

Hydrofoil Pioneers...

Helmut Kock, a Hydrofoil Designer and Builder

by Helmut Kock

(Last Update 16 Jun 01), (Last Note 18 April 09)

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Editors Note: This 1993 autobiography by Helmut Kock has been only slightly edited. The desire was to keep the character and style just as Helmut wrote it. I first met Helmut in 1955 when he arrived in Miami to build a 16 foot hydrofoil runabout complete with Cadillac fins. Miami Shipbuilding Corp. made space available in their shops for this project. I well remember, with amazement, Helmut shaping the foils with only hand tools. The story of this boat and Helmut's partner are a couple of tales that will have to be told in detail one of these days. Helmut knew very little English at that time, but was always easy and pleasant to communicate with. Helmut has done many outstanding things in the field of hydrofoils and has not received the recognition that he deserves. By publishing his story in our I.H.S Newsletter and posting it here on the internet, we may we start to correct this situation. More information about Helmut Kock may be found in an article about Helmut Kock's partner. See [The Intriguing Story of George Meinas](#) -- Bob Johnston

Note: 18 April 2009

Barney,

Thanks for Helmut's phone and address. I just this afternoon talked to him on the telephone at the number below and we had a great time reminiscing about developing the Discoverer in San Diego and the Albatross in Costa Mesa/Newport Beach, CA. Helmut says he is blind, as he tells us in his article on the website, but he is well taken care of. I look forward to visiting him soon in San Diego to really go over old times.

Another important man in the development of the first Albatross in Costa Mesa is William R. Batley, Jr. of Brawley, CA who helped us develop the extrusion process and the welding techniques for the foils. Bill Batley is in his 80s and doing very well. He and I have remained close friends and occasional business associates since I first met him on the Albatross project.

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In 1955 I came to the United States from Chile, South America, my native country, with the purpose to work on the development and construction of hydrofoil boats. How could I get such an idea in a remote

country like Chile?

My interest in boats began as a young boy with ship model building. At the age of 13, I had built a canoe to play with in our nearby river. From 14 to 17, during my high school years, I built two one-seat folding kayaks and three two-seaters for friends interested in traveling the many lakes and rivers of Chile. From this effort I earned the money to buy my own boat as well as pay my camping and traveling expenses. Alone and with these friends, I spent days and weeks on the rivers and lakes in the wilderness. These boats consisted of wood framing with a canvas hull which could be assembled in 15 to 20 minutes after being taken from their traveling bags. One bag held the mast, paddles, and sail and was about 4 feet long. The other bag carried the frames and the canvas hull. These bags could be carried as a backpack, in a car or railcar, or even on packhorses.

After four years of study, travel, and work in Germany, I returned to Chile. There I took the job to install sawmills in a virgin forest and to cut the trees and produce lumber. This place was located on the shore of Lake Villarrica without any access roads. The only way to get there was by boat. That was the reason why I took the job and challenge to start from nothing in the wilderness. The first thing I did was build some small rowboats and then add outboard motors when available. After this I built a 16 foot outboard.

During this time I found a 36 foot motorboat named *PATRIA* which had been discarded by its owner. It had been built by a German fellow, many years earlier, for passenger transportation on the lake. He left it to rot when he started a bus service along the lake. I got it for nothing but had a time repairing the hull and the engine. The engine was an old 8-cylinder Packard car engine. Gasoline was expensive and scarce in the 1920s, so the owner had built a charcoal burning gas-o-meter. This contraption was a vertical tube, mounted outboard, amidship, filled with charcoal, lighted and vented with a hand driven ventilator. Then it was closed with resulting gas being fed to the engine. The engine was started with gasoline and then switched to the gas. It worked perfectly well and was very economical, but it was a lot of work handling the charcoal and very dirty. I did use this boat for some time until it was destroyed by a storm. It is amazing the capacity for inventions and improvisation that the immigrants used in trying to conquer the wilderness.

