effective ways with a minimum possibility of serious casualties.

-Col. Rex Applegate[68]

b. ***Components of Impact Weapons***. All batons, regardless of their shape or design, share the same basic components: the **tip**, the **shaft**, the **grip**, and the **butt**. The terms are the same whether the baton is collapsible or not. The baton may or may not have a **thong** attached to the butt; the thong aids in weapon retention and can be used as a restraining tool (see Fig. 4-5) The grip of the baton should be either constructed of a non-slip material or modified in such a way to give a sweaty hand increased traction. Skateboard tape can be used to enhance the gripping surface.

68 *Riot Control – Materiel and Techniques* (1969). 230.

Table 4-5. Components of One-Handed Baton (T), Tactical Baton (C), & Two-Handed Baton (B)



I) **Tip**. The tip (see “A”) is the portion of the baton which is farthest from the hand when the baton is gripped normally.
II) **Shaft**. The shaft (see “B”) is the body of the baton.
III) **Handle**. The handle (see “C”) is the portion of the baton held in the hand when the baton is gripped normally.
IV) **Butt**. The butt (see “D”) is on the opposite end of the baton from the tip.
V) **Thong**. The thong (see “E”) is a loop that aids in retention (see Fig. 4-15). It is an aid to retention, not a replacement for it. The thong does not go around the wrist, but around the thumb. This is to prevent your hand from getting caught if the baton is taken from you.

c. ***Safety & Storage***. If your baton is made of metal, it should be kept dry to prevent rust. If you are using a collapsible baton, ensure the moving parts are well-lubricated (if recommended by the manufacturer) and free of any debris that could interfere with deploying the baton. If your baton has a thong loop, ensure it is free of dryrot or fraying.

d. ***Effects of Impact Weapon***. While batons can be employed to inflict disruption (through the use of pain compliance holds) and circuit damage (by targeting the head and spine), this chapter is only concerned with neutralizing a threat using the baton's ability to inflict mechanical damage on bones, joints, and muscles. For mechanical damage to be effective, it must target the structures of the body responsible for action and movement, which in this case are the legs and arms. If employed with sufficient force, a single well-placed baton strike can fracture the collarbone or kneecap, which will render that part of the body ineffective. Blows to the meat of the thigh and upper arms can be painful and might leave large bruises, but are unlikely to cause permanent injury; if the strikes are moved up the arm, to the collarbone, or down the leg, to the kneecap, a baton can break bones and cause incapacitating injury. Strikes to the hands and feet are riskier, because they can fracture the small bones of the fingers and toes. Blows to the abdomen or diaphragm can be incapacitating, but can cause internal damage. Blows to the head, neck, and lower back can be fatal, and should only be employed when lethal force is appropriate.

e. ***Selecting an Impact Weapon***. The most versatile tactical baton has an extended length of approximately 60 cm. When collapsed, these batons take up as much space as a one-handed baton, and can be employed from that configuration when quarters are tight; when extended, they can be used to deliver strikes, thrusts, and smashes. A one-handed baton can be an effective backup weapon, but its small size limits its usefulness. Two-handed batons are not as common as one-handed or collapsible batons, and are likely too large to be carried daily, but circumstances will, as always, dictate what is appropriate.

4-10. **BATON CARRIES, PRESENTATION, GRIPS, & STANCE**.

a. ***Baton Carries***. The way you carry your baton will depend on the design and configuration of the baton. One-handed and collapsed tactical batons can be carried in much the same way as RCA sprayers, while two-handed batons cannot generally be carried in deep concealment. Regardless of the preferred method of carry, ensure that the position of the baton does not interfere with any other equipment you might need to get in a hurry, and do not position the baton where a threat could disarm you easily.

b. ***Baton Presentation***. You will draw and deploy your baton similarly to the way you draw and deploy an RCA sprayer: you will first **gain control** of the baton, **defeat the retention** keeping the baton secure, **draw** the baton, and **orient** yourself in the proper stance. The only difference is with tactical batons, which require either a flick of the wrist or a press of a button to extend the baton to its full length. Do not attempt to deploy a baton from support-side carry with your action hand if you are within arm's reach of a threat, because reaching across your body leaves that arm vulnerable to being pinned. In these circumstances, deploy the baton with your support hand and either use it from there or transfer it to your action hand.

c. ***Baton Grips***. If your baton has a thong on the grip, loop your thumb through it, not your wrist. Keep your thumb in line with the baton, and redirect the thong over your knuckles. Using the thong this way maximizes your control of the baton. Do not loop the thong over your wrist. If you do this, you risk getting yourself tangled up if a threat tries to take your baton from you (see Fig. 4-15).

I) **One-Handed Batons**. Hold the one-handed baton in an ice-pick grip , keeping roughly equal portions of the baton on either side of the grip.

II) **Tactical Batons**. When extended, hold the baton in a hammer grip. In the collapsed configuration, there should be roughly equal portions of the baton on either side of the grip.

III) **Two-Handed Batons**. Hold the two-handed baton in an overhand grip, leaving approximately 10 cm of the tip on the outside of your support hand.

d. ***Baton Stance***. The baton stance is similar to the basic fighting stance: the feet are shoulder-width apart, there is a slight bend in the knees, and weight is distributed evenly on the front and back feet (see Fig. 4-17).

I) **Collapsed Baton Stance**. One-handed and collapsed tactical batons are employed differently from expanded tactical and two-handed batons, and this is reflected in the appropriate fighting stance. This position, **collapsed baton stance**, is identical to the basic fighting stance, except for the baton held in an ice-pick grip. Your support hand is kept in front of your chest.

II) **Vertical Baton Stance**. Once you have expanded a tactical baton, it can be carried in the **vertical baton stance**. In the vertical (or **one-handed**) baton stance, the baton is held in the action hand. The tip of the baton can be oriented either up or down. In tip-down vertical carry, hold the baton parallel to your same-side leg, with your arm straight. In tip-up vertical carry, plant your elbow against your hip and bring the tip of the baton up until it touches your tricep. The support hand is kept close to the body to defend against strikes, jab, and grab the shaft of the baton, if necessary. From this position, you can quickly bring the baton into action for strikes, but with only one hand, it is harder to maintain control of the weapon if the threat

attempts to disarm you.

III) **Two-Handed Baton Stance**. The **two-handed baton stance** is the standard fighting position for employing a two-handed baton or a fully-extended tactical baton. From here, you can defend against horizontal and vertical strikes as well as deliver thrusts to a threat's face and abdomen. This position also offers the most control over the baton in the event a threat attempts to disarm you. In the two-handed baton stance, you will acquire a proper overhand grip, with your support hand approximately 10 cm from the tip. Keep your elbows tight against your body, with the tip of the baton pointed at the threat, the shaft angled up approximately 45° to the ground.

Figure 4-15. Initial Baton Grip (UL), Thumb Loop (UR), Final Grip (LL), Incorrect Grip (LR)

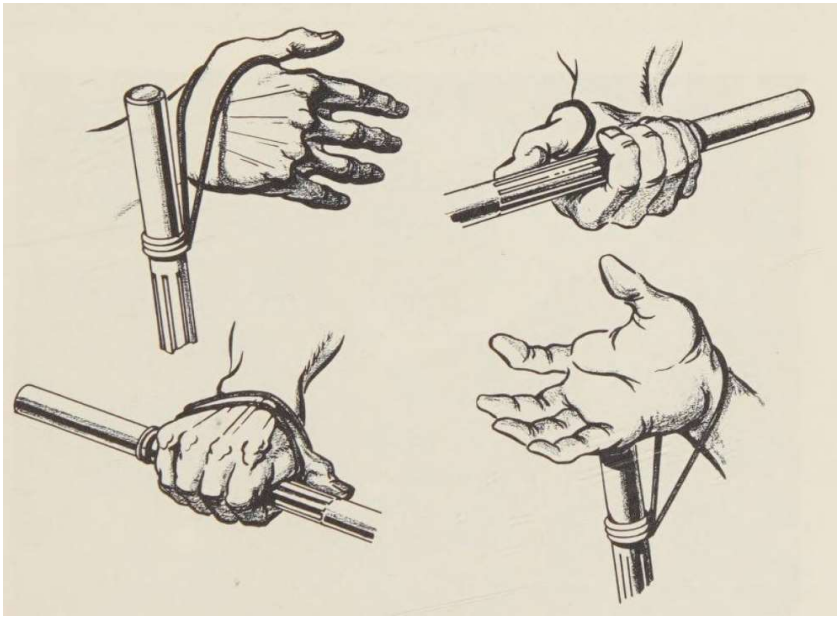


Figure 4-16. Deploy Baton from Action Side (L), Deploy Baton from Support Side (C), Deploy Baton from Deep Concealment (R)

Figure 4-17. Tip-Down Vertical Carry (L), Tip-Up Vertical Carry (C), Two-Handed Baton Carry (R)

4-11. **BATON EMPLOYMENT**. Under most circumstances, the baton is the ideal choice to fill the gap between temporary disruption and lethal force. With adequate training, a baton or improvised impact weapon is a potent tool for attack and defense, generally superior to a knife because of its greater reach, nonlethal utility, and increased versatility.

a. ***Baton Targets***. In an expert's hands, one- and two-handed batons can be used to put pressure on the joints, enabling the user to apply painful holds to neutralize a threat. These maneuvers are too advanced to be covered here. Instead, you will use the baton as a striking tool. The level of appropriate force dictates the appropriate targets. See Figure 4-18 for more information about baton target areas. If the threat is wearing body armor or padding, avoid those areas in favor of areas without protection.

b. ***Baton Employment Techniques***. Whether one- or two-handed, strike with the tip of the baton to concentrate the force of the impact. Keep the baton close to your body when not striking, and after striking, bring the baton back to the fighting stance; if you leave your arm extended before or after a strike, the threat can trap your arm and attempt to disarm you.

I) **One-Handed Baton Employment Techniques**. One-handed and collapsed tactical batons are employed primarily as an extension of the hand. They can be used to add weight to punches (“A” in Fig. 4-19), the tip can be used to stab or thrust (“B” in Fig. 4-19), and the butt can be used to deliver hammer blows (“C” in Fig. 4-19).

II) **Tactical Baton Employment Techniques**. When extended, a 40 to 60 cm baton is the ideal size to deliver one-handed strikes without getting within arm's reach of a threat.

i) *Overhand Baton Strike*. The **overhand baton strike** (see Fig. 4-21) is a powerful technique that can cause significant mechanical damage to a threat, especially when targeting vulnerable areas. To execute the overhand baton strike, start from a vertical carry with your action-side hand in the proper grip. The baton can either be oriented tip-up or tip-down; a baton in tip-up vertical carry can be used to target the threat's upper body, especially the collarbone or shoulders, while a baton in tip-down vertical carry can be used to target the threat's lower body, especially the knees and shins. To strike, simultaneously rotate your hips from your strong side to your support side while bending your elbow and snapping your wrist forward to whip the tip of the baton to the horizontal. Follow through with the strike after making contact by allowing the baton to go “through” the target, then either execute a reverse baton strike (following) or return to the fighting stance, based on your assessment of the threat.

ii) *Reverse Baton Strike*. The **reverse baton strike** (see Fig. 4-22) is used primarily as a follow-up strike to the overhand baton strike. It has less power than the overhand baton strike, but can be executed quickly to keep a threat off balance. To execute the reverse baton strike, start from the baton in an extend position, such as the follow-through after an overhand baton strike. To strike, simultaneously rotate your hips from from your support side to your strong side while bending your elbow to snap the tip of the baton to the horizontal. Follow through with the strike and return to a fighting stance.

III) **Two-Handed Baton Employment Techniques**. Do not try to use the two-handed baton with one hand. Not only will it be slower to bring the tip around, following-through with a two-handed baton can damage your wrist. Instead, use the two-handed baton from the rest position to deliver **thrusts**, **pushes**, and **smashes** to the threat. Depending on its size, you can use these techniques with collapsible batons as well.

i) *Thrust.* The **baton thrust** (see Fig. 4-20) is a useful technique for any level of force. A succession of quick jabs to the face, equally quickly withdrawn, can force a threat back; more forceful thrusts to the throat or abdomen can cause mechanical damage. To execute the baton thrust, start from a two-handed carry with your support-side foot forward. Hold the baton with your support hand, palm up, near the tip of the baton, and

your strong hand in the proper grip. To strike, simultaneously explode off your rear foot while driving both hands forward and return to the fighting stance. Do not attempt a one-handed thrust with a two-handed or fully-extended tactical baton. This kind of overextension will take you off balance and leave you vulnerable to counterattack or a disarm attempt.

ii) *Push*. The **two-handed baton push** is an effective way to create distance by forcing a threat backward. To execute the two-handed baton push, start from the rest position, bring the horizontal baton up to chest-level, and simultaneously step forward while firmly extending both arms. Follow through with the push to generate more space.

iii) *Smash*. Execute a two-handed baton smash similarly to the way you would execute a butt smash with your rifle (see Fig. 4-8): rotate your action-side hips forward and push with your action hand while jerking back with your support hand to drive the butt of the baton into the threat. To execute a two-handed baton smash with the tip, reverse the movements and use your support hand to drive the tip into the threat.

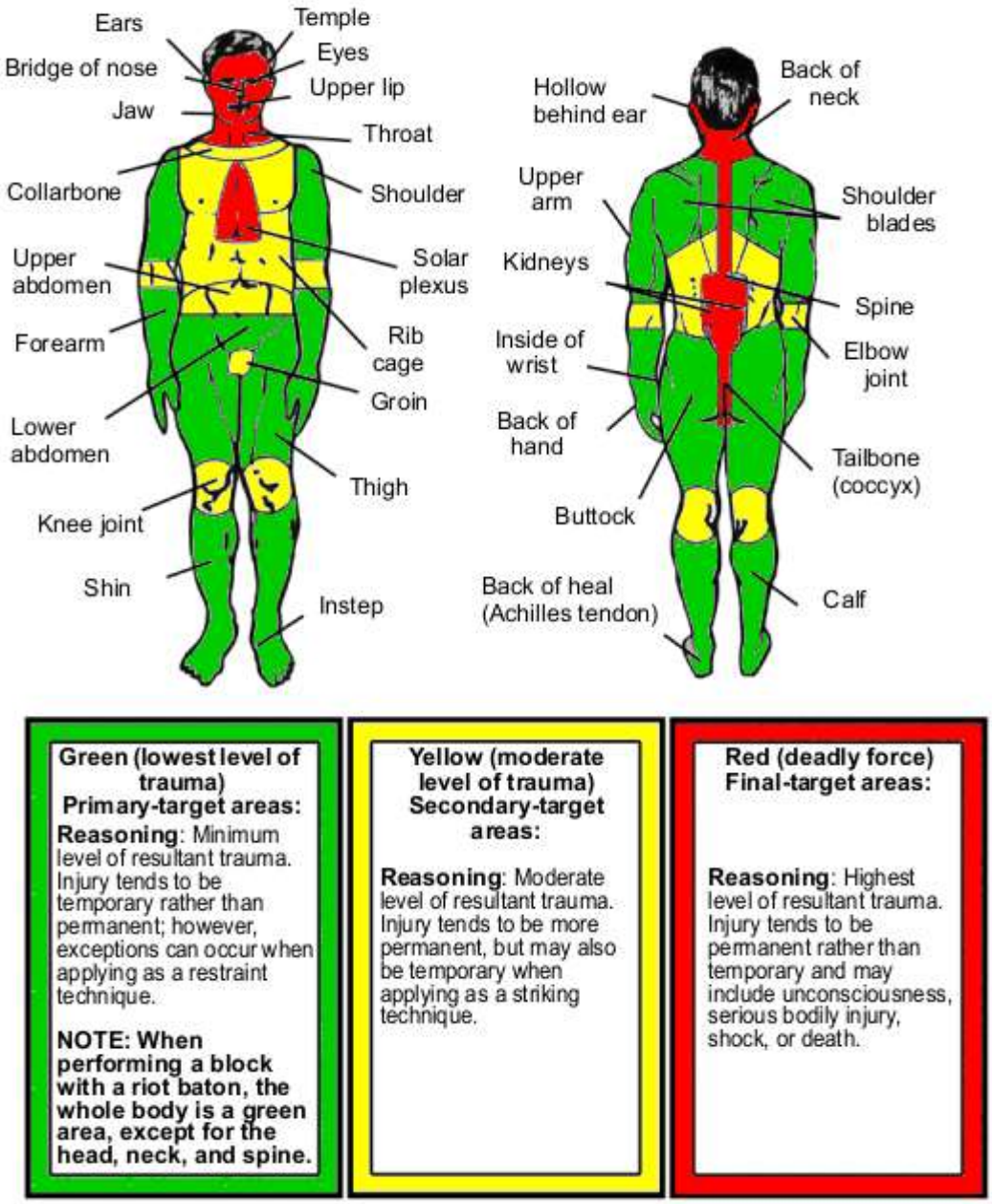
IV) **Baton Retention**. If the threat grabs your baton, do not immediately try to yank it away. Instead, maintain a two-handed grip on the baton, step into the threat with your support-side foot, and execute the **"C-trace" technique** (see Fig. 4-23.). To execute the "C-trace" technique, pull one end of the baton up and clockwise, as if you were tracing the letter "C" in the air from bottom to top. At the apex of the "C", sharply bring the top end of the baton straight down.

V) **Defense With the Baton**. The baton is a very effective defensive tool; when employed from a stable position, it can redirect a threat's movements and attacks and maintain enough space for you to protect yourself. The baton is best employed as a defensive tool from the two-handed carry. From here, the shaft can be kept horizontal to block over- and under-hand strikes to your head and groin, or vertical to block lateral strikes to your torso (see Fig. 4-24). When blocking, keep your elbows close to your body to better control the baton.

c. ***Baton Employment Considerations***. Much more so than RCA, you must be well-trained before attempting to employ a baton in combat. In the hands of an inexperienced user, a baton is almost always the wrong weapon. It is too easy to accidentally strike a lethal blow with a baton when only incapacitation is required; conversely, being overly timid with a baton when immediate action is necessary to neutralize a threat can just as easily lead to the loss of life. Furthermore, space is required to effectively employ a baton; in confined quarters or in a crowd of people, you will not have adequate room to swing. But given adequate space and a modicum of skill, a baton can be employed to neutralize a threat with relatively little effort and a minimum of risk.

d. ***Defense Against Batons***. If you are attacked by a threat wielding an impact weapon, you can negate much of the weapon's effectiveness by closing the distance and achieving the Hook, which will tie up the threat's arms and interfere with their ability to swing. From here, either create or maintain enough space to draw and employ a weapon or use elbow strikes to the head or knee strikes to the groin to subdue the threat. As always, proximity negates skill; it is better to keep your distance and engage the threat with longer ranged weapons than to grapple, except as a last resort. If the threat is unskilled, they might overextend themselves trying to strike with a baton; if they do, sidestep the attack and target their hand or arm with strikes to force them to drop the baton.

Figure 4-18. Impact Trauma Chart.[69]



69 ATP 3-39.33: *Crowd Control* (2022). 5-5.

Figure 4-19: One-Handed Baton Techniques

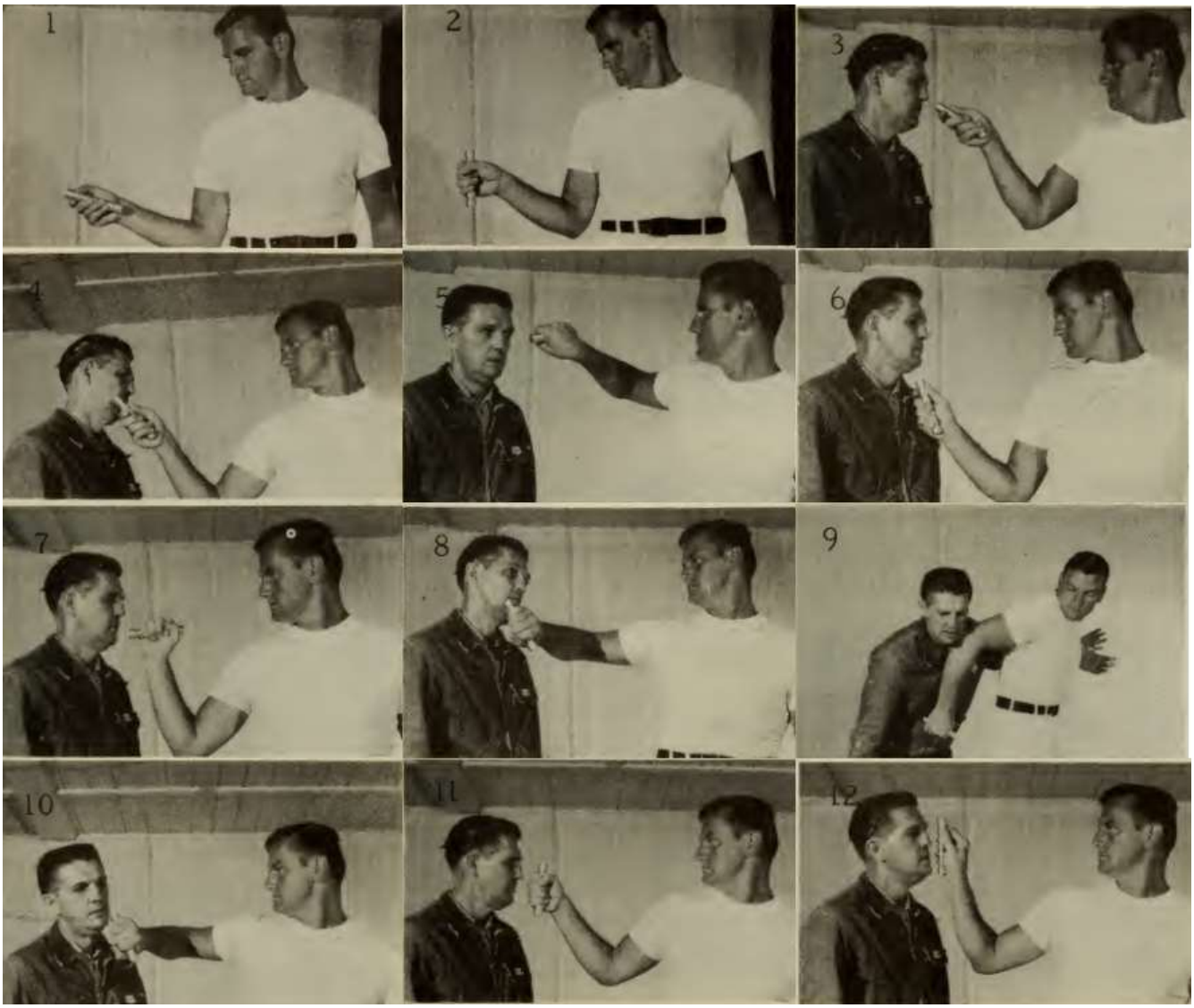


Figure 4-20. Baton Thrust.

Figure 4-21. Overhand Baton Strike.

Figure 4-22. Reverse Baton Strike.

Figure 4-23. “C-Trace” Technique.

Figure 4-24. Horizontal Block (L), Vertical Block (R)

Section V. KNIVES & EDGED WEAPONS.

4-12. **KNIVES & EDGED WEAPONS**. A knife is such a useful tool that it is likely you will have one on your person while you conduct community defense operations. That means that even if you do not have any other weapon, you will most likely at least have a knife, meaning you must learn how to use it in combat. Knives lack the nonlethal utility of batons, which somewhat limit their versatility; however, in proficient hands, a purpose-built double-edged fighting knife is an incredibly deadly weapon, not to mention silent. The pocket knives that are still carried by millions, even those living in the affluent Global North, can, have, and frequently are pressed into service as lethal weapons, but lack the performance of purpose-built fighting knives. This section offers basic instructions for using both double- and single-edged knives.

a. ***Types of Edged Weapons***. Almost every culture has developed at least one unique pattern of sword or dagger, which for our purposes can be categorized as **single-edged knives**, **double-edged knives**, and **choppers**. The techniques described in this chapter are oriented around the double-edged fighting knife, as made famous by the Fairbairn-Sykes and Fairbairn-Applegate models, but they can be applied equally well to single-edged fighting and utility knives.

I) **Single-Edged Knives**. By far the broadest category of knives, **single-edged knives** have, as their name suggests, one sharpened edge. Kitchen knives, utility knives and box cutters, and most pocket knives are single-edged knives. Single-edged knives are more useful tools than double-edged knives, as the unsharpened spine of the single-edged knife allows the user to exert precise control over the tip, but they are less effective as weapons.

II) **Double-Edged Knives**. Unlike single-edged knives, double-edged knives do not have an unsharpened spine opposite the sharpened edge; rather, they have two sharpened edges (hence the name). Double-edged knives are better suited than single-edged knives for combat because their second sharpened edge allows for effective slashes with minimal wrist and arm movement.

III) **Choppers**. Machetes, hatchets, and other heavy blades meant for cutting through dense materials like wood or foliage can be collectively termed **choppers**. More of a tool than a weapon, choppers can be pressed into service in combat, although their weight will make them slow. Most choppers are big enough that they can be employed as though they were batons (see Section IV).

b. ***Components of Edged Weapons***. Knives, especially folding knives with moving parts, can have a tremendous variety of components, but all share similar features (see Table 4-6). You will use the **point** to stab and thrust and the **blade** to slash. The **handle** should allow for an appropriate grip, and should be augmented, if necessary, with grip tape or other features to improve traction. The **guard** will protect your hand from slipping forward onto the blade. The **pommel** can be used to add force to hammer-fist blows or strikes.

c. ***Safety & Storage***. Keep the blade of your knife dry and free from any chemicals or substances that can lead to rust or corrosion. If you are going to store your knife for long periods, apply a thin layer of oil to the blade. If you are carrying a folding knife, ensure that all moving parts are lubricated.

A properly trained knife fighter with a double-edged knife should prevail in any close-quarter encounters against individuals armed with most weapons, other than firearms. In fact, at close quarters, given the element of surprise, the opponent armed with a handgun is still vulnerable to deadly attacks against a trained knife fighter.

-Rex Applegate, Col. (Ret.)[70]

70 *Combat Use of the Double-Edged Fighting Knife* (1993). 3.

Table 4-6. Components of Single-Edged Folding Knife (T), Single-Edged Fixed-Blade Knife (C), & Double-Edged Fighting Knife (B)

I) **Point**. The point (see “A”) is the portion of the knife which is farthest from the hand when the knife is gripped normally.
II) **Blade**. The blade (sometimes called the “belly,” see “B”) is the cutting edge of the knife.
III) **Spine**. The spine (see “C”) is the unsharpened portion of the knife opposite the blade. Double-edged knives do not have a spine, or have a smaller spine than single-edged knives.
IV) **Guard**. The guard (see “D”) is a feature on some knives that prevents the hand from slipping up off of the handle and onto the blade.
V) **Handle**. The handle (see “E”) is the portion of the knife held in the hand when the knife is gripped normally.
VI) **Pommel**. If present, the pommel (see “F”) is the opposite end of the knife from the point.

I) **Sharpening**. A fighting knife doesn't need a delicate edge that can produce paper-thin tomato slices; it needs a robust edge that will take the abuse that comes from cutting through thick fabrics, tough sinews, and bone. A 20° angle is desirable for a fighting knife, as it is small enough to be sufficiently sharp but not so small it will dull after a single use. To sharpen a knife, you will need a sharpening stone and a small quantity of oil or water (depending on the manufacturer's instructions). After wetting the stone, lay the blade flat against the stone, then rotate the knife 20° up (see Fig. 4-25). Push the knife, from guard to tip, across the stone, repeating this process an equal number of times for each side. After sharpening, “strop” the blade on a leather belt or strap by holding the knife at a 20° angle and pulling against the grain of the leather (see Fig. 4-26).

