# PYR▲MID

# GUNPLAY

## MODERN WARFIGHTER: GEAR
### by Kenneth Peters

## BROCK-AVERY GUNS
### by David L. Pulver

## THE DEVIL'S CHARIOT
### by Hans-Christian Vortisch

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### by Christopher R. Rice

# STEVE JACKSON GAMES

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## IN THIS ISSUE

Our aim is true in this month's *Pyramid!* We're looking at all aspects of gunplay, with new weapons, options, gear, and more.

It's not enough to be able to shoot the enemy – you have to get there first. You'll find everything you need with *Modern Warfighter: Gear*. From warfighter and *GURPS Ultra-Tech* co-author Kenneth Peters, learn what members of modern professional land forces carry into the field, with *GURPS* stats for new gun-thwarting body armor and an arsenal of other support equipment.

Once they're outfitted, those warfighters, mercenaries, and monster hunters can get a lift in *The Devil's Chariot*. Hans-Christian Vortisch – marksman behind *GURPS Tactical Shooting* – provides details, usage ideas, and *GURPS* stats for the popular Russian "Hind" helicopter . . . along with the big guns it wields.

Explore the rise of a potential weapon source in this month's Eidetic Memory. *GURPS Mass Combat* author David L. Pulver reveals the fictional history and *GURPS* stats of the *Brock-Avery Guns,* from their first TL5 flintlock through modern-day arms. Add a new line of weapons your heroes have *never* heard of before . . .

The best way to deal with weaponry wounds is not to get hit in the first place! When your shooting matches aren't realistic enough, you should *Dodge This*. Find out how to use existing *GURPS* rules – or add minor optional tweaks – to make dodging, parrying, and blocking more satisfying experiences in your adventures.

For your Wild West and 18th-century high-seas adventures, be sure to grab *The Nock Volley Gun*. *GURPS Crusades* co-author Graeme Davis reveals the history and *GURPS* stats of this intimidating seven-barrel carbine from another time.

You already know to choose your ammunition based on what you expect to shoot. When your targets are supernatural, you need more than ordinary ammo; it's time to turn to *Magic Bullets*. With these *GURPS* costs and simplified stats, you'll find the right combination for any situation – no matter how exotic.

This month's Random Thought Table examines how to make every hero's shot count, Odds and Ends looks at existing ammo resources and unexpected weapon situations, and a well-armed Murphy's Rules means you no harm . . . honest.

If you're looking for an issue with kick, you need to pull the trigger on this one. With rules, tools, rods, and rides, *Pyramid #3/57* might just be our *Magnum* opus!

## Article Colors

Each article is color-coded to help you find your favorite sections.

*Pale Blue:* In This Issue
*Brown:* In Every Issue (letters, humor, editorial, etc.)
*Green:* Columnist
*Dark Blue: GURPS* Features
*Purple:* Systemless Features

# FROM THE EDITOR

## ~~FROM~~ GUN THE EDITOR?

This issue revolves around all things gun-related – including intel of interest to those who sling firearms to get the job done (or just want to get out of their way). For many folks in near-modern campaigns, the choice of weapon is one of the first questions that helps shape character creation; someone who favors a shotgun almost certainly evokes a different image than a hero with two silver revolvers or an AK-47.
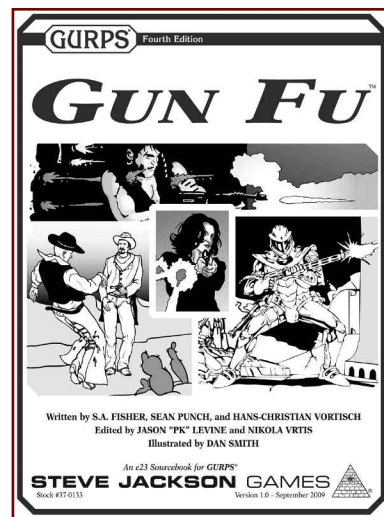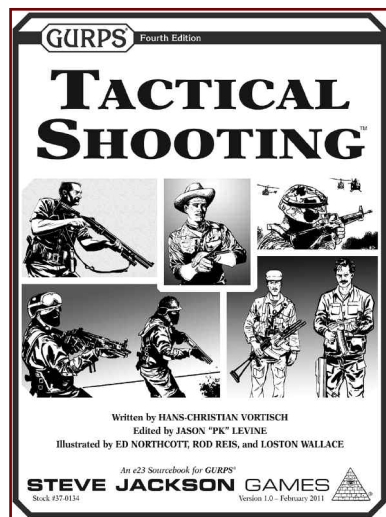
Fortunately, even with as specific a topic as "gunplay," it's still a wide-open area . . . and the assortment of subjects here should provide a lot of opportunities and options even for gamers who already have a weapon of choice. Plus, new ideas mean you might come up with predicaments you never considered: A plethora of magic-bullet options (pp. 34-35) gives you reason to go up against new threats that only succumb to magic bullets. Having a whole new (fictitious) company that's manufactured weapons throughout the ages (pp. 23-26) means you can now have a ready-made source of usable background material . . . or even an easy-to-add explanation for the source of Mr. Bigg's wealth.

*GURPS* has always been a great game for those who love guns . . . or even those who *didn't know* they loved guns, until they discovered a game that made 'em fun. We hope our aim was true with this locked and loaded issue of *Pyramid!*

*More guns and more gear mean more adventure!*

## WRITE HERE, WRITE NOW

Despite the header above, we don't really want you to gun down the editor as commentary about this issue. We'd much rather hear your thoughts using words! Did you find the gun issue to be a fun issue? Or was it a misfire? Let us know how well we hit the target privately at **pyramid@sjgames.com**, or join the straight-shooting community at **forums.sjgames.com**.

# Modern Warfighter: Gear

## by Kenneth Peters

*The Soldier System includes the Soldier and those items and equipment the Soldier wears, carries, or consumes. It includes all items in the Soldier's load and those items of equipment to accomplish individual tasks and missions (for example, crew-served weapons, inter-unit radios) that the Soldier must carry. The Soldier System includes physiological, as well as applied capabilities and considerations for the operational environment (both natural and man induced) that range from home station to the battlefield.*

*– U.S. Army,* **TRADOC Pamphlet 525-97** *(2006)*

The *raison d'etre* for warfighters is to bring deadly force to bear on his enemies. To do this, they need weapons (the more destructive and portable the better) and all manner of clothing and equipment to survive contact with the enemy and accomplish the many and varied tasks that are the unglamorous side of a warfighter's duties. As important as the firearms are the *non-weapon* equipment that a late TL8 infantryman on the battlefields of today and tomorrow carries to get the chance to use their bolts of technological lightning.

### What Is a Warfighter?

Within this particular context, "warfighter" is a generic term for members of any modern, *professional* land force that carry out combat operations in the complex post-Cold War world. It includes the trigger-pullers who directly engage the enemy in firefights, logistics personnel who supply crucial food and ammunition, intelligence analysts that provide targets and information, and the crews who man many distant support artillery and armed drones. It does not refer to any specific branch of service (as opposed to "soldier", "sailor", "marine", "airman", etc.) or nation.

Within the broader military community, "warfighter" is a term of art that refers to *any* individual responsible for operational decisions that result in the use of military force. This can include members of the political leadership who commit military units to advance political and economic goals on the behalf of their nation or patron.

*The soldier's body becomes a stock of accessories that are no longer his own.*

*– Antoine de Saint-Exupéry*

# Full Battle Rattle

***Standard Issue:*** *100-lbs. of the lightest weight gear.*
*– Anonymous warfighter*

Warfighters are expected to chase fleeting targets across mountains, race through devastated urban landscapes, and trek across trackless desert wastes while bearing so much equipment that it's too exhausting to stand, much less run. A player may be happy to outfit his character with little more than an assault rifle, bandolier of ammo, loincloth, and a grin, but actual warfighters are burdened by equipment lists with items that range from the absolutely vital to the situationally useful.

Even for special forces and other assault troops, the absolute minimum of uniform, body armor, helmet, carbine, and ammunition can still exceed medium encumbrance (p. B17) for a ST 11 warfighter! This reduces the speed that the warfighter can travel (see *Encumbrance and Move*, p. B17) and penalizes most physical activities by the encumbrance level. This is a vicious feedback loop that contributes to extra expenditure of Fatigue Points (see *Fighting a Battle*, p. B426).

## Basic Gear

In addition to their uniform, armor, and weapon, these are items that you can expect every warfighter to be carrying into the field no matter his mission or role.

*Clothing:* A clean undershirt and a pair or three of extra socks are the only changes of clothing that many warfighters carry, even on multi-day patrols. To keep weight down, many units also restrict warfighters to only a bare minimum of inclement weather gear – an insulated poncho liner is often both a blanket and emergency shelter! Some personnel and units purchase ultra-lightweight camping gear for long patrols.

*Drink:* The water pack (**GURPS High-Tech**, p. 53) is ubiquitous, supplemented by older plastic and metal canteens (**High-Tech**, p. 53). These are filled with water or sport drinks (**High-Tech**, p. 35). In arid environments, the warfighter will carry at least a two-day supply of water; the human body cannot be trained or conditioned to rely on less water, and only fools take their chances in environments where local water sources are nonexistent or heavily polluted.

*Food:* Warfighters carry only a limited amount of food unless on extended patrol, instead relying on a few high-calorie snack bars (**High-Tech**, p. 35) or trail food (**High-Tech**, p. 35) to keep up their energy. Retort-packaged military rations (**High-Tech**, p. 34) are issued, but usually "stripped" of unnecessary desserts and condiments to reduce weight and bulk (treat as compressed rations) before going out on patrol. Contrary to popular imagination, these meals are actually quite tasty, but there is an active barter economy to stock up on personal favorites!

*Identification:* Warfighters are issued ID tags (p. 12) and laminated military identity cards with their picture and Geneva Convention information. At TL8+, the card may have magnetic strips, RFID tags, and solid-state data storage that holds biometric information, access rights to restricted areas and computer networks, and encrypted medical information.

*Light:* With the near-universal use of low-light optics, combat operations are often undertaken under cover of night. Warfighters usually carry some form of a smart flashlight (**High-Tech**, p. 52) or strobe marker (**High-Tech**, p. 58) for both illumination and signaling. Bundles of colored or infrared chemlights (**High-Tech**, p. 52) are used for route marking, traffic control, and identification.

*Navigation:* A traditional compass and map (**High-Tech**, p. 52) is a common backup for a GPS, but many modern warfighters are surprisingly mediocre (or outright unskilled) at using them for Navigation (Land) (p. B211).

*Timekeeping:* A wristwatch (**High-Tech**, p. 31) with luminous display (covered with a flap or worn with display on inner wrist) is vital for coordinating team activities.

# PERSONAL GEAR

These are small objects that are not standard military issue and carried at personal discretion. They are small, and fit in clothing pockets or easily accessible areas of a backpack. In areas with inclement weather these items will be stored in waterproof plastic bags.

*Comfort Gear:* Reminders of home, or small items to stave off boredom, are not unusual. This can include a combination of small spice bottles, sewing kit (**High-Tech**, p. 31), digital media player (**High-Tech**, p. 42), or a few photographs of loved-ones. Devout individuals often carry a religious symbol (**High-Tech**, p. 31) and holy book. If allowed (or it can be hidden), those with minor Addictions (p. B122) may carry a cigar

## Encumbrance and Combat Effectiveness

*Infantry Soldiers carrying a load of 101 pounds for 12.5 miles had a decrease of 26 percent in marksmanship (number of targets hit), a 33 percent increase in distance from the target center, and an increase in back pain compared to pre-load and march scores.*

– U.S. Congress, **Statement of General Peter W. Chiarelli on soldier equipment ergonomics** *(2009)*

The basic rules for carrying heavy loads and exhaustion (see *Fatigue*, pp. B426-427) do not realistically portray the degradation in combat effectiveness from carrying heavy loads. Instead, it is highly recommended the rules for long-term fatigue (from *The Last Gasp* in *Pyramid #3/44: Alternate **GURPS** II*) be used to reflect the mental and physical impairment faced by the modern dismounted soldier on extended patrols in harsh terrain.

These detrimental effects are well-known and often-lamented, but the emphasis on reducing casualties and adding capabilities through gadgets has *far* outpaced mitigation efforts. Even offloading some of the load to unmanned robot mules (**GURPS Ultra-Tech**, pp. 79-80) or exoskeletons (**Ultra-Tech**, pp. 181-182) is unlikely to be more than a short-term reprieve, as every pound saved is seen as space for another pound of new gear or additional armor. See *Future Soldier* in *Pyramid #3/55: Military Sci-Fi* for an example loadout of a heavily laden TL9 infantryman.

or cigarette case (**High-Tech**, p. 31), or an inconspicuous hip flask with liquid comfort (**High-Tech**, p. 31).

*Computers:* Tiny and small portable computers (**High-Tech**, p. 20) and smartphones (even if internet access is not available) are popular as multi-purpose comfort gear both in camp and on patrol. They are also useful for filing reports, sending and receiving text messages or video, and viewing digital maps. Note that cell phone service is surprisingly ubiquitous even in combat areas, and is sometimes more reliable than military radio nets.

*Fashion Accessories:* Shemaghs (a traditional Arabic scarf) in various patterns have become common accessories for the modern warfighter, in addition to the more traditional balaclavas. They are useful as everything from caps and dust masks to neck warmers and hand towels. Although they make for a striking appearance, balaclavas and other face coverings with intimidating designs (such as a skull or daemon face) are generally not worn (if just because they are a distinguishing feature that draws unwanted attention). Velcro-backed or embroidered fabric "morale patches" with team logos and personalized designs placed on packs, equipment pouches, and body armor are a popular accessory, and are often considered unofficially exempt from standard uniform regulations (within limits).

*Navigation:* Military GPS receivers (**High-Tech**, 53) are not issued universally, and tend to be clunky and unimpressive, with limited display and storage capability. Privately purchased civilian models with downloadable digital maps are popular, but often do not connect properly to military forward observation equipment.

*Notebook:* A blank book or notebook (**High-Tech**, p. 17) and one or more ballpoint or "space" pens (**High-Tech**, p. 18) and waterproof markers are useful for taking notes during briefings, recording interviews, sketching maps and layouts, quietly passing orders, and documenting events on patrol.

*Personal Basics:* Warfighters almost always include a set of basic "survival" equipment (p. B288) with their mission gear. This meager collection of eating utensils and hygiene items is usually augmented with hand sanitizer gel (**High-Tech**, p. 221) and moist towelettes (which are especially popular for "field showers" when water is scarce). Small items – such as a handful of water-purification tablets (**High-Tech**, p. 59), analgesics (**High-Tech**, p. 226), and vitamin pills (**High-Tech**, p. 221) – can make long marches less uncomfortable and physically debilitating. A combination of insect repellant and sunscreen (both **High-Tech**, p. 221) can provide a respite from environmental nuisances.

*Tools:* The multi-tool (**High-Tech**, p. 26) is ubiquitous among warfighters; not possessing one is a notable quirk with many units. Models marketed towards the military are usually *expensive* (no weight decrease, but a wider selection of tools).

*Video:* Although frowned on by public relations (and occasionally subject to sanctions against their use), the portability of modern digital cameras and ruggedized micro-camcorders (for both, see **High-Tech**, p. 43) makes them popular with warfighters who want to capture some of their combat experiences or to keep a record of their comrades and interesting sights they come across. Most of these pictures and videos are never seen outside of close friends, since they can record candid or ethically questionable events that the sheltered public (and families) may find objectionable.

> **snivel gear** *n.*
> *A soldier's equipment or clothing perceived as providing comfort beyond that which is strictly necessary.*
> **– Double-Tongued Dictionary**

# SPECIAL ISSUE

These are common items that may be issued to the warfighter for special tasks or because the unit commander has mandated they be carried.

*Biometrics:* Coalition forces in Afghanistan have attempted to enroll most of the population into biometric databases to identify outsiders in an area, escaped criminals, and individuals present at multiple attacks ("recidivist combatants"). This involves testing for gunshot residues and then recording everyone possible into the biometric system by scanning fingerprints and retina prints using a biometric scanner (p. 10) and taking a digital photo. This is currently very time consuming, and the program's success is dubious at best, but it is a precursor to wholesale geotagged biometric documentation of populations in conflict areas for security screening, border control, and threat identification.

*Breaking and Entering:* Most modern military operations occur in urban areas, with plenty of doors and windows that need to be broken or pried open to gain building access with the Forced Entry (p. B196) or Soldier skill (p. B221). The most common tool for this is an expensive go-bar (**High-Tech**, p. 29) – usually referred to as a "hooligan tool" – that can pry apart door jambs, break locks and windows, and cut metal sheets. A lock-pick gun (**High-Tech**, p. 213) is issued when a bit more subtlety is needed; otherwise, an old-fashioned bolt cutter and sledgehammer (both **High-Tech**, p. 25) can breach most obstacles.

*Combat Identification:* Avoiding fratricide ("friendly fire") is a major concern for warfighters operating in fluid combat situations with multiple agencies liberally throwing around heavy explosives – not all of which will use the same communication frequencies, uniform styles, or tracer colors, or show concern about the opinions of their erstwhile allies. Operating within carefully delineated areas and using IR reflective panels or large strobe markers (both p. 11) can avoid most lethal cases of mistaken identity, but hand flares (**High-Tech**, p. 58) and illumination rounds (**High-Tech**, p. 171) are battle-proven options.

*Counterinsurgency Support:* Stability operations require the ability to perform many law-enforcement tasks. Disposable latex gloves and a metal detector wand (p. B289 and **High-Tech**, p. 206), sandbags, and a pack of flex cuffs (**High-Tech**, p. 217) are used to search, hood, and detain suspects, with evidence collected in plastic bags. Casualty and witness information cards are carried for basic investigations, but language reference material (p. 13) or an interpreter is needed to ask any but the most rudimentary questions. Expandable batons (**High-Tech**, p. 198) are also carried for subdual and general compliance when using the business end of warfighter's carbine as a tool bonus for Intimidation is not appropriate. For hearts-and-minds campaigns, candy (**High-Tech**, p. 34) and a few good cigarette lighters (p. B288) to use as gifts can be surprisingly useful.

*Engineering:* The basic "e-tool" folding shovel (**High-Tech**, p. 25) has not changed much over the years, but modern versions are expensive and plastic. These are not always carried on patrol, and may be only carried by half of the warfighters when some combat engineering is needed (one man digs, the other stands guard or performs other tasks before switching off).

*Explosives Disposal:* A simple remote pull kit (p. 15) can be used to safely check suspicious items, and can trigger explosives with contact triggers. For more intensive surveys, troops need to use mine detectors (p. 14) or IED jammers (p. 11). Disposable scout robots (p. 15) and EOD robots (pp. 11-12) can also locate and detonate many types of booby traps and mines.

*Signaling:* All warfighters carry a multi-purpose light that can be used as an infrared strobe, but a few pen flares (**High-Tech**, p. 58) in one or more colors – to mark targets, call for rescue, or use for pre-arranged signals – are usually standard issue on patrol. Officers and team leaders also use whistles (**High-Tech**, p. 58) for various tasks.

# PERSONALIZED GEAR

Unless otherwise noted, items issued to warfighters are *basic equipment* (see *Equipment Modifiers*, p. B345): They meet military specifications ("mil-spec"), but are otherwise unexceptional. Aftermarket manufacturers produce higher-quality versions of most standard military equipment and warfighters are often willing to pay out of their own pocket to ensure their gear is more rugged, lighter, or more stylish than what the government purchases from the lowest bidder. Some take this to absurd lengths, shopping around to save fractions of an ounce on their grip or stock, paying top-dollar for the trendiest brand names, and aggressively replacing "old" parts. This can actually be *useful* in a campaign that doesn't take itself too seriously (see the Tacticool perk in **GURPS Gun-Fu**, p. 22).

That said, even budget-minded warfighters personalize their gear in some way, such as using a marker to give their weapon a meaningful name, attaching a velcro patch to their body armor with a personal logo or rank marking, or painting "kill rings" on their rifle barrel. Some will permanently modify their equipment (often against orders!) by whittling away at the casing so it will fit in a smaller pocket, replacing an unreliable government-issue antenna with a cheap civilian alternative, taping down every loose strap and wire so they don't snag, etc. This intimate knowledge of the warfighter's gear can translate into either a Weapon Bond (**High-Tech**, p. 250) or a more general Equipment Bond (**High-Tech**, p. 6), as it represents constant tinkering and ease-of-use changes for otherwise off-the-shelf components.

Practical examples of how experts use or customize their gear include the following.

*Ammunition:* It is common practice to load at least three tracer rounds in each magazine, two at the bottom to alert the firer that he is almost out of ammo, and one at the top to help orient fire; team leaders may carry entire magazines of tracer ammo to direct suppression fire. A full magazine of armor-piercing ammo may also be kept on hand in case opponents are in vehicles or behind heavy cover.

*Canteens:* Most warfighters use water pack hydration systems, but extra canteens and water bottles negate the stealth bonus from high-quality load-bearing vests if they are not filled to the brim (**High-Tech**, p. 53). Warfighters that want to reduce their auditory signature purchase canteens and water packs with collapsible bladders – eliminating air voids that cause water to slosh around – for +0.5 CF.

