



## Bob Rice

### Notable – Accomplishments/Contributions



Weather router Bob Rice closes shop  
Jan 1, 2003

An institution in the marine industry and the adventure expedition industry recently announced his retirement from the weather-routing business. Bob Rice, whose company Bob Rice Weather Window has provided weather routing information to seemingly every high-profile sailboat record attempt, announced in August that he would be closing his Wolfeboro, N.H., office. He will, however, be offering weather services to New Zealand's America's Cup campaign this winter.

Here's a look at some of Rice's contributions: He guided Phil Weld to victory in the 1978 Route du Rhum; routed Dodge Morgan in his 1986 solo circumnavigation aboard American Promise; routed two Jules Verne Trophy winners to victory (ENZA New Zealand, 1994, and Sport Elec, 1997); and offered weather analysis to New Zealand's team, which took the America's Cup in 1995.

Rice also assisted American technology magnate Steve Fossett in his various adventures in balloons and sailboats. While Fossett failed to be the first to circumnavigate by balloon last year, Rice picked a weather window and route for Fossett aboard the 105-foot cat PlayStation in March 1999, which established the fastest run in a 24-hour period. "Bob offers precise advice, like when he says, 'You should gybe now,' it's really the exact time to do it," said French photographer and former Fastnet winner Christian Fevrier, who has worked closely with Rice over the years.

"I'd have to say that my real reward was formulating a service that helped people accomplish their goals, whether it be records, races, or fulfilling dreams," Rice said. "These were activities that I personally would not have attempted, yet I was allowed to play an active part in achieving, literally, hundreds of records and achievements." Rice acknowledged that the most difficult aspect of the job was knowing that people were trusting their lives to his decisions about how to choose and interpret weather scenarios. "These friends were placing not only their dreams but their lives in my hands. I experienced every thrill and fear that they did, and I think this is what made it all possible: that I understood what they were going through; I went through it with them."

See a listing of meteorological flight support programs provided for long distance manned balloon flights on the following pages.

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FEATURED IN THE BALLOON LIFE .. MAY 1986

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LONG DISTANCE MANNED BALLOON FLIGHT METEOROLOGICAL SUPPORT PROGRAMS  
PROVIDED FOR:

- 1/ SILVER FOX - OCT. 1976 ED YOST  
SOLO TRANSATLANTIC ATTEMPT (DISTANCE RECORD)  
LAUNCH SITE .. MILLBRIDGE, MAINE
- 2/ DOUBLE EAGLE - SEP. 1977: MAX ANDERSON AND BEN ABRUZZO.  
TRANSATLANTIC ATTEMPT  
LAUNCH SITE - MARSHFIELD, MASSACHUSETTS
- 3/ DOUBLE EAGLE II - AUG. 1978: MAX ANDERSON, BEN ABRUZZO, LARRY NEWMAN  
FIRST SUCCESSFUL TRANSATLANTIC FLIGHT (RECORD DISTANCE  
AND DURATION.  
LAUNCH SITE - PRESQUE ISLE, MAINE
- 4/ DA VINC - OCT. 1977: VERA SCHONS, RUDY ENGLEMAN AND FRED HYDE.  
TRANSAMERICA ATTEMPT  
LAUNCH SITE - TILLAMOK, OREGON
- 5/ KITTY HAWK - MAR 1981: KRIS ANDERSON  
HOT AIR BALLOON DISTANCE RECORD  
LAUNCH SITE: MINNEAPOLIS, MINNESOTA
- 8/ JULES VERNE - DEC 1981: MAX ANDERSON AND DON IDA  
TRANSPACIFIC AND GLOBAL ATTEMPT  
LAUNCH SITE: JAEPUR, IMULA
- 9/ JULES VERNE - NOV. 1982: MAX ANDERSON AND DON IDA  
GLOBAL ATTEMPT  
LAUNCH SITE: RAPID CITY, SOUTH DAKOTA
- 10/ SOLUS - 1983: JIM THIELE  
SMALL BALLOON DISTANCE RECORD  
LAUNCH SITE: BILLINGS, MONTANA

