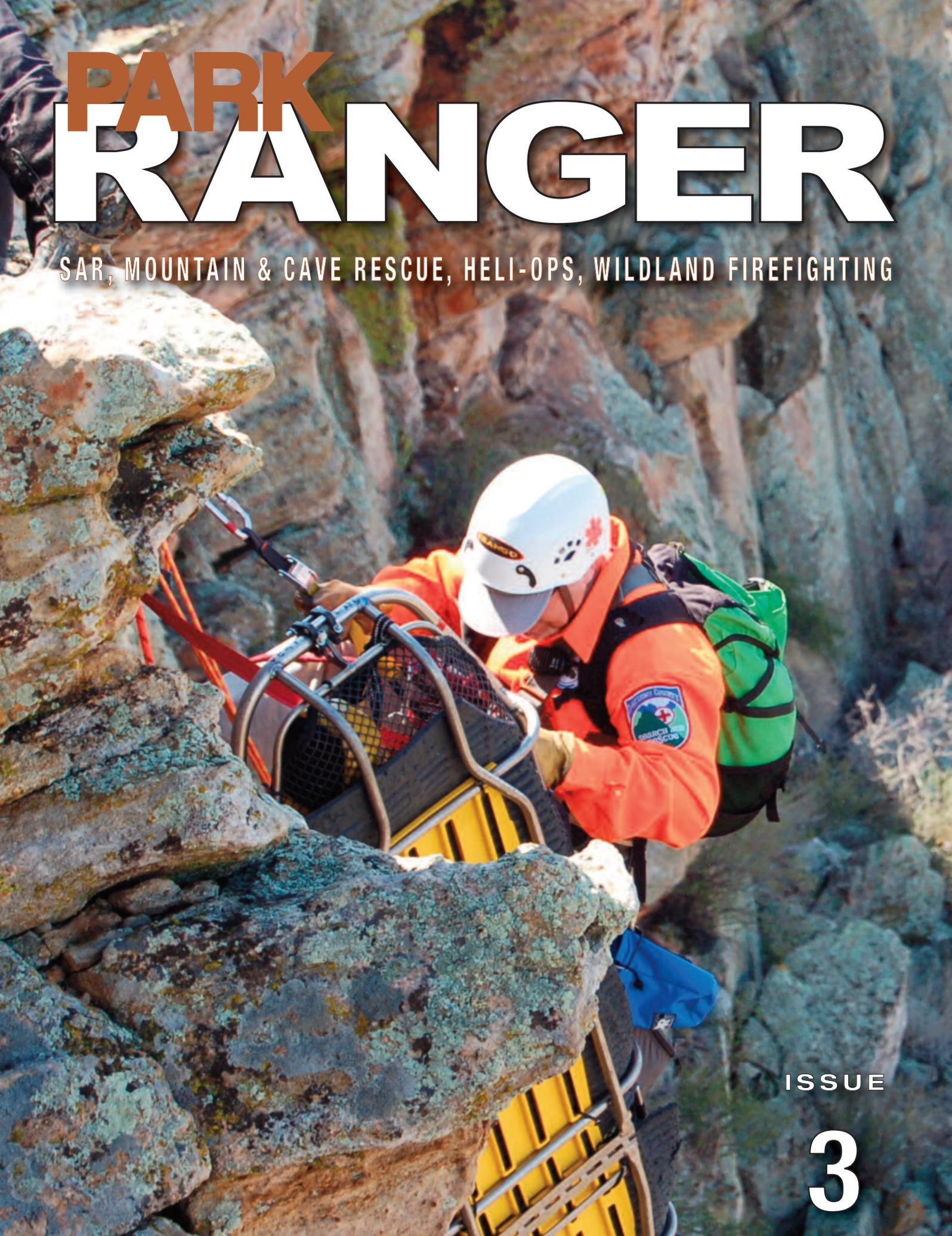


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ISSUE

3



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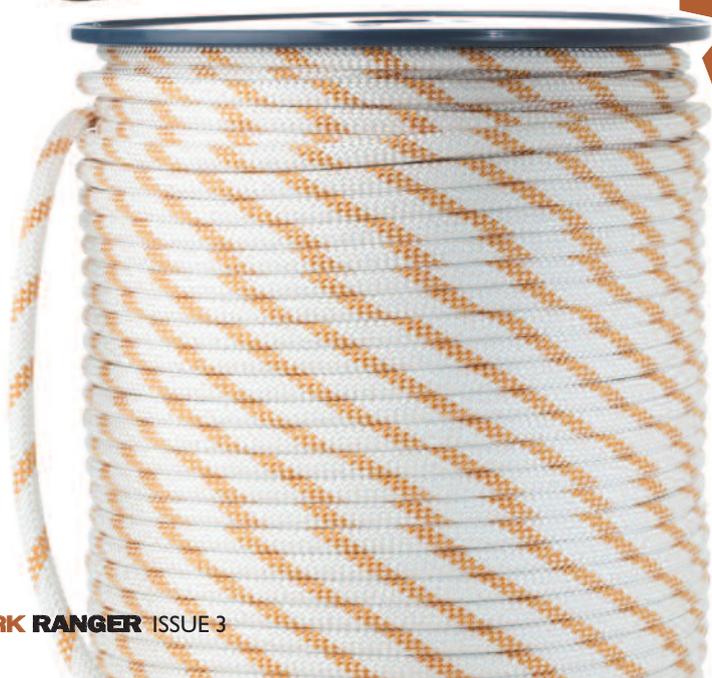
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FRONT COVER:

Manoeuvring a litter down rock faces that are less than vertical or congested with loose rock, outcrops and overhangs can turn an easy lower into an epic. In this case a team member from the Editor's own team, Larimer Search & Rescue in CO, USA guides the litter in vertical orientation to the waiting casualty during MRA accreditation. Picture by Lee Lang

This Page:

Inside a gaping crevasse at 9,500 feet, Tech Sgt. Anthony Reich, pararescueman, 304th Rescue Squadron, Portland, Ore., carefully makes his way around a couple of large ice blocks that have peeled off a melting glacier on Mount Hood, Ore. Belaying Sergeant Reich is Staff Sgt. Patrick Dunne, pararescueman, 308th Rescue Squadron, Patrick Air Force Base, Fla. This is part of a search for the bodies of two climbers presumed killed during a fierce December snowstorm. An additional four pararescuemen from the 304th RQS and one SERE (search evasion resistance and escape) specialist from the 943rd Rescue Group, Tuscon, Ariz., joined Sergeants Reich and Dunne on the mountain. In all there were 59 climbers, most of them volunteers from civilian mountain groups searching the high country.

'Demote' the PIO?

(Public Information Officer)

Evolution is characterized as the ability to adapt to a changing environment. I believe it is time for the Incident Command System (ICS) to evolve to the environment we now operate inside. I have come to this conclusion after much discussion and observation of incidents (both large and small). Don't get me wrong - I am not saying that there is something "wrong" with ICS; rather, society has changed in a manner that makes the old ICS structure less responsive.

By now - you are probably wondering what in the hell I am talking about and what is the change I am proposing. First, we need to consider how "our environment" has changed. Our world, our environment, is information driven - data reaches almost every part of everyday life. When ICS was developed we were not so hyper-connected. When you consider emergency responders performance on major incidents (i.e. Hurricane Katrina, Hurricane Sandy, the Christchurch Earthquake in New Zealand) one common theme emerges, ICS had a difficult time handling information. Why?

ICS is defined as having five functional areas (Command, Operations, Plans, Logistics, and

Finance). Investigation, the collecting of information, is typically a unit, branch or division under Plans. Public information, typically associated with talking to the media, falls upon the Public Information Officer which in ICS is a Command Staff Position. This structure was ideal for a time before the Internet and mobile age or the 24 hr news cycle - it is designed to essentially be unidirectional. Information flows from Incident Command out to the "masses". In a world where there is a cell phone capturing pictures or video on every corner, often acting as the eyes and ears on scene, Command can no longer ignore this stream of information. Incident Command can no longer be satisfied with unidirectional information flow.

I believe it is time to "demote" the PIO from a Command Staff position to a General Staff position, creating a new functional area called the Information Section. Simultaneously, move Investigation from Plans and specifically define it as being part of the Information Section. Two

other units should be defined under the Information Section - Media and

Intelligence. The Media Unit performs the old PIO function and handles the outflow of information over social media channels (Facebook, Twitter, Tumblr, Linked-in, etc) as well as traditional media outlets (newspaper and television). The Intelligence Unit focuses on collecting information,

real time, through all of the possible data streams that now exist. Consider the vast amount of data that is commonly available today real time - it extends well beyond the traditional media. Information is being tweeted, statuses are being updated on Facebook, Video are being posted on YouTube, Photos are being dumped in Photobucket (or many other public photo sharing sites), people are writing blogs,



discussions are occurring on forums, websites are being updated.... the list goes on. Managing all of this information exceeds any one person's span of control - a fundamental element of ICS. Further, the rate of flow, both in and out, exceeds the ability of the Command Staff to provide the attention required to properly process and analyze real time.

You might be saying that this discussion is only relevant to "large events". I beg to differ! A couple years back a well known Colorado mountaineer went missing on one of the state's 14,000 ft peaks. It was only a short time before the mountaineering community heard that their friend had gone missing. During the

search - a forum used by the mountaineering community lit up with discussions regarding the individual's planned route, other potential routes he had discussed with people... all this information might have been critical to the Command Staff (I have no idea whether Command was aware at the time and if so whether the information was utilized). A search for a single individual is the bread and butter to most SAR teams and I could easily think of an example where bidirectional information flow could make a difference.

Certainly, any "medium" sized event could utilize the structure I am proposing. Consider any fire or flood - where local residents are

posting pictures or video - offering different angles, showing local hot spots, depicting real time life threatening emergencies, etc. Unless personnel are devoted to find, review, analyze, and process this data it is lost to Command. And as social media has become a primary communication device to younger generations, Command can no longer simply assume that utilizing traditional media sufficiently pushes data to the public. I know of a SAR team who was notified of a mission via their Facebook page from friends and family of the missing individual - these people simply expected the SAR team to be connected real time through Facebook - oddly enough a team

member did look at the teams page that evening. The point is however, that these people looked at social media as their primary communication tool - not the phone.

I challenge each and every reader to consider my proposal - "demote" the PIO to a more important role - as the Information Sections Chief. And as the incident increases in size this sections Chief needs the logistical support of trained individuals that can efficiently perform 3 functions - investigate, gather intelligence, and communicate through all media options.

Sorry to my PIO friends out there... I think you are far more valuable not as an Officer but as a Chief. PR

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PRODUCTS

GEARSLINGER



you have immediate access from the top down without having to take the pack off. Shown here is the new NOATAK but there is also a larger pack, the Sitka which you may have seen in Transformers Dark Side of the Moon! and an even bigger pack the Kodiak . Accessories include a concealed Weapon Holster, Dual Magazine Insert and a Pocket Organiser pack. Cost for the Sitka is \$139, Kodiak is \$ and for the NOATAK \$119



A lightweight grab-and-go pack that's designed to stay put when loaded-up heavy. The SITKA™ GEARSLINGER®'s little brother is now available for left-side carry. The Noatak S-Type™ Gearslinger has main and front compartments that include multiple organizational pockets to separate your gear and conveniently store your CCW. It also has a built-in zippered compartment to accommodate a 50oz/1.5L hydration reservoir and a side cinch pouch fitted for 32oz/1L water bottle (sold separately).

PRm: The Maxpedition Gearslinger series packs are a great variation on the traditional rucksack strap and enable secure bandolier-style carriage with rapid conversion to frontal access, ie. drop your shoulder, swing the bag around to your front and

OVERALL SIZE - NOATAK

- Approx. 12"(L) x 13"(H) x 6"(W)
- Main compartment approx. 7"(L) x 12"(H) x

EXTERIOR REAR

- Breathable padding

EXTERIOR LEFT

- Grab handle made from 1" webbing
- Anti-theft zipper capture system
- D-ring

EXTERIOR RIGHT

- One (1) 7.5"(H) x 3" diameter paracord cinch pouch with drainage grommet for 32oz/1L water bottle or radio

Exterior top

- 1.25" integral padded grab handle

MAIN INTERIOR FRONT

- One - 6.5"(L) x 6"(H) zippered mesh pocket with 4"(L) x 4.25"(H) external loop field for CCW
- One - 4.5" x 6"(H) zippered mesh pocket
- One - 10.5"(L) x 7"(H) slip pocket

MAIN INTERIOR REAR

- One - 8"(L) x 7"(H) slip pocket
- One - 5.25"(L) x 7"(H) slip pocket

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- Integral 3" ergonomic left-side shoulder strap with 2" quick release buckle, 6 channels of PALS webbing, and key retention
- Concealable sternum strap made from 0.75" webbing with distress whistle buckle

ADDITIONAL STORAGE

- 4"(L) x 3.75"(H) waist pad with 2 channels of PALS webbing

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The Peli 2720 features hands-free on-off activation enabling rescuers to simply wave a hand in front of the motion-sensor to turn it on.

The sensor requires a positive action to activate so will not simply switch on or off when a leaf falls! Light output via the main beam can be adjusted to four times the beam width. Additionally red LED's provide either an SOS signalling beacon or a constant variable light source preserving night vision.

- Light Output = 5-80 lumens / 60-790 Candelas
- Endurance = 8 - 175 hours (depending on light strength)
- Width = 63mm • Wt = 130g inc 3xAAA batteries (included)
- Cost = \$50 / £68 / €72. www.peli.com / www.peliproducts.co.uk



SAR PRODUCTS

Technical Access & Rescue Equipment



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A new range of camouflage equipment which complements the existing multicam and multi terrain patterns

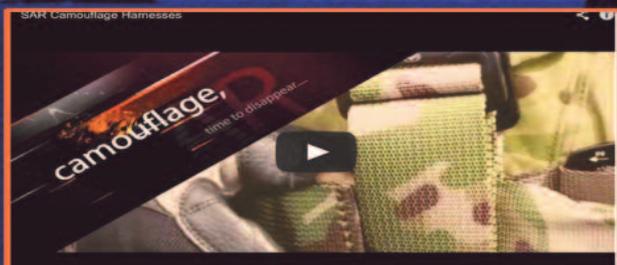


A+B DESCENDER

Fully compliant for two person loads as in EN12841-C



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.....defy gravity & blend in!



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OKA multipurpose descender for canyoning

[We're not usually advocates of descenders that aren't 'in-line' because of their tendency to impart twist to the rope but in ultra-lightweight response you can't beat a modified 8 and the Oka looks to give a great range of rope-loading options. Shown with the carabiner keeper which is available separately]

This new descender especially conceived for canyoning, designed not only for individual progression on rope but also for use in emergency, recovery and rescue situations which are very

difficult to manage with other manual devices. The OKA is fast to load, versatile and safe under a wide range of circumstances with different diameters and a multiplicity of breaking positions. The OKA has been a joint development with rescue technicians.



www.kong.it

Diameters: 7.8 - 12.7mm
Weight: 95g
Height: 141mm



Already appreciated by professionals as the workhorse shape of carabiners, the rockO WireEye brings you the added utility of a wire keeper. This new capability gives you the flexibility to leave your lanyard pin, or captive eye carabiner at home. • Releasable wire gate gives you quick access to capture and release lines or gear. • Takes the place of a fixed lanyard pin or captive eye carabiner when a permanent, high-strength restraint is not needed. • Reduces the chance of dangerous cross-loading. • Features the same strength and quality characteristics as other Rock Exotica carabiners. The WireEye holds gear, lanyards and lines with enough resistance to help prevent gear from moving past the end of the carabiner, but releases easily when lifted up. When the potential for dangerous leverage or cross-loading can occur, the WireEye helps keep the carabiner oriented correctly, and the gear where it belongs. When you need to keep gear oriented in light

rockO

use, use the WireEye and carry one carabiner that does the job of two! Available in 3 stage autolock.

SPECIFICATIONS

MBS-Major: 24kN
 MBS-Minor: 11 kN
 MBS-Open: 6kN
 Gate: 0.93"/ 22 mm
 Height: 4.4" (111 mm)
 Width: 2.5" (64 mm)
 Weight: 2.85 oz (80g)
 Certification: CE
 COST: \$20.95



www.rockexotica.com

STAYK

The ever growing demand for the SMC Rescue StayK (picket system) from all divisions of the Emergency Response Industry, Fire Departments, Rope Rescue, Swift Water Rescue, etc., is due to the fact that all other picket systems are viewed as primitive at best. The SMC Rescue StayK system is versatile, accommodating, and by far the most effective, efficient, and reliable system available today that renders all other systems obsolete.

Once installed the self-equalizing SMC Rescue StayK System can be divided into multiple safety systems. The SMC Rescue StayK System design allows easy attachment of additional holding support if needed. When installed at a 20o angle away from the rescue load, the anchor rods provide a maximum holding force if load is shifted.

Designed by Stan Wiggins, as a certified trainer and technical engineer, he solves everyday anchor issues. Stan worked with instructors and has achieved numerous Pro Board Certifications from Texas A&M (TEEX) (Brayton Field), to provide the rescue industry with the SMC Rescue StayK, a self-equalizing rescue anchor system.

SPECIFICATIONS:

Aluminum & Stainless Steel
 Anodized and Natural
 Dimensions: 35.1" x 1"
 Weight: 9.24 lbs (Single)
 28.37 lbs (Kit)
 COST: \$172 ea.

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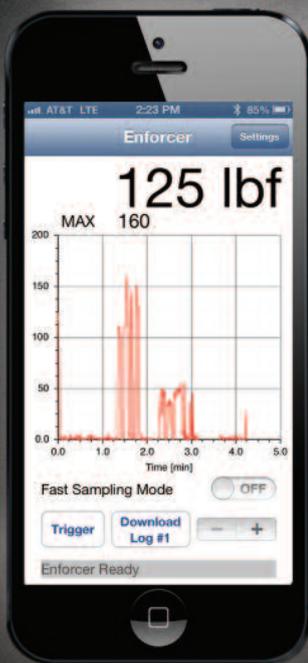
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MONITOR WIRELESSLY VIA BLUETOOTH

The Enforcer iPhone iOS app* lets you monitor forces in your rigging remotely in real-time, and download for later analysis.

*App sold separately For use with 4S or newer



Weighs just 14oz. with batteries!



EXPERT USE ONLY

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Help your dog beat the heat with this innovative cooling vest.

Just soak it in cold water, wring it out, and fasten around your dog. Evaporative cooling (like an actual swamp cooler) exchanges the dog's heat with the coolness of the stored water in the coat to keep them comfortable and ready to run that extra mile. The pale color is more sun-reflective for dark-coated dogs keeping them cooler for longer.

KEY FEATURES

Maximum cooling through evaporation and heat reflection
Three-layer construction maximizes cooling effects:

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- comfortable inner layer transfers cooling effect to the dog
- Active fit for full range of motion
- Side-release buckles for easy on/off

Low-light visibility with reflective trim and light loop for



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PRODUCTS

www.rangermagazine.com

---Unlike other emergency service professionals who can often get backup in minutes, Park Rangers are often working alone in the wilderness with poor transportation and communication support. Not only that the Ranger is often working in extreme weather conditions which adds a whole new dynamic to their role.

It is from this background that plug and play mobile video camera surveillance from Trace Technology Inc. (tt-i) can play a vital role in assisting in training programs and also to support patrols who encounter incidents often in remote areas with no witnesses about to verify what has happened.

A training tool:

The only way to keep and maintain high standards of service support is by training, drills, practice and more of the same. Nothing can replace real life incidents but this is where your quality training tries to prepare you for all those unexpected situations. Mobile video cameras can help in the training program by actually recording the training session for either reviewing instantly in the field or back in the classroom. It is by reviewing and understanding the decisions and choices that were made in split seconds that we can learn and move forward. With some cameras having drop down screens built into them driver trainers can instantly playback the maneuver to give praise or suggest alternative approaches.

Safety, Security

For those rangers who have to do regular patrols a mobile video camera can capture any incident that you see in front of you i.e poachers, vandals, animals, landslides etc with high quality video and day & night visibility functions evidence is captured for review and action.

Operational Efficiency

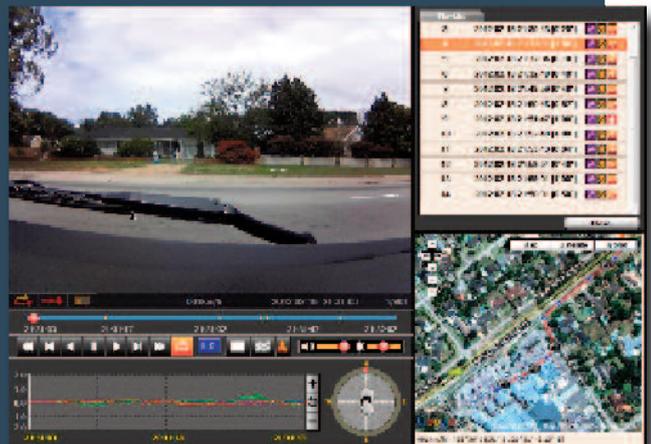
Some cameras come with built in passive GPS which synchronizes with the video so you know exactly the location of an incident on Google maps, speed, braking, date and time. This data can also be used to see where your fleet of vehicles have been that day/week and calculations of what fuel and mileage they have

done, which is great for resource planning.

So what is a HD Plug & Play mobile video camera

The cameras can either be powered by the cigarette lighter in the vehicle or wired directly to the vehicle battery. This with either suction cup or pre installed bulkhead mounts means the cameras can be totally flexible and moved to other vehicles in the fleet within minutes. Just like your flatscreen tv at home these cameras record in high definition with sound so you get great quality for playback on a pc or review on large screens. This takes the guesswork out of what really happened which unlike conventional analogue cameras on the market which are grainy and unclear.