Figure 4-25. Sharpening a Knife[71]

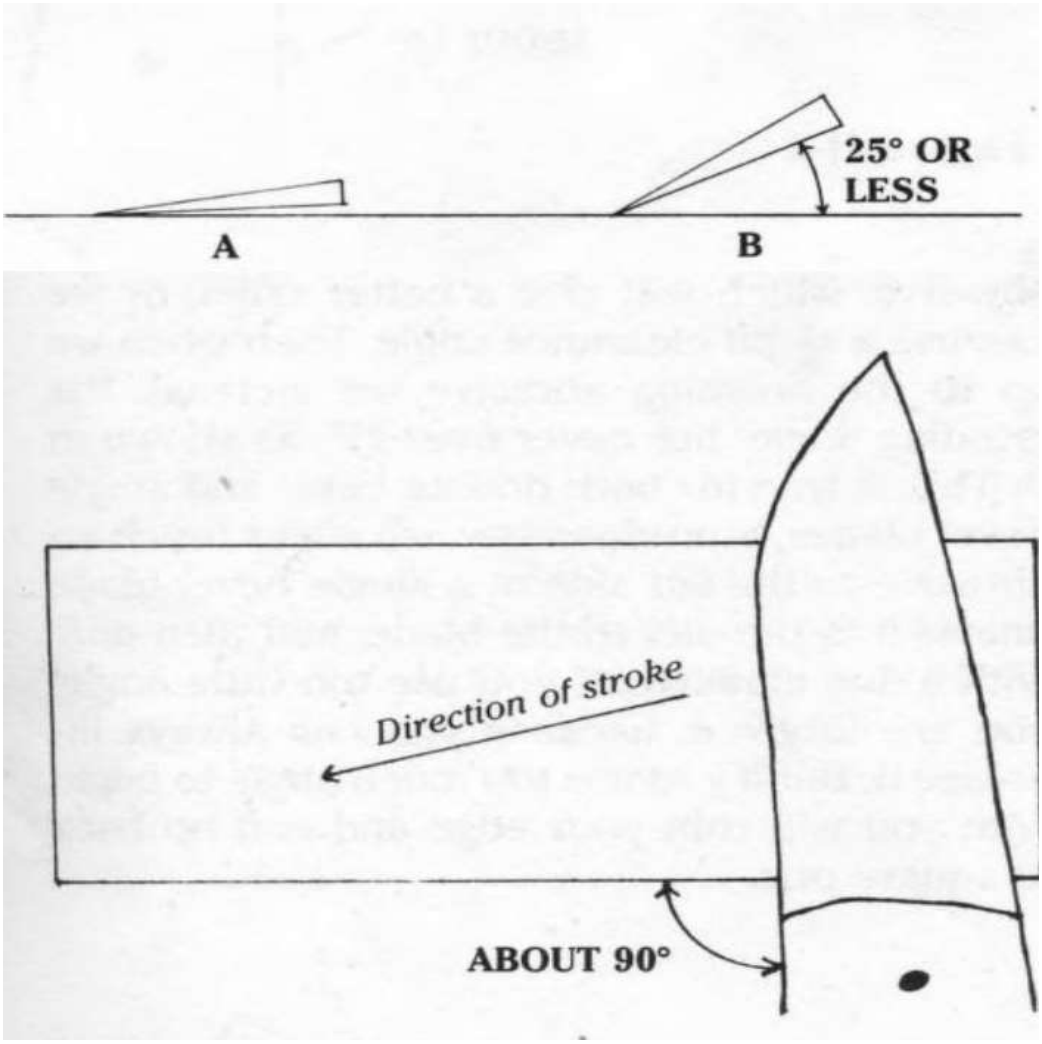
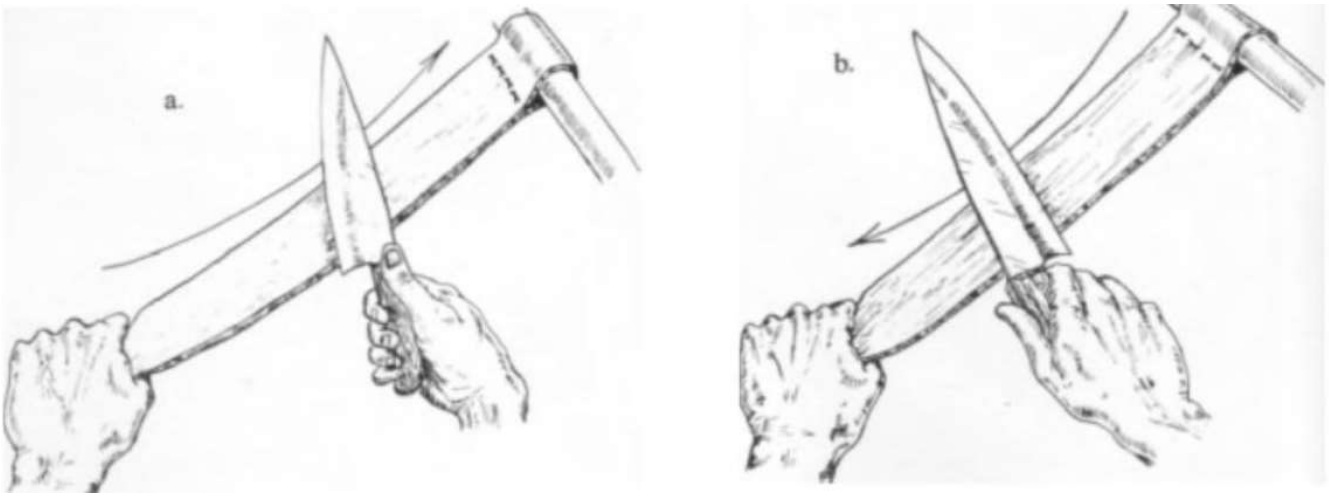


Figure 4-26: Stropping a Knife[72]



71 Juranitch, John. *The Razor Edge of Knife Sharpening*. 55-6.
72 Boye, David. *Step-by-Step Knifemaking* (1977). 197.

d. ***Effects of Edged Weapons***. Knives and other edged weapons can cause both mechanical and hydraulic damage. The former is inflicted by severing tendons and slicing muscles, preventing the limb from moving; the latter, by cutting open arteries and veins. The size of the blade and the size of the threat will determine, to a large degree, the amount of damage that a knife can cause. It is possible, even with limited training, to reliably inflict fatal amounts of hydraulic damage with a knife, with even relatively small cuts to critical arteries like those in the throat and groin being potentially lethal. However, hydraulic damage is not a predictable or reliable method of rapidly incapacitating a threat. Depending on the size and location of the wound and the threat's heart rate, it can take more than a minute to render a threat unconscious from blood loss, during which time the threat still has the capacity to hurt you or your neighbors. To predictably, reliably, and rapidly incapacitate a threat, a greater level of skill with a knife is required to inflict mechanical damage to the tendons and muscles of the hands, wrists, and arms, which can interfere with the threat's ability to strike or use a weapon.

e. ***Selecting an Edged Weapon***. Selecting a fighting knife is different than selecting a pocket knife or other everyday carry blade. A fighting knife is usually a fixed-blade knife with a longer cutting edge than a pocket knife; a well-designed fighting knife will have a hilt or handguard to protect the wrists and fingers when cutting, slashing, and stabbing. Unfortunately, purpose-built fighting knives and bayonets are heavier, more conspicuous, and usually far more expensive than folding pocket knives. If you carry a pocket knife, practice these techniques with it as well, not only the blade you think is most suitable to combat.

4-13. KNIFE CARRIES, PRESENTATION, GRIPS, & STANCE.

a. ***Carries***. Positioning your knife requires the same considerations as with a baton or RCA sprayer. The sheath of a fixed blade knife must not interfere with other pouches, or with your movement; as best as you are able, secure the sheath to your belt to prevent it from rattling. Experiment with different carry methods to find the one best suitable for you, and practice deploying the knife until you can do it flawlessly.

I) **Action-Side Carry**. If you are not carrying a handgun on your strong-side hip, you can position the sheath of your fighting knife there. This position allows the fastest deployment of the fighting knife.

II) **Support-Side Carry**. Carrying your fighting knife on your support side is the best choice if you are wearing a handgun on your hip.

III) **Deep Concealment**. Deep concealment is the only type of carry allowed by pocket knives; the intended carry position is right there in the name. Many folding knives, even defensive or combat-oriented blades, are designed to be carried in pockets, while others are meant to be carried on the ankles (“boot knives”) or tied to lanyards around the neck (“neck knives”). While it is possible to make even a robust knife virtually disappear in a trouser pocket, this method of carry will lead to the slowest deployment. However, given that the majority of knives are carried in this position, this is the position from which the majority of knives will be deployed.

b. ***Presentation***. Your method of carry will determine your method of deployment, with action- and support-side carry being faster than deep concealment.

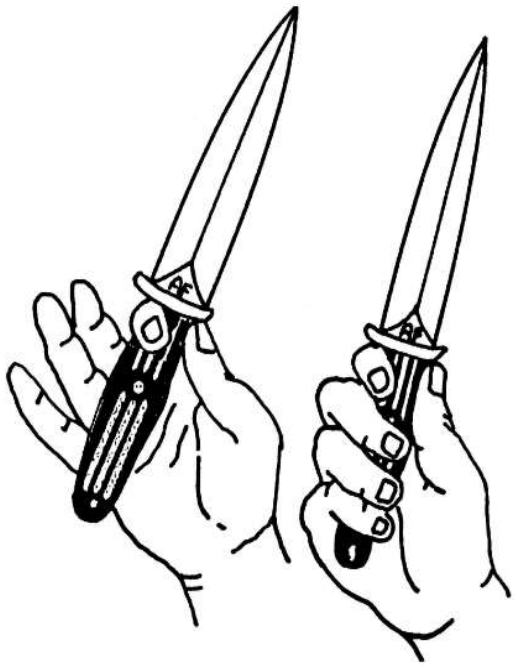
I) **Deploy a Fixed-Blade Knife from Action- or Support-Side Carry**. Presenting a fixed-blade fighting knife from strong-side or support-side carry is similar to presenting a baton: you will **gain control** of the knife by acquiring the proper grip; you will **defeat the retention** keeping the knife in the sheath; you will **draw** the knife out of the sheath, and you will **orient** the blade to the threat.

I) **Deploy a Folding Knife from Deep Concealment**. Presenting a folding knife from deep concealment is more difficult that deploying a fixed-blade fighting knife. You will require training to familiarize yourself with the appropriate movements necessary to **gain control** of the knife, **defeat the retention** keeping the knife in your pocket, **draw** the knife out of your pocket,

extend the blade, and finally **orient** the blade to the threat. These movements will be unique to your knife, your physiology, and your wardrobe, and extensive practice is necessary to develop the muscle-memory needed to rapidly deploy a folding knife from deep concealment. Remember that if you have to deploy your knife quickly, you will likely be doing so while in Condition Red, where adrenaline will be reducing your motor control. If your knife requires fine manipulations of safety catches or flippers, it is not suitable for deep concealment.

c. ***Grips***. The ideal grip for a double-edged fixed-blade fighting knife will have the body of the knife resting in your palm, bisecting the 90° angle created by your thumb and forefinger when you lay your hand flat. Grasp the handle with the thumb and forefinger as close to the guard as possible. The rest of the fingers will wrap around the handle, with no space between the fingers. If your blade does not feature sufficient surface area for the thumb to be stable, or if you have a single-edged knife, you should instead employ a hammer grip.

Figure 4-27. Knife Grips.



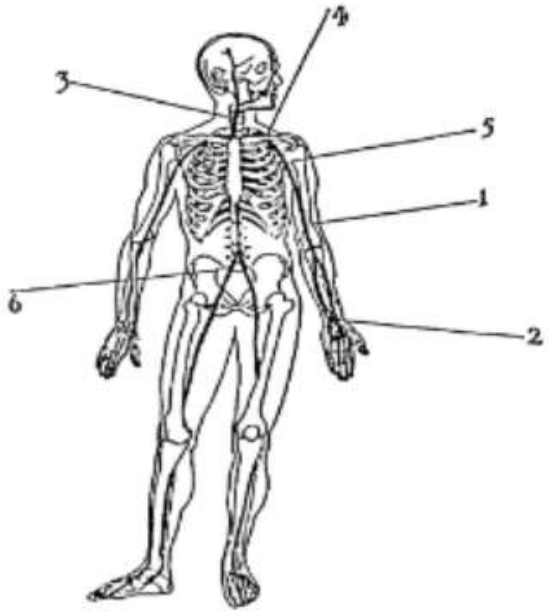
d. ***Stance.*** As with the baton and the RCA sprayer, the foundation of the knife fighting stance is the basic fighting stance. To acquire the proper knife fighting stance, keep your knees bent and your feet staggered and hold the knife in the proper grip between belt level and chest. The tip of the knife is oriented to the threat, and the action-side elbow is kept close to the body to prevent overextending your arm and leaving yourself vulnerable to counterattack. Your support hand will stay in front of your chest to perform feints and execute defensive techniques (see Fig. 4-28).

4-14. **KNIFE EMPLOYMENT**. The knife is lethal. Although the pommel of a fighting knife can be used as an impact weapon, using a knife the way it is intended will result in the death or permanent disfigurement of the threat. The lethality of a knife means that it will be your primary weapon in the event you do not have a firearm. Therefore, you must be familiar with the unique nature of employing a knife, as opposed to an impact or ranged weapon.

a. ***Knife Targets***. Figure 4-29 shows the location of the largest veins and arteries. It is vital that you know the capabilities of your knife, and that you do not to try and penetrate thick clothing with too short a blade.

Figure 4-28. Knife Fighting Stance.

Figure 4-29. Knife Targets



b. ***Knife Employment Techniques***. Defensive knife-fighting instructor Michael Janich writes that tactics for knife employment should be based on "natural, easily learned movements that take into account human instincts and the natural effects of life-threatening stress...this means that simple, straightforward tactics that rely on gross motor movements are your best bet."[73] For our purposes, we may divide those gross motor movements into two categories: **slashes** and **thrusts**. Before and after delivering a slash or a thrust, use your support hand to launch quick jabs to the threat's face and chest, which will keep them off-balance. If you are holding an object in your support hand, like a towel or a handful of sand, throw it at the threat to distract them before attacking.

I) **Slash**. You can employ fast slashes as feints, or to slice the threat's hands, wrists, arms, and legs, the eyes, and the arteries of the neck. To execute a slash, thrust forward and at an angle up (or down, as necessary), then draw your arm down (or up, as necessary) pulling the blade across the threat's body. Rotate your hips as you bring the knife across the threat, and follow through with the knife before returning to the basic knife-fighting stance. Slashes are also very effective when employed defensively; by trapping the threat's arm with your support hand, you can slash at their arm with your blade.

II) **Thrust**. Use thrusts to target the groin, stomach, chest, and neck. To execute a thrust, first push off with your rear leg and jab forcefully with your knife. After striking the threat, pull back and up (or down, as necessary) to cut the threat as you withdraw the blade and return to the basic knife-fighting stance.

c. ***Knife Employment Considerations***. Using a knife effectively means, by definition, being within arm's reach of a threat and exposed to their bodily fluids. You will recall from Chapter 1 that proximity negates skill. If you are close enough to use a knife against a threat, they are close enough to do the same to you. Get as close as you need to, but no closer, and stay close only long enough to deliver your attack. Furthermore, when it is practical to do so, you should always treat bodily fluids like blood as though they carry a transmissible disease, but do not delay your efforts to neutralize a threat just because you do not have appropriate medical barriers (see Chapter 5 for more information about **Body Substance Isolation**, or **BSI**).

d. ***Defense Against Knives***. The ease of concealing a folding knife means that you must always consider the possibility that any threat you encounter might be armed with a blade. The best defense against a knife is distance; attempting to disarm the threat will put you in range where they can employ the knife. To put it another way, if you get within range of a threat with a knife, *you will be cut*. If you cannot keep your distance, the next best course of action is to force the threat to drop the knife. Do not try to wrestle the threat for the blade. Instead, strike the hand holding the weapon with whatever weapon you have, including your hands. Wait for the threat to strike, and when their arm is extended, target their wrist and forearm with a hammer fist, elbow strike, or blow with a baton or improvised impact weapon.

73 *The Best Defense* (2013). 85-6.

Figure 4-30. Slash.

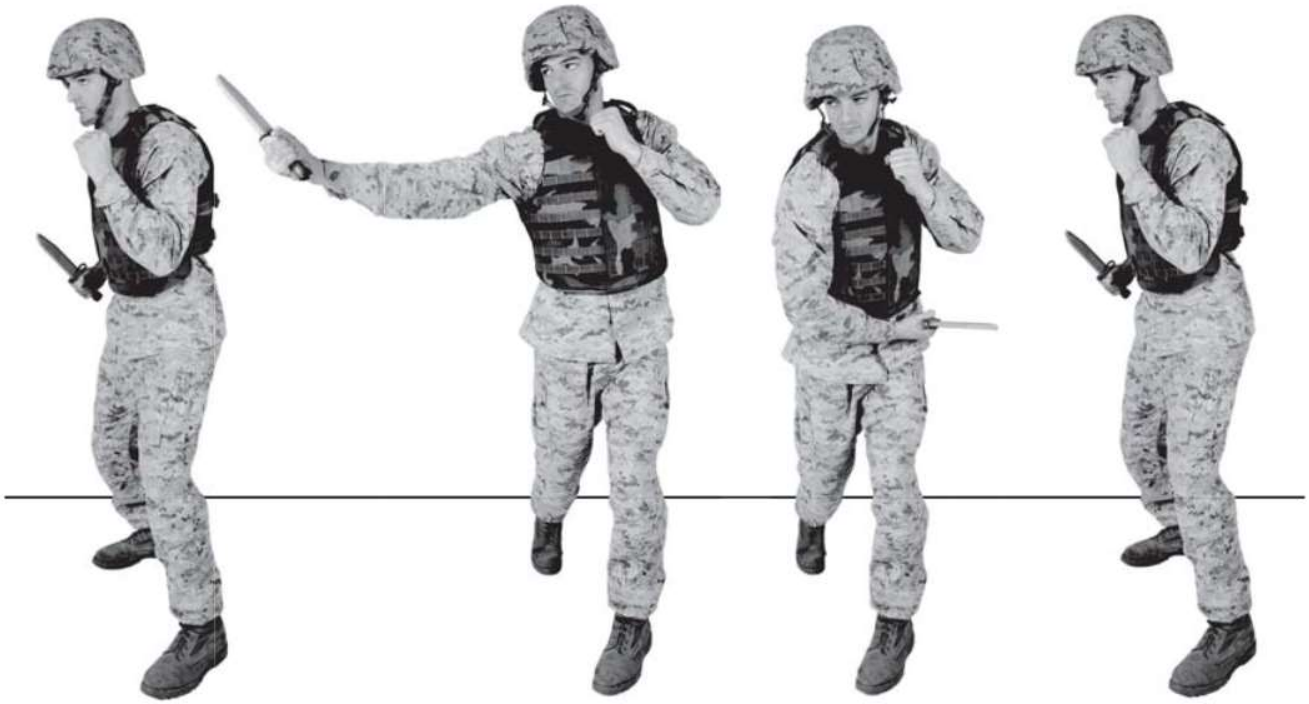
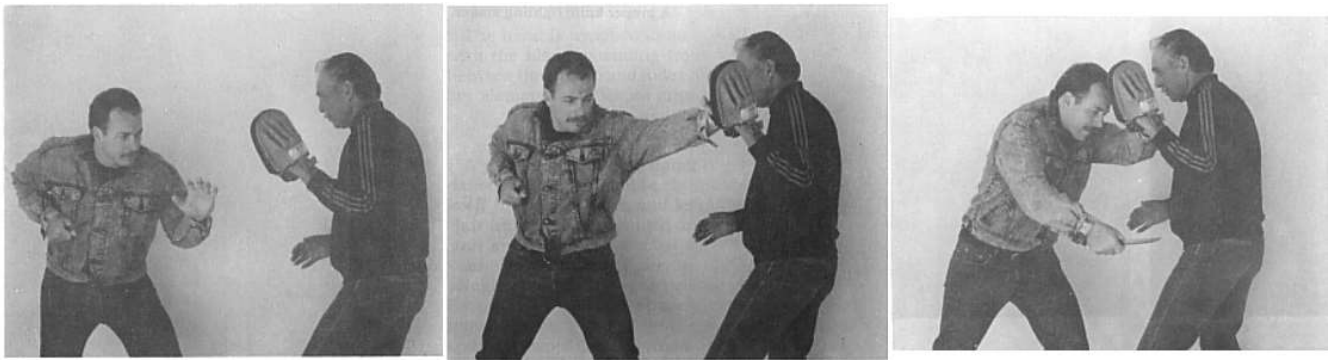


Figure 4-31. Support Hand Jab and Thrust.



Section VI. FIREARMS.

4-15. **FIREARMS**. **Firearms** are now and will remain the most critical tool for personal and community defense. Familiarity with firearms – how to aim them, fire them, and maintain them in good working order – is a mandatory component of self-reliance. This manual cannot provide information on every make, model, and configuration of firearm, so it will instead cover the basics. Information for how to load, unload, and clean your specific weapon, provided it is not ancient or unique, will be available from multiple sources, including the manufacturer.[74]

a. ***Types of Firearms***. A comprehensive accounting of every type of chemically-driven projectile weapon is not possible given the space of this section, so it will suffice to limit ourselves to three: **rifles**, **shotguns**, and **pistols**.

I) **Rifles**. A **rifle** is a firearm designed to be fired from the shoulder and with the support of both hands. Rifles get their name from the spiral grooves cut into their barrels; these grooves are called **rifling**. Rifling confers gyroscopic stabilization on the bullet by engaging with the outer surface of the bullet as it travels down the bore. A rifle allows you to engage threats with lethal force at long range, ideally from a position where they cannot see you or effectively return fire. Because of their effectiveness, your rifle will most likely be your primary weapon.

II) **Pistol**. A pistol, for our purposes, can be defined as a firearm with a rifled barrel designed to be fired with one hand. While the intricacies of American gun law have led to a proliferation of "rifle-caliber pistols" intended to be fired from one hand using a dubiously-legal "brace," these are outside the scope of this this section.

III) **Shotguns**. A shotgun differs from both rifles and pistols in that it is a **smoothbore** weapon – that is, there is no rifling in a shotgun barrel. Instead of using the rifling to add spin stabilization to a single projectile, shotguns fire clusters of small, round projectiles called **shot**, which spread out to cover a wide area after leaving the muzzle. Shotguns have something of a mythical reputation, thanks to films and video games, with novice shooters assuming that a shotgun will obliterate anything in the vague direction of the barrel. While it is true that shotshells designed for bird hunting ("**birdshot**") will spread a cloud of pellets over a relatively wide pattern, the type of ammunition ("**buckshot**") that is suitable for personal defense will not. Shotguns are versatile weapons for hunting and survival, and can be employed in CIDA for community defense, but have reduced capacities and slower rates of fire (with some exceptions) compared to rifles. Shotguns deserve more attention than they receive in this chapter; the author hopes one day to expound on this topic in more detail.

b. ***Components of Firearms***. Although rifles and pistols are available in a vast number of configurations and designs, there are four universal components present in every firearm. These are the **fire control group**, the **action** (what was once called the "lock"), the **stock**, and the **barrel** (see Table 4-7).

*In the final analysis, the only thing that the guns on our side contribute is the possibility of **slowing down a massacre**, since they introduce the potential for return-fire. However, bloodshed is just bloodshed, and there's nothing to celebrate in it ethically, or socially, on its own terms.*

-Adrian Whollben[75]

74 Most of this will be remedial to anyone who has played more than one session of *Doom*.
75 "Weapons and Ethics." *Ill Will Editions* (2020). Emphasis in original.

Table 4-7. Components of Firearms

I) **Fire Control Group**. The fire control group are the components used to initiate the sequence of events that results in the firearm shooting a projectile. These components are the **trigger**, the **firing pin**, and in most firearms, the **safety mechanism** and **magazine**. II) **Action**. The action is the part of the firearm that loads, chambers, extracts, and ejects a cartridge. There are different types of actions (like bolt-action, lever-action, or gas-operated), each of which performs those tasks differently, but the tasks themselves are functionally the same. III) **Stock**. The stock is the portion of the firearm held in the hand when the firearm is gripped normally (this is often referred to as the **frame** or the **butt** when referring to pistols). IV) **Barrel**. The barrel is a metal tube through which the bullet travels after it is separated from the cartridge case. The barrel consists of the **chamber**, the **bore**, and the **muzzle**. The **chamber** is the portion of the barrel closest to the shooter. It is a small cavity that is precisely sized for a specific cartridge. When a cartridge is loaded into a rifle, the cartridge rests in the chamber. The rear opening of the chamber is called the **breech**. The **bore** is the hollow body of the barrel down which the bullet travels. The **muzzle** is the opening in the barrel opposite the breech.

c. ***Safety and Storage***. More than any other weapon, firearms require the utmost care and responsibility. Handling firearms means adhering to the **Four Rules of Firearm Safety** and observing best practices for safe gun storage. Furthermore, firearms have more moving parts than RCA sprayers, batons, or knives, meaning they require additional attention to ensure they do not malfunction.

I) **The Four Rules of Firearm Safety**. Firearms are precision instruments designed to kill people. They are tools that must be treated with the proper respect at all times. There are four rules you must keep in mind when handling firearms (see Table 4-4). These rules are not optional, and if you fail to adhere to them you can kill or permanently disfigure someone you care about. Failing to adhere to these rules at all times puts your teammates and noncombatants at risk of death or permanent disfigurement. **THERE IS NEVER ANY EXCUSE FOR IRRESPONSIBILTY. THERE IS NO SUCH THING AS AN ACCIDENTAL DISCHARGE.** If you demonstrate carelessness or negligence during training or combat, you will be disarmed and forbidden from handling weapons until you can receive remedial training.

II) **Firearm Carry Conditions**. All weapons are carried and stored in different states of readiness. These states are called **carry conditions**. Each carry condition (or "**CC**") describes a specific method by which the you handle your weapon (see Table 4-5 for the list of carry conditions). Circumstances will dictate the carry condition you use, but CC2 and CC1 are the most common.

III) **Firearm Storage**. Unless you carry all of your firearms on your person any time you leave your residence, you will, at some point, have to leave them out of your sight. If there is any time when others will be at your residence while you are absent, or if you live with roommates, partners, or children, you *must* have some method of securing your firearms. The most common method of securing guns is with a combination of **gun locks** and **cases**.

i) *Basic Storage Considerations*. All firearms must be stored in CC3. If you share your residence with a partner or roommates, inform them about your gun or guns, and make sure they are familiar with the four rules of gun safety. If you have children, impress on them the importance of never touching your guns, and ensure that all safety precautions are employed at all times.

ii) *Locks*. There are two types of locks that attach to the guns themselves. **Trigger locks** fit into the trigger guard, and prevent manipulation of the trigger; **cable locks** snake through the barrel, preventing the firearm from going into battery. At the time of this writing, readers can request a free cable lock from Project Child Safe, a program of the National Shooting Sports Foundation. These locks are only as secure as their corresponding keys, but are more than adequate to deter the ignorant and curious.

iii) *Cases & Safes*. While locks form the foundation of gun security, your firearms are not secure until they are in a locked case. Do not assume that hiding the case in the top shelf of your closet will prevent children from finding it; children are better explorers than adults remember, and they have a lot of time on their hands.

a) Cases. Most handguns, purchased new, will include a plastic carrying case. These cases are suitable for transportation, but are not secure; upgrade to a locking case, or better yet, a gun safe, at the earliest opportunity.

b) Safes. A gun safe is the most secure option. Locking gun safes range from laptop-sized (for single handguns) to free-standing vaults capable of holding dozens of rifles. High-quality gun safes are expensive and heavy, but if you own or plan to own more than a couple of long guns, they are a priceless investment. Gun safes have different security mechanisms; some use keys, others are PIN-coded, and still more have thumbprint scanners. Get whatever you can afford that will offer you the greatest security.