*First Aid Kit:* Standard-issue small first aid kits (**High-Tech**, p. 221) and military first aid kits (p. 14) are sufficient for even major injuries when quick casualty evacuation (CASEVAC) is available, but special forces and other safety-conscious warfighters purchase or requisition additional emergency equipment and *fine*-quality kits on the civilian market for situations where quick extraction is not possible. These improved kits are designed (or carefully repackaged) to fit in existing ammo and first aid kit pouches.

*Gun-Cleaning Kits:* Combat veterans often purchase their own good- or fine-quality gun-cleaning kits (**High-Tech**, p. 160) with superior cleaning chemicals and tool selection, but just as many leave the standard kits back at base and rely a small bottle of standard lubricant and a rag when on patrol (treat as improvised equipment if serious cleaning is needed).

*Load-Bearing Equipment:* Properly arranging the gear on a quality LBE has a number of advantages (**High-Tech**, p. 54). Both assault vests and improved assault vests already incorporate straps and attachment points that make them the equivalent of at least a basic-quality load-bearing vest (no quality bonus or penalty). As an *optional* rule, a successful setup roll with Soldier or IQ-based Hiking adds a temporary +1 quality bonus, and a critical success adds +2. Failure results in no bonus, with a critical failure imposing -2.

*Magazines:* It's not unusual for warfighters to purchase their own high-quality magazines (**GURPS Tactical Shooting,** p. 75) to minimize the possibility of jams and other malfunctions. Fast-draw magazine loops (**Tactical Shooting,** p. 75) are widely used (nearly universal for infantry units), but budget-minded shooters can improvise similar helpful modifications. Warfighters will discard magazines to save time during reloading in emergencies but magazine retention is the norm, despite the extra Ready maneuver that is required (see *Reloading* in **Tactical Shooting,** p. 20).

*Packs:* Planning out how to stow gear in a pack takes some experience and careful consideration. Proper weight balancing and storing items so that they can be efficiently retrieved requires a Soldier or IQ-based Hiking roll (**High-Tech,** p. 54). Quality backpacks are designed with multiple pockets, strong and well-placed straps, and ergonomic features that not only make packing them easier, but also apply a quality bonus to Hiking skill rolls (obviously of importance to warfighters on long patrols).

# UNIFORMS

*While we often define them in terms of costume – such as denoting similar appearance, distinctiveness of a group, or uniformity, they also say much more. Uniforms function through their delineation of hierarchy, status, authority and value . . .*
*– Jennifer Craik, **Uniforms Exposed***

Military uniforms are as much symbols of corporate identity and synchronicity of purpose as they are camouflage or practical protection against the elements. Individual services have idiosyncratic rules governing how their uniforms are worn, what symbols may be displayed, precisely how they should fit, and other minutiae that are difficult to describe in **GURPS** game mechanics. For real-world warfighters (and the majority of gamers), it is the *practical* components of a military uniform – especially those worn as part of their combat load – that matters.

In **GURPS** terms, most militaries issue multiple sets (in varying styles) of Status 0 ordinary clothes (see p. B266 and **High-Tech**, p. 63). A complete wardrobe (p. B266) of military clothing and accessories includes four utility uniforms, a service uniform, sports gear, and winter clothes. Additional work uniforms – such as flight suits or coveralls – are issued as needed.

Infantry are provided additional infantry utility uniforms (below) and periodic replacements (as they wear out very quickly). Formal wear is not always included, but is a common purchase. Replacement of worn or damaged uniforms is effectively free, through the use of clothing allowances and steep discounts.

## Utility Uniform

Known variously as "battledress uniforms," "cammies," "combat pajamas," " 'utes " etc., these are ordinary clothes with the basic camouflage feature (**High-Tech**, p. 77). Utility uniforms are worn for day-to-day military business, even in the air-conditioned safety of rear-echelon offices, but are often *prohibited* for wear outside of protected safe areas in combat zones due to their lack of fire protection. A complete utility uniform consists of ID tags (p. 12), cotton or linen undershirt, a blouse, underwear and trousers, rugged belt, cloth cap (also see **High-Tech**, p. 64), socks, and hiking boots (**High-Tech**, p. 68). Note that **High-Tech** clothing includes the cost, but not the weight, of footgear A standard utility uniform with boots is $240 and 5 lbs. (4 lbs. at TL8).

## Infantry Utility Uniform

The utility uniforms worn by infantry have been refined to take into account the types of threats faced on the modern battlefield, as well as incorporate usability and comfort suggestions from the troops themselves. Infantry utility uniforms are made with flame-resistant materials (p. 12), have pockets to simplify the attachment of knee and elbow pads (**High-Tech**, p. 71), and incorporate undershirts (and socks) with moisture-wicking (**High-Tech**, p. 64) properties. A complete infantry utility uniform consists of ID tags (p. 12), a flame resistant moisture-wicking blouse tailored to wear under body armor, underwear, flame resistant trousers, moisture wicking socks, flame-resistant baklava (can cover neck and head, except for the eyes), flame-resistant shooting gloves (cloth gloves; see p. B284), knee and elbow pads, a rigger's belt (can act as an improvised climbing harness; see **High-Tech**, p. 55), and hiking boots. A complete infantry utility uniform with boots is $310 and 5 lbs. at TL8.

## Service Uniform

This uniform is often worn for semi-formal military activities, such as checking in at a duty station or meeting with dignitaries. These are often somewhat modular in appearance (e.g., the U.S. Marine Corps service uniform has three major variations), with one or more combinations being work clothing at certain duty stations. A complete service uniform consists of an undershirt, one or two button-up collared shirts in different cuts, coat, underwear, trousers, belt, one or two soft cap variants, a tie, and black shoes (p. B284). Women usually have the option of wearing a skirt. A standard service uniform with shoes is $120 and 4 lbs. (3 lb. at TL8).

> *Winski and his soldiers gave chase, but in their battle rattle they had no chance of catching up. Behind the house were open chicken coops. A teenaged boy stopped to watch the giant Americans, dripping sweat, walk back to their Humvees.*
>
> *– Bing West,* **The Strongest Tribe**

# BODY ARMOR

> *Body armor has a protective effect on victims of high velocity gunshot wounds; lower rates of head, brain, chest, and abdominal injuries are seen. In addition, armor reduces the severity of injuries to the chest and the abdomen.*
>
> *– Peleg et al.,* **Does body armor protect from firearm injuries?** *(2006)*

Until combat in Iraq and Afghanistan proved otherwise, it was thought that body armor was too encumbering for mobile infantry operations, and even when useful, should only be given to front-line troops. This was largely due to the inadequate ballistic properties of older body armor that rarely made them worth the weight and bulk. Political sensitivity to casualties and greatly improved ballistic protection technology has altered the cost-benefit analysis.

Lightweight body armor that can effectively block high-velocity rifle rounds is now widely issued by most wealthy nations. Military personnel are almost always under orders to wear some amount of armor even in operational areas thought to be mostly safe from enemy attack, as a precautionary measure against snipers, improvised explosives, and mortar strikes. However, the proliferation of effective personal armor on the battlefield has also re-energized the development of novel bullet designs, increasing use of armor-piercing ammo (**High-Tech**, p. 167), and research into more energetic propellants (see **Ultra-Tech**, p. 139). It is only a matter of time before the typical insurgent fighter or militia member can gain ready access to such technologies.

## Standard Armor

TL7 improved fragmentation vests (**High-Tech**, p. 66) – using TL8 trauma plates, if any – will likely remain in use into TL9 with paramilitary and military reserve forces in a large number of countries (even those rich enough to afford current designs) as extraordinarily cheap protection against incidental combat and riot threats. It is worn with either a simple medium helmet (**High-Tech**, p. 70) or frag helmet (**High-Tech**, p. 70).

Early TL8 improved fragmentation vests (**High-Tech**, p. 67) – such as the U.S. manufactured PASGT vest (and its derivatives) – was the primary body armor of most well-equipped military forces into the early years of the 21st century. These vests incorporate significantly lighter trauma plates to provide rudimentary ballistic protection against pistol and rifle fire, but are still bulky, rigid, and extremely uncomfortable to wear in hot weather. The high cost of the trauma plates means that most troops are issued the standard version without pockets for plates. It is usually worn with a frag helmet (**High-Tech**, p. 70).

TL8 assault vests (**High-Tech**, p. 67 and pp. 12-13) provide ballistic protection even without trauma plates, but are designed from the ground up to be fitted with them. They are more comfortable to wear for extended periods, especially with moisture-wicking undershirts, and feel lighter due to better load balancing. Their use is still considered somewhat contentious, as they comprise a significant percentage of a warfighter's combat load and can impede reconnaissance and pursuit tasks. Most are issued with side armor plates (p. 13), neck yokes (p. 12), and deltoid protectors (**High-Tech**, p. 67) to cover armor gaps; the additional weight and bulk makes these attachments unpopular on patrol. A ballistic helmet (**High-Tech**, p. 70) or advanced ballistic helmet (p. 10) with integral NVG mount is worn with the vest.

Plate carriers (p. 15) are the preferred body armor for special forces and airborne assault troops, if any armor is worn at all. These cover only the most vital areas – agility, comfort, and mobility are prioritized. Even if armor is not worn, such warfighters will don at least bump helmets (p. 11) with NVG mounts and accessory rails to guard against injuries when quickly maneuvering in buildings and vehicles.

## USING ARMOR

The following are additional considerations for body armor that the GM can apply to his campaign. See *Shooting in Armor* (**Tactical Shooting**, p. 12) for other special considerations when wearing body armor.

*Donning Armor:* Body armor can be slipped over the head, or put on like a coat, in two Ready actions. Properly securing the armor, tightening straps and adjusting the fit, takes another 10 seconds. Quickly donned armor assesses -1 to DX until they can

> # Nothing Left to Chance
>
> *As many as 42 percent of the Marine casualties who died from isolated torso injuries could have been prevented with improved protection in the areas surrounding the plated areas of the vest. Nearly 23 percent might have benefited from protection along the mid-axillary line of the lateral chest. Another 15 percent died from impacts through the unprotected shoulder and upper arm.*
>
> – U.S. Marine Corps, **Marine Lethal Torso Injuries: Preliminary Findings** *(2005)*
>
> Most armor has gaps that are not covered by trauma plates, are thinner than normal due to the shape of the body and limitations of materials technology, or cannot be armored at all to allow for a full range of movement. For this reason, warfighters are drilled to avoid oblique firing stances (**Tactical Shooting**, pp. 11-12). Instead, the shooter directly faces the target to present only the heavily armored front of the torso.
>
> *Targeting Chinks in Armor* (p. B400) covers most situations when an attacker can bypass some of the opponents DR, but GMs that want more detail can also use the rules for *Armor Gaps* in **Tactical Shooting** (p. 12) and both *New Hit Locations* and *Notes for Existing Hit Locations* in **Martial Arts** (p. 137). The rules for *Harsh Realism – Armor Gaps* in **Low-Tech** (p. 101) can also prove useful, but note that striking locations such as the armpit are extraordinarily difficult to hit with most ranged attacks.

be squared away. It takes five seconds to remove the armor, unless hidden quick-release straps are used (takes two Ready actions to dump).

*Fatigue:* Military body armor is heavy and inflexible, but most of the weight is evenly distributed over the entire torso – it doesn't feel as heavy as one would imagine. Even with encumbrance penalties, warfighters can perform typical physical activities – running, jumping, climbing over walls, etc. Buddy-lifts and other cooperation mitigate the reduced mobility and the extra bulk.

*Off-Size Armor:* The listed **GURPS** weights for armor assume they are sized to a wearer of average build (115-175 lbs. – see the *Build Table*, p. B18). This is a deliberate abstraction, as build is just a game feature and not worth any points. In reality, large or unusually shaped individuals must wear different sizes (with correspondingly scaled armor inserts) that weigh more or are stocked in small numbers. A reasonable *optional* rule is to multiply the weight of armor by (character weight / 150), and assess a penalty of -1 to DX *and* -1 to DR when wearing off-sized body armor. Body armor specifically tailored for women has seen some use, but most designs are unisex with adjustment straps to fit most body shapes.

# NEW EQUIPMENT

*For in this modern world, the instruments of warfare are not solely for waging war. Far more importantly, they are the means for controlling peace.*

– Admiral Arleigh Burke

Many of these items are built to survive significant abuse (often by the operator!) and are noted as being ruggedized (**High-Tech**, p. 10). Note that mil-spec and ruggedized are not always synonymous!

## Acoustic Detection System (TL8)

These are refined, and significantly more compact, versions of the acoustic countersniper systems (**High-Tech**, p. 32). The device consists of one or more lightweight omnidirectional microphones and a microprocessor to detect the shockwave and muzzle blast noise of an enemy shot (it can be set to ignore nearby gunfire, to avoid spurious warnings from friendly troops). The device provides range and bearing with both an audio warning ("Shot! 200 yards, 11 o'clock") and more detailed visual output to a HUD or included display (including shot horizontal/vertical angle and weapon caliber). If linked to a GPS system, it will log the coordinates and data of the shooter(s) for coordination with other military resources.

Roll at the device's skill plus the total Hearing modifier for the weapon's type, ammunition, distance, suppressor, etc., to see if it can locate the shooter.

*Portable:* An integrated microphone and dedicated computer worn on the non-shooting shoulder. Can determine direction to within 10° and range to within 10% for supersonic projectiles that pass within five yards (half accuracy out to 50 yards). Multiple shots can be logged at once, but it will filter multiple shots from the same location to avoid notification spamming. Skill 10. $5,000, 1 lb., S/12 hours. LC3.

*Emplaced:* A larger, more sensitive microphone that can be attached to a vehicle or set up on a pole or tripod. Requires a Complexity 3 program, usually running on a fast, small computer with a datapad interface (see **High-Tech**, pp. 20-21). Skill 12. $5,000, 4 lbs., S/12 hours or external power. LC3.

## Advanced Ballistic Helmet (TL8)

This lighter ballistic helmet has additional fragmentation protection and stopping power against rifle rounds, such as the U.S. Enhanced Combat Helmet (ECH). It is compatible with all accessories designed for standard ballistic helmets (**High-Tech**, p. 70). This is comparable to the TL9 light infantry helmet from **Ultra-Tech**, (p. 176). The GM may wish to use that instead (at the price below), with any differences accounted for by slight alterations in design and included accessories (such as better shock padding or integral head cooling unit for the TL9 version).

| TL | Armor | Location | DR | Cost | Weight | LC |
|----|-------|----------|----|------|--------|-----|
| 8 | Advanced Ballistic Helmet | skull | 16 | $700 | 2.5 | 3 |

## Advanced Night Vision Goggles (TL8)

These are refinements to older night-vision devices that eliminate some usability issues and drawbacks. While they do not necessarily eliminate Color Blindness (p. B127) and No Depth Perception (p. B145) when in use, they do not suffer *all* the penalties listed in **Tactical Shooting** (pp. 19-20). All include standard interface ports that allow them to be connected to a digital video recorder or external monitor, and are waterproof to a depth of at least a yard.

*Lightweight:* The latest night vision devices, such as the AN/PVS-31, have significantly better image quality. They are better balanced (an optional battery pack can also serve as a rear counterweight). They also incorporate ergonomic improvements such as glove-friendly controls and independently

pivoting tube housings that can be stowed against the helmet side when folded to reduce the chance of breakage. These units do not have an integral infrared illuminator, but include an IR strobe marker (**High-Tech**, p. 58) for ground personnel identification. Gives Night Vision 9. $15,000, 0.9 lbs., XS/12 hours. LC3. The optional battery pack contains 2×XS batteries (+$25, +0.3 lbs.) and adds an additional 24 hours of endurance.

*Low Profile:* Improved head-mounted night vision device, such as the AN/PVS-21, has shorter optics, better weight balancing, larger field of view, and hands-free transitioning from dark to light environments. The ergonomic design reduces fatigue (no concentration penalty). The operator still suffers from No Peripheral Vision (p. B151), but the night vision view is projected onto a HUD. If the NVG would be overloaded ("white out") from bright light sources it simply fades out the night vision without blinding the user. The HUD can also accept imagery and additional information from other sources, such as a thermal sight mounted on the weapon. The low-profile NVG *can* be used with iron sights or scopes, but a laser illuminator is still recommended. Finally, a refocus ring can be flipped down over one eye with a Ready action to allow the user to clearly see objects within two feet. Gives Night Vision 9 and includes built-in IR illuminators (**High-Tech**, p. 47). $20,000, 1.7 lbs., XS/15 hours. LC3.

*Panoramic:* Wide-angle view night vision goggles such as the AN/AVS-10 eliminate No Peripheral Vision (p. B151). Use the stats for any NVG but +1 CF.

> *U.S. military forces have used biometrics as a nonlethal weapon in counterinsurgency operations in Afghanistan to remove the anonymity sought by enemy combatants.*
>
> *– GAO,* **Defense Biometrics** *(2012)*

## Biometric Scanner (TL8)

This is an early, and significantly more cumbersome, version of the TL9 biometric scanner (**Ultra-Tech**, p. 104). It is a portable package that consists of Complexity 2 biometric software running on a small computer, a digital camera for taking facial photographs and iris scans, and a fingerprint scanner. It takes approximately three minutes to enroll an individual into the system, or half that to check their identity against profiles that are on file. Quadruple this if the check needs to be made over relatively low-bandwidth tactical networks. $25,000, 3.6 lbs., 2×S/4 hours. LC3. Older versions use a separate laptop, digital camera, and scanner for double the weight.

## Bump Helmet (TL8)

Essentially a glorified hockey helmet or hard hat (both **High-Tech**, p. 70), these protect against general bumps and falling debris but do not provide any appreciable ballistic protection. However, they are very lightweight and have excellent ventilation. They provide enough structural integrity to hold NVGs on the integral mounting bracket and accessories on the side accessory rails.

| TL | Armor | Location | DR | Cost | Weight | LC | Notes |
|----|-------|----------|-----|------|--------|-----|-------|
| 8 | Bump Helmet | skull | 5/1 | $150 | 1.5 | 4 | [1] |

**Note**

[1] Split DR: Use the first, higher DR against *crushing* attacks; use the second, lower DR against *all other damage types*.

## Canine Tactical Harness (TL8)

This load-bearing vest (**High-Tech**, p. 54) is designed for large (40+ lb.) military working dogs (p. 14). The integral fasteners allow it to function as a climbing harness (**High-Tech**, p. 55). Sensors (such as a micro-camcorder transmitting video over a radio communicator), identity panels (e.g., "POLICE"), and strobe markers can also be affixed. $100, 2 lbs. LC4.

## Combat Earplugs (TL8)

These adjustable earplugs (**High-Tech**, p. 70) do not filter out low-frequency sounds (normal conversation, footsteps, sound of a weapon being cocked, etc.), but will dampen gunfire and other momentary loud noises (anything above 85 dB). In high-noise environments (around helicopters or generators, for example), the earplugs can be adjusted to a "constant protection" setting. Provides Protected Hearing but -1 on any Hearing roll while worn. $15, neg. LC4.

## Combat Identification Items (TL8)

Combat identification is the process of distinguishing between friendly, neutral, and enemy targets. This can be the result of successful Intelligence Analysis (p. B201), but is usually an informed decision made after a simple Vision roll and Electronics Operation (Communications) attempt. Flares and visually distinctive uniforms is one way to aid in identification, but the following are now very common, especially at night when unaided vision is heavily penalized, and light-amplification devices obscure other characteristics.

*Reflective Panels:* IR reflective patches and panels can be affixed to the shoulders and helmets of individual warfighters or placed on vehicles and facilities to better mark them to allies using night-vision optics. +1 to spot marked units when using Night Vision.

*ID Strobe:* Infrared/visible light strobe markers (**High-Tech**, p. 58) can be set to emit coded flashes and have a shutter for omni- or uni-directional visibility. Coded IR beacons are worn during night operations to reduce the chance of friendly fire by aircraft and distant heavy weapons teams (+2 to Vision rolls made to identify friendly forces if using Night Vision). Can also be used as a flashlight (but drains the batteries in two hours). Includes both a blue light and IR filter, and is visible up to six miles away. $150, 0.4 lb., 2×XS/8 hours. LC4.

## Counter-IED Electronic Warfare Suite (TL8)

These specialized area radio jammers (**High-Tech**, p. 212) disrupt signals used to remotely detonate improvised explosive devices, such as jury-rigged car key fobs, garage-door openers, cell phones, and walkie-talkies. The refined versions listed here do not interfere with military radio communications (which was a significant problem with early prototypes), but will jam most civilian signals used for IEDs.

*Single-Threat EWS:* These are small, low-power jammers visually indistinguishable from any small squad radio. They operate against a single detonator type and cannot be reprogrammed in the field. Range is 50 yards. $25,000, 2 lbs., M/4 hours. LC2.

*Multi-Threat EWS:* A programmable system with an adaptive jamming capability (for example, it can record and play back suspected IED detonator signals to prematurely detonate them). Range is 500 yards. $50,000, 15 lbs., L/30 minutes. LC2.

