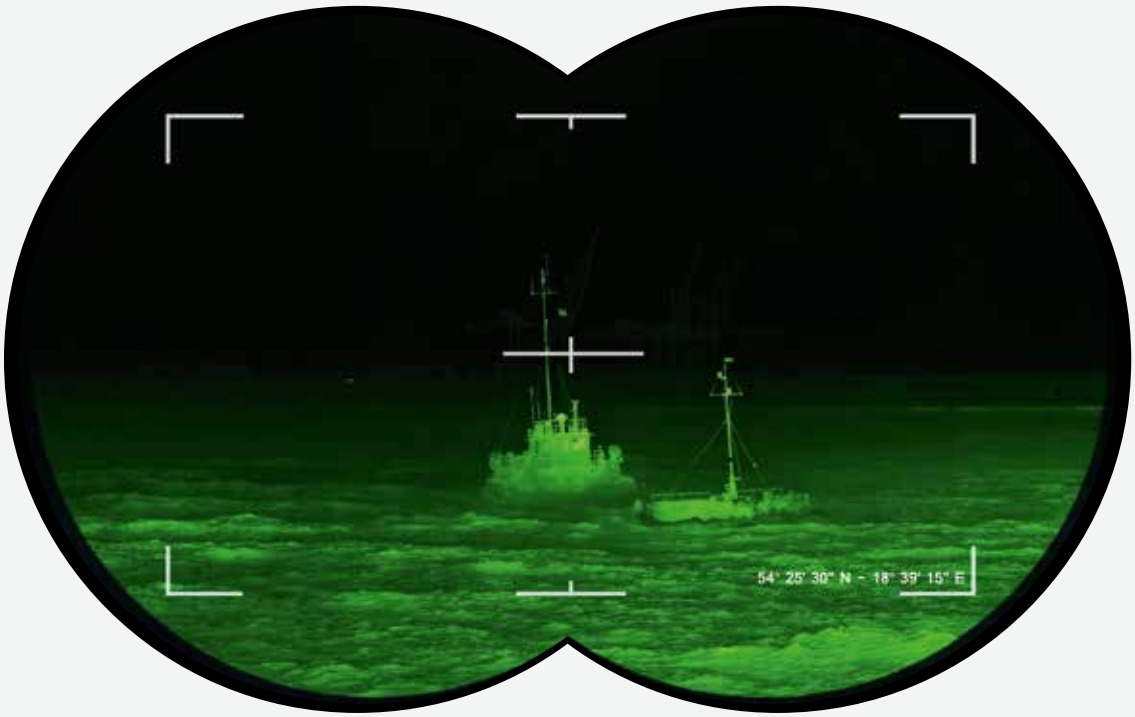
Security solutions



Privacy is an essential requirement for all superyacht owners, but as threats become increasingly sophisticated, security contractors are having to work ever harder

TONY JONES REPORTS

Security awareness has increased enormously over the past decade. Not so long ago it was quite normal to find large luxury yachts moored stern-to in Mediterranean ports with the passerelle stretched out, all of the crew forward, and no one on watch. The owner and his guests would be relaxing just a few yards from a busy public quay.

That was back in a more innocent and trusting era – before the advent of International Ship and Port Facility Security (ISPS). This amendment to the SOLAS convention prescribes responsibilities to governments, shipping companies, shipboard and port/facility personnel to 'detect security threats and take preventative measures against security incidents affecting ships or port facilities used in international trade'.

Certain types of vessel, including all superyachts above 500grt, must therefore acquire an International Ship Security Certificate (ISSC) in order to operate normally.

An essential element is access control, not only to the vessel itself but also to different areas on board. This is normally achieved through programmable swipe cards. The owner, captain and senior members of the crew may have 'access all areas' cards, whereas guests will be normally limited to their own cabin, communal accommodation and recreational areas. This is particularly true when the yacht is on charter.

Crew selection process

Many superyacht crewmembers come into intimate contact with the owner, his family and guests on a daily basis. Clearly, it is vital that they be law abiding, dependable and endowed with appropriate personal qualities. They must also have appropriate professional qualifications. Crew agencies such as Camper & Nicholsons and Super Yacht Crew take these essential requirements very seriously.

"Vetting candidates is probably the biggest challenge of our work and the primary added value that we provide as crew agents," explains Deborah Blazy of Camper & Nicholsons.