Table 4-8. The Four Rules of Gun Safety

Rule #1	**ALWAYS TREAT EVERY WEAPON AS IF IT IS LOADED.** Any and every weapon MUST be treated as if it is loaded and prepared to fire. Whether or not a weapon is loaded should not affect how a you handle the weapon in ANY instance.
Rule #2	**NEVER POINT A WEAPON AT ANYTHING YOU DO NOT INTEND TO KILL.** When the gun is fired, whatever is in the path of the bullet is going to die. If you do not want to kill someone, do not point the gun at them. You MUST be aware of the orientation of your weapon's muzzle and what is in the path of the projectile if you fire the weapon. Shooters MUST ensure the path between the muzzle and target is clear of ANYTHING the shooter does not want to kill or maim. When this is unavoidable, the shooter MUST minimize the amount of time the muzzle is oriented toward people or objects they do not intend to kill.
Rule #3	**KEEP FINGER OFF TRIGGER UNTIL READY TO FIRE.** You MUST not place your finger into the trigger guard UNLESS and UNTIL you intend to kill your target. Whenever possible, you should move the weapon to mechanical safe when a target is not present. If the weapon does not have a traditional mechanical safe, your trigger finger acts as the primary safety. You MUST adhere to all safety rules regardless of whether the weapon has a mechanical safety.
Rule #4	**BE AWARE OF YOUR TARGET & WHAT IS BEHIND IT.** You are responsible for ALL bullets fired from your weapon. You are also responsible for what happens when the bullet reaches its final destination. Never shoot at anything you cannot positively identify. Bullets often penetrate their target; you MUST be aware of what is in the entire path of the bullet, not just the path to the target.

Table 4-9. Carry Conditions.

Carry Condition	*Description*
Carry Condition 3	In **Carry Condition 3** (**CC3**), also called "**administration condition**," the weapon is completely empty. The magazine is removed, the mechanical safety is ON, and the hammer. Your firearm should be stored in CC3.
Carry Condition 2	In **Carry Condition 2** (**CC2**), the weapon is ready to be loaded. The magazine is inserted, the mechanical safety is ON, the chamber is empty, and the hammer is down. Your firearm enters CC2 when you insert the magazine, but before you transition to CC1.
Carry Condition 1	In **Carry Condition 1** (**CC1**), the weapon is ready to fire. The magazine is inserted, a round is in the chamber, the mechanical safety is ON, and the hammer is cocked. Your firearm enters CC1 when you chamber a round from CC2.
Carry Condition 0	In **Carry Condition 0** (**CC0**), you are prepared to fire the weapon. The magazine is inserted, a round is in the chamber, the mechanical safety is OFF, the hammer (or bolt) is cocked (or forward), your finger is on the trigger, and the muzzle is pointed toward your target.

IV) **Firearm Maintenance**. When you buy a firearm, take the time to locate a manual that explains how to disassemble, clean, and reassemble your firearm. These will most likely be available for free online, but it is a good idea to find a physical copy that you can use a reference if and when you do not have access to the Internet. Buy a gun cleaning kit that includes, at the very least, some oil, some bore solvent, some patches, and some threaded rods; experiment with different formulations until you find the one that works best with your firearm.

d. ***Effects of Firearms***. The most effective way to use firearms to rapidly and reliably neutralize a threat is by inflicting sufficient circuit damage to cause immediate incapacitation. Failing that, firearms can be used to cause massive amounts of hydraulic damage, which can lead to shock, unconsciousness, and death, although the time it takes for that to happen will depend on the size and location of the wound. As bullets tumble through flesh, they shatter bone and sever tissue, which can lead to significant mechanical damage. In 1989, the Federal Bureau of Investigation published a memo in which they wrote the four components of a bullet wound were **penetration**, **fragmentation**, the **temporary wound cavity**, and the **permanent wound cavity**.

I) **Penetration**. Every bullet will have a different amount of **penetration**, that is, the distance the bullet will travel through the material it impacts. Penetration is the primary factor in determining a bullet's lethality. According to the FBI:

> *The bullet must penetrate sufficiently to pass through vital organs and be able to do so from less than optimal angles. For example, a shot from the side through an arm must penetrate at least 10-12 inches to pass through the heart. A bullet fired from the front through the abdomen must penetrate about 7 inches in a slender adult just to reach the major blood vessels in the back of the abdominal cavity. Penetration must be sufficiently deep to reach and pass through vital organs, and the permanent cavity must be large enough to maximize tissue destruction and consequent hemorrhaging...* ***Bullet selection should be determined based on penetration first, and the unexpanded diameter of the bullet second, as that is all the shooter can reliably expect. It is essential to bear in mind that the single most critical factor remains penetration****.*[76]

II) **Fragmentation**. When a bullet strikes a bone inside the body, it will either **ricochet** or **fragment.** Fragmentation can cause serious internal damage, but is less critical than penetration for determining effectiveness, especially in smaller-caliber firearms; the report found that “Fragmentation...does not reliably occur in handgun wounds due to the relatively low velocities of handgun bullets. **Fragmentation occurs reliably in high velocity projectile wounds (impact velocity in excess of 2000 feet per second) inflicted by soft or hollow point bullets**.”[77]

III) **Temporary Wound Cavity**. The temporary wound cavity ("The expansion of the permanent cavity by stretching due to the transfer of kinetic energy during the projectile’s passage"[78]) was likewise downplayed as "frequently, and grossly, overrated as a wounding factor when analyzing wounds." Our muscles and tissues are very elastic, and can withstand significant stretching and deformation without permanent damage.

76 Patrick, Urey. *Handgun Wounding and Effectiveness* (1989). Emphasis added.
77 Ibid. Emphasis added.
78 Ibid.

IV) **Permanent Wound Cavity**. The permanent wound cavity is the channel created by the bullet as it passes through soft tissue. A large permanent wound cavity is second in desirability only to penetration; unfortunately, gaining one usually means losing the other. The size of the bullet is the primary factor in the permanent wound channel, although smaller bullets can create large permanent wound cavities by **yawing**, **tumbling**, and **deforming**.

i) *Yaw*. A bullet is said to have **yaw** if the bullet shifts around its axis; that is to say, the rear of the bullet is no longer in alignment with the tip. Yaw increases the surface area of the bullet and therefore the size of the permanent cavity, but the increased surface area lowers the velocity of the projectile, decreasing the amount of penetration.

ii) *Tumbling*. **Tumbling** occurs when the bullet actually completes at least one rotation. Like yaw, tumbling increases the size of the permanent cavity at the expense of penetration.

iii) *Deformation*. **Deformation** refers to the process by which a bullet's shape changes as it passes through tissue. Hollow-point bullets are designed to be deformed in order to increase the size of the permanent cavity; as with yawing and tumbling, deformation robs the bullet of kinetic energy and therefore reduces penetration.

e. ***Selecting Firearms***. Purchasing firearms involves interacting with the administrative State in the form of background checks and registration. Certain individuals are legally barred from owning firearms; if you are not one of them, you are strongly encouraged to buy a gun now, so you can train with it before you need to use it. It would be naive and irresponsible to declare that there is a single make or model of firearm that is appropriate for all readers in all circumstances; not only do individual differences in physiology make finding a “one-gun-fits-all” solution impossible, different readers will have different priorities and limitations. A snub-nose revolver is woefully inadequate for engaging multiple targets at extended ranges, while trying to maintain a low profile with a fully-loaded semi-automatic rifle on your back is an exercise in futility. Finally, even modest competence with firearms requires a significant investment in both money and time, neither of which the global working class has in abundance. That said, there are ways to get some experience with firearms before investing the money in one yourself. If there are any shooting ranges near you, contact them and inquire about their rental policy; many shooting ranges offer guns for shooters to use, for a fee, for the duration of the range session. This is an inexpensive way to familiarize yourself with the methods of loading, unloading, aiming, and firing different guns. In the author's experience, most gun store employees are enthusiastic about assisting new shooters; ask if the range offers any courses of classes in gun safety or marksmanship. Take advantage of all instruction you can find.

l) **Selecting a Handgun**. Choosing a handgun is primarily a matter of choosing what to prioritize: concealability or capacity and controllability. As handguns get bigger, they tend to be easier to control, both because the extra weight of the gun absorbs more recoil and because the shooter is able to make contact with more of the weapon's surface area. In addition, larger guns can (but do not always) have larger magazines than smaller guns, meaning they are not only easier to shoot, but they can be fired more times before reloading. However, larger guns cannot be concealed as easily as smaller guns, and carrying heavy pistols all day can be exhausting. If the reader has no handguns, it is recommended that their first purchase be a small semi-automatic pistol chambered in 9mm, a proven, widely-available round with mild recoil and high damage potential. A small handgun can be carried concealed, which improves your ability to avoid scrutiny, and their light weight means it is less onerous to carry for hours at a time (which increases the odds that you will have it when you need it). Small pistols do not have to be concealed, of course; they can also be carried openly, which improves the speed of presentation; large handguns can only be carried openly, limiting their versatility.

II) **Selecting a Rifle**. Readers are likely nauseatingly familiar with the **AR-15**, the semi-automatic civilian version of the United States military's M4, thanks primarily to its use in the ghoulish massacres of schoolchildren. Despite its use by reactionaries, white supremacists, and violent misogynists, the AR-15 (from "Armalite Rifle, also referred to as a **modern sporting rifle**, or **MSR**), is the best choice for the majority of readers. The AR is popular enough that there is enormous aftermarket support, so you will never run out of spare parts or compatible ammunition. Volumes have been written on the care and maintenance of the AR, so it is easy to find answers to even to most challenging malfunctions. The modular nature of the AR means that it can be endlessly customized, meaning shooters of every shape, size, and level of skill can configure the ideal rifle for their specific purpose.

There is an ethics wrapped up in the selection of firearms, and the visibility this entails. For instance, when we think about the presence of guns on the side of protestors, we need to distinguish guns openly carried versus those concealed. […] *Unlike the folks carrying long-rifles and wearing bulletproof-vests, those who had pistols concealed in their belts are able to continue to also engage in more "social" forms of rebellion. By this, I mean those non-specialized forms of action accessible to anyone who simply shows up, such as graffiti, breaking windows on the courthouse, throwing rocks at police, setting dump trucks on fire, rioting and looting, etc...Having a gun is not treated like an identity or a "social function" that distinguishes them from everyone else.*

-Adrian Whollben[79]

4-16. **PISTOL CARRIES, PRESENTATION, GRIP, & STANCES**.

a. ***Carries***. Carrying a handgun is usually a compromise between concealability and accessibility. Carrying a handgun in a hip or thigh holster (see Fig. 4-32) means it will be clear for a fast draw, but it will also be more conspicuous. The opposite is true of a handgun carried inside the waistband (**IWB**); compact and subcompact automatics and snub-nose revolvers can virtually disappear in a well-made holster, but getting to them takes precious seconds. Your specific circumstances will dictate the type of holster you use. Under normal circumstances, keeping a lower profile might be more valuable than speed, while in CIDA, being able to deploy the weapon in a hurry might be a higher priority.

I) **Outside the Waistband (OWB) Carry**. The fastest and most conspicuous way to carry your pistol is **Outside the Waistband** (**OWB)**. Your OWB holster should be positioned such that you can perform basic tasks with both hands without the holster interfering with your actions. The holster must be positioned in such a way that it cannot be seized by a threat, and there must not be any obstacles, like garments, that can come between the pistol and the holster during deploying or re-holstering.

i) *OWB Holster Characteristics*. The ideal holster must provide adequate retention and comfort. The gun should not come loose during everyday activities or even sudden exertions, and the holster should not cause pain or blisters when worn. The holster should completely cover the trigger guard to prevent negligent discharges, but should allow a full grip on the butt while the pistol is holstered. Ensure that you wear a high-quality, sturdy belt with your holster; guns are heavy, and fragile belts might fail at an inopportune time.

II) **Inside the Waistband (IWB) Carry**. In **Inside the Waistband** (**IWB**) carry, the holster is situated between the shooter's body and the inside of their trousers (hence, inside the waistband). IWB carry draws less attention than OWB carry, but it takes longer to draw a firearm from an IWB holster because, under most circumstances, the butt of the gun is covered by a shirt, jacket, or coat, which has to be moved out of the way prior to the draw. This means that, all else being equal, drawing a weapon from an IWB holster will be slower than drawing a

79 "Weapons and Ethics."

weapon from an OWB holster. IWB holsters are appropriate for circumstances where a show of force is unnecessary or unwise.

i) *IWB Holster Characteristics*. The same qualities to look for in an OWB holster apply to IWB holsters. They must be well-made and secure enough to prevent your pistol from coming loose while completely covering the trigger guard and allowing for a complete grip prior to deployment. More so than OWB holsters, ensure your IWB holster does not chafe or irritate the skin when worn for long periods.

b. ***Presentation***. As with the knife, the baton, and the RCA sprayer, deploying a pistol is a matter of **gaining control** of the pistol, **defeating retention**, **drawing** the pistol, and **orienting** the muzzle to the target (see Fig. 4-33). If your pistol has a mechanical safety, you must train to the point where you can disengage the safety as you draw. Deploying a pistol from IWB is fundamentally the same, although the support hand usually has to move a piece of clothing out of the way. During presentation from an IWB holster, greater care must be exercised to ensure that nothing is snagged during the draw.

c. ***Grip***. The best grip is the one that allows you to most easily operate your handgun's firing controls (the trigger, the safety mechanism, and the magazine release). For the majority of pistols, this can be achieved with some variation of the following grip. Hold the butt firmly, but not tightly, as you would hold the hand of a child while crossing a busy street.

I) Wrap your action hand around the butt of the pistol so that the first joint of your index finger rests on the trigger. When you are not actively aiming, your index finger should be placed on the side of the gun, outside the trigger guard. Your thumb should be positioned such that you can easily operate the safety selector, if one is present. Your hand should be as high on the grip as possible, with no space between your middle finger and the trigger guard. (see Figs.4-34 and 4-35). Align the barrel of the pistol so that it bisects the 90° angle created by your thumb and forefinger when you spread your fingers to grab the butt.

II) Use your support hand to exert an equal and opposite force on the butt. The exact position of your support hand will depend on the size of your hands and the size of the pistol, but in general, always try to maximize the amount of the butt's surface area in contact with your palms.

d. ***Pistol Stance***. The pistol shooting stance is similar to the basic fighting stance. This is the basic stance you will use when employing the pistol from a standing position, but its principles can be adapted to all pistol shooting. To acquire the proper pistol shooting stance, hold the pistol in the proper grip, muzzle pointed down at a 45° angle. Maintain a slight bend in your knees and lean forward at your hips. Do not roll or hunch your shoulders (see Fig. 4-36).

4-17. **PISTOL EMPLOYMENT**. Effective employment of the pistol is a matter of achieving proper **aim** and **control** of the weapon. Proper aiming is a combination of of **sight alignment**, **sight picture**, and **focus**; control of the weapon is a matter of **trigger control** and **breath control**. With training, you will learn to combine these discrete processes into a single seamless action.

a. ***Pistol Targets***. The intended purpose of all firearms is to deliver lethal hydraulic or circuit damage. You will do different types and levels of damage depending on where you hit the threat. The lethal zone map (see Fig. 4-37) shows the primary target areas for lethal hydraulic and circuit damage, respectively. Remember that hydraulic damage is not rapid or reliable enough to be a dependable method for immediate incapacitation. Not included on the lethal zone map is the **pelvic girdle**. The pelvic girdle is not only a junction of several large blood vessels, but also includes the lower spine. Even if neither of those areas are hit, destroying the bones of the pelvis will immediately remove your adversary's ability to stand. In short: pelvis shots are a good bet, especially if your adversary is wearing body armor.

I) **Target Prioritization**. In the event you are engaging multiple threats, engage the most

dangerous threat – that is, the threat with the greatest combination of opportunity, intent, and capacity to harm you or your neighbors – first. If all threats appear to be equally dangerous, engage the closest threat first.

b. ***Pistol Employment Techniques***. After you have deployed your pistol and acquired the proper grip, apply the fundamentals of **aim** and **control**.

l) **Aim**. Proper aiming is a combination of of **sight alignment**, **sight picture**, and **focus**.

i) *Sight Alignment*. Sight alignment is the relationship between the **front sight**, the **rear sight**, and your **eye**. Proper shot alignment has the tip of the front sight post in the center of the rear aperture (see Fig. 4-38).

ii) *Sight Picture*. Sight picture is the relationship between the **front sight post** and the **target**. Proper sight alignment sees the tip of the front sight post in the center of the target. Effective aiming means maintaining both sight alignment and sight picture.

iii) *Focus.* Once you have achieved proper sight alignment and proper sight picture, bring the tip of the front sight post into focus. This will result in both the rear sight and the target to become blurry (see Fig. 4-38). You should focus on the front sight because your eye can only focus on one object at a time. Instead of focusing on the target, focusing on the front sight post gives you a solid aiming point, while your peripheral vision gives enough information to complete the aiming process. When acquiring proper sight alignment and proper sight picture, look at the target while bringing up the weapon's sights. When the sights are level with your eye, find the target through (or over) the rear sight, then bring the front sight post into focus.

Figure 4-32. Pistol Carries.

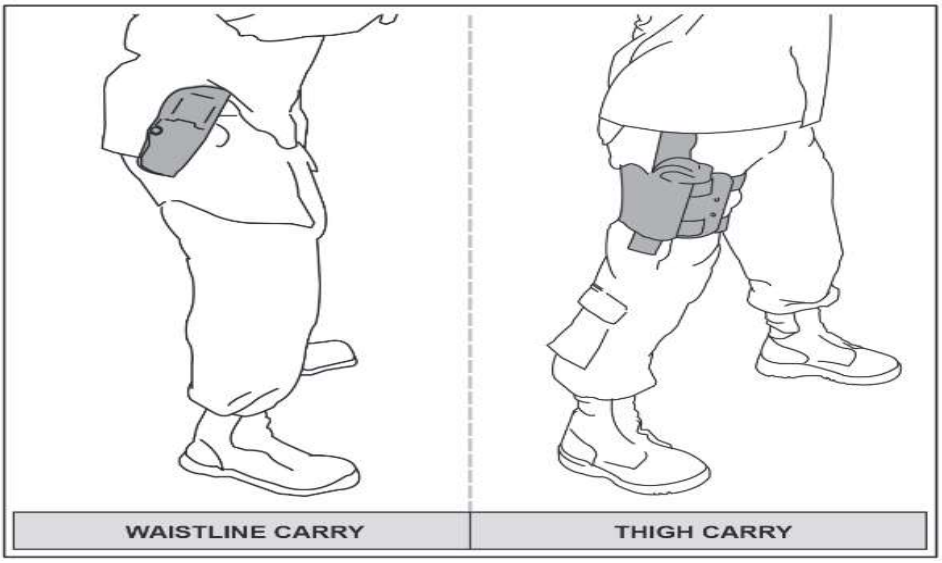


Figure 4-33. Deploying Pistol From Holster

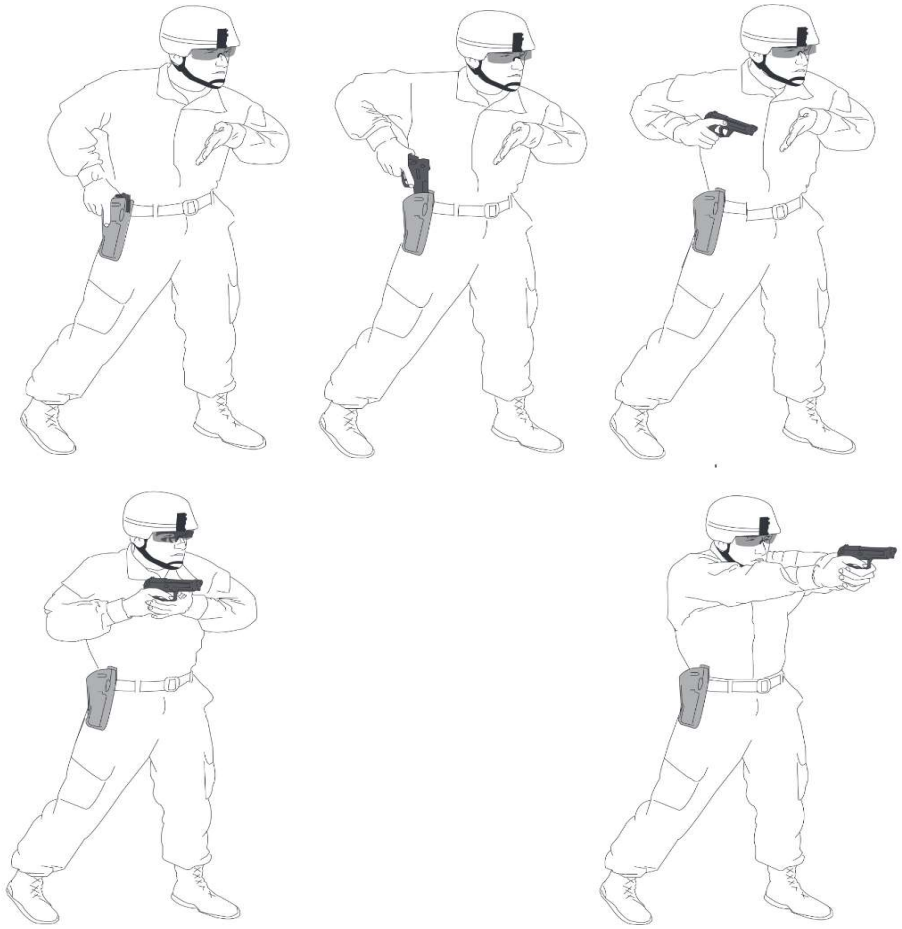
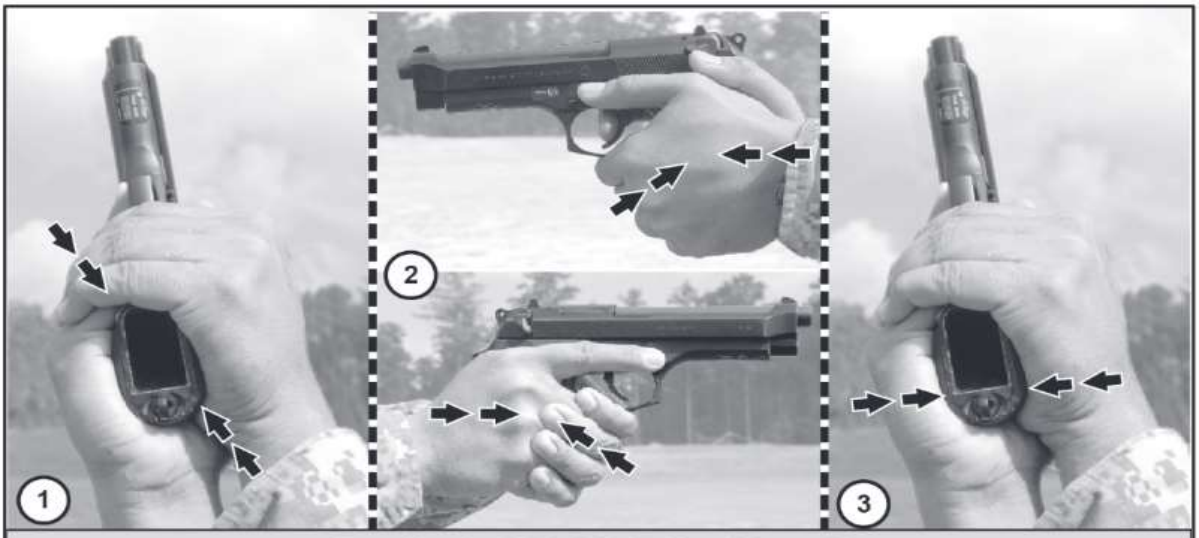


Figure 4-34. One-Handed Pistol Grip.

One-Handed Grip (Right-Hand Example)

Hold the pistol in your firing hand with enough force to keep it from falling. Maintain pressure from the pad of the fingers (the force) to the heel of the hand (the counterforce).

Figure 4-35 Two-Handed Pistol Grip



Two-Handed Grip (Right-Hand Example)

1. Position the nonfiring hand so that its pressure will run 45 degrees to the firing hand's grip. Position the heel against the pistol grip and the fingers over the firing hand. The fingers will provide the force to the heel's counterforce.

2. Extend the thumb and roll the wrist forward, putting downward pressure on the muzzle of the pistol (force). Use the heel of the hand to put pressure on the back strap of the grip (counterforce). This movement assists in recoil management.

3. Press the heels of both hands together as the arms are extended during presentation of the pistol. Each heel will exert force/counterforce against the other.

Figure 4-36. Standing Unsupported Pistol Shooting.

1 Support:	Unsupported.
2 Leg Position:	Standing firm, feet shoulder-width apart.
3 Stance/Center of Gravity:	Aggressive lean forward toward the target.
4 Firing Hand:	Grasping the pistol grip, finger off the trigger until ready to fire.
5 Nonfiring Hand:	Wrap the fingers around the fingers of the firing hand, thumb extended as far forward as possible to aid in recoil and transitioning.
6 Shooter-Gun Angle:	Shooter's body is approximately 90 degrees to the gun-target line.

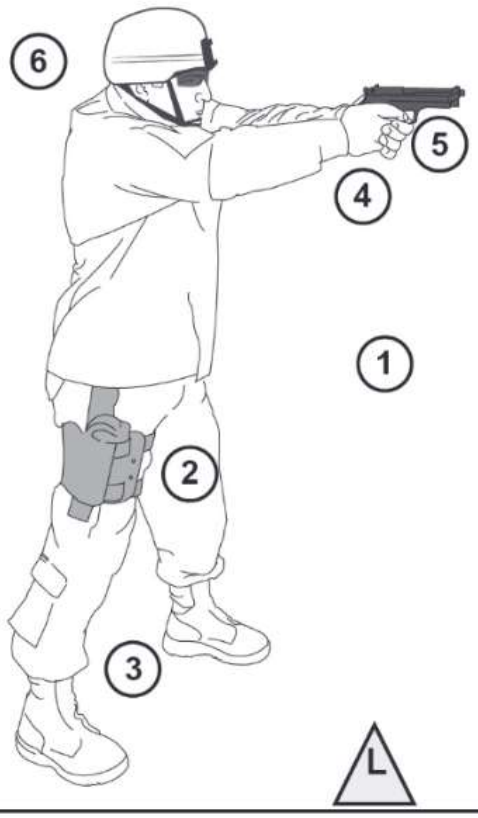


Figure 4-37. Lethal Zones.