## Dummy Cords (TL5)

Gear (flashlights, magazines, GPS units, etc.) can be attached to the LBE or belt by short lengths of parachute cord; this is a more general use of the lanyard (**High-Tech**, p. 154). This allows the item to be dropped free to quickly grab another item, and makes it more difficult to lose the item during the confusion of combat. Recovering the item takes a Ready maneuver and a DX roll. The cord can be cut: -6 to hit, DR 2, HP 2. $1, neg. LC4.

## EOD Utility Robot (TL8)

This heavy tracked robot (SM 0, DR 3, HP 32, Move 4) has a turret-mounted manipulator arm (Reach 1, ST 7) ending in a Ham-Fisted (p. B138) gripper. Cameras are on the gripper and turret. Three smaller cameras are on the chassis facing the front and sides. The unit can right itself if it tips over, and climb over small obstacles or travel up stairs.

The operator controls the unit using any computer running its Complexity 1 teleoperation software, and a small radio communicator (effective range is typically 500' due to the bandwidth required). A standard video game controller ($20, 1 lb., available in various styles and colors if desired) is used to drive the robot. $50,000, 500 lbs., M/6 hours. LC4.

## Expeditionary Shelters (TL7)

Modern military shelters are designed for rapid setup. They include integrated power- and network-wiring harnesses and ducting for heating/cooling. They are reasonably insulated and have numerous attachment points for lights and yet more cables. They are lightly constructed (DR 1), and are often surrounded by berms and gambions (see *Multi-Cellular Defense Barriers*, p. 14) for protection against gunfire and to mitigate area damage from mortar attacks. Grey, olive drab, and tan are the most common colors, and they are usually hemispherical or rectangular in shape. Multiple shelters can be attached to each other or to more permanent buildings (including cargo containers) to create elaborate structures.

*Internal Frame:* Although these use more advanced materials, these shelters look almost identical to large military tents that have been in use for over a century (including ports for stovepipes). They can be set up by six personnel in 15 minutes once unpacked and laid out (all required tools and instructions are contained in the shelter package). Includes a detachable waterproof floor covering. A typical 630-square-foot shelter (18'×35' with 10' ceiling) is $1,000 and 710 lbs. LC4.

*Inflatable Beam:* As for internal frame shelters, above, but using semi-rigid inflatable tubes to provide structural support. They are (comparatively) lightweight and can be set up by two people in 10 minutes using an air compressor after it has been laid out and staked to the ground. Maintenance inflation is usually provided by an air-conditioning system attached to the shelter. A typical 430-square-foot shelter (20'×21' with 10' ceiling) is $2,000 and 520 lbs. LC4.

## Flame-Resistant Clothing (TL7)

Clothing can be made with flame-retardant materials to provide protection against fire and flash burns. Flame-resistant clothing has DR 2 against burning damage and is resistant to being set aflame (see *Making Things Burn*, p. B433). +0.5 CF.

## Heavy Targeting Laser (TL8)

A powerful infrared targeting laser (**High-Tech**, p. 157) for crew-served weapons; it can be used as a laser pointer for coordinating air strikes and support weapons, and as a target illuminator. It can be switched from an extremely bright four-mile range tight-beam targeting mode to a 0.5-mile-range IR searchlight (**High-Tech**, p. 228). A typical example is the AN/PEQ-18 used by the U.S. military (commercially available as the IZLID 1000P). Pressing the laser against a window or canopy with the included attachment cap allows it to be used inside a vehicle without reflecting light back and blinding the user. Adds -1 to Bulk. $2,500, 1.5 lbs., 4×XS/4 hrs. LC3.

## ID Tags (TL5)

Often called "dog tags," so named for their resemblance to identification tags used on pets, these small metal identity discs or rectangles are embossed with basic identifying and medical information. They are usually issued in pairs and worn around the neck on a metal chain; warfighters often put extra tags in their boots "just in case." The tags clank during movement, so rubberized pads are a common accessory. Upon death, one tag is removed and used for recordkeeping and verification, and the other is left on the body.

Medical information listed includes blood type – to prevent accidents during emergency blood transfusions (**GURPS Bio-Tech**, p. 130) – and any allergies to penicillin or other common therapeutic drugs (see **Bio-Tech**, pp. 149-152). $5, 0.3 lbs.

## Improved Assault Armor (TL8)

This is a refinement of the existing assault vests (**High-Tech**, p. 67), incorporating the latest in ballistic fiber weaves and design features requested by combat veterans. These vests provide better coverage of the torso (-6 to bypass the trauma plates when *Targeting Chinks in Armor*, p. B400, but a successful hit still applies the base DR of the vest). Includes a detachable neck collar (1.4 lbs.) and groin guard (0.7 lb.), straps and attachment points for equipment (treat as a load-bearing vest, **High-Tech**, p. 54), and can be quickly removed with two Ready actions. These vests incorporate a front/back pocket for a large trauma plates, and side pockets for small trauma plates. Deltoid and auxiliary protector (**High-Tech**, p. 67) attachments are usually issued as well (referred to as brassards in Commonwealth countries). The vest itself is flame resistant (above).

## Improved Assault Armor Table

| TL | Armor | Location | DR | Cost | Weight | LC | Notes |
|----|-------|----------|-----|------|--------|-----|-------|
| 8 | Improved Assault Vest | neck, torso, groin | 12/5* | $1,100 | 8 | 3 | [1] |
|  | + Ballistic Panels | torso | +4/1* | $200 | 2 | 3 | [1] |
|  | + Large Trauma Plates | torso | +25 | $600 | 8 | 3 | |
|  | + Small Trauma Plates | torso (side) | +23 | $300 | 4.6 | 3 | |
|  | + Enhanced Ballistic Plates | torso | +30 | $1,200 | 11 | 3 | |
|  | + Enhanced Small Inserts | torso (side) | +27 | $600 | 5.1 | 3 | |
|  | + Advanced Trauma Plates | torso | +35 | $1,800 | 13 | 2 | |

Note

[1] Split DR: Use the first, higher DR against *piercing* and *cutting* attacks; use the second, lower DR against *all other damage types*.

Examples include the Improved Outer Tactical Vest (IOTV) and Modular Body Armor Vest (MBAV) used by the U.S. Army, Modular Tactical Vest (MTV) used by the U.S. Marine Corps, and the Osprey Mk. 4 used by the British Army.

*Ballistic Panels:* Lightweight aramid fiber panels inserted behind the large trauma plates for spall protection, or used alone for enhanced defense against fragments.

*Large Trauma Plates:* Ceramic armor plates (known as Small Arms Protective Inserts – SAPI – in U.S. service) designed to work in conjunction with ballistic fiber vests or panels backing them. Wearing them alone in improvised plate carriers will lead to heavy bruising or even fragmentation damage from spall produced when the plates are struck (1d-2 cutting damage)! Set includes two interchangeable plates that protects the torso from the front and back.

*Small Trauma Plates:* A pair of smaller plates worn to protect the side of the torso under the arm.

*Enhanced Ballistic Plates:* Boron carbide ceramic plates that provide additional protection against armor piercing bullets. Replaces both large trauma plates.

*Enhanced Small Inserts:* More advanced trauma plates used for side protection. Replaces both small trauma plates.

*Advanced Trauma Plates:* Composite armor plates to defeat 7.62mm armor-piercing rounds. Replaces both large trauma plates.

> *If I have to have a robot carry my gear, maybe there is another problem: **too much gear**.*
>
> *– 1st Sgt. David Roels*

### Language Reference Materials (TL7)

Warfighters are often issued small booklets or flashcards with written messages and pictures to allow basic communication without actually knowing the local language. This is effectively Broken language comprehension with Preparation Required (1 minute) for every complex concept that needs to be communicated.

*Pocket Interpreter (TL8):* In areas where literacy is uncommon, user-selectable pre-recorded messages can be played back on a laptop or PDA and/or relayed through a bullhorn or large speaker setup. This is a Complexity 0 software application, usually distributed for free.

*Translator Program (TL9):* Sophisticated language translation software (**Ultra-Tech**, p. 47) is available at late TL8, on an experimental basis. This usually means it's glitchy, does not handle idiomatic speech (or translates it in hilarious/dangerous ways), and costs at least 10× as much.

### Large View Dot Sight (TL8)

These large reflex sights (**High-Tech**, p. 156) are designed to be used on crew-served weapons (autocannons, medium machine guns, miniguns, etc.). The viewing aperture is very large so the gunner can keep both eyes open while aiming; the operator does not suffer from the *Peripheral Vision* harsh realism note from *Tactical Shooting* (p. 32). Includes two rails for mounting IR lasers or other sighting aids, a mounting bracket to in-line a standard night-vision device, and an adjustable dial to correct for bullet drop at various increments. A typical example is the BE Meyers DCL-110. Adds -1 to Bulk. $500, 2.9 lbs., XS/700 hrs. LC3. Can fit a flip-up 3× magnifier for long-distance aiming ($200, +0.9 lbs.).

### Laser Target Locator (TL8)

These rangefinder binoculars (**Tactical Shooting**, p. 77) have an integral military-grade GPS receiver (**High-Tech**, p. 53) and thermograph (**High-Tech**, p. 48). In addition to ranging information (**Tactical Shooting**, p. 27), the locator provides geolocational data in reporting formats useful for Forward Observer (p. B196) and GPS-guided weapons. $20,000, 5.5 lbs., XS/12 hours. LC3.

*Laser Target Designator:* The IR laser rangefinder can be replaced with a multi-function system that also serves as a pulse-code encrypted designator for laser-homing and marker-tracker systems. $30,000, 7 lbs., XS/4 hours. LC1.

### Lightweight Tripods (TL8)

Newer, lighter tripods can replace older models. They are often better designed and easier to set up. Examples include the M192 Lightweight Ground Mount (11.5 lbs., $2,250) listed for the M240B (**High-Tech**, p. 134) and the M205 Lightweight Tripod for Heavy Machine Guns (31 lbs., $4,200) that replaces the 44 lb. M3 tripod used by the M2 (**High-Tech**, p. 133) and MK 19 (**High-Tech**, p. 143).

### Loitering Munition (TL8)

Essentially a micro-UAV armed with an explosive charge, these systems provide a limited surveillance and reconnaissance capability as well as the functionality of a small guided missile. They can be deployed and operated by a single warfighter. They are either hand-launched or propelled out of a mortar-like launch tube. They are not reusable, and will self-destruct if not committed to a target. All have an integral digital compass (**High-Tech**, p. 52) and GPS receiver (**High-Tech**, p. 53).

*Drone Bomb:* This small propeller-driven drone (SM -3, DR 1, HP 5, Move 40) is intended to function as portable air support. The most relevant example is the AeroVironment Switchblade, in service with the U.S. Army, Marine Corps, and Special Forces since 2012. The complete system is composed of a controller and antenna (compatible with other systems) and a drone packed in a launch/shipping tube. Setting up the controller and launching the drone bomb takes two minutes.

The control system includes a ruggedized small computer (**High-Tech**, p. 20) and antenna. $30,000, 7.5 lbs., M/6 hours. LC2.

After launch, the drone's wings unfold, and it propels itself using a quiet electrical propeller (can be heard at one yard on an unmodified Hearing roll). The drone has a useful operating range of three miles and will generally fly less than 500' above the ground. The drone includes a color video camera with 2× zoom. For simplicity, use Artillery (Guided Missile) to control and attack with the drone – it is simply crashed into a target, detonating its warhead (Dmg 9d [2d] cr ex). Each drone, including the launch tube and accessories is $10,000, 5 lbs., S/10 minutes. LC1.

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# Military Working Dogs

*Like other highly specialized pieces of equipment, MWDs supplement and enhance the capabilities of military security forces.*
– U.S. Navy, **OPNAVINST 5585.2C** *(2012)*

Military working dogs (MWD) are used by security forces for patrolling and law enforcement. MWDs are mostly large, gregarious, and intelligent breeds such as German or Dutch shepherds: use the statistics for *Large Guard Dogs* (p. B457).

Typically, MWDs are fitted with only a basic harness, but canine tactical vests (p. 11) are increasingly common. Cameras and speakers for relaying commands are standard with many who use MWDs for combat patrols and bomb detection. Canine body armor is available, but rarely used due to the threat of heat exhaustion (the most common cause of death for MWDs).

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## Military Divecomm (TL8)

A typical military diver communicator (**High-Tech**, p. 40) is actually a civilian model with the ruggedized option and additional channels. They can function to a depth of 100 yards.

## Mine Detectors (TL8)

TL8 land mines have very little metal content (only the firing pin is metallic in many models), and improvised explosive devices are often deeply buried or placed in areas with extensive metallic debris in the soil, limiting the capability of metal detectors (**High-Tech**, pp. 50 and 206) to detect dangerous objects. Modern military metal detectors find both ferrous and non-ferrous metals, and are calibrated to locate buried wires and the metal in detonators, although detection rates remain poor.

A recent trend combines metal detectors with ground penetrating radar (**High-Tech**, p. 46). Buried objects above a set size threshold (SM -4 or larger) with a detectable metal content are flagged as suspect, which results in significantly fewer false alarm rates than if either type of sensor was used alone.

*Military Metal Detector (TL8):* The VMC1 Gizmo used by the U.S. military – and similar modern systems – is a lightweight metal detector that can collapse into a package the size of a large book. $500, 5.3 lbs., 3×S/6 hrs. LC4.

*Dual-Sensor Detector (TL8):* This combines a conventional metal detector with a ground-penetrating radar. Modern examples include the Vallon VMR3 MineHound and AN/PSS-14 HMDS used by the U.S. military and international agencies. $2,000, 8.8 lbs., 4×S/8 hrs. LC4.

## Military First Aid Kit (TL8)

This is a refinement of the small first aid kit (**High-Tech**, p. 221), incorporating TL8 emergency medical equipment. This kit gives +1 (quality) to First Aid when treating combat trauma. The contents are held in pockets and attached to the kit holder with a lanyard. Exact contents vary, but a typical kit contains two combat tourniquets (see below), two hemostatic bandages (**High-Tech**, p. 221), enough normal bandages for two major wounds (**High-Tech**, p. 221), a burn dressing, antibiotic ointment (**High-Tech**, p. 225), water purification tablets (**High-Tech**, p. 59), eye-patch, and a casualty card with marker. $100, 2 lbs. LC4.

*Combat Tourniquets (TL8):* These plastic-framed tourniquets can be applied to an arm or leg with one free hand and winched down with an integrated windlass. When bandaging a bleeding wound (p. B424) located on a limb, these give +2 (quality) to First Aid, and reduce the time required to 10 seconds. Per tourniquet: $35, 0.2 lb. LC4.

## Multi-Cellular Defense Barriers (TL7)

Usually referred to as a "HESCO" after the British company that developed it, these are collapsible containers are constructed with welded steel wire mesh and heavy geotextiles that can be pulled open and quickly filled with soil and gravel to be used as vehicle barriers, blast walls, and temporary dikes. They can replace sandbags in many military and civil engineering applications, and most sizes can be stacked at least two units high. Standard cellular barriers are designed to be semi-permanent (they degrade after about five years), but there are recoverable versions as well (with a hinged side to allow fill material to be removed and the cell to be repacked). A typical fill material of local soil, sand, and gravel provides DR 2/inch when used for cover. Field expedient versions use oil drums filled with earth, concrete poured into molds, and even medieval-style gambions made of wicker reinforced with old chain-link fence pieces.

*Standard Deployment:* Barriers are removed from a pallet, stood up, expanded, and then pinned together. A standard pallet of nine cells can form a wall 4.5' tall, 3.5' thick, and 32' long. It takes 30 minutes for two workers to unfold and pin all nine cells together, with a front-end loader filling the units behind them (requires 777 cubic feet of filler). Per pallet: $650, 2,450 lbs. LC4.

*Rapid Deployment:* The latest version of the cellular barriers can be deployed and ready to fill very quickly by using vertically stacked preconnected barrier sections loaded onto a special pallet. The sections can then be deployed by dragging the pallet behind a vehicle. The barriers can be set in curved patterns or on uneven ground from a vehicle travelling at up to Move 5. +0.5 CF.

## Plate Carriers (TL8)

Plate carriers are slimmed-down variants of assault vests and assault armor. The carriers provide normal levels of direct-fire ballistic protection from the front and back, but little or no protection to the sides. The front and back pockets holds standard large trauma plates. The carrier can be fitted with a detachable cummerbund (2.5 lbs.) that can hold a small trauma plate on each side (2/6 protection on the sides if worn).

*Nonballistic Carriers:* These have pockets for holding trauma plates. They function as load-bearing vests, but provide only DR 1 themselves. Can be improvised from a load-bearing vest by using Sewing (p. B219).

| TL | Armor | Location | DR | Cost | Weight | LC | Notes |
|----|-------|----------|-----|------|--------|-----|-------|
| 8 | Plate Carrier | torso | 12/5* | $400 | 6 | 3 | [1] |
| 8 | Nonballistic Carrier | torso | 1 | $150 | 2 | 4 | |

### Note

[1] Split DR: Use the first, higher DR against *piercing* and *cutting* attacks; use the second, lower DR against *all other damage types*.

## Remote Pull Kit (TL8)

A simple set of tools for pulling or accessing suspicious items from a distance, without requiring a full EOD ensemble. A typical small pack holds 100' of line, a hook knife (for quickly cutting webbing, paracord, straps, and clothing that is in the way), a folding grapnel hook (p. B299), and a carabiner. Counts as improvised equipment for the Explosives Ordnance Disposal skill (p. B194), but the intent is to trigger any traps from a safe distance, not disarm them. $350, 1.5 lbs. LC4.

## Scout Robot (TL8)

This small tracked robot (SM -5, DR 3, HP 7, Move 1) can be thrown into dangerous areas, maneuver itself in confined spaces, and discretely observe a location. It is self-righting if it flips over, and is waterproof to one yard. It has low-light cameras with 8× digital zoom on the front, back, left, and right. There is an IR illuminator (**High-Tech**, p. 47) on the front of the robot. The operator uses a command unit (2 lbs.) featuring video-game style controls and a small LCD screen to control the robot out to 600'. Can fit an optional payload module with mechanical release pins that allow it to carry a sensor, thermal imager, or small explosive device weighing up to 0.5 lb. $20,000, 5.4 lbs., S/6 hours. LC4.

## Shooting Gloves (TL7)

Gloves designed specifically for combat shooters come in a dizzying array of styles and colors, but are basically cloth or leather gloves (p. B284). They are often expensive, and have the flame-resistant option (p. 12) and moisture-wicking properties. Many include a polymer knuckle guard to help protect against cuts and abrasions; this provides DR 2 for the hand if struck in combat (2/6 protection). Others are marketed with features such as conductive materials on the fingertips to allow gloved use of capacitive touch screens or metallic inserts in the palms to reduce heat transfer when fast roping.

## Tactical Sound System (TL8)

This ruggedized set of loudspeakers for hailing and notification. The speakers are packaged in two hard plastic cases (DR 2) with accessories stored in the lids. The full ensemble includes a hands-free microphone, mounting stand, extension cables, and rechargeable battery pack. May be connected to a pocket interpreter (p. 13) to play prerecorded or translated directives. The sound system can be heard 128 yards away on an unmodified Hearing roll. $5,000, 92 lbs., 1×L/4 hours or external power. LC4.

# ABOUT THE AUTHOR

Kenneth Peters was forward deployed at MARCENT headquarters in Bahrain during Operation Iraqi Freedom/Operation Enduring Freedom, working as a MAGTF Planning Specialist and tracking everything from bedsheets to thermobaric warheads. He has contributed material to numerous **GURPS** books, freelanced for several **Shadowrun** products, and authored a number of *Pyramid* articles.

# THE DEVIL'S CHARIOT

## BY HANS-CHRISTIAN VORTISCH

*And the shapes of the locusts were like unto horses prepared unto battle; and on their heads were as it were crowns like gold, and their faces were as the faces of men. And they had hair as the hair of women, and their teeth were as the teeth of lions. And they had breastplates, as it were breastplates of iron, and the sound of their wings was as the sound of chariots of many horses running to battle. And they had tails like unto scorpions, and there were stings in their tails: and their power was to hurt men five months.*

*– Revelations 9:7-10*

The world's most famous helicopter gunship is the Russian Mi-24 series, or "Hind," as it has been code-named by NATO. It is perfectly suited for **GURPS Action** campaigns. Heavily armed and armored, it has a two-man crew and a cabin to carry a team of operators. It can be used by the opposition or flown by the PCs.

The "Hind" can also be used in many other campaigns. It might see straight-forward military action with **GURPS Special Ops,** or be operated by a monster-hunting mercenary company with **GURPS Monster Hunters.** Obsolete "Hinds" can play a role in dystopian near-future campaigns using **GURPS Autoduel, GURPS Cyberpunk, GURPS Horror,** or **GURPS Reign of Steel.**

*. . . it [the Mi-24] remains the most widely used ground-support helicopter in the world.*

*– Al Venter, **War Dog** (2006)*

## MIL MI-24V "HIND-E" (RUSSIA, 1976-1986)

*MHI's helicopter was a surplus MI-24 Hind. Harbinger had picked it up for next to nothing after the collapse of communism. It was possibly the ugliest thing ever designed, but it was considered a flying tank for a reason.*

*– Larry Correia, **Monster Hunter International** (2009)*

The Mi-24V of the Russian Mil design bureau is the most common variant of the Mi-24 series of armed helicopters. It is a 59'-long, twin-engined helicopter gunship with a five-bladed 57'-diameter main rotor and a small, three-bladed tail rotor. The Mi-24V is armed with a 12.7mm minigun in a chin turret, and has wing-mounted hardpoints for rockets, missiles, bombs, and gun pods. Crewed by two men, it has a large rear cabin that seats up to eight troops.

