



Winning the Volvo Ocean Race 2005-2006



Photos by Jon Nash, ©TEAM ABN-AMRO

## Navigating, Stacking, Surfing, Snacking, Surviving

By Stan Honey, San Francisco Station

### About the Volvo Ocean Race

The Volvo Ocean Race (VOR) is generally considered to be the world championship of professional ocean racing. It is a fully-crewed around the world ocean race via the Southern Ocean. From 1973 through 1998 it was known as the Whitbread. The VOR 2005-2006 comprised nine offshore legs starting in Vigo, Spain, then to Cape Town, Melbourne, Wellington, Rio de Janeiro, Baltimore, New York, Portsmouth, Rotterdam, and then finishing

in Gothenburg. There were inshore short-course races in seven of those stopover ports, complicating the choice of boat and sail design and adding interest for spectators. I was fortunate to be asked by Mike Sanderson to navigate on ABN AMRO ONE. I was impressed with the caliber of the crew that Moose had attracted and was further impressed to learn that Moose had the time and sufficient sponsorship from the ABN AMRO bank for a two-boat program. While at 51 years of age I was a bit surprised to be asked to navigate a Volvo Race, the skill of the team and professionalism of the overall program were too good to miss, so I quit



my normal job and joined the team. By the end of the 18-month program we had won six of the nine offshore legs and five of the seven short course races, which enabled us to win the Volvo Ocean Race overall.

### **The VOR 70 Rule**

The Volvo Ocean Race Organization wanted the VOR to be raced in the fastest monohulls in the world. To meet that objective they developed a new rule defining a 70-foot-long carbon fiber monohull that would displace 31,000 pounds, have a 103-foot rig with

7,300 square feet of sail, and have canting keels that were 14.5 feet deep. The VOR Organization achieved their goal. Three times the VOR 70's have broken the world record for the fastest 24-hour run under sail by a monohull, and they still hold that record at 563 miles in 24 hours for an average speed of 23.5 knots.

The VOR 70's are brutal boats to sail, but are hugely rewarding due to their stunning performance. The canting keel makes the boats extremely stiff for their size, allowing them to carry lots of sail even in heavy winds. The crew size is limited to a crew of 10 offshore and 11 for inshore races. This is a very small crew

for a boat with the stability and sail-carrying capacity of the VOR 70. Even routine maneuvers like sail changes can be very demanding.

### The ABN AMRO Project

ABN AMRO is the twelfth-largest bank in the world with 4,500 branches in 53 countries. ABN AMRO's objective in sponsoring a team in the Volvo Ocean Race was to highlight the importance of teamwork among the bank's employees and customers by demonstrating the effectiveness of teamwork in ocean racing. We had a two-boat program in which the first boat to be built, confusingly named ABN AMRO TWO, would be used by the professional team to learn about VOR 70's, enabling us to optimize the sec-



ond boat to be built. We on the professional team sailed the second boat which was named ABN AMRO ONE. Once the professional team had access to ABN AMRO ONE, a "high potential" team of young sailors was selected to race ABN AMRO TWO in the VOR. The "High Potential" team of young sailors was immediately branded "The Kids" by the Volvo Race community and the media. They convincingly demonstrated their high potential by finishing second in the first two offshore legs and by posting the fastest 24-hour passage for any VOR 70, and for any

**(above and right) With a canting keel and a cloud of sail, Volvo 70s can hit 40 knots**

monohull in history. By the end of the VOR they were unquestionably grown-ups.

The ABN AMRO team did things right. The boats were beautifully built by a team led by Killian Busche. We had a highly skilled and motivated shore crew of approximately 30 people with two sets of six containers full of equipment and tools. We needed two sets of containers to leap-frog around the world since the boats sailed too fast to allow the shipped containers to arrive at the next stopover before the boats arrived. The containers included a full sail loft with wooden floor, tent roof, and four sewing machines, a machine shop container with a lathe, milling machine, and welder, a boatbuilding container with all of the equipment and tools, an office container, and an electronics shop. At every stop the boats had the complete maintenance that is given a normal boat only every 20 years: the keel would come off, the rig come out, and every system would be disassembled, inspected, and rebuilt for the next leg.