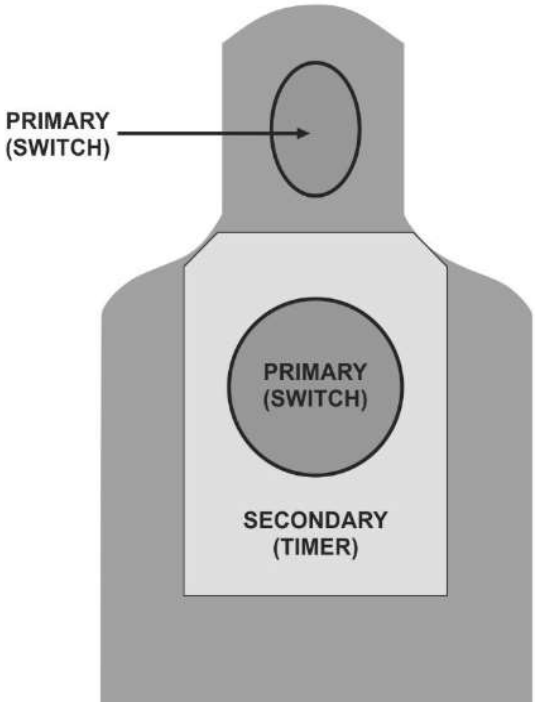
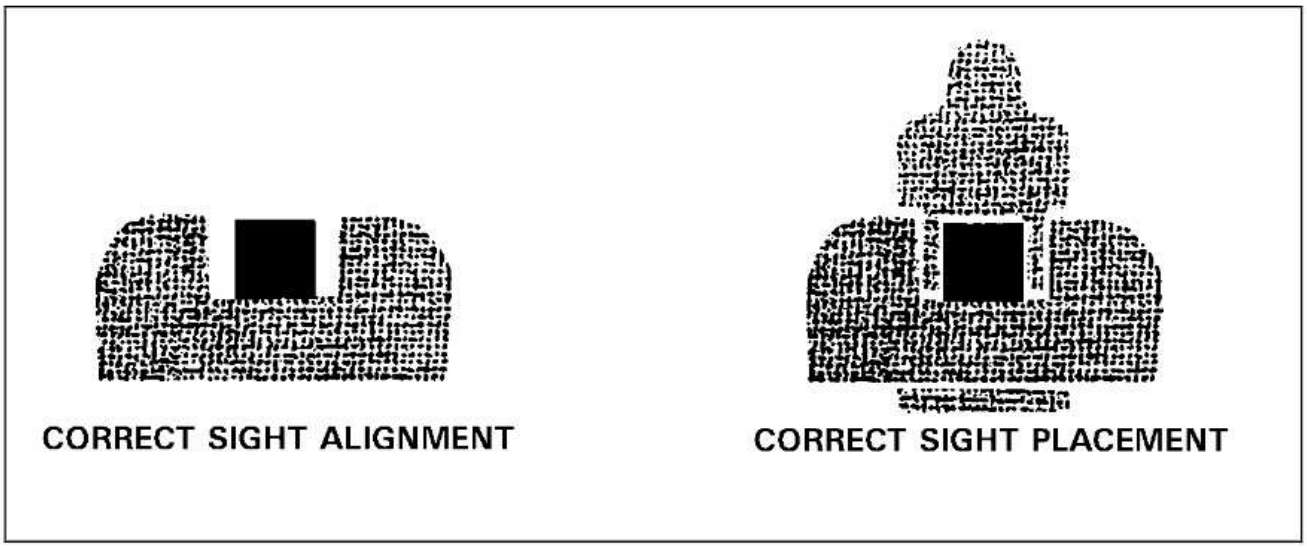
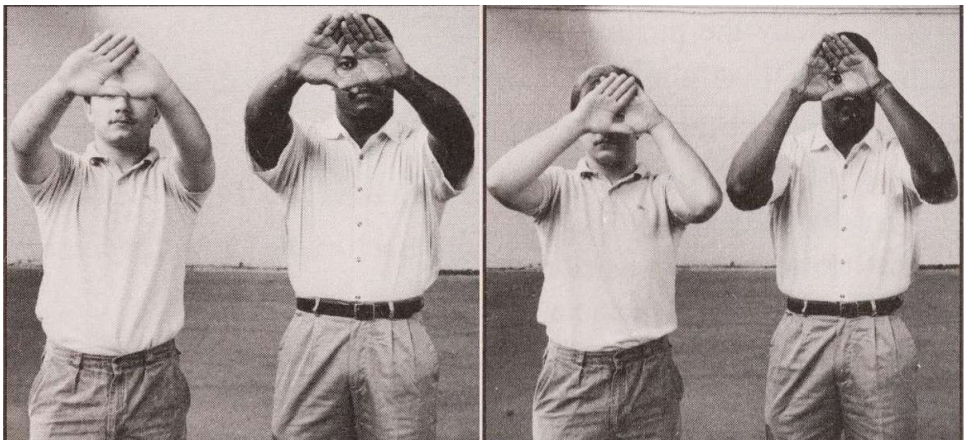


Figure 4-38. Sight Alignment (L) and Focus (R)



iv) *Eye Dominance*. When aiming, keep both eyes open, if possible. Keeping your non-dominant eye open improves your situational awareness, and your aiming eye will automatically track the scope's reticle. If you are cross-eye dominant, which means you are right-handed but left-eye dominant (or vice versa), it might be necessary to close the cross-dominant eye when aiming. To determine your dominant eye, make a triangle with both hands and look at a specific point about two meters away. Bring the triangle toward your face until your thumbs are almost touching your nose, then alternate closing your eyes. The eye that is not blocked by your hands is your dominant eye (see Fig. 4-39).

Figure 4-39. Determining Eye Dominance.



II) **Trigger Control**. A theoretical perfect trigger would behave like a glass rod, with no bend or flex until the moment sufficient pressure has been applied, at which point the rod breaks instantly. No trigger is that precise, but the idea is the same: do not "squeeze" trigger; press it with smooth and consistent force. The press should be smooth enough that it does not disturb the sight picture. Jerking the trigger or tensing in anticipation of the recoil will disrupt the lay of the weapon. Learning to manipulate the trigger correctly is a vital skill. If you are a novice, you should practice trigger manipulation while the pistol is in CC4. Practice pressing the trigger until you can do so without moving the rest of the gun.

i) *Flinching*. When pressing the trigger, do not attempt to predict when the gun will fire. If you are anticipating or expecting the recoil, muzzle flash, and report, you will tense up, causing the weapon to become unstable.[80] Do not anticipate the exact moment of the break, which will cause you to flinch. The increase in pressure is always smooth and constant, regardless of the time over which the pressure is applied.

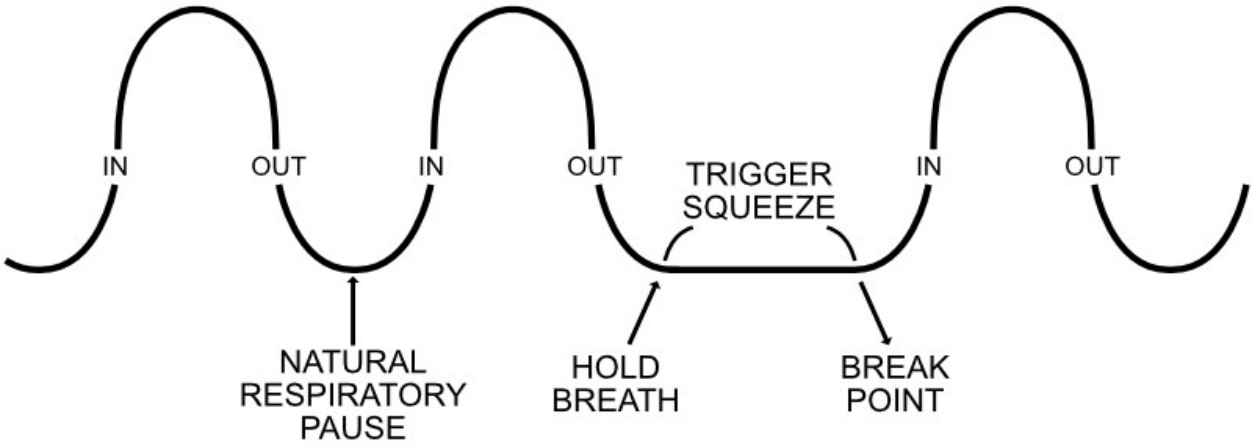
ii) *Controlled Pairs*. A **controlled pair** (also called a "**double tap**") refers to the process of firing a second follow-up shot immediately after the first. When firing a controlled pair, the first shot will cause the front sight post to rise; the second shot should be fired as soon as the front sight post is brought back onto the target. You should train with controlled pairs until they become instinctive.

III) **Breathing Control**. The process of respiration naturally causes the body to move. Therefore, awareness and control of your breathing is critical for maintaining stability. There are two primary breath control techniques: the natural pause and the short hold (see Fig. 4-40).

i) *Natural Pause*. When you breathe, there is a moment after you have exhaled but before you inhale. This moment is the natural pause. When you are zeroing the rifle or when firing at single or stationary targets, fire during the natural pause. It is important to breathe normally and to not extend the pause until you start to feel discomfort.

ii) *Short Hold*. If you are engaging multiple targets and you do not have time to use the natural pause technique, use the short hold technique. With this technique, you will inhale and hold your breath right before you pull the trigger. During engagements with multiple targets, take short, shallow breaths, and do not hold your breath long enough to cause discomfort.

Figure 4-40. Breath Cycle.



80 Of course, this does not mean that the *fact* the gun fires should be a surprise to you; proper adherence to the firearm safety rules means that you should treat every gun as if it is able to be fired.

c ***Pistol Employment Considerations***. In terms of capacity, power, and stability, the small handguns designed for concealed carry are eclipsed by all but the most rudimentary semi-automatic magazine-fed rifles. If you have a rifle, it should be your primary weapon. However, there are many circumstances, even in CIDA, where it is inappropriate to carry a rifle. A handgun is rarely the best choice for any hypothetical shootout, but it is very frequently the only choice.

4-18. **RIFLE CARRIES, PRESENTATION, GRIP, & STANCES**.

a. ***Rifle Carries***. The vast majority of the time you will carry your rifle, you will not be firing it. Adhering to the rules of safe gun handling demands that you keep the muzzle pointed in a safe direction at all times and fingers off of the trigger[81] until such a time as you are ready to fire. Under most circumstances, the easiest ways to carry your rifle while handling it safely are **high ready**, **low ready**, and **sling arms**.

I) **High Ready**. In the **high ready** position, hold the rifle with the muzzle angled upward and the butt tucked under the armpit (See Fig. 4-41). High ready is less fatigue-inducing than low ready, and is used when there is no immediate threat present, but you still to be able to engage targets faster than would be possible from sling arms.

II) **Low Ready**. In the **low ready** position,hold the butt of the rifle in the pocket of the shoulder with the barrel pointing downward at a 45º angle (see Fig. 4-41). Low ready is the fastest carry position from which to aim and fire, and is therefore used when hostile contact is likely or expected, but is more tiring over long periods than high ready.

III) **Sling Arms**. A sling is essential for maintaining control of your rifle. Without a quality sling, you will be forced to use one or both hands to carry your rifle. This is acceptable if you believe you will need to use your rifle quickly, but given that those circumstances will hopefully be rare, you must have a method of carrying your rifle that keeps both hands free for other work. Sling arms is used when hostile contact is not likely or when the shooter needs their hands free for extended periods of time. There are three primary methods of sling arms: **muzzle up** (also called “American Carry”), **muzzle down** (also called “African Carry”) and **cross-body** (either muzzle up or down, see Fig. 4-42). Personal preference and circumstances largely determine which method to use.

i) *Characteristics of a Rifle Sling*. A good sling should be sturdy. It should be adjustable so you can tighten it against your body when not needed to avoid snagging on brush or other objects in the environment, or loosen it when you need to transition out of sling arms carry. It should have minimal excess material, which adds bulk and noise, and care should be taken that the hardware that attaches the sling to the rifle is taped or wrapped to prevent rattling.

ii) *Shooting Slings*. It is possible to use specially-designed slings, especially the CW and Ching slings, as aids to steady and support your rifle. The use of these slings is outside the scope of this publication; see Jeff Cooper's *The Art of the Rifle* for complete instructions on this topic. Suffice it to say, the type of sling described in this section are not suitable for use as an aiming aid; Col. Cooper writes that, “In my youth several coaches encouraged the use of what was called the 'hasty sling.' It never did anything for me, and it is geometrically unsound...It may be useful for packing out your meat if you are successful, but it will do nothing for your shooting.”[82]

81 While I find the phrase “booger hooks off the bang switch” repulsive, I cannot deny its effectiveness at staying in one's memory.

82 *Art of the Rifle*. 73.

b. ***Rifle Presentation***. Depending on how you are carrying the rifle, you will either **present from ready** or **present from sling arms**.

I) **Present Rifle from Ready**. To transition from high ready to the offhand position, push the muzzle of the rifle forward, slide the butt into position against your shoulder, and aim. To transition to the offhand position from low ready, simply raise the muzzle of the rifle until your have acquired your sight picture.

II) **Present Rifle from Sling Arms**.

i) *Muzzle-Up Sling Arms*. To transition from muzzle-up sling arms to either of the ready positions, reach over your shoulder with your support hand and grab the rifle's forend. While holding the rifle with your support hand, slip you action-side shoulder out from under the sling and grab the rifle's grip with your action hand. At this point, the move the buttstock into the appropriate position for high or low ready.

ii) *Muzzle-Down Sling Arms*. To transition from muzzle-down sling arms to either of the ready positions,reach behind you and grab the rifle's forend with your support-side hand. From here, push the muzzle forward, keeping the barrel oriented in a safe direction. Grab the buttstock with your action hand and pull it into position against your shoulder or under your armpit, as appropriate. Finally, slide your action hand to the rifle's grip.

iii) *Cross-Body Sling Arms*. To transition to either ready position from cross-body sling arms, the shooter reaches across their body with their support-side hand and grabs the rifle's forward swing swivel. The shooter pulls the rifle around the body using their support-side hand, keeping the muzzle pointed in a safe direction at all times. When the grip clears the shooter's body, the shooter grabs it with their shooting-side hand, then positions the buttstock as appropriate.

III) **Stowing Rifle from Ready**. To transition into muzzle down sling arms from either ready position, release the rifle's grip and push the barrel down with your support hand. Use your action hand to place the sling over your support-side shoulder and hold the sling with your support hand.

IV) **Stowing Rifle from Sling Arms**. To transition into cross-body sling arms from muzzle-up sling arms, grab the grip with your action hand and the sling with your support hand. Bring the rifle up and bring the sling over your head. To transition into cross-body sling arms from muzzle-down sling arms, grab the sling with your action hand and the rifle's forend with your support hand. After bringing the rifle up, the slide the sling over your head.

Figure 4-41: High Ready (L), Low Ready (R)

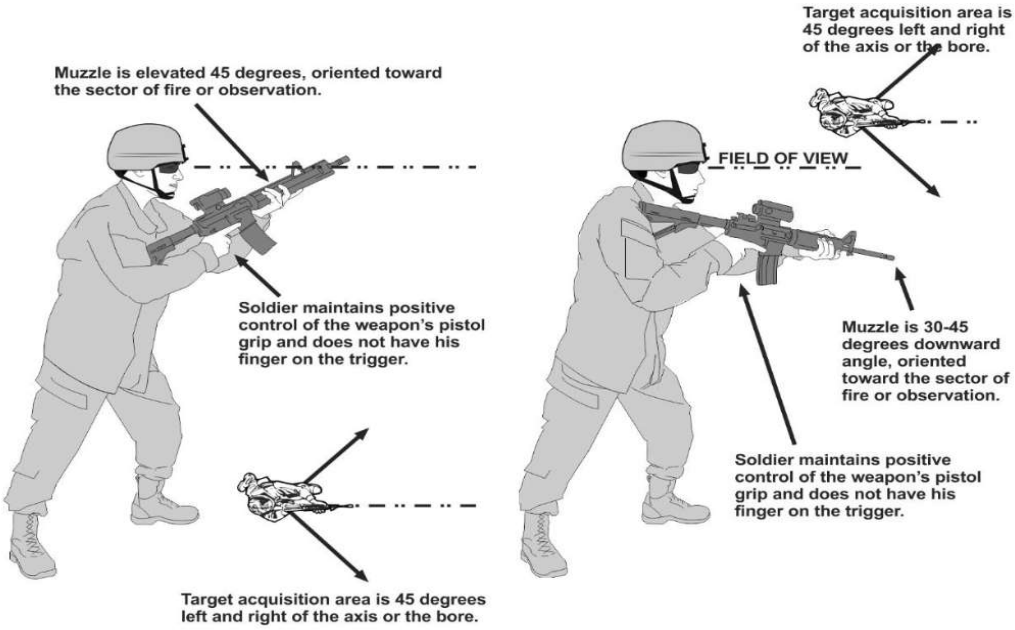


Figure 4-42: Cross-Body Carry.

4-19. **RIFLE EMPLOYMENT**. Anyone able to shoot a pistol under pressure should be able to shoot a rifle just as well, if not better; the principles are the same, but the design of the rifle means it can be used to engage threats from a few meters away to a few hundred. Like the pistol, proficiency with a rifle is built on proficiency with the basics.

a. ***Rifle Targets***. The same zones targeted when employing a pistol are targeted when employing a rifle. Remember that your rifle has more power than your pistol, so you might be able to penetrate barriers and armor that would defeat a pistol bullet.

b. ***Rifle Employment Techniques***. The same principles applied when employing a pistol are applied when employing a rifle, with the only difference being one of ergonomics. The larger size of the rifle means you can use external supports, like fenceposts, logs, or windows to stabilize your shot, but never rest the barrel of the rifle on a support; always rest the forend of the rifle on the support instead.

I) **Aim.** The fundamentals of sight alignment, sight picture, and focus are the same when shooting a rifle as they are when shooting a pistol. If your rifle is equipped with a red-dot optic instead of iron sights, you will focus on the target, not the illuminated dot.

II) **Trigger Control**. The fundamentals of trigger control and controlled pairs are the same when shooting a rifle as they are when shooting a pistol. The same dry-fire drills used to practice the trigger press with the pistol can be applied to the rifle.

III) **Breath Control**. The fundamentals of the natural pause and the short hold are the same when shooting a rifle as they are when shooting a pistol.

IV) **Rifle Shooting Positions**. When shooting a rifle, the butt should be pressed, not jammed, into the pocket of your shoulder where the arm meets the torso. When you bring the rifle up to your eyes, the point where the butt meets the pocket of the shoulder will serve as the pivot point, so ensure that the butt is stable and will not slip. A proper butt position is one in which either hand can be removed from the rifle without it moving while also allowing for a proper **cheek weld**. From here, you will apply the fundamentals of aim and control and take up a proper position (see Fig. 4-43). Rifles are heavier than pistols, and extended employment can cause muscle fatigue, which leads to inaccurate shots. Use external supports whenever available.

i) *Cheek Weld*. **Cheek weld** (or **stock weld**, see Fig. 4-44) refers to the proper position of the shooter's head relative to the position of the buttstock. Hold your head such that your dominant eye is directly in line with the iron sights, the fleshy part of your face lightly pressing against the top of the buttstock. Given that each shooter will have a different face structure, some experimentation may be necessary before the proper cheek weld can be determined.

ii) *Natural Point of Aim (NPA)*. After you have acquired your stance and steadied your rifle, relax your muscles. Observe how the gun moves, and note the position of the sights when the gun comes to rest. The sights are pointing to your **natural point of aim** (**NPA**) is the point where, absent any adjustments or modifications, your barrel will point. Shift your position as necessary so that your natural point of aim is as close to your desired point of impact; you should be able to relax your muscles without the point of aim shifting.

c. ***Rifle Employment Considerations***. The risk of overpenetration – that is, a bullet or bullet fragment traveling through the target to come out the other side with enough velocity to cause damage – is greater with rifles than with pistols, due to their more powerful ammunition. The fourth rule of gun safety (“Be aware of your target and what is behind it”) applies here, as it always does.

Figure 4-43. The Offhand Position.

1 Support:	Unsupported
2 Leg Position:	Standing, firm, feet shoulder-width apart.
3 Stance / Center of Gravity:	Aggressive lean forward toward the target.
4 Firing Elbow:	Tucked toward the shooter's side.
5 Non-Firing Elbow:	Slightly outward.
6 Firing Hand:	Grasping pistol grip, finger off the trigger until ready to fire.
7 Non-Firing Hand:	Extended as forward as possible, for aid in recoil and transitioning.
8 Butt Plate:	Highest point of shoulder to absorb recoil impulse.
9 Stock Weld:	Firm stock weld.
10 Shooter-Gun Angle:	Shooter body is approximately 45 degrees to the gun-target line.

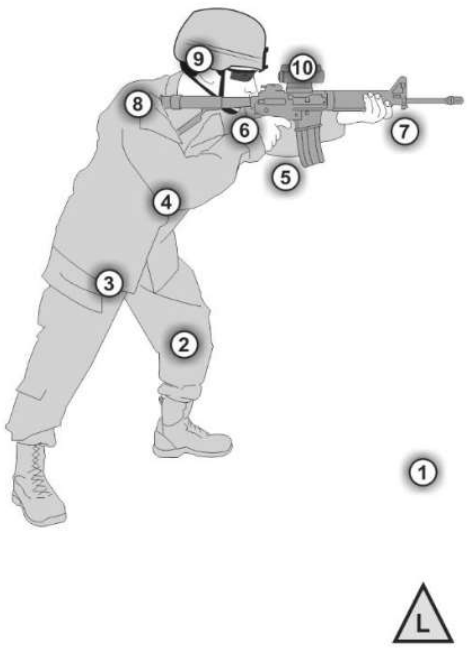
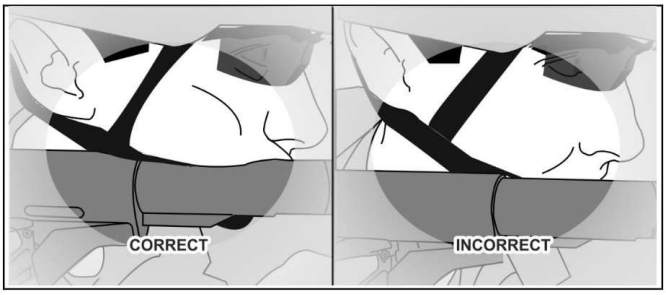


Figure 4-44. Cheek Weld.



Chapter 5
SURVIVE

"If the final outcome of the present world system is a general threat to life on planet earth, then it is crucial to resuscitate and nurture the impulse and determination to survive, inherent in all living things."

-Maria Mies & Vandana Shiva[83]

The human body is a staggeringly complex living machine capable of stunning feats of strength, endurance, flexibility, and creativity. At the same time, our existence is characterized by fragility. Being alive means being vulnerable to disease, poison, and injury, whether inflicted accidentally or maliciously. This chapter seeks to provide an overview of the most essential concepts in physiology and medicine, so you will know what to do in the event of a medical emergency. It further introduces some of the foundations of hygiene, sanitation, and wellness, all of which will be pressing concerns in CIDA.

Section I. BASIC LIFE SUPPORT.

In *Riot Medicine*, Håkan Geijer defines **basic life support** (**BLS**) as "the steps taken to ensure that patients who are not breathing or do not have a pulse continue to have their brain and other organs supplied with oxygenated blood until they can be treated by more advanced medical personnel. This includes unblocking a patient's airway, artificial ventilation, and cardiopulmonary resuscitation (CPR)."[84]

83 *Ecofeminism* (1993). 3.
84 (2020). 98.

5-1. **CHOKING, HEART ATTACK, & CARDIAC ARREST**. BLS is oriented around conditions that are amenable to treatment administered by untrained personnel in the field, namely **choking**, **heart attacks**, and **cardiac arrest**.

a. ***Choking***. Air from the environment enters the respiratory system through the mouth or nasal cavity, where it enters the trachea, also called the **airway** or windpipe. Air moves through the airway until it reaches the lungs, where it oxygenates blood. If a person's airway becomes obstructed by a piece of food, blood, or vomit, the person is **choking** or asphyxiating. Asphyxiation leads to **hypoxia**, a condition in which the body does not have sufficient oxygen. The times vary, but on average, brain damage occurs after being deprived of oxygen for three minutes, with irreversible brain damage occurring after six to ten minutes. If a person is asphyxiating, they need medical assistance immediately.

I) **Signs & Symptoms of Choking**. The universal symbol for “I'm choking” is to wrap both hands around your throat, but do not assume every person experiencing choking will know this. A person who is choking may look panicked or surprised. They may be attempting to speak or cough, but if the airway is completely blocked, they will not be able to make any sounds. Their skin may turn red, but will start to turn blue or pale from oxygen deficiency.

b. ***Heart Attack***. A myocardial infarction, also known as a **heart attack**, occurs when the blood flow to the heart is interrupted. Blood flow can be interrupted due to any one of several reasons, including coronary artery disease (a buildup of plaque within the blood vessels of the heart), drug overdose, or extreme stress.

I) **Signs & Symptoms of Heart Attacks**. There are a handful of signs and symptoms associated with heart attacks, but different people experience heart attacks differently, even people who have had multiple heart attacks. Frequently, care for heart attacks is delayed because people either do not recognize the symptoms or believe the symptoms will pass. The widely-known signs and symptoms of heart attacks are:

- Chest pain that lasts longer than 3 to 5 minutes or disappears and recurs. The pain can be mild or severe, and may take the form of tightness, pressure, or aching in the chest, and is not alleviated by taking medication (such as for indigestion or heartburn) or changing position;
- Pain, either mild or severe, in one or both arms, the back, one or both shoulders, the neck, and/or the jaw;
- Dizziness, vertigo, and/or lightheadedness;
- Difficulty breathing;
- Nausea or vomiting;
- Blue-tinged, pale, or ashen skin around the lips and fingernail beds (cyanosis);
- A sudden sweat;
- Anxiety or fatigue; and/or
- Unresponsiveness.

i) Men and women frequently experience different signs and symptoms for heart attacks, with men exhibiting the well-known signs of chest pain, dizziness, nausea, shortness of breath, and fatigue. Women can and do experience those symptoms, but they can be milder and persistent (for hours or days at a time). People who believe heart attacks are always sudden and intense might fail to recognize that a woman complaining of persistent tightness in the chest, fatigue, and nausea is actually suffering a heart attack.

II) The cells that make up the heart will start to die if they do not receive oxygenated blood, which can lead to permanent damage and long-term complications. Time is critical; if you

suspect someone is having a heart attack:

i) Call EMS immediately.

ii) Direct the casualty to stop what they are doing and sit down.

iii) Loosen any restrictive clothing.

iv) If they are responsive, ask them if they take any medication for chest pain. If they do, have them tell you where it is so you can assist them with taking it.

v) If they are responsive, ask them if they are allergic to aspirin, if they are on any blood-thinning medication, or if they have any stomach ulcers. If they answer "No" to all three questions, have them chew aspirin.

a) Chewing and swallowing two 81mg or one 325mg tablet of aspirin can prevent blood clotting and increase the casualty's chances of survival.

b) Only administer aspirin, and not another type of painkiller.

vi) Monitor their condition until EMS arrives or they lose consciousness.

vii) If the casualty loses consciousness, administer CPR or an AED as required.

c. ***Cardiac Arrest***. As previously stated, the heart is responsible for supplying oxygenated blood to the body. If someone's heart is not pumping effectively, they are in **cardiac arrest**. Cardiac arrest can mean the heart is not beating at all; it could mean that the heart is fluttering or quivering (fibrillating) too weakly to effectively circulate blood, a condition called ventricular fibrillation; or the heart might be beating too fast, a condition called ventricular tachyardia.

I) **Signs & Symptoms of Cardiac Arrest**. Someone suffering cardiac arrest will be unconscious and unresponsive. They will have no pulse. They will not be breathing. It is possible the casualty will be gasping infrequently; these are **agonal breaths** and are not true respiration. A casualty demonstrating agonal breaths is not actually breathing.

II) **Cardiac Chain of Survival**. Cardiac arrest is a serious medical emergency, because without oxygenated blood circulating through the body, death occurs within minutes. Treatment for cardiac arrest requires quick, decisive action to ensure the body's organs are supplied with oxygen. These actions are collectively referred to as the **Cardiac Chain of Survival**. According to the American Heart Association, the steps in the cardiac chain of survival for out-of-hospital cardiac arrest (OHCA) are "Immediate *recognition* of cardiac arrest and *activation* of the emergency response system, early *CPR* with an emphasis on chest compressions, rapid *defibrillation* with an AED, effective advanced life support (including rapid stabilization and transport to post–cardiac arrest care), [and] *multidisciplinary post–cardiac arrest care*."[85] According to Bircher, *et al*., a casualty's chances of survival decrease by about 10% for every minute CPR is delayed following cardiac arrest[86].

i) *CPR*. **Cardiopulmonary resuscitation**, or **CPR**, is a technique used to keep oxygenated blood circulating through the body of a casualty experiencing cardiac arrest. CPR uses a combination of chest compressions (pressing down on the casualty's chest; this manually forces blood out of the chambers of the heart, whereupon the pressure is released and blood flows back into the heart) and rescue breaths (supplying fresh oxygen to the lungs). While CPR with rescue breathing is preferred, the casualty's body will have several minutes of oxygen in their body, so if you are unable (trauma to the casualty's face makes providing rescue breaths impossible) or unwilling (you do not have access to BSI) to provide rescue breaths, compression-only CPR will keep a casualty alive for several minutes while you wait for emergency responders to arrive.

85 American Heart Association. *Basic Provider Manual* (2016). 6. Emphasis in original.

86 Bircher, Nicholas, M.D., *et al*. "Delays in Cardiopulmonary Resuscitation, Defibrillation, and Epinephrine Administration All Decrease Survival in In-hospital Cardiac Arrest." *Anesthesiology* Vol. 130 (2019).

ii) *AED*. CPR is useful for keeping the body's organs supplied with oxygen, but it cannot restore the heart's normal rhythm. An **automated external defibrillator**, or **AED**, can deliver an electrical shock to a casualty suffering from ventricular fibrillation or ventricular tachyardia. The AED shocks the heart, causing it to stop beating just long enough for the sinoatrial cells to restore its normal rhythm. If there is an AED in your workplace, ensure that you are familiar with its location and its method of operation, especially the lights or sounds it uses to indicate its status or whether or not a shock is recommended. Regularly check the AED's batteries and maintain it according to manufacturer specifications.

