

## PAUL'S TIPS

### Surface Ops Tip of the Month

---



#### How Far Away is that Waypoint?

January 2020

Imagine you are on patrol and your OPCON contacts you to respond to a boater who needs assistance at a given location. Where is that waypoint and how do you get there? Of course you are familiar with your chartplotter and can enter that waypoint and get underway. But with just a few seconds of mental math you can derive a rough solution and respond.

You are at the following location (which happens to be the coordinates of Blossom Rock Buoy in San Francisco Bay):

37° 49.1'N  
122° 24.2'W

Also recall that one minute of latitude is equal to one nautical mile.

You are given the following coordinates of the boater requiring assistance (at Harding Rock Buoy):

37° 50.3'N  
122° 26.7'W

By quick inspection of the numbers you can see that both the latitude and longitude are greater than your current position so you know it is roughly northwest of your current position. The latitude is 1.2 minutes greater so they are 1.2 miles of “northing” from you.

Also note that the longitude is 2.5 minutes greater and therefore they are west of you. But those would only be miles at the equator and we are at latitude 38. At this latitude, the longitude scale is shorter than the latitude scale by an amount equal to the cosine of our latitude or about 80%.

So 80% of 2.5 is 2.0, therefore they are 2 miles of “westing” from you.

The triangle is therefore 2 miles west and 1.2 miles north. If you guessed the actual distance of around 2.5 miles you'd be close – it's actually 2.35 NM. If you were to roughly sketch the triangle, you'd be very close if you guessed that the course is about 30 degrees north of due west, or 300 degrees True. At least you could proceed in the right direction while you fine-tuned your navigation plan.

Now, knowing your cruise speed is 15 knots and that 2.5 miles is one-sixth of what you can travel in an hour, your estimated time enroute is around 10 minutes (one-sixth of 60 minutes).

If you practice this you'll be amazed in how quickly you can come up with a reasonable estimate. Remember that this does not replace proper navigation and hazard avoidance.

## PAUL'S TIPS

### Surface Ops Tip of the Month

---



#### Reciprocal Course

February 2020

There are situations where it is useful to quickly and precisely derive a reverse course. The scariest scenario is a man overboard when shorthanded.

A smaller facility (less than 26 feet LOA) only requires the coxswain and one crewmember aboard. While underway, the crewmember might go over the side without the coxswain/helmsperson even realizing it. Imagine the dread when you turn around from the helm and your crewmember is not aboard!

In addition to marking your current location on the chartplotter, it is important to immediately note your heading. Then you must establish a reciprocal course and estimate how much time has elapsed since you last saw or talked to your teammate.

OK, so what is the quickest way to figure out the precise reciprocal course without adding or subtracting 180? It's very simple:

“Add Two, Subtract Two”

Example – your heading is 160, the reciprocal course is 340. You add 2 to the first digit, and subtract 2 from the second digit.

In cases of larger initial headings, the total would be over 360 which would be nonsensical. In those cases you subtract first:

“Subtract Two, Add Two”

Example – 245 on the compass – the reciprocal is 065. Subtract 2 from the first digit, and add 2 to the second digit.

In this way you can figure out your exact reciprocal course in a couple of seconds!

There are a couple of places on the compass where you need to adjust the method a bit. For headings between 100 and 119 degrees, there is a bit more mental math. Think about it and you'll see. Same for 280-299.

NOTE – Remember that there is a difference between course and heading. The course is what you intend to steer, and the heading is which way the boat is pointed at any particular instant.

## PAUL'S TIPS

### Surface Ops Tip of the Month

---



#### How to Report Position While Underway

March 2020

We are all familiar with the requirement to report our ops status and position to whomever is maintaining our radio guard, normally at 30-minute intervals. Of course the reason for this is to keep track of you for your safety, and to take action to find you in case something happens and you do not check in. Also, by knowing your position your OPCON can more efficiently assign assets in the particular AOR as needed.

I sometimes hear crews read off the numbers on their GPS to the third decimal place while reporting their position which is way too precise. For example, the latitude on the unit might read

37° 49.302'N

This should be reported as “Three Seven Degrees, Four Niner Decimal Three North”.

Why not report it all? Well, for a couple of reasons – the first is brevity, to keep the transmission as short and meaningful as possible. Additionally, a more detailed position does not add any value for this purpose.

Let's review what these digits represent. Recall that one minute of latitude (the “9” digit above) is equal to one nautical mile (2000 yards). One tenth of a minute (the “3” digit above) represents one tenth of a mile. That's only 200 yards – plenty accurate to find you if necessary. If you've taken the AUXSC&E course (which is great...) you learned that the sweep width and derived track spacing for a facility-sized target is roughly 1-6 NM depending on several factors so one-tenth of a mile reporting precision is plenty good.

The hundredth digit (the “0” above) is equal to plus or minus 20 yards – that's only two or three boat lengths. And the thousandth digit (the “2” above) is only plus or minus six feet! No one cares on which side of your boat you installed your GPS antenna.

