



G Crib Gogh

**ASCENT SOLDIER SYSTEM AND
OPERATIONAL CAPABILITY**



HELIX





Ascent is a mission specific Torso Sub System (TSS) that can and does enhance the Generic Soldier Architecture (GSA), answering the needs and demands of the soldier in today's various theatres of combat.

The changing dynamic and the need to view the "Soldier as an operational platform", creating an integration of capabilities, brings new solutions to major challenges. Not all generic systems meet the specific risk to life operational needs that some combat units require and Ascent bridges this shortfall.

This is the only system at the time of publication and certainly the first TSS platform that is fully certified to BS EN:361 and is qualified to meet the international standards for safety at height.

- The Ascent Torso Sub System is fully codified with NATO Stock Numbers.



ASCENT SOLDIER SYSTEM AND OPERATIONAL CAPABILITY

■ SCALABILITY

The Crib Gogh TSS platforms are the only systems that come with a genuine scalability that is not only multifunctional and multi-operational, but they have no hook or loop in the systems. They all utilise our unique and patented buckle systems that not only enhance mobility and movement, they also make scaling up or down simplistic and fast. As protection is becoming more and more crucial and mission complexity increasing, the physical demands on the soldier are ever expanding. The Ascent TSS is complimented and matched by the Revision Caiman scalable helmet, boasting unique operational step changes that make the Ascent platform a true step change.

Mission specific needs require having load carriage that integrates seamlessly with the system and options that are tailored to the unique requirements of Specialist Cadre's. Ascent takes these operational factors into account and becomes a risk to life solution that increases survivability and the lethality of the dismount in the execution of their duties.

■ WEIGHT DISTRIBUTION

Crib Gogh have worked with the Royal College of Physicians and have developed what is regarded as one of the best Weight Distribution Systems (WDS) in service at this time. Unique in its features it not only works with the muscular-skeletal chassis, it also enhances air flow and cooling, gives higher levels of comfort and increases the survivability of the dismount with high trauma reduction properties that were tested by both Her Britannic Majesty's Defence Scientific and Technology Laboratories and Helston Forensic Laboratories¹ stating that the WDS increases the survivability of the wearer by 70 per cent over the next best vest in NATO.

■ REDUCING THE BURDENS

Ascent through the innovative design and the input of our working partners have led to the increase in survivability, a significant reduction in the thermal burden and in turn reducing the cognitive burden. This all makes the user, use less energy when operational, increasing their operational awareness for longer periods.

¹ Crib Gogh TSS systems were tested at Helston in 2014 against a full spectrum of NATO TSS systems where they were all shot to see what survivability the carrier offers in a ballistic impact. The Crib Gogh systems offering a 70 per cent increase in survivability over the next best vest.



■ THE THREAT

The threats facing tier one operational units seems to change almost daily with asymmetrical combat evolving at an incredible rate. Ascent meets a number of these threats that gives the user unique step changes in the execution of their duties. Vertical Assault from mountain warfare to high rise urban warfare has huge inherent risks for the troops that train for this operational theatre of combat.

The cost to train these unique and specialist troops is immense and the time to master all of the associated skill sets needed to qualify is significant. Each one of these unique troops is a capital investment by their respective governments and maximising their survivability is both a key and legal requirement to maximise in this investment.

