

## **Pacific Cup Weather and Tactics**

### **Stan Honey**

*Stan Honey has navigated in 23 Hawaii races, winning line-honors or class 14 times. As navigator, Stan has set 7 records in Hawaii races including single-handed, double-handed, and multiple fully-crewed records for monohulls to Hawaii. In 1996, Stan and Sally (Lindsay Honey) won the Pacific Cup overall, sailing their Cal 40 Illusion doublehanded.*

### **Overall race structure and necessary decisions**

The primary feature that determines the tactics in a Hawaii race is the Pacific High. Typically there is no wind in the center of the high, and increasing wind as you get farther south, to a degree. The central question concerning course selection is: how close to sail to the high, or how many extra miles to sail in order to stay farther from the high? In years when the Pacific High is weak (or weakening), zonal, and positioned well south, there can be strikingly more wind to the south, and paradoxically, the trades to the south can be strong. There have been Hawaii races where yachts that are 10 miles to the south of competitors can experience one knot more wind. A high performance boat, in one knot more wind may sail 1/2 knot faster, and therefore would gain 12 miles per day on the northern competitor. Although the gain is less for heavier boats, it may still be a significant factor if the northern boats are in sufficiently light wind. This condition can persist for the entire middle third of the race. Note that all yachts in this middle third of the race are nearly fetching the finish on starboard gybe, so the boats caught too far north cannot gybe out of their predicament without sailing a dramatically unfavored angle, and passing far astern of the competitors to the south.

Occasionally, however, the Pacific High will be strong (or strengthening), and located far to the north. In these conditions, it IS possible to be too far south. The boats that are farther north will not only get more wind, but will sail the shorter distance. Typically in these sorts of years, the wind stays "reachy" throughout the middle third of the race, so the boats that paid extra distance to get south cannot even "cash in" the southing and reach up in front of the northern boats, because everyone is reaching fast.

You need to pick the right slot in order to win your race.

## **The start and exit from the Bay**

Get a conservative start. It is senseless to risk a foul or collision at the start of a 2000 mile race, so don't get swept up in the competition for the best start. The start is generally scheduled for an ebb tide so boats tack promptly after the start and spread out across the bay. A conservative start is relatively inexpensive because you will be able to get clear air soon after the start as the boats spread out. Tack shortly after the start, and take long tacks across the center of the bay in order to stay in the favorable current. Pass under the bridge at mid-span. Outside the Bridge, if you can see Alcatraz you are typically still in the favorable ebb. Pay attention and stay in the current. It often makes sense, however, to sail close to Point Bonita and tack to starboard there. The boats that tack to starboard close to Bonita often get the veer and the increased wind sooner than the boats in mid-channel. In particular don't sail down the coast and get stuck in the Montara Hole.

Race to the location where the synoptic wind will blow all night. Most years that is equivalent to racing to SouthEast Farallon.. The best source of data useful to determine where the inside edge of the synoptic wind will be the evening of the start, and the quickest route to get there, is the HRRR grib data. HRRR grib files are legal to access during the race so long as you retrieve them from a free source. Saildocs is one example of a free source but there are others.

Once you get to the synoptic wind, generally in the vicinity of SE Farallon, you need to work out your overall race tactics. The course that you select for the first night and the next day will determine your tactics for the rest of the race, and your result.

## **The three portions of the Pacific Cup:**

It is helpful to think of the Pacific Cup in three sections:

1. the windy reach to the ridge;
2. "slotcars" through the middle third; and
3. the run for the last third..

The Pacific High nearly always has a ridge extending from its southeast corner. On the weather map this is visible as a "U" shape in the isobars on the southeast corner of the high. After leaving coastal waters, you will have a windy reach for a couple of days, depending on your yacht's speed, but when you get to the ridge, the wind will lighten and veer very quickly. Within 6 hours after you initially set the spinnaker, the wind will lift and you will be running on your downwind polars in much lighter air. You just crossed the ridge.

The most critical decision of the Pacific Cup is where to cross the ridge. The reason this is critical is, once you get to the ridge and the wind veers, it is difficult to get farther south without giving up miles. It never pays to sail lower than your polars, and at this point in the race you can not gybe (onto the dramatically unfavored port gybe) without huge penalty. That is why the middle third of the race is called "slotcars."

As you left the coast you made your decision where you wanted to cross the ridge, you sailed there, and now you have to live with it for four or five days. If you are too far to the north, you will be slowly destroyed by the yachts to the south of you who have more wind, and there is nothing that you can do about it. You cannot gybe (without huge penalty), and it never pays to sail lower than your polars. If you are substantially too far north, you will experience torture. As the wind gets lighter, you have to sail higher and higher, until you "spin out" up into the high. When you have to gybe to avoid total calm, your angle on port gybe will have you heading due south, far behind your competitors' transoms. The "slotcars" leg ends when the wind eventually veers far enough so that both gybes are symmetrical around the course to the finish, allowing you to sail either gybe. So in summary, the goal is to pick a "slot" such that by the time the wind is getting light, it has veered enough so that you can gybe onto port on a good angle. The boats that pick a slot that is too far N have to gybe out on a terrible angle. The boats that pick a slot that is too far S will have the boats in the ideal slot (to the north of them) gybe before them and cross their bows. Note that routing software always suggests a course that is too close to the high. The software doesn't take into account light spots that force you to sail higher, and once you're too far north, the lighter air forces you still farther north.

