

G.P.S....a remarkable tool for extraordinary adventure....with great care. Warren Blake.

The advent of the Global Positioning System of satellites in the 1980's ushered in a quiet, but revolutionary improvement in the safety of navigation at sea. It has also made feasible feats of navigational derring-do that would have been unthinkable fifteen years ago. This is the story of one such bold use of the new technology. Before G.P.S. and its temporary antecedent the Trident System, I used to do all my oceanic navigation with a sextant, shooting the sun in the daytime, and the stars during two narrow windows of about twenty minutes each, first at the dawn and later the sunset, when the navigator can see both the brighter stars and the horizon through the eyepiece of the sextant.



One of my youngest students

achievement and elegance of the laboriously derived “celestial fix”, but I cannot argue with the great increase in safety offered by G.P.S....*as long as it is appropriately used by an experienced seaman and navigator, for there are attendant dangers as well!*

One short anecdote to illustrate the dangers: My schooner FOUR FRIENDS was moored in Raffle's Marina in Singapore. In the berth next door was a shiny, new, white, generic motor boat. It's owner, a young local chap, proved friendly, and very anxious to show me his boat. It was fitted out with every conceivable modern gadget, all of which he turned on to display various data on various screens. One of these was a chart plotter of unusually large dimensions. The Owner zoomed in on the Marina, showing the individual pontoon arms and our position alongside one of them. I was impressed, for the first time, with a chart plotter, not hitherto realizing one could discern that level of information. The Owner then switched with a flourish to show the dotted track that his vessel had made in manoeuvring around the various pontoon arms...in graphic detail. I asked did he have tracks like that of his longer voyages, to which he laughingly admitted that he not yet sailed his new, first command outside of the Marina.

A small alarm bell started to ring in my ear, just as he began to say “Now I know I can go anywhere in the world using this plotter!” The ear-splitting Klaxon in my head must have resonated in my eyes, because he immediately looked concerned that he had made a faux pas of some sort.

I told him that he had better come and look at the charts on my vessel...he eagerly accepted. On my old, discoloured, heavily annotated paper charts I pointed out reefs in the Java Sea that I had determined to be

Under good conditions I might observe the altitude of six or seven stars, along with the exact GMT of each observation. I would then enjoy about an hour of trigonometrical calculations which would produce six or seven Lines of Position on the chart, which, with luck, would all cross roughly in the same area (the navigator's “cocked hat”) providing a “fix” of position with an accuracy of, at best, plus or minus half a nautical mile (900 metres).

This fix was obtained under good conditions just twice a day, and was a very personal and satisfying way of determining one's position. I continue to gain vicarious pleasure in this art by teaching the occasional group of enthusiasts

By contrast our modern GPS gives a fix of accuracy plus or minus 10 metres, and is automatically updated every two and a half seconds...no trigonometry, no waking before the cold gray dawn in the hope of identifying a star or two through gaps in the clouds.

Every child of the the 21st. Century will immediately discern the superiority of the modern system: it is automated, it requires no mental labour, it is always instantly available day and night, and best of all, the results are presented on an Electronic Screen, that iconic opiate of Post-Literate Society. I am dismissive of these effete virtues, and I miss the

variously 2.2 nautical miles (Celestial Reef), 1.7 nm (Wild Pigeon), 1.1 nm (Discovery Shoal) out of position as marked on the charts. I showed him Hayes Reef, off Miri, 0.7 nm out of position, where the wreck of my old Ketch FOUR FRIENDS lies, in order to more dramatically emphasise the dangers. I showed him many others, and also the dozen or so reports to the Admiralty I had turned in over the years, warning of just such dangers.

I told him that **apart from the Singapore Strait and parts of the Malacca Strait, no area in South East Asia has been resurveyed to match the accuracy of G.P.S....**so a careless navigator might “sail past” a reef in the dark with an apparent mile or more of sea room, only to fetch up a wreck in the surf. All of our charts were originally constructed using a sextant and the stars, with the depths sounded with an old-fashioned lead-line....so the accuracy obtained was remarkable, and their deficiencies only recently realized.