Plug & Play mobile video cameras can play a vital role for Park Rangers



The video is recorded onto a SD card which is a stable format and ideal of tough environments i.e track roads as conventional hard drives are prone to miss data capture due to them recording onto a spinning disk, just like the old vinyl records. Some Plug & Play cameras come with IR lights built in, this is ideal in poor light conditions as it eliminates the area in view, but not visible to the naked eye so you get great quality video capture in poor light.

What types of vehicles?

You can position a plug and play video camera inside any vehicle if it has a battery, so patrol and support vehicles are ideal. tt-i has not tried it yet but we see know reason why helicopters could not be fitted with a high definition camera as they will capture some great action from above for review.

www.tt-i.info

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SRT
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ZODIAC MILPRO SUPPLIES FIRST BOAT FOR THE AA



www.zodiacmilpro.com

[ED: The Automobile Association is the UK equivalent of the AAA and as a vehicle breakdown rescue service used to have an ad campaign as the '4th Emergency Service.....much to the dismay of Coastguard, RNLI and Mountain Rescue etc. In recent years it actually has become more proactive as an organisation able to rescue in adverse weather conditions.]

The AA has moved its services onto water after becoming equipped with a Zodiac MILPRO UAB® Scout River Runner for use by the AA's C-Type Special Operations Response Team (AA SORT). The bright yellow 3.73 metre long craft is capable of carrying seven people and will be used by the AA's inland water rescue team to provide back-up for other emergency responders during major floods. In recent years, the AA has typically attended over 1000 vehicles trapped in water and the purchase of a Zodiac MILPRO UAB® Scout River Runner is a natural evolution. Since 2008 the team has grown to 95 individuals and with the addition of the new boat, along with the DEFRA Level 3 SRT-certified crew, completes the C-Type capability and qualifies the team to be listed on the DEFRA Water Asset Register as an available resource.

In addition to their normal roadside duties each 8-person team member is a level 3 Swiftwater Rescue Technician responding in two off-road vehicles with the boat stowed inside. The boat can be quickly inflated and be on the water in minutes with its two or three-person crew providing paddle power. The UAB® River Runner is manufactured by Zodiac MILPRO UK's South Wales factory from where it has been exported throughout the world.

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MATTRACKS®, the innovator of 4x4 rubber track conversion systems introduces the M3 PLUS™ system for side-by-side Utility Terrain Vehicles (UTVs).

With 20 years of 4x4 pickup, tractor and ATV/UTV rubber track system design and development, engineering and manufacturing experience the new M3 PLUS™ system will enable your UTV to go where wheeled vehicles cannot.

The new M3 PLUS™ system will give you greater performance in deep snow and still allow you to use this system year-round. With minimal power loss, you will still have the maximum performance capabilities in any operating conditions.

With an approximate 51 inch by 13 inch footprint, which is 12 inches longer than the standard track, the rear track on the M3 PLUS™ provides unbelievable floatation in deep snow, sand, mud, swamps or any challenging terrain. Its self cleaning system allows the snow, sand, rocks, or any other debris to be ejected from the inside of the

track so you are not losing riding time. Coupled with the M3™ aggressive lug pattern and built in suspension the traction is outstanding, while providing 25% greater footprint compared to the standard M3™.

WWW.LITEFOOTATV.COM

Less search— more recovery...

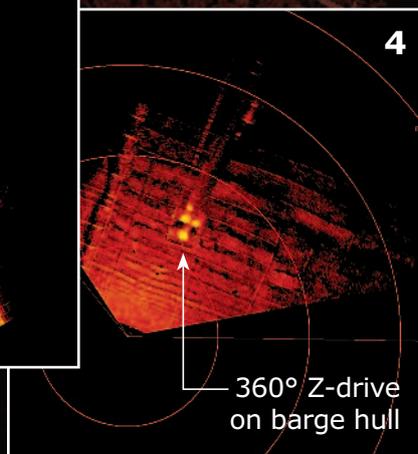
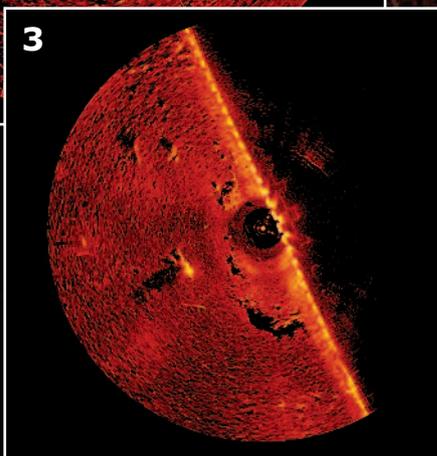
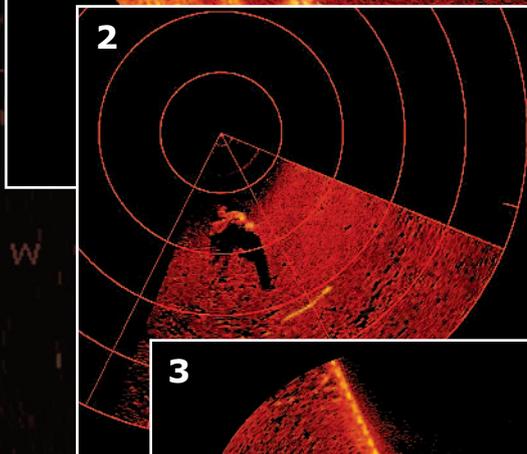
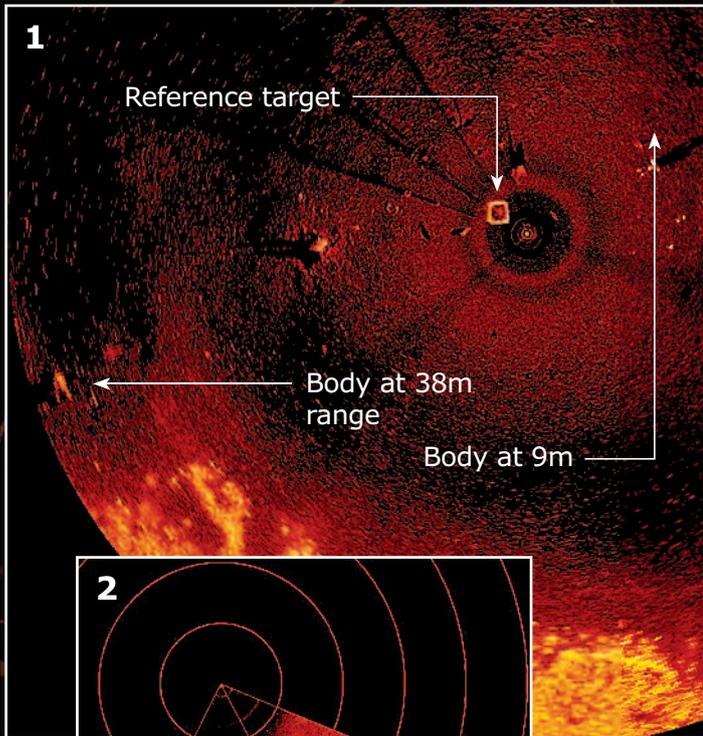


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- **Speed:** direct the diver to the target in real-time and zero visibility
- **Accuracy:** plan the dive and dive the plan according to what is really there
- **Chain of Evidence:** retain the sonar record showing target location, date, time, and recovery process

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1. Body location
2. Homicide victim
3. Diver alongside sheetpile
4. Hull inspection



THE FULL PICTURE

rock river armory

AR15

LEFT HANDED RIFLE

by Lee Lang

As any south paw, Mollie Dooker, Mancino, or sinister person knows, being left handed presents special challenges in a world of righties. While in ranger academy this realization was never more pronounced than on the rifle range firing the standard AR-15. I had fired AR-15s before - but as a recreational shooter. Now, after all my law enforcement training, I had a entirely new perspective - "Crap I am soooo screwed if I ever have to use the standard AR-15 in real life!"

So why are left handed people screwed?

Standard AR-15 rifles are designed for right handed people. The rifle ejects spent cartridges to the left. This means for the normal left handed person our head is on the same side as the ejection port. For the recreational shooter or the law enforcement officer during training this is not especially a big deal because we are wearing PPE (safety glasses and ear protection). But, while I was on the range, reflecting on the idea that I may have utilize an AR-15 in a law enforcement capacity on the spur of the moment - where I may or may not have glasses on and I would not have hearing protection I realized I would essentially have to win the encounter in the first or second shot. Why? Because

after that I would be blind and deaf.

You see it suddenly dawned on me that every time I pulled the trigger my face was being pelted with particulate matter while the spent cartridge was ejected, as attested to by my spotted glasses. I also realized that each trigger pull exposed me to a concussive blast as the cartridge ejected. Right handed persons get neither because their heads are on the other side - placing the rifle between their eyes and the flying particulate matter and sending the concussive blast away from their ears.

This experience got me wondering - Are there AR-1s made for left handed people? The answer is yes - but not many. I contacted Rock River Armory and requested that they provide a left handed AR-15 for review and they kindly obliged.

The LEF-T Tactical Operator-L LH1278.

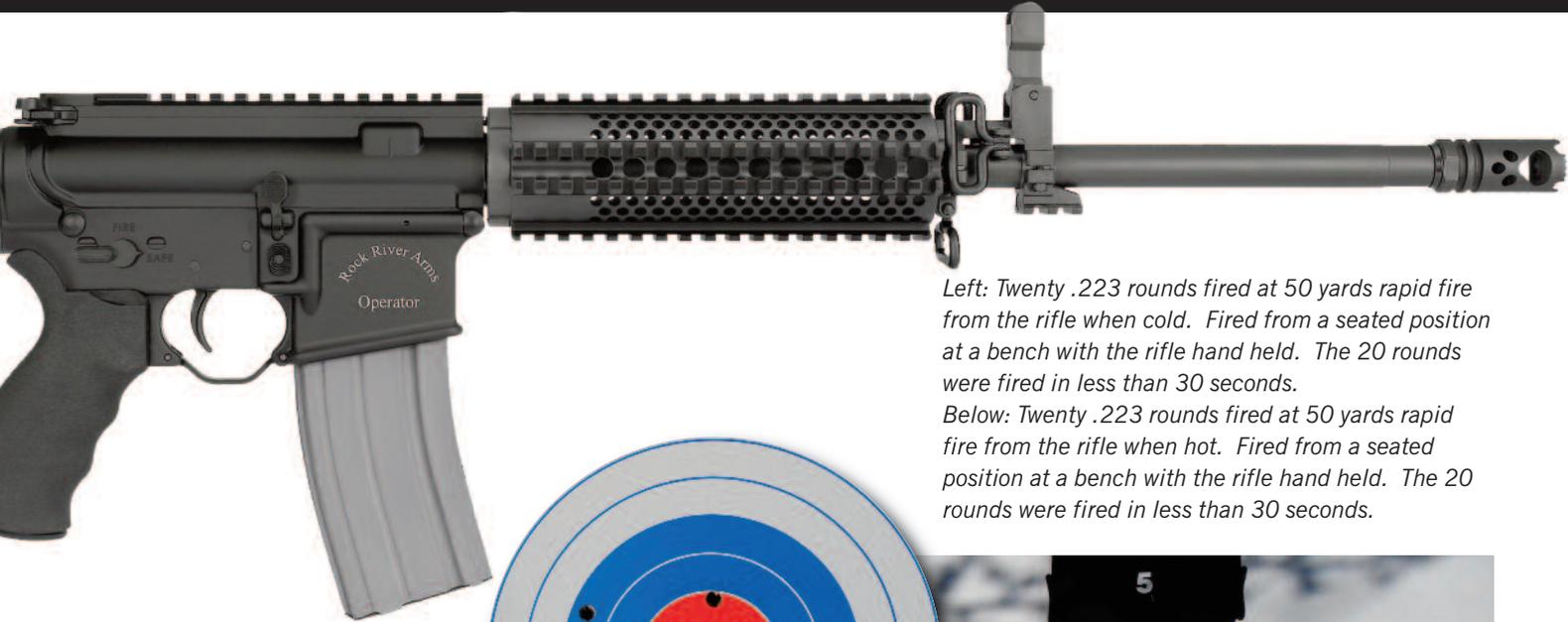
As I unpacked the LH1278, I was immediately impressed with Rock River's rifle. Unlike so many other AR-15 I have picked up, the Rock River rifle minimizes its use of plastic. Simply put - if you are in the back country performing drug interdiction you need not fear about tripping and damaging this rifle. In fact I believe if you were to fall on the rifle that you would break before the rifle

SPECIFICATIONS:

Caliber: 5.56 NATO for 5.56 and .223 Cal
 Lower Receiver: Forged RRA LAR-LAR-15LH
 Upper Receiver: Forged A4 LEF-T
 Bolt Catch/Safety Selector: Left Hand Specific
 Mag Release/Charging Handle: Ambidextrous
 Barrel: 16 inch Chrome Moly, 1:9 twist
 Muzzle Device: RRA Tactical Muzzle Brake
 Gas Block: RRA Flip Front Sight Gas Block
 Assembly
 Trigger: RRA Two Stage/ RRA Winter Trigger
 Guard/Pistol Grip: ERGO SureGrip
 Buttstock: RRA Operator CAR Stock
 Handguard: RRA Quad Rail Free Float

Weight: 8.0 pounds
 Length: 37 inches
 Accuracy: 1 MOA at 100 Yards
 Price: \$1,360





Left: Twenty .223 rounds fired at 50 yards rapid fire from the rifle when cold. Fired from a seated position at a bench with the rifle hand held. The 20 rounds were fired in less than 30 seconds.

Below: Twenty .223 rounds fired at 50 yards rapid fire from the rifle when hot. Fired from a seated position at a bench with the rifle hand held. The 20 rounds were fired in less than 30 seconds.

would be damaged. Rifle reviews are commonly tricky - and I personally find reviews go into minutia and "crazy" hyperbole not super useful. Instead, I am going to focus this review on issues that are important for a law enforcement ranger with limited support for help. Essentially, I do not care if the rifle has a "tactical gravitational auto-aerial trigger". What I do care about is that the rifle will put a slug down range where I need it in the rain after I tumbled down a muddy embankment and it is covered in mud.

So let's get to the review.

The specifications state that the rifle weighs 8 pounds, I would have to say it is a "heavy" 8 pounds. If one had to carry the rifle for an extended carry in the backcountry, you would certainly start feeling the weight. However, that weight provides a stable shooting platform for long distance or rapid shooting. I have small hands but found the pistol grip very comfortable to hold, and the rubberized grip helped keep my ungloved hand warmer in the winter air. The handrail is machined aluminum and feels

very solid - the downside is that it felt very sharp in the hand. The front sight folds down - an excellent feature for a ranger that needs to move through thick brush - on other AR-15s I have used the front sight was fixed and easily could catch on brush.

The muzzle brake on this rifle is ear piercing especially to anybody that is 15-30 degrees to your side. The trigger pull is very smooth and the 2 stage trigger felt very natural in its break points. As I indicated before, its weight helps provide an overall smooth action that allows the shooter to easily maintain his or her target while firing. The adjustable stock was solid, easily adjusted and certainly leaves me with the impression that it would be an effective "club" if I ever had to beat someone with it - though certainly not advised.

I ran the rifle through rapid fire drills cold and hot at 50 yards - firing off 20 rounds in 30 seconds. The purpose was not for "target" shooting but



rather a look at how a ranger could expect the rifle to handle in a high stress situation. And the rifle performed excellently - with the hot rifle providing a spread a little larger than the cold rifle.

Unfortunately, because of current events in the United States, I was unable to obtain NATO 5.56 ammo for the test - all ammo fired was FMJ 55 grain .223 ammo. I would

expect the rifle to perform better using 5.56 ammo.

The best point about this rifle - for a left handed person - I did not get crap spewed in my face after every trigger pull! Let me tell you that wish I could be issued this rifle. If you are left handed person, I highly encourage you to explore this rifle - and I believe one can justify its importance from an officer's safety perspective. 

From PWC to

Personal Water craft to Rescue Water craft: Assess



RWC

ment of K38 Training Course

by **Rich Hackwell**
Technical Rescue Lead
HM Coastguard (UK)



Back on the horse..... When I first took a course with K38 UK, PWCs were taking off in the USA but almost exclusively used in the UK by lifeguard units on surf beaches. While they are invaluable in this role it is not their only potential arena of use. The craft have many attributes which lend themselves to rescue in a variety of environments; shallow draft, manoeuvrability, reserve power, size, response speed and very casualty-friendly drive system and recovery method. The craft are suitable for surf, open water, rivers, estuaries, harbours/docks and have great potential as a flood response craft, a discipline in which they are already proven but many remain skeptical. In wilderness response their relatively small size and manoeuvrability make them a great search asset. They can be manned effectively with one or two operators and can fulfill useful functions with or without a rescue board.

The term 'Rescue' watercraft better illustrates their professional use as distinct from 'personal' water craft. and in the UK their utilisation now includes the following:

- Still used extensively by lifeguard units to offer beach rescue cover.
- Open water sporting events have never been more popular whether sea, river or lake. Examples include; open water swims, triathlons, cliff diving, coasteering, surfing etc. The use of RWCs at these events is increasing as their characteristics make them perfect for use in both marshalling and rescue of participants.
- RWCs are being used to provide standby safety cover for construction works over water, the craft are able to effectively work where big flows would preclude the use of traditional craft around the structures or restricted access needs a smaller more adaptable craft.
- A number of police forces have used them in site specific roles for patrol and response, notably the 2012 Olympics. The crafts' ability to respond quickly and to access a wide variety of areas as well as perform a rescue if necessary makes them a perfect tool in the law enforcement box.
- Independent lifeboats in the UK are starting to look at RWCs to work with their larger RIBs and IRBs to provide a mix craft response to cover varied patches. Hornsea Rescue have operated an RWC for a number of years alongside their lifeboat. Portsea Rescue in the Solent have begun working with Yamaha UK to trial the use of a RWC in the busy waters and harbours of the Eastern Solent. These craft provide fast response and allow the units to access areas which were challenging with traditional RIBs or IRBs.

The key to the value of any piece of rescue equipment, whether it's a carabiner or a helicopter comes down to the training and the operating procedure. The most amazing, world changing, item of kit can be quickly dismissed if it is utilised poorly, by misinformed users!

This was brought home in regard to the use of PWCs in rescue during a project I worked on for HM Coastguard. We were faced with providing a waterborne rescue capability at

one of our rescue stations. The Kent Estuary, Cumbria, UK, and especially around the viaduct at Arnside presents very challenging conditions, the area has dangerous working conditions at all states of the tide. The fast changing tidal levels mean that rescue craft have to be able to deal with both shallow and deep, fast flowing water. The channels are constantly changing both in path and depth. The tidal movements create swiftwater conditions around the base of the viaduct which in turn creates difficult operating conditions requiring specialist training and equipment. Rescue boats were ineffective in this environment, they were restricted by draft and lacked the power and manoeuvrability to operate in the strong flows around the viaduct. We identified that a Personal Watercraft could be utilised for rescue operations in this area as they can maintain an effective response at all states of tide with their shallow draft, water jets, power and manoeuvrability to operate in the powerful flows and around the viaduct structure.

We consulted a number of operators and training providers and quickly recognised that personal Watercraft may be highly effective craft but only when utilised by well trained personal using effective and appropriate techniques.

This is where pioneering Californian PWC training company K38 came in, or, in this instance their UK arm. K38 UK provided both a consultancy service providing scope on the diverse uses of a PWC and bespoke training to cope with the varied conditions found in our particular target risk. The company has excellent experience operating these craft in open water, surf and

swiftwater, in many different environments and operational roles. This proven track record provides confidence in their abilities. The tool i.e. the RWC, is a good one, the key to its success is the training and operating procedures.

At the risk of sounding like an

Fend off drills are essential preparation before hitting the moving water



ad for K38 it was founded by PWC guru Shawn Alladio and has partner organisations world wide offering both off the shelf and bespoke courses in the use of PWC/RWCs. At a time when many in rescue looked down their noses at the diminutive PWC Shawn was championing their attributes helped in no small part by the amazing tow-ins and pick-ups performed at surfing events and by surf rescuers. K38 expanded that proven specialisation with courses catering for a myriad of uses in all manner of aquatic environments. But Shawn maintains a strict 'quality

control' on her instructors. So much so that our chosen course provider, Ben Granata of K38 UK is the only instructor approved by Shawn in the UK and Ireland. Before I discuss the course and at further risk of seeming like a sales brochure it's as well to mention how K38 perceives and promotes its own

professionals and those who utilise PWC for patrol and safety in a marine environment students are taught to operate PWC's in a controlled and disciplined manner. This 3 day course, with optional night operations will show students how to technically operate a PWC in the toughest of marine environments, perform rescues as single operator or with a rescuer on conscious, unconscious and with multiple casualties.

Whilst there are surf training elements this is not simply a surf rescue course and covers the basic elements needed to safely patrol and perform rescues with a PWC and rescue board. Training in the surf environment develops operator skills and prepares operator ability for real life rescue situations.

Training incorporates hands-on training with multiple skill stations, mock rescue drills and rescue board techniques, as well as downed PWC retrievals, boat maintenance, troubleshooting and considerations for implementing a successful PWC program. The course provides many rescue evaluations from actual incidents, video, extensive workbook information, technical boat handling skills, boat/oil/fuel and necessary gear associated with the instructional overview, with the exception of mandatory personal gear. Students will receive a workbook, tests, homework, skill sheets and a certificate upon satisfactory completion.