- 11/ ROSIE O'GRADY - SEP. 1984: JOE KITTINGER  
FIRST SOLO TRANSATLANTIC BALLOON  
LAUNCH SITE: CARABOO, MAINE
- 12/ VIRGIN ATLANTIC FLYER - JUNE 1987: PER LINDSTAND/RICHARD BRANSON  
FIRST HOT AIR BALLOON TRANSATLANTIC BALLOON  
HOT AIR BALLOON DISTANCE AND DURATION RECORDS  
LAUNCH SITE: SUGARLOAF U.S.A., MAINE
- 13/ STRATOQUESTS - 1988: PER LINDSTRAND  
HOT AIR ALTITUDE RECORD  
LAUNCH SITE: CALAGHANS RANCH (OUTSIDE LAREDO TX)  
ALTITUDE ATTAINED : 65, 000 FT MSL
- 14/ ABSOLUT VODKA - 1988: LORNA DAILY  
FIRST WOMAN TO FLY OVER THE CONTINENTAL DIVIDE IN A  
HOT AIR BALLOON.  
LAUNCH SITE: ASPEN, CO.
- 15/ VIRGIN PACIFIC FLYER - DECEMBER 1970: PER LINDSTAND/RICHARD BRANSON  
FIRST HOT AIR BALLOON FABRIC FAILED AFTER INFLATION  
AND LAUNCH ABORTED.
- 16/ VIRGIN PACIFIC FLYER - JAN. 1991: PER LINDSTRAND/RICHARD BRANSON  
FIRST HOT AIR BALLOON TRANSPACIFIC BALLOON.  
HOT AIR BALLOON DISTANCE AND DURATION RECORDS.  
LONGEST BALLOON FLIGHT IN HISTORY (ALONG THE PATH)  
LAUNCH SITE: MYARANOJO, JAPAN
- 17/ EARTHWINDS - JAN. 1992: LARRY NEWMAN, GLOBAL ATTEMPT. BALLOON WAS  
NOT LAUNCHED DUE TO PERSISTING UNFAVORABLE GROUND  
CONDITIONS AND END OF WEATHER WINDOW FOR THAT SEASON.
- 18/ EARTHWINDS - JANUARY/FEBRUARY 1992: LARRY NEWMAN, GLOBAL ATTEMPT.  
BALLOON WAS NOT LAUNCHED DUE TO PERSISTING UNFAVORABLE  
GROUND CONDITIONS AND END OF WEATHER WINDOW FOR THAT  
SEASON.
- 19/ CHRYSLER #5 - U.S. TEAM OF TROY BRADLEY AND RICHARD ABRUZZO FOR THE  
1992 CHRYSLER TRANSATLANTIC RACE. LANDED NEAR CASABLANCA  
MOROCCO WITH LONGEST FLIGHT AND DURATION FOR THE RACE.  
THE DURATION ACHIEVED IS ABSOLUTE BALLOON DURATION  
RECORD, PREVIOUSLY HELD BY THE DOUBLE EAGLE II. NEW  
RECORD IS 144 HOURS.  
LAUNCH SITE: BANGOR, MAINE.

#### SELECTED BALLOON RACES

- DOUBLE EAGLE III - 1979: MAX ANDERSON AND BEN ABRUZZO.  
1979 GORDON BENNETT RACE  
LAUNCH SITE: LONG BEACH, CALIFORNIA