Its distinctive appearance has led to several nicknames in Russian service, including *Gorbach* ("Hunchback") and *Krokodil* ("Crocodile"). The Russians employed the Mi-24V heavily in the war in Afghanistan (1979-1989) and during the two conflicts in Chechnya (1994-1996 and 1999-2000), mainly for armed escort, search and destroy, and combat search and rescue missions. In this, it was so successful that the Afghan *Mujahideen* called it the *Shaitan Arba* ("Devil's Chariot").

The Mi-24V entered service with the Soviet air force in 1976 and was built until 1986. Some 1,000 were produced, making it the most numerous of all variants. A mildly modified export version of the Mi-24V is called the *Mi-35.* Total "Hind" production at two of the Soviet Union's helicopter plants topped 2,570 when it ceased in 1989. Low-rate production has resumed at Russia's Rostvertol factory, but almost all recently made "Hinds" are upgrades of old airframes.

The Mi-24V "Hind-E" is currently still used by Afghanistan, Belarus, the Czech Republic, Ethiopia, Georgia, Hungary, Kazakhstan, Macedonia, Mongolia, Poland, Russia, Uganda, and the Ukraine. The Mi-35 "Hind-E" is operated by Angola, Burkina Faso, the Congo, the Czech Republic, India, Libya, Sri Lanka, and Zimbabwe. Many smaller countries have only a handful of the aircraft. In some cases, the choppers are grounded most of the time due to lack of maintenance. For example, of the 12 Mi-24V owned by Uganda, five are reported unserviceable, and three more crashed simultaneously in 2012 while crossing a mountain in Kenya.

Former users of the Mi-24V include Croatia, the Ivory Coast, Serbia, Sierra Leone, and the Slovak Republic. Sierra Leone owned three Mi-24Vs, two of which were operated by international mercenaries during the civil war in Sierra Leone in 1999-2002, while the third was cannibalized for parts. One was shot down, and the last was grounded when its crew left the country. Two Mi-24Vs were operated by the infamous Serbian *Jedinica za Specijalne Operacije* ("special operations unit"). Nominally a police unit, it was heavily engaged in combat in the Kosovo. The JSO was disbanded in 2003 after several members had taken part in the assassination of the Serbian premier.

Its "Hinds" were transferred to the Serbian air force, but are no longer airworthy. The aircraft owned by the Ivory Coast were destroyed on the ground in a punitive action by French peacekeepers during the civil war in 2004.

There are even some "Hind" users in North America. The U.S. Army flies two Mi-25 "Hind-D" and an Mi-35P "Hind-F" as opposing forces in training exercises. As of 2013, there are seven operational Mi-24D "Hind-D" choppers registered with two private companies in the United States – presumably, these are unarmed.

# THE MI-24V IN DETAIL

*In Afghanistan, the Hind has gained a reputation for being almost impervious to small arms fire. This statement should be treated with reservation, as several reports exist where Hinds have been downed by the Afghan resistance firing down at them from higher up mountainsides. While certainly resistant to anything up to 12.7mm calibre, much of the ground fire has been at extreme range, where much of its penetrative capability has been lost.*

*– Mike Spick,* **Mil Mi-24 Hind** *(1988)*

The streamlined airframe of the Mi-24V is an aluminum semi-monocoque. Since armoring the entire craft would be much too heavy, the designers at Mil instead provided partial armor for critical components. The floor of the cockpit and rear cabin are fitted with 8mm steel armor plates, as are the sides of the cockpit. The cockpit interior is covered with nylon spall liners to catch any penetrating fragments. The cockpit windshields consist of 50mm-thick armor glass, while the other parts of the cockpit bubble are made of 8mm plexiglas, the latter not offering any protection against small arms. In an emergency, it's designed to be cut through with the special canopy knives found in clips beside the pilot's and gunner's seats. The cockpit and cabin are sealed (p. B82) against biological, chemical, and nuclear attack. The engines and transmission are protected by 5mm armor plates. The rotor head is made of titanium; the rotors are of titanium and glassfiber.

While this is more armor than carried by most Western combat helicopters, it sounds much less formidable than the claims about the Mi-24's "invulnerability" to attack from heavy machine guns and even 20mm autocannon. However, it has to be remembered that many such attacks will be from beyond 1/2D Range and at unfavorable angles. In 10 years of fighting in Afghanistan, the Soviets lost a staggering 333 Mi-24 helicopters – most of these were shot down.

The two turboshaft engines develop 1,660 kilowatts each, a slight improvement over earlier models. Together with the upgraded gearshaft, this is the reason for the "V" in Mi-24V, which stands for *Vysotnyy* ("high altitude"). The Mi-24V's service ceiling is about 14,750', half that if hovering. The engines are considered underpowered for a craft of this size and weight, a disadvantage that was accepted in light of their reliability. Both engines are fitted with integral fire extinguishers (**GURPS High-Tech,** p. 229), which are manually initiated by the crew.

The maximum take-off weight of the Mi-24V is 13.2 tons. At such a load, the helicopter operates at the limits of its performance envelope – it can only get into the air with a rolling take-off, to take advantage of the additional lift generated by the stub wings. The normal operational weight is 12.3 tons. With a full load of fuel, this leaves only 1.7 tons of payload, including crew, cargo, and weapons. Depending on mission specifics, the craft will often fly with only two rocket pods and a reduced load of minigun ammunition.

The Mi-24V has five interconnected self-sealing fuel tanks located under and aft of the main cabin. These hold 562 gallons of fuel (1.8 tons of jet fuel). This gives the craft an endurance (p. B463) of 2 hours 35 minutes. Two optional auxiliary tanks in the cabin can hold 324 gallons (1.1 tons), increasing endurance to 4 hours 4 minutes and range from 280 miles to 485 miles. Up to four 118-gallon ejectable fuel tanks can be carried on the inner hardpoints. Each *pair* increases endurance by 1 hour 5 minutes and range by 118 miles.

The Mi-24V has an IFF system (**High-Tech,** p. 230), a radar warning system (+1 on Dodge rolls against radar-guided weapons), and a number of built-in measures to protect it against infrared-homing missiles (p. B413). These include passive heat dissipators on the engine exhausts and an active IR jammer, the latter fitted since 1982. This always gives -2 to hit. Furthermore, the Mi-24V carries six 32-round flare dispensers, which on command by the pilot can eject 16 flares every two turns for 12 turns. This gives a further -2 penalty to hit, but only as long as flares are in the air. (The IR jammer becomes very hot when switched on, and during the war in Afghanistan, forward-deployed "Hind" crews would use it to cook potatoes and heat tea water.)

The Mi-24V lacks any night-vision equipment whatsoever. The vaunted low-light television and forward-looking infrared sensors mentioned in most Cold War reports were not actually available to Russian pilots until 2005, when 14 of the Mi-24PN upgrade were delivered. This means the Mi-24V can only operate in daylight and fair weather, severely limiting its operation envelope.

The tandem cockpit has two crew positions. The gunner/copilot sits in front, with the pilot behind him in a slightly elevated position. The pilot needs Piloting (Helicopter), Navigation (Air), Electronics Operation (Comm), Gunner (MG), Gunner (Bombs), and Gunner (Rockets). The gunner needs the same skills plus Artillery (Guided Missile); his Piloting skill will usually be lower. Both have harnesses. The crew has good vision to the front and sides. Rear-view mirrors allow a measure of protection against sneak attacks from behind. The canopy includes the gunner's door on the port side and pilot's door on the starboard side.

The cockpit stations are more spacious than in comparable Western gunships, but still not comfortable, especially for tall people. The analog instruments, outdated targeting equipment, and non-ergonomic layout make for a cluttered look and inefficient design. Despite restricting the front view, both cockpits have ventilation fans mounted at face height, testament to the limitations of the air-conditioning system in warmer climates.

The crew has dual flight controls, although the foot pedals at the gunner's station stow away and are for emergency only. Unlike Western helicopters, the Mi-24V has a limited-authority autopilot that reduces the pilot's workload and increases the helicopter's flight stability. It has standard navigation instruments (+3 to Navigation), including a weather radar. A 300-mile radio is also installed, but lacks encryption. There's a small searchlight (**High-Tech,** p. 228) with 200-yard white-light beam mounted on the port side below the pilot's position, fixed shining forward and slightly down. It's primarily used to examine possible landing sites.

The pilot has a reflex sight (**High-Tech,** p. 156) that gives +1 to Gunner (Bombs, MG, Rockets) to fire the unguided ordnance, including the minigun if it is locked to fire forward. The gunner has a reflex sight that gives +1 to Gunner (Bombs, MG, Rockets). He can also fully control the turreted minigun. He has a telescopic sight (p. B471) in the form of a television-style display with 8× magnification (+3 Acc) for use with the guided missiles.

The 162-cubic-foot cabin is located behind the cockpit, being 8.6' long, 4.8' wide, and 3.9' high. It can accommodate eight fully equipped combat troops on two sets of removable folding benches facing outward. Usually only the rear set is installed, seating four men, two facing either side. A folding seat near the gangway to the cockpit faces aft, to be occupied by a flight engineer or loadmaster. It can only be used when the forward benches are removed.

The troop complement, if carried, usually consists of specialists like an antitank squad, combat engineer detail, or team of *Spetsnaz* (**Special Ops,** p. 40). With half or all the benches removed, the cabin can also be used to carry auxiliary fuel tanks, spare ordnance for the underwing stores, or any other cargo up to 1.65 tons in weight. Another option are two casualties on stretchers and two sitting casualties, plus a medical attendant and his equipment.

There is a two-piece door in either side, the lower part with integral step folding down to open, the upper part folding up. Four small windows are provided on each side. The forward three are inward-opening and have rifle rests to allow deployment of assault rifles for suppressive fire (treat as braced for +1 to Acc). Instead of infantry troops, many users instead carry one or two door gunners who deploy a machine gun from one or two of the rifle rests. The Russians use the KMZ PKM (**High-Tech,** p. 135), while during mercenary operations in Africa, a pair of FN MAG machine guns (**High-Tech,** p. 134) has been popular. The cabin's occupants have no way to communicate with the cockpit other than shouting through the gangway at the pilot – the interior in the Mi-24V is very loud.

The manually controlled chin turret (**High-Tech,** pp. 229-230) under the nose mounts a KBP YakB-12.7 minigun (p. 19). The turret requires a Ready maneuver to change facing. The gun can be tracked 60° to either side, +20° upward and -60° downward. Belted ammunition comes from a 1,470-round magazine. A standard load is either duplex for antipersonnel use or API and API-T mixed 3:1 (**GURPS Tactical Shooting,** p. 31) for use against vehicles and structures. The length of burst can be selected between 10 and 400 rounds. Due to the requirement to use pyrotechnic starter cartridges, only 10 bursts can be fired per flight, regardless of their length. The empty cases are ejected downward from the chin in an impressive shower of hot steel. Both pilot and gunner can fire the gun, but the pilot can only strafe with the gun locked forward.

The stub wings feature six underwing hardpoints (p. B467), the four inboard ones tapped. The stub wings are stressed for a maximum external payload of 2,640 lbs. on either side, with the innermost hardpoints rated for up to 1,760 lbs., the mid positions rated for 1,100 lbs., and the wingtips for 440 lbs. The two outboard pylons can only carry launching rails for missiles of the 9K114 *Shturm-V* ("Storm for helicopters") antitank system. The four inboard pylons can be fitted with a variety of weapons, including rocket pods, gun pods, unguided bombs, or external fuel tanks.

The 9K114 Shturm-V system uses the Kolomna 9M114 *Kokon* ("Cocoon") antitank guided missile (p. 20) – NATO code "AT-6a Spiral." In addition to the two launching rails under each outboard pylon, the two middle hardpoints can be fitted with two rails as well, for a total load of eight missiles.

The UB-32-57 is a 32-round pod for unguided 55mm S-5 rockets (p. 19). A loaded pod weighs 509 lbs. Up to four rocket pods can be carried, linked in pairs (**High-Tech,** p. 229).

The B-8V20 is a 20-round pod for unguided 80mm S-8 rockets (p. 20). A loaded pod weighs 770 lbs. Four rocket pods can be carried, linked in pairs.

The GUV-8700 gun pod holds a KBP YaKB-12.7 minigun (p. 19) with a 750-round belt and two KBP GShG-7.62 miniguns (p. 19), each with a 1,800-round belt. The gunner can fire the YaKB-12.7, the two GShG-7.62s, or all three guns together linked. A loaded pod weighs 994 lbs. Four of these can be carried, linked in pairs.

The GUV-1 gun pod holds a single KBP AG-17A automatic grenade launcher (p. 19) with a 300-round belt. It weighs 603 lbs. loaded. Four of these can be carried, linked.

The UPK-23-250 gun pod holds a KBP GSh-23L autocannon (p. 19) with a 250-round belt. It weighs 480 lbs. loaded. Four of these can be carried.

# Hit Location Table

Instead of the generic *Vehicle Hit Location Table* (p. B554), use this for the Mi-24V.

| Roll | Location (Penalty) | Notes |
|------|--------------------|-------|
| 3-4 | Exposed Weapon Mount [X] or Small Glass Window [g] (-7) | [1] |
| 5 | Chin Turret [t] (-5) | |
| 6-7 | Helicopter Rotor [H] (-2) or Stub Wing [Wi] (-2) | |
| 8-10 | Body (0) | [2] |
| 11 | Large Glass Window [G] (-3) | [3] |
| 12 | Body (0) | [2] |
| 13-14 | Helicopter Rotor [H] (-2) or Stub Wing [Wi] (-2) | |
| 15-16 | Wheel [W] (-4) | [4] |
| 17-18 | Vital Area (-3) | [5] |

## Notes

[1] Check for an occupant hit (p. B555). The cabin windows have DR 2.

[2] Check for an occupant hit. Roll 1d to randomly determine who was hit: (1) pilot; (2) gunner; (3-6) one or more of the cabin occupants. The pilot and gunner are protected by DR 25 from the front, sides, and underside. The cabin passengers are protected by DR 25 from the underside and DR 5 from all other angles.

[3] Roll 1d: 1-2 means a hit on the windshield (DR 40); 3-6 means a hit on the canopy (DR 2). Attacks from the front always hit the windshield. Check for an occupant hit.

[4] During flight, the wheels are normally retracted; treat as Body hit instead.

[5] Due to the ruggedized construction, self-sealing fuel tanks, and doubling of important components, the wounding modifier for an impaling or piercing attack is only ×2, not ×3 (compare p. B555)!

The FAB-100 M-62 (p. 21) and FAB-250 M-62 (p. 21) are simple impact-fused general-purpose bombs with a weight of 220 lbs. and 550 lbs., respectively. Instead of individual bombs, the hardpoints can support multiple ejection racks for four FAB-100 bombs, allowing up to 16 of the smaller bombs to be carried. Bombs are released by the pilot, but can also be ejected by the gunner.

The retractable landing gear is of the tricycle type. It's sturdy enough to allow a rolling take-off from a grass field.

The Mi-24V is usually painted in a two-color camouflage pattern, with a blue-gray belly, but those on loan to the United Nations are painted white overall. From the 1990s, many have received a shark's teeth paint job on the nose, mimicking the Western tradition for fighter aircraft.

Many, but not all, Mi-24V have a cargo hook for a slung load under the belly. This has a capacity of 2.6 tons. An external load hampers flight considerably (all Piloting rolls are at -2, and Move is halved). The load can be jettisoned in an emergency by either the cockpit crew or the loadmaster.

Maintaining a craft of this type requires a ground crew with Armoury (Heavy Weapons) and Mechanic (Helicopter).

# Mi-24V Armament

*These [multi-barrel] weapons (with autonomous gas-operated drives) are characterized by the maximum absolute and specific (per weapon weight unit) rate of fire.*

*– KBP catalog (1997)*

As a gunship, the Mi-24V has a wide selection of armaments for all sorts of targets. Some of these are specific to its design, but most are also used in other Russian combat vehicles. In real war, much of the Mi-24V's bristling array of weapons has proven to be relatively ineffective, lacking range, punch, precision, or all of it together. With a skilled crew, PCs may find it nonetheless useful – especially at comparatively close range and if the enemy can't shoot back . . .

## Machine Guns and Autocannon

For additional information, see **High-Tech,** p. 129.

### KBP GSh-23L, 23×115mm AM-23 (Russia, 1965-)

This is a fast-firing, twin-barreled autocannon operating on the Gast principle, where the barrels fire alternatively. It was designed by Vassily Gryasev and Arkady Shipunov. On the Mi-24V, it's only used in gun pods, but the Mi-24VP "Hind-E Mod" and Mi-35M carry it with a 450-round belt in the rotating chin turret instead of the minigun.

It uses disintegrating belts (202 lbs. per 250 rounds). In addition to SAPHE (in the table), it fires API (Dmg 6d×2(2) pi++ inc with 1d+2 [1d+1] cr ex follow-up) and APEX (Dmg 6d×2(2) pi+ with 1d+2 [1d+1] cr ex follow-up).

### KBP YakB-12.7, 12.7×108mm Degtyarev (Russia, 1973-1997)

This four-barreled gas-operated rotary gun was designed by Petr Yakushev and Boris Borzov. It entered service together with the Mi-24D "Hind-D." It's a standard armament of the Mi-24V, both in the chin turret and in gun pods. Unlike American miniguns, it isn't externally powered, instead requiring a pyrotechnic cartridge to start it. The gun has a magazine loaded with 10 such starter cartridges, meaning it can fire only 10 bursts per sortie.

The YakB-12.7 uses disintegrating belts (16.9 lbs. per 50 rounds). Aside of API-T (in the table), it fires duplex (Dmg 9d-1 pi+ inc, Range 800/3,500, RoF 70!×2, Rcl 1). SAPHE (Dmg 6d×2 pi+ with 1d [1d-2] cr ex follow-up) is available but usually not used in this gun.

The weapon attracted much criticism during the war in Afghanistan because of its limited punch and range. It was replaced by the GSh-23L (above) in some models, while the Mi-24P "Hind-F" and Mi-35P "Hind-F" received a fixed KBP GSh-30K instead, a much more powerful gun.

### KBP GShG-7.62, 7.62×54mmR Mosin-Nagant (Russia, 1980-1997)

Developed by Vassily Gryasev, Arkady Shipunov, and Evgeniy Glagolev, this is a four-barreled minigun. The GShG-7.62 has both an electric motor to start it and a gas-operated action for continuous operation. It feeds from a 1,800-round disintegrating belt. Other than in gun pods, its only other use is as nose gun in the Kamov Ka-29TB "Helix-B" helicopter (**Special Ops,** p. 124).

Due to its lighter weight and the fact that it only requires limited electric energy to start it (rather than to continuously power it), the GShG-7.62 would make a more credible man-portable weapon than the GE M134 minigun (**High-Tech,** p. 136), although the idea is still cinematic because of recoil issues and the ammunition requirements. In *Predators,* the *Spetsgruppa Alfa* operator Nikolai was supposed to carry this gun, but a M134 had to be used as prop instead.

*The Mi-24V has a wide selection of armaments.*

## Grenade Launchers

For further details, see **High-Tech,** p. 142.

### KBP AG-17A, 30×29mmB VOG-17 (Russia, 1980-1994)

This is a variant of the AGS-17 (**High-Tech,** p. 142), with a faster cyclic rate for use as aircraft armament. It normally feeds from a 300-round disintegrating belt. The AG-17A gun is also used as a door gun with 29-round belts on the Mil Mi-8TVK "Hip-E" helicopter (**Special Ops,** p. 125).

## Vehicular Rocket Launchers

For more information, see **High-Tech,** p. 150.

### UB-32-57, 55mm S-5 (Russia, 1974-)

The UB-32-57 is a 32-shot rocket pod firing 55mm S-5 unguided rockets from 57mm tubes. Rockets can be fired individually or in ripples of two, four, eight, 16, or 32 – an entire pod can be emptied in one turn. Available warheads include HE (in the table), HEAT (Dmg 5d×2(10) cr ex with 5d×2 linked), HEDP (Dmg 4d×2(10) cr ex with 5d×2 [3d-1] cr ex linked), and beehive (Dmg 2d+2 cut, Range 300/2,500, RoF 16×1,000, Rcl 1). The HE and HEDP warheads are most commonly used. A HE rocket costs $650.

## Mil Mi-24V "Hind-E" Table

Terms and notation are as defined in *Vehicle Statistics* (pp. B462-463).