### Life On Board

The Volvo Race allows everything on the boat except for sealed safety equipment to be "stacked," i.e. moved to the windward side after a tack or gybe. That adds dramatically to the brutality of sailing a VOR 70. A routine tack or a gybe becomes a 45-minute endurance event involving the entire crew in preparing for and executing the maneuver, and then restacking the boat so that the thousands of pounds of food, sails, tools, personal gear, and spares are moved to the new windward side. The boats are



unpainted pitch-black carbon below making it hard to see without a flashlight even when it is daylight on deck. The boats are nearly always wet on deck and below, and because the boats don't have a bilge or sump, there is almost always a sheet of water sloshing around. The boats are required to carry a heater but the heaters seldom survive the pervasive water and so in the Southern Ocean or North Atlantic the boats are bone-chillingly cold. The food is a dreary repetition of freeze-dried dinners, one every eight hours. On ABN AMRO ONE, we had enough food, but the combination of being cold much of the time and not eating enough due to the unappetizing food causes most crewmembers to lose about 20 or more pounds over the course of the race. The

galley has one insulated bowl with a lid that is set into the countertop, and two gimballed burners each with a kettle. "Cooking" involves dumping a plastic bag of powder into the bowl and then dumping two kettles of boiling water on top. A quick stir, wait 15 minutes, and the salty-brown slurry is ready to eat. One advantage of only using the burners to boil water is that when the crew below is called on deck to help, nothing burns due to neglect below. The interior of the boat just gets even wetter with condensation than normal as the kettles whistle away. We had a "four-on, four-off" watch system with four guys on deck. Every two hours two guys would change. Mike Sanderson and I hot-bunked. Whenever Mike and/or I were awake and working below we would be "suited-up" in our weather gear so that we were on-standby to help on deck with little notice. The crew is small enough so that every maneuver, tack, gybe, or sail-change requires all hands. Mike and I got about three to four hours of sleep per day on average.

### ABN AMRO ONE

Roy Heiner, the technical director of the program, made an early choice of Juan Kouyoumdjian as designer. This was a brilliant choice because designing to a new rule would require a designer to make hard, innovative decisions rather than optimize previously successful designs. Juan had both the genius and the guts to be extremely effective. Extensive routing of various theoretical designs on eleven years of historical weather data on the Volvo course confirmed our suspicions that the best boat for the race would be optimized for medium air reaching. Our first boat, ABN AMRO TWO, which was eventually raced by the Kids, was designed to be very stable at the expense of having more drag in light air. Testing of the first boat was extremely encouraging, so our final boat, ABN AMRO ONE, was designed to be even more extreme with maximum stability for fast reaching at the expense of light-air performance. The analysis which indicated that it was worth trading off light-air performance for good reaching performance proved correct. We finished last in two light-air inshore races and last on one light-air offshore leg, but our boat's performance in medium and heavy air reaching more than made up for being slow in light air. As the analysis had predicted, in light air none of the boats are sailing very fast and so the slow boats don't lose significantly. To achieve our boat's impressive reaching performance, Juan's design was quite beamy with little "rocker" and had its transom immersed several inches when at the dock. In light air when our boatspeed dropped below about seven knots, ABN AMRO ONE was slow and dragged an impressive wake much like a planing powerboat hull being driven below planing speed.

Our crew, particularly Mike Sanderson and Mark Christensen, provided critical input to Juan on the design. Mike had raced extensively on the Open 60 *Pindar* and this experience proved critical since the canting keel, high-performance, and difficult sailhandling of the VOR 70 is more similar to the Open 60's

than to the more conventional Volvo 60's of previous VOR's. Mark Christensen had been aboard two winning Volvo programs in the past and made many improvements to the configuration of our boats. We had twin rudders, which were likely slower in light air, but made our boats extremely controllable in breeze. We had three grinding pedestals, which on a windy gybe allowed four guys to grind the mainsail with two on the kite. We went to lots of effort in designing our keel canting system and were able to cant our keel from 45 degrees one side to 45 degrees the other side in 10 seconds whereas many of our competitors took up to 30 seconds to cant. All of these characteristics of ABN AMRO ONE, coupled with more time and more practice than the other teams, allowed us to pull off every heavy wind gybe over the entire VOR without a single broach, unlike some of our competitors. That advantage alone allowed us to win a couple of the windy in-port races in which competitors broached during the gybes. We also had the substantial advantage of a two-boat program, which allowed us to do extensive two-boat testing with radio telemetry between the boats. We completed over 1,000 two-boat tests of various sail and trim combinations.

