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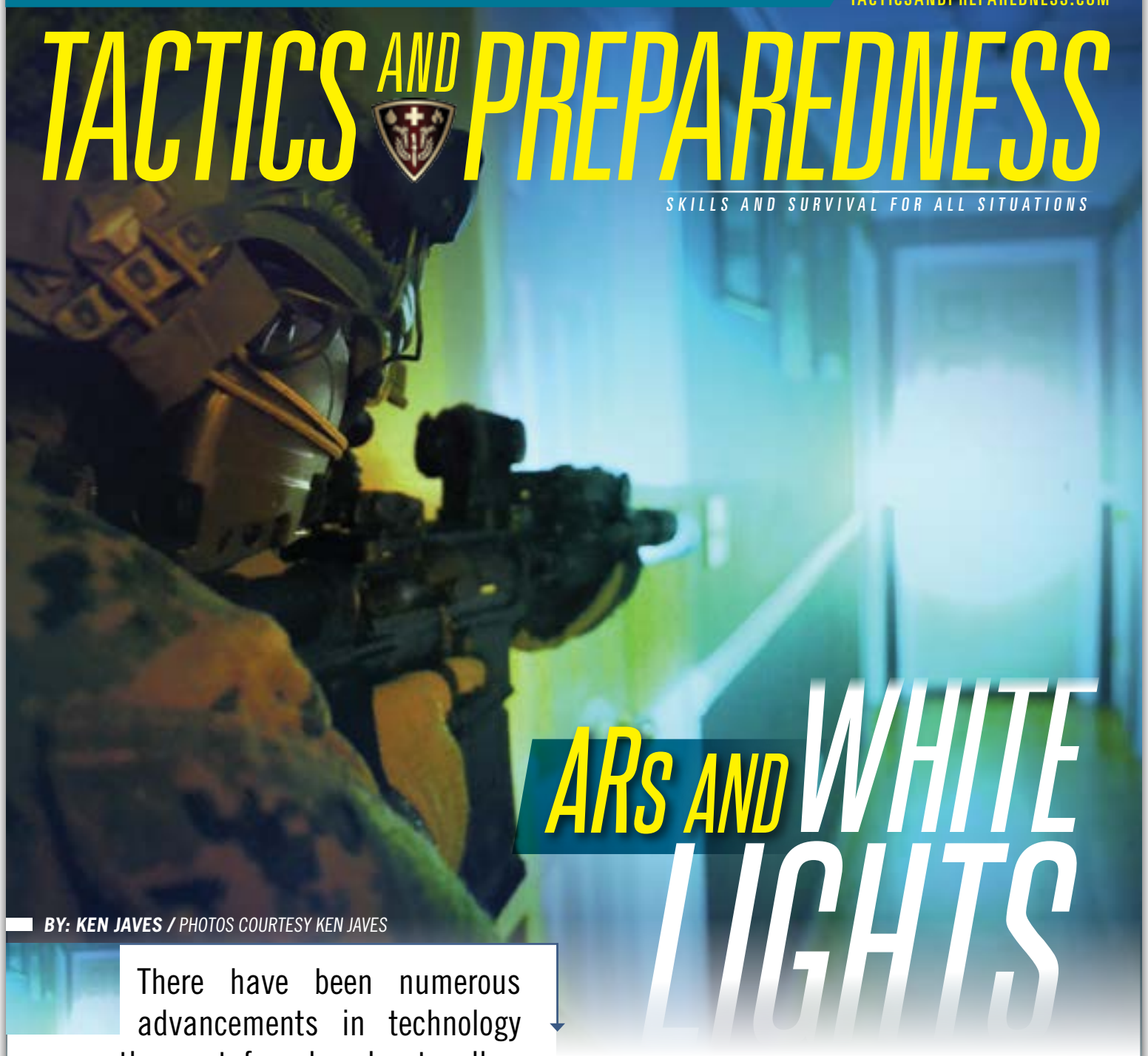

ARs AND WHITE LIGHTS

BY: KEN JAVES / PHOTOS COURTESY KEN JAVES

There have been numerous advancements in technology over the past few decades to allow us to see and operate in dark places; such as night vision equipment that can amplify a light source up to 50,000 times, thermal imagers that you can clip to your phone, and combination systems that blend the two technologies together.

