

## — CHILLIN' WITH THE 1%



watched the pre-race coverage as the last guests boarded and the boat pulled away from the dock.

Our skipper announced that we were to be the port side of the leeward gate. Not a bad position to draw, because the fleet would round us twice in each race. But we didn't have that great a view of the start, so our eyes bounced between the wings darting around the starting area and the much better view on the screen.

The wind was up, the ebb current chop was starting to build, and a couple of the more lubberly guests were already having trouble with their equilibrium when they tried to watch the TV screen and deal with the boat's motions, even though I thought the boat was riding extremely well in the Bay chop.

The start was exciting, but the first mark rounding was more impressive than I ever could have imagined. The lead boat took the starboard side of the gate opposite us, but the next two rounded on our side, so close that we were wet from the spray shooting off the tips of the

"We almost saw them capsize!" shouted the stockbroker.

"Dynamic forces on the wing and the foils go up with V-squared," observed Lee, "but the boat, like, still relies on hydrostatics for pitch stability."

No one expected anything technical out of a bartender in a black party dress, so it was as if her comment had never been made.

"Wait till next year," said the surgeon. "The 72-footers will be going a lot faster and they won't recover from an incipient pitchpole nearly as easily. And their wings are significantly taller, even compared to the length of the boat."

"Boats get inherently more stable as they scale up," Lee reminded us. "Heeling moment goes up by the third power of scale factor — area times rig height — but, like, righting moment goes up by the fourth power because it's displacement times metacentric height."

"The big difference is that the 72s will be up on hydrofoils," suggested the skipper of our mark boat, still not realizing that Lee could probably out-geek everyone on board. "It will give them a lot more control."

"Not really," countered the software entrepreneur, who had apparently done some of his homework. "The AC72 class rules allow only one centerboard and one rudder for each hull. The centerboard can be a curved or angled wing that lifts the boat, but the rudder has to be a regular rudder that can only have one degree of freedom. So I don't see how they're going to control these things when they're foil-borne."

"Damn right," said Lee, reverting to the agree-with-everything sympathetic bartender style as she poured another round of Champagne for everyone except the football fans, who opted for private label beer.

"It's a stupid rule," continued the software guy. "If they would only let the designers use as many controllable foils as they want, then we'd see some real development of the technology and the boats would be faster and safer and more interesting. But how are they going to get control of pitch and roll with only one lifting foil and nothing but conventional rudders back aft?"

"They do have little foils on the rudder blade tips," added our skipper. "But, as you know, they can't be actively controlled, they just sit there at a fixed pre-set angle. I race a Moth, a little foiler dinghy. Even my Moth has a surface feeler and a linkage that adjusts the angle of attack for pitch and altitude control when the boat is up on foils."



**America's Cup viewing doesn't get much better than when you're on a mark boat.**

other screens in the room do the close-ups and the onboard camera views. That way we'd have a reason to jump up and yell at the TV if the boat we're rooting for was doing it wrong."

"I scream at my TV all the time when I watch football," one of the sports fans confessed. "You're not a real fan if you don't. Especially when the refs make a bad call."

"Can't say I've ever done that," I said. "In fact I've never really cared much about any spectator sports. You know, the last baseball game I attended was to see the Brooklyn Dodgers in Ebbets Field."

They both shook their heads with a mixture of disbelief and pity.

Of course this mark boat was outfitted with a large TV screen, so we

retracted daggerboards, grazing the water underneath their airborne windward hulls. Then another boat took the starboard side of the gate, and the next boat was aimed to round on our side just as a puff and a wave seemed to push them much faster than the boats that had rounded ahead of them. Or maybe it was just more aggressive trim of the wing — hard to tell when you can't see anything luff. They nosed down, the bows submerged and the rudders on both hulls came clear out of the water. The boat practically came to a stop, pitching down precariously, and through it all I was close enough to make eye contact with the skipper as he helplessly worked a tiller that only moved rudder blades through air. Miraculously they did not go all the way over. The bows popped back up, the wing was trimmed in again, and they accelerated around our mark boat into the next upwind leg.

"That's what we call a handlebar stand," announced the mark boat captain.