SEA CHANGE

Transforming the Albatross into a certificated G-111 was not easy.

BY MARY F. SILITCH

PHOTOGRAPHY COURTESY OF GRUMMAN AEROSPACE CORPORATION

continued

When the world's newest amphibian aircraft lifted off from West Palm Beach at the end of May for an Atlantic crossing, the flight was old hat for the two chief pilots. Frank Steven had logged thousands of hours in the aircraft already. In fact, he had commanded a squadron of 10 of the amphibians for 10 years in the Canadian Air Force. And Fred Rowley—why, Fred Rowley had flown the original flight tests, back in 1947, when Grumman Aerospace Corporation introduced the Albatross as a military aircraft. Rowley had worked for Grumman ever since, until his retirement.

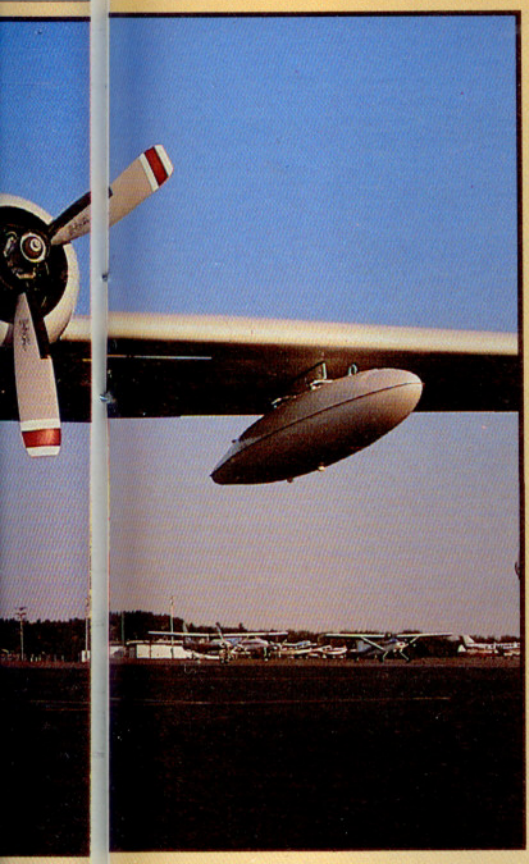
And the Albatross had been a military aircraft ever since, never being certificated for civilian use. It was used by most branches of the United States military service and flew under the flags of many other countries—including Brazil, Greece, Portugal, Nationalist China and Japan. Originally designated PF-1A by the U.S. Navy and SA-16A by the Air Force, the Albatross later was called the HU-16 by those two services and by the Coast Guard.

There is no retirement in sight for the Albatross, for now Grumman and Resorts International have joined forces to certificate the old HU-16, after more than 30 years of use. The prototype G-111, as it is called, was on its way to the Paris Air Show for its civil debut as a well-proven, newly remanufactured and finally certificated amphibian workhorse.

With its crew of seven, the Albatross would be following the route of the Navy Curtiss seaplanes—the NC-1, NC-3 and NC-4 that were the first aircraft to cross the Atlantic, hopping from St. John's, Newfoundland, to the Azores and on to Portugal. There were slight differences—no water landings were planned for this trip, and we would end up at Paris' Le Bourget Airport (where another famous American flight terminated in 1927), rather than in England.