■ TECHNICAL KNOWLEDGE

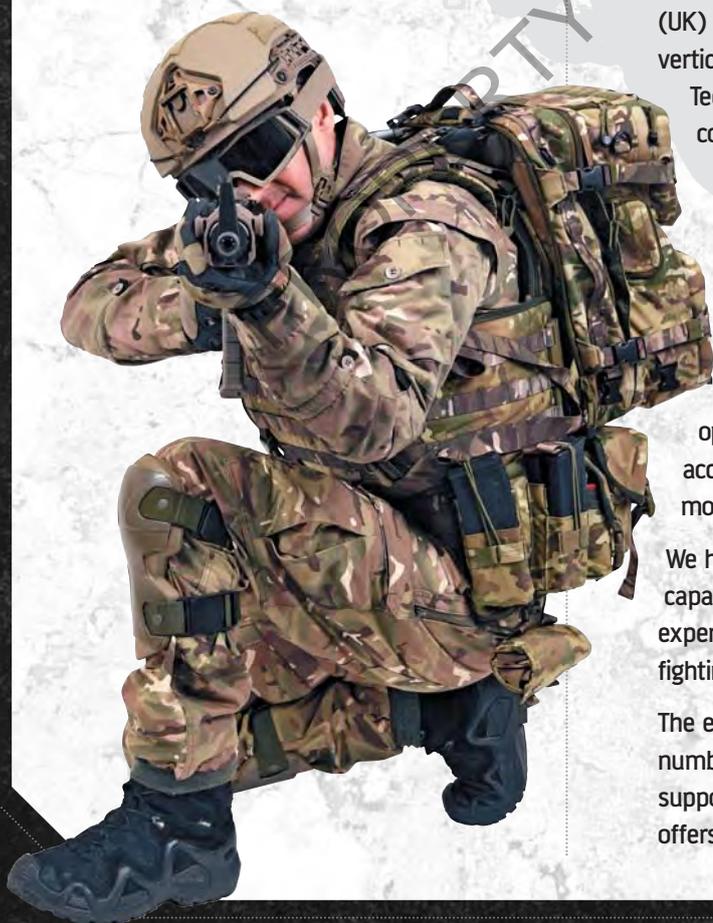
Crib Gogh was the first company to utilise trauma mitigation as standard in a TSS capability. We were the first to have a completely integrated system in 2009 with the Spartan TSS system. This allowed a rucksack to encapsulate the rear plate protection in to the rucksack design that gave the load carriage seamless integration. Our working partners, The Royal College of Physicians (RCP), The Royal Society of Science (RSOS) Her Britannic Majesty's Defence Scientific and Technology Laboratories (DSTL), Helix DMM of Wales (UK) Ltd, Revision Military HSS Systems UK Ltd and D30 (UK) Ltd have created what is deemed to be an unparalleled vertical assault capability for Urban, Mountain, Maritime and Technical Rescue that is the envy of the defence industry and a complete operational capability in a one stop shop.

■ TACTICAL ADVANTAGE

With all of our working partners the Ascent Tactical Platform offers a tactical advantage in every operational scenario where ascent or descent capability needs are required. We will provide equipment, systems and training to enable special operators and cadre's to work with speed, ease and safety when accessing objectives across a wide range of environmental terrains; mountain, urban or maritime theatres of combat.

We have been at the forefront of combat systems and TSS capabilities development for over 10 years and have used our experience to work with units to modify and develop capable fighting systems for the tactical environment.

The entire commercial Ascent team have worked closely with a number of tier one units who require that special operational support and unique service that the Ascent Operational Capability offers.



ABSTRACT TORSO SUB-SYSTEM

■ ABSTRACT

Combat situations are diverse and vary greatly from one operational context to another. Land, Airborne, Maritime and a variety of terrain and environmental factors impact greatly on the optimum system design.

There are no Soldier Systems that can properly claim to cover every operational need and to function in every context and environment required.

Ascent is a minimal silhouette Soldier System integrating load carriage, soft and hard armour protection and a belay designed for combat situations involving:

- Vertical ascent and/or descent.
- Working in tight spaces such as bulkheads and buildings.
- Working in a situation that requires rope safety.
- Working in a situation that requires the soldier to be anchored to a fixed point.

■ COMPLIANCE AND GOVERNANCE

Ascent is designed to preserve life in a combat situation, in particular one where the added risk of injury from a fall from height is apparent. Ascent therefore must undergo testing as a safety harness. Crib Gogh Ltd approached the problem by ensuring the necessary components of the system are certified to:

- BS EN 361:2002 – Personal protective equipment against falls from a height. Full body harnesses.
- BS 13407:1999 – Human-centred design processes for interactive systems.
- ISO 105 B02:2000 amdt 2.2000 – Tests for Colour Fastness.
- ISO 13934-1-1999 – Tensile testing standard determining fabric strength.
- ISO 13937-2000 Textiles – Tear properties of fabrics – Part 1: Determination of tear force using ballistic pendulum method (Elmendorf).
- ISO 811-1981 – Textile fabrics – Determination of resistance to water penetration – Hydrostatic pressure test.
- FMVSS 302 title 49 section 571.302 – Flammability of interior materials (Phosphorous test).
- BS 5131, part 11:1981 (1992) Buckle Strength (derived from foot wear as no vest standard existed).
- ISO 2062:2009 – Textiles – Yarns from packages – Determination of single-end breaking force and elongation at break using constant rate of extension (CRE) tester.
- BS 3084:2006 performance code C – Slide Fasteners.
- STANAG 2895 – Extreme climatic conditions and derived conditions for use in defining design/test criteria for NATO forces materiel.
- EU Regulation 1907/2006 REACH – 138 substances in candidate list.
- BS 5131, Part 11:1981 (1992) – Tear Strength of straps (derived from foot wear as no vest standard existed).