'This is an extremely physically demanding course:' students must be in excellent physical condition and be competent ocean swimmers with good knowledge of surf conditions and ocean dynamics.

courses since these descriptions provide your first impression and a basis to compare other courses you may be considering. Remember though that the glossiest brochure is no use without experienced and capable instructors:

K38 Rescue Boat Operator
The K38 UK Rescue Boat Operator course develops basic operator skills to safely operate a PWC in an ocean environment. This tiered training program has specific learning outcomes that must be achieved before students can progress to the next skill sets. Designed for rescue

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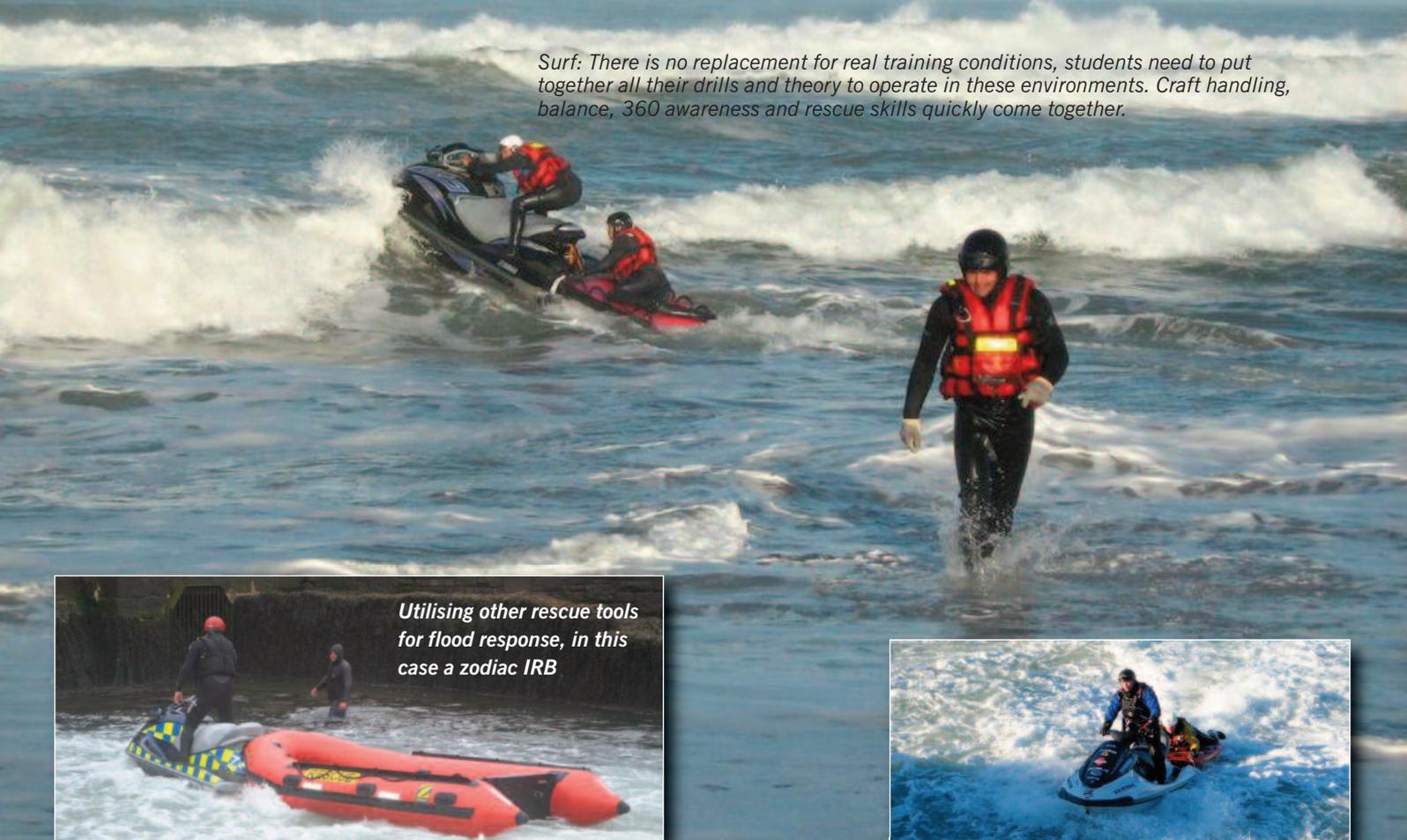
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Surf: There is no replacement for real training conditions, students need to put together all their drills and theory to operate in these environments. Craft handling, balance, 360 awareness and rescue skills quickly come together.



Utilising other rescue tools for flood response, in this case a zodiac IRB



Casualty pick-up in swiftwater

K38 Swiftwater Rescue Operator

Personal Watercraft are an invaluable tool in Swiftwater and flood rescue scenarios as shown by Shawn Alladio Higgins & Langley Award winner in the aftermath of Hurricane Katrina. The K38 Swiftwater Rescue course builds an operators technical handling skills in a moving water environment. This is an extremely physically demanding course: students must be in excellent physical condition and be competent swimmers with good knowledge of river conditions and river rescue dynamics.

Swiftwater/ Flood Rescue Operators course

The use of RWC in the Swiftwater/ Flood Rescue environment continues to divide opinion although I'm not sure why. As an experienced RIB operator I tried to approach



The author manoeuvring around structures and obstacles, in restricted space.

RWC training with an open mind and have now completed various training courses and events and operated RWC in a range of environments, including fast moving water at our Arnside site. So having become an open water RWC operator and as a SWFR technician, I was keen to find out what the RWC would offer for swiftwater and flood rescue..

I attended the K38 UK Swiftwater/ Flood Rescue Operators course based at Hayle in Cornwall although it can be run at various sites

throughout the UK. Hayle offers a good venue as it is based in an historic harbour with many docks, walls and 'hard' features. It has open water, ocean and surf at the harbour entrance but importantly it offers swiftwater through the use of tidal sluice gates. Candidates are expected to be SWFR technicians to ensure they possess the appropriate knowledge and experience for fast moving water and will be safe when operating on, in or near the water. There is no necessity for pre-existing

experience as an RWC operator but if all course attendees are experienced to a similar level the training can obviously move up a notch and some of the basic drilling will not be necessary. However, just as cave diving instructors would rather you had no previous experience so RWC instructors may need to weed out some bad habits or inappropriate techniques..

The course comprises theory sessions, with flat water skills stations to practice and hone technique before hitting the flow. Training is tiered, specific skills sets must be achieved before students can progress to the next skill set. Training covers the characteristics, capabilities and the pros/cons of operating the RWC in a swiftwater and flood environment. Handling techniques for working in moving water and working around structures. Rescue

techniques for conscious, unconscious and multiple casualties as single operator or with a second rescuer.

K38 are keen to encourage skills in rescue with and without the rescue boards. There is no doubt about it, a dedicated rescue board enhances the capability of the PWC for rescue. While a fully kitted RWC is likely to have a rescue board, a dedicated patrol craft may not. Even on a rescue craft, if the rescue board becomes damaged during operations, operators must know how to operate without it, or you end up with an expensive spectator seat!

K38 UK have access to various rafts and boats that can be utilised behind the RWC for large casualty evacuation. Training courses can be adapted to train with craft used by your organisation or to gain experience of different craft.

The craft and techniques performed well in swiftwater which is no surprise when you have an experienced instructor. The question is, can you translate the skills exhibited by that veteran RWC instructor into a viable service in your own area of operations and of course, can you maintain those skills? Under skilled tutorledge during a course the RWCs handling characteristics were well exploited demonstrating controlled handling with the craft's plentiful reserves of power. A PWC of any design is well suited to picking up 'in water' casualties from the water whether holding station to meet them or chasing them downstream. Techniques taught allowed the craft to be manouvered into position to pick up casualties from static positions in the flow, hold position for searching or downstream protection and working around obstacles and structures. Regular

maintenance drills included dealing with debris in the intake, operating with reduced power and clearing techniques. These were practiced in various levels of flow both during the day and at night. Night elements are dependent on operational need rather than an integral part of every course but we saw a definite benefit from this extra element.

An RWC provides a useful moving water rescue tool wether for direct rescue, search or as back up rescue cover for other assets. It would be a useful asset as part of an intergrated response to flood incidents where its ability to deal with a range of flows and depths would make it a useful tool. It could be used to search or scout areas during initial operations, provide imediate rescues and stabiliss situations. Its ability to access restricted areas means it can be used to ferry casualties to a 'mother boat' or safe haven.

Interestingly once a PWC is prepared as an RWC it needs no adaption to work in the myriad of conditions described in this article. A surf RWC is the same as a SWFR RWC. The difference is the application of techniques and appropriate training for the operating conditions.

As an organisation this means with the right training, one piece of equipment can be used in a number of roles, great news in times of austerity. This takes me back to my earlier point; buy the right kit, but ensure you get the right training to unlock its full potential. K38 offers a very professional package based on some impressive experience and a tried and tested program. Equally, back in the UK her well trained, appointed representative Ben is doing a great job of flying the K38 flag. 🇬🇧



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WOMAN'S HOODY

by Michelle Schonzeit

As the owner of several awesome softshells, I was excited to see what Arc'Teryx would come up with in their new "hardfleece" jacket. What I found with the Acto MX Hoody was a "go-to" softshell that quickly became my jacket of choice for a wide range of outdoor pursuits..

The Claim.....

Arc'Teryx lists this jacket as a trim fitting hooded hardfleece jacket designed for bulk free warmth, ventilation and mild weather protection. Of particular note, is the "snow-shedding Aerius™ Grid Loft" fabric, which is moisture-resistant. Its claims include being "the ultimate highly breathable insulated mid layer".

Its Full Feature List includes the following:

Technical Features

- Moisture-resistant outer face fabric
- Snow-shedding
- Highly air permeable—allows air and moisture to move through the fabric to speed drying
- Highly breathable—maintains comfort during aerobic activity
- Durable

Construction

- DWR finish (Durable Water Repellent) helps bead water from fabric surface

- Soft, brushed lining adds light insulation
- Finish-taped seams for a clean aesthetic

Patterning

- Anatomical shaping for fit and comfort
- No-lift gusseted underarms
- Stretch wrist gussets

Hood Configuration

- Adjustable hood drawcords
- Storm Hood™
- Soft hood brim

Zipper & Fly Configuration

- Quick-pull full front zip for easy venting
- Webbing zipper pulls

Hem Configuration

- Laminated hem
- Adjustable hem drawcord

Pocket Configuration

- Two hand pockets with hidden zippers

The Test...

As a lover of snow-based winter pursuits, in a climate that is anything but fluffy dry powder, this jacket had a tough road ahead of it. This jacket went trail running in the rain, backcountry skiing in rain/wind/snow/freezing temperatures and spent a good deal of time on the wind-buffed cliff faces of the Northeast. It also was used to carry in fire wood and had coffee spilled on it

**SPECIFICATIONS:**

Manufacturer:	Arc'teryx
Model:	Acto MX Hoody (womans)
Origin:	Canada
Cost:	£200 / \$299
Colours:	Brimstone (yellow) Black Camelia (magenta)
Waterproofing:	Aerius™ Grid Loft fabric (moisture-proof)
Weight:	455 g / 1 lb 1oz
Sizes:	XS, S, M, L, XL
Fit:	Trim fit, (Hip Length)
Website:	www.arcteryx.com

at least once. Okay, probably more than once.

I also failed to follow any of the recommended care guidelines. It was thrown in a standard household washer with blue jeans, uniforms and whatever else happened to be in the laundry basket. It was washed with laundry detergent that was purchased because it was the best buy at the grocery store and had fabric softener mixed in, again selected from the bargain brands. It was then tossed in a household dryer on a heated setting...and generally for much too long, as I got side tracked with the latest episode of Big Bang Theory on TV (after 7 years of not having TV hooked up while living on the west coast, it is amazing how easy it is to get sucked in now!) For the record, Arc'Teryx clearly recommends the following care instructions:

- Machine wash in cold water.
- Wash dark colours separately.
- Tumble dry on low heat.
- Iron on low heat.
- Do not use fabric softener.

The Verdict...

This jacket is a surprising stand out. What I find the most intriguing, is for a jacket that doesn't claim to be anything more than "snow-shedding" and "moisture-resistant" is that this jacket is more water-resistant than many of my quality brand hard shells. Really. It beads water on the surface and still



remains breathable. If I were heading out the door right now in a full on rain storm, I would be as likely to grab this jacket as my Patagonia Torrentshell hard shell jacket. I decided initially that this was due to the DWR finish and set out to see if my normal use and abuse of tossing it in a washing machine with other clothes would start to diminish those properties. Surprisingly, after pretty close to a full year of this treatment it is just as water repellent as the day it showed up at my door.

Another standout feature for this jacket is its durability. It is a much heavier fabric than many of my other softshells and after even putting it through abuse I wouldn't normally subject a nice jacket made for alpine pursuits to (read carrying in firewood) it has no fraying or wear spots. This abuse includes a black lab that loves to take loved ones for walks by grabbing sleeves with his teeth. And still no fraying or wear.

Other highlights for this jacket include a hood that fits as comfortably over a helmet as it does when I am not wearing a helmet. Also the chest pockets are nice if layering it under a harness, although I often found myself wishing for more traditionally located hand pockets.

The interior of the jacket (inset right) is great to wear against your skin- the brushed interior isn't too warm or clingy when running, but offers great warmth and wind



protection when standing around as well.

So, you might ask, what are this jacket's downsides?

The cuffs on the sleeves offer no adjustment and while the feature list mentions as adjustable hem drawcord, there doesn't appear to be any such drawcord on my jacket. Adding both of these features would be something that would greatly improve this jacket. Also, the fit seems to make even a trim-fitting warmth layer under it challenging. A light Capilene® layer works fine, but not anything a whole lot bulkier. While I found that it runs fairly true-to-size for a trim fit jacket, I found it best for active pursuits such as trail running and x-country skiing, where I was moving enough to

not need a lot of layers underneath it and could enjoy its breathable properties.

While I definitely love this jacket for search and rescue activities, it would be great if it was offered in a few other colors that might better blend with team uniforms. My SAR team has yellow uniform components, and while the color "Brimstone" pictured opposite falls under the yellow color family, it is reminiscent of the neon yellow of fire trucks (and many of the less than flattering names for that color). It is bright, though, and I found that I enjoyed that property for running in it near roadways. [ED: orange is available in the men's version in place of the magenta/vivid pink]

Overall, I would give this jacket 4.5 out of 5 stars. And yes, the coffee stains wash out. ☹️

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Improvised Rescue

Large Animal Rescue using Fire Hose or Cargo Strap

By Timothy B. Collins

Technical Animal Rescue Specialist

Tim Collins is employed by the Santa Barbara Humane Society as a technical animal rescue specialist and instructor. Tim travels and puts on workshops and seminars on horse owner emergency preparedness and technical rescue training for those who will respond to accidents involving horses. He also designs technical rescue equipment for large animals. For further information, contact Tim Collins at {timcollins@sbhumanesociety.org, (805)-964-4777 or FAX (805)-683-0827.

You can figure the average horse weights approx. 1,000 pounds or almost half a metric tonne. A cow can weigh even more. With this knowledge, if you get an emergency call to a horse stuck in a hole or mud and it needs saving, what are your resources? Do you know the limitations of what you have to work with? Most stations do not have rescue equipment specific to large animals, yet they are expected to respond and attempt a rescue. Let's consider what you do have in the station or close at hand that you might use in a large animal rescue that involves lifting.

When a call comes in to rescue a large animal, do you have 4-inch fire hose on your repair shelf? Does the maintenance yard have a cargo strap lying around? You might track down some distant agency that has large animal rescue resources. This could require hours of

waiting, which you might not have. If you cannot wait

for the trained people with their resources, you can use the above mentioned items

with the right accessories and precautions thereby

increasing the possibility of a successful rescue.



There is concern by some that fire hose and cargo straps are not designed for lifting and therefore not suitable for rescue, and should never be used. The fear is you will be setting yourselves and your agencies up for lawsuits. The lawsuit issue can be saved for another article. This article will address the realities of how strong fire hose and cargo straps are when using them to lift and a safe technique to do so.

For this I solicited the help of North American Fire Hose Corp., Pacific Cargo Control Inc., CMC Rescue Inc., Tierra Contracting Inc. and the Santa Barbara Humane Society. Santa Barbara County Fire Department provided used fire hose and several truckers provided used cargo straps.

None of the entities donating time or material warranty any use of these materials beyond their designed use. For the record, fire hose is not designed for lifting large weights off of the ground. Most cargo straps are designed to hold down loads. Also for the record, it was pointed out to me that paper towel is not designed for blowing your nose, but it works. If it is what you have, don't assume; test and verify if something will work. Until tests are run, no opinions will be credible. After all we do want to know the truth as to what we can use in an emergency.

We all are aware of the fact that fire hose and cargo straps have been used to lift large loads for a long time, successfully. Another fact you may not be aware of; there have also been times when the load has fallen. What caused the fall needs to be considered. In an emergency we will inevitably use what ever we can find to do the job in the limited time allowed us. If all that is available is cargo straps or fire hose then so be it. But we must be aware there are limitations; let's find them, work around them and avoid a failed rescue.

I talked to manufactures of fire hose and cargo straps to learn about the construction of these items. There are many strands, running the length of the hose or strap, called warp. These strands are known by their ply, such as 7 ply for a fire hose. Because it can be made of filament poly, polyester, cotton or nylon the longevity of its strength will vary. To keep it simple we will refer to both fire hose and cargo strap as "straps".

We took brand new fire hose jacket and cargo strap as well as used and retired samples of both items. The straps were subjected to a hydraulic load test up to 10,000 lbs and only old weathered straps failed before we reached the maximum testing load. This testing simulated the type of load that would be applied in a lifting

rescue. Even the old weathered straps held up until approximately 4,000 lbs load. This is well above the average weight of a horse or cow.

From the hydraulic testing, the conclusion is, unless the item has been left out side to weather several years, (and we had some in our tests) there is little chance of a strap breaking during a rescue. See (figure 1). Repeated testing proved this conclusion. To keep this an article and not a book, I will not include the test data. But if you want to contact me about the data, I will share the information.

So, why do animals come out of our contraptions put together to save them? Part of it is lack of understanding the leveraging that an animal can cause when they start to thrash around. Then there is a lack of working knowledge of knots. It has been determined that fire hose and cargo straps are strong, so where is the weak link in the system? Usually the issue stems from not creating a secure system around the animal.

There are methods of connecting straps to a lifting source and to itself that work better than other methods. There is also the limitation of how much material gets used up in tying an overhand knot with

big bulky straps. You can expect to use up three feet of strap to create one overhand knot. So if you need a knot at each end of a piece you are going to place beneath an animal, you should figure a good six feet beyond the length of material going under the belly. Once you put a knot in the material there will be slippage as the knot tightens so you must have enough of the material sticking out of the end of the knot that it does not get sucked into the knot and come undone.

It is likely, the resources you bring to a rescue for creating a makeshift harness, are going to get cut up and be replaced later.

Creating a make shift harness

As it turns out, there is not a fancy application of straps to create a hasty harness for a large animal. The process will be simplistic, but you must take all of the steps.

Knots to know:

- Overhand Knot,
- Water Knot,
- Girth Hitch,
- three wrap prusik hitch,
- several Figure Eight Knots.



Fig 1

Material to secure the animal:

- strapping material,
- webbing or rope,
- locking carabiners or quick links (screw link),
- enough strap to go under the animal twice, and enough to go around the chest and rump.

You can figure two feet for the chest strap after knots and three feet for the rump strap. For the belly pieces five to six feet each. Now add two knots for each piece. Each knot takes up about three feet of strap. Because there are 8 knots, you want at least 24 feet of strap just for the knots. Two belly straps, one rump strap, and one chest strap add up to approximately seventeen feet of strapping. About twenty-four feet for the knots gets added to the seventeen feet and you are at approximately forty-one feet of strap needed.

Now we need to connect all of this material. So hopefully you have webbing. But rope will do because for the most part this will not be load bearing. It is to hold all of the wide stuff in place. You'll be cutting a lot of short pieces to connect the straps to each other and create a contact point for the lifting source.

Take a length of strap approx. 10 feet long, place an overhand knot at each end of the strap (for fire hose the length should be 12'). (figure 2)

Now get this underneath the animal's belly and forward enough that it is up against the front legs. Take a length of webbing and tie the two ends of the strap together over the animal. This will keep the



Fig 2

strap in place while you attach other pieces. (figure 3). Repeat this process farther back just in front of the rear legs. So, there are two straps doing the lifting. Now to make it safe; under the belly, use a length of webbing and tie the two straps to each other with a gap of 2 feet plus or minus. For the chest piece you'll need about eight feet of strap and knot it at each end.

To connect the chest strap to the belly, have two lengths of webbing; a length for each side of the chest strap;.

- 1) Create a girth hitch in the middle of a length of webbing
- 2) slip it over the knot on one end of the chest strap
- 3) repeat the process for the other side of the chest piece.
- 4) Now take the loose webbing around to the front belly strap and wrap the webbing around the strap
- 5) Secure with a water knot.
- 6) Next, a very important step, take another length of webbing and

again fold in half (create a bight) and use this to create a girth hitch in the center of the chest strap. (figure 4)

7) Without tying the two ends of the webbing together place the loose ends between the animal's front legs,

8) Wrap the free ends around the front belly strap and tie a water knot. See (figure 5) overleaf.

9) Repeat this process for the rump strap.

This last item will allow you to avoid trying to get a carabiner



Fig 3

around a thick, hard piece of strap. Without an oversized carabiner this is next to impossible; but with a webbing loop going around the strap below the knot and creating a girth hitch, you can connect to the webbing loop with the lifting source. Here is where a picture equals a million words.