As our lumber production increased, shipping it to the railroad station at the other end of the lake, with the existing equipment, was too costly and unreliable. Therefore I built a 52 foot long tug boat, powered with a two-cylinder steam engine with an old wood burning boiler. Four 90-foot barges and a 50-foot landing vessel were towed with this tug. This fleet carried the output of the sawmill and well as cattle, machinery, and all the needs of the sawmill operation. Years later, when the lumber production diminished, the entire fleet was sold. A 33 foot workboat was then built, with a cabin and a four ton load capacity. This boat was powered by a 4-cylinder, 82 HP, BMW 1924 gas marine engine. After a complete overhaul it served without problems for many years until I left for the U.S.A.

I was fascinated by the sparse news of hydrofoil boat developments in the 1930s in Germany. In 1951 I met a German who had worked at the Schertel-Sachsenberg shipyard in Dessau- Rosslau, Germany during the development of the hydrofoil program at the start of World War II. He had been drafted into the German Army and spent two years at the Eastern Front, being wounded five times. At the end of 1945, he was captured by the Russians in East Berlin and sent to a camp in Leningrad where an extensive hydrodynamic and hydrofoil research program was underway. After two and one-half years he escaped back to Germany, where in a refugee's transport he took his family to Chile.

It was there that I met him and where we became friends. I had the opportunity to learn about hydrofoil boat design from his personal knowledge and the scientific material he had in his possession. Enthusiastically I built several hydrofoil boat models. We tested these on a lake by towing them with a line winding on to a pulley attached to a small gasoline engine.

In 1955 my friend decided to move to the USA, and I followed him in June of that year to participate in the construction of a 17-foot outboard hydrofoil sport boat in Miami, Florida. The design of the foils was based on the results of the model tests in Chile. Shortly after the conclusion of this project my friend left for Germany. I was now left on my own in a strange country, trying to learn the language and customs. To survive I took several different jobs, finally moving to California.



Then in 1961, I designed and built the foils for an existing aluminum, glass bottom, sightseeing boat in the Tod Shaffer Shipyard in San Diego. The successful demonstration of this flying boat resulted in a contract for the design and construction of the 35-foot, hydrofoil boat *ALBATROSS* for Hydro Capitol Company in Newport Beach, California. An empty, large building was rented and an aluminum welding machine, saws, tools, and materials were acquired. With these on hand, the construction was started after we got the approval of the drawings from the U.S. Coast Guard. The boat was finished, tested, and then approved and certified by the Coast Guard as the first hydrofoil boat approved for commercial passenger service in this country.



The *ALBATROSS* and the construction rights were sold. Ludwig Honold Manufacturing Company was contracted for the production of twenty vessels of the same kind. By May 1964, 14 boats had been delivered to New York for passenger service between Manhattan and the [New York Worlds Fair](#).* Of the original 20 production boats in addition to the 14 in New York, Wilson Lines in Washington, D.C. operated three boats for many years on the Potomac River and other places, one boat went to Lebanon, and one went to the Virgin Islands. At the closing of the Worlds Fair, four of these boats went to Miami and two to Alaska.



[Click Here](#) to read "*ALBATROSS I* and the Commercial Hydrofoil Era in America."

In 1966, [Crillon Tours of La Paz, Bolivia](#) bought one of the New York boats. The engine was replaced by a VT8-370 Cummins Diesel because of about a 30% power loss at the 12,000 foot altitude of Lake Titicaca where the boat was scheduled to operate in Bolivia. The boat was shipped on a freighter to Matarani, Peru and then by railroad up to the lake. I trained the Indian crew for the maintenance and operation of this vessel. We built landings and facilities at the harbors in Huatajata, the Sun Islands, and Capacabana.