### PILOTING/TL7 (HELICOPTER)

| TL | Vehicle | ST/HP | Hnd/SR | HT | Move | LWt. | Load | SM | Occ. | DR | Range | Cost | Loc. | Stall | Note |
|----|---------|-------|--------|-----|------|------|------|-----|------|-----|-------|------|------|-------|------|
| 7 | Mil Mi-24V | 105 | -1/2 | 12f | 3/104 | 13.2 | 2.4 | +6 | 2+8S | 5 | 280 | $9,000,000 | GgHt3rWWi6X | 0 | [1] |

#### Note

[1] Rotors have DR 20; all other locations have DR 5 except where indicated in the *Hit Location Table* (p. 18).

## Mi-24V Armament Table

Terms and notation are as defined on pp. B268-271.

### GUNNER (MACHINE GUN) (DX-4 or other Gunner at -4)

| TL | Weapon | Damage | Acc | Range | Weight | RoF | Shots | ST | Bulk | Rcl | Cost | LC | Notes |
|----|--------|--------|-----|-------|--------|-----|-------|-----|------|-----|------|-----|-------|
| 7 | KBP GSh-23L, 23×115mm *follow-up* | 5d×3 pi++ 3d [1d+1] cr ex | 5 | 1,600/7,000 | 111/202 | 56! | 250(30) | 23M | -9 | 2 | $17,000 | 1 | |
| 7 | KBP YakB-12.7, 12.7×108mm | 8d+2(2) pi inc | 5 | 1,700/7,100 | 99/16.9 | 70! | 50(5) | 22M | -9 | 2 | $15,000 | 1 | |
| 7 | KBP GShG-7.62, 7.62×54mmR | 7d pi inc | 5 | 1,000/4,200 | 41.8/149 | 100! | 1,800(30) | 18M | -7 | 2 | $10,000 | 1 | |
| 7 | KBP AG-17A, 30×29mmB | 4d [1d+2] cr ex | 2 | 35/1,900 | 48.4/209 | 8 | 300(30) | 18M | -7 | 2 | $12,000 | 1 | [1, 2] |

#### Notes

[1] First Range figure is *minimum* range.
[2] Weight is *empty* weight.

### GUNNER (ROCKETS) (DX-4 or other Gunner at -4)

| TL | Weapon | Damage | Acc | Range | EWt. | RoF | Shots | ST | Bulk | Rcl | Cost | LC | Note |
|----|--------|--------|-----|-------|------|-----|-------|-----|------|-----|------|-----|------|
| 7 | UB-32-57, 55mm | 5d×2 [3d-1] cr ex | 2 | 300/3,300 | 227/8.8 | 32 | 32(10i) | 28M | -11 | 1 | $2,000 | 1 | [1] |
| 8 | B-8V20, 80mm *linked* | 6d×5(10) cr ex 5d×4 [4d] cr ex | 2 | 300/4,400 | 270/25 | 20 | 20(10i) | 31M | -11 | 1 | $2,500 | 1 | [1] |

#### Note

[1] First Range figure is *minimum* range.

### ARTILLERY (GUIDED MISSILE) (IQ-5)

| TL | Weapon | Damage | Acc | Range | Weight | RoF | Shots | ST | Cost | LC | Notes |
|----|--------|--------|-----|-------|--------|-----|-------|-----|------|-----|-------|
| 7 | Kolomna 9K114 Kokon, 130mm *linked* | 6d×7(10) cr ex 6d×6 cr ex | 3+3 | 380/5,500 | 101/69 | 1 | 1(20) | 19M | $80,000 | 1 | [1, 2, 3] |

#### Notes

[1] Missile has a *minimum* range of 440.
[2] Guided attack (p. B412).
[3] Cost is for disposable launcher including one missile.

### ARTILLERY (BOMBS) (DX-5)

| TL | Weapon | Damage | Weight | Cost | LC |
|----|--------|--------|--------|------|-----|
| 7 | FAB-100 M-62, 216mm | 6d×22 [5d×2] cr ex | 220 | $1,500 | 1 |
| 7 | FAB-250 M-62, 292mm | 6d×36 [7d×2] cr ex | 550 | $2,500 | 1 |

The Russians were unimpressed with the rockets' performance in Afghanistan, complaining about their inaccuracy and lack of power. They now prefer larger models, but mercenary pilot Colonel Neall Ellis, veteran of the fighting in Bosnia and Sierra Leone, favored the smaller rockets and stated that eight of them at a time would "dislocate everything in an area half the size of a football field."

### B-8V20, 80mm S-8 (Russia, 1984-)

This is a 20-shot rocket pod firing 80mm S-8 unguided rockets. The pod can release individual rockets or ripples of five, 10, or 20 – an entire pod can be emptied in one turn. Available warheads include HEDP (in table), FAE (Dmg 6d×7 cr ex), and beehive (Dmg 2d+2 cut, Range 300/3,800, RoF 20×2,000, Rcl 1). A HEDP rocket costs $1,200.

## Guided and Homing Missiles

For further information, see **High-Tech,** pp. 150-151.

### Kolomna 9M114 Kokon, 130mm (Russia, 1976-)

The 9M114 Kokon missile has a HEAT warhead and semi-automatic radio guidance (p. B412).

### Bombs

For additional details, see **High-Tech,** p. 194.

### FAB-100 M-62, 216mm (Russia, 1962-)

This *Fugasnaya Aviabomba* ("aerial demolition bomb") is a streamlined general-purpose free-fall bomb with a nominal weight of 100 kilograms and a Torpex filler. It replaced an earlier design dating to 1943.

### FAB-250 M-62, 292mm (Russia, 1962-)

The FAB-250 has a nominal weight of 250 kilograms.

# USING THE MI-24V

*Got hold of a Sov gunship. Helicopter, you know. Flew it back to Finland. Didn't have entry codes, of course, and shot hell out of the Finnish defense forces in the process.*

*– William Gibson, **Neuromancer** (1984)*

The greatest difficulty in stealing a "Hind" is probably getting close to one – usually this means overcoming one or more checkpoints (**GURPS Action 2: Exploits,** p. 29) or fences (**Action 2,** p. 20). Once you stand next to one, a pilot needs neither to break into it nor have a key to start it (**Action 2,** p. 23). A fully serviced and fueled Mi-24V can be started by one man in two minutes.

The cockpit instruments of the Mi-24V are labeled in Russian, requiring the crew to have the appropriate language. Learning Cyrillic on the fly is rather cinematic, with a BAD of -5 . . . During operations in Africa, mercenary-operated Hinds often had their instruments relabeled in English using ticker tape. Most Mi-35 export machines have English-labeled cockpits.

Obsolete second- or third-hand 20-year-old "Hinds" are offered occasionally on the surplus market for $2.5 million or so. These may or may not be refurbished before changing hands. See *Used Vehicles* (**GURPS Action 1: Heroes,** p. 34) for suggestions of possible problems. A multi-million dollar aftermarket exists that modernizes old "Hinds," typically with new avionics, better sensors, upgraded engines, and new armaments. Suppliers can be found in Israel and South Africa, but most are upgraded in Russia.

Many of the "Hinds" that came on the market in the 1990s and 2000s were sold off by former Soviet countries like Belarus and the Ukraine, which not always check their customers as thoroughly as might be imagined or even legally required.

Compared with Western choppers, the huge Mi-24V has sluggish, obsolescent controls and rather limited maneuverability, particularly in nape-of-the-earth flight. It's underpowered for true hovering, especially at full load. Rated for 1.8G, it has been known to pull up to 3G at high speeds. However, it has problems with negative G-force and even 0G maneuvers (fast downward movement), which will often result in the main rotors whipping down and striking the tail boom, resulting in catastrophic failure (**Action 2,** p. 35).

If using *Chases* (**Action 2,** pp. 31-35), a Mi-24V operated by the book will use either the Move or Move and Attack maneuvers, relying on its superior Speed (+10 on Chase rolls) and excellent climbing rate. The Attack maneuver is discouraged because of the helo's limited hovering capability (-1 on Chase rolls). The Stunt maneuver suffers from the vehicle's relative lack of maneuverability and resultant low Handling (-1 on Chase rolls). Note that most realistic combat helicopter engagements are beyond 500 yards in the Extreme Range Band (**Action 2,** p. 31).

Used individually, the Mi-24V is vulnerable to ground fire and enemy aircraft, mainly due to its limited maneuverability and lack of rear view. The Russians operate it either in pairs or in scout/attack teams of three, with one of them used for rearguard and overwatch duties, flying at a higher altitude, while the other two use alternating scissors flight paths.

The only loose equipment that comes with an Mi-24V is a small first aid kit (**High-Tech,** p. 221) in the pilot's compartment, a hatchet (p. B271) clipped to the forward cabin wall, and two canopy-cutting knives of the cockpit crew. Unlike in most Western aircraft, there's no handheld fire extinguisher.

Pilot and gunner usually wear a parachute (**High-Tech,** p. 61), but their chances of using it in an emergency are slim. In Russian (and previously, in Soviet) service, the crewmembers wear a survival vest (**High-Tech,** p. 59). This is a nylon loadbearing vest (**High-Tech,** p. 54) in which they carry an Izhmekh PM pistol (**High-Tech,** p. 100) with two magazines and three 30-round magazines for their a TOZ AKS-74U assault carbine (**High-Tech,** p. 114). The carbine may be carried in a long arm holster (**Tactical Shooting,** p. 73) or simply slung over the shoulder; in the cockpit, it slides beside the seat. During combat operations, many pilots increase their ammunition load by loading the carbine with two 45-round magazines taped together jungle-style (**Tactical Shooting,** p. 33).

The vest also contains a small radio (**High-Tech,** p. 38), pen-flare launcher (**High-Tech,** p. 58), signal mirror (**High-Tech,** p. 58), strobe light distress marker (**High-Tech,** p. 58), whistle (**High-Tech,** p. 58), pocket knife (**High-Tech,** p. 31), nine matches (**High-Tech,** p. 57), mini-flashlight (**High-Tech,** p. 52), wire saw (**High-Tech,** p. 25), fishing kit (**High-Tech,** p. 58), empty water bladder, 20 water-purification tablets (**High-Tech,** p. 59), and small first aid kit (**High-Tech,** p. 221); the latter includes an autoinjector with one dose of morphine (**High-Tech,** p. 226), 10 doses of mild painkillers (p. B441), 10 doses of antibiotics (**High-Tech,** p. 226), six doses of mild stimulants and six doses of potent stimulants (p. B440), antibiotic ointment (**High-Tech,** p. 226), as well as insect repellent (**High-Tech,** p. 221).

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### Mi-24 at the Movies

The Mi-24V "Hind-E" can be seen in *Charlie Wilson's War, Hitman,* and *Rambo III.* Other movies show different versions, including the Mi-24 "Hind-A" in *Firefox, Rambo: First Blood II,* and *Red Dawn;* the Mi-24P "Hind-F" in *9th Company, Air Force One,* and *A Good Day to Die Hard;* and the Mi-24 "SuperHind Mk IV" in *Blood Diamond.* (Some of these films use props built from other helicopters, but their general appearance and use can still be seen.)

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# ABOUT THE AUTHOR

Hans-Christian "Grey Tiger" Vortisch is the author or coauthor of **GURPS High-Tech,** *Fourth Edition,* **GURPS Tactical Shooting,** and **GURPS WWII: Motor Pool,** among other books. He regularly visits the decrepit Mi-24V exhibited in the air force museum in Berlin.

*Special thanks to the Hellions.*

# FIGHT BACK!
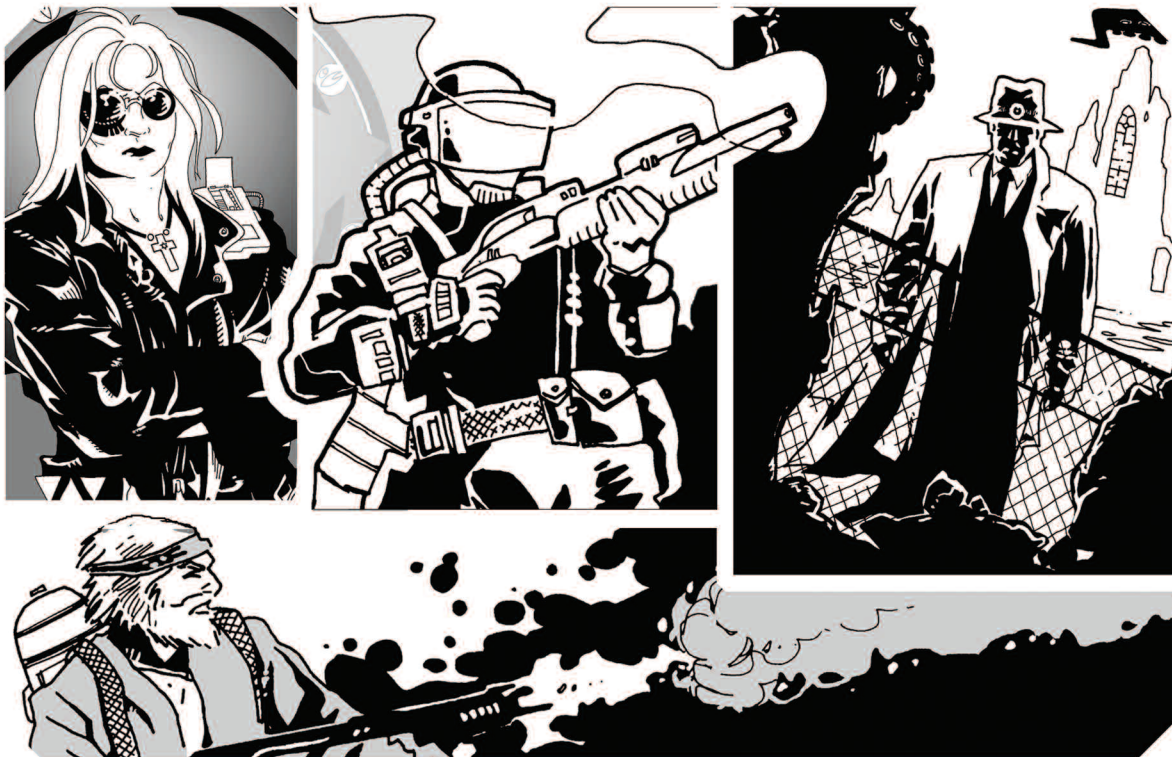


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# EIDETIC MEMORY

## BROCK-AVERY GUNS

### BY DAVID L. PULVER

*. . . the New England firearm's manufacturer's low profile conceals its longstanding involvement in the shadowy world of America's military-industrial-security-paranormal complex stretching back to World War II, but its roots go far deeper than. The Brock family has a lengthy history as gunsmiths, one that stretches back to colonial times . . .*

*– Danielle Lawrence, **Brock-Avery: Fire in the Dark***

Brock-Avery Defense is a family-owned firearms manufacturer with ties to U.S. intelligence and special-operations community. It is intended to serve as a Patron and possible source of exotic weaponry for black ops, espionage, or monster-hunting games set in the pulp era, World War II, the Atomic Age, or the present day. The company, its weapons and their stories are fictional, but were inspired historical examples and might-have-beens.

## Cemetery Gun, .50 Flintlock (TL5)

In the 18th and 19th century, medical students had few legal routes for acquiring cadaver on which to practice their skills. With demand far outstripping supply, "resurrection men" raided fresh graves and sold the bodies to aspiring surgeons or medical schools. Such was the demand for cadavers that no burial was safe, with graveyards in large cities like Philadelphia and New York being particularly hard-hit. To combat this outrage, various ingenious methods were employed by cemetery caretakers to protect corpses in their charge. One such was the cemetery gun, which aimed to protect one corpse by creating another.

Albert Brock's Cemetery Gun was a typical example of such a weapon. In 1717, a Boston gunsmith and inventor, Albert Wilbur Brock, was hired by his local parish to protect their cemetery after a rash of grave robberies. His solution was a three-barrel .50 caliber flintlock mounted on a fixed rotating platform and set up at night near a recent burial. The weapon was placed to defend recent graves, with multiple tripwires connected to the gun's triggers. If a resurrection man infiltrating the cemetery stumbled over a tripwire, it would swing the gun in his direction and fire the weapon. The result would either eradicate the ghoulish intruder, or, if it missed – as was considerably more likely – the triple muzzle flash in the dark would at least give the impression that a party of stout armed watchmen were present, and hopefully frighten the attacker off.

Up to three tripwires can be set for the weapon, each triggering a particular barrel. They can be as long as 20 yards without risk of snarling. Each tripwire requires 30 seconds to rig. A successful Vision roll (with usual darkness penalties) is required to spot the wires. A wire is triggered if walked through. At that point, roll against the Traps skill of whoever emplaced them. On a failure, the wires snarled or the gun failed to rotate and fire properly. If it *does* fire, use skill 9 modified by target SM and Range (only) to see if a ball hits whoever triggered a wire.

Brock's Cemetery Gun was not the first such weapon, but the mechanism was better made then many of its contemporaries, and a few dozen were sold in New England. Due to their high price, the guns were also rented, usually for $20 per week. The main users were cemeteries in Massachusetts from 1717 until 1730, when Brock ceased to manufacture them.

Contemporary newspaper accounts indicate these weapons were triggered on numerous occasions, doubtless scaring off or wounding the occasional grave robber as well at least two dogs. One of the odder accounts was reported in *The Boston News-Letter* (America's oldest paper) in the summer of 1719. The Boston's Granary Burying Ground (adjacent to Park Street Church) had been troubled by a series of grave robberies and corpse mutilations. This was answered by the rental and nocturnal deployment of a pair of Brock Cemetery Guns. Two nights after it had been emplaced, the eastern gun was tripped and fired. Elijah Peabody, a stalwart groundskeeper who ran to investigate the gunshot, reported his lantern illuminating "a deformed figure, naked, with a curiously elongated jaw of almost canine-aspect" that was clutching his shoulder where he had obviously been struck by one of the balls. The man "howled and ran into the trees behind the tombs." Attempts to apprehend him failed, but after that, the thefts ended. Clearly some sort of madman had been prowling about the area, doing who knows what, and had either been frightened off or died of his wounds. However, one puzzling aspect was that the grave appeared to have been opened *from the inside*.

Brock's weapons were mainly used in the early 18th century, but similar products of Yankee ingenuity (including various tripwire-triggered and spring-loaded guns) continued to defend cemeteries throughout the 18th and 19th century.

These devices would have had utility for 18th-century monster hunters dealing with things clawing out of graves or emerging from tombs (assuming, of course, that the balls were loaded with a material puissant against such a fiends – see *Magic Bullets,* pp. 34-35, for some ideas).

Brock's cemetery guns remain in private collections and museums in the Boston area, and one has long been on display in the lobby of Brock-Avery Technologies.

## Brock Portable Machine Gun, .380 ACP (USA, 1927-1936)

Winston Carter Brock (born in 1902) was a brilliant amateur gunsmith from a well-to-do Boston family. At the tender age of 12, Brock was cleaning out boxes in his family attic when he discovered an 18th-century diary written in the crabbed hand of his distant ancestor Albert W. Brock. It contained diagrams of the man's inventions, including his infamous cemetery gun. Winston was a clever boy who was good with his hands, and he loved to shoot in the woods behind the family home. These diaries ignited his imagination and sparked a lifetime interest in the development of firearms, which his family fortune helped support. Indeed, while a callow teenager, he and a close school chum made his first amateur gun, a copy of Albert Brock's classic design, which they set up on the family's summer cottage and used to trap rabbits. Its accidental near-execution of a trespassing vagrant almost assured a premature end to Winston's career as a firearm designer, but his father's influence instead saw him unceremoniously packed off to an out-of-state boarding school. Appropriately enough (for an amateur gun enthusiastic) he ended up at Hotchkiss School (founded by the widow of the French arms manufacturer), which lead to his proud boast in later years that he was a "son of a gun."

Winston's father, Randolph Brock, was not an arms dealer but a pioneer of the aluminum business. Brock Alloys and Metals (BAM) had offices and warehouses in Boston and a thriving aluminum plant on the Niagara River in upstate New York. Young Winston Carter survived boarding school, narrowly missed service in World War I, and ultimately graduated from Harvard with twin business and engineering degrees. He joined the family firm, taking the reins himself after his father succumbed to a severe case of encephalitis lethargica in 1921. However, young Winston soon grew bored with BAM's major focus – making aluminum foil containers for ice cream "Eskimo Pies" – and resolved to expand into the field of his first love, firearm manufacturing.

After several false starts, he conceived the Brock PMG, based on the experience of Brock's uncle Randolph, who had fought in World War I. The PMG was an "trench broom" intended for the bloody close assaults that characterized Western Front fighting during World War I. Unlike its far better known competitor (the Auto-Ordinance M1921 "Tommy Gun"), Brock created a scaled-down carbine-sized *belt-fed* light machine gun firing a small caliber (Browning .380 ACP) projectile at a high rate of fire. The weapon had all the latest features: a pistol grip, front fore grip, and wooden stock. A 100-round belt of .380 ammunition was held in a can underneath the weapon. Problems with cloth belts jamming led to an innovative early use of the disintegrating link concept. The PMG was nevertheless somewhat heavy, and Brock became obsessed with attempts to reduce its weight, even contemplating the use of an aluminum frame, although cost and fabrication problems led to steel being retained.