"If a captain or owner uses a crew agency it's because we provide reassurance and offer more than just a CV. Of course, as an MLC-compliant agency we have stringent procedures in place to ensure that all deck and engineering certificates are verified with the issuing maritime authority, and that each candidate's medical certificate is valid, with no limitations. However it goes much further than that. We follow up with previous owners, captains and heads of department to gain first-hand feedback about the candidates we present. Certainly written references are a plus but the true story generally comes through direct contact with those who have hired and worked with the candidates in the past.

"Each candidate we send out has also been interviewed face to face by one of our specialists to gain a better understanding of their personality and to ensure that we make the very best possible match of the candidates with the yachts and the positions available.

"Each of our agents has extensive yachting experience and knowledge – which is definitely a plus when matching the right candidate with the right position," says Blazy.

When hiring a new member of staff to join a superyacht crew, the selection process is both comprehensive and thorough.

"Many yacht owners have a need for confidentiality and discretion, and therefore trusted agencies such as ours take away the time-consuming aspects of hiring staff from the yacht itself," says Charlie Stanton, a recruitment consultant at Super Yacht Crew.

"We make it our first priority to check every single candidate's references as part of our screening process. Candidates are expected to display their previous history and personal information in a clear and honest way along with contact details for references. Alternatively, written references are acceptable so long as they are signed and dated to confirm previous employment. This means that we can provide the best crew members to our superyacht clients with confidence," continues Stanton.

Understanding the threats

Virtually all superyacht security companies stress the primary importance of being aware of the wide variety of risks and having plans in place to deal with each one.

"Preparation is everything," argues Wayne Britton, a superyacht specialist at Securewest International, a leading global security company that provides virtually all the

Deborah Blazy of Camper & Nicholsons (left) and Charlie Stanton of Super Yacht Crew

services that a superyacht captain or head of security could wish for – from ISPS compliance, through risk and security assessments to tracking systems and the provision of close security teams.

"Management companies, captains and crew who have not prepared have almost no chance of surviving with their business and reputation intact. Understanding your operating environment and the threats faced, internally and externally, is critical.

"Conducting detailed risk assessments will identify specific vulnerabilities. Appropriate plans, crisis management teams and mitigation measures are then put in place. Training and testing are fundamental to make sure that all are fit for purpose," says Britton.

> **Superyachts travel far** and wide, so keeping owners and crew up to date with the ever-changing threats in various areas is part of our service

Because threats are continuously changing and shifting, having up-to-date information is essential. Dryad Maritime is a specialist in this area, and the publisher of the highly regarded monthly maritime security circular and quarterly maritime crime statistic reports, as well as timely extras such as the Mediterranean Advisory Report of November 2015.

"Superyachts travel far and wide, so keeping owners and crew up to date with the ever-changing threats in various areas is just part of our support services to yacht managers and captains," says Dryad's chief operating officer, Ian Millen.

"Based at our high-tech 24-hour manned operations centre, our teams are supported by bespoke intelligence, meteorological and maritime operations software, and our practices are underpinned by ongoing research and development. We understand the pattern of life in each area, so we can detect changes that indicate an elevated climate of risk.

"Our team is formed of experienced maritime operations and intelligence specialists and professionals from a variety of commercial disciplines and we are confident that our depth of knowledge and analytical base is unrivalled in the maritime-security marketplace.

"Although we don't recruit or employ privately contracted armed security personnel or maritime security operatives ourselves, we are in touch with companies that provide those services.