### Sailhandling

The ten-crew limit, the extreme conditions in the Southern Ocean and the North Atlantic, and the enormous righting moment and sail-carrying capability of the VOR 70's made sailhandling very difficult. As a result we used techniques that are more often seen





ABN AMRO ONE blasting to the finish; (inset) the victorious team



on shorthanded cruising boats than on professionally-crewed ocean racers. Most of the boats were initially rigged like conventional ocean racers with luff groove headstays and spinnakers set in stops. By the end of the VOR, many of the boats had converted to hanks. The foredeck was sufficiently hair-raising so that instead of hanking on the new jib under the old one we would set a changing staysail and then douse and bag the old jib before hanking on and hoisting the new jib. The changing staysail maintained our speed and prevented us from ever being bald-headed. There were sporadic development efforts around the fleet to devise cassette loading and unloading systems to quickly attach and remove the hanks from the headstays, but to my knowledge no boat perfected this by the end of the race. Once perfected, a cassette hank loading and unloading system will be a boon to cruisers and shorthanded sailors. Several of the boats, including both ABN AMRO boats, used spinnaker socks offshore. We used soft-furlers for large reaching sails like Code-0's as well as for heavy weather jibs. We set a J4 on a soft furler, tacked well back from the headstay that we used for a variety of applications from a changing headsail, to a heavy weather jib, to a reaching staysail.

### Breakdowns

It was easy to underestimate the loads on the new VOR70 boats, especially the fatigue on the highly-loaded metal components such as the canting keel mechanisms. The two ABN AMRO boats were the only boats to finish every leg of the race. All the other boats had a failure that caused them to drop out of one or more legs. *Movistar* had some early failures and finally a catastrophic



keel failure that required her crew to abandon her on the North Atlantic leg; *Movistar* is presumed to have sunk after being abandoned. We had the advantage of more time than many of the other programs. We used much of that time doing many demanding passages prior to the VOR, with time between the passages to fix what we learned. Well before the start of the race, we had two breakdowns of the keel system on our first boat that enabled us to rebuild the system on that boat, and allowed Juan

to design the keel system for our second boat with the benefit of the accumulated knowledge. In the actual race we had few keel problems on either boat. We benefited enormously from having a complete set of electronics and boatbuilding spares onboard the boat. David Endean, one of our trimmers and pit-man, was an experienced boatbuilder and was able to keep up with the necessary repairs during the offshore legs. On the first leg, Dave re-laminated our port helm pedestal after two crewmen tore it out of the deck as they were washed aft along the jacklines. I had the necessary parts to re-wire the data communications in the navigation station after an electrical fire during the first leg.

### Safety

The Volvo Ocean Race Organization showed skill and foresight with their selection of high-quality safety equipment for the crews. They specified useful and complete "Safety at Sea" training prior to the race. The training included in-the-water practice with our actual life rafts, survival suits, harnesses, and Jon-Buoys. The onboard first-aid equipment and the training of the designated medics on each boat were excellent.

In spite of the quality equipment and training, Hans Horrevoets, was lost from ABN AMRO TWO. Much can be learned from that incident. Hans was washed off ABN AMRO TWO at 0200 on May 18, 2006, on the transatlantic leg from New York to Portsmouth, England. As the wind increased to 30 knots that night, the crewmen on deck were taking turns going below to put on their harnesses. Hans was swept off the deck before he had the opportunity to go below for his harness. At the same time that night, the crews on the other VOR 70's were going through the same process with the guys on deck going below one at a time to put on their harnesses.