Fig 4



Fig 5

Creating a lifting point

Take an eight-foot length of rope or webbing and tie the ends together, making a loop. Fold it in half and at the bight tie an overhand knot (if using rope use a figure eight on a bight) creating a double-layer loop. This is where it will be the lifting point. (figure 6) This method prevents tri-axial loading the carabiner. At the bottom you will have two loops hanging from the figure eight.

7. These can be connected to the front and rear belly straps with carabiners.

8. To connect the ends of this webbing to the belly straps take a 36" utility loop, create girth hitches of the utility loop and you can slip them over each of the knots of the belly straps. Do the same for the front and back strap. Then the carabiners hanging from the lifting point can clip over these utility loops .

In today's economy, emergency response agencies are hard pressed to allocate funding where it will do the most good. If you are in an area where there are going to be large animal rescues, training should be the first priority and making choices such as pieces of equipment will come later. In the interim, knowing what resources are available and knowing how to adapt them to the need will go along way to keep responders safe and the ability to save an animal. 🐾



Fig 6





rescue equipment
helicopter operations



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SAR DOGS

Distance Alerts & how they can impact the search effort

by Marcia McMahon

Team Commander

The Rocky Mountain Region of the United States is famous for its unparalleled mountains, valleys, and foothills with their corresponding variations and weather. People love to come and climb, hike, fish, etc. and sometimes they get lost in the process.

Searches in this type of terrain quickly expand into miles and miles of area, should the subject not be found right away, not be noticed missing for several days, not have left any information as to their travel plans, etc. In these cases, clues become terribly valuable.

This article explores the training and use of Scent Discriminating Airscent Dogs and Cadaver Dogs for the purpose of aiding in the search effort to provide clues to further the search effort. It is to be emphasized that dogs are just one of the many specialized resources that work together to achieve a successful search outcome. When used properly, dogs can and should have a strong impact on the information available to help the search.

The thought on searches is all too often that either the dog



Acknowledgements: Thanks to Paula Bindrich and Phoebe, Sabine Johnson and Annie, Jewell Seymour and Sadie, Koert and Maui for their help, pictures and maps



team found the subject or it didn't and no other information is retained from the debrief.

However, dogs can very positively impact every search in one or more of the following ways:

1. Locate the subject.
2. Provide directional alerts in the general direction of the subject allowing for successful placement of other dog teams, foot teams, or helicopters in the next operational period.
3. Indicate the subject is not in the area.

For this article, "Alert" means when the dog enters, reacts to and follows scent and the corresponding body language.

"Distance Alert" would be those alerts initiated from a minimum of ½ mile or more from the subject. Well-trained dogs can begin to follow scent from well over a mile away; even farther with nighttime downslopes above timberline or from subjects who have been missing for several days. (See maps overleaf)

Training:

Traditional methods for working search dogs mandate using a grid

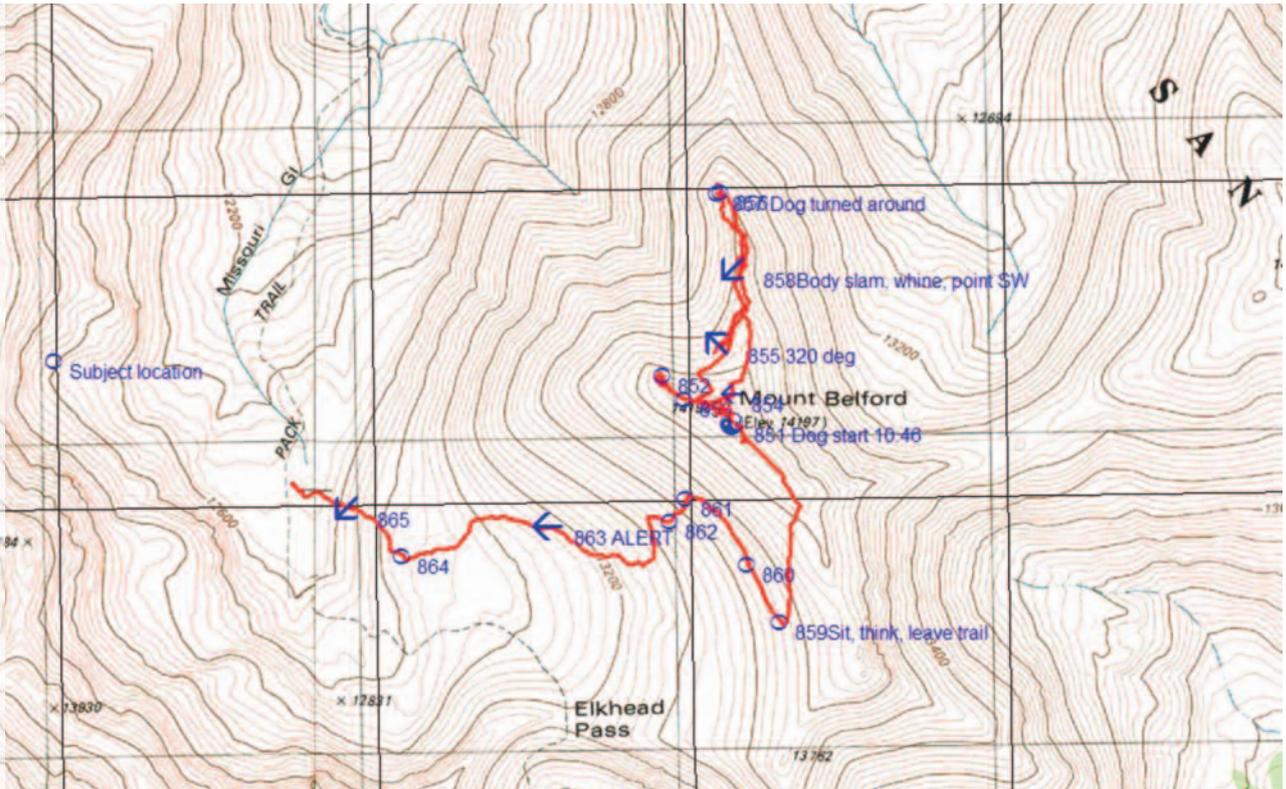
pattern and working until the dog alerts and finds the subject or comes up with no positive indications. Using distance alerts, however, emphasizes a much stronger trust of the dog earned by careful training and education. Education is the key here, as the dog is learning to compile its scent information from quite far away, when properly trained, and to work the area on its own initiative if enough scent is present to draw him forward. This portion will briefly address the progression method of establishing the foundation for proper scent cone work. It will not address the issue of scent discrimination, which the dog should already have learned. It is expected the dog will always use a scent article or, in the case of the cadaver dog, the appropriate command. Depending on the terrain, time of year, and time the subject has been missing, scent discriminating dogs can be effective for up to 2-3 weeks (Bison Peak, Park Co, CO, 2011), even in the event that the subject is suspected of being deceased, which is almost never a known variable. These dogs can and will give accurate alerts in spite of how many searchers, hikers, etc. are in the area during the search.

Basic Scent Cone Education:

When thinking about basic scent movement, envision water flowing down rivers-it will follow the path of least resistance. Scent is impacted by wind, terrain, temperature, vegetation, time of year, obstacles, etc. Heat makes scent rise upwards, sometimes causing it to loop up into the air and come down in a different location and flow onwards, bouncing and swirling unpredictably. Cool air helps the scent flow settle into more complete, careful downslope patterns. Then the wind will aggravate or enhance the entire process.

1. Start training with small areas of a specific terrain characteristic-i.e. down drainage with subject at top, bowl feature with subject higher in

Winds gentle out of W; Upslopes up all sides but also cross valley winds. Consistent. Dog dropped by helicopter onto Belford shoulder. Lots of scent pecking at #852: Dog on scent most of the time with some strong body language. Scent contour = 13,700'. Scent swirling in bowl lower down. Coned north, south, then west/ wnw. Extreme terrain.



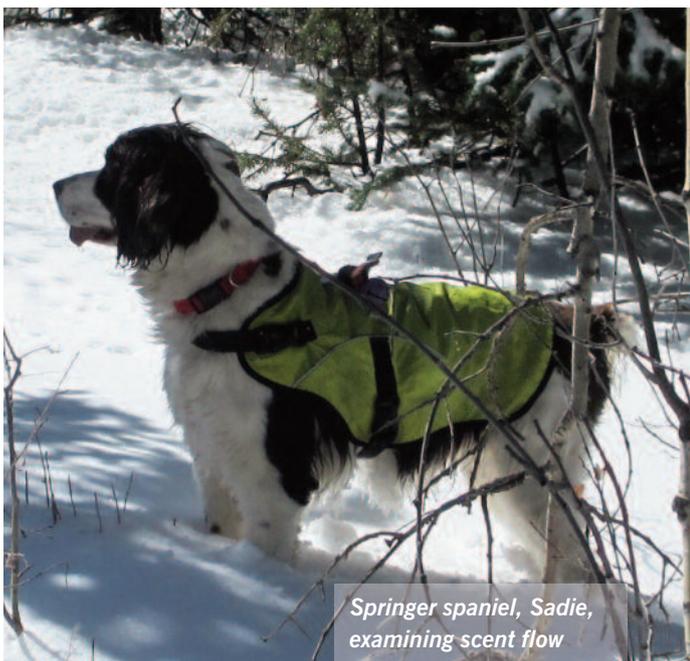
Missouri Mission Map-Dog was dropped by helicopter onto Belford southern shoulder; dog immediately went on scent. Worked cone north, then turned around and worked south, with several sit and points towards the Missouri ridge. Scent was travelling along the 13,700' contour line as well as depositing on top of Belford. Dog examined scent (scent-pecking) on top of Belford for quite awhile before deciding to continue cone south and then down the mountain. Scent was extremely "sticky" due to heavy, late snowpack melting rapidly. Winds out of W consistently. Subjects had been in place for 10 days. Subjects located by helicopter on first flight the next morning.

bowl, etc. These problems can be worked in a matter of minutes-the scent cone from subject to dog will be continuous from the beginning and immediately workable by the dog. The goal is

a find based on a hard hit scent cone.
 2. Continue the size of the problem, keeping the scent cone strong and continuous, but vary the terrain style. Always do 2-3

problems of the same terrain type in a row for sequential days so the scent cone work will be similar and the dog will learn the scent patterns.
 3. Remember that dogs learn from short problems when a new variable is introduced. Types of problems include: •up/down drainage, •cross drainage with subject placement on different sides with different wind directions, •intervening high ridges (features) with valley floors, •looping culprits such as isolated aspen groves, •subjects in trees, •cross-ridge problems with scent gaps, etc. The list is endless; the point is to educate the dog and the handler, and let the dog educate itself so be able to figure out how to work increasingly longer scent cones.
 4. As the dog learns, and it doesn't take long, the distance involved can be increased so it is learning to work through scent

pools and scent gaps (often confused with scent pools or negatives), interspersing short problems with the long problems to work on sharpening the brain skills and enthusiasm, while adding in new types of scent problems and endurance.
 5. Always allow the dog to follow the nose pop. A trustworthy dog is a joy to watch working scent. Encourage him. If the dog can't put enough pieces together, continue the grid from the new location and move on through the search area, following the dog as soon as it gets more information and wants to break the grid. As its confidence grows, and the dog's faith in you to trust it, the farther the distance over which it will be able to work scent.
 6. Watch all body language, including scent rolling and grass biting. Your dog is not messing around when it does these.



Springer spaniel, Sadie, examining scent flow

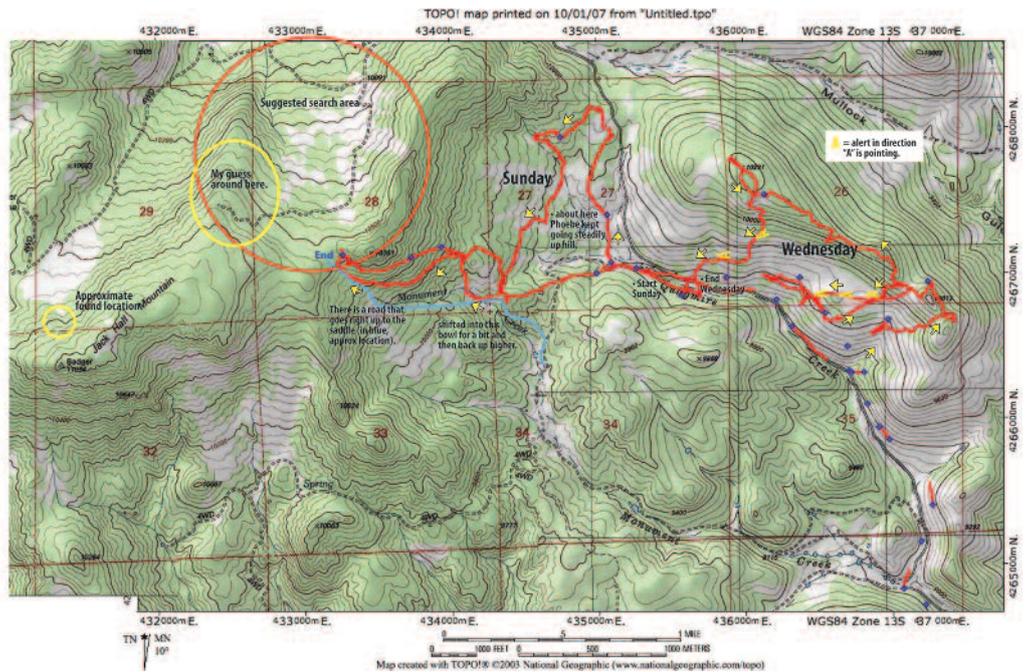
These are clues. GPS them. Clues come in packages - note and learn the clue patterns your dog uses while working scent and when it is not in scent.

7. Include all types of weather and times of day/night in trainings. Understand when the dog is working scent and try to understand how that scent is travelling. Avoid the common mistake of calling quick negatives. These can very often be scent gaps. Think positive information and work forward from that location.

8. Most problems should be known problems. This is the only way to understand what your dog is doing, learn to use the clues, and have the confidence to follow him.

GPS work & direction:

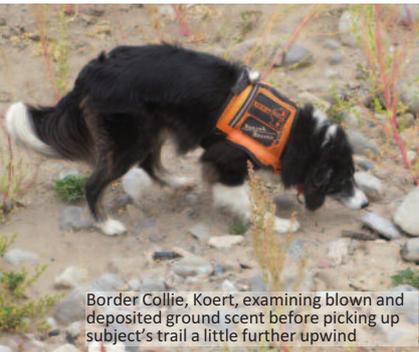
The GPS is the key to successful distance work. As your dog works, you will be marking its clues on your GPS, as well as the track. The fastest way to do this is to carry a small notebook in your harness and write down the number of the waypoint with a quick note and compass bearing (if applicable). This will begin in training when your dog starts becoming good at following his scent cones and the problems increase in size. Things to note especially in training will be scent rolls, nose pops with bearings, grass biting, ground scent analysis, etc. As you become more of a team, you will have your own clues that you recognize that are important to putting the scent picture together to try to determine the direction and location of your subject. For example, ground scent is particularly important to one of my dogs. This dog can pick his way right over a ridge by analyzing the line of ground scent that has deposited and the strength. Excessive ground scent can often mean the subject is fairly close. Why is the scent depositing so heavily in one spot? For relatively recently deceased subjects, the ground scent deposits can be extremely strong; some might misread the dog's interest as trailing



Cotopaxi Mission map of dog's work and alerts. Subject found at "approx. found location" 1 month later. Winds out of SW. Red line is the route taken by dog; yellow arrows point in the direction of the alerts. Yellow circle, "my guess is around here," was pretty accurate. Base can consider a wider circle extending in the direction of alerts for moving the search forward.



Google Training Map-The bluish line is the scent cone worked by dog. Dog was working scent the entire time and chose this route. Subject was high up in a rock formation on south side at the "Find" marker. Time of day was 11:00-14:00. Hot conditions. Strong winds out of south. Notice the geography and how the scent followed the paths of least resistance. Scent was popped up high by rocks and then blown NW.



Border Collie, Koert, examining blown and deposited ground scent before picking up subject's trail a little further upwind

when it is actually "scent pecking"- trying to get a direction towards the subject to get into an airborne scent cone.

At home, download the tracks and waypoints onto your mapping program, adding a description of each waypoint and directional arrows for alerts, as well as the start and find locations. Draw lines out from these waypoints according to the bearings and see how the triangulation flows. How do the alert directional lines line up with the find location? What terrain features are affecting direction and scent flow? For your training maps, all this information should be saved and printed onto topographical maps so you will be able to visualize the scent flow patterns as they are affected by the terrain and see, the dog's style of working through these issues caused by terrain, wind, subject placement, etc. By studying the training maps, the handler will learn how to better work through difficult times on searches by hopefully recognizing similar terrain, etc. patterns from problems set up and studied in training so as to achieve a much more positive result on real searches.

Information that will be relayed to base upon debrief for real searches:

The information above is mostly for the handler. When giving the results of your search to the search manager, you will relay only the important information:

1. Coordinates of dog interests

and alerts with bearings.

2. High probability areas according to the above.
3. If interest is high enough while searching, ask for the area ahead to be checked out by ground teams, helicopter, etc.
4. Triangulation of all alerts (particularly if several dog teams bring information back to base) that might point to the high probability area for the subject. Mark the points with bearings and draw the lines well out across your map.
5. What factors might be affecting your information?
6. Do not give excess information. The search manager only needs the information that might directly lead the search forward. Don't over emphasize, either. Misleading the search is a very bad thing.
7. Negative areas, areas cleared, and holes that you missed in your area.

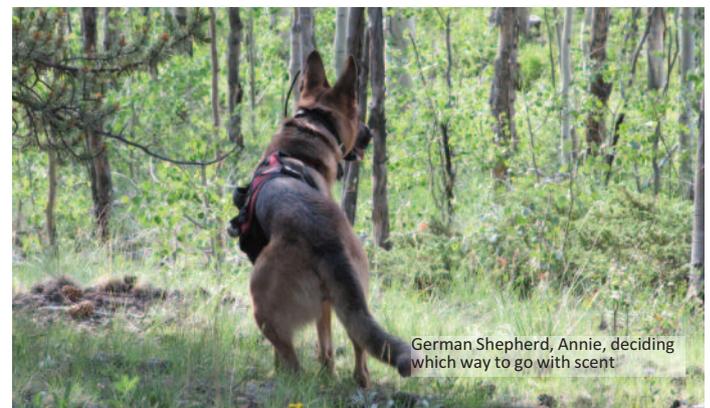
How Search Managers use this information:

Good information from well-trained, reliable dogs teams can help further the search in a major way. In addition, having a "Dog Team Leader" or the equivalent at base to analyze the dog information and consolidate it all onto one map to look for the areas of dog interests and where they lead can give a good idea as to where the subject might be and assist in a find in the next operational period.

1. Record interests from all dog teams, with coordinates and bearings, onto one base map. Include the cleared areas and areas not searched.
2. Draw lines forward in the direction of the bearings looking for triangulation of interests.
3. If dog alerts appeared skewed, look for terrain features, weather issues, etc. and how those might be affecting the direction of the alerts. (Think rivers and how the

water runs around the rocks, eddies, etc. when thinking about scent movement through wind and terrain.)

4. Draw the lines well out; find out the strength of the alerts, as lighter alerts with lots of scent gaps can mean the subject might be quite a bit farther away, and circle your high probability area(s). Dogs jumping for scent in the air can mean several



German Shepherd, Annie, deciding which way to go with scent

things, such as subject is up high somewhere or the scent is having to bounce over a very high ridge, rock formation, etc. to travel across the area.

5. Do not redirect all resources to the area; continue the search as you would normally for any other clues, but do send enough appropriate resources out to the dogs' area of interest to check it out thoroughly.
6. It must be remembered the subject might also be moving which might explain inconsistency in alerts - but direction of travel can be determined by noting the direction of the alerts.
7. In the case of a deceased subject, several issues exist:
 - Scent from recently deceased parties will manifest as fairly strong scent, along with very strong ground scent deposits that might look like trailing, especially when humidity is high, evaporative conditions exist, etc.
 - Scent from deceased subjects who have been out for several months will manifest quite

differently - this type of scent tends to "pool" as well as set up as scent pools in different locations due to the repeated depositing of scent, from possibly different sites (depending on the condition of the subject). Often the scent pool can be stronger than the source. It is critical to research the history of missing persons in the area, including animal activity, if relevant, to

understand the entire picture.

8. Take note of patterns in the GPS track. A long line with consistent direction followed by a sudden change in course could mean the subject is close. The change in direction might be caused by heavy scent pooling or by intervening terrain that suddenly interferes with the scent and widens the cone. A high probability area in this type of situation could be farther along the original line of scent.
9. Location of the subject also impacts the strength of the scent - If subject is up high in the wind, scent will be much stronger and easier to follow than that of a subject down in the bottom of a cold drainage, etc.

Again, dogs are just another one of all the wonderful resources available to help in the search for the missing person. However, scent discriminating airscent and cadaver dogs well-trained in large area distance alerting can have quite a successful impact on difficult searches involving moderate to difficult terrain in the Rocky Mountain Region. 🐾

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mammut EL HELMET

by Mel Harms



When my editor asked me for my dream list of gear to test, I had been struggling with my helmet. Despite every adjustment I could make, (I even read the instructions...to a HELMET!) I could not get it to fit correctly. This bummed me out because it was a female specific helmet and I try to support things that are made with women in mind. It had a spot for my pony tail, which I thought was groovy considering I REALLY do not want to get my hair caught in my ATC device and it was pretty light weight. Despite having an emotional connection to this helmet because I had worn it on some pretty sweet climbs, I was done with it, especially after I got hit in the arm by rock fall and realized it could very easily have been my head. I just really could not fall in love with the helmet and decided to make a change.

