



Dropping in at sunset: A Eurocopter-EC-130-B4 helicopter, taking up to eight passengers, parks on the upper deck of the 68.60 metre Feadship "Atessa" directly behind the dining table.





TOUCHDOWN FOR DINNER

Fast, agile, but also extremely delicate: Helicopters have become an integral part of superyacht operations. The number of these fascinating, high-maintenance, airborne tenders – just like their size – is growing.

Text **Martin Hager** Photos **Neil Rabinowitz**



Fast arrival: A Bell 407 approaches the “Starship” helipad.

Especially during large annual events, such as the Monaco Yacht Show and the spectacular Formula 1 Race – the Monaco Grand Prix – the Principality’s Port Hercule is filled to the brim with the world’s largest and most beautiful yachts. If you cast a sweeping glance over the densely packed harbour, one of the first things you will notice is numerous helicopters tethered to the aft decks. Sporting a helicopter seems to be the done thing these days – it almost appears as if these spectacular aero-tenders are the current must-have item for yacht owners. But Nigel Watson, owner of the helicopter consultancy and management businesses HeliRiviera and Luvai, knows better: “This impression is misleading. As of now, there are no more than



Stowage position on board: Helicopters can land anywhere, if the landing place has the required size. Unique for a sailing yacht, with backstay and boom out of the way, the 54-metre Alloy sloop "Tiara" has a helipad for a single-engine Eurocopter EC130. More than just one helicopter is able to land on Paul Allen's 126-metre "Octopus" (bottom). A Mc-Donnell-Douglas-MD-900 is parked on the foredeck, while the large aft deck, which includes a double hangar, houses a Sikorsky-S-76C for up to 12 passengers. On board his second yacht, the 61-metre Feadship "Meduse", the Microsoft founder has another MD-900 available.



Approach for landing: The new Eurocopter-EC-130-B4 approaches the helipad of the four-decker Feadship "Attessa" from aft. The helicopter's function as flying tender is also indicated by the lettering above the tail rotor: "T/T Attessa".

PHOTOS: IVOR WILKINS (1), MARCUS KRALL (1), YACHTIMAGES (1)

Turbulences aft of the superstructure make landing difficult

fifty-four yachts worldwide with a helideck permit for a helicopter. Another twenty yachts capable of running a helicopter operation are currently under construction. By 2013, about 100 yachts in total will have helicopter-capable decks, many with embarked helicopters on board," predicts the experienced helicopter-manager. "It is interesting to

note that during events like the Grand Prix or the Monaco Yacht Show there are some helicopters embarked on the decks, although they are not permitted to move in the harbour. They are simply there as eye-catchers." But even during a cruise or charter, in comparison to other offshore uses of the helicopter the hours flown are few. "A helicopter pilot

working in a yacht is likely to fly between 60 and 150 hours annually, especially when crew rotation programmes are considered," says Nigel Watson, who can look back on many years' experience on mega yachts, notably as Captain of the 67-metre yacht "Golden Shadow". Ninety percent of a pilot's time is occupied by flight planning for excursions

such as airport transfers, between the jet and the yacht, sightseeing tours, logistics support to the yacht and perhaps heli-shopping, hiking and skiing. Trips that the owner might like to make and for which the pilot has to obtain takeoff and landing permissions in advance. When the owner or the charter guests are not on board, the pilot's