The final third of the race is "the run." This is why we sail Pacific Cups. The wind picks up as you approach the Islands, and you get to practice your helmsmanship surfing tradewind swells. Generally the right hand side of the course is favored in the final third of the race, because the wind typically slowly veers as you sail west.

Do keep an eye out for tropical depressions or their weaker siblings which are sometimes referred to as "inverted troughs." They are both visible as omega shaped waves in the isobars in the tropics. If you will be approaching the finish following an inverted trough, or a tropical, approaching the finish from the right hand corner works particularly well as there is often a veer and light air east of an inverted trough. If you will lead an inverted trough or tropical to Hawaii, then it often pays to gybe down in front of it because there is often more wind and a back in the wind west of a tropical or inverted trough.

Most years when there is not a tropical behind you, the right corner pays. Favor starboard gybe until you can nearly lay the Islands, and then approach Oahu on port gybe. Be sure to account for the fact that the wind will continue to veer, and do not overstand Kaneohe.

## Approaching the Finish

Arrange your final gybe or two so that you pass 10 miles due upwind of the finish. Then sail half the remaining distance on starboard gybe, and make your final 5 mile approach on port gybe. As you approach the finish take bearings with your hand bearing compass on major landmarks and plot the resulting lines of position on your GPS track. Those bearings will be a useful backup but they will also keep your "head in the game" and will calibrate your impressions of what you see on the shore.

In the daytime, take bearings on:

Makapuu (the left edge of Oahu)

Mokapu (the turtle's head)

the giant ping pong balls near Pyramid Rock (labeled "radomes" on chart)

Pyramid Rock (white house with diagonal stripes on conical rock)

At night, take bearings on:

Makapuu Pt Lt (occulting 10s, 19M range)

Marine AeroBeacon, sometimes obscured (alt green/white or red/white)

Pyramid Rock Lt (Fl 6s, 10M range)

Remember that the reef isn't far beyond the finish line, so douse your spinnaker promptly. If for some reason you have trouble dousing your spinnaker, gybe onto starboard and sheet in your mainsail. If you can maintain a beam reach, even with the kite flogging in the rigging, you will stay clear of the reef.

## Squalls

Typically, you will get tradewind squalls for the last three or four nights of the race. They only occur at night, starting about midnight and continuing and strengthening until dawn. If there is a moon, the squalls are visible for miles because of their height. If there is no moon, you can often detect squalls behind you by watching for the absence of stars. If you have radar, the rain in squalls is easily detectable. Each squall on a given night will behave similarly to its predecessor, except it will be a little stronger. So "go to school" on each squall in order to sort out how to best take advantage of the next one. If one squall provided more fun than you really wanted, douse the kite and wing out a jib for the next one. If a squall is approaching, and you get rain before the wind, prepare for lots of wind. At dawn the squalls vanish, but leave calm zones

around and particularly behind them. These calm zones are worth taking great care to avoid.

In contrast to popular perception, squalls do not generally work the way "catspaws" do. Catspaws have diverging wind in front of them. Tradewind squalls at night often have converging winds at their leading edge. The wind converges because there is an updraft in front of the squall. In addition, the average wind in the squall is generally veered about 15 degrees or so to the right of the prevailing surface wind, and the squall itself moves about 15 degrees to the right of the path of the surface wind. Behind squalls the wind is light, particularly near dawn.

If you want to race aggressively, watch for squalls and gybe to get in front of them. As they overtake you, gybe to port. Stay on port gybe during the squall, sailing as deep as you dare, and then gybe back to starboard only when the squall has passed completely over you and your wind speed and angle have returned to the prevailing conditions. If you gybe back to starboard gybe too early, you run the risk of crossing behind the squall and getting into the light air in the wake of the squall. Boats that sail downwind at the speed of a SC70 or TP52 can sail fast enough to stay in the accelerated wind in front of the squall for hours. This requires jibing back and forth in front of the squall, jibing about every 15 minutes. Each gybe "back" towards the squall will be at a horrible angle, because of the way that the wind "toes in" in front of the squall, but gybe back anyway. The additional wind velocity in front of the squall makes up for the horrible angle. If you are racing aggressively, you may gybe over 25 times in a Pacific Cup, with many gybes taking place at night in squalls.

Port gybe is more effective to avoid the calm behind a squall because the squall itself is moving to the right of the path of the surface wind, so port gybe allows you to diverge rapidly from the light air area behind the squall. It is perilous to exit a squall on starboard gybe because of the risk of getting becalmed behind the squall, particularly near dawn.

## **Weather Information**

The best source of weather data is the HRRR grib files for the region inshore of the Farallones, and from GFS grib files for the remainder of the race. The NAM grib files can give you a good forecast for local winds approaching the finish.

If you have the ability to receive weathermap images via weatherfax or satellite, the 500mb progs and surface progs are worth reviewing.

If there are any signs of a tropical storm, be sure to listen to the voice or text forecasts from the NOAA National Hurricane Center. The GFS works pretty

well for the location of tropical storms but underestimates their wind speed. The experts at the NHC provide the best data.

### **Author's Disclaimers**

All of the above comments are relevant to typical Pacific Cups. There are unusual races in which the above rules don't apply.

### **Finally**

Pick your strategy, and stick to it. Then whatever happens, make up your story for the bar in Kaneohe, and stick to it.