The platform is based around a MOLLE belt that is designed to allow a yoke and a full complement of pouches, or a load vest to be quickly fitted to allow for basic soldiering drills. It can then be scaled up to a full operational tactical vest. With the addition of the front harness, it is then a tier one system for any asymmetrical vertical assault requirement.

There is absolutely no stress to the spine from weight carried along the back with this system. Putting weight on to the lumbar region of the spine adds to long term disc and spinal damage later on in life.

None of the Crib Gogh range, including the rucksack range, puts the weight on to the spine but on to the working muscles along the back.

DESIGN STATEMENT

Countless hours were dedicated to the design of the system with as many again in testing. Working with other Ascent platform partners making sure that all of the components of this capability have a unique and seamless integration when operational.

Taking the best of the UK's RCP consultants and the DSTL's input, our design philosophy resulted in the following design features:

■ **Full System Integration** – All of the system components are designed to work seamlessly together in a manner which enhances rather than inhibits the performance and function of each system component whatever the operating terrain. Allowing full military kinetic drills to be achieved.

■ **Operational footprint** – Special attention was put into streamlining the final system by eliminating any loose ends with a completely clean front. This allows the dismount to manoeuvre in places where other systems fail due to the pouch configurations along their front. This meets all of the dynamic shooting drills required by today's tier one capabilities.

■ **Robust, Lightweight yet Durable** – Materials and design were carefully chosen to achieve maximum performance, comfort and survivability with the lightest possible weight, yet giving the maximum comfort, cooling and protection.

ASCENT CONSISTS OF THE FOLLOWING ITEMS:

- MOLLE belt
- Yoke
- Front plate carrier
- Rear plate carrier
- Left and right hand side panels
- Soft Armour Packs
- Hard Armour Plates
- Front Helix Harness Assembly and Carabiners

The system allows the user to assemble the MOLLE belt with the operational pouches required, for the needs of the mission to be completed. The front panel of the vest is MOLLE lined but it is recommended that in any vertical assault that the front of the vest remains clean and clutter free.

The system has a built in belt order capability and this benefits the user by:

- When in enclosed areas (FIBUA, breaching, bulkheads, deck heads, tight crevasses etc.) a clean front will allow the natural articulation of the body to achieve difficult and tight manoeuvres. Systems with pouches on the front prove to be cumbersome and restrictive and do not allow for natural movement.
- The belt with pouches correctly fitted will allow the user to follow the natural articulation of the lumbar region of the spine. The chest area has no natural articulation and adding pouches reduces the ability to manoeuvre in tight spaces.
- A clean front allows the harness to fit correctly.
- It will reduce the inherent problems with an arrest fall at height.
- It reduces the silhouette when in tight areas under fire.
- Crib Gogh's unique buckle system allows the wearer to scale up in under a minute.

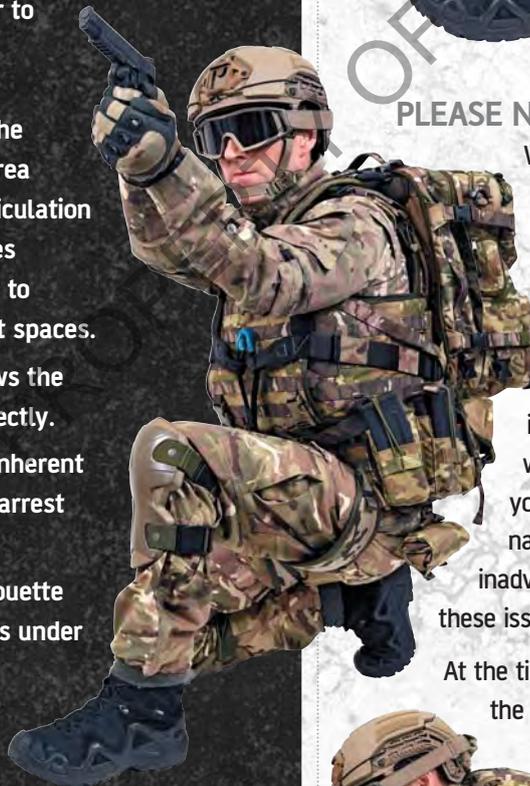


**MEETS FULL
DYNAMIC
SHOOTING
DRILLS WITH
HARNESS
FITTED**

PLEASE NOTE:

Wearing a SAR harness system over a tactical vest, TSS or plate carrier may not be operationally safe and may not meet the legal requirement BS EN:361. In an arrest fall the system is not tested for blood pooling or snatching, you may run the risk of the harness damaging your neck or stopping the blood supply to your head. You also run the risk of vest lock, impairing your ability to move and fight. If a harness is worn under a vest then the same issues may apply as you impair the safety of the harness and restrict it's natural centre of gravity, and you may run the risk of inadvertently inverting. Ascent was designed to remove these issues making it the system of choice to climb and fight.

At the time of this document being published the Ascent TSS is the only system available that is fully certified to BS EN:361 and meets all legal requirements² for safety at height.



² www.safesite.co.uk/assets/uploads/Work_at_Height_Legislation_and_Guidance.pdf
It is a legal requirement that all systems meet BS EN:361 and EN:365.

THE HEAD SUB-SYSTEM (HSS)

The Caiman Carbon Hybrid Helmet, is a streamlined, lightweight next-generation helmet designed for specialist operations and Cadre's. Unique in its approach to SF operations allowing the end user to have higher levels of comfort and lower levels of neck and cognitive burden as they approach their objective.

The simplistic approach to accessory and component integration, allows the end user to increase the protection level of the Caiman Carbon Hybrid system with a ballistic applique for varying threats and unpredictable scenarios. Designed with high levels of airflow that will reduce the heat in the head area allowing a more natural heat release process in high stress scenarios.

This reduces both the thermal and cognitive burdens³ allowing the end user to have a higher state of readiness when engaging their operational threat. Heat loss through the head is between 7-12 per cent and failure to release this heat can lead to a dull headache and nausea.

When the Applique is fitted the design still allows a higher degree of ventilation over other modular systems. This is a particular bonus for Littoral Military Manoeuvres, as the Caiman reduces the stress on the occipital lobe whilst in a sea borne raider and if they were unfortunate enough to go overboard, the venting system allows a higher level of water flow reducing the initial stresses on the neck with entry in to water.

A series of modular accessories – including a Wilcox® Mount, a lean rail system and an innovative multi-size pad and liner system – enhance this helmet suite, ensuring SF operators are equipped with the lightest, most comfortable, and

highest performance head protection possible.

Working directly with tier one SF units and specialist Cadre's, Revision built the Caiman Head System from the ground up, crafting a helmet solution designed for peak performance in high-intensity, volatile conditions – optimised for riverine, maritime, high-altitude, free-fall, and ground manoeuvres. The result: an unconventional helmet system for unconventional missions.



KEY FEATURES:

- Only Bump System that provides bump and scalable armour, ballistic protection.
- Bump System exceeds industry standard impact requirements.
- Bump with Applique: exceeds industry standard ballistic protection requirements.
- Multiple Sizes: 39 per cent of users benefit from a better-fitting, lighter helmet.
- Weight: Advanced materials and manufacturing process achieve a lightweight helmet solution.
- Best-in-class suspension system provides comfort and impact protection.

³ Reference www.bmj.com/rapid-response/2011/11/02/head-cover-cold Heat loss through the head is between 7-12 per cent and failure to release this heat can lead to dull headaches, increased thermal burden and nausea.

THE HEAD SUB-SYSTEM (HSS)

KEY FEATURES:

- **Unique Suspension System Design:** Customisation and design features mean seamless integration with military and communications equipment.
- Suite designed for a range of uses including ground and maritime environments.
- Integrated and fully scalable allows operators to increase or decrease the level of armour protection with the ballistic applique, Rails & NVG Mount.
- Ground-up design: minimizes weight & bulk while offering maximum protection & performance.