After a little research, I lucked out with Mammut's El Cap. My head runs on the small side but I was able to make this helmet fit perfectly with the height and size adjustable headband. It is by far the most comfortable climbing helmet I have ever worn, which is a bonus considering the El Cap's

2K-EPS technology that is designed to absorb maximum impact. As a woman with a lot of hair, my head tends to get hot in climbing helmets and I am not a big fan of sweaty eye, but the El Cap is well designed with plenty of vents to keep your brain from cooking. Weighing in at 350g it is nearly identical to other helmets in its price class, retailing at \$69.95 USD. It has a small visor on the front which does not seem like it would shade much sun, but I was pleasantly surprised, as were all the friends I've loaned it to. When considering a helmet I

strongly urge you to give

this helmet a go. I give it five stars from me, one for protection, comfort, price, weight, and overall design. Well done Mammut! 🌟



SPECIFICATIONS:

Manufacturer: Mammut
Model: El Cap
Origin: Switzerland
RRP/SRP:SFr.100.00/
\$69.95

Colours: (Helmet/web)
Flash/iron [Yellow/grey]
Smoke/liane [Grey/seaweed green]
Basilic/graphite [Green/grey]
White/iron [White/grey]
Oak-palau [Grey/teal blue]

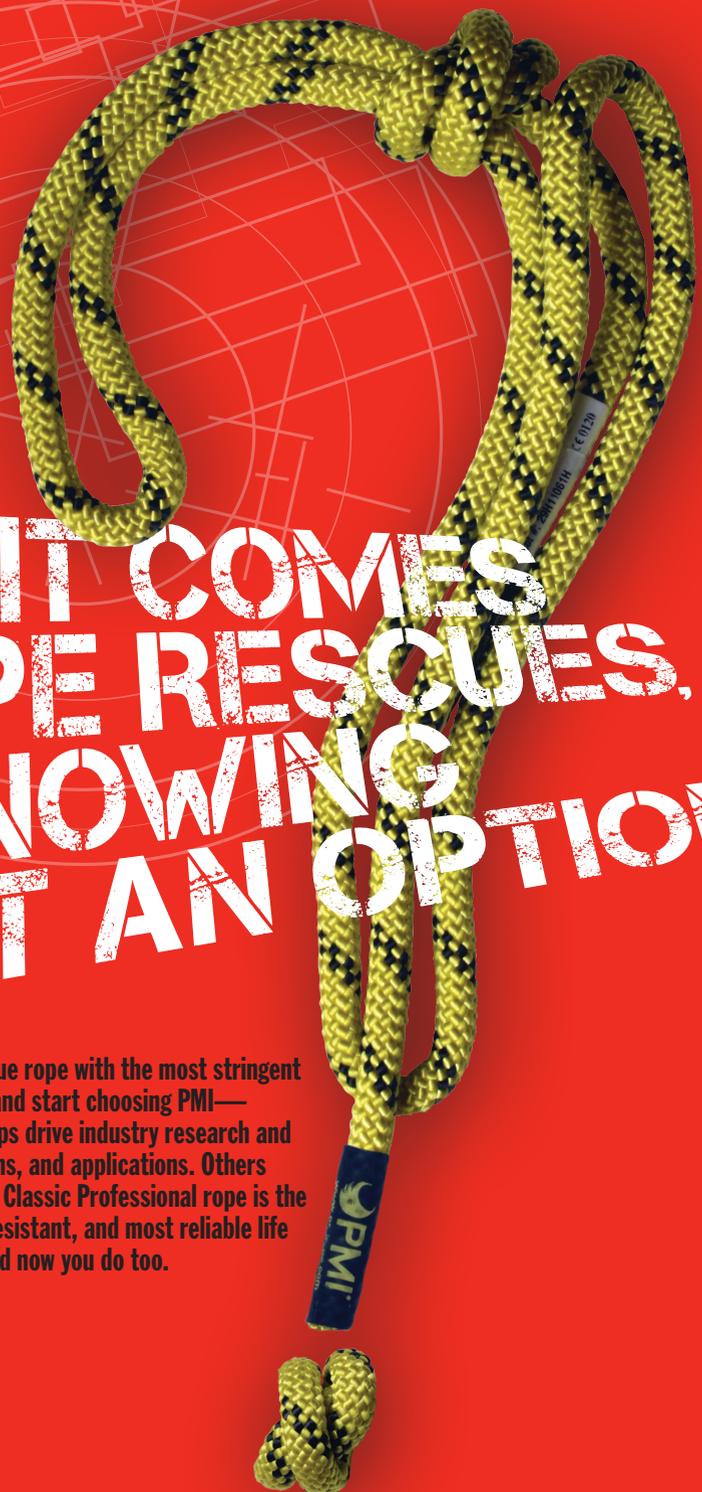
Weight: 350 g
Size: 56-61cm/22-24"

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METEOR CRATER

TECHNICAL RESCUE

by Sgt. Aaron Dick,
Search and Rescue Coordinator,
Coconino County Sheriff's Office
&
Engineer Roy Lippman,
Flagstaff Fire Department

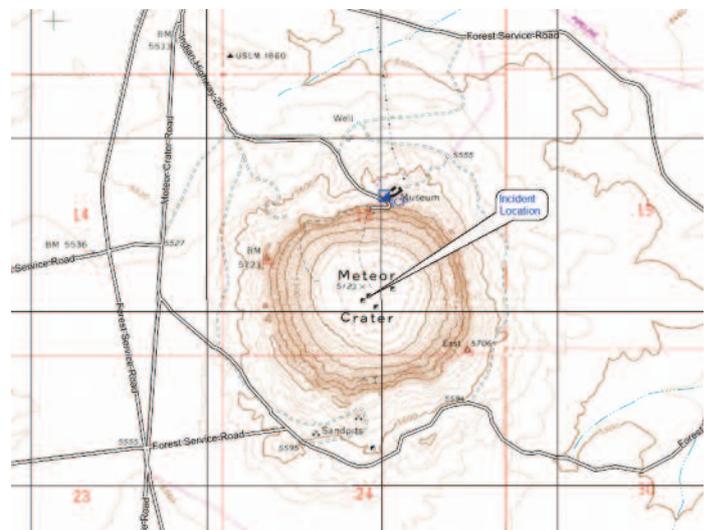
Meteor Crater in Northern Arizona is believed to be world's best preserved meteorite impact crater. The impact that created Meteor Crater occurred around 50,000 years ago. The crater is almost 600 feet deep and 0.7 miles across. Meteor Crater is a popular tourist attraction and was also the site of some NASA astronaut training for the Apollo missions in the 1960s. In the early 1900s Daniel Barringer became aware of the existence of the crater and iron fragments found around the crater. He believed that a large iron meteorite may be buried in the

crater and spent the next 27 years trying to find it. That included drilling a couple of mine shafts in the 1920s and 1930s. When it was determined that a large iron meteorite was not going to be found the mine shafts were abandoned. As far as we know until this rescue no one had been inside the mine shafts since they were abandoned.

Normally visitors are not allowed to hike into the crater but can instead view it from the visitor's center and from a rim trail. On January 10th, 2013 at about 4:30 pm the Coconino County Sheriff's Office was responding to a

report of a subject trespassing in the bottom of Meteor Crater between Flagstaff and

Winslow. The subject was being watched by an employee through binoculars. As the



2013



man had just climbed a fence surrounding one of the abandoned mine shafts and jumped feet first into the shaft. The shaft was reported to be at least 100 feet deep. [Photo below]

The call quickly changed from a trespassing investigation to a search and rescue mission. Sgt. Dick received the call from deputies on the scene and immediately the Coconino County Sheriff's Office Search and Rescue Unit was dispatched to the scene. The weather was changing with high winds and snow moving into the area. The high temperature in Flagstaff that day was 38 degrees Fahrenheit with sustained winds of 30 to 35 miles per hour with gusts to over 50 miles per hour. The Search and Rescue Unit requested aviation support to quickly transport rescuers to the bottom of the crater to size up the situation. The Arizona Department of Public Safety Air Rescue helicopter based in Flagstaff was out of service on a regularly scheduled maintenance day. Sgt. Dick contacted Guardian Air Transport, a private air ambulance company that also had helicopters based in Flagstaff and Winslow for assistance. Guardian Air

responding deputy sheriff arrived at the visitor's center the employee reported that the



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Transport graciously agreed to respond from their Flagstaff base and aid in transporting rescuers to the bottom of the crater before the weather got worse.

The Sheriff's Office Search and Rescue Unit arrived at Meteor Crater at about the same time at Guardian Air Transport. An incident command post was established at the visitor's center parking lot. Starting at 7:45 pm four Coconino County Sheriff's Office Mountain Rescue Team members were flown into the crater along with the manager of Meteor Crater and a deputy sheriff as well as technical rescue equipment. The weather quickly deteriorated and Guardian Air Transport had to depart from the scene.

Just before 8:30 pm the team in the bottom of the crater, led by Coconino County Sheriff's Office Search and Rescue Volunteer Randy Marlatt, reported that they had made voice contact with the subject in the bottom of the shaft and had determined that he was injured. The rescue plan that we had discussed while we were responding began take shape once we determined that there was a viable patient. Due to the confined space nature and the fact that it was an abandoned mine shaft that had been reported to be of unknown stability a careful risk assessment was conducted. A complicating factor for the rescue was the lack of anchors on the crater floor. The only vegetation was some sagebrush and there were no rocks or boulders to place bolts in. The mine shaft had a fence around it but it was unknown how the fence posts were secured into the ground. Based on the terrain it

was decided that artificial anchors were going to be necessary. We decided that a picket anchor system was going to be the best option. We did not have any picket materials, other than snow pickets, in our cache as it is not an anchor type that is needed very often in our area of operations. [Photos overleaf]

We decided that we would need some t-posts and a t-post driver but the hardware stores in Flagstaff were already closed for the day. Search and Rescue Volunteer Bart Thompson recently retired from a local hardware store and contacted a current manager to see if he would be able to open the store after hours so that we could purchase the materials to construct the anchors. The hardware store manager was very accommodating and opened the store so that we could purchase the items. Sgt. Dick had requested the assistance of the Flagstaff Fire Department Technical Rescue Team and their Rescue Squad vehicle to aid in evaluating the stability of the shaft as well as providing an artificial high directional. Flagstaff Fire Department Squad 1 picked up the t-posts and driver from the hardware store as they responded to Meteor Crater. The Maricopa County Sheriff's Office Mountain Rescue Posse had also been requested as they were trained for abandoned mine shaft operations.

While the Flagstaff Fire Department and Maricopa County Sheriff's Office Mountain Rescue Posse were responding the team in the bottom of the crater continued to assess the situation. A portable radio was lowered into the shaft so that better communication could be established between the patient and the



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rescuers. Once that communication was established a more thorough assessment of the patient's situation was conducted. We were able to determine that the patient was at the bottom of the shaft and not in any danger of falling further. The patient also reported that he was standing up and walking around and his major complaint was right arm pain believing that he had broken or dislocated his arm. As time passed he also complained about being cold. Additional clothing, food, and water were lowered to him to aid in keeping him more comfortable as the rescue was being put together.

Throughout the night the weather was constantly being evaluated with National Weather Service to determine if aviation support might become an option again but the weather never broke to allow for safe helicopter operations.

Search and Rescue personnel marked the primitive trail into the crater with chemical light sticks for the additional resources that were beginning to arrive at the incident command post.

Flagstaff Fire Department personnel arrived at Meteor Crater just before 11:00 pm and were given a briefing about the situation. The four technical rescue technicians and two Coconino County Sheriff's Office Search and Rescue personnel carrying additional warming supplies for the patient, air monitoring equipment, the t-posts and driver, and an Arizona Vortex Artificial High Directional made the difficult hike into the scene. The hike from the incident command post to the mine shaft was approximately one mile and took about an hour to complete with deteriorating

weather and wind chill values below zero.

By 1:20 am on the anchors had been constructed, the air quality checked, and the stability of the shaft evaluated. The first rescuer from Flagstaff Fire Department, Engineer Roy

England Rope KMIII.

Again the availability of an EMS helicopter was checked to transport the patient from the crater floor to the hospital but the weather remained out of parameters. The rescue team comprising Coconino County

transported to the Flagstaff Medical Center.

All the rescuers were safely out of the crater but much of the rescue equipment remained at the mine shaft. As the weather improved on the morning of January 11th search and rescue recovered the equipment with the assistance of an Arizona Department of Public Safety Air Rescue helicopter.

The patient stated that he was instructed to jump into the mine shaft by his God in order to survive another meteorite impact and had no intention of harming himself. He was fortunate that the Meteor Crater employee saw him walking in the bottom of the crater and continued to watch him as he jumped in the crater otherwise it may have taken some time to have located him, if ever.

The entire incident was a good example of the close working relationships between emergency response agencies in Northern Arizona and beyond. The Coconino County Sheriff's Office Mountain Rescue Team and the Flagstaff Fire Department Technical Rescue Team had conducted a joint technical rescue training in October of 2012 that involved the use of the Arizona Vortex. The Coconino County Sheriff's Office Mountain Rescue Team and the Maricopa County Sheriff's Office Mountain Rescue Posse, as Mountain Rescue Association teams, regularly interact throughout the year. None of the rescuers that responded to this call had ever preplanned a technical rescue response of this type. As far as we know this may be the first technical rescue in an abandoned mine shaft that was located in the bottom of a meteorite impact crater. 



Lippman was lowered into the shaft followed by a second Flagstaff Firefighter, Jess Maier. The patient was packaged in a LSP Half Back and raised out of the shaft by 2:00 am. The raising system consisted of a 5:1 mechanical advantage system running through the Arizona Vortex and a separate belay using a CMC MPD as the belay device. The rope used was 7/16" New

Sheriff's Office, Flagstaff Fire Department, and Maricopa County Sheriff's Office Mountain Rescue conducted a litter carry of the patient from the crater floor up the one mile long trail climbing the 600 feet out of the crater to the incident command post in the parking lot. By 5:00 am the patient was at the incident command post and he was in an ambulance and was

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- *Heavy duty Vibram rubber sole*
- *Removable stainless steel instep grip*



Innovative chainsaw footwear created for superior performance and day long comfort.

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AT900 CHAINSAW GLOVE

Xpert

- EN381-7 Class 0 (16m/s) Left Hand
- EN388 3122
- Excellent flexibility and comfort
- Breathable and water resistant

SIZE RANGE: 7-12



AT500 CHAINSAW GLOVE

Forester

- EN381-7 Class 1 (20 m/s) Both hands
- EN388 3142
- Top quality water resistant cowhide
- Heavy duty padded rubber palm

SIZE RANGE: 8-11



AT950 CHAINSAW GLOVE

Pro Climbers

- EN381-7 Class 1 (20m/s) Both hands
- EN388 3122
- Reinforced leather palm for longer life
- Ultra snug fit • Velcro wrist closure

SIZE RANGE: 8-11



AT1500 UTILITY GLOVE

XT Work Glove

- Expert glove with XT rubber grip
- Top quality leather construction.
- Padded palm • Superb fit & dexterity
- Breathable shower resistant backing

SIZE RANGE: 8-11



AT1100 CLIMBING GLOVE

3-Digit

- EN 388 3121 & EN420
- Designed for ultimate dexterity.
- Extra Knuckle protection
- Velcro wrist closure

SIZE RANGE: 8-11



AT1200 CLIMBING GLOVE

Fingerless

- EN 388 3121 & EN420
- Designed for ultimate dexterity.
- Reinforced pull on tab
- Velcro wrist closure

SIZE RANGE: 8-11



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KERNMANTLE
LOW
STRETCH
ROPES
11-11.5mm

In PRm Issue 2 we looked at 10mm ropes as the lighter of two key rope diameters used for rescue in wilderness environments. 11 to 11.5mm static ropes may be the lightest rope in urban-industrial fire rescue but in the boonies it's the heaviest of the rope options you want to be lugging up a mountain or down a cave. It does however offer an extra degree of strength and durability that might swing things your way, especially if the rock on your patch is particularly aggressive. Everything we said about 10mm ropes is also valid for 11mm ropes including the fact that this class of ropes may be variously termed static, semi-static or low stretch depending on the % of stretch. We'll just use the term static generically. Softer or more supple ropes are great for handling and knot tying but are rarely as abrasion resistant as the tough-as-old-boots stalwarts like Sterling's HTP, New England's KMIII Max and PMI's MaxiWear. These days there are a number of ropes designed to resist flattening without necessarily having the handling characteristics of an iron bar, ropes like PMI's Tendon and New England's Escalator which are therefore well suited to the use of mechanical devices. One other thing that warrants special

mention not detailed in the first article is the new generation of unified sheath-core ropes. Normally, the sheath is separate from the core and free to 'ride' over it such that when squeezed between the surfaces of a bar or bobbin it can 'slide' along the core and you end up with bunching of the sheath most easily seen near the end of a rope when you have a handful of sheath and no core. This is known as milking, or creep and it's not only the compressing bobbin/cam devices like the Petzl ID and GriGri that can cause it, manual devices like the Figure 8 or the Conterra Scarab can also be quite abusive. The new rope design options have the sheath strands woven into the fibres of the core so that it can no longer move differentially when subjected to high loads using compressing devices like descenders. Ropes like Meetic from Courant, Platinum from Teufelberger and Unicore from Beal are examples. Cost is higher but if you've had problems with sheath slippage this could be the answer.

In the following tables we've tried to fit as many ropes as possible but there always seems to be one more over that hill.

[Description of table data columns continues on page 62]

WELCOME TO THE TEST LAB

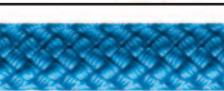
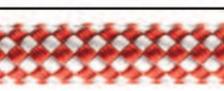
Where our products are inspired, and concepts are proven by a dedicated team of highly-experienced engineers and rescue professionals. From the lab to the field, and everywhere in between, CMC Rescue is the most trusted name in rescue training and equipment.

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Images NOT to scale	MODEL	COMPANY	ORIGIN	COST /metre (foot)	Φ	Standards	Materials	Flexibility	Carrier	Access	Rescue	Caving	USE
	Tower Line	ALL GEAR			7/16		Polyester sheath Nylon core		32	■	■		
	Access Unicore	BEAL		\$3.58 €2.90 A\$4.05	11 7/16	EN 1891-A	Nylon	n/a	n/a	■	■		
	Antipodes	BEAL		€2.75	11.5	EN 1891-A	Nylon	n/a	n/a	■			
	Australis	BEAL		A\$5.20	11.5	AS4142.3	Polyester sheath Nylon core	n/a	n/a	■	■		
	Industrie	BEAL		£2.68 €2.98 A\$3.25	11 7/16	EN 1891-A	Nylon	n/a	n/a	■			
	Hotline	BEAL		€3.35 A\$6.10	11 7/16	EN 1891-A	Nylon sheath Aramid/nylon core	n/a	n/a	■	■		
	Intervention	BEAL		£2.30 €2.98	11 7/16	EN 1891-A	Nylon	n/a	n/a				
	Intervention	BEAL		£2.55 €2.65	11.5	EN 1891-A	Nylon	n/a	n/a				
	North Sea	BEAL		€2.10 A\$3.75	11 7/16	EN 1891-A	Nylon	n/a	n/a	■			
	Pro-Water	BEAL		£3.35 €3.55	11 7/16	EN 1891-A	Nylon sheath Nylon & Neoprene core	n/a	n/a		■		
	Raider	BEAL		£5.85 €6.10 A\$10.50	11	EN 1891-B	Aramid sheath Nylon core	n/a	n/a		■		
	Raider Tactic	BEAL		€4.85	11	EN 1891-A	Aramid sheath Nylon core	n/a	n/a		■		
	Hardcore	BLACKSAFE		€1.79	11	EN 1891-A	Nylon	0.62	n/a	■	■	■	
	Strong	BLACKSAFE		€1.99	11	EN 1891-A	Nylon	0.9	n/a	■	■	■	
	Armortech	BLUEWATER		\$6.00 (\$1.91)	11.5 7/16	NFPA 1983 -G	Technora sheath +Polyestersheath Nylon core	n/a	32				
	Armortech Assaultline	BLUEWATER		\$6.45 (\$2.05)	11.4 7/16	-	Technorasheath Nylon core	n/a	n/a				

NOTES: **ORIGIN** = Company selling the product, not necessarily the country of manufacture **TYPE**: manufacturer's own definition