However, the most cost effective and the best for positively identifying friend from foe in the dark is still the humble flashlight. The flashlight has undergone dramatic evolutionary improvements. The amount of light output, clarity, reduction in size and cost, as well as increases in battery life have been astounding and have surpassed what was thought to be possible just ten years ago. I consider a good white light to be a mandatory piece of equipment for any rifle meant for defensive use. The small size and high output of modern tactical lights offers great capability and leaves little room for excuses for not incorporating one.

HUMAN EYE CHARACTERISTICS

The human eyeball uses chemical processes and electrical impulses to transmit vast amounts of information to the brain to allow continued on next page

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Some different switching options, from top to bottom: tape switch, momentary with twist lock-on/off, click-on/off.

A GOOD WHITE LIGHT should be a mandatory piece of equipment for any rifle meant for defensive use.

us to do all sorts of things—except in the dark. Of all the predatory animals that roam the earth, the human animal is one of the least adapted to operate at night and we are at a significant disadvantage when compared to even the lowly housecat. Without a significant source of external illumination we are legally blind. Even under a full moon, with no cloud cover, the best we can do is often around 20/200 vision and we lack the ability to discern color. Under clear skies with only the stars to guide us, our vision is further reduced to around 20/800. Achieving that meager ability requires approximately 40 minutes in a dark environment for our eyes to adapt. And for every ten years we age, 40 percent more light is required to achieve the same visual acuity. All of that effort can be wiped away in an instant if we are exposed to a light source. From an operational or defensive standpoint, very few situations allow the time required to adjust our eyes to the environment. Even with all of our technological achievements we are still disadvantaged in the dark. To quote one of my night-lab instructors at the Marine Corps Infantry Officer Course, "Some like to advertise that 'We Own the Night', but I think we've only got a long-term lease with an option to buy."

WHITE LIGHT

Night time is when we are supposed to be sleeping, but the discovery of electricity and invention of the light bulb has screwed that up for all of us. People are up and moving around later than our ancestors were. Opportunities abound for an enterprising criminal element looking to take advantage of the reduced awareness that a lack of light brings. Those who hunt bad guys must be able to operate in the dark as well. Positive identification or being able to discern friend from enemy, is one of the primary uses of white light in a tactical environment. Even the most advanced night vision devices, such as the PVS-31 system, will not allow positive identification of an individual outside of 50-75 yards and purchasing a set will put you back around $13K. Other devices that we use to enhance our ability to aim our weapons at night, such as aiming lasers, tritium night sights, etc; may allow us to improve our shot groups in the dark, but do nothing to help us identify the target. This can be a big deal if you are trying to figure out if

The IR filter on this incandescent light will not work with a white-light LED.

THE TOP LIGHT *is one I had mounted to my rifle through three combat tours. It was absolutely state of the art at the time, and the brightest available. It is now dwarfed in output and battery life (certainly not in size and weight) by the hand-held light on the bottom. . .*

your house is being broken into in the middle of the night or if your dog just got into the trash again.