It has been suggested by some unfamiliar with VOR 70's that as soon as Hans was swept overboard, ABN AMRO TWO should have performed the widely taught quick-stop turn. This method cannot be used on VOR70's when running in heavy winds. This is also true on the MaxZ86, *Pyewacket*, and on the Maxi-catamaran *Playstation/Cheyenne*, both of which I have recently navigated. When any large high-performance boat is sailing downwind in 30 knots of wind with lots of sail, it is using its maximum stability to sail at a very fast speed. *Cheyenne* would be nearly flying a hull. To attempt a "quick-stop" and immediately round up in that much wind with a spinnaker up would knock-down a VOR 70 or *Pyewacket* (and likely would capsize *Cheyenne*). Getting the spinnaker down once the boat was knocked down would be very difficult because of the high apparent wind and the fact that the spinnaker would be blown through the rig.

On the other hand, the crews of those boats are highly trained at dousing the kite using certain procedures. So the fastest and most reliable way to slow down those boats when running in heavy winds is to douse the kite the way the crew has trained to do it. In the case of the ABN AMRO TWO, a spinnaker

In rough weather, the going got wet—on deck as well as belowdeck—on ABN AMRO ONE



sock was being used so the technique was to run down, sock the kite, and then drop the sock down the hatch. The crew of ABN AMRO TWO did exactly that. They were able to douse the kite and slow the boat within about five minutes after Hans was washed overboard. They subsequently dropped the staysail and then dropped the main, deciding it would be faster than reefing, and that they would be better able to search for Hans without the danger of getting caught in irons with the main up in 30 knots and 15 foot seas.

Once the sails were down they motored back towards the GPS location recorded when Hans fell over, stopping to investigate and plot the location of every light that was visible in the water. They found, investigated, and plotted the location of the life ring, then the Jon Buoy, but Hans was not at either location. They then proceed to the MOB location stored by the GPS and started a search. About 45 minutes after Hans was washed off, the crew found Hans about 300 meters from the GPS location. It wasn't until they were quite close that they were finally able to see Hans' strobe light, which was flashing, but was obscured

underneath him because it was on his chest and he was floating face down. Once they found Hans it took four attempts and 15 minutes to maneuver the boat to recover him in the large seas.

Those of us out there that night on other boats were extremely impressed with the seamanship of the ABN AMRO TWO crew and with what they accomplished. When we heard that Hans had been floating face down, we were astonished that the ABN AMRO TWO crew had been able to find him at all in a pitch black night with 15-foot seas. I suspect that the reason the ABN AMRO TWO crew was able to find Hans as quickly as they did was a result of their care and seamanship in finding and plotting the locations of the ring and Jon Buoy, then pursuing a sensible search pattern incorporating that information with the location data supplied when the MOB button was pressed.

### Navigation

Our boat was equipped similarly to most large ocean racers today. We had three laptops, one for routing and tactics, one for communications, and one for editing and uploading video. For

## On Sailing Safe at High Speed

**GPS MOB button on deck.** Most VOR crew figure that the MOB button at the helm locations is the single tool that provides the most help in finding a guy in the water. This is because in windy running conditions there is no way to stop a boat quickly. Since the boat will have to return to the MOB from over a mile away after dousing the kite, it is an enormous advantage to provide the crew with a reliable position where the person was lost. On the Volvo boats (as on *Pyewacket* and *Cheyenne*), there is a button at each helm location that, when pressed, enters the boat's current GPS position into the instrument system and then displays the range and bearing to that location on a deck display. Many GPS's have a MOB button, but only a few (e.g. Leica and some Ray-Marine units) have the critically important ability to wire in an external button that can be installed at the helm locations. The VOR sensibly required this. Oddly, it is not required or recommended in the ISAF Special Regs.

**Personal EPIRBs.** The VOR boats were all required to carry personal EPIRBs for everyone on the crew and an ADF system to display the bearing to an EPIRB in the water. Each boat was required to test that system with a guy in the water. In the tests the system only worked at such a short range that few crew on our VOR boats bothered to actually carry their personal EPIRBs. The range of the EPIRBs (300 meters) would have been sufficient, however, for boats that were capable of performing a quick-stop.

