



The Southern Indian Ocean leg of this no-instrument circumnavigation almost ends in disaster

A Star To Steer Her By

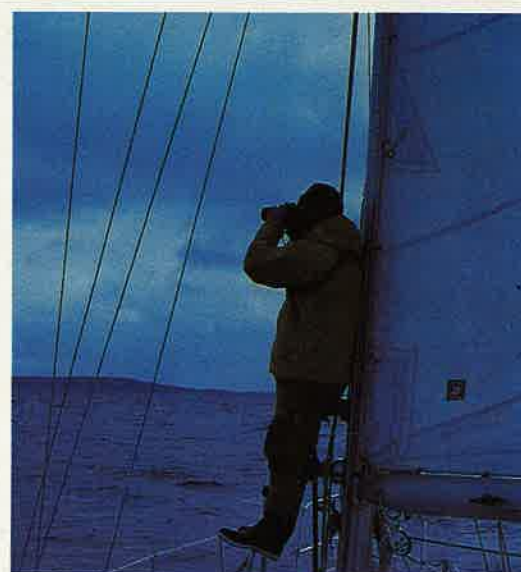
by Marvin Creamer
Illustration by Gary Gowans

Navigating without a sextant, compass, electronics of any kind, or even a wristwatch, Marvin Creamer, 68, of Pitman, New Jersey, accurately guided his Goderich 35 Globe Star around the world. Seventeen months after his departure in December, 1982, Creamer and his crew arrived back in Cape May, New Jersey, on May 17, 1984, after an epic 30,000-mile voyage that took him to Cape Town, South Africa; Hobart, Tasmania; Sydney, Australia; Whangaroa Harbor, New Zealand and Port Stanley, Falklands Islands. ("Incredible Journey," the story of the first leg appeared in the May issue of Cruising World.)

The second leg led through the Southern Indian Ocean at the height of winter. Portsiders in Cape Town, where Globe Star stopped to refit, warned Creamer against the perils of a winter passage, yet the retired geology professor was confident his cutter and his new, no-instrument navigational technique—based in part on the principal of parallel sailing—were up to the test. With Creamer for the second leg were crewmembers Rick Kuzyk, 19, who had never been to sea before and had no sailing experience, and Jeff Herdelin, 22. Yet Creamer and his young crew prevailed, despite an exciting encounter with the southern coast of Australia prior to making port in Tasmania. The following story is an account of Globe Star's run across the wintry Southern Indian Ocean, her brush with the Australian coast, and Creamer's own description of the innovative navigational procedures he has devised that guided him around the world.



After a thorough going-over in Cape Town — painting, tiller and vane repairs, and major stay adjustments — *Globe Star* sets off on the 7,000-mile jaunt to Australia.



Inclement weather and a procession of gales escorted us all the way across the Southern Ocean to our final landfall: Tasmania.

Throughout our voyage in the Atlantic and then across the Southern Indian Ocean, our latitude had never been much in doubt. Without instruments, we were reliably within 60 miles of our DR latitude, and it was latitude we used for homing in on our landfalls. But two months into the voyage, as we approached Tasmania, our longitude — always the less certain element in no-instrument navigation — became an object of real doubt, largely because we could not know with certainty how much surface current we had experienced since leaving Cape Town.

Subtle changes in the cloud patterns, wind direction and air and ocean temperatures led us to believe, as we neared Tasmania, that our DR was reasonably accurate and that we had slipped past the southern tip of the island without sighting it.

If that was the case, then ahead of us lay the infamous Tasman Sea and the dangerous lee shore of New Zealand's South Island, which we wanted to avoid at all costs. The prospect of having missed our landfall cast a gloom over the boat, a gloom that was not helped by the long winter nights, the rain and the poor visibility. We needed to secure an accurate fix, so on July 25, with the barometer standing at 1007 (a very low reading for our uncorrected instrument) and having made a good observation of theta Scorpii and ankaa, we turned north, planning to make contact with land on southeastern Australia if we had passed Tasmania, or on southern Australia if we were still to the island's west.

Which was it? As we sailed north the sea and sky continued to support our hypothesis that we were moving toward

Sydney. There were no southeast gales that had been our lot for the last two months, and instead we had moderate south winds and warm nights, the weather we expected to find along the southeastern Australian coast. The clues were clear. But we soon learned the riddle had a twist to it, a twist that could have proved disastrous for *Globe Star* and her crew.