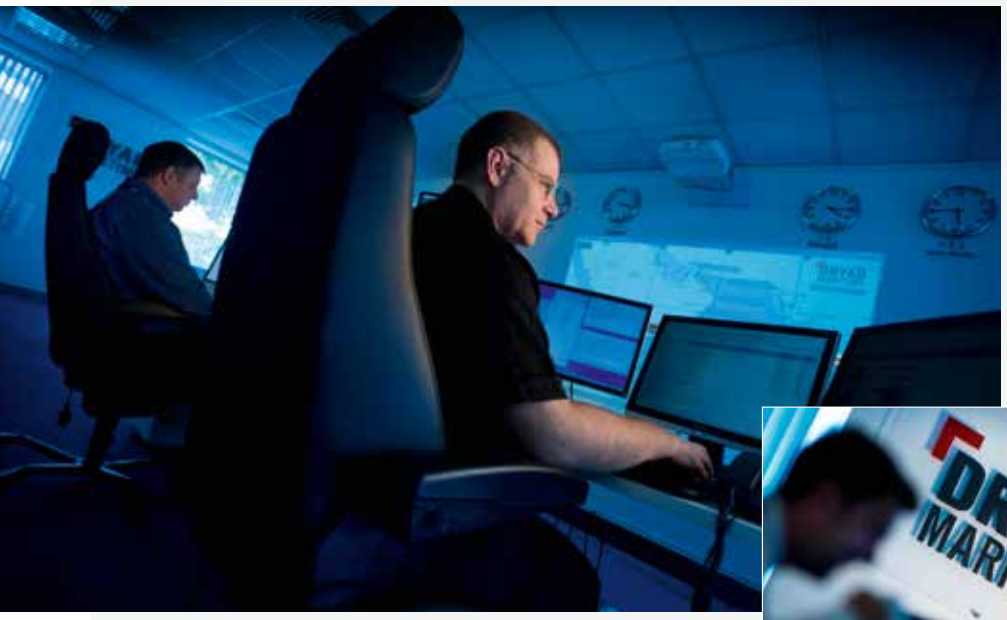
"My primary advice to superyacht captains is to encourage them to do their homework on their destinations and transit routes. Whilst there are relatively few threats in the open ocean – with some notable exceptions where piracy and small-scale terrorism exists – it is an unfortunate fact that some of the most beautiful places in the world, those that superyachts often visit, are also the most dangerous places in the world. Where you find large socio-economic divides and visiting, visibly wealthy tourists, you will find crime – sometimes violent crime. The same caution should be applied to some idyllic anchorages in certain parts of the world where opportunist criminals have been known to strike."

Technology and systems integration

Safety and security technology has now become so complex and wide ranging that even yacht management companies are struggling to keep abreast of things.

Effective onboard safety and security relies heavily on all concerned having the correct frame of mind. When it comes to equipment, a 'systems approach' is essential. Whatever technologies are used, they must be integrated into a single, easy-to-use system. A loose collection of disparate products is never going to be efficient. But integration is another of those things that's easy to say but a lot more difficult to put into practice.

MAST Yacht Security, a specialist division of Maritime Asset Security and Training, which specialises in global security services for the global maritime community, not only emphasises this aspect but also stresses that for maximum effectiveness the 'security architecture' should be part



An appropriate security strategy is paramount

of the vessel's design, and incorporated during the construction.

This message is becoming more widely accepted as Gerry Northwood, chief operating officer at MAST, explains: "Marine security has shifted from being an afterthought to an essential part of superyacht design. Our consultants are able to integrate the design and installation of a selected security system into build programmes and refits. Working alongside the builder, project manager and design team, we have a track record in successfully designing and specifying the best possible integrated security system based on threat assessment and expectations of the owner. We can recommend an appropriate security strategy, and go on to provide the hardware and software necessary to manage CCTV, access control, emergency lock-down and intrusion detection from common displays and controls, making everything intuitive to understand and operate.

"Advanced security technology is normal on superyachts to augment the security regulations and standards required by ISPS, and control access by creating a monitored perimeter and allowing crew and security personnel to react to unwanted visitors before they step foot on board.

"We recommend a combination of motion detection CCTV-driven perimeter protection systems, and an integrated locking system as the basic minimum.

"Such systems are increasingly found on modern superyachts, coupled with the use of professional dedicated security teams in support of the crew and guests both afloat and ashore. We also offer security operative vessel rendezvous and escort service through high risk areas, ensuring safety without having firearms embarked on the yacht."

When underway, yacht owners and skippers should take the security of their vessel as seriously as navigational safety.

Skip Blair is a highly experienced electronics expert who spends much of his time as a member of teams supporting owners' representatives during new builds.

"These days the largest superyachts feature a permanent security team of up to five people who operate a duty roster to ensure 24/7 coverage," he says. "That's in addition to any personal bodyguards the owner may employ. The favoured place for the centre is just behind the wheelhouse to maximise communication between the team and the captain. Here you will find all the display and control systems for the vessel's sensors – often arranged in the form of a video wall. The controls are normally touch screens based around a central console.

"Security concerns fall into two basic categories, Beyond the Hull (BTH) and Onboard. BTH sensors can also be divided into two basic types – above and below water. Above-water detection starts with the ship's long range navigation radar and will probably include specialist 'micro radars' capable of tracking fast moving contacts at close quarters. Thermal imaging cameras are standard for night operations.