5-2. **PRIMARY ASSESSMENT**. BLS begins when you first observe the casualty. This might involve witnessing someone presenting the signs or symptoms of heart attack, cardiac arrest, or choking, or it might involve being at the scene of an accident in which someone has sustained a traumatic injury. Regardless of the circumstances, the first step in BLS is to call the local **emergency medical services** (**EMS**), after which you will secure the scene and assess the casualty.

a. ***Calling EMS***. BLS will not restore a casualty to health. It is neither designed nor intended for that purpose. BLS is a tool that can keep a casualty alive long enough for them to reach definitive care (that is, a facility with the appropriate personnel and equipment to treat and, hopefully, resolve the casualty's underlying illness or injury). The faster the casualty gets to a definitive care facility, the greater their odds of survival, so calling EMS, to the extent they are available in CIDA, is a critical priority (for details on what information to provide to EMS, see Table 2-7).

"There are a number of conditions that should immediately trigger calling emergency medical services (EMS). Some of these conditions are:

- *Loss of consciousness*
- *Difficulty breathing*
- *Respiratory of cardiac arrest*
- *Suspected poisoning or overdose*
- *Massive hemorrhage*
- *Cardiac chest pain*
- *Anything your instinct suggests is 'very bad.'"*

In order to keep your hands free and to allow you concentrate on treating the patient, have your buddy call EMS. If you buddy is helping, or you have no buddy, assign someone to call EMS. Do not make a general statement like "Someone call 9-1-1" as no one may make the call due to the bystander effect and the diffusion of responsibility. Instead, single out someone from the crowd and call out to them based off an obvious feature. Say "You, with the red shirt. I need you to call 9-1-1." Direct them to come to you so can ensure they are following through with your instructions and so that you can answer questions the dispatcher may have.

If no one is able to help, put your phone on speakerphone, turn the volume all the way up, and place it next to you. Talk to the dispatcher while you work.

When talking to a dispatcher, remember to speak slowly, to be concise, and to give the most relevant information first. If the call is cut off, the dispatcher may still be able to send an ambulance to you.

-Håkan Geijer[87]

87 59

b. ***Scene Safety***. While you are calling EMS, you should be observing the scene to ensure that it is safe enough for you to render BLS. Do not attempt to provide first aid to a casualty if the scene is unsafe – you might injure yourself, and it is more important to stay safe so you can provide information as necessary to EMS.

I) Look for environmental hazards, like downed power lines (remember that live wires or hot metal look the same as dead wires and cool metal). If you can eliminate the source of the danger (for example, by shutting off a breaker box), do so; if you cannot, attempt to evacuate the casualty to safety (see “Casualty Evacuation” at the end of this chapter).

II) While you are rendering aid, maintain awareness of your surroundings. Be prepared to stop providing BLS if it becomes necessary to act to make the scene safe or evacuate the casualty.

5-3. **BODY SUBSTANCE ISOLATION**. Any time you are administering medical care, especially BLS, there is a possibility you will be exposed to the casualty's bodily fluids, like blood, mucus, or vomit. These fluids can potentially carry dangerous pathogens, substances that can cause disease. In order to prevent medical providers from infection, the National Standards Curriculum for Prehospital Providers and Firefighters developed a set of procedures, known as body substance isolation (BSI), which superseded the older universal precautions introduced by the Centers for Disease Control during the late 1980s to prevent accidental exposure to HIV and Hepatitis B.

a. ***BSI Employment***. Under BSI, all bodily fluids are treated as though they carry transmissible diseases, meaning medical caregivers must wear use whatever infection-control barriers are necessary. For the BLS provider, this means donning disposable non-latex surgical gloves before giving aid to a casualty, washing hands with soap and warm water or alcohol-based hand sanitizers after removing handling a casualty, and using a disposable CPR shield when performing rescue breathing. Eye protection and face shields are recommended as well.

b. ***When to Employ BSI***. If a casualty is exhibiting two or more of the following symptoms, employ all normal BSI techniques and additionally isolate the casualty downwind of others (if practical), wear disposable gowns or other impermeable clothing, and sterilize the room in which the casualty is resting using chlorine bleach:

- Fever in excess of 39°C;
- Bleeding from the nose or gums;
- Yellow skin or yellow or bloodshot eyes;
- Small red or purple spots or any pox-like rashes on the casualty's body;
- Painful, swollen, or draining lymph nodes;
- Red or painful insect bites;
- Previous exposure to sewage, human or animal remains, or human or animal bodily fluids;
- Bloody or black stools;
- Vomiting blood; or
- Two or more casualties exhibiting any of the above symptoms.

5-4.**THE ABC OF BASIC LIFE SUPPORT**. After ensuring that the scene is safe, approach the casualty and make your initial assessment. Start by kneeling beside the casualty and calling their name. If you do not know it, loudly call out to the casualty. If the casualty responds to you, whether by speaking, nodding their head, or opening their eyes, introduce yourself to the casualty and ask for their consent for you to start examining them. If the casualty does not respond, you will need to check their **airway**, **breathing**, and **circulation** (**ABC**) to determine the nature of the problem. If the casualty is bleeding severely, stop the bleeding before checking the casualty's ABC.

a. ***Airway***. When you encounter a casualty, you will need to verify that the casualty's airway is clear. If the casualty is speaking, their airway is likely clear, but ask them to open their mouth anyway to confirm. If the casualty is unresponsive, there is a possibility that the muscles in their tongue will relax. This will cause their tongue to fall backward in the casualty's mouth, potentially blocking the their airway. Use the **head-tilt/chin lift** or **jaw thrust** methods to open their airway and ensure that it stays open. When you have opened the casualty's airway, check for any foreign objects. If any are present in the casualty's airway, remove them by using the **finger-sweep technique** (see Fig. 5-3). If the casualty has vomit or fluid in their mouth, roll them into the **rescue position** to allow the fluid to drain.

I) **Head-Tilt/Chin-Lift Method**. If you do not believe the casualty has experienced an head or neck injury, use the **head-tilt/chin-lift** method to open their airway. To use this method:

i) Place one hand on the bottom of the casualty's chin and one hand on their forehead.

ii) While gently lifting the casualty's chin, tilt their forehead back (see Fig. 5-1).

Figure 5-1. Head-Tilt/Chin-Lift Method.

II) **Jaw-Thrust Method**. If you suspect that a casualty has suffered a head or neck injury (for example, they were involved in a vehicle collision), you should clear their airway using the **jaw-thrust** method before stabilizing their c-spine (see paragraph 5-8). *Opening the airway takes priority over spinal support*; if the jaw-thrust method is insufficient to open the airway, use the head-tilt/chin-lift method. To use the jaw-thrust method:

i) Kneel above the casualty and place your hands on the side of the casualty's head with your fingers resting just behind the casualty's jawbone.

ii) Use your fingers to lift the casualty's jawbone, which will force the casualty's head backward, opening their airway (see Fig. 5-2).

Figure 5-2. Jaw Thrust Technique.

Figure 5-3. Finger-Sweep Technique.

III) **Rescue Position**. There is a risk in unconscious casualties that they will vomit and subsequently choke. The rescue position (see Fig. 5-4) is used for unconscious casualties or conscious casualties who may become unconscious. To place a casualty in the rescue position:

i) Kneel beside the casualty and position the casualty's near arm perpendicular to their torso.

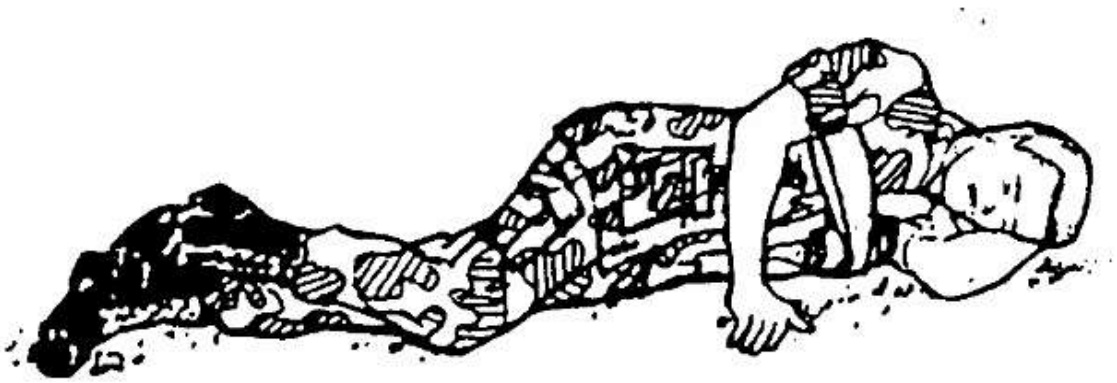
ii) Lift the casualty's far leg and move their foot toward their buttocks.

iii) Roll the casualty toward you so that they are on their side. The near side is now on the ground. If you believe the casualty has suffered a spinal injury, roll the casualty per the instructions in the “Casualty Evacuation” section later in this chapter.

iv) Bring the casualty's knee to their chest and place their far arm over their near arm.

v) Position the casualty's head so their airway is clear and any vomit or blood will drain out of their mouth.

Figure 5-4. Rescue Position.



II) **First Aid for Airway Obstructions**. If someone is choking, designate a buddy or a specific bystander to call EMS. Deliver five back blows followed by five abdominal thrusts. Alternate between delivering five back blows and five abdominal thrusts until the obstruction has been dislodged or the casualty loses consciousness.

i) *Back Blows*. To effectively deliver back blows, position yourself behind and slightly to the casualty's left or right. Place one arm across the casualty's chest and bend them forward so that their upper body is as parallel to the ground as possible. With the heel of your hand, strike the casualty firmly between their shoulder blades (see Fig. 5-5).

ii) *Abdominal Thrusts*. To deliver effective abdominal thrusts, position yourself behind the casualty with one foot in front of the other to aid in balance. Wrap your arms around the casualty's waist, with your arms under theirs. With one hand, make a fist and place it halfway between their navel and breastbone. Grab this fist with your other hand and pull upwards and inwards, like you are trying to pick the casualty up (see Fig. 5-5).

a) Chest Thrusts. If the casualty is too large for you to wrap your arms around, or if they are pregnant, deliver chest thrusts instead of abdominal thrusts. Get behind the person as though you are going to deliver abdominal thrusts, and place a fist, with the thumb facing inward, against the center of their breastbone. Cover this fist with your other hand and pull straight back.

Figure 5-5. Back Blows (L), Abdominal Thrusts (R)

III) **Choking First Aid for an Unconscious Casualty**. If the casualty loses consciousness, or if you encounter an unconscious casualty who is choking, position them on their back. Check the casualty's airway using the techniques outlined earlier in this chapter. If abdominal thrusts are necessary, straddle the casualty's legs and place the heel of one hand halfway between the casualty's navel and breastbone. Place your other hand over the first and interlace your fingers. With your elbows locked, push with a J-motion.

IV) **Choking First Aid for Children & Infants.** If a child is choking, kneel behind them, and then deliver five back blows and five abdominal thrusts as normal. If an infant is choking, you must hold the infant in such a way that their head is lower than their chest, meaning you might need to support the infant on your thigh, or you might be able to support the infant with your forearm. The infant's head should be cradled in one hand, with the jaw supported with your fingers.

i) *Back Blows for Choking Infants*. To deliver back blows to an infant who is choking, turn the infant over, ensuring that their head is cradled. With the infant in position, strike firmly between their shoulder blades with the heel of your free hand (see Fig. 5-6).

ii) *Abdominal Thrusts for Choking Infants*. To deliver abdominal thrusts to an infant who is choking, place one hand along the infant's back, with the back of their head supported by your hand. Turn the infant over so they are facing up, ensuring that their head is lower than their chest. Place the pads of two fingers on the center of the infants chest and press down about 1 ½ inches. Allow the infant's chest to return to the normal position before the next chest thrust. Alternate between back blows and chest thrusts until the infant can cry or scream or the infant loses consciousness (see Fig. 5-6).

Figure 5-6. Back Blows & Abdominal Thrusts for an Infant.

b. ***Breathing***. After confirming that the casualty's airway is clear or after clearing any obstructions, you need to check if they are breathing under their own power. A conscious, responsive casualty who can speak should be considered to be breathing normally, but their condition should be monitored until EMS arrives. If the casualty is unconscious, lean close, place your ear (or cheek, if the scene is too noisy) and one hand on the casualty's chest, and look, listen, and feel for respiration (see Table 5-1. If the casualty's airway is clear and they are breathing normally, place them in the rescue position and proceed to check their circulation. If the casualty is not breathing normally, including exhibiting agonal breathing (infrequent, labored gasps) start CPR immediately – do not waste time checking the casualty's circulation.

Table 5-1. Checking for Respiration

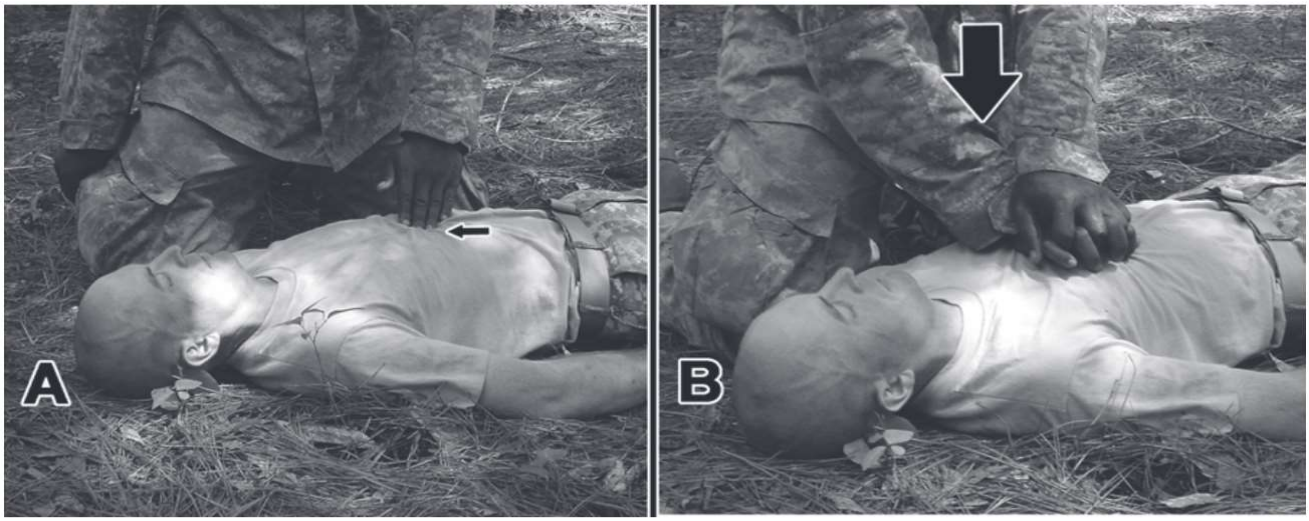
Look	***Listen***	***Feel***
Watch the casualty's chest for the rising and falling that indicates respiration.	Listen for the sounds of air entering and leaving the casualty's mouth and nose.	Use your hand on the casualty's chest to feel for any rising and falling.

l) **Performing CPR**. First, get into position. The casualty needs to be lying face-up on a flat, stable surface. Kneel beside the casualty. Find the center of the casualty's xiphoid process, then place the heel of one hand a two-finger length higher, toward the casualty's head. Place your other hand over your first hand and interlace your fingers (see Fig. 7). If the casualty's clothing interferes with administering chest compressions, remove or cut it away if you have not already done so. Position your upper body so your shoulders are directly over your hands, which will allow you to use your entire upper body to compress the chest, conserving your energy and preventing premature fatigue. Do not rock back and forth. Do not lean over the chest. Administer 30 compressions by keeping your arms straight and pressing down, at least two inches deep with each compression. After each compression, allow the chest to return to its normal position. When you have delivered 30 chest compressions, give the casualty two rescue breaths. Immediately after delivering the second rescue breath, return to delivering chest compressions. After 30 compressions, deliver two rescue breaths. If your buddy or another medic is available, swap with them every two minutes. While one medic administers CPR, the other medic should be contacting EMS (if this has not already been done) or preparing an AED. Continue this cycle until one of the following events occurs:

- The casualty exhibits an obvious sign of life, like moving or coughing. If the casualty exhibits an obvious sign of life, discontinue CPR and place the casualty in the rescue position. Monitor their condition until emergency responders arrive.
- An AED is available and ready to use, and you do not have a buddy available to assist you. In this case, administer the AED yourself.
- EMS arrives.
- You become fatigued and cannot continue.
- The scene becomes unsafe.

i) *Chest Compressions*. The proper rate of compressions is between 100 and 120 compressions per minute (try to match your compression rate to the song “Stayin' Alive” by the Bee Gees, which, at 104 beats per minute, will allow you to deliver compressions at the appropriate rate). Count out loud as you deliver compressions, calling out “one and two and three and four” until you reach 12, at which point you will call out “thirteen, fourteen, fifteen, sixteen,” until you reach 30. Push down as you say the number and come up as you say “and.” If you hear ribs or cartilage breaking, *do not stop delivering compressions.*

Figure 5-7. Chest Compressions



ii) *Rescue Breathing*. Open the casualty's airway, if you have not done so already, using the head-tilt/chin-lift technique. If you have a breathing barrier, deploy it now. After the casualty's airway is clear, pinch their nose shut, inhale, and form a complete seal around their mouth with your mouth. With the casualty's head tilted back past neutral, blow into the casualty's mouth for one second. Repeat this process one more time. The casualty's chest should rise with each rescue breath. If the casualty's chest does not rise when you administer your first rescue breath, ensure their airway is open by re-tilting their head and confirm their mouth and nose are sealed before administering the second rescue breath. If the casualty's chest does not rise when you administer the second rescue breath, their airway may be obstructed. Do not give a third rescue breath; instead, resume chest compressions. After 30 compressions, open the casualty's mouth. If you can see an obstruction in the casualty's mouth, remove it before administering two rescue breaths. Avoid blowing too hard, which could force air into the casualty's stomach, causing them to vomit. If the casualty vomits, roll them on their side and try to clear their mouth with a gloved finger or a piece of gauze using the

finger sweep technique. After clearing the casualty's mouth, roll them on their back and continue administering CPR. Do not administer more than two rescue breaths during this phase.

a) you are unable to form an adequate seal around the casualty's mouth, use mouth-to-nose breathing. Tilt the casualty's head back and close their mouth by pushing upward on their chin. Make a complete seal over the patient's nose with your mouth and deliver two rescue breaths.

II) **Performing CPR on a Child**. If you are administering CPR to a child, try to compress the chest to a depth of two inches, instead of using two inches as the minimum depth. When tilting a child's head back to administer a rescue breath, do not tilt their head back as far as you would with an adult casualty.

III) **Performing CPR on an Infant**. If you are administering CPR to an infant, you will position your hands higher on the infant's chest. Place two fingertips on the center of the infant's chest, just below the nipple line, then move your hand two finger-lengths higher. Instead of interlacing your fingers, place your other hand on the infant's forehead. Use the pads of your fingertips to compress the infant's chest to a depth of 1 ½ inches (see Fig. 5-8). When tilting an infant's head back to administer a rescue breath, tilt it back to a neutral, rather than past-neutral, position, and use your whole mouth to make a seal over the infant's mouth and nose.

Figure 5-8. Performing CPR On An Infant.

IV) **Using an AED**. If you have a buddy or the assistance of another medic, one of you must initiate CPR while the other prepares the AED.

i) Remove or cut away the casualty's clothing, if you have not done so already. Clean the casualty's chest as best you are able, using a cloth or piece of gauze. The pads of the AED will adhere better if the casualty's chest is dry. If the casualty's chest is excessively hairy, use the razor provided in the AED to quickly shave the spots for the AED pads.

ii) Peel the backing off the AED pads to expose the adhesive, and apply the pads to the casualty's chest. The first pad should be placed on the upper right side of the casualty's chest. The second pad should be placed on the left side of the casualty's chest, under their armpit (see Fig. 5-9).

iii) Plug the pads into the AED. At this point, the AED will analyze the casualty's heartbeat automatically (some models will require you to press a button to start this process). Do not touch the casualty while the AED is analyzing the casualty's heartbeat.

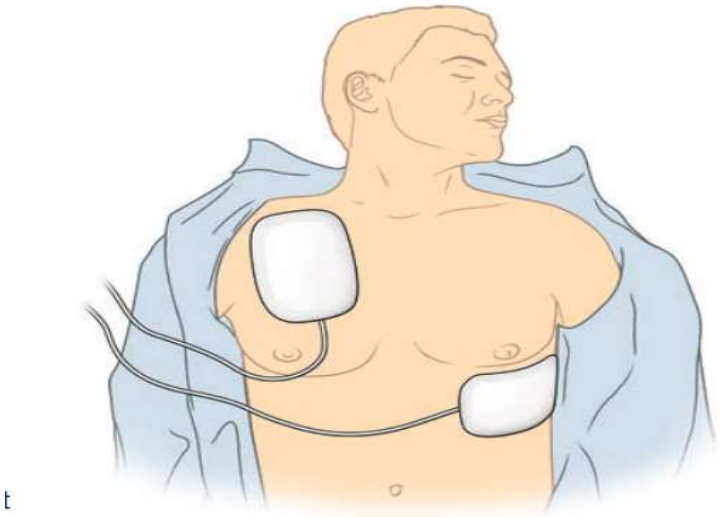
If the AED determines that a shock is required, it will prompt you to press the “SHOCK” button. If there is a charging period, continue administering CPR while the AED is charging. The AED will give an audible alert before administering the shock. Ensure no one is touching the casualty while the AED is administering the shock.

a) After the AED administers the shock, immediately resume CPR. The AED will analyze the casualty's heart rhythm every two minutes. Repeat the process of shocking the casualty until you see an obvious sign of life, emergency services arrive, or the scene becomes unsafe.

b) Do not use an AED if the casualty's skin or clothing has been contaminated with flammable materials. If the casualty is lying on a metal surface, do not allow the AED pads to touch the metal. If the casualty is fully or partially submerged in water, remove them and ensure there are no puddles of water around you or the casualty before applying the AED pads.

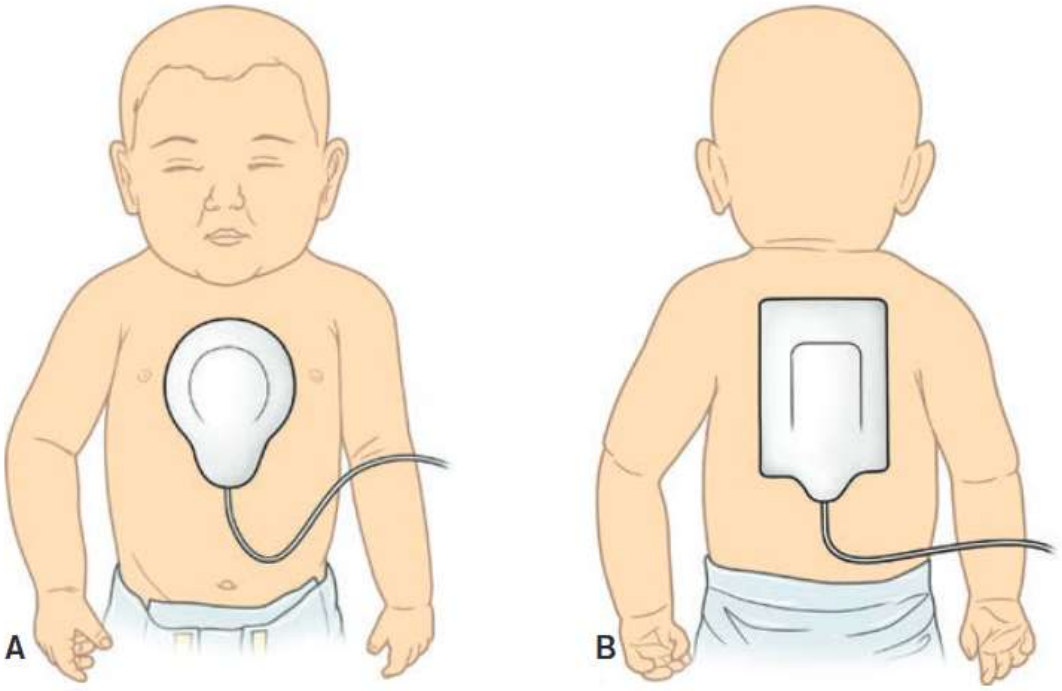
c) It is safe to use an AED on a casualty who is pregnant. If the casualty has a pacemaker (you might be able to see or feel the outline of the device on the casualty's chest, or they might be wearing medical identification), do not place the AED pads directly over it. If the casualty is wearing any medical patches, remove them (with gloves, if possible) before applying the AED pads.

Figure 5-9. AED Pad Placement.



e. ***Using an AED on a Child or Infant***. For child or infant casualties, use the AED the same way you would with an adult. The AED might have smaller pads for use on children or infants, or it might have a setting that will deliver a lower-level shock. If the AED has no pediatric pads or a pediatric setting, use the AED anyway. If the child or infant's chest is too small for a left-right pad placement, place one pad on the center of the chest and the other pad on the center of the back, between the shoulder blades (see Fig. 5-10).

Figure 5-10. AED Pad Placement for Children or Infants.



c. ***Circulation***. The **circulatory** (or **cardiovascular**) system is responsible for supplying oxygen to cells and tissues via the blood. The heart pumps oxygen-rich blood through arteries that distribute blood to the body's organs. After the blood delivers its oxygen, it returns to the heart, which pumps it through the arteries of the lungs, where the blood is oxygenated and the cycle starts over. On average, people have between 5 and 6 liters of blood in their body. During blood donation, eight to 10% of the body's blood is removed; blood loss between 15-30% of the body's total volume can lead to shock (see Paragraph 5-7), with 40% or greater blood loss being life-threatening. A casualty who is breathing normally and has a clear airway will present a detectable pulse, so do not spend excessive time trying to determine the exact rate. Instead, check the casualty for signs of limited circulation, especially shock and hypothermia.

I) **Skin Color, Temperature, & Moisture (SCTM)**. Check the casualty's circulation by checking their **skin color**, **temperature**, and **moisture** (**SCTM**):

i) *Skin Color*. If a casualty's circulation is poor, capillaries near the skin will not be able to transport sufficient oxygenated blood to keep skin looking flushed. Check the casualty's palms, fingernail beds, and gums; if the casualty's skin is pale, or if it is bluish or purplish (a condition called cyanosis) their blood-oxygen saturation is low.

ii) *Temperature*. In the same way poor circulation leads to pale skin, it also leaves skin cool to the touch.

iii) *Moisture*. Moist or clammy skin is an indication of shock.

II) If the casualty has a clear airway, is breathing normally, and has a detectable pulse, but is unconscious or unresponsive, they may be experiencing hypoglycemia (low blood sugar) or a drug overdose (frequently, the ABCs are modified to include additional letters, especially “D,” which is used for both “Drugs” and “Diabetes”). Monitor the casualty's condition, treat for shock (see paragraph 5-2), and wait for EMS to arrive.

5-5. **WOUNDS**. Almost 10% of cardiac arrests occur as a result of traumatic injuries that cause **wounds**.[88] A wound is an injury in which the skin or other bodily tissues are damaged. Wounds are classified as either **closed** or **open**.

a. ***Closed Wounds***. In a closed wound, the injury is below the skin, which is unbroken. The most common type of closed wound is a **contusion**, better known as a bruise. A bruise occurs when the capillaries beneath the skin are damaged enough that blood leaks out into the surrounding tissues.

b. ***Open Wounds***. An open wound is one in which the injury has cut, torn, or otherwise penetrated the skin, causing bleeding outside of the body (external bleeding). The four main types of open wounds are **abrasions**, **lacerations**, **avulsions** and **puncture** wounds.

I) **Abrasions**. An abrasion is an open wound caused by the surface of the skin being damaged by rubbing or scraping. Abrasions usually occur as a result of slipping and falling, but can be caused by more serious trauma as well. Abrasions are painful, because the sensitive nerve endings under the skin have been exposed, but usually do not bleed significantly.