To find latitude, I checked the nearness of specific stars to the boat's zenith (the point in the sky directly overhead) and used the sun, moon, planets, stars, clouds and the wind for finding and maintaining direction. Because a knowledge of longitude is dependent upon correct time, longitude must be deduced from the distance covered in a specific direction. Without a recording log, time-piece, pelorus, or compass, it is necessary to estimate the speed the boat maintains for an approximate period of time in a presumed direction. Occasionally, longitude can be checked against water color, bird species, seaweed and outcrops of rock, but in general DR longitude cannot be trusted, so I relied heavily on parallel sailing, a technique that was widely used before the invention of the chronometer.

In parallel sailing, the boat, early in the voyage, is maneuvered in a north/south direction to the latitude of the landfall and then sailed directly east or west until the landfall is made. Non-instrument steering is easiest on clear nights in the Northern Hemisphere. Polaris is always within about one degree of True North and provides excellent direction. By placing my hands above my head and opening them to a right angle, then closing them halfway, two-thirds of the way,

et cetera, I made a satisfactory pelorus measuring 45 degrees, 30 degrees and so on. A distinct advantage in using the pole star is that all headings are true; there is no need to correct for deviation or variation.

Because there is no pole star in the Southern Hemisphere, setting a course there on a clear night is more difficult than it is north of the equator. And with the weather we were experiencing — gales, storms, rain and fog — sometimes it was impossible. Both for steering and latitude finding, it is essential to be able to designate a polar point in the southern sky. A line drawn from Gacrux in the Southern Cross through Acrux and beyond passes very close to the southern polar point. And because nearby Rigil Kentaurus and Hadar are almost identical in declination (equivalent to latitude), an extended perpendicular that bisects the line between them also passes very close to the polar point. The spot where this perpendicular (a near meridian) and the extended Gacrux/Acrux line (a near meridian) cross in the southern void is a workable polar point. This point can be used in the same way that Polaris is used in the opposite hemisphere.

By using amplitude tables as found in Bowditch or elsewhere, or a standard formula, the direction of the sun and moon at the time of rising or setting can be determined and used to confirm or correct the boat's heading when these bodies are visible on the horizon. Sudden shifts in wind direction can be detected by keeping notes where the sun appears on the rail, but ordinarily gradual shifts will go unnoticed. To find gradual wind shifts on clear days, or any shift on cloudy days, you have to remember from the last time you checked the boat's heading the angle

made by the boat's keel line and the line of identifiable swell or wave patterns. Long-distance swells are reasonably constant in direction and waves of any size do not change direction immediately after a wind shift. Sometimes it is possible to see the wave-top curls slanting to the left or right as they tumble down the face of a wave after a wind shift has occurred. These are clues to a changing wind direction.

Wind shifts on cloudy nights are the hardest to deal with. As you become sensitive to the total environment, you begin to notice when there is a subtle change in the boat's rhythm, sound or motion. This alerts you to a changing wind direction. Sometimes, experimentation with the boat's heading will be all the adjustment the boat needs; sometimes it's possible to read the bioluminescent outlines of wave crests to translate the wave/keel line angles in the same way as for cloudy days. Even if cloud cover persists, it is rare when the sun, moon, and usable planets and stars are hidden for as much as 24 hours at a time.

To determine latitude from the stars, select fairly bright ones whose declinations match the latitudes of intermediate checkpoints or latitudes of your destination — in our case, Tasmania. Each selected star is then observed at the time of its meridian transit. At that time, if a star stands directly over you (i.e., your zenith) your latitude is equal to the star's declination. If it is not directly overhead, but still on the meridian, it will stand either north or south of you. The angular distance north or south of the zenith can be estimated by comparing this zenith distance to that between stars in the area of the sky above you. You have to be careful in determining the time of meridian

transit. It is helpful to draw an imaginary line from the polar point to the rising, pre-selected latitude star. When the star is near the eastern horizon, the imaginary line extending in both directions will make an uneven division of the firmament, but when the extended line (in reality a celestial meridian) reaches a place in the sky where the line divides the sky equally into an eastern and western half, the revolving imaginary line coincides with your meridian. At that time, the star that fixes one point of the line is on your meridian and is making a meridian transit. At this instant in time, if there is any departure of the star from your zenith, the departure occurs in a north/south direction only.

To make a judgment of the star's location with reference to the zenith (i.e., at the zenith, north of the zenith or south of the zenith), and distance involved, I position my shoulders in a north/south direction, stare upward, fix an imaginary zenithal point and make a zenith distance judgment. This is followed by turning to the opposite direction, east or west as the case may be, and making a second zenith distance judgment. Normally, an observer has a bias to his left or right and this will affect where he "sees" the star. By averaging the two "sights" you can fix a point for the star and estimate your latitude based on the star's declination.

The technique is simple and dependable, and had stood us in good stead halfway around the world, until now.

