

# TEAMWORK PROPELS AERO STUDENTS TO FIRST PLACE

by Darlene Slack

**T**o learn, have fun, and win. That was the mission of eight Cal Poly aeronautical engineering students at the beginning of a year-long aircraft design class and national design competition.

Mission accomplished.

The Sierra design team soared to first place and took home \$1,000 in the prestigious 1996/1997 American Institute of Aeronautics and Astronautics (AIAA) Lockheed Martin Undergraduate Team Aircraft Design Competition.

The challenge: design a 60-passenger regional amphibian aircraft, compete against 35 other universities, and have the 100-page proposal be judged the best by AIAA and industry volunteers.

The fun: team camaraderie, activities, and lasting friendships mixed with 50-hour work weeks, all-nighters, learning by doing.

The team: aeronautical engineering seniors Bruno Bachinger, Jesse Borge, Nick Demogines,

Mark Doan, Ricky Gan, Kipp Peppel, Kaaren Sorensen, and Daniel Vigna.

"It was overwhelming at the beginning," says Bachinger, Sierra team leader, of the process. "We felt like we were standing in the middle of a desert and didn't know which way to walk out." Cal Poly's four teams were basically on their own to develop their plans and procedures. Aero Professor Robert van't Riet acted as adviser when necessary.

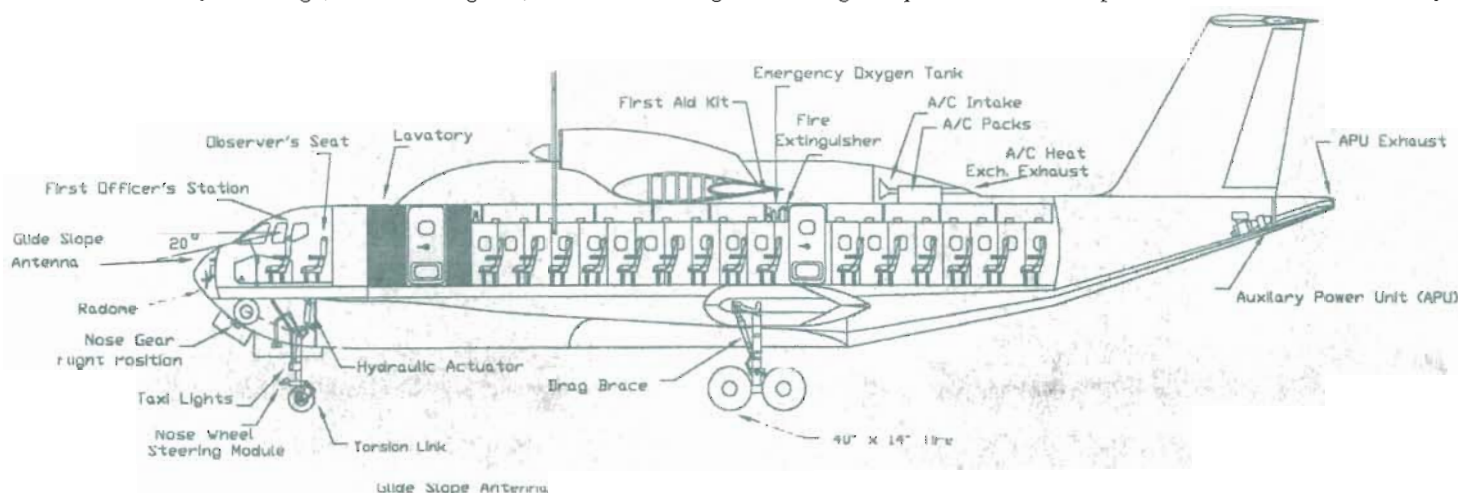
The Sierra team members soon found the right direction. The keys to their success were establishing realistic goals, timelines, and a hierarchy of responsibility where each member held both a primary and secondary role for some phase of the design; issuing rules (along with penalties for breaking them); maintaining precise records; doing in-depth research on current amphibious aircraft designs; and, finally, creating something unique.

"Everyone from professors to industry people advised us against trying to design something new," says Bachinger. "But our research showed the basic design for this type of aircraft hasn't changed since the 1950s. We knew we could do something better."

The Sierra's distinctive design, which now has some of those same doubters excited, features a hydro-ski to reduce water impact loads, sponsons (winglike pieces attached to the hull) for lateral water stability, and an overhead cargo bay to better distribute weight. The design has twin turboprop engines on a high wing and a T-tail.

Thanks to the team's extensive research, their first design was a good one. "Instead of having to re-design our craft, we used the extra time to tweak ours," Bachinger says.

Kaaren Sorensen, who was in charge of aerodynamics and helped with





team organization, says being the only female wasn't a problem. "I'm just one of the guys . . . we all work together so well."

As she hunts for a job performing aerodynamic tests, the June graduate knows the value the project adds to her resume. "Being able to show professionals from Boeing or Lockheed Martin our award-winning report and being able to talk knowledgeably about the project is very impressive."

Bachinger agrees that being able to apply engineering principles learned in the classroom and getting good results are two benefits of the project, especially for the self-described perfectionist and results-oriented student.

"The experience was often terrible," Bachinger says. "It was stressful, time-consuming, and

you're trying to balance other classes at the same time as you're working 50 hours a week on this. But, in retrospect, it was great."

Bachinger was having doubts about his academic career before he started the senior aircraft design class, but that all changed. "I learned about my potential and stepped up to the challenge. I never saw myself as becoming a manager but now I think I might have a small knack for it," he says modestly. "I learned a lot about motivating people, timelines, trade-offs, and keeping the whole project in focus."

The June graduate says the experience will be instrumental in his future success. "Now I know I can do anything if I apply myself." **CP**

Two other Cal Poly teams also won awards in the most recent AIAA competition: Zephyr won second place and Oberon AT won an honorable mention.

This is the second year the senior aircraft design class has swept the national contest. Two years ago, Cal Poly teams took first, second, and honorable mention awards for their "high altitude, long endurance, unmanned aerial vehicle" designs.

The class runs for three quarters. During the first quarter, each student designs an aircraft. The following quarter, random teams are assembled. Each team is solely responsible for the way it carries out the project. The Sierra design team crafted a 1/36th scale model and tested it in Lake Nacimiento.

The Cal Poly Aeronautical Engineering Department has added some twists that no doubt help its students win. The students make on-site presentations to various aircraft manufacturers, getting feedback and honing their social and speaking skills. Then at the end of the third quarter, Cal Poly hosts an annual design symposium, where the proposals are presented to industry members. Extensive interaction with corporate and government giants such as Boeing, Rockwell, McDonnell Douglas, Lockheed Martin Skunk Works, and NASA help ensure the proposals' success.

A week later, the revised proposals are sent off for competition judging, and the waiting begins. **CP**

## THE SIERRA TEAM

**(left to right): Mark Doan, Jesse Borge, Ricky Gan, Nick Demogines, Kaaren Sorensen, Daniel Vigna, Bruno Bachinger, and Kipp Peppel.**

**(Photo by Robert van't Riet)**