The Lake Titicaca hydrofoil trip is a link of the tourist route between La Paz in Bolivia and Cuzco, Machu Pichu, Peru. The following year a second *ALBATROSS* was bought, and later two more. Increases in tourism demanded more capacity. We agreed to build a larger, 50-foot hydrofoil boat for 40 passengers. After finishing the design, detail drawings, and a material list of over 1,400 items, all material, equipment, engines, and tools were assembled in Pennsylvania and shipped to Bolivia. The construction started in December 1975, the boat was launched in September 1976, and it was then tested, completed and entered service in February 1977. This boat was named the *BOLIVIA ARROW*. The performance of the boat was excellent and a second of the same type was planned, but problems with my eyes developed, and the project had to be cancelled. I had three retina operations in Bolivia and three more later in the U.S. This condition kept me from working for three years. Crillon Tours then acquired a *SEAFLIGHT* from Italy with accommodations for sixty passengers to be able to cope with the passenger flow. In 1983-84, for Crillon Tours, I stretched one of the old *ALBATROSS* boats six and one half feet to increase the passenger capacity to 30 persons. A Cummins VTA-903-M, 8 cylinder Diesel Engine was installed. The performance of this boat was also



above expectations.

In 1984 I overhauled and re-powered with Cummins VT-555-M two of the old *ALBATROSS*-es in Miami. These hydrofoil boats went to Paraguay for tourist service on Lake Itaipu.



After 13 years of continuous service, the replacement of the engines in the *BOLIVIA ARROW* was necessary. I went and spent four weeks in Bolivia in May 1990 to supervise the installation of the New Cummins VTA-903-M Diesel engines. With more power than the old boat VTA-370 engines, the performance of the boat was impressive, and the speed increased to 34 knots. Crillon Tours now has 3 *ALBATROSS*-type boats for 20 passengers, one stretched *ALBATROSS* for 30, one new design hydrofoil for 40 people, and one *SEAFLIGHT* hydrofoil for 60 passengers. They use the different size boats according to the number of persons going on each trip which saves fuel and equipment. Their last acquisition was a Russian built *VOLGA* hydrofoil for six passengers which is used for short trips to the nearby islands to show tourists the building of the reed boats.

In 1980, I rebuilt an old *ALBATROSS* boat in San Francisco and powered it with a Cummins V-903-M Diesel rated at 295 HP. It was named the *SCENIC FLYER* and sold to a tour operator in Salt Lake City for service on the Great Salt Lake. It operated on the lake until the water level rose over 20 feet, swamping all marinas and facilities. This boat was then sold to Miami where recently it was overhauled, painted and renamed the *BISCAYNE CLIPPER*. It is waiting to go into service again.

Sea World in San Diego has operated three hydrofoil boats since the mid 1960s. These boats were fitted out with 28 seats but could load only 14 because it was impossible to fly with more load. Three times they changed engines trying to improve the performance, but in vain. On a visit to Sea World in 1980 I waited over an hour in line to get a ride of only 10 minutes. I was told that they could load no more than 14 people. Next day I came back and gathered information and



HYDROFOIL BOAT

measurements. After some calculations I told them that I could fix the boats to carry 28 people. We got to work in their own machine shop, changing the shape of the foils. The first boat tested perfectly with a full load, was faster and had lower fuel consumption. All of that was with the same engines. As a result the three boats were modified. From about 75,000 persons carried before, they carried 202,761 people during the May to September 1982 season. Sea World has had to suspend the operation of the hydrofoil boats as requested by their insurance company. This is because of the danger of collision with the jet-scooters which now swarm Mission Bay, as well as with other water-sport activities.

In 1969, I was hired by International Hydrolines, Inc. to check out the reason why their Russian built hydrofoil boat *RAKETA* would not fly. On the way down the Inland Waterway from Montreal to New York to Miami, the crew noticed the loss of power of the engines and finally the inability to fly. The boat had to be towed to Trinidad. The *RAKETA* was not designed for tropical conditions with 82 degrees F water temperature and 90 to 100 degrees F air temperature. I doubled the size of the oil-water heat exchanger and built two scoops on top of the engine housing with air ducting to the engine air intakes. I then reduced the area of the six bladed propellers and increased the pitch of the foils. That did it, and the boat performed very well. I was then sent to the USSR to check out a Hydrofoil *KOMETA* that International Hydrolines had bought for Caribbean operation. But that is another story I shall tell some day.