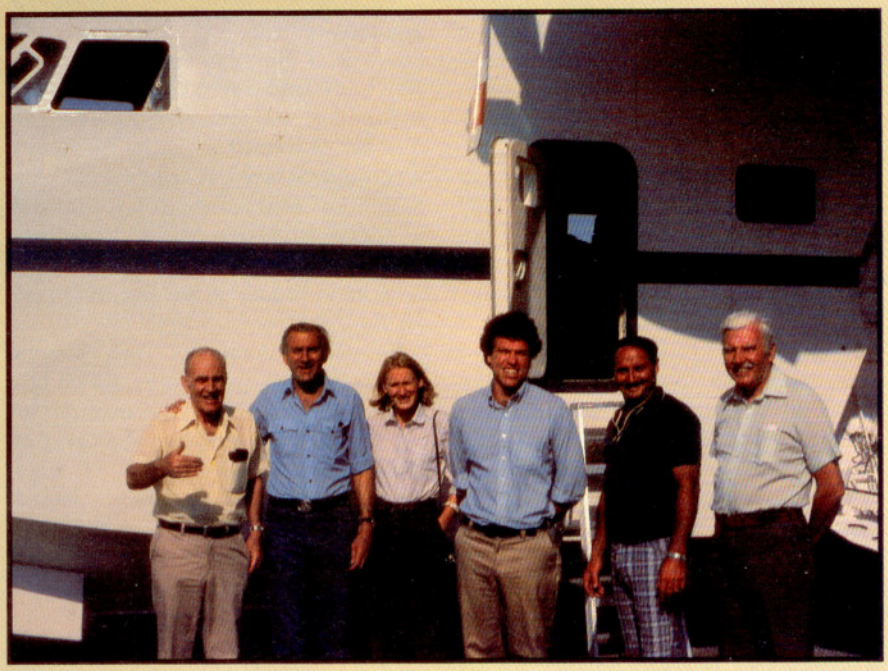
There were other differences between this Albatross flight and others. For the crossing, we would be flying 6,000 pounds over gross, carrying 10,000 pounds (1,666 gallons) of avgas to give us an endurance of 16 hours. There would be no worries about having to stretch fuel to make the longest hop—the 1,361-nautical-mile, 8.6-hour flight from St. John's to the Azores. And there should be no worries about navigational difficulties—a $45,000 Litton omega long-range navigation system and a $110,000 Litton inertial navigation system (INS) were installed especially for the trip.

Since the aircraft had not been certificated prior to departure, the Albatross, veteran of thousands of crossings, would be flying the Atlantic as an Experimental aircraft. Since it would be over gross, we would be operating on a special ferry permit. Before we could leave West Palm Beach—Grumman is producing the G-111s in St. Augustine, Florida—N112FB made a short flight with bags of cement in place of the relief crew and baggage to demonstrate to the Federal Aviation Administration that the Albatross could haul the load. It also served as a demonstration of one of the Albatross' strong suits—its useful load, which is normally 7,965 pounds for seaplane operations and 7,205 for land. Total fuel in the main tanks is 662 gallons (625 usable), or 3,750 pounds; but the additional 100LL in the float tanks and added drop tanks brought our ferry capacity up to 10,000 pounds (use of the float tanks in regular operations will be okayed shortly). Normal maximum takeoff weight is 31,365 pounds for sea operations and 30,605 for land. We would be at 36,000 pounds, but the Canadians, according to Steven, often flew them at 39,000 successfully.



ALBATROSS

The Albatross has been in military service for 34 years, and now civilian pilots have their chance.



The huge white Albatross, with its cantilever wings reaching up to 25 feet 10 inches above the ground and spreading out 96 feet 8 inches, sat on the ramp ready to take off for the epic voyage. At normal gross weight, the G-111 needs 4,400 feet of runway (or 4,425 feet of open water) to clear a 50-foot obstacle, single engine. Accelerate/stop distance is 6,010 feet for seaplane operations, 5,990 feet for land. It normally gets off in about 3,000 feet; the extra runway is needed in case an engine fails.

Along with Steven and Rowley, the crew included Philip Russell, of Resorts International, who would guide us across with the omega and INS and also help fly, having started his Albatross training. Larry Jackson, of Grumman, would monitor the engine and the systems and take care of engineering details. The relief crew was made up of Columbus O'Donnell of Resorts, who would help plot our way across the 40th parallel, and two other pilots, Andrea Mortensen and me.

The small puff of black smoke that shot out of the big radial engine to the right as we took off was incongruous, considering the modern, airline-like interior of the passenger cabin with its tasteful white walls. True, the heavy,

As the G-111, neé Albatross, rested in the Bangor sunset, after the first leg of its precertification cruise to Paris, engineer Larry Jackson (top) carefully checked over the 1,475-hp Wright Cyclone radials before pronouncing them more than satisfactory. The crew agreed. From left to right: Fred Rowley, Columbus O'Donnell, Andrea Mortensen, Phil Russell, Larry Jackson and Frank Steven. The seventh member was behind the camera.

PHOTOGRAPHY BY MARY F. SILITCH

continued

N112FB will start flying in Chalks' Florida service soon.

navy duck slipcovers on the bench seats lent an old-fashioned, nautical air to the cabin, and the deep rumblings of the 1,475-hp Wright 982CH9HE3 nine-cylinder engines (the original Wright Cyclone R-1820-76s) was a belated reminder of the noise of the radial days. (Considerable soundproofing was added, Jackson said, once the G-111 flight tests were over.)