The only charts on which one can safely rely on the G.P.S. solely for accurate position fixing are marked along the upper margin with the caption: “Positions in WGS 84”...in conformity with the World Geodetic Survey standard of 1984, and these are rare outside of the best-charted areas of the industrial world...immense areas of the globe await resurvey.

My chastened fellow Captain retired to his boat vowing to be careful...I hope I did not spoil his dreams of adventure on the sea...but it is incumbent upon we old hands to remind the young and inexperienced that the modern plethora of labour-saving and “safety” devices can seduce the novice into an illusory sense of security and omnipotence. Auto-pilots linked to GPS, automatic sheet releases, chart-plotters, EPIRB beacons, instant satellite communications, shallow alarms, weather machines, canting keels for Frederick’s sake!...all have their uses, but unless their limitations are clearly understood, they can be dangerously seductive. I am reminded of my Father’s dictum: you go to sea in safety only if your vessel is well-found, well equipped, and sailed with sufficient care and experience that **you can get out of any foreseeable emergency through your own efforts!** He spoke thus before the days of electronic gadgetts, but I see no modern reason to repeal that Number One Rule of seamanship! In later years he would also remind the young people who sailed with him that the first capability one loses in a Force 12 sustained gale in the open ocean is the ship’s electronics...the driving salt spray finds its way into every modern gizmo...”Then you had better know how to apply the traditional skills...or you will end up a wreck on some dismal lee-shore downwind!”

On the other hand, G.P.S. can be used to carry out feats of navigation that would have been unthinkable fifteen years ago. Any such triumph requires first that the navigator must be absolutely sure of the correct GPS position of any dangers involved, which, away from the WGS 84-ready Singapore Strait and Malacca Strait, or similar regions, virtually means that he must “survey” the area himself. Secondly, such derring-do requires a clear appreciation of just how close he can sail to the dangers present, considering the prevailing conditions; plus a nice balance of the benefits gained, such as a night’s good shelter, against the inherent perils, such as shipwreck.

One example of finding a good night’s shelter that I am proud of took place in the distant Talaud Isles, NE of the North tip of Sulawesi, lying between that great drunken spider of an island and Mindanao in the Southern Philippines. The Schooner FOUR FRIENDS sailed out of Manado in Sulawesi with seven scientists from The Nature Conservancy plus four crew, eleven souls in all, on a thirty day expedition amongst the Sangihe and Talaud Archipelagoes...thirty days in which we sailed among fascinating and beautiful remote islands, and during which we were able to purchase no supplies at alla wonderful expedition, but that is another story!

rely on continuous plotting of position on my own paper grid with slight corrections relayed to the helmsman where necessary. One sleepless scientist was appointed to call out soundings, the other sleepless scientists

clustered on the rolling foredeck, hanging on grimly, and gazing anxiously ahead into the howling gloom.

The first sounding, 400 plus feet showed up a worrying minute later than expected, reassuring in its appearance, but no guarantee of whether lethal reef lay close ahead, or safe channel entrance. We slid along a line of decreasing soundings...no sign of reef ahead.

Suddenly we all realized that our ship was now motoring along safely in calm water!...we were inside the bay! We rounded up at the anchorage point, dropped the anchor, and discussed the drama over nightcaps and coffee.

