# CROOKED COURSES

By Tom Collins

You're working over your chart on the kitchen table while preparing your predictions. You use a straightedge and a pencil with an ultra fine point. You deftly draw the straightest line possible between each checkpoint. It wouldn't even occur to you to to draw anything other than a straight line. In fact, the S.C.C.A. rules specify that "Deviation from a straight line course shall be the minimum required for safety while maintaining the shortest distance between control points."

But now its the day of the contest and you're on the water running that same straight line course you predicted . . . or are you? As you approach the first checkpoint you realize that there must be a current coming from your starboard because you find yourself increasingly correcting course to starboard as you approach the buoy. You recall that small course corrections, those less than five degrees, give a negligible speed error. However, right now you are already correcting twelve degrees and you may have to add even more correction to safely get around the buoy. This is really going to screw up the leg unless you do something quick. So you grab your dog leg correction table, look up the RPM increase needed to compensate for the off course error and adjust the throttles accordingly. Tragedy averted.

Now you've settled out on the new course to the next checkpoint. But the autopilot isn't holding course very well in this combination of wind and swells. You notice by the compass that the boat is swinging back and forth about ten degrees either side of the course. This extra distance will surely give you a big error. Once again you check the dog leg correction table. This time, because you are correcting for an oscillating heading error, you use only one half the RPM from the table.

As you prepare to turn onto the third leg, you recall the sideways current you encountered on the first leg and decide to try to take measures to avoid repeating that spiral course to the buoy. Immediately after marking, you turn to the new course and position the boat so that the buoy is directly astern while on the course to the next mark. Sighting over the buoy you note a point on shore directly behind the buoy and mentally note it so that it can be used as a rear range. Over the next few minutes you constantly adjust the course until the range holds its alignment. Noting the crab angle required you once again refer to the dog leg correction table and make the appropriate adjustment for the course offset due to the cross-current.

Success! You finish the contest with a respectable score, due in part to the use of the dog leg correction table.

Making a dog leg correction table is relatively simple. For each degree of course offset, multiply the percent speed increase from the accompanying table times the vessels baseline speed to compute the required speed increase in knots. Then multiply the speed increase times the speed sensitivity in RPM per knot to determine the required increase in RPM.

# DOG LEG CORRECTION TABLE

Baseline Speed: 9.3 Knots
Speed Sensitivity: 180 RPM/Knot

My Baseline Speed: _____
My Speed Sensitivity: _____

| Course Offset Degrees | Percent Increase Required | Speed Increase Knots | RPM Increase Required | My Speed Increase | My RPM Increase |
|---|---|---|---|---|---|
| 1 | 0.0% | 0.00 | 0 | _____ | _____ |
| 2 | 0.1% | 0.01 | 2 | _____ | _____ |
| 3 | 0.1% | 0.01 | 2 | _____ | _____ |
| 4 | 0.2% | 0.02 | 4 | _____ | _____ |
| 5 | 0.4% | 0.04 | 6 | _____ | _____ |
| 6 | 0.6% | 0.05 | 9 | _____ | _____ |
| 7 | 0.8% | 0.07 | 13 | _____ | _____ |
| 8 | 1.0% | 0.09 | 16 | _____ | _____ |
| 9 | 1.2% | 0.12 | 21 | _____ | _____ |
| 10 | 1.5% | 0.14 | 26 | _____ | _____ |
| 11 | 1.9% | 0.17 | 31 | _____ | _____ |
| 12 | 2.2% | 0.21 | 37 | _____ | _____ |
| 13 | 2.6% | 0.24 | 44 | _____ | _____ |
| 14 | 3.1% | 0.28 | 51 | _____ | _____ |
| 15 | 3.5% | 0.33 | 59 | _____ | _____ |
| 16 | 4.0% | 0.37 | 67 | _____ | _____ |
| 17 | 4.6% | 0.42 | 76 | _____ | _____ |
| 18 | 5.1% | 0.48 | 86 | _____ | _____ |
| 19 | 5.8% | 0.54 | 96 | _____ | _____ |
| 20 | 6.4% | 0.60 | 107 | _____ | _____ |
| 21 | 7.1% | 0.64 | 119 | _____ | _____ |
| 22 | 7.9% | 0.73 | 131 | _____ | _____ |
| 23 | 8.6% | 0.80 | 145 | _____ | _____ |
| 24 | 9.5% | 0.88 | 158 | _____ | _____ |
| 25 | 10.3% | 0.96 | 173 | _____ | _____ |
| 26 | 11.3% | 1.05 | 188 | _____ | _____ |
| 27 | 12.2% | 1.14 | 205 | _____ | _____ |
| 28 | 13.3% | 1.23 | 222 | _____ | _____ |
| 29 | 14.3% | 1.33 | 240 | _____ | _____ |
| 30 | 15.5% | 1.44 | 259 | _____ | _____ |
| 31 | 16.7% | 1.55 | 279 | _____ | _____ |
| 32 | 17.9% | 1.67 | 300 | _____ | _____ |
| 33 | 19.2% | 1.79 | 322 | _____ | _____ |
| 34 | 20.6% | 1.92 | 345 | _____ | _____ |
| 35 | 22.1% | 2.05 | 370 | _____ | _____ |

Example: 15 degrees, 3.5% X 9.3 kts = 0.33 kts; 0.33kts X 180 RPM/kt = 59 RPM