Tactical Use	Water	Heat-retard	MBL	Knotted BL	F1 Falls	Wt g/metre lbs/100ft	Colours	Elongation	Sheath Mass	NOTES	WWW.
						89g 6 lbs	Neon Ylw/blue, Yellow/black, Red, yellow	n/a	n/a		allgearinc.com
			32 kN 7052 lb	21 kN 4628 lbf	20	73g 4.9 lb	Red/grey/white Yellow/grey/white	2.8%	36%		beal-pro.com
			34 kN 7495 lbf	23 kN 5069 lbf	20	78g 5.2 lb	White/blk/red	2.6%	38%	See Industrie for Antipodes 11mm	beal-pro.com
			34.9 kN 7691 lbf	17.9 kN 3945 lbf	n/a	93.7g 6.3 lb	Blue	n/a	42%	Very static & abrasion resistant for Australian market	beal-pro.com
			32 kN 7052 lb	21 kN 4628 lbf	20	73g 4.9 lb	Red/White, Yellow/White, Blue/White White	2.8%	36%	white version also known as Antipodes	beal-pro.com
		■	25 kN 5510 lbf	19 kN 4187 lbf	15	79g 5.3 lb	White	3.1%	42%	Specific chemical resistance	beal-pro.com
■			32 kN 7052 lb	21 kN 4628 lbf	20	73g 4.9 lb	Khaki, Black	2.8%	36%	moderate speed abseils	beal-pro.com
■			34 kN 7495 lbf	23 kN 5069 lbf	>20	78g 5.25 lb	Khaki, Black	2.6%	38%	moderate speed abseils	beal-pro.com
			30 kN 6612 lbf	19 kN 4187 lbf	>20	75g 5.04 lb	White/black	4%	44%		beal-pro.com
		■	25 kN 5511 lbf	16 kN 3526 lbf	n/a	80g 5.4 lb	Hi-vis Red	n/a	33%	combination Floating & abseil rope	beal-pro.com
■		■	26 kN 5730 lbf	19 kN 4187 lbf	8	81g 5.45 lb	Black	3.3%	41%	for high speed descent	beal-pro.com
■		■	24 kN 5289 lbf	18 kN 3967 lbf	6	75g 5.04 lb	Black	3.2%	30%	Reduced ratio of sheath to core to qualify for Type A rating	beal-pro.com
■			32 kN 7052 lb	15 kN 3306 lbf	n/a	73.5g 5 lb	Yellow/black, Black	3.2%	34%	3.8% shrinkage	blacksafe.de
			34 kN 7495 lbf	15 kN 3306 lbf	n/a	77g 5.2 lb	White/black	3.5%	33%	3.7% shrinkage	blacksafe.de
■		■	35.5 kN 7824 lbf	n/a	n/a	97g 6.5 lb	Tan	5.1@1.35kN/300lbf 7.3@2.70kN/600lbf 9.8@4.40kN/1000lbf	53%	Double Sheath	bluewaterropes.com
■		■	40 kN 8816 lbf	n/a	n/a	93g 6.3 lbs	Tan	1.5@1.35kN/300lbf 2.35@2.70kN/600lbf 3.0@4.40kN/1000lbf	n/a		bluewaterropes.com

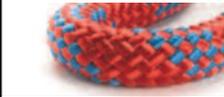
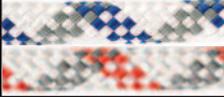
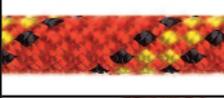
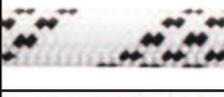
of rope characteristics **DIAMETER:** Nominal - as given by manufacturer **WATER:** floating rope able to be used with rope hardware

Images NOT to scale	MODEL	COMPANY	ORIGIN	COST /metre (foot)	Φ	Standards	Materials	Flexibility	Carrier	Access	Rescue	Caving	USE
	AssaultLine	BLUEWATER		\$3.05 (\$0.98) A\$5.60	11.4 7/16	UIAA EN 1891 NFPA 1983. T	Polyester sheath Nylon core	n/a	32	■	■		
	BWII +	BLUEWATER		\$3.05 (\$0.97) A\$5.75	11.4 7/16	UIAA EN 1891 NFPA 1983. T		n/a	16	■	■	■	
	DGR	BLUEWATER		\$2.90 (\$0.92)	11	NFPA 1983. T	Polyester sheath Nylon core	n/a	32	■	■		
	Dyna-Stat	BLUEWATER		\$3.75 (\$1.20)	11	-	Nylon	n/a	32		■		
	HR3	BLUEWATER		\$2.65 (\$0.85)	11.5 7/16	-	Polyester/ Polyprop sheath Polyprop core	n/a	32	■	■	■	
	Protach	BLUEWATER		\$3.25 (\$1.05)	11.5	NFPA 1983- T	Polyester sheath Nylon core	n/a	32				
	Safeline	BLUEWATER		\$2.90 (\$0.92)	11.5 7/16	EN 1891 NFPA 1983- T	Polyester sheath Nylon core	n/a	32	■	■	■	
	SpecStatic	BLUEWATER		\$3.21 (\$1.03)	11.5 7/16	NFPA 1983- T	High Tenacity Polyester	n/a	32		■	■	
	TITANIUM	CAMP		€2.32	11	EN1891-A	Nylon	0.74	32	■	■		
	Hercules	CANCORD		n/a	11 7/16	-	Polyester	n/a	n/a	■		■	
	Hercules	CANCORD		n/a	11 7/16	NFPA 1983 CSA Z259.2.1	Nylon	n/a	n/a	■		■	
	Lifeline	CMC RESCUE		\$3.80 (\$1.22)	11 7/16	NFPA 1983-T	Nylon	0.91	32	■	■	■	
	Static-Pro Lifeline	CMC RESCUE		\$3.80 (\$1.22)	11 7/16	NFPA 198-T	Polyester	1.1	32	■	■	■	
	Bandit	COURANT		€1.55	11	EN 1891-A	Nylon	0.95	n/a	■	■		
	Equirial	COURANT		€1.75	11	EN 1891-A	Nylon	0.7	n/a	■	■	■	
	Ultima	COURANT		€2.10	11	EN 1891-A	Nylon	0.7	n/a	■	■	■	

NOTES: **ORIGIN** = Company selling the product, not necessarily the country of manufacture **TYPE**: manufacturer's own definition

Tactical	Water	Heat-retard	MBL	Knotted BL	F1 Falls	Wt g/metre lbs/100ft	Colours	Elongation	Sheath mass	NOTES	WWW.
■			34.2 kN 7691 lbf	n/a	n/a	90g 6.05 lb	Black	3.1@1.35kN/300 lbf 5.8@2.70kN/600 lbf 9.1@4.40kN/1000 lbf	n/a	Double twist cabled poly sheath & nylon core. Also Berry compliant. May be listed as 11.2mm	bluewaterropes.com
			34.2 kN 7691 lbf	n/a	n/a	97g 6.55 lbs	Gold/blue	3.4@1.35kN/300 lbf 5.42@2.70kN/600 lbf 8.44@4.40kN/1000 lbf	n/a		bluewaterropes.com
			32.8 kN 7229 lbf	n/a	n/a	86g 5.78 lbs	White/red White/blue	3.9@1.35kN/300 lbf 6.4@2.70kN/600 lbf 8.8@4.40kN/1000 lbf	48%	Specially developed for rope access	bluewaterropes.com
■			30.1 kN 6634 lbf	n/a	n/a	93g 6.26 lbs	Orange/black, Black	3.8@1.35kN/300 lbf 6.7@2.70kN/600 lbf 10.2@4.40kN/1000 lbf	n/a	Combination dynamic and static rope suited to heli rappels, hauling & lowering rescue ops	bluewaterropes.com
	■		17.3 kN 3900 lbf	n/a	n/a	61g 4.1 lb	Orange	1.6@1.35kN/300 lbf 2.9@2.70kN/600 lbf 4.8@4.40kN/1000 lbf	50%		bluewaterropes.com
■			32.4 kN 7283 lbf	n/a	n/a	80g 5.39 lbs	Black	4.2@1.35kN/300 lbf 6.4@2.70kN/600 lbf 8.4@4.40kN/1000 lbf	50%		bluewaterropes.com
■			34.1 kN 7663 lbf	n/a	5	87g 5.86 lbs	Wht/red,Wht/blue, Red/ylw,Orng/ylw, Ylw/blue,Blue/ylw Grn/orng, Black,	2.9@1.35kN/300 lbf 5.9@2.70kN/600 lbf 8.4@4.40kN/1000 lbf	48%		bluewaterropes.com
■			33.7 kN 7587 lbf	n/a	n/a	100g 6.7 lbs	Black/White	1.8@1.35kN/300 lbf 2.3@2.70kN/600 lbf 3.0@4.40kN/1000 lbf	41%		bluewaterropes.com
■			29 kN 6391 lbf	20.5 kN 4519 lbf	15	73g 4.9 lb	Red, Yellow, White, Black	2.8%	36%		camp.it
			32 kN 7052 lb	n/a	n/a	n/a	White	@1.35kN/300 lbf @2.70kN/600 lbf @4.40kN/1000 lbf	n/a		cancord.com
			30 kN 6612 lbf	n/a	n/a	n/a	White, Black, Red, Orange, Olive-Drab	@1.35kN/300 lbf @2.70kN/600 lbf @4.40kN/1000 lbf	n/a		cancord.com
■			30 kN 6612 lbf	n/a	n/a	83g 5.6 lbs	Orange, Red, Black	3.6@1.35kN/300 lbf 6.7@2.70kN/600 lbf 9.9@4.40kN/1000 lbf	n/a		cmcrescue.com
■			27 kN 5950 lbf	n/a	n/a	96g 6.5 lbs	Blue/white Orange/white Red/white	1.2@1.35kN/300 lbf 2.0@2.70kN/600 lbf 2.7@4.40kN/1000 lbf	n/a		cmcrescue.com
			35 kN 7716 lbf	24 kN 5289 lbf	15	73g 4.9 lb	White/ylw/purple	2.5%	34%		cordescourant.com
			33 kN 7273 lbf	23kN 5069 lbf	18	75g 5.04 lb	White/grn/black, Green/black, Red/black	3.8%	39.5%	Also available in 10 & 10.5mm	cordescourant.com
■			33 kN 7273 lbf	n/a	20	72.5g 4.9 lb	Blue, Red, Yellw, White,Olive, Blk all blk/purpl thread	3%	40%	Core-sheath fusion Also available in 10mm	cordescourant.com

of rope characteristics **DIAMETER:** Nominal - as given by manufacturer **WATER:** floating rope able to be used with rope hardware

Images NOT to scale	MODEL	COMPANY	ORIGIN	COST /metre (foot)	Φ	Standards	Materials	Flexibility	Carrier	Access	Rescue	Caving
	Wild	COURANT		€0.98	11	EN 1891-A	Nylon	1.1	48	■	■	
	Thermocore	COUSIN-TRESTEC		£1.98	11 7/16	EN 1891-A	Nylon	0.98	32	■	■	■
	Sécurité Intervention	COUSIN-TRESTEC		£2.66	11 7/16	EN 1891-A	Aramid sheath Nylon core	0.95	32			
	Sécurité Industrie	COUSIN-TRESTEC		£2.11	11 7/16	EN 1891-A	Nylon	1.0	32	■		
	Sécurité Industrie Pro	COUSIN-TRESTEC		£1.78	11 7/16	EN 1891-A	Nylon	0.7	32	■	■	
	Worksafe Worksafe Plus	DMM		£1.50 £1.65	11 7/16	EN 1891-A	Nylon (polyamide6)	n/a	32	■	■	
	Response LSK	DONAGHYS		A\$4.40	11 7/16	EN 1891-A AS4142.3	Polyester sheath Nylon core	n/a	32	■	■	
	Response XT	DONAGHYS		A\$4.40 £2.65	11 7/16	EN 1891 AS4142.3	Nylon	n/a	32	■	■	
	Performance Static	EDELRID		€1.99	11 7/16	EN1891-A	Perlon Polyamide6	1.0	40	■	■	
	Power Static II	EDELRID		£2.45 €3.33	11 7/16	EN1891-A	Perlon Polyamide6	0.9	40	■	■	
	Prostatic	EDELRID		€2.12 A\$5.35	11 7/16	EN1891-A	Perlon Polyamide6	1.0	40	■	■	■
	Safety Super II	EDELRID		€3.00	11 7/16	EN1891-A	Perlon Polyamide6	1.0	40	■	■	■
	Static Float	EDELRID		£3.54	11 7/16	EN 1891-B	Polyprop. core Nylon sheath	0.8	36			
	Speleo	EDELWEISS		€2.40 \$2.37 (\$0.76)	11 7/16	UIAA EN1891-B	Nylon	1.01	n/a	■	■	■
	Lizard Viper	GLEISTEIN		€3.17	11 7/16"	EN 1891-A	Nylon	0.75	32	■		■
	GeoStatic NE	GLEISTEIN		€2.15	11 7/16"	UIAA EN 1891-A	Nylon	0.77	32	■	■	

NOTES: **ORIGIN** = Company selling the product, not necessarily the country of manufacture **TYPE**: manufacturer's own definition

Tactical	Water	Heat-retard	MBL	Knotted BL	F1 Falls	Wt g/metre lbs/100ft	Colours	Elongation	Sheath mass	NOTES	WWW.
			34 kN 7495 lbf	23kN 5069 lbf	13	76g 5.1 lb	White/prpl/grey Fox, Scorpion, Wolf,	3.1%	33%	lower priced rope	cordescourant.com
			39.5 kN 8705 lbf	24 kN 5290 lbf	>35	76g 5.1 lb	White/ylw/blk	2.5%	n/a	Merged sheath & core	cousin-trestec.com
■		■	36 kN 7934 lbf	>15 kN >3306 lbf	>5	74.9g 5.03 lb	Anthracite	3.2%	n/a	1.8% shrinkage in water Military & heli-rappel	cousin-trestec.com
■			30.9 kN 6810 lbf	>15 kN >3306 lbf	8	75.4 g 5.07 lb	Black White/red	1.8%	45%		cousin-trestec.com
■			32.6 kN 7185 lbf	>15 kN >3306 lbf	>20	74.4 g 5 lb	White/black, Black, Red/blue	2.9%	38.4%		cousin-trestec.com
■			32 kN 7052 lbf	18 kN 3967 lbf	n/a	75g 5.04 lb	White/grey/blue, Black, White/grey/red	3%	n/a	Worksafe Plus =increased wear resist- ance with twisted core and tighter weave	dmmwales.com
			34.75 kN 7658 lbf	19 kN 4187 lbf	n/a	81g 5.4 lb	LSK= White/blk Red/yellow/blk	>3%	n/a		donaghys.com
■			34.75 kN 7658 lbf	19 kN 4187 lbf	n/a	90g 6 lb	Rescue=Orng/blk XT= Red/black	1.8%	42%	XT= Heatset (preshrunk)	donaghys.com
			31 kN 6832 lbf	20 kN 4409 lbf	n/a	79g 5.3 lb	White/black Grey/black	3.4	41%	Value for money, Diameter code in sheath	edelrid.de
■			29 kN 6391 lbf	17 kN 3821 lbf	n/a	81g 5.4 lb	Black, Orange/black	4.3	39%		edelrid.de
			33 kN 7273 lbf	22 kN 4850 lbf	n/a	75g 5.04 lb	White/black	4.0	43%	Designed for extreme ascender use	edelrid.de
■			29 kN 6391 lbf	21 kN 4628 lbf	n/a	81g 5.4 lb	Red/black Blue/black	3.6	40%	Pre-shrunk, High abrasion resistance,	edelrid.de
		■	≥18 kN ≥3967 lbf	≥12 kN ≥2645 lbf	n/a	71g 4.8 lb	Orange	≤5	41%	Floating	edelrid.de
■			30 kN 6612 lbf	20 kN 4409 lbf	>20	81g 5.4 lb	White/red/blk, Black/red/yellow, Ornge, Khaki, Blk	3	33.6%		edelweiss-ropes.com
			33 kN 7273 lbf	>15 kN >3306 lbf	>5	82g 5.6 lb	Orange/black Green/black, Red/yellow	4.3%	54%	Dry coated	gleistein.com
			39 kN 8596 lbf	22 kN 4850 lbf	n/a	77g 5.2 lb	White/orange, White/red, White, Blue, White/black	2.8%	36.5%		gleistein.com

of rope characteristics **DIAMETER**: Nominal - as given by manufacturer **WATER**: floating rope able to be used with rope hardware

Images NOT to scale	MODEL	COMPANY	ORIGIN	COST /metre (foot)	Φ	Standards	Materials	Flexibility	Carrier	Access	Rescue	Caving
	Tetra	HEIGHTEC		£1.90	11 7/16"	EN 1891-A	Nylon	1.0	40	■	■	
	Safe White (01011)	LIROS		€2.24	11 7/16"	EN 1891-A	Nylon	0.7	32	■		
	Performance Static	MAMMUT		SFR 4.5 £1.60 \$2.49	11 7/16	EN 1891-A	Nylon	n/a	n/a	■	■	■
	Aeris	MARLOW		£2.25	11 7/16	EN 1891-A	Nylon	0.7	24	■	■	■
	Aramid	MARLOW			11 7/16	-	Aramid sheath Polyester Core	0.8	16	■	■	
	Black Marlow	MARLOW		£3.16	11 7/16	CE -MR 10-81	Polyester	0.74	16			
	Diablo (LSK)	MARLOW		£2.50	11 7/16	EN 1891-A	Aramid sheath Nylon Core	0.8	24	■	■	

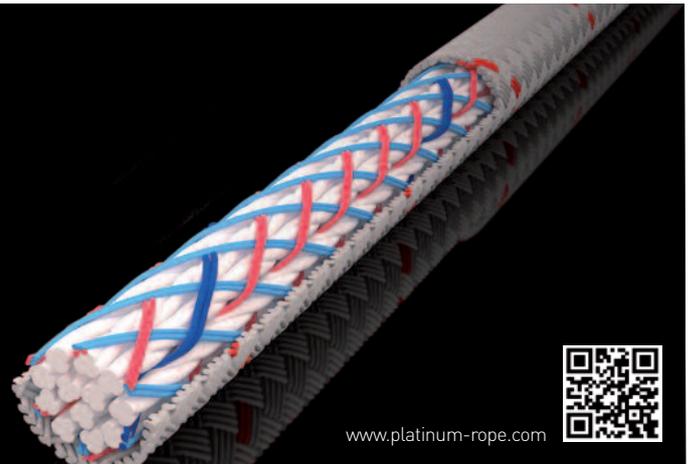
NOTES: **ORIGIN** = Company selling the product, not necessarily the country of manufacture **TYPE**: manufacturer's own definition



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PLATINUM[®] provides a permanent mechanical connection between core and cover. At certain intervals, core and cover yarns are intertwined with one another. These junctures block sliding of the cover on the core and thus effectively prevent cover slippage.

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TEUFELBERGER Ges.m.b.H., Vogelweiderstraße 50, 4600 Wels, Austria, T +43 7242 413-0, www.teufelberger.com

Tactical	Water	Heat-retard	MBL	Knotted BL	F1 Falls	Wt g/metre lbs/100ft	Colours	Elongation	Sheath mass	NOTES	WWW.
			31 kN 6832 lbf	15 kN 3306 lbf	30	77g 5.2 lb	White/orange,	4.1%	42.7%	2.8% shrinkage	heightec.com
			27 kN 5950 lbf	n/a	n/a	70g 4.7 lb	White/yelw/blue	3.7%	53%		liros.com
			34 kN 7495 lbf	24kN 5289 lbf	11	75g 5.04 lb	Red/black, White, Red	2.8%	n/a	2.3% shrinkage	mammut.ch
			35.1kN 7736 lb	20.4 kN 4574 lb	>10	75.9g 5.1 lb	Yellow/red, Yellow/blue	3.1%	37.2%		marlowropes.com
■		■	43.1 kN 9500 lb	n/a	n/a	96g 6.45 lb	Black, Yellow (Natural)	n/a	n/a	Black=Technora Yellow=Twaron	marlowropes.com
■			30.8 kN 6788 lb	19 kN 4187 lbf	4	95.4g 6.4 lb	Black, White, Black/lime	0.8%	50.2 %		marlowropes.com
■		■	35.5 kN 7824 lb	18.3 kN 4033 lb	6	82.5g 5.5 lb	Orange, Black	3.4%	44.1 %	Heat Resistant Sheath Dri-coat available	marlowropes.com

of rope characteristics **DIAMETER:** Nominal - as given by manufacturer **WATER:** floating rope able to be used with rope hardware



Rope & Process

AUTOROLL V.6MAX

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Images NOT to scale	MODEL	COMPANY	ORIGIN	COST /metre (foot)	Φ	Standards	Materials	Flexibility	Carrier	Access	Rescue	Caving
	LSK	MARLOW		£2.05	11 7/16	EN 1891-A	Nylon	1.0	32	■	■	■
	Monster Static	METOLIUS		\$2.83 (\$0.90)	11 7/16	UIAA, CE certified	Nylon	n/a	n/a	■	■	■
	Escalator	NEW ENGLAND/ TEUFELBERGER		\$3.82 (\$1.16)	11 7/16"	ANSI	HMPE/Aramid/ Polyolefin core Polyester sheath	n/a	32	■	■	■
	Fly Firefly Dragonfly	NEW ENGLAND/ TEUFELBERGER		£3.08 \$2.54 (\$0.78)	11 7/16"	EN 1891-A	Polyester sheath Nylon core	n/a	24	■	■	
	KMIII	NEW ENGLAND/ TEUFELBERGER		\$3.52 (\$1.10)	11 7/16	EN 1891-A NFPA 1983-T	Polyester sheath Nylon core	n/a	32	■	■	
	KMIII Max	NEW ENGLAND/ TEUFELBERGER		\$3.95 (\$1.26)	11 7/16	NFPA 1983-T	Polyester sheath Nylon core	n/a	32	■		■
	River Rescue (Water Rescue)	NEW ENGLAND		\$2.96 (\$0.95)	11 7/16	-	Nylon sheath Polypropylene core	n/a	n/a			
	Tachyon	NEW ENGLAND/ TEUFELBERGER		£2.99 \$3.00 AU\$6.60	11.5	EN 1891-A	Polyester sheath Nylon Core	n/a	24	■	■	■
	Vector	PETZL		\$3.80 (\$1.21)	11	NFPA 1983-T	Polyester sheath Nylon core	n/a	32	■	■	
	Axis	PETZL		£2.14 \$4.10 (\$1.31)	11	EN 1891-A	Nylon	n/a	32	■	■	
	P48F	PLASMODIA		R\$9.999 £2.95	11	-	Nylon	n/a	32	■	■	
	Access Pro	PMI		\$3.15 (\$1.00)	11 7/16	CE, CI1801, NFPA 1983-T	Polyester sheath Nylon core	1.1	32	■		
	Classic Pro EZ-Bend	PMI		\$3.85 (\$1.17)	11 7/16	EN 1891-A NFPA 1983-T	Nylon	n/a	16	■	■	■
	Classic Pro Max-Wear	PMI		\$3.85 (\$1.17)	11 7/16	CI1801 NFPA 1983-T	Nylon	n/a	16	■	■	■
	Classic Sport	PMI		\$3.03 (\$0.97)	11 7/16	CI1801	Nylon	n/a	16	■	■	■
	Global Pro	PMI		\$2.25 (\$0.75)	11 7/16	CI1801 EN 1891-A	Nylon	0.74	32	■		