FIRST PLACE

ENIHANA - 1981:	BEN ABRUZZO AND ROCKY AOKI 1981 GORDON BENNETT RACE LAUNCH SITE: FOUNTAIN VALLEY, CALIFORNIA FIRST PLACE (RECORD)
CRAZY HORSE - 1981:	MAX ANDERSON AND KRIS ANDERSON 1981 JACK B. KELLEY RACE LAUNCH SITE: AMARILLO, TEXAS FIRST PLACE
VIKING MAURU - 1982:	MAX ANDERSON AND KRIS ANDERSON. 1982 GORDON BENNETT RACE LAUNCH SITE: FOUNTAIN VALLEY, CALIFORNIA SECOND PLACE
VIKING MAURU - 1983:	MAX ANDERSON AND DON IDA 1983 GORDON BENNETT RACE LAUNCH SITE: PARIS, FRANCE
ROSIE O'GRADY - 1984:	JOE KITTINGER 1984 GORDON BENNETT RACE LAUNCH SITE: PALM SPRINGS, CALIFORNIA FIRST PLACE
WIND SONG - 1987:	GORDON BORING 1987 PLYMOUTH TO PLYMOUTH RACE LAUNCH SITE: PLYMOUTH, MICHIGAN FIRST PLACE
MULTIPLE GAS BALLOONS - 1987:	EVENT METEOROLOGIST 1987 HIDDEN MANOR HALLOWEEN BALLOON RACE LAUNCH SITE: SPRINGTOWN, PENNSYLVANIA
ROSIE O'GRADY - 1988:	JOE KITTINGER 1988 GORDON BENNETT RACE LAUNCH SITE: PALM SPRINGS, CALIFORNIA FIRST PLACE
WIND SONG - 1988:	GORDON BORING 1988 GORDON BENNETT RACE LAUNCH SITE: PALM SPRINGS, CALIFORNIA FIRST PLACE
ROSIE O'GRADY - 1989:	JOE KITTINGER 1989 U.S. GORDON BENNETT RACE LAUNCH SITE: PALM SPRINGS, CALIFORNIA SECOND PLACE
ROSIE O'GRADY - 1989	JOE KITTINGER 1989 GORDON BENNETT RACE LAUNCH SITES: LECHT, AUSTRIA SECOND PLACE

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ALL PRELIMINARY METEOROLOGICAL CONSULTATIONS FOR FOLLOWING, FOR LAUNCH SITE, ALTITUDE PROFILE, TIME OF YEAR, ETC. PREPARED FOR THE FOLLOWING (PRIOR COMMITMENTS PROHIBITED OPERATIONAL SUPPORT FOR THE ACTUAL FLIGHT).

DOUBLE EAGLE V - BEN ABRUZZO, LARRY NEWMAN, ROCKY AOKI AND RON CLARK  
FIRST BALLOON TRANSPACIFIC FLIGHT

SUPER CHICKEN - JOHN SHOECRAFT  
TRANSAMERICA FLIGHT

FLYING DUTCHMAN: HENK BRINK, NETHERLANDS  
TRANSATLANTIC FLIGHT



**RICE, Robert "Bob"**      USA      (HB/ (GB)

Sport balloonist 1980s (Bio-data unknown).

p: Professional Micro-Meteorologist (specialist in balloons & sail boats); Chief Meteorologist for WX-Services Corp. of Bedford, MA.

l: Meteorologist for E.YOST Transatlantic attempt; Meteorologist for ABRUZZO/ANDERSON/NEWMAN Transatlantic attempt; Meteorologist for LINDSTRAND/BRANSON Transatlantic attempt.

r: BL-May 1991p28; BM-Jul.1995p10.

## Science Behind the Scenes During Fossett's Recent Around-the-World Ballooning Effort

PAGE 405-406

"In my mind, there's no question. If you eliminate that one temporary setback, he completes the global," Bob Rice said on August 17, exhausted after having slept little during the previous 8 1/2 days of intensive weather forecasting and emotional roller coaster riding.

As chief meteorologist for the Solo Spirit balloon trip, Rice helped to navigate 54-year-old balloonist and businessman Steve Fossett on his fourth attempt to circle the globe non-stop. During that effort, which began at 23:30 UTC on August 7 from Mendoza, Argentina, Fossett had floated 24,460 km—63% of the way around the world longitudinally—surpassing his previous world distance record of 16,674 km set in January 1997. His "roziere" balloon, a combination of gas and hot air, had risen or descended to avoid violent weather systems and winds that would blow him in the wrong direction, and to catch air currents that would push his vessel along. With the Atlantic and Indian Oceans and Australia behind him, only the wide Pacific Ocean lay in Fossett's path.

But about 500 nautical mi east of Australia, at an altitude of 8,840-9,144 m, the balloon touched into a violent thunderstorm, and Fossett crashed into the Coral Sea shortly after 13:25 UTC on August 16.

"As I was going through the thunderstorm, the balloon was just being thrown from one side to another, was visibly tearing. And tremendous amounts of hail would just come in just huge sheets and cover me. And I looked around, and looked again at the variometer, and saw that I was still descending in excess of 2500 ft [762 m] a minute. And I said out loud, 'I'm going to die'," an uninjured Fossett described from a rescue boat.