"Below-the-surface sensors such as Sonardyne's Sentinel are used exclusively when the boat is in port or at anchor, because sub-surface threats while the craft is underway are virtually impossible."

Automatic integration of these systems is vital to keep the workload manageable during a crisis.

Perhaps the most comprehensive multi-function system is NIDAR from Marine and Remote Sensing Solutions (MARSS) a C2 system displaying data from multiple sensors in an easily understood and managed format, creating a single tactical picture of the yacht's immediate environment.

NIDAR originated in the European Union's Sectronic project (www.sectronic.eu) designed to provide observation and protection for critical maritime infrastructures such as passenger and goods transport, energy supply and port infrastructures.

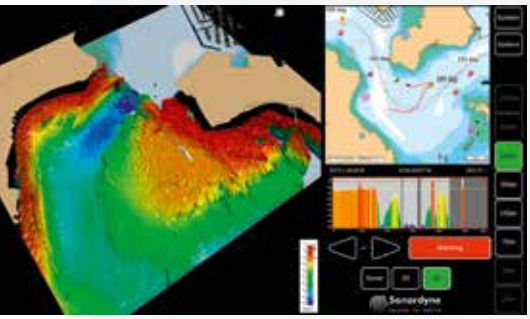
"NIDAR has evolved from an EU project into a cutting edge platform in operation around the world," explains Rob Balloch, MARSS' vice president of operations.

"For superyachts, it offers security personnel an automatic, intelligent, centralised command and control platform which combines highly advanced technology with an intuitive multi-touch user interface.

"It effectively draws an electronic bubble around the vessel, the nature of which can be customised according to the perceived threat level. NIDAR accepts inputs from multiple sensors including camera, radar, satellite and AIS as well as the diver detection and NOAS sonar data provided by Sonardyne's Sentinel system. An important aspect of NIDAR is that it is 'sensor agnostic', and can accept inputs from a wide variety of components.

"The key element of NIDAR is its ability to take data from those sensors and

> **Advanced security technology** is normal on superyachts to augment the security regulations and standards required by ISPS



Sonardyne's Sentinel automated sonar technology for underwater tracking

automatically analyse it for potential threats through the use of sophisticated algorithms.

"Rejection of false positives such as vessels moving away or small boats that are close but are moving slowly is essential to sorting the wheat from the chaff. Once a target has been classified and confirmed by the security team, anti-intrusion systems such as cameras, searchlights, laser dazzlers and loud hailers will focus on that object, automatically tracking its movement.

"Alternatively, targets can be designated manually by simply highlighting a radar or sonar contact on the control touch screen.

"NIDAR's sophistication is such that it continues to analyse other contacts while tracking the primary focus of attention – known in military terminology as track-while-scan. Should a more threatening target appear while another is being tracked, it flags up a warning, allowing the security team to switch their attention if they so wish.

"Various deterrent technologies can be automatically operated by the system (slew to cue) to let the potential intruder know they have been spotted, removing the element of surprise and warning them off. This includes hailers sending voice messages in multiple languages to divers and surface threats.

"All in all, we believe NIDAR offers large yachts unrivalled security and protection."

Given that the vessel's radar will provide initial contact detection, supplementary systems can be divided into two basic categories – above and below surface.

The former can be further subdivided into day and night. During daylight one should never underestimate basic human vision, supplemented by a good pair of binoculars.

At night, technology is used in the form of thermal imaging systems that take infrared heat sources and convert them into on-screen images that the human eye can understand.

FLIR Systems is one of the leading providers of such equipment, which is used routinely by military and law enforcement agencies.

The range extends from hand-held monoculars to fully marinised, gyro stabilised, high definition, multi-sensor systems suitable for radar arch mounting. FLIR says that the latest development in its dedicated marine range, the SeaFLIR 280-HD gives a quantum improvement over every other compact system available, and is specifically tailored to give excellent long-range performance in the extreme conditions found at sea.

Below-surface detection is more complex.

Sonardyne is a big player in underwater technology and the provider of a range of products and services. Its Sentinel automated tracking sonar technology is the most relevant product for superyachts, enabling underwater intruders to be reliably detected at long ranges, classified and differentiated from non-threats such as pleasure craft, large fish and cetaceans. The system reliably detects, tracks and then classifies divers and small underwater vehicles approaching from any direction and then alerts security personnel to the potential threat.

