

NUMBERS EVERY LOG RACER SHOULD KNOW

by Tom Collins

Listed below are the important numbers pertaining to my boat that I use to make quick adjustments while underway whenever some new information comes available. For example, assume I've just received the time at a waypoint after a 1½ mile run that says I'm 15 seconds late and I have 2 more miles to go to get to the checkpoint. Dividing 15 seconds slow by the 1½ nm distance traveled shows I was 10 seconds-per-mile slow. At 5.6 sec/tenth knot (e below), that indicates there is *about* a 0.2 knot current against me ($10 \text{ sec/nm} \div 5.6 \text{ sec/tenth knot}$). I'll have to add 24 RPM to correct for the current ($12 \text{ RPM/tenth} \times 2 \text{ tenths}$). I'll also need to add some RPM's to make up the 15 seconds I was late at the waypoint by dividing the 2 nm remaining into the 15 sec I was late to get 7.5 sec/nm. Multiplying 7.5 sec/nm times 2.1 RPM/sec/nm from the table below yields 15.75 RPM. Rather than use a calculator I would simply round and multiply 8×2 to get 16 RPM which is close enough as I can't set ¼ RPM anyway. What is important here is to get the calculations done quickly so the RPM's can be adjusted as soon as possible. Exact precision in the calculations isn't as important as getting a quick approximation as to what is needed and correcting the RPM's right away. In this example we would add 24 RPM for the current and 16 RPM to correct for the late arrival at the waypoint or a total of 40 RPM. Adding that to the baseline 860 RPM gives a new RPM of 900 for the rest of the leg. Good Luck!

<u>Description</u>	<u>Misty Sea's Value</u>
a. Base speed RPM (<i>a</i> , <i>b</i> , & <i>d</i> are from measured mile speed curve)	860 RPM
b. Vessel speed in knots (on measured mile average knots, not seconds)	8.0 kts.
c. Vessel speed in seconds per nautical mile ($3600 \div \text{speed in knots}$)	450 sec/nm
d. Speed Sensitivity, RPM change required to change speed $1/10$ knot	12 RPM/ $1/10$ knot
e. Seconds/nm per tenth knot ($3600 \div \text{speed } b$) - ($3600 \div (\text{speed } b+.1)$)	5.6 sec/ $1/10$ knot
f. Speed Sensitivity, RPM to change speed 1 sec/nm ($d \div e$)	2.1 RPM/sec/nm
g. Acceleration time, dead stop to full speed (additional time for 1 nm)	6 seconds
h. Turn time, seconds per 180° (time for continuous 360° turn $\div 2$)	40 seconds/180°
i. Turn radius in yards ($645 \times \text{turn time } h \div \text{speed } c$)	57 yards
j. RPM added for 10° dogleg ($.154 \times \text{speed } b \times \text{speed sensitivity } d$)	15 RPM
k. Weight sensitivity, pounds per second per nm ($.007 \times \text{boat weight lbs.}$)	350 pounds/sec/nm

August 2010