The weapon was effective in its design purpose and surprisingly reliable, but Brock's attempt to sell the weapon to U.S. and foreign armies failed. A surviving U.S. Army report cites concerns over the limited penetration of the .380 round and the unwillingness to add another caliber to the supply chain. However, the primary issue was competition from the contemporary and far more popular Tommy gun. Nevertheless, Brock's local connections led to two dozen of these "automatic .38" weapons being purchased by Massachusetts police departments on the New England coast. Additional weapons may have been acquired by less reputable straw purchasers in the late 1920s and early 1930s. A surprisingly large number of .380 casings were found by Boston police at the site of the Hanover Street Massacres, which suggests the Italians may have acquired at least one such weapon for their war against the Irish mob. Anecdotal testimony indicates police officers with the Brock PMG successfully used a few examples in 1928 in support of a major raid against an inbred nest of bootleggers in a decaying fishing village on the coast of Essex County.

The Brock PMG never entered large-scale production, but the limited police sales of the led Winston to formally incorporate the Brock Armaments Division in 1928.

In 2013, the Brock PMG is an extremely rare weapon. The only working examples are found in a few private gun collectors. The last one sold at auction fetched $92,000.

## Brock 45 Mark I and II, .45 ACP (USA, 1929-1940)

Despite the U.S. Army showing little interest in the Brock PMG, Winston Brock was not discouraged. He traveled widely, attempting to sell the weapon to foreign customers (while at the same negotiating various contracts for his more profitable aluminum business). In 1929, the 27-year-old industrialist was in China's Shanxi province paying a call on the warlord Yen His-Shan when Brock was shown a sample of the domestically produced Shanxi Type 17 pistol, essentially a .45 ACP derivative of the famous Mauser C96 Broomhandle. A fan of the Mauser – he carried one himself – Brock was pleased to see it made in a caliber with more stopping power than 7.35mm. He promptly negotiated a deal for the American licensing rights to the weapon.

An inveterate tinkerer, Brock not only produced the Mark I as an American-made equivalent of the Chinese Type 17, but also created his own Brock 45 Mark II in a selective fire machine pistol configuration that was similar to the M712 *Schnellfeuer* but in .45 caliber. It should be mentioned at this point that Brock, who stood 6'4" tall in his socks and had been famous in Harvard as much for his wrestling as for academics, had an unfortunate habit of creating guns that were comfortable for his impressive frame but whose recoil tended to defeat lesser men.

One man who was definitely not in the "lesser" category was Jack Thorndike, a swashbuckling Boston socialite, orientalist, amateur boxer, and author best known for his series of pulp adventure novels (loosely based on his own exploits). The books featured the caped, gun-toting occultist called the White Raven, who battled various monsters, Fascists, and Satanists with a pair of signature Brock 45s. Like his literary alter ego, Thorndike also owned a Brock 45 Mark I, which he famously described in 1939 as "useful for hunting jackrabbits and jackboots."

During World War II, Thorndike joined the Office of Strategic Services (OSS), where he apparently used his influence at the agency to advocate in favor of acquiring some of Brock's weaponry. It was Jack Thorndike who introduced Brock to William "Wild Bill" Donavan, the head of the OSS, paving the way for the weapon's acquisition, along with several later lucrative postwar contracts.

Ironically, while Thorndike survived World War II, he was killed in a postwar OSS operation in 1946 during America's intervention in the bloody Greek civil war, apparently with a smoking Brock 45 in his hand.

> *Brock-Avery Defense is a possible source of exotic weaponry for black ops, espionage, or monster-hunting games set in the pulp era, World War II, the Atomic Age, or the present day.*

## Brock Paragon, .30-06 ACP (USA, 1944-1946)

Brock's gun business had failed to take off prior to America's entry into World War II, but the wartime and postwar aluminum market boomed thanks to new demand for the light metal. In 1943, Brock decided to plow some of these alloy profits back into what was still called the Brock Arms Division. He had long wanted to combine the two halves of his business enterprise by making an aluminum-framed battle rifle with a light-alloy magazine. He felt this combination would make the perfect sidearm for paratroops (who were limited in the weight they could carry) and whose daredevil exploits had caught his imagination.

Brock himself was increasingly focused on management, with his best designer – Vermont-born clock designer turned gun maker Porter Greene – doing much of his actual R&D. Throughout the early 1940s, Greene and a small team of assistants ironed out the kinks in the Brock Paragon, an aluminum-framed automatic rifle using a complex gas piston-powered counter-mass system to balance the high recoil (a similar but somewhat less reliable precursor to the "balanced system" developed by V.M. Kalaskinkov for the AKB rifle and its successors, AEK-971 and AK-108). The weapon was fed by a top-mounted 28-round magazine (similar to that used by the Bren light machine gun).

Brock hoped the U.S. Army would buy it to equip soldiers in the 82nd and 101st Airborne Divisions. To his intense disappointment, they proved unreceptive, dismissing it due to its high complexity and dubious reliability, both of the action and the aluminum frame. (It would take a few more years – and the demonstrable success of the Colt Commander – before aluminum guns became acceptable to the U.S. military.)

Although the U.S. Army had no use for the Brock Paragon, the corporation was able to find another buyer – the OSS. This division was interested in a lightweight assault weapon with a high rate of fire that could be easily handled by agents not used to full automatic weapons. After some intense personal arm twisting and social networking by Brock 45-user and partisan Jack Thorndike, the Brock Arms Division acquired a contract in 1945 to supply the OSS with several hundred Brock 45 pistols and Brock Paragon auto-rifles.

Although some in the OSS were skeptical of the latter weapon's reliability, at least some of these guns appear to have been carried by covert teams parachuting behind enemy lines in Europe and Asia. A number of Paragons – perhaps most of them – were issued to Jedburgh teams operating against the Japanese in French Indochina in the last year of the war. A heavily censored report of a Jedburgh team's raid on a secret Unit 731 biowarfare laboratory in summer of 1945 mentions the value of their high rate of fire against infected "redacted" and giant, mutant, vampiric "redacted," although there were also some angry reports from the Pacific theater of Paragons jamming. However, enough of the weapons were used that a few of these light but lethal carbines even continued to turn up in the region as late as the Vietnam War. CIA assassins in the Phoenix Program sometimes used them where intense firepower was called for, and a Brock Paragon, probably left over from the fight against Japan, can be seen in a photograph of North Vietnamese General Vo Nguyen Giap in 1975, carried by one of the commander's bodyguards.

## Brock-Avery Orion .380 ACP/.50 Br-Av (USA, 1972-1979)

In 1946, at the funeral of Jack Thorndike, Winston Brock met Thorndike's sister-in-law, Liberty "Libby" Avery, the fiery young heiress to Avery Munitions, third largest ammunition factory in the state of Virginia. It was love at first sight, although it was not until 1948 – after Libby gave up her job as a reporter to devote herself full time to the family business – that a series of complicated financial maneuvers formalized both their engagement and the subsequent merger of their respective companies.

Brock-Avery's association with the OSS was continued in the 1950s and early 1960s with its successor the CIA. The company gained a string of government contracts throughout the 1950s and 1960s to modify or develop special-purpose firearms and accessories. One of the most lucrative of these was the development of the Brock Orion.

The Orion was part of MK-ORCHID, a secret CIA program that grew out of the USAF's Blue Gemini project. It was intended to develop weapons that would protect USAF and CIA personnel and systems by developing projectile weapons usable by American astronauts and satellites in vacuum (though not necessarily in microgravity).

The Br-Av Orion (like the contemporary Soviet TP-82) was a triple-barrel weapon, but far more sophisticated. Its lower receiver was a seven-shot automatic pistol chambered with subsonic .380 ACP hollow points and incorporating a derivative of the Block Paragon's recoil reduction system. Its upper barrel was a pair of single-shot break-open launch tubes for spin-stabilized .50 rockets (obviously inspired by the MBA gyrojet, but using an advanced fast-burn solid propellant).

It was theoretically reloadable, but doing so while wearing a spacesuit glove would have been extremely tricky (roll vs. DX-4 each turn for the maneuver to count toward reloading time.) It had a oversized trigger and trigger guard to accommodate a space suit glove (even so, clumsy TL7-8 suit gloves will give a -2 to skill).

## Brock-Avery Gun Table

Terms and notation are as defined on pp. B268-271.

### GUNS (MUSKET) (DX-4 or other Guns at -2)

| TL | Weapon | Damage | Acc | Range | Weight | RoF | Shots | ST | Bulk | Rcl | Cost | LC | Note |
|----|--------|--------|-----|-------|--------|-----|-------|-----|------|-----|------|-----|------|
| 5 | Brock Cemetery, .50 Flintlock | 4d pi+ | 1 | 100/1,100 | 65/0.035 | 1×3 | 3(40) | 18M | -8 | 2 | $450 | 3 | [1] |

#### Note

[1] Intended for emplaced use; weight includes 25-lb. platform. If removed from platform (30 seconds), it is 40 lbs., ST 15. Malfunctions on a 15+ (see p. B407).

### GUNS (SMG) (DX-4 or other Guns at -2)

| TL | Weapon | Damage | Acc | Range | Weight | RoF | Shots | ST | Bulk | Rcl | Cost | LC |
|----|--------|--------|-----|-------|--------|-----|-------|-----|------|-----|------|-----|
| 6 | Brock PMG, .380 ACP | 2d-1 pi | 3 | 110/1,100 | 10/3.3 | 20 | 100(5) | 9† | -5 | 2 | $2,400 | 2 |

### GUNS (PISTOL) (DX-4 or other Guns at -2)

| TL | Weapon | Damage | Acc | Range | Wt. | RoF | Shots | ST | Bulk | Rcl | Cost | LC | Note |
|----|--------|--------|-----|-------|-----|-----|-------|-----|------|-----|------|-----|------|
| 6 | Brock 45 Mark I, .45 ACP | 2d pi+ | 2 | 180/2,000 | 3/0.5 | 3 | 10(3) | 10 | -3 | 2 | $500 | 3 | |
| 6 | Brock 45 Mark II, .45 ACP | 2d pi+ | 2 | 180/2,000 | 4.5/1 | 12 | 20+1(3) | 9† | -3 | 3 | $600/$30 | 2 | [1] |

#### Note

[1] If fired with a one-handed grip, use ST 11, Rcl 4.

### GUNS (RIFLE) (DX-4 or other Guns at -2)

| TL | Weapon | Damage | Acc | Range | Weight | RoF | Shots | ST | Bulk | Rcl | Cost | LC | Note |
|----|--------|--------|-----|-------|--------|-----|-------|-----|------|-----|------|-----|------|
| 7 | Brock Paragon, .30-06 | 7d+1 | 4 | 1,100/4,600 | 11/2.8 | 14 | 28(3) | 10† | -5 | 2 | $5,000/$31 | 2 | [1] |

#### Note

[1] The unusually low ST and recoil (for a .30-06) is the result of the weapon's unique recoil reduction system, which is also its Achilles' heel. Paragons in brand-new, factory-fresh condition have no Malfunction penalty, but the recoil system is delicate; most guns exposed to a few weeks of regular field use Malfunction on a 16+ (see p. B407).

### GUNS (GYROC and PISTOL) (DX-4 or other Guns at -4 or -2)

| TL | Weapon | Damage | Acc | Range | Weight | RoF | Shots | ST | Bulk | Rcl | Cost | LC | Note |
|----|--------|--------|-----|-------|--------|-----|-------|-----|------|-----|------|-----|------|
| 7 | Br-Av Orion, .380 ACP | 2d-1 pi | 2 | 110/1,100 | 1.5/0.3 | 3 | 6+1(3) | 9 | -2 | 1 | $12,000/$27 | 3 | |
| | or .50 Br-Av Rocket | 2d+2 pi+ | 0 | 800 | –/0.05 | 2 | 2(3i) | 9 | – | 1 | – | – | [1] |

#### Note

[1] Divide damage by 3 at 1-2 yards and by 2 at 3-7 yards. Has no 1/2D range.

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As every pound carried to orbit would cost many thousands of dollars (and anything carted to the moon cost 10 times as much), weight reduction was deemed critical. The handgun was thus fabricated with a titanium frame and steel super alloy barrel.

Its extensive use of dissimilar exotic metals were intended not just to reduce weight, but also to make it resistant to temperature fluctuations. The weapon and ammunition also were carefully "space proofed" to reduce the requirement for lubrication – lubricants evaporate quickly in vacuum. (For a summary of the problems of firing guns in space, see *Tactical Shooting: Tomorrow* in *Pyramid #3/55: Military Sci-Fi.*)

CIA officers to protect ultra-secure payloads on a number of classified military shuttle missions in the 1980s and 1990s carried the Orion. However, there are rumors that its first deployment may have been aboard the top-secret Apollo 18 mission that was carefully disguised as the Apollo-Soyuz program. Some sources suggest this joint U.S.-Russia space mission was launched in 1975 with the goal of investigating transient lunar phenomena (TLPs) detected in the "Cobra's Head" region of the Vallis Schröteri. The Lunar Lander carried one Soviet and one American astronaut to the moon, and apparently "we knew the Russians would be packing heat, so we had to as well." (The reference is apparently to the TP-82 survival pistol carried by Soviet cosmonauts, a precursor of which may have been in use on the secret multinational mission.)

## ABOUT THE COLUMNIST

David L. Pulver is a Canadian freelance author. An avid SF fan, he began roleplaying in junior high with the newly released **Basic Dungeons & Dragons.** Upon graduating from university, he decided to become a game designer. Since then, David has written over 70 roleplaying game books, and he has worked as a staff writer, editor, and line developer for Steve Jackson Games and Guardians of Order. He is best known for creating **Transhuman Space,** co-authoring the **Big Eyes, Small Mouth** anime RPG, and writing countless **GURPS** books, including the **GURPS Basic Set,** *Fourth Edition,* **GURPS Ultra-Tech,** and the **GURPS Spaceships** series.

# DODGE THIS

## BY DOUGLAS COLE

*An active defense is a deliberate attempt to avoid a particular attack. It's only possible if the defender is aware of the possibility of an attack from his assailant and is free to react . . .*

– *GURPS Basic Set*

**GURPS** does a great job providing plausible verisimilitude for firearm-style combat – especially for games based on fairly realistic outcomes. The results match the statistics (see *Why Doesn't **GURPS** Do This Already?* on p. 28), but the way the rules get these results can clash with player expectations. A successful attack roll in **GURPS** is usually defined as one "good enough to hit," barring action of the defender. With attacks that come so fast that no subsequent reaction of the defender should matter – so fast you can't block or parry – it can strain believability that you could dodge it.

**GURPS Tactical Shooting** does propose one solution: You may choose *one* foe. If you can see him shooting at you, and you took one of a restricted list of maneuvers (naturally excluding All-Out Attack), you may dodge normally. Otherwise, you're out of luck. Call that a *Harsh Realism* concept.

What other mechanics can be invoked that might satisfy the sense of expectations but not remove player agency or ruin the already-good reflection of the rules' outcomes with reality?

## KEEN EYES AND FAST REFLEXES

The rule for allowing a dodge against an incoming attack is both straightforward and generous. If you are aware of a potential foe that might attack you, and he's not in a rear hex (p. B391), you may elect to Dodge an attack if it occurs. You may retreat against a melee attack, or Dodge and Drop vs. a ranged one. Either gives +3 to Dodge.

The fulcrum of many arguments is usually around what it means to be aware of an attack: Can you see your foe? Can you adjust your actions in a useful way if he's seen to be readying or pointing a weapon in your direction?

That second item can be a real sticking point, since you do not have to declare an active defense if your foe's roll doesn't succeed. This immediately breaks the willing suspension of disbelief for some players, especially where firearms and zero-time-of-flight weaponry is concerned.

### Threat Perception

The first question is whether you're aware of your foe. **GURPS**' assumption here is basically "yes," provided he's in a front or side hex (though you defend against side attacks at -2). This has the beneficial side effect of PC longevity, as well as avoiding the difficulties in dealing with Abe being able to see

Vince the Villain, Bob not being able to, but Abe and Bob's *players* being pretty darn aware of the marker in front of them on the battlemat!

Still, it may be useful in some games to invoke the not-so-invisible hand of additional rules.

### Perception Rolls All Around!

The default **GURPS** case can be thought to be a fairly straightforward application of the "+10 for plain sight" rule (*Vision,* p. B358). A typical character with Per 10 will have an effective Vision roll of 20, for a 98% chance (16 or less on 3d) to notice anything within 10 yards. The genre played most often in gaming is fantasy (including **GURPS Dungeon Fantasy!**), and most encounters (though not all) will only be resolved usefully at ranges that are in keeping with "don't bother to roll."

For games where such things *do* matter, require a Sense roll before a defense is allowed. (This could be any sense, including vision, smell, hearing, Vibration Sense, using *The Schwartz,* etc.) If the defender makes the roll, he is aware of the attacker and may act normally. If not . . .

### Tracking Foes Visually

Again, the normal rules are generous. If you can be declared aware of an attack, you can defend against it, and all attackers are more or less treated equally. As an option, unless the defender takes All-Out Defense or Evaluate, each subsequent Vision roll might be penalized. Some options include:

*Flat penalty:* Take -4 to each subsequent Vision roll on any given turn, mimicking repeated attempts to Parry (-4) or Block (-5).

*Arc of Vision:* You may make unpenalized Vision rolls in a 60° cone within your character's front arc (pick a single hex-side on a tactical map). Vision rolls are at no penalty within this arc, -4 in the rest of your front hexes, -8 in side hexes, and impossible in your rear hex. Peripheral Vision extends the -4 into the side hexes, and allows any front or side hex to be selected as unpenalized. Those with 360° Vision get one primary arc, and all of the rest are treated as -4.

*Tunnel Vision:* If you are currently making an unaimed ranged attack against a foe or hex, your chosen arc must include the target hex! If you made or have defended against a melee attack – or are in the process of Aiming – and are targeted with an attack by anyone but your immediate foes or target, increase *all* Vision penalties by -4.

*Enhanced Tracking:* Each level of Enhanced Tracking gives you one additional target or arc you can watch for free. You may Aim at one target and keep your arc of vision unimpaired, watch your front-left and front-right hex simultaneously, etc.

*Danger Sense:* A PC with Danger Sense (p. B47) who fails to notice an incoming attack that will hit him gets a flat Per roll (generated in secret by the GM) to be made aware of the danger. If it is successful, he may defend as if he has received a verbal shout of "Look Out!" . . . unless prior maneuver selection, such as All-Out Attack (Determined), precludes such action. On a critical success, he knows what arc the attack is coming from and whether it's a ranged or melee threat. More generous GMs might increase the amount of information given, but it should almost always be enough that the potential victim has enough warning to do something useful.

These mechanics are intensive in die rolls but not bookkeeping. They will likely drive a lot more attacks against which no defense is possible, and foes can flit in and out of detectability from turn to turn. The natural reaction to such uncertainty should be to drive defenders behind cover or force the use of suppressive fire to keep foes' heads down, just like real life.

# BOB AND WEAVE

The standard way to make yourself harder to hit – that is, to avoid a blow that induces an effect roll – is to select All-Out Defense. In this discussion, the specific maneuver is All-Out Defense (Dodge). With a half move, +2 to Dodge, and no preclusion of retreats or Dodge-and-Drop, this can be a major boost, especially against ranged attacks where the Prediction Shot optional mechanic (**GURPS Martial Arts,** p. 121) is not operative. Given the restrictions – you've given up all your attacks and you still can't defend against what you cannot see, *plus* you declare your action on your own turn – this is the best strict rules-as-written way to drive dodge and evasive movement against guns, beams, and other attacks.

An additional mechanic for dealing with unpredictable motion is a variant on Move and Attack.

## Move and Attack (Evasive)

Reduce your chances to be hit by ranged attacks by moving unpredictably. Decide on a penalty to be hit by incoming direct-fire attacks up to your encumbered Move (this has no impact on Suppression Fire!). Replace the flat -4 to attacks listed under Move and Attack with *double* the chosen penalty to all DX-based skill use, including any Contests of Skill. If carrying a shield, an attack that succeeds by less than the DB of the shield allows it to count as *Cover* (pp. B407-408). Ranged attacks still have the additional pain of suffering from -2 or the Bulk of the weapon, whichever is worse, and you lose any previously acquired Aim bonuses. You may not slam (p. B371) when using this option. No matter what, your adjusted skill is still capped at 9.

This maneuver affects you in two other ways.

*Movement:* You may cover distance up to half your Move (round down), but *must* move at least one yard. As with Move and Attack, you are -2 on any rolls the GM requires to avoid falling, tripping over obstacles, etc.

*Active Defense:* Parry or block only; but you take the same penalty to your own defenses that your foe takes to hit you. Your erratic movement is represented by the penalties to your foe's attack rolls.

This method forces an attacker to be more skilled (or use saturation fire) to hit a rapidly jinking target, but makes it more difficult for the defender to use his own skills by an equal measure. This *replaces* any use of Dodge, and interferes with the other active defenses as well.