Sonardyne says Sentinel was originally developed to meet the underwater security requirements of commercial, government and naval end users and is the world's most widely deployed intruder-detection sonar. The system's autonomous monitoring capabilities, long range detection and proven low false alarm rates, provide a rapidly deployable, 360° underwater security solution for any application.

Many superyachts are fitted with FarSounder's forward-looking echo sounders, but the company's Ship Protection System combines that with detection of underwater threats such as divers while at anchor.

"One big advantage with our product is that there's no separate sensor to deploy and recover," explains FarSounder's vice president of engineering, Matthew Zimmerman.

Matthew Zimmerman of FarSounder (left) and Robin Clifford, CLA Communications

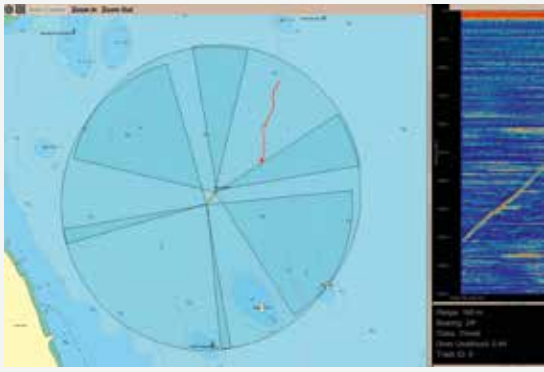
"When a threat is detected, no time is wasted retrieving the system, and you can get underway immediately. As nothing protrudes below the hull it can be deployed in very shallow water. Sophisticated algorithms automatically detect, track and classify possible underwater threats. Additionally, easy-to-use analysis tools allow quick human verification of the automated alerts.

"A big plus is that when underway, the Ship Protection System provides a 3D forward-looking sounder capability that is the equal of our dedicated FarSounder-1000 unit."

> **Unless transmitting over** military grade networks, users must assume their satellite phone calls are no more secure than a standard cellphone

Cyber security

Cyber security has become a high-profile issue in recent years with information being hacked from institutions and corporations who could reasonably be expected to have appropriate countermeasures in place. And there is undoubtedly a lot of commercial hacking that



Diver detection software from FarSounder

Cyber security is now an essential consideration for all superyacht owners

goes unreported. Obviously the hacker doesn't want their target to know that their information has been compromised, and in many cases the 'hackee' remains blissfully X. And most victims prefer to keep the fact private if at all possible.

"Security is not just a technical issue – it is a combination of appropriate technology, user awareness and behaviour," argues Robin Clifford of CLA Communications, a British professional services consultancy that provides risk and incident management, security solutions, technical services and defence consulting to governments, corporations and private clients.

"The starting point is a properly designed and installed communications system. It must be simple to operate and provide assurance that it is working properly. Until recently SATCOM was assumed to be a secure alternative to cellphones, particularly for remote and offshore use. However in 2012 the two most commonly used encryption algorithms were published online and in 2014 an investigation by IOActive identified further vulnerabilities. Unless transmitting over military grade networks, users must now assume that their satellite phone calls are no more secure than those made using standard cellphones and that all conversations are vulnerable to the threat of unlawful intercept.

"In collaboration with our technology partners, Abatis (UK) and Armour Communications, CLA Consulting can provide an integrated solution to protect not only cellphone and satellite communications but also IT and OT systems from intercept and cyber attack without degrading systems performance."

According to Ed Hill, founder and managing director of Intrepid Risk Management, cyber security poses a real problem for all superyacht owners.

"Few management companies and captains fully appreciate how vulnerable the confidential information held aboard their yacht is," he says. "Traditional anti-virus software is known to be less than five per cent effective against a determined attack. In many cases onboard data can be accessed remotely without much effort."

A lot of data breaches are caused by human error. Thorough personnel training is the key. No amount of technology can protect against someone clicking on an email link or opening an attachment that contains a virus or a Trojan.

In port, the main route into the vessel's IT systems is Wi-Fi. Awareness of Wi-Fi security among the crew may be reasonable but hackers are employing increasingly sophisticated methods to break into Wi-Fi routers. Smart phones are increasingly vulnerable to malware, and a guest's infected phone can easily contaminate every other device on the network in the absence of strict measures to limit access.

At sea, the vessel's satellite communications and systems are more difficult to access but can't be regarded as secure without encryption and other measures. There are systems available on the market to provide protection against this type of attack. However, an air of apathy exists, with many feeling that this type of attack will never happen to them.