**Harnesses/PFD's.** Several of the crew on ABN AMRO

ONE, on other VOR boats, and on *Pyewacket* have built their own lightweight Spectra harnesses that have no metal parts. The guys who have these harnesses find that they are so comfortable that they wear them more often than the heavier integrated harnesses/PFD's. Integrated harnesses, coupled with the second shackle on the person end of the tether, have made the gear so heavy and cumbersome that many crew delay wearing them until they feel it is necessary for safety. The guys who wear the light Spectra harnesses sometimes wear "fanny-pack" style PFD's. Some folks criticize this approach stating that the fanny pack PFD's will not save an unconscious person in the water. All VOR crew have gone through the VOR in-the-water training for PFD's/survival-suits/liferafts. After that training many concluded that no PFD will keep them alive in the water if they are unconscious unless the sea is absolutely calm. As many have experienced, when you're in the water in any reasonable wind and sea state, it is hard to keep water out of your nose and mouth. The spray hoods on PFD's are a huge help, but you need to be conscious to deploy them. So some crew figure that they are better off with the light Spectra harness and a fanny pack PFD because they will wear it more often than they would an integrated harness/PFD. This approach is permitted by the ISAF Special Regs, but the trend of most boats to use the bulkier integrated PFD/harnesses might be counterproductive since the crew is likely to delay wearing this integrated harness.

routing we used both Deckman for Windows and Expedition. We used Volvo-supplied Inmarsat F77 and F33 Satcom systems to download weather data and to uplink video to the race organization. All race boats were tracked by Sat C transponders that allowed folks ashore to follow the race on the Internet via the Volvo Ocean Race website and via Virtual Spectator. All boats



(above) Navigator Stan Honey with a digital nav tool; (right) the Leg 7 start

used B & G instruments. The rules prohibited the navigators from retrieving weather data from the Internet. We could only use weather data that was distributed to the fleet by the Volvo Race Organization and we had to do all of our routing onboard. The race organization contracted with Chris Bedford of Sailing Weather Services to collect and format the weather data for distribution to the fleet every six hours. The data mostly comprised US

NOAA GFS and UK Met Office grib files, NOAA radar altimetry data, satellite imagery, and various text and mesoscale weather data and imagery. Chris did a very nice job and the navigators had access to most of what we would have retrieved if we had access to the Internet. The fact that the navigators were all using identical data made the race more interesting since it focused the navigators' attention more on routing, tactics, and competitive analysis rather than on the search for additional sources of weather data.

I had a big advantage over some of the other navigators by the size of the team that I worked with in preparing for each leg. At each stopover we would set up an office with Internet access for our team of four who worked together on the navigation and weather preparation. The team comprised me, Simon Fisher, the navigator of ABN AMRO TWO, Mike Quilter (our navigation consultant who has navigated five VOR's), and Ken Campbell, the founder of Commanders Weather and one of the best meteorologists I've ever worked with. It was a huge advantage to have the time, the money, the equipment, and the support to be able to be perfectly prepared for each leg. It is enormously confidence-

building to leave for each offshore leg knowing that if you had more time, there is nothing more you could do to prepare. Even if the weather changes suddenly and the extensive preparation is not useful, the confidence that one gains from the preparation makes it enormously worthwhile.

### Reflections—and Next Time...

The Volvo Ocean Race has much to offer for offshore sailing in general. The intensity of the competition, extreme high performance of the boats, the brutality of the course, and the substantial funding of the teams is resulting in significant development that is benefiting more conventional ocean-racers and cruisers. While the jury is still out on how prevalent canting keels will become, the developments in offshore sails, sail handling,



navigation/routing, and safety procedures have been substantial. I was honored, especially at 51 years of age and potentially the oldest sailor in the fleet, to be asked to navigate one of the best boats in the VOR. It was certainly rewarding to win the event. When asked if I will do it again I answer that I'm not sure. It is hard, however, not to recall my father's characterization of a bruising experience in his life, "The experience was worth millions, but I'm not sure I'd pay a nickel for another minute." 