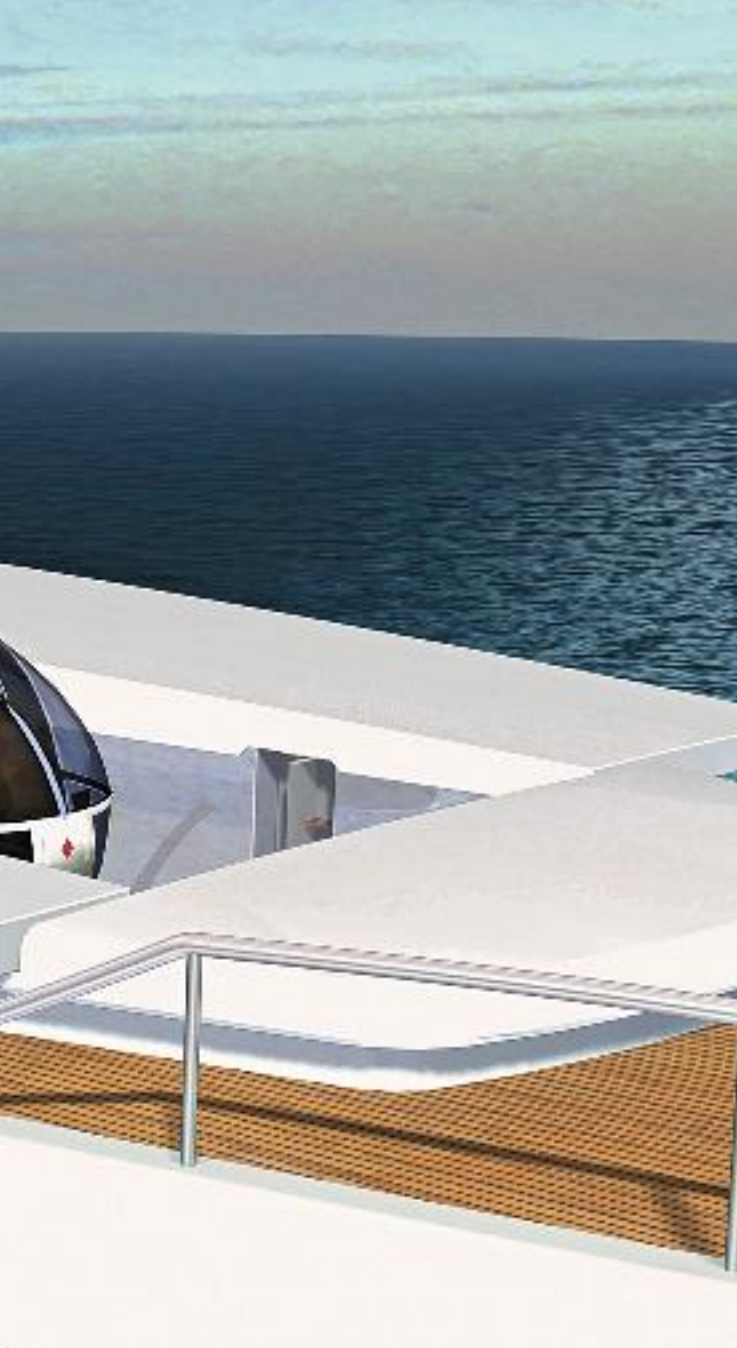
A hangar is the heli's best protection against rough environment

time is taken up by assisting the yachting crew and the continuous maintenance of the highly sensitive flying equipment. "A saltwater environment is highly corrosive," explains Watson. "The turbines need to be rinsed on a regular basis after flights. The engines need to be started and a ground run carried out at least once a week in order to keep

seals flexible and ensure that the engine remains lubricated with oil," adds the aircraft manager, whose HeliRiviera offices are conveniently situated at the airport of Cannes-Mandelieu. As practical and versatile as a helicopter may be for a yachting operation, it is still extremely high maintenance with regard to man-hours and upkeep. Since the prevalent

helicopter types require between 230 and 380 litres of JET A1 fuel per flight hour, most shipyards install a dedicated Helicopter fuel station for the extremely flammable JET A1 kerosene next to the helipad. "Jet fuel on board is an important subject. In order to make an onboard fuel station viable, the yacht has to carry a lot of JET A1 fuel on board," ex-

plains Watson. "And kerosene is not exactly easy to handle. The fuel must be tested for contamination on a daily basis. Even the smallest amount of water, sediment or fungal growth in the fuel is enough to bring the engines to a grinding halt," he adds. Since Jet A1 has a flashpoint of 38 degrees Celsius and is therefore classified as highly explosive, most



Garage for the aero toy: Helicopters do not benefit from seawater and aggressive salty air. For this reason, yards and designers increasingly include heli hangars into their concepts. This Feadship project features a lift to store the helicopter below deck. There is also a washing plant and a fuelling station planned. If there is no place on a yacht for a heli garage, the helicopter must be carefully wrapped for passages. The daily routine of a pilot includes, besides washing and polishing the helicopter, an extensive check of the complex rotor systems.





Aircraft marshaller: The helicopter landing officer directs a Eurocopter EC 145 on the helipad.



Stormy arrival: Before the 2.2 ton Bell-407 helicopter can touch down on board the 44-metre charter yacht "Starship," the crew must secure all loose and lightweight equipment. When the helicopter of the 85-metre charter yacht "Alysia" is in service, the guests can use the landing pad for relaxing.



PHOTOS: NEIL RABINOWITZ (2), HELI RIVIERA

"These measurements make sure that the helicopter can take advantage of the 'hovering in ground effect' (HIGE) capability of the helicopter. This means that the helicopter is cushioned by the air from the blades directly over the deck during the hover, which whilst making some fuel savings provides an important reserve of power, maximizing the helicopter's performance."