* According to *American Airlines' Guide Book to the World's Fair and New York* issued at the time, "Boats leave from South Street at the foot of Wall, from the East River at 25th Street and from Hunts Point Avenue in the Bronx directly to the World's fair Marina. The trip takes 30 minutes from Wall Street, 25 minutes from 25th Street, fare \$3.50. From Hunts Point Avenue, 11 minutes, fare \$2.50."

Correspondence About Helmut Kock

Autobiographical Update by Helmut Kock...

[16 Jun 01] I was recently surprised to get a copy of everything that has been published about me on the Internet through my old friend Darius Morgan in Miami, the owner of Crillon Tours Hydrofoils of Lake Titicaca in Bolivia. My son-in-law in Chile and my grandson in Germany also are searching for everything which has been published about me and the hydrofoil boats. Recently, I found a copy of a publication written many years ago about American tourists who visited Bolivia and took the tour across Lake Titicaca in the hydrofoil boats. It must have been in 1967 on the first hydrofoil boat, which came to that lake.

Why several hydrofoils on such a remote lake on the top of the world? It began thirty-five years ago through Darius Morgan, the dynamic owner and developer of this enterprise, which promised great development and expansion. It started with four, twenty-passenger *ALBATROSS* type hydrofoil boats. In 1976, I built the *BOLIVIA ARROW*, the fifty-foot, forty-passenger vessel. Because of the problems with my eyes, a second boat could not be built. So Mr. Morgan went to Italy to purchase the sixty-passenger *SEAFLIGHT*. Later on, a twenty-eight foot Russian-built hydrofoil boat was purchased to be put in service on the lake to take tourists to visit an island to see the construction of reed boats made there.

All boats are kept in constant, excellent condition. There is a crew of mechanics, pilots and sailors for the boats. There is no regular passenger service on the lake. Only that which is scheduled for tourists which come from all over the world. The quantity of passengers varies from day to day. From a single person to groups of any size, and so the boats are selected according to the amount of passengers, and also to economize on the fuel consumption because the price of fuel has risen enormously in Bolivia. The fuel consumption of the *ALBATROSS* type hydrofoil boat is eight gallons per hour. The forty-foot, thirty-passenger, stretched *ALBATROSS* type hydrofoil boat, which carries thirty passengers, uses only ten gallons per hour. The fifty foot *BOLIVIA ARROW*, with forty passengers, uses twelve gallons per hour. So the *SEAFLIGHT* is used only rarely when large groups come by.

The tourist service of Crillon Tours is really exceptional. It was based on and can only be maintained with such fast hydrofoil boats. The founder of Crillon Tours has been living in Miami for many years. The office in Bolivia is managed by his son and daughter. It is a pity that the tremendous potential for tourism in Peru and Bolivia can not be expanded due to the political and financial turmoil in those countries.

I thank the IHS for the deep interest the Society has demonstrated for my work. It took a long time for me to digest and get over the very emotional visit to Chile, which I made over a year ago. Which interrupted the work on my memoirs. Now I have started again, trying to unravel the many episodes in the sixties when I built the *ALBATROSS* in California and then the mass production of that model in Pennsylvania. Then to get fourteen boats in service to the New York Worlds Fair. Four boats went to Lake Titicaca in Bolivia and three to Washington D.C. Four went to Miami and others to the Caribbean, Lebanon and Alaska. In 1969 came my involvement with the two Russian built hydrofoils, the "Raketa" and the "Kometa". I still owe you their story, which I had promised to provide at the end of my article in 1993. -- Helmut Kock

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