BALLISTIC PERFORMANCE (COMPLIANT WITH APPLIQUE)

- Significantly exceeds 17G FSP at 670 MPS.
- Stops NIJ IIIA level threats.
(9mm, 44 mag & .357 SIG) (NIJ 0106.01).
- Meets U.S Army Standard for impact protection (CO/PD-05-04).

SHELL GEOMETRY & CONSTRUCTION

- A carbon bump shell, provides extreme impact protection and structural rigidity.
- Designed to increase or decrease the level of armour protection with the ballistic applique to achieve the same level of protection as a ballistic helmet.
- Reduces the thermal burden.
- Reduces the cognitive burden.
- Modular Suspension System.
- Impact liner provides best-in-class impact protection.
- Comfort liner – optimised for stability, comfort and heat mitigation.
- Removable, repositionable sections – for integration with overhead communications equipment.
- Dial Ratchet Mechanism adjusts the fit band – provides on-the-fly dial adjustment whilst retaining one hand on a weapon.
- Skeletal rails – are rugged, durable design but 30 per cent lighter than current rails.
- Optional cable management bungees – ensures bungees are securely attached.
- Easily adjusted for a comfortable fit with one hand still on a weapon.



D30 PADDING AND PROTECTION

D30 are probably the industry leader with extremity protection especially in high risk hazardous areas where high skill sets are required and high protection needed. The D30® High Performance (HP) External Knee and Elbow pads have been engineered primarily for the military tactical market. The composite construction incorporates Lite by D30 material for long-term resilient comfort, a D30 XT insert for focused impact protection and a hard shell for puncture and abrasion resistance.

PRODUCT FEATURES

- D30 TRUST HP Pads offer a 50 per cent reduction in trauma when compared to the leading competitor.
- Pads feature Lite by D30, the latest in D30's lightweight materials.
- Pre-curved for ergonomic enhanced fit.
- One size fits all – wide adjustable elasticated fabric straps.
- Suitable for tactical and workwear as a low profile, durable solution.



HELIX TACTICAL SOLUTIONS

The Helix-DMM International Group specialise in the manufacture of equipment and systems for operating safely and efficiently at height. They have proudly manufactured all of their hardware in the United Kingdom since 1981. Over that time they have established a reputation for innovation, quality and industry leading products that are now in service with a number of tier one units.

The high standards of quality control maintained throughout the process of taking the raw material to finished product, are reflected in the fact that each and every day, thousands of people around the globe rely on DMM products to safeguard their lives.

The following core competencies are:

- Mountain Operations.
- Urban Operations.
- Maritime Operations.
- Rescue and Casualty Evacuation.

■ MOUNTAIN OPERATIONS

The mountain environment varies enormously and requires a broad skill set for teams to be able to move across a wide variety of terrain and obstacles. The systems Helix Tactical offer allow a full spectrum of operations to be carried out no matter whether it is a small team moving quickly with lightweight systems, or whether it is moving a company en masse onto high ground.

The Helix Ascent systems can increase the capability of units to move over scrambling/fifth class terrain, climb rock, ascend, descend, navigate, haul supplies and cross obstacles such as ravines or fast flowing water and all with kit that will minimise the weight burden and pack size that needs to be man portable.

The Ascent Operational capability provides equipment systems and training to enable units of all sizes to move over steep terrain in all environments and seasons.

All of the systems are tested and proven with combat units operating in the full range of conditions from hot, arid landscapes, to the high alpine mountains.

The Ascent capability has supported mountain professionals and specialist mountain troops allowing us to deliver a capability that is always at the cutting edge of operational capability and technology. Maintaining the operational step change.

■ ACCESSING HIGH POINTS IN ROCKY TERRAIN

A range of equipment and systems to allow small teams to access high ground for observation points and ISR operations.

■ TACTICAL CLIMBING

Full racks of climbing equipment in subdued colours to allow mountain leaders to establish access points through steep terrain and establish fixed lines for the main troop to follow.



MARITIME INTERDICTION

Ascent when stripped down to its basic form as a plate carrier, will meet the operational needs for Maritime Interdiction. Offered with the Helix R3 or Renegade seat harness it will allow the end user to swim with a tactical load of up to 18kg of operational equipment.

PLEASE NOTE:

The Ascent MI is offered as a unique operational capability that comes complete with special armour and unique buoyancy insert fillers incorporated in to the system.