A satellite operated by the National Oceanic and Atmospheric Administration first detected Fossett's emergency radio beacon, and relayed the information to search and rescue missions within minutes.

The balloon expedition hinged on one man, who ultimately fell to Earth, but it was supported by a number of Earth scientists. Fossett was backed up by a veteran mission control team and also received support from scientists and students from Washington Uni-

versity in St. Louis, Missouri, where he is a board member.

In addition, the gondola carried a prototype science payload of sensing instruments designed for an "aerobot," an unmanned exploration vehicle designed to float like a balloon. The payload was on loan from NASA's Jet Propulsion Laboratory (JPL), and on a training run to prepare for upcoming missions to other planets.

### The Meteorological Adventure

Rice, with 45 years of experience as a weatherman, has forecast for 26 balloon flights and many sailing competitions, and has been called the "dean of adventure meteorology." The day after the balloon crashed, he relived the latest adventure in his mind, including the team's decision to attempt a route over the Southern Hemisphere this time.

Rice said the northern route, over three continents, can hit thermal upwells that can send a balloon off course. But he said that although the southern route mostly passes above water, its reputation for zonal air patterns that can make for a more direct easterly ride than flights above land "is largely overrated."

He also said the southern route presents many disadvantages, including a briefer history of accumulated climate data, a broad stretch of potentially bad weather over the southern oceans, and very few ships passing that might be able to help a downed balloonist.

"The balloon is a lot happier over water than land. The pilot is not," said Rice. He added that the southern route was chosen primarily to solve the political problem of gaining permission to overfly a number of different countries.

Though the flight encountered some moderate challenges, it mostly proceeded fairly smoothly, with the balloon bobbing in altitude to find a good path, and picking up a fast track over Australia that sped the vehicle along at about 203-222 km per hour.

"Somebody laid out a path for us. Unfortunately, it went right smack into a thunderstorm," he said. Eight hours before Fossett encountered the storm, Rice had started warning of trouble ahead.

Rice considered placing Fossett in a "parking lot" pattern to wait out the storm for 4-5

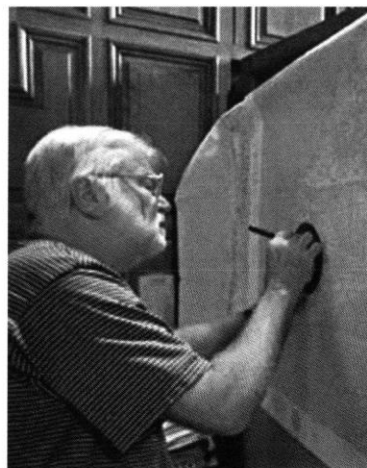


Fig. 1. Chief meteorologist Bob Rice plots the balloon's course across Australia. Photo by Joe Angeles, Washington University.

hours, but a deteriorating weather condition was developing behind the balloon. Instead, Fossett rose to near the pressure ceiling of the balloon, near 9,140 m, to try to clear the storm.

Nine times out of ten, a balloon will skirt a storm at that altitude, said Rice. But this time, during the night, the hot air of the balloon collided with the storm's cooler temperature. According to Rice, with the sudden cold, the balloon "drops like a stone."

"We flew over 15,000 miles [24,140 km]—over halfway around the world. And you get shot out of the sky by a relatively tiny thunderstorm," Rice said. The storm may have been bigger than originally thought, though; mission control said the storm may have generated about 10,000 lightning strikes during the night. "If that balloon is perhaps 1 mile further north, 1-2 miles on either side of the core, it zings right through. The thunderstorm he hit was on the extreme northern edge of the primary cluster."

Rice added, though, "I'd do exactly the same thing again. I'd hope for different results."