NOTES: **ORIGIN** = Company selling the product, not necessarily the country of manufacture **TYPE**: manufacturer's own definition

Tactical	Water	Heat-retard	MBL	Knotted BL	F1 Falls	Wt g/metre lbs/100ft	Colours	Elongation	Sheath mass	NOTES	WWW.
			35.3 kN 7780 lb	21.1 kN 4650 lb	>10 kN >2204 lbf	73.8g 5 lb	White/black, Black, Hi-Vis, Red, Blue	2.4 %	33.1 %		marlowropes.com
			35 kN 7714 lbf	n/a	n/a	79g 5.3 lb	White, Black	3.2%	n/a		metoliusclimbing.com
			26.7 kN 5884 lb	n/a	n/a	77.4g 5.2 lb	White/orng/blk, Green/whitr/blk	0.5%@330lbs	47%	Ultra low stretch - designed for ascending	neropes.com teufelberger.com
			24 kN 5289 lbf	n/a	n/a	86.3g 5.8 lb	Red/White, Orange/ylw/blk, Green/black,	1.6@330lbs	57%		neropes.com teufelberger.com
■			35.1 kN 7736 lb	n/a	n/a	86.3g 5.8 lb	White, Green Red,Blue,Black, Olive, Orange	2.9%@ 10%ABL	46%		neropes.com teufelberger.com
■		■	36kN 7934 lbs	n/a	n/a	87.8g 5.9lb	Black/gold	2.9@1.35kN/300 lbf 5.1@2.70kN/600 lbf 8.0@4.40kN/1000 lbf	n/a	Low friction sheath 17% more abrasion resistant than KMIII	neropes.com teufelberger.com
	■		16.5 kN 3636 lbf	n/a	n/a	73g 4.9 lb	Yellow/blue, Yellow/red	n/a	n/a		neropes.com teufelberger.com
■			25.7 kN 5664 lb	n/a		93.7g 6.3 lb	Orange/yellow Grn/blue,Blue/grn Orange/blue Blue/orange	2.2%@330lbs	58%		neropes.com teufelberger.com
■			34.4 kN 7581 lbf	n/a	n/a	90g 6 lb	Red, Blue, White, Black	4.1%@1.35kN/300lbf 7.3%@2.70kN/600lbf 10.6%@4.4kN/1000lbf	n/a		petzl.fr
			30 kN 6612 lbf	15 kN 3306 lbf	20 kN 4408 lbf	73g 4.9 lb	Black, Yellow/Black, Yellow/White	2.8%	36%		petzl.fr
			30 kN 6612 lbf	n/a	n/a	105g 7 lb	Orange/black, White/black	n/a	n/a	Also available with Polyester sheath	plasmodia.com.br
			27.4 kN 6038 lbf	n/a	>14 >3085 lbf	84g 5.6 lb	Red/black	3.4% 5.8@1.35kN/300 lbf 9.3@2.70kN/600 lbf 12.4@4.40kN/1000 lbf	49.7%		pmirope.com
■			27 kN 6070 lbf	n/a	n/a	80g 5.4 lb	White/orng,Camo Blue/white, OD, Black,Red/white, Org/wht,Ylw/wht	1.8@1.35kN/300 lbf 3.0@2.70kN/600 lbf 5.2@4.40kN/1000 lbf	50.4%	Also available as 9, 12.5& 16mm	pmirope.com
■			28.6 kN 6303 lbf	n/a	n/a	80g 5.4 lb	Blue, Black, Gold, OD, Red	2.7@1.35kN/300 lbf 4.6@2.70kN/600 lbf 6.5@4.40kN/1000 lbf	n/a		pmirope.com
			30 kN 6612 lbf	n/a	n/a	88g 5.9 lb	White/red/black	2.7@1.35kN/300 lbf 4.6@2.70kN/600 lbf 6.5@4.40kN/1000 lbf	n/a	Also available as MaxWear	pmirope.com
			30 kN 6612 lbf	n/a	20 kN 4408 lbf	73g 4.9 lb	Green, White	2.8% 2.6@1.35kN/300 lbf 4.9@2.70kN/600 lbf 8.4@4.40kN/1000 lbf	36%	Shrinkage 4%	pmirope.com

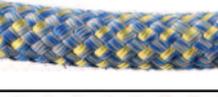
of rope characteristics **DIAMETER:** Nominal - as given by manufacturer **WATER:** floating rope able to be used with rope hardware

Images NOT to scale	MODEL	COMPANY	ORIGIN	COST /metre (foot)	Φ	Standards	Materials	Flexibility	Carrier	Access	Rescue	Caving
	H-T-O	PMI		\$3.64 (\$1.17)	11 7/16	CE CI1801 NFPA 1983-T	Nylon	0.9	n/a	■	■	■
	Isostatic	PMI		\$3.18 (\$0.96)	11.5 7/16	NFPA 1983-T EN 1891-A	Polyester	n/a	32	■	■	
	Pit Rope	PMI		\$2.93 (\$0.94)	11 7/16	CI1801	Nylon	n/a	16	■		■
	Passage	PMI		\$4.37 (\$1.40)	11 7/16	CI1801	Nylon	0.9	16			■
	Talon	PMI		\$3.36 (\$1.10)	11.5 7/16	CE, CI1801, NFPA 1983-T	Polyester sheath Nylon core	n/a	16	■	■	■
	Access	RESCUE TECH		\$3.60 (\$1.15)	11 7/16	EN1981 NFPA 1983-T	Nylon	0.8	32	■	■	
	Static	SINGING ROCK		€0.78	11 7/16	EN 1891-A UIAA NFPA 1983	Nylon	0.9	32	■	■	■
	Route 44	SINGING ROCK		€0.80 \$2.47 (\$0.79)	11 7/16	EN 1891-A UIAA NFPA 1983	Nylon	0.9	44	■	■	■
	Static	SAMSON ROPES		\$1.20	11 7/16	NFPA	Polyester sheath Nylon core	n/a	n/a	■	■	
	Superstatic	SKYLOTEC		€2.00	11	EN 1891-A	Nylon	n/a	32	■	■	
	HTP	STERLING ROPE		\$3.30 €2.75 (\$1.05)	7/16	NFPA 1983-T	High Tenacity Polyester	n/a	44	■	■	■
	Safety Pro	STERLING ROPE		\$3.30 (\$1.05)	11	EN 1891-A NFPA 1983-T	Nylon	n/a	40	■	■	■
	Superstatic2	STERLING ROPE		\$3.30 (\$1.05)	11	NFPA 1983-T	Nylon	n/a	40	■	■	■
	Tech11	STERLING ROPE		\$6.45 (\$2.06)	11	NFPA 1983-T	Aramid sheath nylon core	n/a	44	■	■	
	Aramid	TENDON (LANEX)			11 7/16	EN 1891-A	Kevlar sheath Nylon core	1	32	■	■	
	Force	TENDON (LANEX)		A\$7.99	11	n/a	Nylon Stainless Steel	n/a	n/a	■	■	

NOTES: **ORIGIN** = Company selling the product, not necessarily the country of manufacture **TYPE**: manufacturer's own definition

Tactical	Water	Heat-retard	MBL	Knotted BL	F1 Falls	Wt g/metre lbs/100ft	Colours	Elongation	Sheath mass	NOTES	WWW.
	☐		27 kN 5950 lbf	n/a	n/a	80g 5.4 lb	Yellow/white, White/orange	1.8@1.35kN/300 lbf 3.7@2.70kN/600 lbf 5.6@4.40kN/1000 lbf	50.2%	Hydro-cover treatment NB not a floating water rescue rope	pmirope.com
			29.4 kN 6479 lbf	n/a	n/a	96g 6.4 lb	Bl/blck/grn, Blk/ grn/wht,Orng/ blk/grn, Red/blk/ grn, Wht/blk/grn	0.9%@1.35kN/300 lbf 1.4%@2.70kN/600 lbf 1.8%@4.40kN/1000 lbf	n/a	Super-low elongation especially suited to high- lines and hauling	pmirope.com
			30 kN 6612 lbf	n/a	n/a	80g 5.4 lb	White	1.6@1.35kN/300 lbf 3.1@2.70kN/600 lbf 5.3@4.40kN/1000 lbf	n/a	The original, tough caving rope	pmirope.com
	☐		28.5kN 6281 lbf	n/a	n/a	80g 5.4 lb	Red/yellow	1.8@1.35kN/300 lbf 3.7@2.70kN/600 lbf 5.6@4.40kN/1000 lbf	n/a	Hydro-cover treatment Ideal Canyoning rope NB not a floating water rescue rope	pmirope.com
■			27 kN 5950 lbf	n/a	n/a	84g 5.6 lb	Blue/grey/yellow	1.4@1.35kN/300 lbf 2.1@2.70kN/600 lbf 2.9@4.40kN/1000 lbf	n/a	Low stretch, high abrasion resistance - ideal for ascen- ders, hauling and descen- ders	pmirope.com
			32.6kN 7185 lbf	n/a	n/a	80g 5.4 lbs	Blk,Or,ylw,Red, Ylw,Blue/ylw,Blue, Red/ylw,Ylw/blue, Lime/blue,Or,OD,	2.9%@300lbs	n/a	Also available in White with red or blue flek \$0.93/ft	rescuetechn1.com
■			37.8 kN 8331 lbf	24 kN 5291 lbf	>20	80g 5.4 lb	White/red, Red, Black	3.3%	39%		singingrock.com
■			34.7 kN 7637 lbf	20.3 kN 4474 lbf	20	77g 5.2 lb	White Red Black Orange	3.2%	38%		singingrock.com
			32 kN 7052 lb	n/a	n/a	89g 6 lbs	Orange/blue, White, Red, Black Blue/red, Ylw/red	3.2%@10%MBS, 4.5%@20%MBS, 6% at 30%MBS	44%		samsonrope.com
			30 kN 6612 lbf	n/a	10	76g 5.1 lb	White	3%	n/a		skylotec.de
■			30.5 kN 6722 lb	n/a	n/a	96.7g 6.5 lb	Neon Green,OD Blue, Orange, Black, Ylw, Red	2.4@1.35kN/300 lbf 3.1@2.70kN/600 lbf 3.6@4.40kN/1000 lbf	n/a		sterlingrope.com
■			32.5 kN 7163 lbf	23.4 kN	>5	76.6g 5.15 lb	Blue/black, Red/black, Black, Ylw/blk	3.3@1.35kN/300 lbf 6.5@2.70kN/600 lbf 9.4@4.40kN/1000 lbf	45.3%		sterlingrope.com
■			29 kN 6019 lbf	n/a	n/a	81.8g 5.5 lb	Blue/red, Ylw/red, Black, White/blk, Red/blue,	3.9@1.35kN/300 lbf 6.4@2.70kN/600 lbf 9.1@4.40kN/1000 lbf	n/a		sterlingrope.com
■		■	40.1 kN 8838 lbf	n/a	n/a	87.8 g 5.9 lb	Natural/grn/orng	4.1@1.35kN/300 lbf 6.3@2.70kN/600 lbf 8.9@4.40kN/1000 lbf	n/a	Most often used as a lanyard/flipline in short lengths	sterlingrope.com
■		■	45 kN 9920 lbf	15 kN 3306 lbf	18	80g 5.4 lb	Black	3%	47%	improved heat and abra- sion resistance	mytendon.com
■			24.9 kN 5487 lbf	15 kN 3306 lbf	n/a	84.9g 5.7 lb	Black	3.8%	42.2%	Stainless steel mesh inner sheath	mytendon.com

of rope characteristics **DIAMETER:** Nominal - as given by manufacturer **WATER:** floating rope able to be used with rope hardware

Images NOT to scale	MODEL	COMPANY	ORIGIN	COST /metre	Ø	Standards	Materials	Flexibility	Carrier	Access	Rescue	Caving
	Secure 11	TENDON (LANEX)		€2.08 €2.75	11 7/16	EN 1891-A UIAA	Nylon	1	40	■	■	■
	Speleo 11	TENDON (LANEX)		€1.78 A\$4.10	11 7/16	EN 1891-A UIAA	Nylon	1	40	■	■	■
	Static 11/ Military 11	TENDON (LANEX)		€1.99 A\$4.17	11 7/16	EN 1891-A UIAA	Nylon	0.9	48	■	■	
	Static Pro	TENDON (LANEX)		€1.99	11 7/16	EN 1891-A NFPA-G	Nylon	1	48	■	■	
	Patron	TEUFELBERGER NEW ENGLAND		€2.10 €1.75	11	EN 1891-A	Nylon	n/a	32	■	■	
	Patron Plus	TEUFELBERGER NEW ENGLAND		€1.96	11 7/16	EN 1891-A	Nylon	n/a	32	■	■	
	Platinum Protect PES/PA	TEUFELBERGER		>€4.69	11.5	EN 1891-A	Polyester sheath Nylon Core	n/a	32	■	■	
	Platinum Protect PA	TEUFELBERGER		>€4.69	11.5	EN 1891-A	Nylon	n/a	32	■	■	
	Kernmaster	YALE CORDAGE		\$3.17 \$0.96	7/16" 11	EN 1891-A	Polyester sheath Nylon Core	n/a	n/a	■	■	
	Tech-Kern	YALE CORDAGE			11.4		Technora Aramid	n/a	48	■	■	
	Static 11	XIAMEN-ANPEN		\$1.35	11	EN 1891-A	Nylon	1.1	32	■	■	■

NOTES: **ORIGIN** = Company selling the product, not necessarily the country of manufacture **TYPE:** manufacturer's own definition

Cont from page 48

Mostly these are rebranded ropes made by one of the manufacturers we have already listed. Amongst the models we left out are the Liberty Mountain ABC, Brazilian ropes by S.tec and BrazilianRopes.com and the Edelrid Hornet. Actually, we did have the Hornet in as Edelrid's newest rope but we were asked to remove it, aiming it more at the arborist market maybe. The data in these tables is always ridiculously difficult to compile because there is so much conflicting information even with the same company with catalogues or websites saying one thing and the company representative saying another. In the end we've had the various companies sign off their own listings.

MATERIALS: Mostly either Nylon (referred to in Europe as Polyamide) or Polyester with some polypropylene (floating) and

Aramid/Kevlar/Twaron etc (heat & abrasion resistant) thrown in for good measure. One manufacture has corrected the data to Perlon Polyamide6 instead of nylon which a few others could also have done to be precise but have opted to stick with the generic term Nylon.

COST: Some manufacturers stoically ignore our question about a retail price. Companies like Sterling Ropes and PMI are great because they list all prices on their websites - nothing to hide obviously. The rest have signed up to some kind of official secrets cartel but we've circumvented that by listing an approximate retail price from one of their key distributors. These may not be exact but they give you a rough, comparative idea. Prices are given in US \$Dollars, UK £ Sterling and/or €Euro with one or two in ANZ \$Dollars. The figure in brackets where given is an approximate

Tactical	Water	Heat-retard	MBL	Knotted BL	F1 Falls	Wt g/metre lbs/100ft	Colours	Elongation	Sheath mass	NOTES	WWW.
■			28 kN 6171 lbf	18 kN 3967 lbf	17	75g 5.04 lb	Red, Yellow	4.6%	48.5%	Patented 4-layer construction	mytendon.com
			37 kN 8154 lbf	19 kN 4187 lbf	30	77g 5.2 lb	White	3.3%	42%		mytendon.com
■			40 kN 8816 lbf	20 kN 4408 lbf	50	80g 5.4 lb	White, Khaki Black, Camo, Red, Blue	3.3%	40%		mytendon.com
■			40.5 kN 8926 lbf	22 kN 4850 lbf	>5	83g 5.6 lb	White, Red, Blue	3.3@1.35kN/300 lbf 5.6@2.70kN/600 lbf 8.3@4.40kN/1000 lbf	39%		mytendon.com
■			32 kN 7300 lb	18 kN 3967 lbf	n/a	75g 5.04 lb	Red/white/black, Olive, Blue, White/red, Red,	3%	35%		neropes.com teufelberger.com
■			35 kN 7716 lbf	18 kN 3967 lbf	n/a	75g 5.04 lb	White/red, Black/white, White/black, Black	3%	35%	specially designed for heavy loads including winches	neropes.com teufelberger.com
			33 kN 7273 lbf	18 kN 3967 lbf	>5	90g 6 lb	Green/grey/gold Orange (Arbor- Access)	n/a	45%	integrated sheath and core prevent milking. Also available in Orange as ARBOR ACCESS	teufelberger.com
			33 kN 7273 lbf	18 kN 3967 lbf	>5	84g 5.6 lb	Blue/grey/gold	n/a	40%	integrated sheath and core prevent milking	teufelberger.com
■			32 kN 7052 lb	n/a	n/a	82g 5.5lb	Blue/orange Black, Orange/blue, White/red	n/a	n/a	Also available in 3/8"	yalecordage.com
			n/a	n/a	n/a	113g 7.6 lbs	Natural	n/a	n/a		yalecordage.com
■			26 kN 5732 lbf	n/a	n/a	80g 5.4 lb	Black/white	2.8%	36%		anpen.net

of rope characteristics **DIAMETER:** Nominal - as given by manufacturer **WATER:** floating rope able to be used with rope hardware

price per foot. Where the rope is available in a colour that is the price quoted - bear in mind that the same rope in white will invariably cost less.

Some of the data columns are for data not actually listed or even tested by everyone - the US tends not to quote the **NUMBER OF FALLS** or a **KNOTTED BREAKING STRENGTH** and **ELONGATION** is given at 300lb (1.35kN) 600lb (2.7kN) and 1000lbs (4.4kN) rather than the European trend for a single figure quoted for 50-150kg loading over a set time period. **Flexibility** should more correctly be defined as the coefficient of knotability as a ratio of 1 but we couldn't fit that in the header. It refers to deformation of a rope in an overhand knot subjected to a 10kg load but is basically how easy it is to tie a knot. This is again not quoted by everyone but ranges from around 0.6 for the

easiest to tie to 1.1 for the hardest. Ropes closer to 1 hold their shape well, work well in mechanical devices and are easier to untie.

Heat-retard ropes refers to their ability to withstand either direct heat/flame or extreme temperature build up and is usually as a consequence of having specialist fibres like Aramid incorporated into the sheath. These ropes also tend to be marketed as military ropes for high speed descent and extreme abrasion resistance but are obviously a lot more expensive. **WATER** refers to the ropes ability to be used in water AND for abseiling and in raising and lowering systems so they are not simply throw lines. Beal have taken this to a new level with the highly specialised Pro-Water but there is a price penalty that will probably limit its use in rescue far more than it deserves 🙄

Leaders & Subordinates...

Who Works for Who?

by **Kevin Moses**

Sometimes leaders can demonstrate their willingness to work FOR their subordinates by giving them the opportunity to beat on them for a while. Here, a field ranger gets a rare—and legal—chance to pommel his district ranger supervisor during control tactics training.

Several years ago I attended a farewell party for a close ranger buddy of mine—I'll call him Joe—who was transferring from a prominent national park to a new park. The event was held at a restaurant near the district he worked in, and I found myself a comfortable seat in a booth whose seat backed up against the seat of the booth right next to it. I had previously worked at the park with Joe, but had transferred myself about a year earlier, thus there were several folks at the party whom I did not recognize. A few minutes later, one such fellow slid into the booth that connected to mine, I shook his hand, introduced myself, and he introduced himself—I'll call him Dave. After some small talk, I asked Dave how he knew Joe, and with a hint of self-importance, Dave told me that Joe worked for him. About this time, the conversation

became...how do the kids say it these days..."aaawwwkward." I replied, "Really? Joe's your boss?" Dave, appearing put-off, corrected me and explained that he was in fact the new chief ranger at the park Joe was transferring from and that Joe was one of "his" rangers. Now, I realize that Dave didn't mean anything offensive by this, and I realize, too, that it's intuitive for most bosses to get themselves into the mindset that their subordinates work for them, so naturally, Dave was probably confused at my question. The reason I reacted the way I did, though, was because all my professional life—at least in the Park Service, anyway—I've listened to supervisors refer to their subordinates as people who work for them. My view of who works for who is exactly 180 degrees the other way. If a person is designated as a supervisor over other people—ergo, their

leader—he or she has been given a sacred duty, and part of that duty is to work FOR the people they lead. In fact, in a way, supervisory rangers, district rangers, and chief rangers all have two jobs: We have to be excellent rangers and we have to be excellent leaders, and both require our absolute best. Rather than be pompous about my own self-instilled notion, I took advantage of the interaction to express my view to this new chief ranger about who exactly works for who in a hierarchy of command. I told Dave it was my opinion that as a chief ranger, one of his most important roles was to serve his subordinates and provide for their needs, whatever those may be: equipment, training, developmental opportunities, quality fellow rangers, solid programs, and "going to bat" for them when necessary. By doing all of these

things—serving "his" rangers—Dave would essentially be working for them, not the other way around. At the time of this interaction with Dave, I was a young punk and probably didn't know much about much, but I had been fortunate thus far in my few years to have served under several leaders who knew that they worked for me, and did so cheerfully. My scoutmaster, pastor, little league coaches, platoon sergeant and Army squad leader, my first NPS chief ranger and my first NPS superintendent all were leaders who understood that when done right, leadership works for its followership. I've had some knucklehead leaders, too, like a particular district ranger who said to me and my fellow field rangers assigned to his district, "Your job is to go out there every day and make me look good." How disappointing. Not only did this bloke completely



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MISS the idea that he worked for us, his motives were so self-serving that they got in the way of just about every aspect of his attempting to serve as our leader, and his would-be followers came to a “no confidence” consensus about him.