Hacking into a vessel's operational control systems is also possible, and could theoretically result in onboard navigation, engine management and even air-conditioning systems being incapacitated or manipulated. There could be a number of motives for this sort of activity, such as hijack, kidnap and ransom, extortion, blackmail or even personal revenge.

Counter surveillance measures

Onboard communications and surveillance security has risen to the top of the agenda following revelations that many of the incriminating conversations between FIFA officials and undercover journalists took place aboard private yachts. Dean La-Vey, founder and CEO of Blake Technical, specialises in this hitherto neglected aspect of personal and commercial security.

"Privacy is paramount for every high net worth individual, and you might think being aboard your private yacht was a pretty secure place in which to conduct sensitive personal conversations and business negotiations. But unless you put in place the appropriate counter surveillance measures, that's a false assumption. Simply Googling 'surveillance GSM' reveals that 'James Bond type' bugging gadgets are available for just a few pounds. Some are things that might be brought on board by a guest or visitor, such as recording key fobs, watches and items of sham jewellery. That's why it is becoming customary for all but the most trusted individuals to be asked to leave such items 'at the door' before entering the yacht's saloons and lounges," explains La-Vey.

"Devices installed semi-permanently are an even greater threat. Some of them are extremely sophisticated. How about a wall socket, light fitting or USB charger that can detect when someone enters the room and will stream subsequent sounds and

From left to right: Ed Hill, founder of Intrepid Risk Management; Dean La-Vey, CEO Blake Technical; and Solace Global's COO James Morton

conversations to a dedicated mobile phone automatically? We have known superyachts to be chartered by an organisation simply with the aim of installing remote bugging equipment that may pick up valuable information the next time the owner comes aboard – perhaps in several weeks' time.

"Blake Technical offers sweeping services to detect such items. A 50m vessel will take a day, a 90m one, three days. I would particularly recommend a thorough sweep immediately after any yard visit – specifically an extensive refit – and after every charter."

Operations at sea

The fact that superyachts are highly mobile poses its own challenges to security providers. Third party provision of security above and beyond whatever measures the vessel has permanently in place is offered by a number of specialists who may be subcontracted to larger companies as part of their portfolio of services.

> **We have known** yachts to be chartered by an organisation with the aim of installing remote bugging equipment that may pick up valuable information

One such company is Solace Global, which claims (as do many others, it has to be said) to be the premier provider of maritime security services and anti-piracy operations worldwide. James Morton, Solace Global's chief operating officer explained: "In one year alone we spent over 1.5 million man hours at sea, protecting over 2,000 transits for some of the worlds' largest shipping companies, oil majors, cruise liners and superyacht clients.

"Our security teams are fully qualified, highly professional, and regularly vetted experts in maritime operations. We regard legality as non-negotiable, and we ensure full compliance with flag state, coastal state and international laws, whilst maintaining stringent Rules on the Use of Armed Force. Our security services extend not only to ship security and crew protection duties, but also include security audits, risk assessments, crew training packages and real time vessel tracking – all supported by an experienced operations, intelligence and incident management team at our 24-hour operations centre based in the UK."

The dangers posed by hijackers and kidnappers to 'high net worth' have increased – or are at least perceived to have increased – enormously. Personal protection is a highly sensitive area and some owners will have permanent, private bodyguards. Others may require special arrangements to be in place when they are on board their yachts.

Intrepid Risk Management provides personalised security solutions for corporate and private high net worth clients. The provision of armed guards, counter piracy measures, stowaway searches and crew drugs testing are significant aspects of a range of services that include embedded security, crew training and remote vessel tracking and monitoring.

Managing director Ed Hill, a former Royal Marines Commando, told *SB*: "Our 'personal' security services are primarily intended for yacht owners and their guests. These range from providing security personnel for when an owner decides to have a party on board, to providing chaperone services when owners and guests venture ashore in the local area. The exact service we provide depends on the client's specific requirements.

"There are certain places like the Caribbean where the threat of being robbed is a primary consideration. Many owners and guests feel particularly safe when they know a team of former Commandos is looking out for them.

"Some owners also have serious concerns for the physical security of their superyacht when they are not aboard. In the absence of a permanent security team, they ask us to provide security training to the crew. It ignites the crew's thought process by making them appreciate the importance of security and gives them the confidence to deal with a number of potential security threats. There are even cases where a yacht owner has asked us to 'test' the alertness of the crew by asking us to compromise the security of the yacht and see how far we can get.