# Why Doesn't *GURPS* Do This Already?

Reality checking of range, lighting, and typical attack option penalties with studies like the *NYPD SOP9 Report* show that **GURPS Tactical Shooting** (p. 42) is right on the money to suggest default or dabbler-level proficiency for the average person on the receiving end of the NYPD's ire, while Guns (Pistol) skills ranging from 9 to 11 are appropriate among cops. This is true *regardless* of whether you include an active defense roll in the calculation: At the skill levels discussed, the impact of Joe Perp's Dodge-8 is to require +1 to the shooter's skill to counterbalance it. And if you're dodging, you're not taking All-Out Attack (Determined); if you *aren't* dodging, you darn well better be! In either case, the choices cancel out. Game-mechanically, the results are correct for these "centerline of reality" cases.

This is where the visceral nature of game mechanics runs up against expectations. **GURPS** assigns no Dodge penalties based on intrinsic attack speed. Knife hit? No penalty. Bow shot? No penalty. Laser beam? No penalty. That *feels* wrong, even if it is *mechanically* defensible and produces statistically accurate results. What might make sense – or more accurately, *feel better* – to folks is giving a penalty to defend against faster attacks. *Parry* against missiles does precisely

this, for both the normal and Parry Missile Weapons version of this feat – you get a penalty to Parry based on the speed of the projectile. For guns, and even more so for hypervelocity projectiles (some conceptions of rail- or coil-guns) and zero-time-of-flight weapons like lasers, this will almost certainly be something ranging from "you can't dodge" to "it's an *impossible* task; roll at -10 (pp. B345-346)."

The statistics suggest this solution engenders the opposite problem: It should certainly be possible to move erratically and be hard to it, while it should also be *impossible* for a regular human to know a shot is incoming, *know the result of some notional to-hit roll,* and then choose his active defense. From the point of view of *player expectations,* this is doubly true when dealing with lasers.

So why doesn't **GURPS** impose this sort of thing already in a uniform way? Partly it's a great deal of complexity for little real gain (as explained above). Also, because **GURPS** is based on fun, and having all the players unwilling to take exciting and decisive action because "reality" says you'll wind up with lots of dead characters is even less fun. So **GURPS** biases outcomes for survival and exciting game play. In the end, it's the fun that counts.

*Example:* Wayne is coming under fire from several foes, and he wants to move from one cover position to another. He chooses Move and Attack (Evasive) and has encumbered Move 6 and a DB 2 ballistic shield. He elects Move 3, and -6 to his assailants' chance to hit. He suffers -12 to all of his own DX-based skill use, -6 to Parry and Block, but his foes are at -6 to target him. If an attack succeeds by 2 or less, it hits his shield first (*Overpenetration,* p. B408, still may apply*).*

# ACTIVE DEFENSES

The GM may still wish to allow the use of Parry, Block, and Dodge in response to ranged attacks – the **Basic Set** explicitly allows Block and Parry versus thrown weapons, Blocks versus everything but bullets or beam weapons, and Parry to be used vs. any missile weapon if you can step into close combat and intercept the weapon arm, rather than the projectile. The following discussion of scaled penalties takes the current list of exceptions and provide a unifying mechanic.

## Under the Hood: Attack Size and Speed

The rules for parrying thrown weapons and the Parry Missile Weapons skill (p. B212 and **Martial Arts,** p. 58) both seem to imply that parrying such weapons is a combined factor of whether the defender can see the incoming threat, how large it is, and how fast it's coming. Thus, thrown weapons are fairly easy (-1 to regular Parry, or +2 to +4 when using Parry Missile Weapons), but parrying bullets is only possible with Enhanced Time Sense (**Martial Arts,** p. 44) in combination with Parry Missile Weapons.

### Incoming!

The first question is whether you can detect the projectile at all based on its size modifier. Some common threats might be a thrown spear or javelin (-0), an arrow (-2), a thrown axe (-2) or hatchet (-3), a thrown knife or baseball (-6), and bullets (-14). A quick comparison: if a Perception roll with this modifier would require a critical success (4 or less), assume you can't see the projectile to track it; if you *can* see it, then the usual rule of movement *adding* to the Perception roll (*Sense Rolls,* p. B551) for tracking applies. The GM can treat Enhanced Time Sense (p. B44) either as an automatic success or as granting +10 to Per – having all the time in the world to find something only gets you so far if you can't resolve it!

### Intercepting the Projectile

Once the question of detection comes into play, there's the question of reaction time. If you know the speed of the attack or projectile, you can estimate what the penalty would be for a to-hit roll, and by the usual math, halve that for Parry and Block, and quarter it for Dodge. For roughly the same threats above, you'd be looking at parrying or blocking a thrown spear or javelin (-3), a medieval arrow (-4) or modern hunting arrow (-5), a thrown weapon such as an axe, knife, or hatchet (-2) or baseball (-3 or -4), pistol bullets (-7), and rifle bullets (-8). Going a bit nuts, a laser (moving at light speed) would be about -50 to hit, -25 to Parry/Block, and -13 to Dodge – if you could somehow know it was coming before the photons arrive.

If you can see a projectile and get a defense up in time, the predictability of the incoming threat would play a big part of the ease of defending. Once you have perceived the weapon, it's conceptually similar to a telegraphed blow. If one applies +2 to Parry/Block or +1 to Dodge as a blanket "if you can see it, you can predict it" bonus, then you would Parry most thrown weapons at no penalty or -1, arrows at -2 or -3, and bullets at -5 or -6. This is close enough to the guidance for Parry Missile Weapons that it shouldn't break the game; the key bit is the Perception comparison that allows a defense in the first place! This logic also provides mild penalties to dodging bullets – about -3 to Dodge the line of fire, assuming you can see the shooter.

*There are many options for balancing believability, complexity, and survivability.*

## Parry and Block

Parrying is not usually allowed versus many fast projectiles, and blocking is often forbidden as well. The high penalties (half the usual skill penalty for speed for parries and blocks) for fast attacks will adequately prevent the feel of retroactive-seeming parries. However, for many attacks, putting a solid object (such as a shield) between you and harm makes a lot of sense.

### Cover

If you take cover, you put the object's DR and HP between you and your attacker. (See p. B407 for more detailed rules.) Conceptually, the GM can rule that an attempt to do this after a hit roll is declared is a Block, subject to the usual large penalties for a defense against a high-speed projectile.

Otherwise, if the Per roll to detect someone in the process of attacking you succeeds (and therefore you're aware of the attack), a Block roll – unpenalized – should be permitted. Success allows you to treat your shield as cover. For a SM 0 creature to be completely under cover, he must be prone if it's DB 1, kneeling if it's DB 2, or crouching if it's a DB 3 large shield.

### Spells

While the normal rules say that you cannot parry or block certain projectile weapons, the same is not true of many spells, which often can be blocked – even fireballs and lightning bolts! If the GM applies speed-related rules, he might wish to alter the energy cost of spells that have suddenly become much more effective, or perhaps make them harder to target precisely. (A fireball might be thrown like a baseball, but a lightning bolt travels tens of thousands of yards per second, something like -13 to -15 to Parry or Block.) Sure, you can't parry or block that lightning bolt, but the caster can only strongly suggest where the strike should land!

## Dodge

Most of these rule options are purposefully directed at dodging, and will make dodging fast attacks much (much!) more difficult. As such, combining these rules with Prediction Shot is somewhere between "not recommended" and "a really bad idea," at mostly realistic defense levels, since the purpose of Prediction Shot is to offset unusually high defenses.

Still, if allowing a dodge against fast projectiles or beams really grates, consider these other options.

### Tactical Dodging, Redux

Much like Tactical Dodging (*Tactical Shooting,* p. 17), you must decide if you are Dodging on your own turn. Unlike Tactical Dodging, you do not have to declare a dodge against a specific attacker. It's sufficient that you declare the dodge on your own turn – your erratic and/or sudden movements might cause an attacker to miss even if you don't perceive the attack. Moving the declaration to your own turn will feel less precognitive than the usual way, but be less restrictive than the requirement to declare not only the dodge, but the attacker whom you're dodging.

If you wish to Dodge and Drop, you must do so immediately. Fall prone, and any Dodge rolls you make until your next turn will be affected by that action. You are prone for all purposes, including penalties to be hit and so on. This effectively moves the decision to Dodge to your turn, but you only roll if the attack would have hit you if you hadn't been dodging.

Any of the options presented for active defenses – the frequent use of Per rolls, alternate rules for cover, or variations on when you declare dodge – can be combined with Tactical Dodging and Unsighted Shooting.

## ABOUT THE AUTHOR

Douglas H. Cole has been roleplaying since 1981, and playing *GURPS* since 1988. He has been an active playtester for both *Third Edition* and *Fourth Edition,* and acted as lead playtester for *GURPS High Tech, GURPS Tactical Shooting,* and *GURPS Loadouts: Low-Tech Armor.* He enjoys watching movies, target shooting, postponing woodworking and home improvement projects, and blogs about roleplaying and other geekery at Gaming Ballistic (**gamingballistic.blogspot.com**).

Douglas has earned two doctorates – a real one from Northwestern University in materials science and engineering, and a cool one in *GURPS* Ballistics from Illuminati Online University. He is an R&D manager for a major hard disc-drive company.

*Special thanks to Peter Dell'Orto, who was instrumental in keeping this project focused on gameable options and fast play with minimal bookkeeping.*

# Summary Tables

## Perception Modifiers Table

| Condition | Penalty | Skill | Notes |
|---|---|---|---|
| Attacked from side hex | -2 | Defense | |
| Attacked from rear hex (unaware) | No roll | Defense | |
| Each subsequent Vision Roll | -4 | Perception (Vision) | |
| Chosen primary arc of vision | No penalty | Perception (Vision) | [1] |
| Other front hex arcs | -4 | Perception (Vision) | |
| Side hex arcs | -8 | Perception (Vision) | [2] |
| Rear hex arcs | No roll | Perception (Vision) | [3] |
| Made or defended against a melee attack or Aiming | -4 | Perception (Vision) | |

### Notes

[1] Each level of Enhanced Tracking gives an additional unpenalized target arc

[2] Peripheral Vision treats the side arcs as "other front hex arcs"

[3] 360° Vision gives one primary arc; others are "other front hex arcs."

## Projectile Size Table

| Weapon Example | Vision Penalty |
|---|---|
| Thrown spear or javelin | 0 |
| Arrow | -2 |
| Thrown axe | -2 |
| Thrown hatchet | -3 |
| Thrown knife or baseball | -6 |
| Bullets | -14 |

## Projectile Speed Table

| Projectile | Skill Penalty | Block/Parry Penalty* | Dodge Penalty* | Representative Velocity |
|---|---|---|---|---|
| Axe, knife, or hatchet | -4 | 0 | 0 | 10 yards/second |
| Thrown spear or javelin | -6 | -1 | -1 | 20 yards/second |
| Thrown baseball (typical) | -7 | -2 | -1 | 30 yards/second |
| Medieval arrow | -8 | -2 | -1 | 50 yards/second |
| Thrown baseball (Major League) | -8 | -2 | -1 | 50 yards/second |
| Modern hunting arrow | -10 | -3 | -2 | 100 yards/second |
| Pistol bullets | -13 | -5 | -2 | 300 yards/second |
| Rifle bullets | -16 | -6 | -3 | 1000 yards/second |
| Gauss rifle | -18 | -7 | -4 | 2000 yards/second |
| Speed of light | -50 | -23 | -12 | 300,000,000 yards/second |

* Includes +2 to Parry/Block and +1 to Dodge for predictability of trajectory.

# THE NOCK VOLLEY GUN

## BY GRAEME DAVIS

Fans of Bernard Cornwell's *Sharpe* series and the 1960 movie *The Alamo* already know the Nock volley gun, although they may not know its name. The history and design of this intimidating seven-barreled carbine are now revealed, along with rules and game statistics for three versions.

## HISTORY

The Nock Gun was invented in 1779 by British engineer James Wilson and manufactured by Henry Nock, an inventor and gunsmith whose most lasting legacy is his popularization of the double-barreled shotgun.

Wilson's design offered a man-portable weapon with devastating firepower that could be discharged into a tightly packed group of enemy sailors from a ship's rigging or elsewhere.

Nock made two prototypes based on Wilson's design. Testing revealed two serious flaws. Their rifled barrels made them very slow to reload, and they used a special powder whose force created a recoil that could dislocate or break the user's shoulder – or plunge him out of a ship's rigging and onto the deck far below.

Another 20 prototypes were made with smoothbore barrels and reduced charges of common powder. In 1780, Nock won a contract to supply the Royal Navy with 500 guns at a price of 13 pounds each: the First Model. On May 23 of the same year, Wilson was paid 400 pounds for his invention by the Board of Ordnance. There is no mention of his having had any further involvement in the gun's development.

Despite the improvements, the First Model was still extremely slow to load and suffered from serious recoil problems. In addition, its muzzle blast was capable of setting nearby sails and rigging on fire, which meant disaster to an Age of Sail ship. Admiral Lord Horatio Nelson, for example, forbade his captains to post snipers of any kind in their rigging during the Battle of Trafalgar. Even the most easygoing pirates' articles of the previous century punished any man for smoking on board "without a cap to his pipe."

Despite these problems, Nock Guns were issued to Admiral Howe's fleet when it sailed to relieve Gibraltar from besieging Spanish forces in 1782. An order for 100 more Nock Guns was placed in October 1787 and completed the following year. The crew of *HMS Pandora* was equipped with Nock Guns when they set sail in 1791 to hunt down the *Bounty* mutineers.

The gun was never liked by its users, though, and anecdotal evidence suggests that many were "lost overboard" in suspicious circumstances. No further orders were forthcoming, even when Nock dropped his price to 10 pounds apiece. The Nock Gun was officially withdrawn from service in 1804.

Nock made sporting versions, some rifled, for big game hunting. Some had five barrels instead of seven, and one, custom-made for the flamboyant sportsman Colonel Thomas Thornton, was a double gun with a total of 14 barrels. It is not known whether Thornton ever attempted to fire it.

Nock continued to experiment. He created a rotating cluster of barrels that could be fired one at a time. According to unconfirmed reports, he also devised a speed-loading system using a multi-spout powder flask.

### Fiction

The Nock Gun has been more successful in fiction than it was in history. The script of *The Alamo* ignored the recoil problem entirely, as does the 2005 video game *Gun*. Bernard Cornwell places a Nock Gun in the hands of the burly Irishman Patrick Harper; despite his strength, even Harper usually fires the weapon from the hip in the TV series developed from the books. In the 1987 James Bond film *The Living Daylights,* a tripod-mounted Nock Gun is seen briefly in the collection of arms dealer Brad Whitaker, but it is not shown in action.

## THE GUN

The Nock Gun was a flintlock carbine with six additional barrels welded around the central barrel in a hexagonal configuration. Small vents permitted the flash of the central barrel firing to ignite the charges in the others. The gun was 37" long overall with a barrel length of 20". Its caliber is most often reported as .46", although some sources report it as .50 or .52.

In real life, the Nock Gun was more trouble than it was worth. Slow reloading, recoil injuries, and accidental fires negated its value as a shipboard weapon. In a cinematic *GURPS* game – as in fiction, TV, and the movies – this need not be the case.

Basic rules and game statistics for the gun are presented along with optional rules covering the weapon's considerable drawbacks. The optional rules are appropriate for a harshly realistic campaign in which ingenious players are likely to enjoy the challenges of overcoming them.

## Nock Gun Table

Statistics are given below for three versions of the Nock Gun: rifled, smoothbore, and the experimental version with rotating barrels. Terms and notation are as defined on pp. B268-271.

### GUNS (MUSKET) (DX-4 or most other Guns-2)

| TL | Weapon | Damage | Acc | Range | Weight | RoF | Shots | ST | Bulk | Rcl | Cost |
|----|--------|--------|-----|-------|--------|-----|-------|-----|------|-----|------|
| 4 | Nock Gun (rifled) | 3d+1 pi+ | 2 | 65/650 | 12/0.1 | 1×7 | 7(420i) | 11 | -7 | 8 | $1,200 |
| 4 | Nock Gun (smoothbore) | 3d+1 pi+ | 1 | 55/570 | 12/0.1 | 1×7 | 7(105i) | 11 | -7 | 8 | $1,200 |
| 4 | Nock Gun (rotating) | 3d+1 pi+ | 1 | 55/570 | 12/0.1 | 7 | 7(105i) | 11 | -7 | 8 | $1,200 |

## Weight

Some sources mention that later versions were smaller and lighter, without giving any details. Other sources are silent on the matter. The information in the table assumes that the First and Second Models were the same size and weight.

The few documented Second Model guns weigh 12 lbs. If there was a weight difference between the First and Second Models, the First Model would be heavier, most likely by 1-2 lbs. Throughout the gun's history, only minor variations occurred in design, most often in the flintlock mechanism.

## Cost

Cost is based on Nock's price of 13 pounds for a First Model gun. A Brown Bess musket (*Flintlock Musket,* p. B279, $200) cost 2 pounds 4 shillings (2.2 pounds) which was about 17% of the price of a Nock Gun.

Historical price information is not available for the rifled and rotating versions. Both the rifled and rotating versions cost more to manufacture than the First and Second Models, but this is offset by the fact that Nock dropped his prices by 30% in 1788. The table assumes that the two factors canceled each other out and thus has the same cost for all three versions. However, the GM is free to vary prices as desired.

> *There's right and there's wrong. You got to do one or the other. You do the one and you're living. You do the other and you may be walking around, but you're dead as a beaver hat.*
>
> *– Davy Crockett, in* **The Alamo** *(1960)*

## Optional Rule: Recoil

The **GURPS** recoil rules (p. B271) only deal with the effect of recoil on accuracy. To simulate a Nock Gun's vicious recoil when fired from the shoulder, the GM can have the shooter take 1d-3 cr damage each time a volley is fired. (Modifiers for DR and other factors apply as normal.) Depending on the circumstances, the shooter may also need to make DX-based checks to keep his balance.

Shooting from the hip negates recoil damage but reduces Accuracy, adding -1 to attack rolls.

Using a tripod mount negates recoil damage but adds weight. A tripod mount costs $380 and weighs 20 lbs.

## Optional Rule: Misfires

All muzzle-loading black-powder weapons are prone to misfires. The Nock Gun's seven barrels make the chance of malfunction higher than usual. Typical TL4 weapons have a malfunction number of 14 (p. B407). Henry Nock was known for the quality of his work, so all Nock Guns are of *fine* quality, raising Malf. to 15.

If a misfire is indicated, roll 3d on the following table.

**3** – All seven barrels misfire
**4** – Six barrels misfire
**5** – Five barrels misfire
**6** – Four barrels misfire
**7** – Three barrels misfire
**8** – Two barrels misfire
**9-12** – One barrel misfires
**13** – Two barrels misfire
**14** – Three barrels misfire
**15** – Four barrels misfire
**16** – Five barrels misfire
**17** – Six barrels misfire
**18** – All seven barrels misfire

For every *two* full barrels that misfire, reduce recoil damage by 1 point. Determine randomly which barrels misfire.

If four or more barrels misfire, the shooter notices automatically. Otherwise, he must successfully roll against Per-2 for one misfired barrel, Per-1 for two, or Per for three.

If the shooter fails to notice and clear a misfired barrel, it will be double-loaded the next time the weapon is reloaded. For each double-loaded barrel, reduce Malf. by 1 and add 1 to the number of shots fired and recoil damage if that barrel fires successfully on the next shot.

## Optional Rule: Muzzle Blast

According to contemporary records, the muzzle blast from a Nock Gun could set sails and rigging alight. The muzzle blast from a volley is a cone attack (p. B413) with a maximum range of three yards and a maximum width of two yards. On the round in which the gun is fired, everything within the cone takes 1d-2 burning damage. Note that a minimum 3 points of fire damage is required to set cloth on fire (p. B434).

### Optional Rule: Intimidation

The Nock Gun's seven clustered barrels present an intimidating appearance. Pointing it at someone gives +1 to Intimidation against the victim.

### Optional Rule: Special Powder

Wainwright (see *Bibliography*) notes that Nock's initial specification included a special powder. Apparently this made the recoil problem even worse, because after initial tests the specification was amended to use a reduced charge of common powder.

The game statistics in the table are based on the reduced charge of common powder. The special powder costs 2.5 times as much as common powder. It increases range by 20% but adds +1 to recoil damage when the gun is fired from the shoulder.

### Optional Rule: Speedloader

The existence of a speedloader for the Nock Gun is not well documented. If the GM decides to allow this accessory in a game, it costs $25 and weighs 1 lb. Since it is just a modified powder flask and does not help with loading wadding and shot, the speedloader reduces reload time by 10 seconds.

## ADVENTURES

The Nock Gun was used from about 1780 to about 1815 – the period covered by **GURPS Age of Napoleon** and **GURPS Scarlet Pimpernel**.

In a cinematic campaign, it can be invented earlier and used later. The video game *Gun* featured a Nock Gun in the Old West, about 50 years after it became obsolete, and volley guns as a class go back 300 years before Nock's time. Therefore a similar weapon would not be out of place in any gadget-heavy campaign set from the European Renaissance on. **GURPS Swashbucklers, GURPS Old West,** and **GURPS Steampunk** are all fair game, as is **GURPS Japan** during the last decades of the Tokugawa Period.