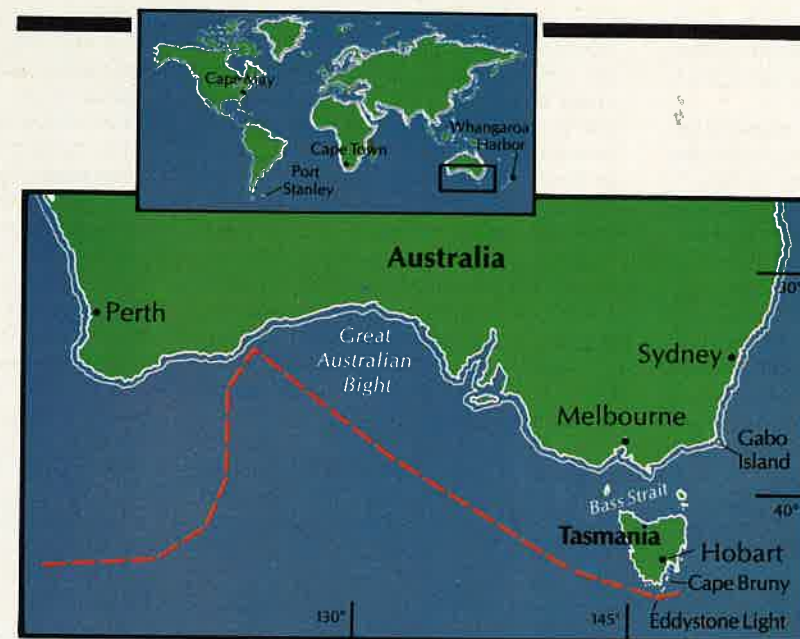
Two months prior to our decision to turn north in search of Australia or Tasmania, we set sail from Cape Town, South Africa, leaving behind a group of Cape Towners who had vehemently warned us against attempting the

winter passage of the Southern Indian Ocean. "You haven't done your homework," proclaimed a prominent member of the Royal Cape Yacht Club.

But we were confident our 35-foot cutter was equal to the occasion. If there appeared a possible weak link in the voyage, it may have been in the person of Rick Kuzyk, who had never been in a boat larger than a canoe. His toughness was not in question, only his stomach. Yet, after our departure on May 27, 1983, Rick soon allayed any worries I had. On the first day out, as we sailed east toward Cape Agulhas, *Globe Star* began to roll heavily under her downwind rig. Rick turned the bilious color of the coastal waters; yet by the next morning, after a good sleep, the young man showed what he was made of. I wrote in my log that day, "Rick is definitely not a seasicker!"

For a month we sailed eastward toward Australia, until on July 2 we decided to alter course for the latitude of Tasmania. We experienced heavy rains that day, the heaviest since leaving home, and found ourselves sailing in a cool northerly wind (unusual because cool air usually comes from the south in the Southern Hemisphere), prions, seaweed, and a choppy sea. The clues made us wonder whether or not we were near the western coast of Australia.

As we worked our way southeastward into the higher latitudes, gales became more and more frequent. The weather cycle in these waters was often maddening. One day we'd be sailing with the drifter and full main and the next we'd be under staysail alone. Yet we knew we were closing land and according to the pilot charts we would be out of the bad weather before long. With anticipa-



tion building and the temperature dropping, we started a two-man watch system at night to keep a better lookout for ships and land.

"A hail and sleet storm this morning left enough slush on the bridge deck to make snowballs," I wrote in my log for July 7. "We put up the storm jib at noon after going more than a day with bare poles. We are not terribly uncomfortable in spite of 40-knot winds and 40-foot seas. The wind makes watch bitter, especially for hands with wet gloves. We have no inclination to light the cabin heater, though, as that would make us sweat up our heavy clothes before we could get them on and out into the cooler air. We can see our breaths in the cabin."

Two days later, we were still peering through the gloom, looking for Tasmania,



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when Jeff spotted a light. Yahoo! Our adrenalin flowed as we squinted through binoculars and zeroed *Globe Star* in for her target.

To our great disappointment, after a frustrating pursuit under engine and sail, the loom was found to belong to a brilliantly lit tuna boat. The incident, however, got our adrenalin flowing. The next morning we set to with renewed energy to repair things around the boat. I got after the vane, which hadn't worked since we left Cape Town; Jeff bolted down the saloon table that had worked loose; I repaired a damaged whisker pole, and planed down the head and forecabin doors so they would close without binding.

These endeavors kept my mind off the fact that the overcast sky prevented me from knowing with certainty in what direction we were sailing. I presumed it to be east, or maybe it was a little north of east.