Our original ferry plan called for a flight direct to Bermuda; but Bermuda no longer had avgas, only jet fuel, we learned from AOPA's Flight Operations Department. The first leg, to Bangor, Maine, that Sunday, served as a test of the Albatross' endurance and of the navigation equipment. On the overwater leg to North Carolina, the omega indicated a 12-knot wind from 173 degrees; groundspeed readout was 145 knots. A wind shift in the Carolinas slowed us down to a little more than 100 knots.

Fortunately, everything went very smoothly on the nine-hour, nonstop flight. At the end of the day, as the Albatross sat in clear, smogless air at Bangor, drawing the crowds of curious people to which we were becoming accustomed, Larry Jackson was happy with his engines' performance. Fuel consumption was 100 gph, and there was no unusual oil consumption.

Weather accounted for the only real problems of the whole trip. St. John's was down on Monday, reporting a quarter of a mile visibility; so it was Tuesday before we arrived, averaging a groundspeed of 190 knots for the flight. The late-blooming daffodils in Newfoundland served as a reminder that spring was just arriving over the treacherous North Atlantic. St. John's was sandwiched between two highs, with a low over northern Canada, and low-level icing delayed our departure until Thursday. There was plenty of time in St. John's to ponder the plans for the Albatross.

Resorts International had bought Chalks International Airline, which operates six Grumman Mallards on its route from Miami to the Bahamas. But Mallards are in short supply, as only 59 were ever built, so Resorts settled on the Albatross—Grumman built 464 of them. The certification problem would naturally seem easy to overcome—the aircraft had been thoroughly tested and proven in its long military service. (In the 1950s, the Department of the Interior operated the Albatross in the Pacific, but as a state airplane, not as a certificated one.) Resorts contracted with Grumman, the original manufacturer of the aircraft, to certify the Albatross. The first batch would be produced for Resorts, then Grumman would sell future production runs.

Since its first flight in 1947, the Albatross has logged millions of hours, all around the world, as a search and rescue ship, as an antisubmarine craft, as an ambulance airplane, as a photography platform and in many other applications. Rowley called it the amphibious equivalent of the DC-3 and pointed out that it is very well-designed. Ralston Stalb, who also designed the Grumman F8F Bearcat, was the project engineer on the original Albatross.

Rowley praised the amphibian's flying qualities and said that, for its size and class, it has exceptionally good performance. Its reliability and forgiving nature are among its best characteristics. Rowley said, that among pilots who have flown the PBY, the PBM and the Albatross, the number-one rating always has gone to the HU-16. Such praise and such a service history, however, did not unduly influence the FAA's Southern Region, which set out to certificate the old aircraft. Because of the idiosyncrasies of the certification regulations, the G-111 was certificated under Part 4b of the Civil Aeronautical Regulations, not under the newer Federal Aviation Regulations Part 25, which now governs the certification of transport craft. The Albatross qualified

PHOTOGRAPHY COURTESY OF GRUMMAN AEROSPACE CORPORATION

for this section because it is a "surplus aircraft of the Armed Forces." According to FAR 21.27f, as a large reciprocating-engine-powered airplane produced after August 25, 1955, it could be certificated under CAR Part 4b or FAR Part 25.

Rebuilt engines, inspection for corrosion and wear, replacement of aluminum cap strips on the wing center-section box beams with titanium ones and numerous other improvements were undertaken, but still certification was not easy. The FAA put the HU-16 through exhaustive tests, even redoing all the power-curve charts.

And there was the problem of certificating, of all things, an amphibian in the transport category. As Resorts' Bob Treat pointed out, the regulatory material was written for landplanes, and some of the aeronautical formulas and requirements for landplanes in the FARs just do not apply to waterplanes. The FAA, for example, wanted a landing-gear warning device, an automatic signal to the pilot to lower the gear when power is reduced, as for landing. Treat had to convince them that automatically warning the pilot to lower the gear when in a landing configuration could be disastrous if he automatically obeyed the signal, making a water touchdown. And so it went.

The final bill was more than anyone involved in the project ever suspected—the civil airworthiness certificate for the G-111 took four years and cost $11 million.

It was with some relief, then, that the G-111 took off for Paris, certification expected upon its return, and the first customer awaiting delivery.