In a black-powder fantasy setting such as **GURPS Castle Falkenstein,** the Nock Gun could be invented by an engineering-orientated race. They might even have overcome some or all of its problems.

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*Alamo, The* (John Wayne, 1960).

*American Guns* (Brett-Patrick Jenkins and Jonathan Haug, 2011-2012). Run on the Discovery Channel. In Season 2, Episode 5 includes the creation of a replica Nock Gun. Some of the historical details in the episode, such as Henry Nock's dates, are inaccurate. A clip can be found online at **dsc.discovery.com/tv-shows/american-guns/videos/manufacturing-history.htm**.

"Coming Soon on American Rifleman TV: Nock Volley Gun," **youtube.com/watch?v=2ZS8A5PbsqU.** Shows a Nock Gun being fired. The muzzle blast and the delay between triggering and firing are both noticeable.

"NFM: Seven Shots. All at Once. The Devastating Nock Volley Gun," **youtube.com/watch?v=2_kDdgCpGM0.** A video from the NRA Museum.

*Sharpe* TV movies (Tom Clegg, 1993-2008). Series of 16 made-for-TV movies based on the book series by Bernard Cromwell. Learn more about each installment at **sharpefilm.com.**

> *[Harper] was loading his seven-barrelled gun, a weapon of extreme unorthodoxy. Each of the barrels was a half inch wide and all seven were fired by a single charge that punched out a spray of death. Only six hundred had been made by the gunsmith, Henry Nock, and delivered to the Royal Navy, but the massive recoil had smashed men's shoulders and the invention had been quietly discarded.*
>
> *– Bernard Cromwell,*
> **Sharpe's Company**

## ABOUT THE AUTHOR

Graeme Davis is the author of **GURPS Vikings, GURPS Middle Ages 1,** and **GURPS Faerie,** among other things. He works as a freelance writer and editor, mostly in the video games industry, and is line developer for Rogue Games' **Colonial Gothic** roleplaying game (available at **e23.sjgames.com**).

# MAGIC BULLETS

## BY CHRISTOPHER R. RICE

Sometimes unusual materials are required to slay supernatural foes. For modern games, the popularity of firearms means that many folks want exotic warheads or loads. This quick reference uses generalized costs and simplified statistics to help players quickly create special ammunition for any situation.

For *GURPS* resources that offer additional exotic ammunition options, see the list in Odds and Ends (p. 38).

## THE RIGHT AMMUNITION

Some materials have a "cost factor" (CF). To find the *final* cost of ammunition made with that material, multiply its base cost by (1 + total CF); e.g., an extra powerful (+0.5 CF) metal-jacketed silver bullet (+49) = 50.5 times its list cost. Unless otherwise noted, weight is unchanged. Additionally, some ammunition has a fixed cost that is added *after* all other modifiers. This usually denotes special ingredients, which must be purchased separately and then added to the ammunition. Some types have both a fixed cost *and* a cost factor.

The exact effects of any special materials are up to the GM. However, many supernatural creatures have a Weakness or Vulnerability to one or more substances.

### Liquid

The ammunition contains a small amount of liquid in the tip. This is typically some form of traditional apotrope like holy water or wolfsbane, but knockout poisons, medicines, etc. can instead be used. Small pieces of solid matter in a fluid suspension are also possible. For shotguns and air guns (like paintball guns; see *GURPS High-Tech*, p. 88), ammunition can be lightly cased (or even suspended in gelatin), and contain larger amounts of a specific liquid.

For most guns, this changes damage type from pi- to pi, from pi to pi+, or from pi+ to pi++ (no effect on pi++), but adds armor divisor (0.5) and objects without DR get DR 1. For shotguns or air guns, halve damage (which becomes crushing), add Armor Divisor of (0.2), and divide range by four. In all cases, add a linked effect that depends on the liquid.

For any pistol, rifle, shotgun, or SMG, see the table below for the costs. LC3 or lower depending on the load.

| Material | Additional Cost | Notes |
|---|---|---|
| Asafetida resin | +$10 | [1] |
| Asafetida smoke | +3 CF *plus* $10 | [2] |
| Garlic extract | +$0.50 | [3] |
| Holy water | N/A | [4] |
| Silver nitrate | +$11 | |
| Silver nitrate tear gas | +3 CF *plus* $175 | [5] |
| Silver shavings | +$8 | [6] |
| Ultraviolet-irradiated solution | +4 CF | [7] |
| Wolfsbane solution | +$5 | |

### Notes

[1] Requires spirit beings that are "hit" to make a Will roll vs. the damage the bullet would have inflicted, or flee the area for 1d seconds.

[2] Releases a colored smoke (typically grey) in a four-yard radius that causes all spirit beings to make a Will roll or flee the area for 1d seconds. This smoke lingers for 1d-2 minutes (minimum 1 minute). To re-enter an area still filled with the smoke, they must make a further Will roll at -1 per 30 seconds that have passed. Failure means they cannot enter the area; success means they can, but suffer from Severe Pain (p. B428) as long as they remain.

[3] Garlic *oil* costs $10, if available, and has four times the effect of garlic extract.

[4] Holy water is not for sale, but is freely available in most churches.

[5] Upon impact, it releases a solution of tear gas that also contains silver nitrate. If they breathe it in, supernatural beings vulnerable to silver immediately suffer the effects of their disadvantage (Weakness, Revulsion, etc.) and any damage sustained is *tripled*. If the subject has to breathe and is vulnerable to airborne gases, he must also make a HT-2 roll to resist the tear gas (p. B439) in addition to any other effects.

[6] Cost was derived from a 1/8th ounce of silver shavings suspended in water. Other metals can be substituted – figure out how much 1/8th ounce costs and treat as the additional cost. Can be combined with other liquids for multiple effects; simply combine costs.

[7] Counts as sunlight against creatures vulnerable to it.

### Special Metal

The ammunition uses a metal jacket around a solid core of some other metal. Silver is a classic example, but other metals are possible. Figure out the cost of the material per pound, divide the weight by 20 and subtract 1 to get the CF for that metal. For more "realistic" games, multiply weight per shot (WPS) by 0.5 and then by the cost per pound of the metal. Add this as a fixed cost *after* all other modifications.

Ammunition merely *tipped* with a specific metal reduces this CF by 1/5. Treat tipped ammunition as if it were coated with the material (see *Silver Weapons*, p. B275). For example, a 9mm silver bullet would cost $26.3 while one tipped with silver would cost $5.5.

Range and damage remain unchanged. For any gun, see the table below for CFs. LC3.

| Material | Cost Factor | Material | Cost Factor |
|---|---|---|---|
| Bronze | +0.5 CF | Iron | +0.3 CF |
| Copper | +0.25 CF | Silver | +49 CF |
| Gold | +999 CF | | |

## Special Mineral

The ammunition uses a metal jacket around a solid core of stone or some other mineral (but not a metal; use the rules above for that).

Since the material has to be shaped to fit inside the bullet, the cost is considerably higher than metal, which can be melted and poured into a mold. The cost of a given bullet with a special mineral in it equals the cost of 1/20 of 1 lb. of the material. For gemstones and jewels, this is approximately seven carats. Organic materials like bone, horn, or teeth may be used, but the cost is usually negligible (you just need to find it). The GM sets the cost for any organic materials that cannot be easily gathered. For "realistic" games, multiply the cost per pound by the weight per shot (WPS) of a given type of ammunition and add that as a fixed cost *after* all other modifiers have been applied. Ammunition merely *tipped* with a specific mineral multiplies the cost of the mineral per pound by 1/5. For precious gemstones or jewels, this is approximately one carat. For example, a 9mm obsidian-core bullet would cost $77.30, while one tipped with a chip of obsidian would cost $5.30. Treat tipped ammunition as if it were coated with the mineral (see *Silver Weapons*, p. B275).

At the GM's option, synthetic or other non-naturally formed minerals might have a reduced effectiveness. In some settings precious stones or other materials might have special properties. For instance, a bullet tipped with a one-carat emerald might serve as a Manastone (**GURPS Magic**, p.70), and thus be an ideal candidate for Spell Arrow or Blank Spell Arrow spells (**Magic**, pp. 65-66).

Halve final range and damage, rounding up. For any gun, the cost is +2 CF *plus* the cost of the mineral (see the table below). LC3.

| Material | Additional Cost | Notes |
|---|---|---|
| Diamond-tipped | +$500 | [1] |
| Dragon claw sliver | +$1,500 | [2] |
| Obsidian core | +$77 | |
| Rock salt | +$0.25 | [3] |
| Human bone sliver | +$6 | |
| Wolf tooth | +$10 | |

### Notes

[1] Can be enchanted to act as a 5-point Manastone or, if enchanted with Spell Arrow, can hold a spell with a maximum energy cost of 5 or less.

[2] Adds an Armor Divisor of (2) and the incendiary modifier. Against dragons or dragon-like creatures, the Armor Divisor increases to (3). Cost assumes that dragons are rare or extinct. In campaigns where this is not the case, the GM can adjust the cost appropriately.

[3] Use the rules from **High-Tech** (p. 103) for shotgun shells loaded with rock salt. Might be especially effective against zombies and their ilk, depending on the campaign.

## Wooden

The ammunition either uses wood in a metal jacket or a carved wooden bullet. Particularly rare woods such as iron-wood (*Lignum vitae*), white oak, or hawthorn cost double CF. Halve final range and damage for jacketed ammunition; otherwise, multiply final range and damage by 0.1 for wooden bullets. Round up in both cases.

Wooden stakes can be fired from manually operated shotguns or grenade launchers (no pump-actions or automatic designs). For shotguns, treat this as a rifled slug (**High-Tech**, p. 166), but divide Range and damage by three. Damage becomes impaling, Acc becomes 0, and reloading requires two *additional* Ready maneuvers (one to get the stake and another to insert it in the barrel). For grenade launchers, damage becomes 1d+1 imp, Acc becomes 1, and Range becomes 20/150. Grenade launcher ammunition can also be used in a flare gun (such as the *Walther Leuchtpistole*, **High-Tech**, p. 142), for characters who would rather not advertise exactly what they are carrying.

For any gun (for wooden bullets) or any shotgun or smooth-bore grenade launcher (for wooden stakes), the cost is +2 CF for metal-jacketed ammunition, -0.5 CF for wood bullets (+0 CF for rare wood types), plus the CF of the material (see the table below). LC3.

| Material | Cost Factor | Notes |
|---|---|---|
| Alder plug | +0 CF | [1] |
| Birch core | +2 CF | [2] |
| Hawthorn core | +4 CF | [3] |
| Holly grenade launcher stake | +2 CF | [4] |
| Palo santo plug | +4 CF | [5] |
| Pine core | -0.5 CF | |
| White oak shotgun stake | +4 CF | [6] |

### Notes

[1] Against supernatural creatures vulnerable to fire, this also gains the incendiary modifier. Against evil supernatural creatures, convert the damage type to *burning* instead, though this completely ruins the bullet.

[2] Functions identically to ammunition loaded with Asafetida resin (p. 34).

[3] Gains an Armor Divisor of (2) against magical armor, barriers, or beings (e.g., golems). This also applies to protective spells that give the subject DR.

[4] Evil supernatural creatures (demons, fallen angels, etc.) that are damaged must make a HT-2 roll or be Nauseated (p. B428) for minutes equal to their margin of failure (minimum of one minute).

[5] Counts as a holy attack against creatures vulnerable to them.

[6] When used to stake a vampire (or similarly vulnerable creature), it gives +1 to hit the heart on aimed attacks as the wood "seeks" its target. Once staked, the subject must roll against his own ST-4 to pull it free; failure inflicts thr-4 impaling damage or half of the damage it originally caused, whichever is less. Another person can remove it normally.

*Unusual materials for unusual enemies.*

## ABOUT THE AUTHOR

# Random Thought Table

## Make Each Shot Count

### by Steven Marsh, *Pyramid* Editor

In modern gaming (or beyond), guns can get heroes out of a lot of bad situations. However, sometimes the gun itself is more than a tool; sometimes firearms are a focal point of a mission or adventure. Here are some ideas for how to turn the spotlight upon those oft-invisible methods of maintaining the peace, by encouraging the heroes to make the most of their gun-slinging skills.

## Be Resourceful!

Just about everything I know about guns I learned from *GURPS* supplements, *Pyramid* articles, and video games. Two of those sources are trustworthy . . . the other, not so much. Still, games generally place a priority on "fun," and resource management is one tried and true way to ramp up the tension. When it comes to guns, "resource management" generally means "ammo."

Campaigns that micromanage inventory already employ this technique as par for the course. However, many campaigns – especially faster-paced ones – don't get bogged down in those details. *Bullets, Beans, and Batteries* (from **GURPS Action 2: Exploits**) gives great options that allow for tense low-ammo predicaments, while not worrying about it most of the time. However, it's also possible to play more fast and loose; most gaming groups are pretty understanding about their heroes finding themselves in situations where it's suddenly important to start tracking ammo, even if that hasn't been done before. Some examples include:

- The heroes escape from captivity in enemy territory. They manage to "borrow" some weapons from the guards they overpower, but those mooks had precious little extra ammo.
- The heroes are in a situation where weight is an issue, and they (or a well-meaning dolt) got rid of much of their ammo.
- Something ruins much of the PCs' ammo and/or supplies (especially if they were stored at a mobile locale they *thought* was safe . . .).

Of course, tracking ammo use isn't an issue if someone has a perk or ability that keeps them well-stocked, such as either of the Infinite Ammunition variants (**GURPS Gun Fu,** pp. 19-20) . . . but such a player has already spent points to make that part of his hero, so it's fair. (If I were GMing a campaign and I felt a particular scene would benefit from ramping up the tension that way, I'd probably pull the player aside and ask if he's okay with the option of possibly earning another bonus character point for the adventure by "disabling" the perk for a bit. If he says yes, then great . . . if not, then no worries; I'll make the player feel smart for outfitting his hero with such a useful ability.)

Having played more than my share of shoot-'em-up video games over the years, I know that there are some situations where there's no greater treasure in the world than another clip of 13 shots. That same sense of triumphant relief works just as well for many RPG campaigns.

> *I have a very strict gun control policy: if there's a gun around, I want to be in control of it.*
>
> *– Clint Eastwood*

## When a Wound Makes a Guy Lycanthrope Up and Die, That's Ammo-y

Another option to turn the spotlight on the heroes' weapons is to draw attention to having the right kind of *ammo.* In a realistic campaign, this might mean a mission demands silent ammunition, beanbag/rubber shot rounds, or a poison. In a less-than-realistic campaign, you might need ammo that's silver-tipped, holy-water-filled, or rune-scribed (see pp. 34-35 for lots more options).

For nonlethal rounds, it can be a fun aggravation for the heroes to realize they could *kill* their target without much effort, but *disabling* the LSD-crazed mayor will be much less messy for the town. Similarly, the need to conserve a special type of ammo introduces all the previously mentioned complications of making each shot count, without resorting to stripping the heroes of their normal goods.

As another option that players love, give their heroes a special type of ultra-rare ammo intended for a mission – and let the PCs keep whatever they don't use. Nothing will make some players conserve every shot more than adding "game wrecking" ammo to the larder for future use. I've had more than one situation in campaigns where the heroes have casually tapped special resources leftover from ages past: "Amnesia bullets?! That adventure was *three years ago!*" (And then there was the **Advanced Dungeons & Dragons** campaign my friends ran where the heroes dutifully picked up every "useless" *sword +1* they accumulated over the years, resulting in enough to outfit an amazingly powerful army using the **Battlesystem** rules . . .)

> *I have a love interest in every one of my films: a gun.*
> *– Arnold Schwarzenegger*

## OUR GREATEST FEAR . . . A DUSTY CORRIDOR!

Firearms require cleaning every day or two of use (p. B485), depending on the model. Situational complications (dust, sand, slime, etc.) can make the need to clean weapons even more dire. Thus, another way to turn attention to the heroes' guns is to ramp up maintenance tension.

The easiest way to do this is to keep the heroes occupied with so many crises that they don't have the time to maintain their weapons. Even heroes with the Cleaning Bug perk (**GURPS Tactical Shooting,** p. 40) might think twice about taking their weapons apart if they keep getting ambushed every time they try to do so. Of course, if it takes a day or two of constant use before weapons start failing, the heroes are going to have greater problems – such as staying awake in firefight conditions for 24-48 hours. Still, if the heroes start out with ill-maintained weapons (say, by taking command of a poorly disciplined unit) and find themselves thrust into more treacherous conditions, they may long for a couple of hours to bring their weapons up to fighting shape.

These potential complications can be accelerated by introducing environmental concerns – see **GURPS High-Tech,** pp. 80-81 and p. B485. The situations tension will certainly increase as the sand, grit, and grime are threatening to make the next pull of the trigger the last.

Of course, as **High-Tech** (p. 80) notes, abuse doesn't necessarily mean the weapon stops working. It might decrease Accuracy or impose any other penalty the creative GM can concoct. From a dramatic gaming point of view, this is *better* than simply saying, "The gun stops working." After all, a hero has bragging rights if he can say, "I fended off an army of alien bugs with a slime-encrusted rifle with bent sights that bucked randomly each time I pulled the trigger."

## SHOOT CAREFULLY

*For the last time, the **Excelsior** is filled with non-flammable helium!*

*– Capt. Lammers, in **Archer** #1.7*

As a final way to encourage the heroes to make each shot count, the GM can place them in a situation where accuracy and planning counts more than going in with guns a-blazing. This is most common in situations where stray shots are dangerous. This can include most vehicles (submarines, spacecraft, dirigibles, etc.) as well as environmental concerns (computer centers, explosives factories, and the like). It can also involve situations where the heroes need to make use of a skilled shot to limit loss of innocent life; for example, the film *Robocop* has a famous scene where the titular protagonist must carefully target his shot in a hostage situation.

Many games encourage adventurers to build their gun-slinging skills to sky-high levels, but often players forget that an advantage of such exceptional levels of ability is that they have options that don't involve going in with a full clip ready. Sometimes the true mark of a hero is one shot – the right shot – and making it count.

## Plenty of Shots, Not Much Time

Another option that works well – arguably better in **GURPS** than in action-adventure movies – is the count-down. If the heroes only have (say) 10 seconds to stop the bad guy and flip the Big Red Switch, then it doesn't matter if they have limitless bandoliers. Here, each shot counts because they can only pull the trigger so many times before the clock runs out. Here, all those tricks the heroes have at being able to shoot as accurately and quickly as possible really come into their own.

The reason this works better in **GURPS** is because "10 seconds" can actually be an hour of game time, if the players are working all their options. Movies can't have split-second situations without resorting to slow-motion camera work (which looks ridiculous for more than a few seconds) or expanding the timeframe. The latter option come across fine for "we need to stop this bomb in five minutes or less!" but is pretty silly for "we only have six bullets and five minutes to shoot this guy!"

## ABOUT THE EDITOR

Steven Marsh is a freelance writer and editor. He has contributed to roleplaying game releases from Green Ronin, West End Games, White Wolf, Hogshead Publishing, and others. He has been editing *Pyramid* for over 10 years; during that time, he has won four Origins awards. He lives in Indiana with his wife, Nikola Vrtis, and their son.

## MORE MAGIC BULLET OPTIONS

by Christopher R. Rice

For additional exotic ammunition options:

- *GURPS Horror,* pp. 52-53.
- *GURPS High-Tech,* pp. 165, 168, 174-175.
- *GURPS High-Tech: Pulp Guns, Volume 1,* p. 23.
- *GURPS High-Tech: Pulp Guns, Volume 2,* p. 12.
- *GURPS Monster Hunters 1: Champions,* p. 63.

For further details on exotic materials and gemstones:

- *GURPS Loadouts: Monster Hunters.*
- *GURPS Low-Tech.*
- *GURPS Dungeon Fantasy 8: Treasure Tables.*

## WHEN SUDDENLY . . . A SHOT RINGS OUT!

In popular culture, a gun in an unexpected situation is a good way to keep the heroes on their toes.

- A weapon was snuck into an unexpected place (a hollowed-out book, broken down into component parts and smuggled in whole and in part, etc.). As a bonus forehead-slapper, see if you can get the PCs themselves to inadvertently do some or all of the smuggling!
- A firearm appears in an unfamiliar era, such as the classic DC *Warlord* fantasy comic-book series. This doesn't necessarily mean "the past"; weapons from the past rediscovered in the future might provide new opportunities. For example, when deadly fae attack a far-future world, they may not succumb to ceramic and plastic firearms . . . but they might have a vulnerability to the "cold iron" of antique weapons.

# MURPHY'S RULES

## BY GREG HYLAND



REMEMBER: HEROES DON'T KILL!

DON'T WORRY...!

IN *DC HEROES* (Mayfair Games), UNLESS THE ATTACKER DECLARES OTHERWISE, ALL ATTACKS ARE ASSUMED TO DEAL NONLETHAL ATTACKS-- INCLUDING KNIVES, GUNS, AND *ROCKETS*...!

Got a *Murphy's Rule* of your own? Send it to murphy@sjgames.com

*I like big guns, and I cannot lie.*

*– Duke Nukem: Manhattan Project*