II) **Lacerations**. A laceration is an open wound caused by the skin being damaged by cutting or slashing. Lacerations are usually caused by knives, pieces of glass, or other sharp objects. Lacerations can be as shallow as the top layer of skin to as deep as bone, and can damage or sever blood vessels, nerves, and tendons. The amount of bleeding caused by a laceration depends on the location of the injury.

III) **Avulsions**. An **avulsion** is an open wound caused by the skin being damaged by tearing, whether partially or completely. Avulsions can occur as a result of animal bites or falls, especially among the elderly. An avulsion can extend into the muscle tissues below the skin. Avulsions often bleed significantly.

IV) **Punctures**. A puncture is an open wound caused by the skin being damaged by piercing or penetration. Punctures can occur as a result of animal bites or gunshots. The depth of puncture wounds extends potentially beyond the body, depending on the nature of the object. The amount of bleeding caused by a puncture depends on the location of the injury.

c. ***Wound Care***. Bacteria and viruses live on our skin and exist all around us in the air we breathe. Most of the time, this is not a problem, because our skin forms an effective barrier to keep the worst pathogens out. But when the skin is compromised, as with open wounds, pathogens can enter the body and multiply. This is known as **infection**. Infection can be either viral or bacterial, and needs medical attention.

I) **Infection Prevention**. Since infections are most often caused by pathogens on the skin, the easiest way to prevent infection is by irrigating the wound with sterile liquid and then cleaning the wound with water and a disinfectant like iodine or soap. Irrigation is the process by which a pressurized flow of saline or water washes dirt, debris, or other material out of the wound.

i) To irrigate an open wound, you will need some sort of sterile irrigation solution. Sterile saline (0.9% sodium chloride) is the standard, but boiled water (that has been allowed to cool) will work as a substitute. An irrigation syringe is the preferred method, but any squeeze bottle that can project a robust stream will suffice. As a basic guideline,100ml of liquid is adequate to irrigate a clean wound, while the minimum for a dirty wound is 250mL. Regardless, irrigate the wound until all foreign material or clotted blood has been washed away.

ii) After irrigating the wound, scrub the area surrounding the wound (but not the damaged tissue of the wound itself) with povidone-iodine or unscented soap and disinfected water. Do not use alcohol or hydrogen peroxide. After scrubbing the wound site, rinse well with saline or clean water, then cover with sterile dressings.

88 Kuisma, M. & A. Alaspää. “Out-of-Hospital Cardiac Arrests of Non-Cardiac Origin: Epidemiology and Outcome.” *European Heart Journal*, Vol. 18-7 (1997).

II) **Tetanus**. *C. tetani* is a bacterium present in soil and in the gastrointestinal tract of animals. Puncture wounds, especially those caused by animal bites or by dirty objects, can introduce *C. tetani* into the body, which can lead to a bacterial infection called tetanus. Tetanus is characterized by severe muscle spasms, and can be fatal. Other common symptoms of tetanus include difficulty swallowing and stiffness, especially around the head and neck.

i) If you have suffered a deep or dirty wound and you cannot remember the last time you received a booster shot for tetanus (you should acquire a booster shot once every ten years), you should have the wound examined by a healthcare professional.

5-6. **FIRST AID FOR WOUNDS**. Methods for wound care depend on the nature of the wound. Closed wounds are characterized by black, blue, red, or purple discoloration, which is often painful, around the injury site. There may be swelling or tenderness. Open wounds are characterized by external bleeding, the amount of which depends on the nature and location of the injury. Certain traumatic events, especially those involving industrial machinery or explosives, can result in the loss of a digit or limb. These traumatic amputations can either be partial or complete. Like other open wounds, the amount of bleeding depends on the nature and location of the amputation.

a. ***First Aid for Closed Wounds***. Cold will reduce swelling. Wrap a cold pack in a thin towel (do not apply ice directly to the skin) and apply it to the site of the injury. Apply the cold pack for no more than 20 minutes at a time, and wait at least 20 minutes before applying it again. Depending on the environment, use of a cold pack might put the casualty at risk of hypothermia.

b. ***First Aid for Minor Open Wounds***. Don BSI and apply direct pressure to the wound to stop the bleeding. To apply direct pressure, cover the wound with a sterile gauze pad or a sterile dressing. If neither is available, use a clean cloth or towel. Press hard on the wound until the bleeding stops. If blood soaks through the first dressing, do not remove it. Place another dressing on top of the first dressing and continue to apply pressure, repeating this process as necessary.

I) When the bleeding has stopped, clean the site of the injury with soap and warm water. Do not apply hydrogen peroxide to open wounds; hydrogen peroxide will kill healthy tissue and delay healing. After washing the wound, irrigate the wound with warm water to remove any debris, then pat or dab the area dry. Unless the casualty has any allergies to common antibiotics, apply a small amount of antibacterial cream, gel, or ointment. Cover the wound with an adhesive bandage. If the wound is too big, secure a sterile gauze pad over the injury using tape, roller gauze, an elastic bandage, or a triangular bandage.

II) After treating any kind of open wound, wash your hands with soap and water, even if you wore gloves. If the wound is deep or extensive, bleeding heavily or uncontrollably, or carries a high risk for infection, call emergency responders.

c. ***First Aid for Major Open Wounds***. A large open wound, or an open wound that is bleeding heavily or uncontrollably, requires immediate action. Call EMS immediately. Don BSI and apply direct pressure to the site of the injury. If direct pressure does not stop the bleeding, use a tourniquet. If the site of the injury is not amenable to a tourniquet, pack the wound with hemostatic gauze. Monitor the casualty for shock and maintain awareness of the ABCs.

I) **Tourniquets**. A tourniquet is a device composed of a strap and a rod called a windlass (see Fig. 5-11). When the strap is placed around a limb, the windlass is twisted, tightening the strap and increasing the pressure on the blood vessels in the limb. If the windlass is twisted enough, the strap will be so tight that no blood will be able to flow through the blood vessels. Tourniquets are used when a casualty is suffering from severe arterial bleeding from a wound on one of their arms or legs and direct pressure is insufficient to stop the bleeding.

i) To apply a tourniquet, form a loop by routing the free end of the tourniquet through the buckle, and place the injured limp through the loop. Place the loop as high on the limb (as close to the body) as possible, then cinch tight. Secure the tail of the tourniquet and

free the windlass from the clip.

ii) Start to turn the windlass clockwise. Use both hands, if necessary, and turn the windlass until the bleeding has stopped or you can no longer tighten the windlass. Secure the windlass in the clip. Use a permanent marker to indicate the time the tourniquet was applied for EMS.

iii) If one tourniquet does not stop the bleeding, apply a second tourniquet immediately below the first.

II) **Improvised Tourniquets**. If you do not have a commercial tourniquet, it is possible to construct an improvised tourniquet from a strip of cloth like a necktie or a triangular bandage and a stick. The stick can be a tree branch, flashlight, or even a stack of tongue depressors. The stick must be strong enough that it will not snap under the tension. Do not attempt to use an improvised tourniquet without a windlass; without it, you will not be able to sufficiently tighten the tourniquet to occlude blood flow.

i) To apply an improvised tourniquet, wrap the cloth around the injured limb, as high on the limb as possible. The cloth should be at least one inch wide; narrower, and you risk cutting into the skin, causing increased damage.

ii) Tie the cloth with a half hitch and place your improvised windlass over the knot. Tie a second half hitch over the windlass to form a square knot. After ensuring the knot is tight (add safety knots as necessary), turn the windlass clockwise until the bleeding stops or you can no longer turn the windlass. Use a second piece of cloth to tie the windlass in place (see Fig. 5-12).

A properly-applied tourniquet must be tight enough to cut off all blood flow to the affected limb. This process is very painful. If the casualty is conscious, warn them that the tourniquet will hurt, and do not allow them to attempt to remove it.

III) **Hemostatic Gauze**. A hemostatic dressing is a dressing impregnated with an anti-coagulant. When the hemostatic dressing is applied to a wound with direct pressure, the anti-coagulant speeds clot formation, stopping the bleeding. Hemostatic dressings should be used on severely bleeding wounds that are not amenable to tourniquet use, especially the neck or torso.

d. **First Aid for Open Wounds with Embedded Objects**. Small objects, like splinters, can usually be removed with a pair of tweezers or a sewing needle, at which point the wound can be treated as normal. If a large object (like a shard of glass or piece of metal) has become embedded in the skin, do not attempt to remove it. Call EMS immediately. Apply direct pressure to the area around the object until the bleeding stops, then secure the object with bulky dressings to immobilize it. Monitor the casualty for shock while maintaining awareness of the ABCs.

e. **First Aid for Traumatic Amputations**. If a casualty has suffered a traumatic amputation, call EMS immediately. Control external bleeding as necessary, monitoring the casualty for shock and maintaining awareness of the ABCs.

l) With prompt surgery, severed limbs or digits can be reattached, so if the injured limb or digit has been totally separated from the casualty's body, try to locate it. Wrap the severed limb or digit in sterile gauze or the cleanest material you can find. Seal the wrapped limb or digit in a plastic bag or plastic wrap and place the entire package in a larger bag or container filled with an ice water bath. Do not place the package directly on ice.

"The very act deciding to care and provide for one another is a radical act. Supporting social movements and providing care to others is insurrectionary."

-Håkan Geijer[89]

Figure 5-11. Commercial Tourniquet.

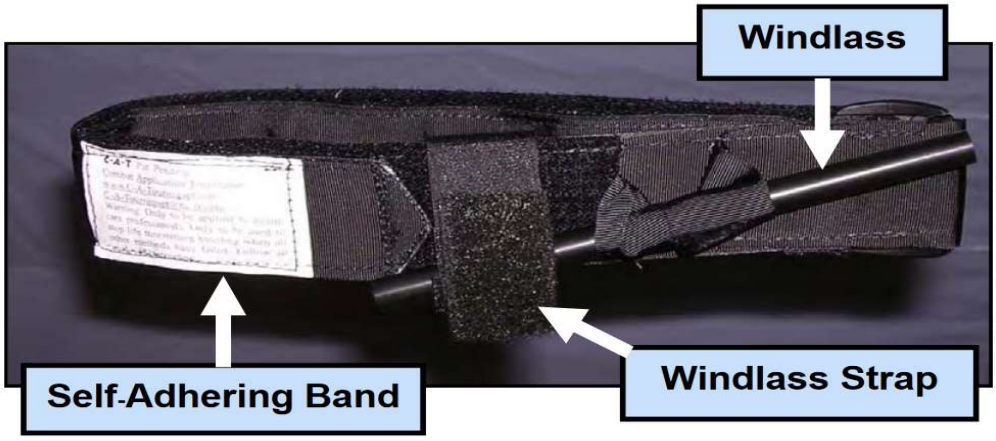
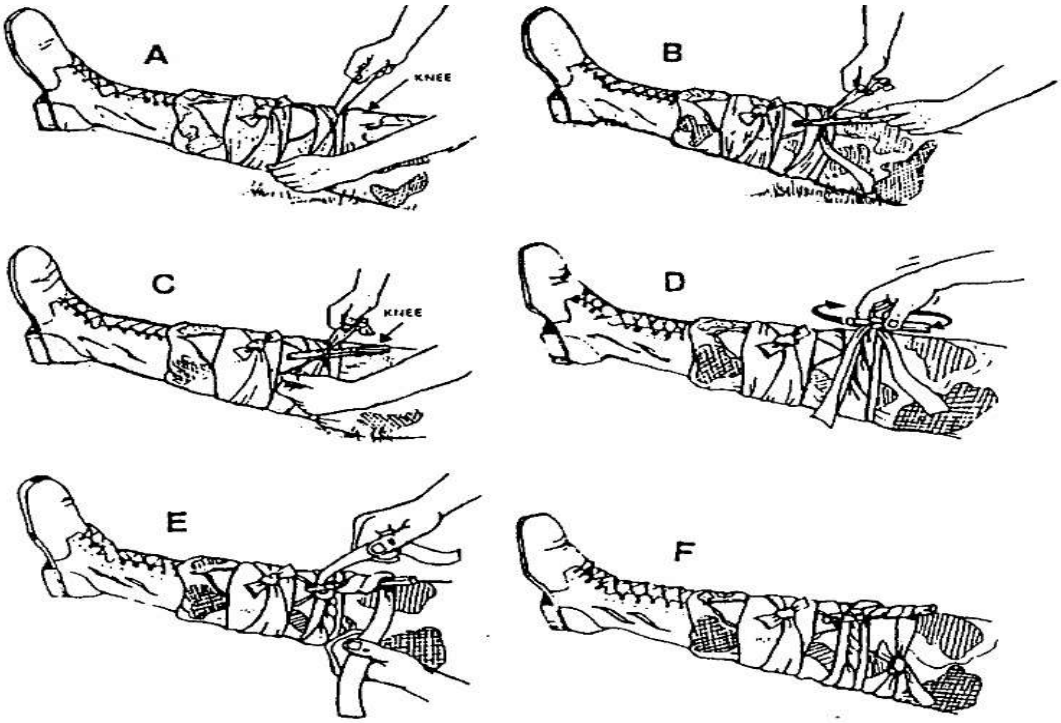


Figure 5-12. Improvised Tourniquet.



89 *Riot Medicine* (2020). 415.

5-7. **SHOCK**. If the heart can no longer supply organs and tissues with sufficient quantities of oxygenated blood, the body will go into **shock**. This can occur because of blood or fluid loss (known as **hypovolemic shock**), weak heartbeat (**cardiogenic shock**), increased vasodilation as a result of injuries to the central nervous system (**neurogenic shock**) or allergic reactions (**anaphylactic shock**). Shock is a dangerous, potentially fatal condition. Many traumatic injuries can lead to complications that can turn into shock, so it is critical to maintain awareness of the casualty's state while treating them for other conditions.

a. ***Signs & Symptoms of Shock***. Not every casualty presents the same symptoms of shock, but the widely-known signs and symptoms of shock are:

- A weak or irregular pulse;
- Nausea or sweating;
- Fatigue, anxiety, restlessness, and/or irritability;
- Rapid breathing;
- Pale, cool, clammy, and/or blotchy skin; and/or
- Feeling too cold or too hot.

b. ***First Aid for Shock***. If a casualty is showing signs or symptoms of shock, call EMS immediately. Have the casualty lie on their back. If the casualty complains of nausea, have them assume the rescue position.

I) It is critical to ensure the casualty's body temperature does not get too high or too low. If the casualty is cold, wrap them in an emergency blanket. Try to have them lie on a cot, cushions, or piled coats instead of directly on the ground. If the casualty is hot, direct them to lie down in the shade. Dampen clothing or bandannas for the casualty to wear.

II) Do not provide the casualty anything to eat or drink. If emergency response is delayed, the casualty may have one or two swallows of cool to lukewarm water every ten minutes. As always, monitor the casualty for other injuries. Maintain awareness of the ABCs.

Section II. CASUALTY EVACUATION.

In the event the scene becomes unsafe, or if EMS cannot reach you, it might be necessary to evacuate the casualty. Evacuation should always be considered a last resort, because moving an unconscious casualty might result in a neck or spinal injury. You should always assume, until you learn otherwise, that a casualty involved in a vehicle collision has suffered a neck or spine injury. Do not move casualties who have been in vehicle collisions unless it is an emergency. When extracting a casualty from a vehicle, always support and stabilize the head and neck as much as possible.

5-8. **C-SPINE STABILIZATION**. To manually stabilize the spine, place one hand on either side of the casualty's head and gently move their head to a neutral position in which their head is not tilting more in one direction than another. As you move the casualty's head, pay attention to any grinding noises or resistance; these can be signs of a spinal injury. If you encounter noises or resistance, leave the casualty's head in its current position.

a. ***Maintaining C-Spine Support***. If you must move or evacuate the casualty, you should maintain c-spine support. The easiest way to do this is with a cervical collar, but if you do not have a commercial cervical collar, you can improvise one out of bulky clothing, like sweaters or hoodies. To make an improvised cervical collar, lay out the garment with the arms outstretched. Roll from the hem of the garment to the neck to make a long tube. While the casualty's head is being supported (designate a bystander for this process, if necessary), slide the improvised collar under the casualty's neck and wrap it around their neck. Tie the sleeves together to secure the collar. It must be secure enough that it will prevent the casualty's head from moving, but not so tight that it restricts the

casualty's breathing or circulation. During evacuation, a casualty with an improvised cervical collar should have their head and neck manually supported at all times.

b. ***Rolling A Casualty***. If you need to roll a casualty (for example, to place them in the rescue position) who you believe has suffered a spinal injury, you must have assistance from at least two people. To roll a casualty:

I) Kneel beside the casualty's head and stabilize their head and neck. The first bystander will be positioned on the side of the casualty according to the direction the casualty will be rolled; if the casualty is to be rolled to the right, the first bystander kneels at the casualty's right side at the level of their torso. The second bystander kneels beside the first at the level of the casualty's hips.

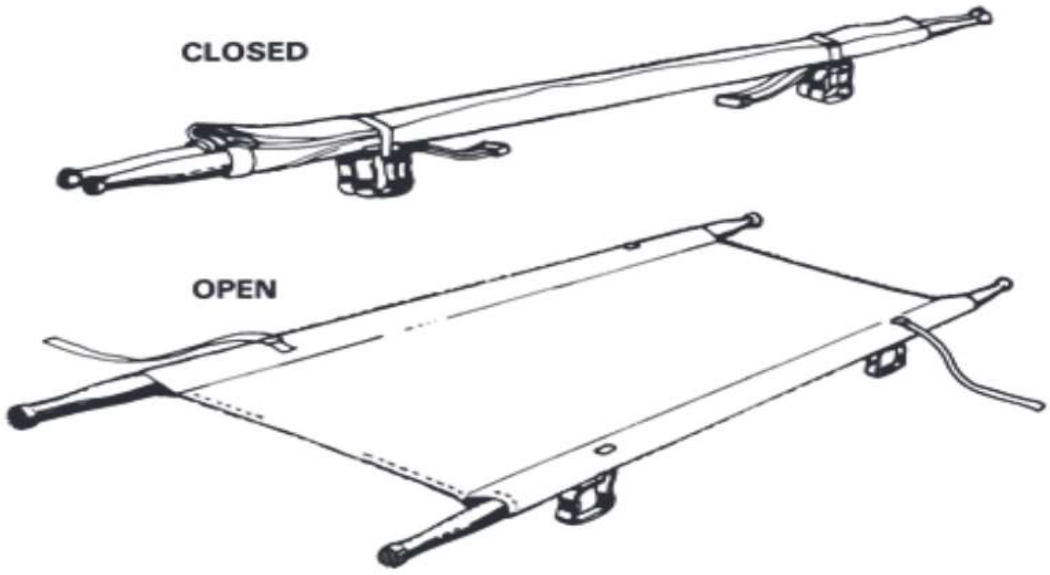
II) While you maintain support of the casualty's head and neck, the first bystander will reach across the casualty's body, grabbing the casualty's shoulder and back behind the casualty's upper arm, while the second bystander grabs the casualty's hip.

III) On a signal, both bystanders gently and smoothly pull the casualty while you maintain support of the casualty's head and neck.

IV) When the casualty is on their side, one of the bystanders will position the casualty's arm so it is under their head. When the casualty's arm is in position, remove your hands from the casualty's neck.

5-9. **STRETCHERS & LITTERS**. A **stretcher** (see Fig. 5-13) is, in its most basic form, is any device used to move a casualty who cannot move under their own power. If stretchers are available, they are the best choice for moving casualties, because it is easier to keep a casualty's neck and spine stable. If commercial stretchers are not available, a stretcher can be improvised from commonly-available materials.

Figure 5-13. Folding Stretcher.



a. ***Employing a Stretcher***. To place a casualty on a stretcher:

I) Position the stretcher beside the casualty with the head of the stretcher next to the casualty's head.

II) Log roll the casualty to one side (see “C-Spine Stabilization” in paragraph 5-8) and slide the stretcher under the casualty. Gently roll the casualty back onto the stretcher, ensuring the casualty's neck and spine remain as straight as possible.

III) Secure the casualty to the stretcher using belts, straps, or other stabilizing materials.

IV) Lifting the stretcher is a four-person job. When the casualty is secure, position each person at one end of each pole, all facing the casualty's feet.

i) Each rescuer should squat down, keeping their back straight, and grab their portion of the pole.

ii) The four carriers will agree on a signal to lift, and on that signal, each carrier will use their knees to lift as one, keeping the stretcher stable and parallel to the ground.

V) Move slowly and smoothly while lifting, lowering, and carrying a casualty. Do not rush or jerk.

b. ***Improvised Stretchers***. If you do not have a commercial stretcher, you can improvise one with commonly-available materials. To construct an improvised stretcher,

I) Gather your materials. You will need the following:

i) A tarp, poncho, or blanket to act as the stretcher material. The material must be at least as long as the casualty and at least three times as wide.

ii) Two sturdy, straight poles or limbs longer than the tarp or blanket.

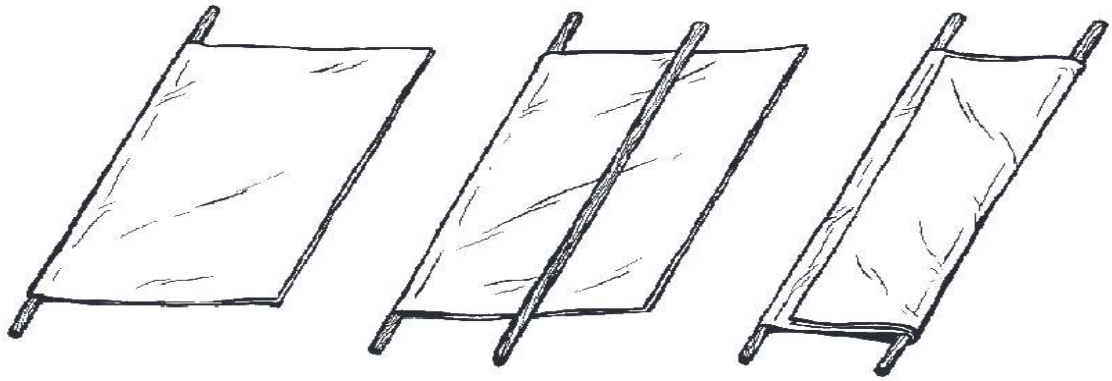
II) Place the tarp, poncho, or blanket on the ground, then place one of the poles on top of the stretcher material approximately one-third of the distance from one of the sides.

III) Fold the stretcher material over the pole such that the edge is one-third of the distance from the other side, then tug the material a few inches farther.

IV) Place the other pole on top of the stretcher material one-third of the distance from the edge such that both poles are equidistant from one another. Then fold the rest of the stretcher material over the second pole (see Fig. 5-14).

i) The weight of the casualty will prevent the stretcher material from slipping, but for extra support, duct tape can be used to secure the edges.

Figure 14. Improvised Litter.[90]



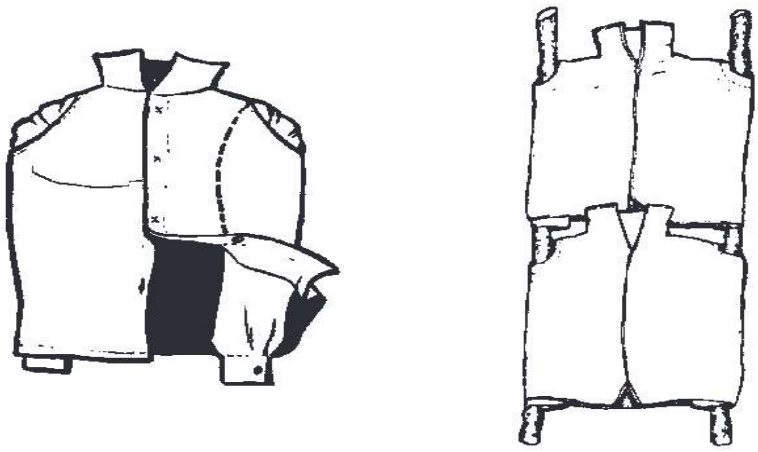
90 These are all gonna be from ATP 4-25.13.

VI) If you do not have a tarp, poncho, or blanket, you can use shirts or jackets to construct an improvised litter. Zip or button up the garments and turn them inside out, leaving the sleeves inside the garments. Lay the garments on the ground, end to end, and pass the poles through the sleeves (Fig. 5-15).

"Moving quickly may save a few seconds, but the increased risk of dropping the patient is not worth it. Lifting and lowering a patient should be done with slow, controlled movements. Walking at a brisk pace is generally the fastest medics should transport a patient."

-Håkan Geijer[91]

Figure 15. Improvised Litter Using Jackets.



5-10. **MANUAL LIFTS, CARRIES & DRAGS**. Manual lifts, carries, and drags are used to evacuate casualties without the use of litters, stretchers, or vehicles. Care must be exercised when employing manual evacuation techniques, because carrying a casualty will significantly slow you down. If the scene is not safe, this could expose you to injury.

WARNING

Do NOT use manual carries to move a casualty with a neck or spine injury, unless a life-threatening hazard is in the immediate area. Seek medical personnel for guidance on how to move and transport the casualty.

a. ***Lifts***. A **lift** is a technique that brings a casualty from a prone position to a sitting position and from a sitting position to a standing position. Lifts are used to place a casualty onto a stretcher or litter or to get a casualty into position where they can be dragged or carried. There are three main lifts: the trunk-leg lift, the shoulder-belt lift, and the side-by-side lift. To be effective, all of these lifts should be performed with two rescuers.

I) **Trunk-Leg Lift**. The trunk-leg lift (also called the fore-aft lift; see Fig. 5-16) is an effective lift that can be used to load a casualty onto a stretcher or transition into a carry. To perform this lift:

i) A rescuer crouches behind the casualty, facing the same direction. The rescuer reaches under the casualty's armpits, then grabs the casualty's wrists. The rescuer then pulls their arms up and back, bringing the casualty's arms against their chest.

91 *Riot Medicine*. 68.

ii) The other rescuer crouches in front of the casualty, facing the same direction. The rescuer backs up into the casualty's legs, then reaches behind them and lifts the casualty's knees. If the rescuer needed a hand free, the rescuer could cross the casualty's legs at the ankles and lift both legs using their support hand. On a signal, each rescuer stands.

II) **Side-By-Side Lift**. The side-by-side lift (also called the chair lift; see Fig. 5-17) is the best lift for loading casualties onto stretchers or litters or into ambulances. To perform this lift:

i) Each rescuer crouches beside the casualty. The rescuer to the casualty's left places their right arm under the casualty's left arm and grabs the casualty's left wrist, and the rescuer to the casualty's right places their left arm under the casualty's right arm and grabs the casualty's right wrist.

ii) Each rescuer grabs behind the casualty's knees with their free hand. On a signal, each rescuer stands.

III) **Shoulder-Belt Lift**. The shoulder-belt lift (see Fig. 18) is used to bring a casualty to their feet for the Hawes carry (later in this section). It can also transition into the shoulder-belt carry (also called the SEAL Team 3 carry), which allows for very quick movement, even over rough terrain, and leaves each rescuer one free hand. To perform this lift:

i) A rescuer stands on either side of the casualty and lifts the casualty to a seated position.

ii) Each rescuer places one of the casualty's arms over their shoulder. The rescuer on the casualty's left side grabs the casualty's wrist with their left hand and grabs the casualty's belt or pants with their right hand. The rescuer on the casualty's right side grabs the casualty's wrist with their right hand and grabs the casualty's belt or pants with their left hand.

iii) On a signal, each rescuer stands, pulling the casualty to their feet. To transition into the shoulder-belt carry, both rescuers move with the casualty, who lets their feet drag.

Figure 16. Trunk-Leg Lift.

"During patient evacuation, it is important to protect patients. This usually only means protecting them from arrest and identification during evacuation. Journalists may try to film or photograph patients for their story, and fascists may try to do the same for the purposes of doxxing. In some regions, police film protesters to use later in prosecution for rioting or property destruction."

-Håkan Geijer[92]

92 *Riot Medicine*. 75.

Figure 5-17. Side-by-Side Lift.