Rice said that serving as meteorologist for an around-the-world balloon mission is the biggest challenge for a weatherman, because it is "pure meteorology." He said the only way to navigate a balloon is to get it to rise or fall in altitude. Rice added that balloon meteorology "is tedious, nerve-wracking, and

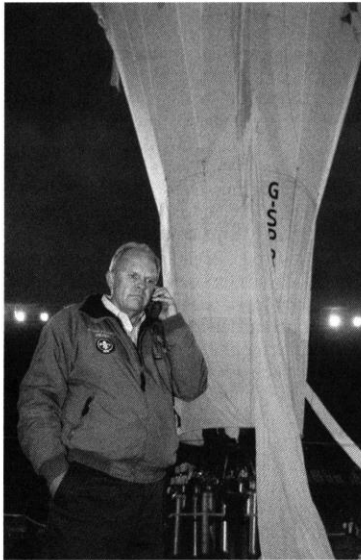


Fig. 2. Balloonist Steve Fossett just before launch. Photo by Claudia Daut, Washington University.

sometimes frightening. But you keep coming back."

During a mission, he said his attention becomes very focused when the pilot is in his "air particle," which Rice defined as what a balloon really is. "Your vision closes in," he said. "You don't even know who Monica [Lewinsky] is. But there's that balloon."

"While it may sound kind of dumb, when I'm sitting at my desk, I'm in the vehicle. It's always been that way. I can't explain it."

"It makes you realize that your decision is a vital part in somebody's life. That's why you feel a sense of failure on a day like this," Rice said. "Yesterday, you did the whole thing properly, but I nearly lost a pilot."

## Aerobot Payload Takes a Test Run

While Rice and two other meteorologists provided much of the navigational guidance that Fossett depended on, the balloonist also received some useful assistance from the 3.4 kg aerobot science payload hanging over the side of the gondola.

Ray Arvidson, the Solo Spirit's science team leader and professor and chair of the department of Earth and planetary science at Washington University, said that when University Chancellor Mark Wrighton asked him a year ago to participate in the Fossett mission, Arvidson thought it would be a good opportunity to simulate an aerobotic planetary mission.

Arvidson, a 25-year veteran at JPL, has been involved with a number of planetary missions and an aerobot payload prototype that rode along on Fossett's January 1998 balloon flight. He said that Fossett was interested in carrying the instrumentation—a sort of portable weather station—again during the mission that just ended.

Arvidson described the aerobot payload as a prototype for similar instruments that NASA plans to use to collect atmospheric and ground data from nearby planets in the 21st century. The device on the Solo Spirit contained instrumentation to measure atmospheric pressure, temperature, relative humidity, upwelling sky radiance, and vertical wind velocity, as well as the balloon's geographic position, altitude, ground speed, heading, total distance, and elapsed time of the mission. The measurements were taken every 2 min, and the data were relayed via satellite telephone every hour to mission control for processing, validation, and Internet posting.

Arvidson said that although the payload collected data about the Southern Hemisphere, its main mission was to serve as a partial "rehearsal" for upcoming aerobot missions to other planets, from end to end, from building them to making data available to the public.

He said that with the recent mission and Fossett's earlier mission that carried an aerobot payload, the science team had learned how to work on two flights in 1 year. Arvidson said that payload provided scientists with intensive experience because they communicated with the instruments every hour, and because the pilot depended in part on the data.

Arvidson said that corroborating Fossett's altitude and other bearings, and providing confirmation for the meteorology team's forecasts, also was an important part of the payload's mission. Though, he stressed that the payload was not crucial to the balloon trip.

In addition to the scientists, Arvidson also received assistance from four Washington University students enrolled in the school's Hewlett program in environmental studies, and two high school students.

Rice said he believes that some of the science packages that wind up appended to balloon flights serve little purpose aside from trying to justify an adventure as being "politically correct." But he said the aerobot was a valuable experiment that provided important navigation information for the mission team.

While some form of the aerobot will go on to be tested in the other extreme locations on Earth and may float in the atmospheres of Mars, Venus, and other planetary bodies in the next century, Fossett currently is settling down after his latest adventure.

He said he has "some serious questions" about whether to keep trying to become the first person to go around the world in a balloon. "Each attempt represents a risk, and you just can't go out and expose yourself to those risks over and over again. And I may never try again, or I may wait and see how the other teams [trying to circumnavigate] do for a year."

For further information about the Solo Spirit and for links to other balloon teams trying to circle the globe, view the Web site: <http://solospirit.wustl.edu>.—Randy Showstack