LIGHT SELECTION

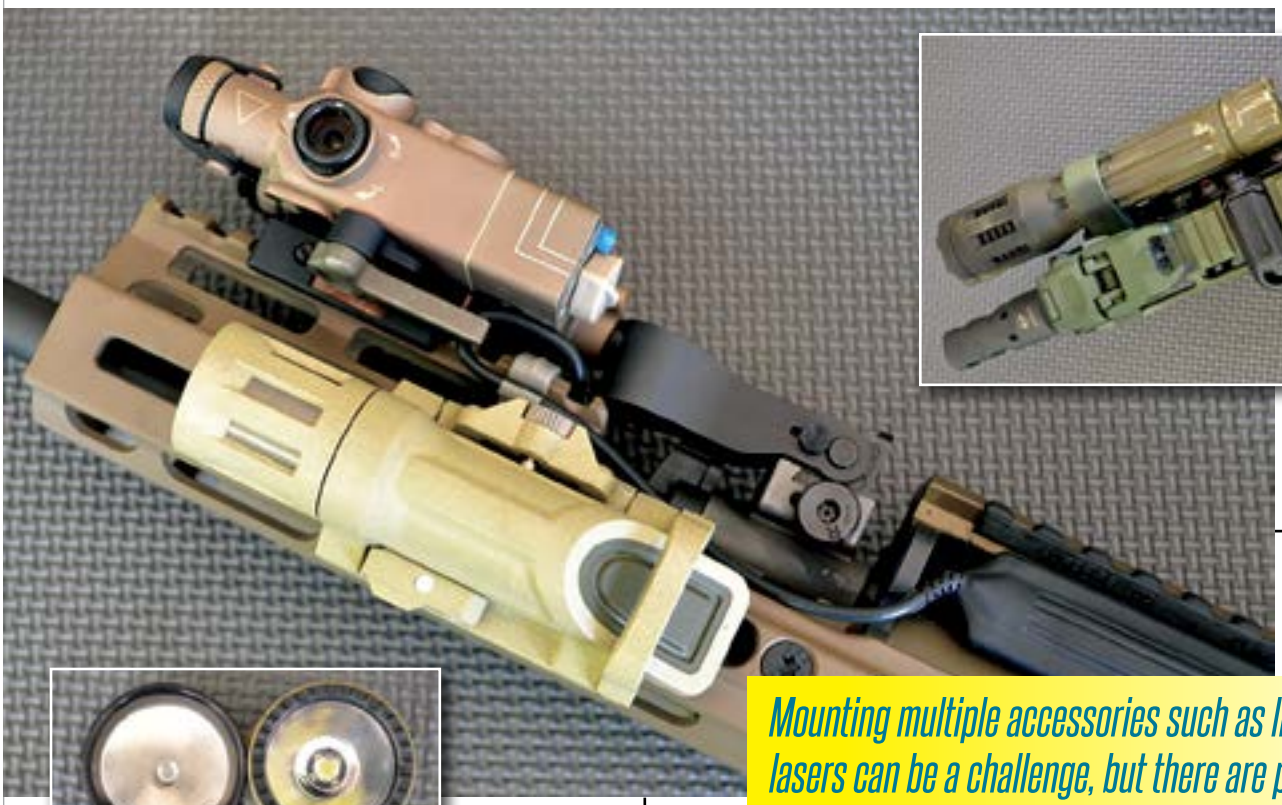
Determining the value of certain features on a tactical light depends on the operational environment, the anticipated situation and the light's intended use.

Light Output is the total amount of directional light energy produced by the flashlight and is typically measured in lumens (candela or candle power is a much less accurate unit for our purposes.) Output from various tactical lights can vary from 1 lumen (amount present in most keychain LED lights) up to 1000 lumens for some of SureFire's newest handheld lights. For comparison of the advancement of the technology, the monster vertical fore-grip light (M900) put out a whopping 210 lumens and a small handheld light available today can deliver 600, with one less battery. The amount of output needed depends heavily on the anticipated environment and distance to the threat. As the distance increases (such as when you anticipate operating outdoors in a rural environment) the majority of the time, the required light output increases. Generally, the only constraint on light output is how much weight and space you would like the light to occupy on your rifle. When in doubt, go with the higher output light. If you anticipate using the rifle in a static or surveillance role a larger light will not become too much of a burden. However, if you plan on carrying the rifle for extended periods of time the ounces can add up. There is also a misconception that too much light, when working in an indoor environment, can blind the operator if the light reflects off of a wall or other reflective surface. This has not been an issue for me, even using lights in the 1000 lumen range.