The Ascent MI is advised to be used as a separate entity to the Ascent Vertical Assault platform, but can be used for both operational needs.

The specially designed Soft Armour Panel (SAP) is designed to add to the floatation of the vest and when fitted with our armour solution will allow a maritime end user to swim with a load of up to 18KG.

The Ascent MI is offered with POM quick draw ammo magazines that are designed to work with the seat harness.

Both the R3 and Renegade harnesses offer full movement when in the water and allow the natural movement of the legs when swimming.



THE RENEGADE HARNESS FULLY LOADED

R3 COMBAT HARNESS

Full certification with both harnesses mean that the Ascent MI meets all military and civil legislation for safety at height especially when scaling a ships side. Meeting BS EN:361/365/12277.

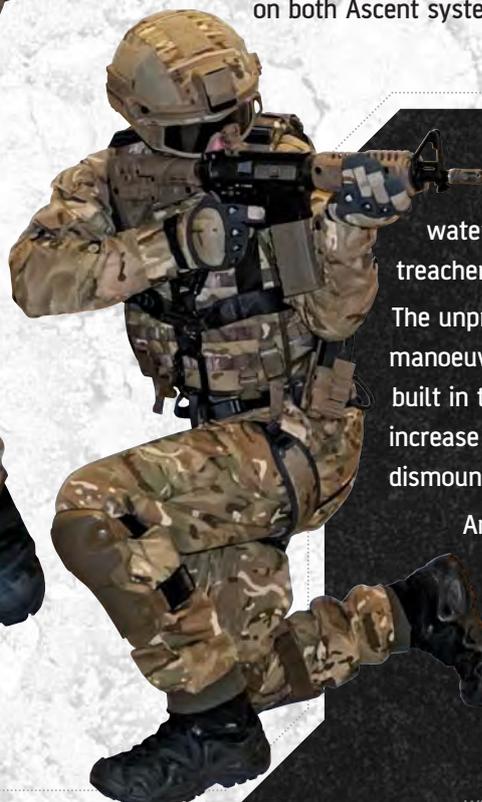
■ FULL ARTICULATION

The Ascent MI allows the full movement of the rotator cuff allowing full movement of the arms when swimming with a full load.



■ HELIX DSD-PLUS

Adjustable gear loops are available to meet the ninety-five percentile fit that will allow the correct centre of gravity on both Ascent systems.



Boarding a hostile vessel in rough waters with a combat load can be treacherous.

The unprecedented high levels of manoeuvrability and high trauma reduction built in to the design and features of Ascent, increase the survivability and lethality of the dismount as they perform their duties.

An optional life preserver is also available that is purposely designed to integrate with the vest without obstructing any of the belay or anchor points.

■ OPERATIONAL RESUPPLY

A comprehensive range of micro systems allow efficient and fast resupply to larger systems to haul ATBs out of ditches.

■ CASUALTY EVACUATION

Equipment and systems to facilitate all sizes of team to evacuate injured personnel across steep and rough terrain. Comprehensive systems from micro pulley/haul/lower systems, to larger company level packs that allow complex 3 dimensional manoeuvres.

■ URBAN COMBAT FIBUA (FIGHTING IN BUILT UP AREAS)

Urban environments are inherently complex environments that can be difficult to manoeuvre in without the correct ascension tools; walls, buildings, trenches, and rubble create potentially challenging obstacles as well as an ever changing insurgency threat.

With the individual's ability to move with the Ascent TSS, the capability offered allows unprecedented ease of access and superior mobility in urban scenarios and gives units a far wider range of deployment capabilities.

Ascent Operational capability provides a full range of training solutions that can be adapted to cover everything from basic techniques to looking at full



mission profiles. Bespoke solutions, equipment systems and training are available on request.

The equipment gives operators the ability to fire a grapnel hook 35m vertically to establish a high anchor point, ascend with a motorised winch up to 100m/min, leap frog past choke points with lightweight carbon ladders, and insert large teams into lower floors quickly whilst avoiding ground level entry points.

All systems are designed to be light, modular and tough so that they can be carried easily and then quickly built up into a custom configuration to overcome the specific problem being encountered.