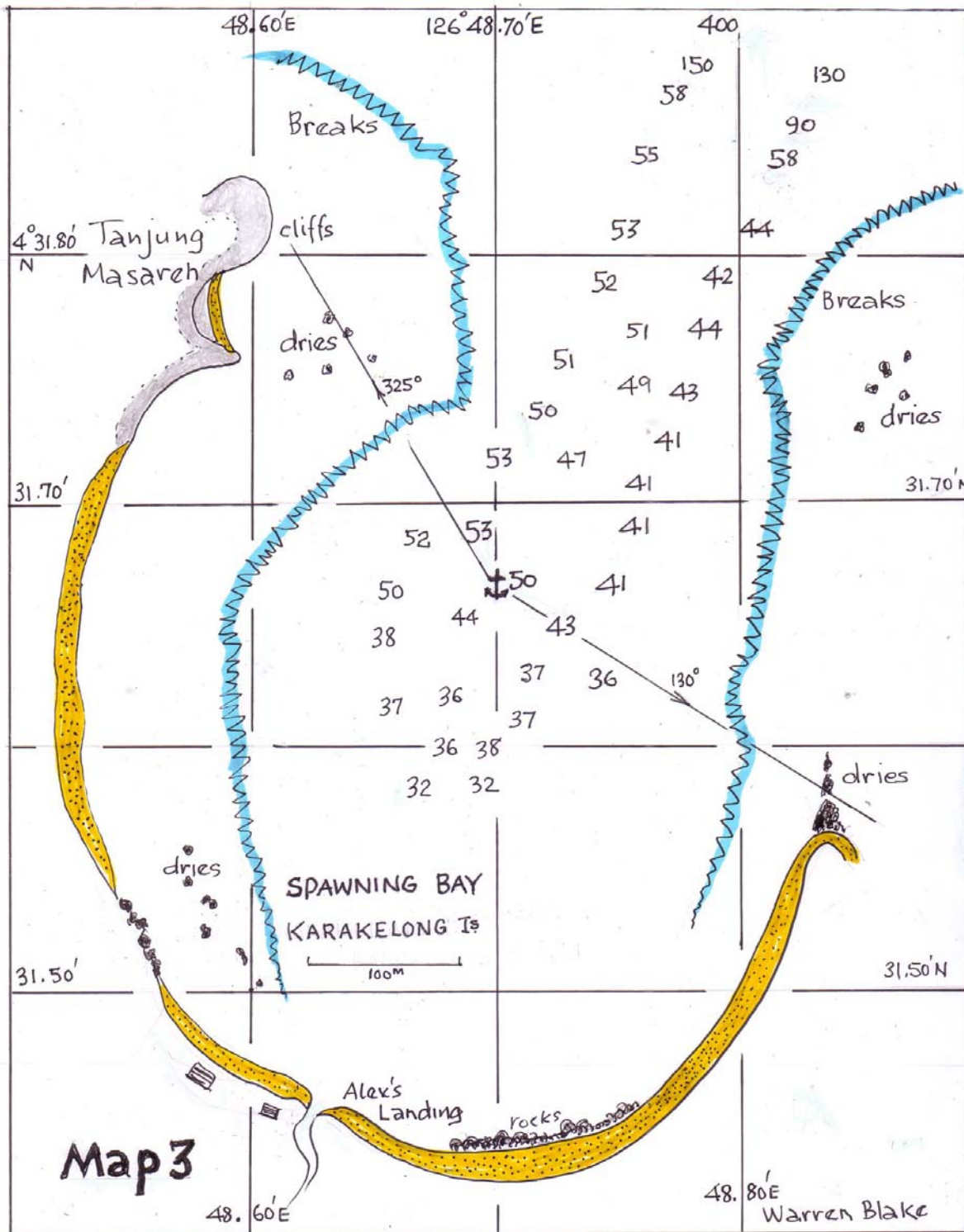
Astonishingly, no one had seen any sign of breaking waves in the complete dark, but the scientists on the

foredeck, away from the engines' noise, had clearly heard the crashing of the storm waves on the reefs on either side as we negotiated the entrance.

We slept well, and woke in the morning to a clear sky and an idyllic anchorage, sheltered to seaward by extensive, glowing reefs, girdled inshore by yellow beaches. While the scientists dived, I surveyed the bay....see Map 3. The channel entrance proved to be nearly two hundred metres wide, plenty of room under calm, clear daylight, but a tiny target to find on a dark and tumultuous sea.

The following night the full moon blazed, triggering a rare wave of coral spawning on the surrounding reefs that kept the ecstatic scientists up most of the night. We had discovered a secure and fascinating small microcosm....thanks to the reliable accuracy of the Global Positioning System.

100%



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