Fortunately, though, my fellow field rangers and I still learned from him...we learned what to NEVER say to subordinates once we became leaders. To be sure, subordinates answer to and are evaluated by their supervisors in a formal structure. But just as importantly, supervisors, when they're doing it right, must answer to their subordinates and should definitely give them opportunities to at least informally evaluate their performance. Every year during mid-year and end-of-year evaluations, I turn the table around and ask the rangers I lead how I'm doing. They know they have full amnesty to communicate to me in clear, unmitigated language what I'm doing well in and what I need to improve in. It's important to me to measure up to my superiors' expectations to me, but it's exponentially more important to me to measure up to the expectations my subordinates have of me. In my previous article, I referred to author and former U.S. Marine Captain Nathaniel Fick's belief in “moral authority” and how, in the battlefield environment, it has so much more power than “legal authority.” As a refresher, Fick's contention is that legal authority is worn on the collar, but that moral authority is the legitimacy granted to a leader by the troops he leads and that it can be revoked by them at any time if he fails them. Another author, and again, another former warrior, retired U.S Army Delta Force commander, Lieutenant Colonel Pete Blaber, touches on this concept from a slightly different angle in his book, *The Mission*,



Obed Wild and Scenic River Chief Ranger (upper left) rigs anchors for his rangers and fellow class mates during a recent technical rescue training course in Tennessee. Big South Fork NRRRA Chief Ranger Randy Scoggins (right) works on his ascending/descending Change-over skills so that he can work side by side with his rangers During technical rescues.



The Men, and Me. Blaber first M stands for the Mission; it's A post-training celebration feast for about 60 participants, provided by the superintendent of Obed Wild and Scenic River and her division chiefs, who aren't afraid to work for the folks they lead.

explains that one of his battalion commanders taught him a vital lesson in leadership early in his career, and it centered around what he called “the 3Ms.” To paraphrase Blaber, who quoted his commander in his book (Editorial note: Blaber served with Delta Force, the Army's pinnacle of special operations. At the time of this writing, female soldiers do not serve in Delta Force, only male soldiers, hence the gender-specific “men.” No offense is intended): “The 3Ms are the key to being successful in life. They're all connected, so if you neglect one, you screw up the others. The

purpose for which you're doing what you're doing. Whether in your personal or professional life, make sure you understand it, and that it makes legal, moral, and ethical sense, then use it to guide all your decisions. The second M stands for the Men. Take care of your men's welfare by listening and leading them with sound tactics and techniques that accomplish your mission, and by always having the courage of your convictions to do the right thing by them. The final M stands for Me. Me comes last for a reason. You have to take care of yourself, but you should only do

so after you have taken care of the mission, and the men. Never put your personal well-being, or advancement, ahead of the accomplishment of your mission and taking care of your men.” Take care of your men's welfare...listen to them...do the right thing by them...lead them...all of this sounds like “work for them” to me. None of this is rocket science, either. It's mostly just “doing the right thing.” Working for our subordinates can be as simple as doing something special for them to show appreciation, such as was the case at a training event I participated in a few months ago at a national park area in Tennessee during which time the park's superintendent and her division chiefs prepared an after-hours feast for over 60 training attendees. Working for subordinates can also be the little, every-day chores, like honoring schedule requests, answering questions in a timely fashion, and purchasing needed equipment and supplies. But it also includes some of the harder stuff, like dealing swiftly and decisively with problem employees in order to maintain the collective morale and being their go-between ambassador, their “voice,” so to speak, with higher management. Whatever actions we take to serve



Former Upper Buffalo District Ranger, and current Dinosaur National Park Chief Ranger Lee Buschkowsky leading his rangers on a cave patrol Fitton Cave, Arkansas' largest cave.



Lower Buffalo District Ranger Jason Flood serving on the ignitions crew during a prescribed fire at Buffalo National River.



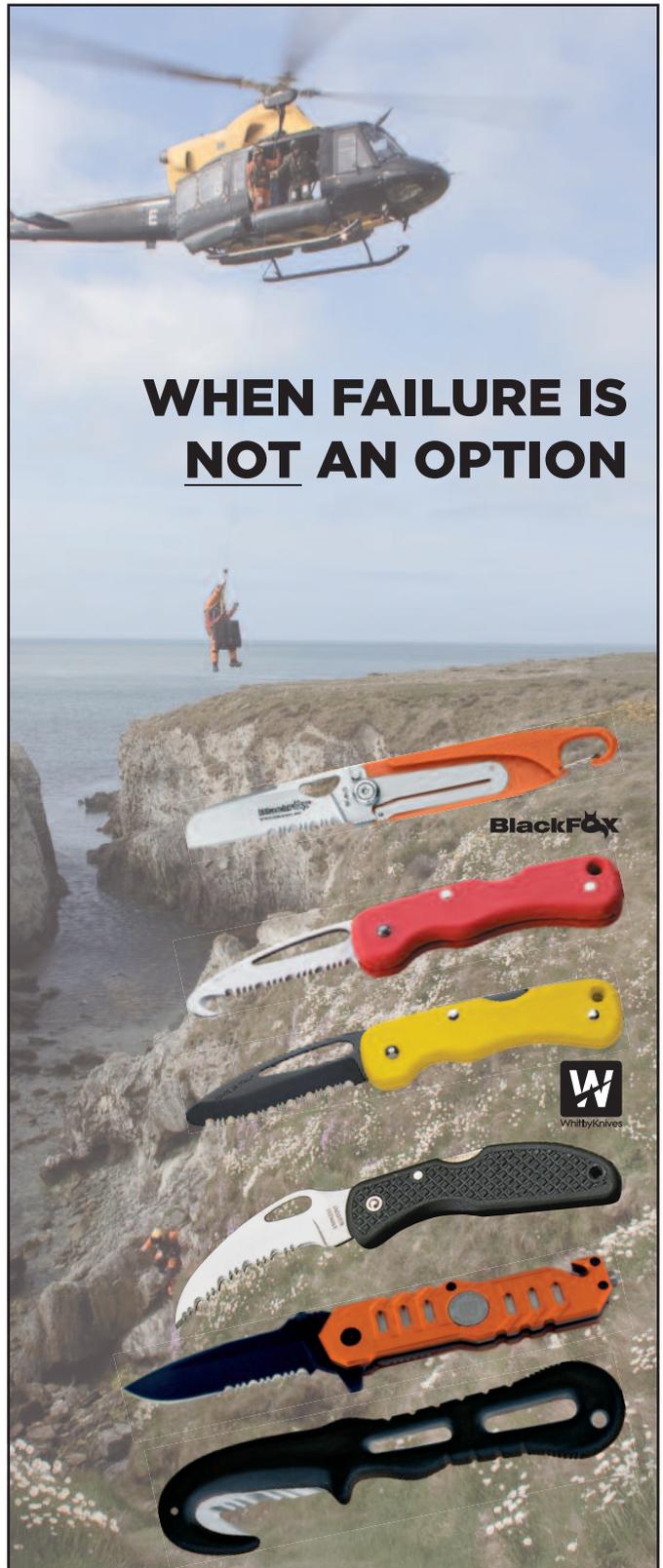
Sometimes working for the folks we lead means providing them with training opportunities so that they're properly trained and equipped to conduct the important, and often hazardous, work required of rangers.

our subordinates, we must remember that sacred duty I spoke of earlier...we must remember to work for them cheerfully, perhaps even feel honored to have been placed a position of their trust.

There's a scene in the movie Braveheart that captures this ideology perfectly: William Wallace has been leading his fellow Scotsmen warriors at the tip of the spear against a ruthless British occupying force. His army is tired, hungry, wounded, fewer than it was, and needing reinforcements from "the nobles" of his own fatherland. Wallace meets with the nobles to recruit their numbers to serve with him and his men on the frontlines, but the nobles quibble and will not fight. Wallace, desperate for help, desperate for a unified front to be made by his country's "leaders,"

implores them: "There's a difference between us." he declares. "You think the people of this country exist to provide you with position. I think your position exists to provide those people with freedom." It's easy to see how Wallace's words can be applied to leaders in any ranger organization. We, as leaders, might not be charged with providing our troops with something as lofty as freedom, but it is our charge to provide them with whatever it is they need. In the final analysis, our positions as leaders most certainly do exist FOR our subordinates. Let's do all we can to ensure that the rangers we lead have confidence that we're showing up every day to work for them.

Kevin Moses is an Instructor with the US National Park Service 



WHEN FAILURE IS NOT AN OPTION

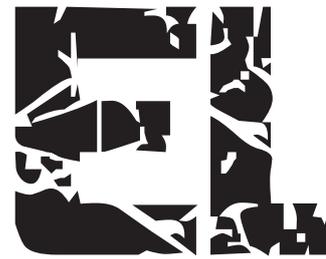
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URBAN



TABLET/IPAD BACK PACK

Hard Case in a Soft Case...

Don't let the 'Urban' tag put you off this back pack. Peli may have identified where the bulk of their money is going to be made on this pack but it's actually far more applicable to the wilderness rescuers and their plethora of electronic search, weather and communications aids. After all, who the hell needs to take 25 cubic litres of gear plus an iPad to the shopping mall? Actually the labelling deserves some mention because my version has the name 'Peli' on it but I've seen the same model with Pelican and Peli in various places around the bag. It may be that North American packs carry the name Pelican and the rest of the world uses Peli?

The concept is simple, integrate a shark-proof, IP67 rated peli case into a soft back pack and better still, make sure you can get at it from the top so that 1) it doesn't fall out when you open the case and 2) you don't have to wade through all your old wet socks and various other dubious items of clothing to get to it. The Elite range of combination back packs includes 4 models divided into 2 Urban Elite and 2 Sports Elite models and within those two models one is for a laptop and one is for a tablet/iPad sized device. The key difference between Sport and Urban is the capacity of the main compartment which is larger in the Sports which also features a waist belt. Other than that, all the nifty storage areas and the well padded back make this a great option for a smaller pack and downright essential for those taking a tablet into the wilderness areas of Echo Park or Wimbledon Common.

CONSTRUCTION

A mixture of ballistic nylon, tough plastic and mesh covered padding with a few pairs of zips and a rubber insert thrown in for good measure. It was a surprise to see a 'made in China' label inside the rucksack portion and it's not clear if this also relates to the integral hard case. I kinda think it does because I've got many Peli cases and torches and this case doesn't have the feel of any of those. Could be wrong of course, it may just be that this a new product requiring a lighter weight option for the tablet protection than a regular peli-case? And I should say straight away that there is nothing at all wrong with Chinese manufacture simply that we always associate Peli with that proudly made in Torrance, California label. Back to the heart of this pack which is the hard-case located in the centre of the pack as you look from above. [ED Peli have confirmed that the case is ABS, a lighter alternative to the polycarbonate they normally use]. And it truly is integral because it not only provides the top carrying handle it forms the attachment point for both shoulder straps. The carrying handle has a tactile rubber insert to provide better grip and sits above the meaty latch

which has a rather garish hazard-style label in yellow and black stating 'BUILT-IN CASE' and an arrow...just in case you have trouble finding the centre of the pack. The hard case has a central foam divider to keep the tablet firmly pressed against the thermo-moulded interior and a pressure equalisation valve on one of the outside edges to ensure that you can get the case open after decompression or pressure change at high altitude. The internal dimensions within the thermo-moulding are slightly different by our tape measure than the Specifications figures opposite, approximately 260mm (10.2") wide by 190mm (7.5") high but on the outside the case occupies a space closer to 330mm (13") wide by 230mm (9") high by 70mm (2.75") . A final detail to mention on the case are two moulded padlock eyes on each side of the handle.

Between your back and the hard-case is a concealed zip pocket the lid of which has a pocket on the inside. On the outside is a lightly padded mesh back with two contoured and thicker pads to protect your bony scapula or is that scapuli?. Similar thick pads protect the lumbar region and disguise another zippered lid access to a slightly deeper, well padded pocket that can also only be accessed when the pack is off your back. This pocket has more 'give' than the larger compartment sat above which is restricted in depth by the back of the hard-case. This is approximately 280mm (11")wide by 180mm (7") high by 70mm (2.75")deep.

All zips appear to be YKK and open from both side/ends with easy to



URBAN ELITE U140

grip cord pulls..

Finally on the Urban Elite are a pair of padded and contoured shoulder straps with metal buckles and fixings rather than the expected plastic. No waist strap on the Urban versions but you could easily jerry-rig something I'm sure. The straps adjust at the shoulder via two sets of 40mm (1.5") webbing and down near your belly/six pack [delete as appropriate] via thinner 24mm (0.95") webbing. The adjustable sternum strap has an odd fish-tail looking 'fastex'-style plastic buckle and this completes the stuff that gets sweaty.

Moving to the sides there are what I thought were two compression straps about two-thirds the way up the pack, in the middle of the hard-case. Turns out there's no way to tighten these straps and they are actually intended to be restraints to stop the case opening too wide and your precious tablet falling out. The strap can be unthreaded to allow you full opening if required. On your left (with the pack on your back) is a small zip pocket that has an elasticated mesh drinks bottle holder. To your right are 6 webbing eyes for attaching all manner of accessories.

And so to the front...or is it the back since it faces away from you when being carried? Anyway, the bit that your colleague walking behind you can see. Immediately in front of the hard-case is the main compartment which in theory can expand to 90mm (3.5") deep at the base and runs the full width and height of the pack. I say 'in theory' because with all these various pockets stuffed to bursting, whichever one is stuffed first wins the



SPECIFICATIONS:

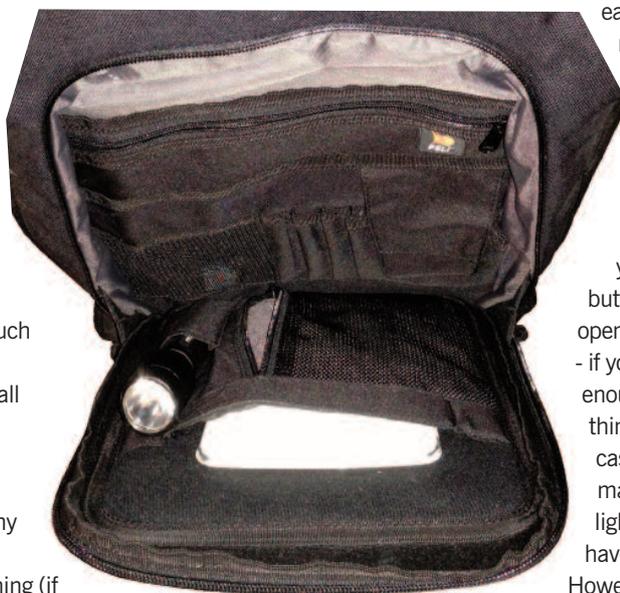
MANUFACTURER:	Peli Products
ORIGIN:	USA
COST:	\$259.
MATERIALS:	Ballistic nylon
HARD CASE DIMENSIONS:	267 x 190 x 43mm 10.5" x 7.5" x 1.7"
PACK DIMENSIONS:	495 x 345 x 292mm 19.5" x 13.6" x 11.5"
WEIGHT:	3.1kg / 6.8 lbs
BACKPACK CAPACITY:	18 litres / 0.6 cu ft
CASE WATERPROOF TO:	IP67 (1m-30mins)

FEATURES:

- Rigid front plate to securely transport e-readers, tablets and notebooks
- Additional pockets for accessories such as smart phones, head phones, water bottles, etc.
- Load Compression straps
- Built-in watertight & crushproof case fits tablets
- Case features fast, top loader tablet access
- Pressure equalisation valve prevents vacuum lock

expansion space and limits the space available in other pockets to some extent. The two chunkiest YKK zips provide closure for the main compartment which, on the inside, is screwed to the hard-case with 18 round headed screws and an 18mm (0.7") wide hard plastic frame. Bear this in mind if putting anything fragile in the main compartment, but with all the other padded compartments available why would you risk a smashed screen? One such padded compartment is the outermost, front zipped pouch. This is roughly 300mm (11.8") high by 220mm (8.7") wide and maybe 20 (0.8") or 30mm (1.2") deep depending on what you've rammed into that main compartment. The outside of the compartment is covered by a stiff sheet of ribbed plastic (with the Peli badge) providing really good protection from penetration or deformation. It also has a small amount of padding on the inside and can accommodate a smaller tablet-style piece of electronic wizardry. This compartment is intended to be your office or stationary cupboard with (pic right):

- one large open pocket on the inside face
- one zipped pocket
- one zipped mesh pocket
- one padded, open top pouch (Kindle sized),
- three pen pouches,
- one open mesh pouch and
- one open, very fat pen pouch or perhaps it's for a spare battery or better still a small LED flashlight.



IN ACTION

The first thing we do with any new item is look at all the fixtures and fittings, at stitching (if there is any) and at material unions, these things will give you a clue to quality and longevity. On the Elite range I like the fact that all seams are overlapped with a strip of ballistic nylon, the zips have an overlapped baffle and the zips are YKK although I had to look twice. In the case of our particular Urban Elite we can't fault their attention to detail, no fraying edges here. The practicality of such a rucksack with an integrated electronics protection case might have been laughed at only a decade ago but nowadays there are very few rescue operations and searches in particular that don't utilise computers and tablets and smart phones. So we've evolved from transporting the bridge of the Starship Enterprise in a caravan of full-size peli cases to rapid miniaturisation and personalisation of electronic assets making this relatively new genre of combination packs an ever burgeoning and welcome addition to the market. The big money is to be made from the modern version of an eighties yuppie (hence the 'urban' tag) but the cases still look to have been made with professional use in mind.

The first consideration would be whether you can actually fit in all that you need for a day's searching and in this respect there will be those who need more and would be best looking at the larger capacity Sports versions and there will be those who prefer to keep things to the essentials and can easily fit those essentials within the four compartments of the U140 using the fifth compartment, the hard case, for your iPad or tablet. The U140 easily made the carry-on size for

international air travel but even allowing it to be abused by baggage handlers in the hold with a fragile E-book reader in the hard case (couldn't quite bring myself to trust them with my iPad) and another in that front pocket didn't highlight any shortcomings. We tried a standard 1 metre drop onto concrete with a naked Ebook reader and an armoured iPad and we hosed the hell out of it and both survived, the latter unsurprisingly since it would have survived in the armour alone. Nevertheless, the key purpose of these Elite packs is to protect your electronics and in this regard, within reasonable limits it succeeds well. There is an art to packing these smaller packs and I took a long time to get it right - too much gear stuffed into that main compartment really impacts the working space of the front pocket. Put softer items like emergency blanket or clothing into that top hidden pocket to ensure that your back doesn't get a niggling pressure point which is always accentuated during running or climbing. The lower pocket is excellent, easily well enough protected for bulkier electronics like medical diagnostics or cameras.

The top handle is familiar to any hardcase user - it's chubby and ergonomic, the rubber insert gives a good tactile grip and it provides an easy attachment point if hauling up El Cap - that's when you'll be wondering if you remembered to inspect the handle union for cracks from that last occasion you dropped it. The case closure has a simple push button which then hinges away from your back. You can open this to get your tablet without taking the back pack off - if you're on a rescue team you surely must be flexible enough to get your arm around to open that closure? One thing to note is that if your tablet has its own protective case, as most will if being used outdoors, the hardcase may not like it. It's designed to house a naked tablet. The light protective covers will fit OK but our iPads currently have armoured cases by Otter and these do not fit.

However, the thermo-moulding has enough give for you to close the case with the iPad case sat on the rim of that internal padding and still close OK. Doesn't get any firmer than that.

A very slight negative would be that, in common with all modern packs the relatively light nylon mesh that does so much to improve comfort on the padded body-contact areas is also the first thing to wear out, nothing at all to be concerned about yet but the signs are there.

And that integral hard case.... it's a brilliant concept, so much simpler than the obvious alternative of putting a peli case inside a rucksack because you then have to take the pack off, take the case out, open it, put it back, you get the idea. The Elite allows you to reach behind, grab your security blanket tablet, get your fix and put it straight back, all without missing a stride on the walk in to the rescue site. But given the slight variances in tablet size and in particular the range of additional protective covers perhaps this should have had more forgiving thermo-formed inner dimensions?

Overall, the Peli/Pelican U140 and indeed the entire Urban Elite range look like a damned fine departure from Pelican's traditional hardcase range. Well made, great features and as versatile as a chameleon but most importantly your iPad, smart phone, tablet and mini-tablet will thank you for it. The hard-case is the key, that and the reputation of Peli are the key reasons you would part with up to \$260 to provide protection for your electronics even if you end up a couple of feet under water! 📱

TAKING DESCENT TO NEW HEIGHTS

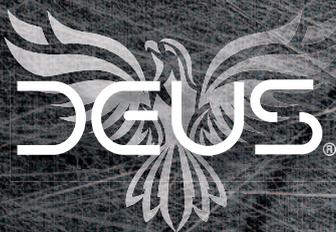


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