SWITCH OPTIONS

There is an overwhelming array of switching options available for various tactical lights: momentary, tail-cap, twist-on/off, strobe, brightness level, tape, remote and now even wireless. I like to keep my weapon light and switch system as simple as possible, because if I have to use it I am probably dealing with a number of other things at the same time and having to cycle through several different light levels or trying to figure out how to get the light to stop blinking is more than I want to deal with. The driving factors for selecting a switch should be: simplicity, ability to operate it with one hand, ease of use under stress, and reliability. All of my weapon lights have one output level—*bright.*

I prefer a momentary or click-on/off tail cap switch to activate the light, with slightly more preference for a positive click-type switch for a couple of reasons. The click-on/off switches are typically a little stiffer and require a more deliberate press to activate the light thus reducing the likelihood of an inadvertent activation of the light by bumping the switch with your hand or on a piece of gear (unintended light emissions can do more harm than good.) They are also easier to use if you are forced to run the weapon with one hand or have to shoot from an awkward position where you may not be able to reach the switch. I recommend that whatever switch you choose has a protective ring around it to reduce the chance



top: Mount the light far forward to minimize light masking.

left: Momentary switch with lock-out protective bar.

Incandescent (left) and LED (right).

Mounting multiple accessories such as lights and lasers can be a challenge, but there are plenty of mounting options, rail systems and switches available.

of it being inadvertently activated, or some type of lock-out system. These tend to add complexity to the light. A simple black-out cap (similar to a lens cap on a rifle scope) can also be used as an added safety measure to prevent being compromised.

BEAM SHAPE AND QUALITY

Most modern tactical lights utilize a precision parabolic reflector which provides an even, bright center surrounded by a wide, dimmer, flood area. The design of the reflector will determine how tight the center beam is and how much area is covered by the flood. Typically the larger the diameter of the reflector, the tighter the center beam, and the more range you will get for the same light output. A tight beam is desired for situations where threats must be identified at greater distances (spot lights, precision rifle lights) where a wide beam is better suited for close quarters or indoor environments (most pistol-mounted lights.) When evaluating the quality of the beam, both the center and the flood areas should be even, with none of the dark spots or rings that characterize cheap, adjustable beam, household flashlights. There should also be a distinct difference between the center and the flood areas. You typically get what you pay for when it comes to quality and I definitely recommend going with a reputable manufacturer for any light that will be used on duty or for defensive purposes. For training or hobbyist pursuits, many $50 and under lights sport the same technology that would have cost multiple hundreds of dollars ten years ago, but you will have to deal with dubious quality and reliability of the light.

MODULARITY AND UPGRADABILITY

Most quality lights now use similar components and light modules which makes upgrading your light or changing its configuration fairly simple. Probably the most easily modified lights are those manufactured by SureFire since they use standard thread pitches, tube diameters and light assemblies in most of their models with the Millennium Universal model perhaps being the most modular flashlight design out there. This allows multiple switch, body, battery compartment, attachment, and light head options all off of the same base tactical light. The ease of replacing or upgrading components as they fail or become obsolete is a factor to consider when deciding which light to purchase.

LED VS. INCANDESCENT

Another option to consider is the bulb type, the two main options being Light Emitting Diode (LED) or incandescent bulb, which uses a standard inert-gas glass bulb and electrical filament to produce light. Incandescent bulbs used to offer more light output at a lower cost than LEDs but that trend has been reversed. New LED systems have surpassed incandescent bulbs and offer enhanced durability (and recoil resistance), bulb life (>100k hours in some cases), battery life, and light output. Incandescent lights do provide a slightly warmer (more yellow) light than most LEDs, which some prefer, but LEDs are now being produced in multiple grades of white, allowing the user to select the color temperature that suits them best. One downside of current LEDs is that one LED can only produce light in one portion of the frequency spectrum. This means that the infrared filter you had been using on your old incandescent light will not work on the LED replacement. LED lights that offer both white-light and IR capability typically use separate bulbs and a separate switch mechanism to select between the different modes.