"Firearms on board are generally only advised when the yacht is transiting through a high-risk piracy area and should then only be used in accordance with the level of the threat and as a very last resort.

"We encourage employing a reputable private maritime security company as the laws surrounding the use of firearms are a minefield and can be somewhat overwhelming for any captain. We can offer a sense of reassurance that both the yacht and crew are in capable hands whilst operating within the parameters of international law." SB

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Camper & Nicholsons
www.camperandnicholsons.com

CLA Consulting
www.claconsulting.co.uk

Dryad Maritime
www.dryadmaritime.com

Far Sounder
www.farsounder.com

FLIR
www.flir.com

I.B.S Superyacht Security
www.superyachtsecurity.com

Intrepid Risk Management
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MarineGuard
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MARSS
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MAST Yacht Security
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www.super-yachtcrew.com

Superyacht Crew International
www.superyachtcrewinternational.com

Van Berger Henegouwen
bergehenegouwen.com

Veritas
www.veritas-international.com

ANTI-PIRACY EQUIPMENT

A wide range of products and systems are now available on the market to discourage intruders and pirates from boarding superyachts

A taser causes a loss of neuromuscular control and should be used as a last resort

THERE'S NO DOUBT that deterrence and prevention is the name of the game when it comes to piracy, and there's no better deterrent than a large naval vessel in close attendance. But in the absence of such good fortune, the right onboard equipment is essential. Radar makes it unlikely that pirates will be able to approach the vessel totally undetected, and at night thermal imaging sensors can provide decent detail at ranges up to 1km. Preventing boarding then becomes the absolute priority. Highly visible armed personnel – and a few well-aimed shots in the right direction – have a good track record, but there are several non-lethal systems suitable for superyachts for those who eschew an armed presence.

Lasers

Laser weapons use a non-lethal laser beam to act a visual warning to pirates, and to distract and discourage them. Laser devices can be used anytime and are easily operated by the ship's crew without much training. The dazzle gun is a specific type of laser weapon which uses green light to disorient and then temporarily blind pirates. The concentrated blast of green light can be used in either day or night conditions.

LRAD

Long-range acoustic devices (LRAD) use a focused, pain-inducing sound beam that produces high-frequency noise higher than the tolerance level of an average human. LRAD has been used on commercial vessels, but is bulkier and more difficult to set up than a laser.

Pain ray

More properly known as the Active Denial System (ADS), this method transmits a narrow beam of electromagnetic energy that penetrates beneath the skin but reputedly causes no permanent damage as long as the recipient does the sensible thing and retreats out of range.

Electric fencing

Electric fences resemble coils of barbed wire hung from the guard rails and are virtually impossible to climb over or dislodge. The coils are collapsible and kept safely folded when not in use.

Kinetic energy weapon

The kinetic energy weapon is the closest thing to a gun without actually being one. The best known is the Buccaneer Ship-Borne Shore Launcher (SBSL) – produced by UK-based company BCB International. The cannon-shaped device is visually intimidating and uses compressed air, either from cylinders or the ship's own system to fire a variety of projectiles. These range from ballistic nets designed to entangle a boat's occupants and foul its propeller, to solid projectiles rather like large rubber bullets. These allow significant kinetic energy to be delivered without resort to dangerous or volatile explosives.

Stun grenade

Also known as flash grenades, these produce a blinding flash of light and a painfully loud noise. They are non-lethal, but if dropped into a small boat that has come alongside without permission it will render the occupants ineffective for several minutes without causing permanent injury. A close relative of the stun grenade is the rubber ball grenade which produces a blinding light, a very loud bang and sprays rubber bullets in all directions on detonation. It is deployed in the same way as a stun grenade.

Foams and liquids

Slippery foam or anti-traction material is a nontoxic substance used to make the sides of a vessel so slippery that getting a purchase or even standing up on a flat surface becomes a huge problem. The Liquid Deterrent System, a technology developed by the International Maritime Security Network, showers intruders with slick, foul-smelling green liquid, which produces a most unpleasant burning sensation. Pirates have to jump into the water from their boats in order to wash it off.

Taser

A non-lethal weapon beloved of police forces worldwide, the electric shock causes loss of neuromuscular control. It needs to be deployed at close range so is best considered as a last resort. SB