It was during this period that drizzle began to accompany the gales and dampness began to permeate everything in the cabin; our clothes, mattresses, sleeping

bags and pillows were sodden. Tension mounted as we continued eastward and our DR longitude, deduced from estimates of speed based on observation of our wake, approached that of western Tasmania. Finally, on July 22 Rick spotted a plane flying over the water north of us. It flew back and forth for about 20 minutes and then zoomed back into the sky headed east and disappeared into the clouds. We presumed—mistakenly—that it was headed for a Tasmanian airport and was killing time waiting for a storm to clear.

Gloomier weather could not have been imagined as gales continued to dampen our spirits.

Where was Tasmania? Our DR, in which we could not afford to put too much stock, showed that we were somewhat south and well east of the southern tip. The barometer stood at 1007, forecasting the onset of heavy southwest gales.

A change in cloud patterns, and other clues, led me to believe that our DR longitude was reasonably accurate and that we had slipped past the southern tip of Tasmania without sighting it. So on July 25 we made the decision to turn north.

Convinced that we were in the warm East Australian Current and approaching southeastern Australia, we were excited but not surprised when Jeff sighted land on the port bow about 3:30 p.m. on July 28.

But something was wrong. We approached and passed two islands that didn't seem to jibe with our small-scale chart. Nothing added up. After lying ahull amid the rocky islands that night, sailing and motoring among them the following day, watching spray from underwater rocks (bomboras) surge 50 feet in the air, sailing slowly at night along a coast seen dimly at sunset, and then sailing all of the daylight portion of the next day along a vertical rock wall with no beach whatsoever, we had to face the devastating facts.

We had turned north prematurely and were paralleling the coast of South Australia. We had undershot Tasmania by 1,000 miles — a distance equal to the surface drift I had been adding to our DR!

We identified the location and pulled away slowly in the late afternoon hours of July 30 into a brisk onshore wind. By dark it developed into, of all things, a gale.

A positive outcome of our encounter with the "wall" — that unbroken line of 100-foot-high, vertical cliffs — was the establishment of a working longitude. Also, knowing that we were nearing a lee shore gave us an opportunity to work out a scheme to minimize the risk of being dashed on the rocky, uninhabited, and almost unlighted coast in the dark of the long winter night. The coast trends northwest/southeast so we determined that, by day, we would sail northeast in order to

speed up the possibility of closing the coast in daylight hours and, during darkness, we would sail southeast in order to avoid closing.

Our thoughts were constantly on our landfall and making the delicate maneuver around Cape Bruny, the southern tip, and into Hobart. It would be the toughest bit of navigation on the whole voyage.

We began to reduce sail during the night as a precautionary measure. On August 6 our log indicated that Tasmania was only about 380 miles away. As we slanted southeastward, low temperatures again became a problem. Rick developed frostbite on the backs of his fingers and Jeff had chilblains on his face from the cold.

Our tactic of paralleling the coast at night by sailing southeastward was not without hazard. We were vulnerable to the heavy seas generated by the southwesterly gales. A few hours after dark on August 9, Jeff, who was on watch in the cockpit, shouted down the hatch that he was going to add the staysail to the storm jib to help improve *Globe Star's* steerage and decrease her surge toward the rocky coast from the huge waves on our starboard beam. He had just positioned himself on the foredeck when a towering wave crashed onto us, rolling *Globe Star* on her port beam and sending her scudding sideways to lee. Rick jumped to the hatch, looked forward, and shouted above the roar of the gale, "I don't see him! I don't see him!"

I gasped. It seemed like an eternity before Jeff raised his head above the cabin top. When the wave hit he had flattened himself on the foredeck between the Dorade vents and hung on as best he could. He was soaked but safe.

In the knockdown, a winch handle had flown across the cabin and broken one of the grates on the galley stove. Water poured in through the sliding hatch soaking charts, records, tape recorder, gun, everything. In the forecabin, jars containing spare parts were shattered and parts were strewn all over the V-berths. Exhausted and frightened, we held our breaths and waited for the next crash, wondering if we would fare as well.

I also couldn't help wondering if these steep, breaking seas resulted from shoaling as they neared Tasmania, but no land came into view on August 10. At noon we estimated our latitude at 43°37'S based on an observation of theta Scorpii during the dark hours.

We continued on the port tack. That night, with a west wind blowing, we put *Globe Star* on starboard tack to sail our southeasterly course during the night. I was on watch as the first blush of dawn appeared in the northeast. Almost without thinking, I changed the yankee over to the port tack and, within an hour, we had Southwest Cape, Tasmania, in view. Its latitude: 43°34'S. We were spot on!