MOUNTING POSITIONS

With the myriad lights, mounting options, rail systems and switches on the market now, we no longer have to make do with the three C-Cell MagLite hose clamped to the barrel of our MP5. Even with all of the mounting options

A quality handheld light can serve as a backup to the weapon light. The Harries technique used with pistols can also work with rifles.

available, light placement usually ends up being a compromise of sorts. The light should be in line with the barrel and face toward the muzzle with the switch positioned so that it can be easily reached without dramatically altering the position of the support hand. If I can avoid using a tape switch I will, just to keep things simple and eliminate a potential source of problems. You should also be able to activate the switch with both hands. For this reason there has been a recent trend in mounting lights at the 12 O'clock or 6 O'clock positions on the rail. At the 12 it requires a rail that extends beyond the front sight, with a short light, removal of the front sight, or a specialized sight that will allow the light to pass through it. At the 6 a different switch or activating the switch with a knuckle instead of a fingertip is usually used. I find that using a knuckle requires more practice and is less intuitive than using a finger or thumb to activate a light. I prefer mounting my lights at the 11 or 1 O'clock positions which still allows me to activate them with either hand without significantly altering my grip and I don't have to worry about my front sight.

The light should also be mounted as far forward on the barrel as possible, but where it can still be easily reached. The farther forward the light head is, the less the barrel and hand guards will mask the light and create shadows. The downside of placing the light head near the muzzle is it subjects the light to muzzle blast (I haven't had any quality light fail due to exposure to blast pressures) and carbon soot tends to accumulate on the lens, eventually dimming the light output. One way to ease cleaning is to coat the lens with petroleum jelly or chapstick before shooting; this allows the build-up to be easily wiped away when you are finished. Depending on where you mount the light you will also have to reconsider how you use cover and I recommend a few dedicated practice sessions to get used to it. Much like we have to consider the height-over-bore of our optics or sights to avoid putting a bullet into the object we are using as cover we also have to ensure our light clears the object to prevent illuminating ourselves with reflected light and masking the target.

TRANSITIONS

If your pistol isn't equipped with its own light there are a few options for utilizing the light mounted on your rifle to illuminate the threat. One is transitioning your rifle to your support side shoulder, keeping your support hand in place and in reach of the light switch while you draw the pistol with your strong hand. This keeps the light at the same level, but if not practiced can result in a collision between rifle and pistol. A more simple and preferred technique is to simply tuck the rifle under the support arm, keeping the barrel level and oriented toward the threat, while drawing the pistol. This offers more support and control over the rifle while moving and is a little more forgiving of error. This is also one of the reasons I prefer a click-on/off switch over a strictly momentary one.

HANDHELD LIGHT WITH A RIFLE

I believe anyone serious about personal defense should have a quality handheld light in addition to any weapon mounted lights and know how to use it. The first reason is to have a backup in case the primary weapon light fails. Most tactical lights utilize a lithium battery power source due to their light weight, high and consistent power output, and durability, but lithium batteries deliver little warning when they reach the end of their useful life. The light works one moment, fades rapidly, and doesn't work the next. The second reason is in most places in the U.S. pointing a weapon at someone, even if your reasoning is just to use the light to identify them, is considered assault—not to mention we should not be pointing a weapon at anything we have not identified and intend to destroy. If the primary weapon light fails, you must now figure out how to manipulate your hand held light while supporting and controlling your rifle. My preferred method is a variation of the Harries technique used with pistols. This variation places the light in the support hand with thumb on the tail-cap switch, light facing the threat. The hand guard of the rifle rests on top of the forearm while at the same time pulling the rifle tight into the shoulder using the front of the magazine well. While it is not perfect, it does provide decent control over the light and rifle.

There are a number of options on the market for outfitting the patrol or defensive rifle with a white light. While there are many reasons to incorporate a light, I have yet to hear a convincing argument against mounting a light especially given the reductions in size and weight and increase in power found in modern tactical lights. Half the earth is dark at any given time. Whatever option you choose, practice with it (dry then live) and develop and maintain proficiency with your chosen tools and techniques. ✓

BIO

Ken Javes has over 19 years of military and security contracting experience to include multiple combat and contract deployments to South West Asia. He has served with Marine Infantry and Force Reconnaissance units. He possesses instructor certifications from multiple agencies and organizations, and has trained with some of the top military and competitive shooters in the country.