■ CROSSING WALLS AND OBSTACLES

Walls can be crossed using a wide range of ladders – rigid modular ladders that are leant against the wall, or rigid-flexible ladders that are placed by a pole and hung from a hook or hooks. If the drop off on the other side is too high to jump or for a hand lower, a flexible wire ladder can be dropped down the far side.

■ ACCESSING HIGH LEVEL WINDOWS AND ROOFTOPS

Recent insurgent incidents have proved the need for this capability as it meets a global threat. Grapnel launchers can reach up to 35m vertically, whilst the latest pole ladders can reach 15m with their flexible ladders attached, and can be positioned by a single person.

■ EGRESS AND DESCENT

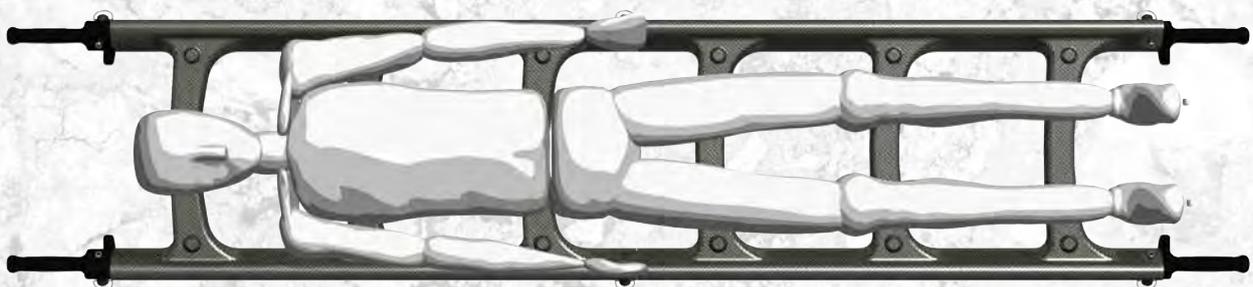
Ascent TSS allows operators to descend into position or make an emergency egress. The systems can be pre-rigged with both descender and rope protector for fast deployment, and can be converted easily into vertical ascent systems.

■ CLIMBING LIFT SHAFTS

Special grab systems allow ascent and descent insertions within the building, highlighting a need when accessing an area that is exposed to IED threats.

■ CASUALTY EVACUATION

A full range of systems that allow casualties to be extracted from high urban positions from micro systems, that allow fire teams to either lower or raise personnel using full or twin line systems for assisted vertical or horizontal lifts in confined spaces. Systems that also offer multi-operational solutions.





■ TRAVERSING GAPS OR BUILDINGS

The ability to cross between buildings or get over blown out floors with ladder systems that can be used as a bridge, or with hi-line and Tyrolean rope systems.

■ ACCESSING LOW ENTRY POINTS

The multiple solutions for low level access allow operators the ability to

be very flexible in how to access a position; assault ladders, hanging ladders that can reach up to 12m, flexible ladders placed by poles and hook and climb systems with integrated pulley/haul systems. Plus the good, old fashioned climbing of external features such as drainpipes.

■ LITTORAL MILITARY MANOEUVRES (LMM)

The access systems and equipment available within the full Ascent range

supports vessel boarding's and dive operations with the tools needed to board all types of ships and marine structures. Once on board the same kit allows operators to climb and manoeuvre to inspect containers and to access confined spaces. This tactical step change with the Helix ranges and the Ascent TSS gives the end user higher levels of operational performance with an ever changing maritime threat.

ASCENT OFFERS UNPRECEDENTED LEVELS OF CAPABILITY, DYNAMIC AND OPERATIONAL PERFORMANCE



Crib Gogh

Frayling Business Park
Davenport Street
Burslem
Stoke-on-Trent
Staffordshire
ST6 4LN
United Kingdom

t: +44 (0)1782 435999
e: info@cribgogh.com
w: www.cribgogh.com

Decimal
Latitude 53.047007
Longitude -2.2110389

Deg-Min-Sec
Latitude 53° 2' 49.2252"
Longitude -2° 12' 39.74"

The Ascent Soldier System is part of the Crib Gogh LCP capability. Crib Gogh Ltd is a UK Defence company 5809453

[dst1]

 THE ROYAL SOCIETY



The Defence, Scientific and Technical Laboratories
Her Britannic Majesty's
Ministry of Defence



Royal College
of Physicians