Now, if you were reporting something that would benefit from the greater precision (such as during an MOB event) then additional accuracy would be appropriate to identify the last known position and the resulting CSP.

## PAUL'S TIPS

Surface Ops Tip of the Month

---



**What's the Most Important Safety Device on the Boat? (It's a trick question...)**

**April 2020**

I sometimes ask prospective coxswains and crewmembers what they think is the most important safety device on the boat. In each case, the individual will invariably begin to rattle off all of the PPE they wear (PFD, PLB, strobe light, etc). Or they will itemize all of the boat's equipment such as the ring life buoy, visual distress signals, ignition cutoff and all other safety equipment.

While these are all very important, there is one other item which is both the cause and prevention of more mishaps than any other item. What is this item?

The throttle.

Of course most folks don't think of the throttle as a safety device. But just think about what the throttle actually does – it THROTTLES the engine, meaning it is used to strangle the engine of air (and fuel) and prevent it from running away at full RPM. It doesn't MAKE the engine go – it holds it back as desired.

What an amazing device! With just a couple of fingertips, the helmsperson can choose at will how fast several tons of facility is moving. With that thought comes the realization that probably the majority of (or maybe all) "close calls" you might have experienced in the past were directly related to throttle position. Remember that wake that was struck with excessive speed and caused your crewmember to bang their head into the bulkhead? Or that time the boat struck the dock too hard due to excessive speed when docking?

Of course this is a bit tongue in cheek, and there are numerous other factors at play. But I feel comfortable in the argument that in the majority of mishaps, the single thing that would have most directly changed the outcome is a different throttle position.

Now, the key thing here is proper manipulation of the throttle for the situation at hand, whether it is approaching a dock, or an alongside tow, or any other maneuver. And that takes practice – lots of it. But the key takeaway should be the need to make an honest assessment of one's skills and the conditions at hand (such as night ops) and more often than not that you should SLOW DOWN! There is no doubt that some maneuvers such as boat handling in wind require more aggressiveness on the throttle.

If you think of those little levers as a miracle safety devices which slow down tons of mass at will, then you will find a greater respect of their importance in staying safe.

## PAUL'S TIPS



### Surface Ops Tip of the Month

---

#### Line Handling Commands – Geek Out on Them

May 2020

Yes, it's that topic again. We discuss them a lot in the Ops world, every year. And yet every year we have folks get underway and use them inconsistently or not at all. Why is that?

Now I'm not suggesting everyone turns into A.J. Squared Away. Who is that? Here are a couple of online definitions:

- A.J. Squared Away: (name for) a sailor who is always "squared away," meaning always has a perfect shave, perfectly ironed uniform, spit-shined shoes, haircut with less than 1mm of hair, etc.
- A.J. Squared Away: Naval term for the mythical sailor who has his s\*\*t together.

There are some topics for which we need to be more squared away than others. No one will get hurt if your boots don't have a perfect shine. But mess up an alongside tow by miscommunicating a line command and you might bend the boat or lose some fingers. This is not an exaggeration.

Besides, it's in the pledge you took when you became a member – remember that? It goes like this: "I solemnly and sincerely pledge myself to ... abide by the governing policies established by the Commandant of the United States Coast Guard." Where are the line handling commands? Well, they are not in the Boat Crew Qualification Guides, nor in the new Boat Crew Handbook (BCH16114.1) – they are in the Nav Standards (COMDTINST M3530.2F).

My good friend and fellow Auxiliarist Michael Brown was on a patrol on another facility last year and handling lines on the bow. When departing from the dock the following exchange occurred:

Coxswain: "CAST OFF LINE 1"  
Michael: "CAST OFF LINE 1 AYE" and dutifully (and tongue in cheek) removed the line from the bow cleat and tossed the line onto the dock.  
Coxswain: "WAIT!...Why didn't you bring the line aboard like we always do?"  
Michael: "You said CAST OFF LINE 1 – you didn't say TAKE IN LINE 1..."

The standard line commands include some that are more relevant to the cutter world – for example, our facilities do not have capstans. But these are some of the more important commands. Use them!

STAND BY YOUR LINES	Man the lines, ready to cast off or moor
SINGLE UP (line number)	Take in all but one bight so there remains a single part
DOUBLE UP (line number)	Pass an additional bight on the specified line
CAST OFF (line number)	Cast off from your boat and leave line on other boat or the dock
PUT OVER/PASS (line number)	Pass the specified line and provide slack
HOLD (line number)	Do not let any more line out even though it might part
EASE (line number)	Let a line out until it is under less tension, but not slacked
SLACK (line number)	Take all tension off a line
TAKE THE SLACK OUT OF (line number)	Take all the slack out of a line, but do not take a strain
SHIFT (line number)	Move a line to the specified location
HEAVE AROUND ON (line number)	Take a strain on a line
AVAST HEAVING (line number)	Stop taking a strain on a line
TAKE IN (line number)	Allow enough slack to undo other end and bring the line aboard