The helipad's touchdown zone should be a non-slip material marked with an aiming circle, a correctly orientated H as well as details of the limitations of the deck, its size and the weight of helicopter it can receive. Not all yachts choose to adopt this conformity for aesthetic reasons, and for non-certified private decks, this may be acceptable – the important issue being, "do you know where to land?"

shipyards nowadays fulfil the strict rules and requirements of the International Civil Aviation Organization (ICAO) and the classification societies under which the vessel will be built. Amongst those requirements is the installation of high ventilation fans to the space, vapour detection and alarms as well as specified fire-fighting equipment. Adequate drainage of the heli-deck is also an important and required feature of design. In case of a ruptured fuel tank on the helicopter during a heavy landing, the kerosene will be led directly overboard. The size of the helipad has been precisely specified according to the Large Yacht Code (LY2) of the UK Marine Coastguard Agency (MCA). "The landing platform should have a minimal diameter of 1D, with D being the overall length of the helicopter with all rotors turning," says Nigel Watson.

Besides the size of the landing pad, its location on board is crucial. Since the yacht's superstructure, masts and the funnels with their hot exhaust fumes create air turbulences that interfere with the airflow to the rotor blades, helicopter pilots would prefer the helipad as far away as possible from these aerodynamic problem zones. Ideally, the helicopter landing area should be a dedicated deck used solely for the purpose. This means using valuable real estate aboard the yacht, which often becomes a conflict between a dining area, an area to relax or a dedicated helideck. Only on the largest

The sun deck is considered the best and safest landing pad

EVEN HELICOPTERS ARE GETTING BIGGER

Single or twin engine? Skids or wheels? Those are just a few of the many decisions that yacht owners must take when they consider buying a flying tender. How many guests should fit in the cabin, four, six or

stick to this brand." The choice of single- or twin engine is very much a matter of personal choice. A twin-engine helicopter is widely considered as safer, as in the case of an engine failure the remaining engine may



Agusta Westland AW 139: Space for 15 guests.



Eurocopter EC 155: 330 km/hour to the yacht.

twelve? Is the helicopter to be kept in a hangar or secured to the deck? What brand should it be – Eurocopter, Sikorsky, Bell or Agusta Westland? "For the most part, the decision will be informed by the preferences of the owner," says Nigel Watson. "If he already uses a Eurocopter for land-based operations, he will most likely

allow the flight to continue and when operating in performance Class 1, provide the possibility of a safe landing being made from the operating surface. But despite this, there are many single-engine helicopters, like the Eurocopter EC 130 B4, on board yachts. "There is a significant difference in cost of acquisition and weight between a single- and a twin-engine aircraft," says Watson. Still, as in the world of superyachts, there is a trend to go big. Megayachts like Paul Allen's 126 metre yacht "Octopus" by Lürssen or the 105 metre yacht "Lady Moura" owned

by the businessman Al-Rashid, increasingly tend to employ helicopters like the almost 5.5 tonne Sikorsky S-76 C, the VIP configurations normally accommodating no more than 6-8 passengers. These 16 metre toys, powered by Turbomeca Ariel turbine engines are flown at speeds of up to 287 km/hour by a crew of two pilots.

yachts can this be easily resolved. The two other common areas to utilise are the upper aft deck or the fore deck, but both places have their disadvantages. On the upper deck aft, the helipad is often small and the tail end of the helicopter, including the tail rotor, juts out from the deck, making the required pre-flight inspection of the entire helicopter impossible. Owners and shipyards like to place the helipad on the fore deck. "This is, quite frankly, the cheapest piece of real estate aboard the yacht," says Watson. "No-one will place a dining table or a sunlounger there." Pilots, however, do not like the fore deck at all. As the bow lies far away from the yacht's centre of gravity, the boat's yaw, roll and pitch are far more pronounced here than anywhere else. This movement, together with wind shear off the bow and the difficulties of visual referencing make this a less than ideal location. To assist both the master of the vessel to understand the limitations of his helicopter deck and report these to the air crew, a movement sensor has to be installed below the helipad. Data from this together with atmospheric conditions like air-pressure, temperature, wind direction and speed, allow the helicopter operation to maximise the possibility of a safe takeoff or landing. Fore deck landing areas are more dangerous because of a lack of visual references. You are flying into the



PHOTO: EUROCOPTER A. GONIN

Cockpit of an EC 135: The pilot's seat is normally located to starboard, the co-pilot's to port.



Command centre: To steer a helicopter, the pilot permanently needs both hands and feet. He controls the longitudinal and transversal motion by means of the pilot stick, and with the foot pedals he controls the tail rotor and the rotation around its own axis. Three artificial horizons provide orientation.