Figure 5-18.Shoulder-Belt Lift.

Figure 5-19: The Basic Drag.

Figure 5-20. Neck Drag.

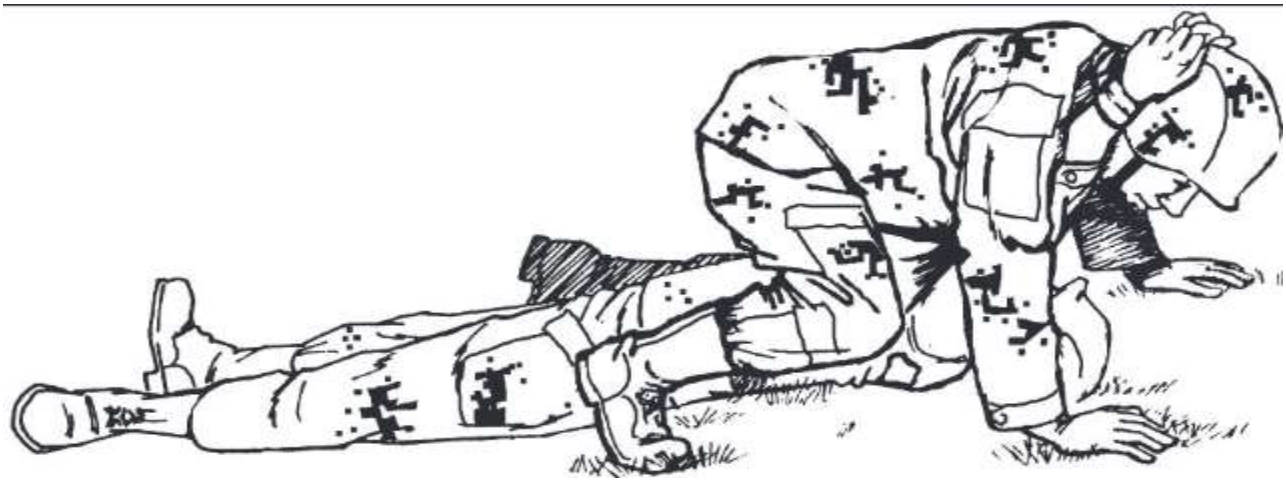


Figure 5-21. Cradle Drop Drag.

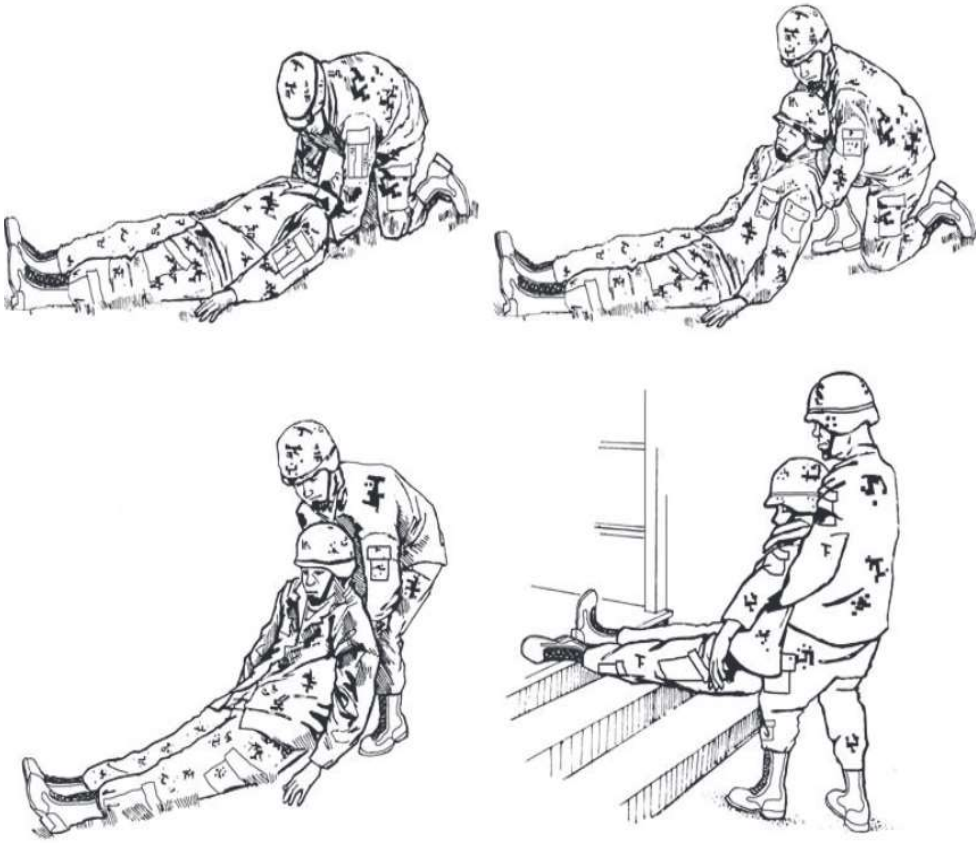


Figure 5-22. Fireman's Carry

Figure 5-23. Hawes Carry.

b. ***Drags***. If the casualty has not suffered a spinal injury, the simplest and fastest type of manual evacuation is a drag. A drag is a type of carry that does not lift the casualty off of the ground. Instead, drags use straps, ropes, or the casualty's clothing to pull the casualty to safety (see Fig. 19). The basic drag is not useful in certain circumstances; for example, it is ineffective if hostile suppressing fire prevents you from standing. There are two drag techniques that should be used if the basic drag is not appropriate: the neck drag and the cradle-drop drag.

l) **Neck Drag**. The neck drag should only be used in emergencies to move a casualty a short distance. It should not be used if the casualty has a broken arm or if you suspect the casualty has suffered and injury to the head, neck, or spine. To perform the neck drag carry (Fig. 20):

i) Place the casualty on their back.

ii) If the casualty is conscious and aware, direct them to clasp their hands together. Otherwise, you will need to tie or tape the casualty's wrists together.

iii) Facing the casualty, straddle them and kneel. Loop the casualty's arms over and around your neck.

iv) While facing forward, begin to crawl, dragging the casualty with you.

CAUTION

Do NOT use the neck drag if the casualty has a broken arm or a suspected neck injury.

l) **Cradle-Drop Drag**. The cradle-drop drag can be used to evacuate an immobile casualty up or down stairs or inclines. To perform the cradle-drop drag (Fig. 5-21).

i) Place the casualty on their back.

ii) Kneel at the casualty's head such that you are facing their feet. Slide your hands under the casualty's shoulders and firmly grasp their armpits.

iii) Bring the casualty into a semi-sitting position, then stand and start dragging the casualty backward. Move up and down stairs or inclines backward, allowing the casualty's legs drop from step to step while you support their head and neck with your forearms.

c. ***Carries***. Carries are the best option to move casualties over long distances as they are more comfortable for the rescuer and the casualty. Any lift can transition into a carry by moving after lifting the casualty; the fore-aft carry, shoulder-belt carry, and side-by-side carry should be self-explanatory. However, there are times when only one rescuer will be available to evacuate a casualty. In these circumstances, the two most effective carries are the **fireman's carry** and the **Hawes carry**.

l) **Fireman's Carry**. The fireman's carry is the most commonly-taught method of carrying an unconscious or immobile casualty. If the casualty is carrying a substantial amount of gear or equipment, they will be much harder to lift and carry. For heavier and fully-equipped casualties, use the Hawes carry. To perform the fireman's carry (Fig. 5-22):

i) Kneel beside the casualty's uninjured side.

ii) Place the casualty's arms over their head, then cross the casualty's injured-side ankle over the casualty's opposite ankle.

iii) Place one of your hands on the casualty's far shoulder and the other hand on their hip or thigh. Roll the casualty toward you so that they are on their stomach.

iv) Straddle the casualty, place your hands under the casualty's chest, and move backward, lifting the casualty onto their knees.

v) Continue to move backward until the casualty's legs are straight, then walk forward,

bringing the casualty into a standing position.

vi) While one arm maintains support of the casualty, grab the casualty's wrist and raise their arm Pass your head under the casualty's raised arm, releasing the casualty's wrist as you pass under it.

vii) Face the casualty, secure your arms around the casualty's waist, and place your foot between the casualty's feet.

viii) Grab the casualty's wrist again and raise their arm. Bend down, and while pulling the casualty's arm over your shoulder, pass your other arm between the casualty's legs. The casualty will be pulled over and onto your shoulders.

ix) While still holding on to the casualty's wrist, use your other hand to push off from your knee into a standing position.

II) **Hawes Carry**. The Hawes Carry (also called the “Modified Fireman” or “Backpack” carry) is best-suited for a situation when only one medic is available to carry a casualty. Furthermore, since the casualty's weight is on the medic's hips instead of their back, it is easier for the medic to carry to casualty over long distances. To perform the Hawes Carry (see Fig. 10):

i) Bring the casualty to a standing position using the Shoulder-Belt Lift or another lift, as appropriate.

ii) Pass under the casualty's arm and move in front of the casualty, your back against the casualty's chest.

iii) Drape the casualty's arms over your shoulders, crossing their wrists in front of your neck. Hold the casualty's arms in place while you lean forward, taking the casualty's weight on your hips and lifting their feet off of the ground.

Section III. HYGIENE AND SANITATION.

One of the greatest risks of austere conditions is the spread of disease due to poor sanitation. Power outages will turn refrigerators into biohazards. Uncollected garbage will attract rats. Standing water will allow mosquitoes to breed. Lack of working plumbing will make excreta disposal an immediate concern; Human feces and urine, in addition to their unpleasant odor, can spread pathogens like *Giardia* and *Cryptosporidium*, and must be disposed of in a safe and hygienic manner where it will not contaminate food or water supplies.

"Bathing is important. And there's a number of good reasons to bathe. One, the stench of body odor is unpleasant, it can lead to social ostracization. But two, your health and well-being as well, it's possible to get a bacterial or fungal infection on the folds of your skin if you don't regularly bathe. That's not pleasant."

-Srsly Wong[93]

5-11. **PERSONAL HYGIENE**. In the absence of running water, the average Westerner will find maintaining their normal standards of personal hygiene difficult. Beyond issues of aesthetics, proper hygiene is critical because poor hygiene can lead to parasitic infestation, infection, and disease. Appropriate personal hygiene consists of **skin care**, **oral hygiene**, and **foot care**.

a. ***Skin Care***. Appropriate skin care is not a matter of vanity; it is a serious element of operational readiness. It is likely that in the aftermath of an event that has created austere conditions, you will be forced to dispose of extraordinarily dangerous and disgusting substances, whether rotted food or carcasses, industrial chemicals, or medical waste. Even without these threats, environmental factors are always present. In cold and dry conditions, the skin will become dry and start to crack,

93 *Papa & Boy*, S1E1 (2022).

allowing bacteria and viruses to enter your body. During hot and humid conditions, dampness and moisture can cause skin irritation and fungal infection. Exposure to wind and sun can cause skin to painfully chap and peel. Protecting yourself from these risks requires regular and effective bathing, hand washing, and sun protection.

l) **Skin Conditions**. Poor hygiene can lead to painful and debilitating conditions of the skin. Avoid these conditions in order to always be prepared to act.

i) *Fungal Infections*. **Tinea cruris**, **tinea pedis**, and **tinea versicolor** (better known by their colloquial names, "**jock itch**," "**athlete's foot**," and "**ringworm**") are common infections of the skin caused by different species of fungus.

a) Signs & Symptoms of Fungal Infections. Fungal infections are characterized by an itchy and red (erythematic) scaly or flaky rash around the affected area.

b) Treatment of Fungal Infections. Apply an anti-fungal medication to the affected area according to the manufacturer's instructions, if available (if the instructions are not available, then apply the medication three times a day over the affected area until it resolves). Keep the area clean and dry while maintaining your normal bathing routine. Do not wear tight-fitting clothing over the affected area.

ii) *Trench Foot*. Trench foot (or "immersion foot") is a condition in which a body part (usually one or both feet, hence the name) is exposed to excessive dampness for a prolonged period of time, which damages the capillaries near the affected area. Left untreated, trench foot can lead to fatal infections. The best way to prevent trench foot is by following appropriate foot care techniques.

a) Signs & Symptoms of Trench Foot. The affected area will be itchy, then numb, and might appear blue or gray. The affected area will be swollen, might be blistered, and in advanced cases will have a strong, unpleasant smell.

b) Treatment of Trench Foot. Do not wet the affected area. Dry it by exposing it to warm air. Do not use the affected limb.

iii) *Parasitic Infestation*. Insects are all around us, especially when we operate in the outdoors; many of these, like fleas, ticks, chiggers, or lice, would likely choose us as hosts, but by regularly bathing and changing clothes, we prevent them from digging in and spreading. In the absence of effective hygiene, parasitic infestations can spread among personnel in close proximity to one another, causing discomfort and disease.

a) Signs & Symptoms of Parasite Infestation. Parasitic insects can transmit a stunning variety of diseases, most notably plague, through fleas, and Lyme, through ticks. Aside from the conditions they carry, parasitic infestations are usually characterized by itching and red marks or rashes around the affected area.

b) Treatment of Parasitic Infestations. Stop the infestation before it starts by using a DEET-based insect repellent[94]. If you have been operating outdoors,

94 "Despite the substantial attention paid by the lay press every year to the safety of DEET, this repellent has been subjected to more scientific and toxicologic scrutiny than any other repellent substance. The extensive accumulated toxicologic data on DEET have been reviewed elsewhere. DEET has a remarkable safety profile after 40 years of use and nearly 8 billion human applications. Fewer than 50 cases of serious toxic effects have been documented in the medical literature since 1960, and three quarters of them resolved without sequelae. Many of these cases of toxic effects involved long-term, heavy, frequent, or whole-body application of DEET. **No correlation has been found between the concentration of DEET used and the risk of toxic effects**. As part of the Reregistration Eligibility Decision on DEET, released in 1998, the Environmental Protection Agency reviewed the accumulated data on the toxicity of DEET and concluded that "normal use of DEET does not present a health concern to the general U.S. population." When applied with common sense, DEET-based repellents can be expected to provide a safe as well as a long-lasting repellent effect. Until a better repellent becomes available, DEET-based repellents remain the gold

check your body regularly. Have a comrade check your back and the top of your head. Remove ticks with tweezers by gripping as close to their jaws as possible and apply steady pressure until the entire tick comes off; do not jerk. Kill lice, fleas, and chiggers by washing clothing and bedding in boiling water.

II) **Bathing**. Bathing or showering at least once a day is the easiest way to keep your skin clean, but under austere conditions, that might not be possible. When running water is not available, keep yourself clean with soap and a wet washcloth. The entire body can benefit from thorough cleaning, but if time is a factor, focus on cleaning areas that get sweaty or chafed, particularly:

- The feet, especially in between the toes;
- The crotch and buttocks;
- Armpits; and
- Breasts.

III) **Hand Washing**. Hand washing is a fundamental component of basic hygiene, and is essential to maintaining personal health and readiness. Wash your hands frequently, not neglecting between the fingers and under the fingernails, using soap and drinkable water. If drinkable water is not available, use an alcohol-based sanitizer after removing dirt and grime with a cloth. Wash your hands:

- Before preparing or consuming food or drink;
- After touching your face, mouth, or genitals, an animal, or any damp or dusty surface;
- After urinating or defecating;
- Before coming into contact with the very young, the very old, or the sick; and
- After handling human or animal remains, blood, or waste or volatile chemicals.

IV) **Sun Protection**. Excessive exposure to the sun's ultraviolet rays can cause a painful condition called **sunburn**, and over the long term, can lead to skin cancer. Always use appropriate sun protection when operating outdoors; this includes hats, long pants and shirts, and sunscreen on exposed skin.

b. ***Oral Hygiene***. In a post-Collapse environment, access to running water might make regular brushing and flossing difficult. Make every effort to maintain an oral hygiene regimen, regardless of the circumstances, to avoid tooth decay and gum disease.

I) **Oral Conditions**. Diseases of the mouth include tooth decay and gum disease. While the mild versions of these conditions are merely inconveniences, if they are allowed to become severe they can lead to fatal infections.

i) *Tooth Decay*. Bacteria and the saliva in our mouths react with the food we eat to create acids, which causes the food to break down for easier digestion. If those acids stay on our teeth, they will, over time, cause the enamel that covers our teeth to erode, exposing the nerve at the root of the tooth. These holes are called **cavities**.

a) Signs & Symptoms of Cavities. The affected tooth will be discolored and may be painful, especially when exposed to heat or cold. Left untreated, bacteria will infect the exposed nerve, leading to a potentially fatal infection.

b) Treatment of Cavities. The best treatment for cavities is prevention. Thoroughly brushing and flossing daily is the most effective way to stop cavities

standard of protection under circumstances in which it is crucial to be protected against arthropod bites that might transmit disease." Fradin, Mark and John Day. "Comparative Efficacy of Insect Repellents against Mosquito Bites." *New England Journal of Medicine*, 347 (2002). Emphasis added.

from developing. Once a cavity has formed, it cannot be reversed; it must be filled or the tooth must be removed.

ii) *Gum Disease*. Gum disease results from bacterial infections of the gums. Any of the various forms of gum disease lead to redness and inflammation.

a) Signs & Symptoms of Gum Disease. The most common gum disease, **gingivitis**, causes the gums to swell and bleed; more serious gum disease, called **periodontitis**, cause the gums to pull away from the teeth, which leads to the teeth loosening and falling out.

b) Treatment of Gum Disease. As with cavities, the best treatment for gum disease is prevention. Maintain an appropriate oral hygiene regimen and avoid oral tobacco products.

II) **Oral Care**. An appropriate oral hygiene regimen includes regularly flossing and brushing the teeth.

i) *Flossing Teeth*. Flossing is a fast and effective way to remove large and small particles of food from between your teeth. You should floss at least once a day, but preferably after each meal.

ii) *Brushing Teeth*. Brushing your teeth using toothpaste and a soft-bristle brush will remove the acids that eat the enamel on your teeth. Brush for at least two minutes, making small circles over your teeth with the bristles. After brushing, do not eat or drink anything for at least 30 minutes.

iii) *Austere Oral Care*. As long as you still have commercially-made toothpaste and floss, use them, even without running water. When you run out, you can make an effective toothpaste by mixing a small amount of water with baking soda (sodium bicarbonate) and forming a paste. Rub this paste around your teeth with your finger, and do not neglect the teeth in the back of your mouth. Gargle daily with salt water, which will help keep your gums clean and wash out any food particles stuck between your teeth. If you have paracord, you can use the internal strands as floss.

c. ***Foot Care***. Wash your feet regularly, and dry them thoroughly, using anti-fungal foot powder, if available. Change out of wet or sweaty socks as soon as possible, and allow boots or socks to dry before using them again. Be aware of "hot spots," or red, painful areas on your feet that might become blisters; use moleskin or an adhesive bandage to cover the spot.

I) **Blisters**. Blisters are not only painful, they can lead to infection. Poorly-fitting footwear is a frequent cause of blisters. If a blister forms, do not pop it. If it pops, allow it to drain and pat the area dry before cleaning the area and covering with a dressing.

5-12. **SANITATION**. **Sanitation** refers to "the appropriate and hygienic disposal and treatment of all solid waste and unhealthy human waste, such as sewerage and drainage."[95] Sanitation should not be an incidental consideration; proper sanitation is essential to prevent disease and poor morale.

a. ***Excreta Disposal***. In the West, what happens to our waste after it leaves our bodies is artfully concealed from us, but without functional plumbing, it would immediately become visible. If austere conditions persist longer than approximately 8 hours, a waste-management solution that effectively and safely disposes of urine and feces will have to be implemented.

I) **Urine Disposal**. Urine can be safely disposed of without treatment. Therefore, in austere conditions, people should be encouraged to urinate separately from defecating and to avoid mixing the two as much as is practical. Mixing urine with feces significantly increases the volume of waste that must be disposed at any one time.

95 TC 4-02.3. 2-4.

II) **Feces Disposal**. The simplest method of feces disposal is to line the bowl of a normal household toilet with plastic (or paper, if practical, to encourage decomposition) and defecate normally. Spread disinfectant, like chlorinated lime or chlorine bleach) over the feces, then remove the liner from the bowl and tie it closed. Dispose of the bag in a container, like a bucket with a gasketed screwtop lid, and seal the container. Sprinkle baking soda (or commercial deodorizer) as necessary to manage the odor (if using a paper liner, cover with a layer of sawdust, small wood chips, finely shredded paper, or coffee grounds to decrease odor and accelerate decomposition). Empty the bucket when the smell becomes unmanageable or the volume of waste nears the one-quarter mark.

i) If a household toilet is not available, the principle can be applied to a 5-gallon bucket: instead of depositing the liner from the toilet bowl into the bucket, the liner starts in the bucket and stays there. Household toilet seats can be affixed to these buckets, and aftermarket seats designed to fit on the buckets are available. Treatment and disposal of waste for a bucket toilet are identical to the household toilet.

ii) Exercise extreme care when disposing of human feces. Fecal matter carries bacteria, and if allowed to come into contact with drinking water, can lead to serious, community-wide illnesses. If the State has retained the capacity to set up a waste-disposal facility, utilize it; otherwise, you will need to dig a latrine.

III) ***Latrines***. Your latrine site should be as far as practical, but at least 60 meters, from any water source, road, or residence. Places near briars or thorns that might prevent others from disturbing the site are ideal. Dig a hole at least 20 centimeters deep (or deeper, depending on the volume of waste), and empty the contents of the bucket into the hole. Cover the latrine with dirt and soil, and be sure to disinfect your hands after handling the waste bucket. When digging a latrine, always adhere to “Leave No Trace” principles:

- Minimize the chance of water pollution.
- Minimize the spread of disease.
- Minimize aesthetic impact.
- Maximize decomposition rate.

Section IV. HEALTH & WELLNESS.

In CIDA, utilities like power and heat will fail, or might only be available on a sporadic basis. The absence of these utilities will expose us to threats that most of us living in the West cannot comprehend. In the event of a power failure, water treatment plants can no longer process and disinfect water. Refrigerators and freezers will stop running, and food will spoil. Being able to provide for your most basic needs in the hours and days after a disaster is not as exciting as shooting a gun or applying a tourniquet, but will keep more of your neighbors and comrades alive.

5-13. **WATER REQUIREMENTS**. In the West, we are fortunate beyond the comprehension of generations past to have virtually unlimited access to clean water and safe food. Of course, as residents of Flint, Michigan know, that access is precarious. Everyone who has lived through a natural disaster or destructive weather event knows that clean water surges to the top of the list of priorities. In the event of a power failure, water treatment plants can no longer process and disinfect water, meaning the safety of formerly-trusted water sources can no longer be guaranteed. In cool weather and during periods of non-strenuous activity, an adult needs between 3 and 4 liters of water a day for drinking, washing, and food preparation. As the temperature increases and the labor becomes more taxing, daily water requirements rise as you will lose more water to sweat (Table 5-2):

Table 5-2. Water Requirements In Hot Weather.

Heat Category	***WBTI[†] (°F)***	***Easy Work***		***Moderate Work***		***Strenuous Work***	
		Work/Rest (min)	Water Intake (qt/h)	Work/Rest (min)	Water Intake (qt/h)	Work/Rest (min)	Water Intake (qt/h)
1	78-81.9	No Limit	0.5	No Limit	0.75	40/20	0.75
2	82-84.9	No Limit	0.5	50/10	0.75	30/30	1.0
3	85-87.9	No Limit	0.75	40/20	0.75	30/30	1.0
4	88-89.9	No Limit	0.75	30/30	0.75	20/40	1.0
5	>90	50/10	1.0	20/40	1.0	10/50	1.0
[†]Wet Bulb Globe Temperature							

a. ***Dehydration***. Insufficient water intake can lead to dehydration. Dehydration is a serious condition which can lead to dizziness, fatigue, nausea, headache, and eventually death. Signs of dehydration include:

- Low urine output or dark, strong-smelling urine;
- Dark, sunken eyes;
- Irritability;
- Inelastic skin;
- Delayed capillary refill in the fingernail bed; and
- “Trench line” down the center of the tongue.

I) Thirst is **not** a reliable sign of dehydration. By the time you are feeling thirsty, you are already dehydrated.

II) If you become dehydrated:

i) Drink plain water or water with an added electrolyte solution of 10 parts sugar and one part salt into one liter of water.

ii) Do not attempt to rehydrate by drinking alcohol, urine, blood, or saltwater.

a) *Alcohol*. In addition to its mind-altering effects, alcohol will cause further dehydration.

b) *Urine*. Urine can be distilled, but should not be consumed because of its high salt content, which will cause further dehydration.

c) *Blood*. Blood is likewise too salty to quench thirst, and its high protein content requires water for digestion.

d) *Saltwater*. Never drink salt water without distilling it first.

5-14. **WATER HAZARDS**. There are three primary hazards in drinking water: **pathogens**, **chemical contaminants**, and **physical contaminants**. Each contaminant poses its own risks, and each requires a different method of treatment.

a. ***Pathogens***. Pathogens include bacteria, viruses, and microscopic worms or single-celled organisms that can cause illness or death. The most common waterborne pathogens are *Giardia* and *Cryptosporidium,* tiny parasites found in untreated water. *Giardia* and *Cryptosporidium* take root in the

intestine, causing severe diarrhea that can lead to dehydration and death. Other waterborne pathogens can cause cholera, dysentery, or hepatitis A. Some of the larger pathogen-carrying organisms can be removed from water by filtration, but all can be killed by boiling.

b. ***Chemical Contaminants***. Chemical contaminants include pesticides, solvents, oils, or heavy metals like lead, mercury, and cadmium. Some heavy metals can be removed through filtration, but distillation is the only sure way to render chemically-contaminated water safe to drink.

c. ***Physical Contaminants***. Physical contaminants include dirt, leaves, silt, sand, or mud, and can result in turbid (cloudy) or bad-tasting water. Physical contaminants can be removed from water through straining and filtration.

5-15. **WATER STORAGE**. You should store, at a minimum, 15 gallons per resident in your household. Storing potable water is far easier and safer than attempting to find and treat questionable water. Use food grade plastic containers (PETE or HDPE, and keep the containers covered at all times. In his magisterial *Nuclear War Survival Skills*, Cresson Kearny writes that "Polyethylene trash bags make practical expedient water containers when used as waterproof liners inside smaller fabric bags or pillowcases."[96] If you use plastic trash bags to store or transport water, you can increase the durability of the bags by covering them with overlapping strips of duct tape[97]. If you have a bathtub, line it with trash bags or clean plastic sheeting, and tape the trash bags or plastic to the side of the tub. Fill the tub as full as you can manage, and use this water for washing, flushing, or even cooking (with proper treatment).

5-16. **WATER SOURCES**. It is easier and safer to collect water before you need it, rather than attempting to find and treat water in the aftermath of a disaster. That said, if you need to supplement your stores, it is possible to collect water, most of it perfectly drinkable, from various locations in your vicinity.

a. ***Municipal Sources***. If you have access to your main water shutoff valve, you can collect the water that was already in your pipes when the power went down. Turn off the water at the street, which will prevent the water in your pipes from flowing back into the water main. It will also prevent any contaminated water from entering your pipes. Next, place a bucket or other container under the faucet at the lowest level of your residence, and open the faucet. Then, open the faucet of the sink at the highest level of your residence. Air will flow into the upper faucet, pushing the water out of the lower faucet. You can also get a small amount of water from a residential heater. Water heater tanks will have a release valve near the bottom. Open this valve and collect the water in a bucket or other container.

b. ***Precipitation***. A common and low-effort method of obtaining water is by collecting rain or snow.

I) **Rain**. Any impermeable material can be used to collect rainfall. Large tarps or plastic sheets can be spread out and suspended over water containers. Make a small incision in the center of the tarp or sheet directly above the container. When it rains, water will run down the sheet into the water container. One millimeter of rainfall will yield approximately ¾ of a liter of water per square meter of collection area. Rainwater collected in this way does not have to be treated, but rain that has fallen off of leaves, rocks, or structures should be considered unsafe and does require treatment.