PHOTOS: EUROCOPTER, J. DEJUN, W. OBRUSNIK

conditions. "The light given off is divided into three colour segments in a vertical beam. The top sector is amber, the middle sector green and the bottom sector red. In order to follow the correct flight path, the pilot needs to keep the aircraft within the green sector. If he sees red, he comes in too low, if an amber yellow light appears, his approach is too high", explains Watson. But all these technical installations are ultimately useless if the yacht crew has not been trained to deal with helicopter operations on board. "Crew training is crucial," says Watson. "If you carry a helicopter on board, you need to train at least four crew members as helideck specialists." A Helicopter Responsible Officer (HRO) is in overall charge of helicopter operations from the yacht's perspective. This might be the Master, but more commonly the chief officer, or 1st officer. The responsibilities extend to day-to-day flight activity together with the maintenance of onboard records and the planning and supervision of training. A Helicopter Landing Officer (HLO) is in charge on deck and two Emergency Helicopter Team Members (EHTM) provide the first aid fire fighting capability and passenger handling assistance. While the HRO coordinates each flight to and from the yacht with the air crew, the bridge and the HLO maintain constant contact with the pilot via airband VHF radio. Prior to

wind, which normally means that the vessel is at best at your side and at worst visually behind you and below. Therefore you cannot easily see what you are landing upon.

Loss of horizon relates to the problem of spatial disorientation. The sky blends into the sea and you can very quickly reach a point where you do not know what is up or down. You can no longer rationalise what control inputs to make, which may result into your flying a perfectly good helicopter into the sea. In order to assist in standardizing the approach to the vessel, some yachts are nowadays equipped with high-tech landing aids, such as a glide slope indicator (GSI), a gyrostabilised prismatic light source, which offers a standard glide slope for an inbound helicopter to approach the vessel. This is particularly helpful in inclement weather

Landing aids direct the pilot safely on board even at night



FROM YACHT CAPTAIN TO HELI CONSULTANT

Nigel Watson is both an experienced mariner and now aviator. In the late 1980s, he worked on board yachts like the 61-metre CRN construction "Il Vagabondo", the 80-metre Blohm + Voss build "Golden Odyssey" and soon after became the Captain of her 67-metre tender "Golden Shadow." Since "Golden Shadow" not only carried a Cessna 206 seaplane on board but frequently employed helicopters in her operation, the experience led Watson to acquire considerable yacht-based air asset manage-

ment experience. Watson is both a fixed and rotary wing pilot and today manages a large group of experienced pilots through the Luvair Operating company (www.luvair.com). "Aboard Golden Shadow the Cessna 206 amphibian was used a lot in my days. Today it is replaced by the Cessna 208 caravan as the seaplane theme continues. Upon leaving the sea I realized very quickly that I wanted to combine my experience of both worlds even after leaving yachting." In 1999, he launched his company HeliRiviera, which is now situated at the small airport of Cannes-Mandelieu with satellite offices in Fort Lauderdale, Florida, and Phuket in Thailand. "We obtain flight permits for our customers, organize flight training and provide technical advice for the integration of helicopters to yachts," explains Watson. The operating company Luvair, established in 2006 and based in the Isle of Man, provides an operating service to HeliRiviera's clients managing their helicopters and air crew worldwide – a symbiotic relationship.



PHOTO: MARTIN HAGER

going to flying stations the helipad must be prepared in order to prevent damage to the turbine engines through Foreign Objects (FOD) by removing loose objects that could be sucked into the turbines such as towels or cushions from the decks nearby.

To ensure optimal preparation, the Heli-Board team goes through a worst-case scenario checklist prior to each operation. This includes the preparation of the fire-fighting equipment – and the launching of the tender. "You just never know what might go wrong,"

explains the owner of HeliRiviera. Apart from well-trained pilots and capable helicopters, these preparations are the reason for the low incidence of helicopter accidents. "Helicopter pilots in megayachting will not run any risk whatsoever. They will not take off in bad

weather or at night if there is the slightest safety concern, they will cancel the flight, if necessary, against the express wishes of the owner. And don't forget that the owner is the man who pays their salary but the pilots are responsible for the safety of their passengers, themselves and the helicopter," stresses Nigel Watson.

But, increasingly, there are yacht owners with a pilot's license. And of course they want to fly their new toys themselves. "With regard to safety, this is a difficult subject," admits Watson. "These owners, most often young and successful businessmen, are usually far less experienced than the pilots they employ." This is why good helicopter pilots working in our industry need to be very comfortable in this complex cockpit environment. They may need to say No, take the controls and remain confident of their position. Just like yachts, helicopters are getting bigger and the number of rules and regulations is growing in accordance with this trend. "The world is becoming more and more hostile towards helicopters," says Watson. Nowadays, the pilots have to obtain special takeoff and landing permits for every country, sometimes even particular regions of these countries, often months in advance. But despite the difficulties involved in having a helicopter on board, the "flying tenders" are coming into their own – expect to see far more of them in harbours in the near future.

Helicopter pilots are enduring more bureaucratic regulations