II) **Snow**. You can also drink snow, but it must be melted first. Eating snow will lower your core body temperature, which could be lethal. Melt snow by collecting it in a metal or glass container and placing it near a fire or heat source; alternatively, collect it in a plastic container and put the container between layers of clothing.

96 (2015 [1986]). 66.

97 But if you thought to store that much duct tape, you probably though to store some more appropriate water containers.

III) **Ice**. Ice can also be a good source of drinking water, but, like snow, must be melted before being consumed. Don't assume it is safe just because the ice is clear; ice is no safer than the water it comes from. If you are near the coast, sea ice contains salt, and must be distilled before consumption.

5-17. **WATER TREATMENT**. Treating water means making it safe to drink by removing or neutralizing any potential hazards. There are three primary methods of water treatment: **filtration**, **disinfection**, and **distillation**.

a. ***Filtration***. Coarse filtration is one of the easiest methods of treating water. Even if filtration is insufficient to remove many of the smaller contaminants, rendering cloudy or muddy water clear is an important first step in all other treatment methods.

I) **Straining**. The fastest and least effective method of filtration is to pour the water through a handkerchief or other finely-woven cloth. This will remove dirt, mud, stones, or other debris from the water, but will not eliminate disease-carrying organisms or dangerous metals.

II) **Soil Filtration**. A soil filter is a more robust method of filtration than straining, and is effective at removing large contaminants, but will not eliminate disease-carrying organisms or dangerous metals. To construct a soil-based filter, you will need the following components:

- A 5-gallon bucket or other similarly-sized plastic container;
- Two pieces of burlap or coarsely-woven cloth between 5-8 centimeters larger than the bottom of the bucket;
- Small stones, pebbles, twigs, steel wool, or twisted wire;
- Fine soil (clayey rather than sandy; the soil can be crushed or pounded into a finer mixture)

i) Punch 12 evenly-spaced holes 5 centimeters away from the center of the bottom of a the bucket. Punch the holes from the bottom upward.

ii) Cover the bottom of the bucket with a 2-4 centimeter layer of small stones, pebbles, twigs, steel wool, or twisted wire. Cover that layer with one of the pieces of cloth. Cover the cloth with soil, gently pressing the soil into the sides of the cloth to keep it pushed against the bucket. Place the second piece of cloth on top of the soil, and place enough small rocks or pebbles on top of the cloth that it will remain in place when the water is poured onto it.

iii) The filter should be elevated above a suitable storage container. After straining your water, slowly pour it over the top layer of cloth. You can determine the effectiveness of the filter based on the amount of time it takes to collect water. If you collect more than 1 liter in 10 minutes, remove the top cloth layer, add additional soil, and repack the layer. If you are collecting less than 5 liters of water per hour, remove the top cloth layer and scrape off a centimeter of soil. The soil in this filter should be replaced every 50 liters.

III) **Commercial Filters**. Filters are available from several commercial vendors. These filters operate on the same principle as the soil filter, forcing the water through narrow openings that are too small to allow foreign particles to pass. Before purchasing a commercial filter, verify that the manufacturer has included third-party testing data, which will indicate how well the filter works against bacteria, viruses, and other contaminants. Many commercial filters will only filter out bacteria.

b. ***Disinfection***. While filters remove contaminants, disinfection kills living organisms that might be in the water. There are three ways to disinfect water: **boiling**, **chemical treatment**, and **solar disinfection** (**SODIS**). These methods of disinfection will not remove chemicals or heavy metals from the water.

I) **Boiling**. The most straightforward way to disinfect water is by boiling. One minute of rolling boil will kill all disease-carrying organisms, but if you have the fuel to spare, keep the boil for at least 10 minutes, just to be safe. If you suspect the presence of lead or other heavy metals in your water, boiling will only increase the risk by concentrating the contaminants in a smaller volume.

II) **Chemical Disinfection**. One of the fastest and lowest-effort methods of water treatment is to use chemicals to kill viruses, bacteria, and other disease-causing organisms. Commercially-available water purification tablets usually contain either chlorine dioxide or iodine. Iodine is effective against all waterborne organisms except *Cryptosporidium.* Most commercial iodine-based tablets include an additional dose of Vitamin C, which neutralizes the iodine taste. Chlorine dioxide will kill *Cryptosporidium,* but may take up to four hours.

i) *Disinfection with Household Bleach*. If you do not have water purification tablets, you can use household bleach to disinfect your water. Household bleach will not kill *Cryptosporidium*.

a) In America, most household bleach is a 6% solution of sodium hypochlorite. Add 8 drops from a medicine dropper (0.5mL) of 6% sodium hypochlorite bleach into one gallon of clear (strained or filtered) water, stir well, and allow to sit for at least 30 minutes.

b) If the water is murky and a filter or strainer is not available, double the amount of bleach. If the bleach is a higher concentration (one common concentration is 8.25%), multiply the dose rate by 0.75 (6 drops for one gallon of clear water, 12 for murky).

III) **Solar Disinfection**. Solar disinfection (SODIS) is time-consuming and labor-intensive, but its effectiveness has been demonstrated over and over again in developing nations[98]. This method is most effective in areas that receive at least six hours of uninterrupted sunshine every day. SODIS operates based on the principle that exposure to heat and ultraviolet light kills waterborne organisms. To use SODIS, fill transparent containers with water and expose them to direct sunlight for at least six hours. Glass or plastic containers are used most frequently. Polyethylene-terephthalate (or PET) plastic is the best option for this method of water treatment, as other plastic compositions admit less ultraviolet light. To increase the efficacy of SODIS, the containers should be placed on a reflective surface, like corrugated aluminum or even aluminum foil (see Fig. 5-24). As with other water treatment methods, the water should be run through a filter or strainer prior to starting SODIS.

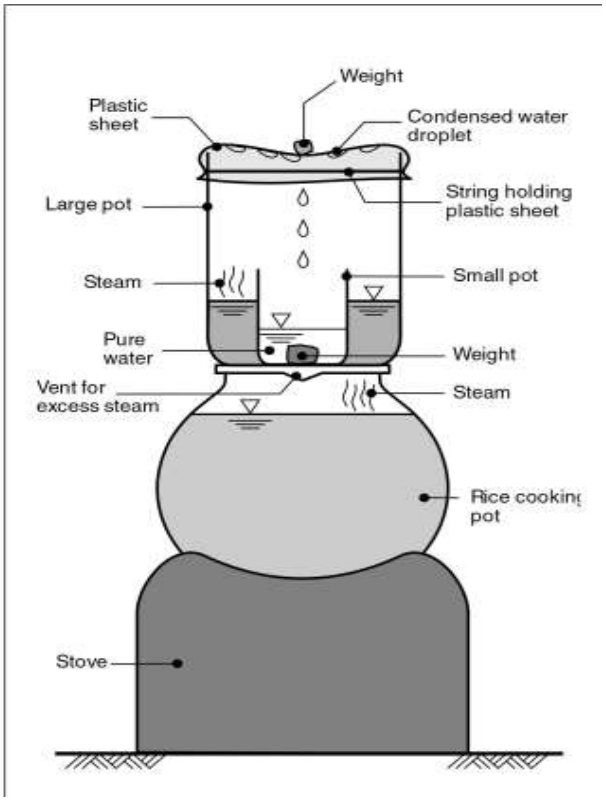
Figure 5-24. SODIS

98 McGuigan, Kevin, *et al.* "Solar Water Disinfection (SODIS): A Review from Bench-Top to Roof-Top." *Journal of Hazardous Materials* (2012).

c. ***Distillation***. All water treatment methods described so far depend on removing contaminants from water, but there are occasions where this is impossible. Boiling salt water or water contaminated with pesticides or fuels will not remove contaminants, nor can the contaminants be rendered inert by exposure to sunlight or chlorine. In these cases, removing the water from the contaminants, rather than the other way around, is the only way to treat the water. The process of separating pure water from contaminated water is called **distillation**. Distillation works by heating the water to a boil, then catching, cooling, and collecting the steam that rises from the water. The steam is pure water; contaminants, like salt or chemicals, will stay behind. A device for distilling liquids is called a **still**. Stills can be constructed from relatively simple materials, but the process is too involved for this chapter. Instead of building a still, a stovetop still can be improvised out of one small pot and one large pot.

l) **Stovetop Stills**. Place the small pot in the center of the large pot, and fill the large pot with untreated water until it reaches the lip of the small pot (it will be necessary to place a rock in the center of the small pot to keep it from floating to the top of the water). Stretch a sheet of plastic over the top of the large pot and secure it to the pot using a string or rubber band. Place a small rock or weight in the center of the sheet to create a cone pointing to the small pot (see Fig. 5-25). Alternatively, you can invert a pot lid and place it over the large pot, as long as the pot is covered. Slowly heat the water in the large pot. It will not take much heat for the water to begin to evaporate, where it will turn to steam, collect on the pot covering, and run down to the point of the cone, where it will drip into the collection pot. This method is effective and simple, but requires some fuel to generate heat, which can be difficult to find after a disaster. If limited quantities of fuel are available, then the stovetop still can be used in conjunction with other cooking tasks; in Fig. 5-25, the stovetop still is perched on top of a pot of cooking rice. As the rice is cooked, the excess heat is captured to distill the water.

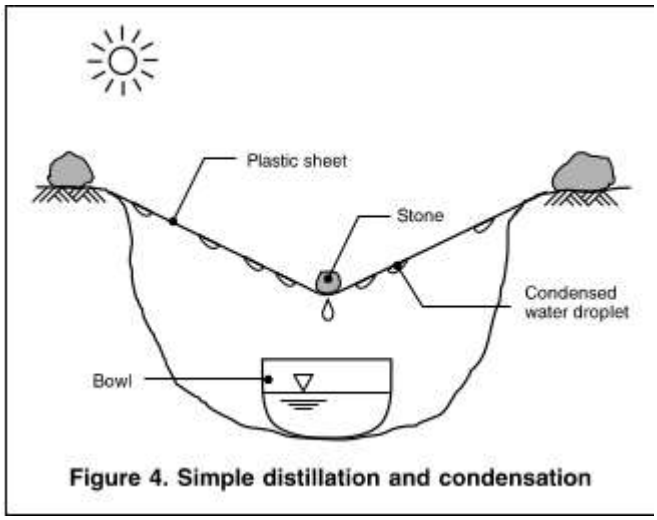
Figure 5-25. Stovetop Still.[99]



99 Smith, Michael & Rod Shaw. “Desalination.” *Technical Brief No. 40*, WELL.

II) **Solar Stills**. If no fuel is available, then you can still harness distillation to obtain clean water. A passive solar still works in the same way as the stovetop still, but uses sunlight instead of a stove. To construct a solar still, dig a pit in the ground approximately one meter wide and half a meter deep. In the center of the pit, place a pot, cup, or other container to collect water. Stretch a sheet of clear plastic over the pit, and secure the sheet in place with rocks or dirt. In the center of the sheet, directly over the pot, place a small rock or other weight. As the sunlight hits the dirt, water will evaporate, collect on the sheet, and run down the sheet until it drips into the pot.

Figure 5-26. Solar Still[100]



5-18. **FOOD SAFETY**. Lack of refrigeration can cause food to spoil, leading to potentially serious illnesses. Adhere to the following food safety guidelines at all times to prevent infection and disease.

a. ***Basic Food Safety Guidelines***.

- Anyone involved in food service must wash their hands before and after touching a food preparation surface.
- Cold foods must be served and stored at internal temperatures < 4° C (40° F). Hot foods must be served and stored at internal temperatures > 65° C (145° F).
- Discard any meat, poultry, fish and shellfish, and dairy products that have been left unrefrigerated for more than 2 hours.
- Raw fruits and vegetables must be washed in potable water. They should be disinfected by submerging them for at least 15 minutes in a solution of 1 Tablespoon of household bleach per gallon of water. Break apart leafy vegetables like heads of lettuce or cabbage to ensure full contact. Afterward, rinse thoroughly in potable water.
- Food in properly-sealed aluminum cans is likely safe, but do not eat from any can that is dented, pierced, or rusted.

5-19. **FATIGUE**. During moments of crisis, adrenaline makes rest impossible. All the same, whenever possible, try to sleep. Lack of sleep will seriously impair your functioning. As much as you are able, get between seven and eight hours of sleep during each 24-hour period. If necessary, you may break up this period of sleep into several smaller periods. Avoid using alcohol or cannabis as a sleep aid; while these will tranquilize the body, they will prevent you from entering into the most restful periods of sleep, and might prevent you from quickly waking, if necessary. If sleep is impossible, you can

100 Ibid.

maintain alertness for up to an additional 24 hours by ingesting 200 to 300 milligrams of caffeine every two to three hours, but this is not sustainable over the long term.

Section V. CBRN AGENTS.

Ever since green clouds rolled over the trenches in Ypres, chemical, biological, radiological, or nuclear (CBRN) agents, or, more broadly, chemical weapons (CW) have held a ghastly place in conflict of all intensities. The reality is, these weapons are out there, and understanding them will make them less fearsome. More importantly, many of the by-products of modern convenience are highly toxic. Having a strong understanding of CBRN agents and CW attacks will leave you better prepared to respond to an industrial accident or spill.

5-20. **CHEMICAL AGENTS. Chemical agents** are a class of CW that includes manufactured or processed substances used to kill or incapacitate hostile elements. More dangerous CW, like nerve, blister, and choking agents, have been deployed in combat and against civilians by States, and there is always a risk of a weather or climate disaster releasing some State's stockpiles. A non-exhaustive list of chemical agents, and the appropriate decontamination methods, is in Table 2.

a. ***Incapacitating Agents***. So-called **incapacitating agents** work by "produc[ing] temporary physical and/or mental effects that result in the inability of the affected individual to continue in their current duties or activity. Often they are described as non-lethal agents, but if administered in high enough doses, incapacitating agents can results in death or serious morbidity."[101] There are three principal types of incapacitating agents: **riot control agents** (**RCA**), **opioids** (or **sedating agents**), and **anticholinergic agents**.

I) **Riot Control Agents (RCA)**. Despite being illegal in combat, RCA like tear gas and pepper spray are used by police and armies around the world to disperse protesters. RCA irritate the eyes, nasal passages, skin, and airway, causing runny eyes and nose, pain, coughing, and difficulty breathing. RCA are dangerous because their effects can last long after the casualty has been exposed to them.

i) *Treatment for RCA Exposure*. See Chapter 4.

II) **Opioids**. Aside from RCA, the most common CW you will encounter will likely be an opioid like fentanyl in the form of an accidental overdose. There are persistent rumors around the dangers of opioids, especially fentanyl, with a common urban legend stating that a dose of fentanyl the size of a grain of sand can kill on contact. This is not true.[102] If you observe someone exhibiting signs of an opioid overdose, it is safe to provide treatment for them.

i) *Signs of Opioid Exposure*. A casualty experiencing an opioid overdose will be pale or exhibiting cyanoisis. They will be limp, and may be unresponsive with a very weak heartbeat.

ii) *Treatment for Opioid Exposure*. The treatment of choice for opioid overdoses is a drug called naloxone (sold as a nasal spray under the brand name Narcan), which can reverse the effects of an overdose. In the case of large overdoses, multiple doses of naloxone might be necessary. You can acquire naloxone without a prescription by visiting Narcan.com, and it is highly recommended you supplement your medical supplies with at least one dose of naxolone. After administering the drug, place the casualty in the recovery position and monitor their condition.

101 "Chemical, Biological, Radiological and Nuclear (CBRN) Injury Response Part 2: Medical Management of Chemical Agent Exposure." Joint Trauma System Clinical Practice Guideline (2022).

102 "Skin contact is also a potential exposure route, but is not likely to lead to overdose unless exposures are to liquid or to a powder over an extended period of time. Brief skin contact with illicit fentanyl is not expected to lead to toxic effects if any visible contamination is promptly removed." National Institute for Public Safety and Health, "Preventing Occupational Exposure to Healthcare Personnel in Hospital and Clinic Settings."

III) **Anticholinergic Agents**. The anticholinergic agents, chiefly 3-quinuclidinyl benzilate, or BZ, are a form of incapacitating CW that causes delirium, hallucinations, and agitation. All American stocks of BZ have been allegedly destroyed, but other nations or non-State actors might possess some.

i) *Signs of Anticholinergic Agent Exposure*. BZ causes increased vasodilation, which leads to red, hot, and dry skin, and temporary blindness; victims of BZ and other anticholinergic agents are said to be "Mad as a hatter, dry as a bone, red as a beet, and blind as a bat."[103]

ii) *Treatment for Anticholinergic Agent Exposure*. A casualty who has been exposed to an anticholinergic agent should be kept cool and hydrated and must be delivered to definitive care at the earliest opportunity.

b. ***Nerve Agents***. The most dangerous CW are the nerve agents, like VX and sarin, and the so-called "blood agents," primarily hydrogen cyanide (AC) and cyanogen chloride (CK). Both nerve and blood agents can be deployed as both a liquid and as a vapor, and can cause death within minutes of exposure. The United States claims that it will have destroyed its stock of lethal nerve agents by 2023.[104]

I) **Treatment for Nerve Agent Exposure**. Nerve agents are treated with atropine & pralidoxime chloride (2-PAM chloride) and diazepam for seizures, while AC and CK are treated with an intravenous infusion of hydroxocobalamin (sold commercially as Cyanokit®). Administering these treatments is best left to those with adequate medical training.

c. ***Blister Agents***. **Blister agents** (also called vesicants) like mustard gas, cause burns and blisters when they come into contact with bare skin or the tissues of the eyes, nose, and lungs.

d. ***Choking Agents***. Choking agents, like phosgene or chlorine, irritate the respiratory passages. While choking agents might be encountered as CW, they, and other chemicals like them, are also a major component of industries worldwide, and might be released as a result of an accident or severe weather event. Both blister and choking agents cause very painful injuries and can be fatal.

Gas! GAS! Quick, boys!—An ecstasy of fumbling
Fitting the clumsy helmets just in time,
But someone still was yelling out and stumbling
And flound'ring like a man in fire or lime.—
Dim through the misty panes and thick green light,
As under a green sea, I saw him drowning.

In all my dreams before my helpless sight,
He plunges at me, guttering, choking, drowning.

-Wilfred Owen[105]

103 I have come across this phrase with additions ("hot as a hare"), subtractions, and in different orders. It's a mnemonic, not a diagnostic tool.

104 "Report of the OPCW on the Implementation of the Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction in 2020." The Organisation for the Prohibition of Chemical Weapons (2021). 1.

105 "Dulce Et Decorum Est" (1921).

Table 5-3. Chemical Agents

	Mechanism						
	Nerve		***Blister***		***Choking***		***Opioid***
Agent	Sarin	VX	Mustard	Lewisite	Chlorine	Phosgene	Fentanyl
Odor	Odorless		Mustard	Floral	Bleach	Mown Hay	Odorless
Persistence	Non-Persistent	>12 Hours	>12 Hours		Non-Persistent		Indefinite
Rate of Action	Rapid for Vapors; Liquid may be Delayed		Delayed	Rapid	Rapid at High Concentrations		Rapid
Consciousness	Unconscious, Seizures		Normal		Normal		Depressed
Respiration	Rapid, Wheezing		Rapid, Dry Cough		Painful Cough		Decreased
Eyes	Constricted Pupils		Normal Pupils, Burning		Normal Pupils, Irritation		Constricted Pupils
Secretions	Eyes, Nose, Mouth		Eyes, Nose, Mouth		Eyes, Nose, Mouth		Normal
Skin	Sweaty		Red, Burning, Painful		Normal		Normal
Treatment	Treat Symptoms				Assist ventilations, rest.		Administer nalaxone if available.
Evacuation	Upwind, uphill, or upriver of the delivery mechanism.						
Decontamination	Render scene safe, remove contaminated clothing, flush with soap and water or 9:1 water and 5% sodium hypochlorite bleach.						

5-21. **BIOLOGICAL AGENTS**. With the SARS-CoV-2 pandemic ravaging the globe, the specter of a weaponized disease has once again crept onto the world stage. That the novel coronavirus was not a biological weapon is irrelevant. The idea that some State would unleash viral or bacterial plagues on a defending army or restive population is bone-chilling, but not entirely realistic. From a tactical point of view, germs are inefficient; they move with the wind and can infect your side just as easily as the enemy. That said, releasing a contagion might not be a tactical decision; the existence of viral and bacterial research labs means that, through neglect or disaster, a biological weapon could break containment.

a. ***Biological Threats***. The most dangerous biological agents include *Bacillus anthracis* (anthrax), *Yersinia pestis* (plague), *Vibrio cholerae* (cholera), *Rabies lyssavaris* (rabies), and the various species of *Variola*, *Ebolavirus*, and *Orthohantavirus* (respectively smallpox, Ebola, and hantavirus). If these were introduced into a populated area, the effects could be devastating, but world-ending plagues, like the one depicted in *The Stand*,[106] remain the work of fiction. Beyond pathogens, the category of biological agents includes naturally-occurring substances like toxins or venoms from animals or plants, including botulinum toxin, which can cause botulism, a potentially-fatal paralysis, and ricin, a toxin produced from castor beans which can be lethal if injected.

106 “M-O-O-N, that spells 'gain of function testing'!”

b. ***Responding to Biological Agents***. If large numbers of people begin presenting the same symptoms, especially for an illness not local to your area, then it is possible you have been exposed to a biological weapon. Part of the effectiveness of biological agents is the fear they produce, so do not panic. Remain calm. If you take BSI precautions (see paragraph 5-3) and immediately contact a medical facility with the capacity to diagnose, isolate, and treat a viral or bacterial outbreak, you can prevent further death and suffering.

5-22. **RADIOLOGICAL DISPERSAL DEVICES (RDD)**. Nuclear bombs are very hard to make, and most of them are controlled by people who nominally have an incentive to never use them. Radioactive material, on the other hand, while not exactly falling off of trees, is easier to acquire than one might consider safe or rational. A **radiological dispersal device** (**RDD**), more commonly known as a "dirty bomb," is essentially a conventional explosive designed to spread radioactive material, analogous to the way a hand grenade is a core of conventional explosive designed to spread fragments of shrapnel.

a. ***RDD Threats***. The primary threat of an RDD is the conventional explosive used in its manufacture, while the danger of the radiation is largely psychological. An RDD lacks the power of a nuclear bomb to send radioactive dust and debris into the atmosphere, where it could potentially spread for miles. The cultural fear of radiation will keep people away from the site of the explosion, making an RDD a potentially effective area denial weapon. However, an RDD with enough radioactive material to cause widespread or long-lasting damage would likely kill the bombmaker before it could be deployed.

b. ***Responding to RDD***. If you are at the scene of an RDD detonation, do not let a fear of radiation prevent you from acting; no healthcare provider has ever been received radiation injuries while performing BLS on a radiation victim.[107]

5-23. **NUCLEAR WEAPONS**. A nuclear exchange between States is an ever-present, but remote, risk. If you do not live in a major city or by a military facility, your odds of being targeted by a nuclear strike are low. Those of a nuclear detonation as a result of a faulty system or vehicle crash, are far greater.4 Samuel Glasstone's *The Effects of Nuclear Weapons*, Cresson Kearney's *Nuclear War Survival Skills,* and the 3rd Edition of *Emergency War Surgery* are priceless resources for making these weapons less mysterious, and thus somewhat less terrifying.

a. ***Blast Wave***. A 10-kiloton ground-detonated nuclear bomb (half as powerful as the bomb dropped on Nagasaki) would have four primary mechanisms of injury. The blast wave will completely destroy structures up to about a kilometer away, overturn cars and snap power lines up to about two kilometers away, and shatter windows up to 15 kilometers away.[108] Injuries can occur as a result of the blast wave itself or from flying debris.

b. ***Thermal Flash***. The thermal flash is an enormous and rapid release of heat and light. A 10 kt nuclear bomb will generate enough heat to cause third-degree burns more than two kilometers away.[109] The flash is also bright enough to cause temporary or permanent blindness, even if you close your eyes.

c. ***Electromagnetic Pulse (EMP)***. The electromagnetic pulse (EMP) is a massive surge of electrical energy that can ruin the sensitive components of electronics, rendering radios, vehicles, and computers caught in the field useless. It is theorized that the range of an EMP for a 10 kt bomb is between three and eight kilometers,[110] while the range of an EMP caused by a nuclear bomb detonated in the atmosphere would be much greater (theoretically hundreds of kilometers).

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107 *Emergency War Surgery*, 30.6.
108 *Planning Guidance for Response to a Nuclear Detonation*, 2nd Ed (2010). 17.
109 Based on calculations found in Glasstone, ***et al***.
110 Ibid.

d. ***Fallout***. For most people, the final mechanism of injury, radioactive fallout, is the most frightening, and lurid tales of Three Mile Island, Chernobyl, and Alexander Litvinenko have kept those fears stoked. Make no mistake, radioactive fallout is dangerous, but it isn't Ice-9. If you are outside the blast radius, you will likely not absorb a lethal dose.

I) **Types of Radiation**. There are four kinds of radiation associated with nuclear weapons: **gamma radiation**, **neutron radiation**, **beta radiation**, and **alpha radiation**.

i) Gamma and neutron radiation are the most dangerous, because they can pass through barriers and damage tissue.

ii) Alpha and beta radiation cannot travel long distances or penetrate barriers effectively, and are only dangerous if the particles (in the form of nuclear fallout) are inhaled or ingested.

II) **The Gray**. The unit of measurement for absorbed radiation is the **gray** (abbreviated “gY,” named for British physicist Louis Harold Gray). One gray is equal to 100 rads. Exposure of up to 2 gY is usually survivable. The **LD 50/60** (that is, the dose of radiation which will kill 50% of an exposed population within 60 days of exposure) is between 3 and 4 gY, but more than that, the chances of survival decrease rapidly.

III) **Field-Expedient Exposure Testing**. The easiest field-expedient method of determining your radiation exposure is **time to emesis** (**TE**), or how long it takes vomiting to begin following a nuclear detonation. Table 5-4 shows the average TE and the associated approximate radiation exposure. Keep in mind that these numbers are, under the best circumstances, approximations; in the aftermath of the carnage of a nuclear blast, there will likely be many reasons for nausea.

Table 5-4: Approximate Dose Based on TE

Time to Emesis (hours)	*Approximate Dose (gY)*
>5	<2
3	3
2	4
1	6
<1	>8

e. ***Responding to a Nuclear Detonation***. If you see a nuclear explosion, get to cover, as though you were sheltering from a tornado: stay low, behind or under something sturdy. If you are in the open, shut your eyes and drop prone, facing away from the explosion, arms over your head.

I) After the blast, take off your clothes. This will remove as much as 90% of the contamination.8 If you have any open wounds, they should be irrigated for at least five minutes or as long as possible with sterile water or saline. Do not use nearby water that might have been exposed to radioactive particles. Wash the rest of your body with soap and water.

II) If available, **potassium iodide** (**KI**) is a safe and effective precautionary measure against thyroid cancer caused by radiation; the Food & Drug Administration has made dosage guidelines available (see Table 5-3).

Table 5. Threshold Thyroid Radioactive Exposures and Recommended Doses of KI for Different Risk Groups[111]

	Predicted Thyroid Exposure (cgY)	***KI Dose (mg)***	***# of 130 mg tablets***	***# of 65 mg tablets***
Adults Over 40 y/o	≥500	130	1	2
Adults 18 - 40 y/o	≥10			
Pregnant or Lactating Adults	≥5			
Adolescents 12 - 18 y/o†		65	1/2	1
Children 3 - 12 y/o				
Children 1 month to 3 y/o		32	1/4	1/2
Birth to first month		16	1/8	1/4
† Adolescents approaching adult body weight (70kg) should be given a full adult dose (130 mg).				

111 USDA. “Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies” (2001).

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112 I obviously do not endorse the editorial content in all or even most of these books. Col. Cooper, for example, waxes nostalgic about fighting for minority-White rule in Rhodesia, Matthew Stein dedicates significant portions of an otherwise solid book to colloidal silver, and Kevin Dunn is, and I am here speaking only of his writing style, just *fucking insufferable*. Take what's useful, discard the rest.

ABOUT THE AUTHOR

Lee Navy is the pseudonym of a libertarian eco-socialist living in occupied Muscogee territory. He is a dues-paying member of the Socialist Rifle Association and the Industrial Workers of the World.