It was also with considerable relief that the Paris crew taxied toward the runway at St. John's, once the meterological office had given its blessing—only a weak front, lurking in the warmer latitudes, remained between us and the Azores. But as we taxied past a line of six red and green fire-fighting PBYs, the INS packed in, and we had to return to the ramp for realignment. The omega, which bases its calculations on transmissions from worldwide ground stations, can be set and adjusted in the air; but the INS, which works off an internal accelerometer, must be set up on the ground, when the aircraft is perfectly motionless. It takes 15 minutes for the system to warm up, and after all of our previous delays, they were anxious minutes. Russell's realignment worked, and

GRUMMAN G-111 ALBATROSS
N112FB
Base price: $3 million
AOPA Pilot Equipment/Operations Category: Global

Specifications

Powerplants	2 Wright 982CH9HE3 1,475 hp
	Recommended TBO 1,300 hr
Propellers	2 Hamilton Standard three-bladed, constant speed, reversible auto-feathering
	Recommended TBO 2,600 hr
Wingspan	96 ft 8 in
Length	61 ft 3 in
Height	25 ft 10 in
Wing area	1,035 sq ft
Wing loading	30 lb/sq ft
Power loading	10 lb/hp
Seats (passenger)	28
(crew)	3
Cabin length	26 ft 1 in
Cabin width	7 ft 5 in
Cabin height	6 ft 2 in
Empty weight	23,500 lb
Useful load (seaplane)	7,865 lb
(landplane)	7,105 lb
Payload w/full fuel (seaplane)	4,115 lb
(landplane)	3,355 lb
Max ramp weight	30,705 lb
Max takeoff weight (seaplane)	31,365 lb
(landplane)	30,605 lb
Fuel capacity, std	662 gal/3,972 lb
	(625 gal/3,750 lb usable)
Fuel capacity w/opt float tanks (experimental only at present)	1,062 gal/6,372 lb
	(1,025 gal/6,150 lb usable)
Oil capacity ea engine	22 gal
Baggage capacity	2,250 lb

Performance

Takeoff distance (ground roll)	3,000 ft
Accelerate/stop distance (seaplane)	6,010 ft
(landplane)	5,990 ft
Takeoff over 50 ft, single-engine (seaplane)	4,425 ft
(landplane)	4,400 ft
Rate of climb, METO power (max except takeoff)	1,250 fpm
Single-engine ROC, sea level (seaplane, 31,365 gross)	225 fpm
(landplane, 30,605 gross)	250 fpm
Max level speed, sea level	229 kt
Cruise speed, 30 in MP/2,000 rpm 5,000 ft	162 kt
Fuel consumption, ea engine	100 gph/600 pph
Range @ 30 in MP/2,000 rpm, gross weight, std fuel, no res	1,012 nm
Max operating altitude	10,000 ft
Landing distance, flaps down (seaplane)	5,405 ft
(landplane)	5,050 ft

Limiting and Recommended Airspeeds

Vmc (Minimum control w/ critical engine inoperative)	81 KIAS
Vyse (Best single-engine rate of climb)	115 KIAS
Va (Design maneuvering)	134 KIAS
Vfe (Max flap extended)	142 KIAS
Vle (Max gear extended)	151 KIAS
Vlo (Max gear operating)	134 KIAS
Vno (Normal operating)	206 KIAS
Vne (Never exceed)	229 KIAS
V1 (Critical engine-failure)	90 KIAS
Vso (Stall in landing configuration)	72 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless otherwise noted. Operations/Equipment Category for aircraft as tested; see June 1981 Pilot, *p. 103.*

continued

we were at last off.

"Have a good crossing," called the tower, as we flew over the high cliffs that line the easternmost part of North America.

For most of the trip, we flew at 9,000 feet. A low cloud cover much of the time hid the formidable North Atlantic, which, in late afternoon, provided beautiful blue tints reflected in edges of the unusually shaped stratus.

Although the aircraft can go higher, the G-111 is not pressurized, the engines are not supercharged, and there is no built-in passenger oxygen system; so maximum operating altitude is listed as 10,000 feet.

The reassuring, but loud, drone of the rebuilt radials easily would have lulled one to sleep through the long flight; but there were positions to plot, navigation systems to investigate and the Albatross to fly. However forgiving Rowley finds the aircraft, after his long experience with it, I found that it initially demands the undivided attention of the newcomer. (My time at the controls was limited—I think they suspected that I might try to sneak in a water landing.) Russell, who will fly the G-111 for Resorts, called it stable as a rock and said it is much easier to fly than the smaller Grumman Widgeon.

The original Grumman plate on the bottom of the panel identifies N112FB as manufacturer's model UF-2, serial number 463 (out of 464), completed April 1961. There have been a number of changes since then. A new solid-state electrical system, including Leland electrosystems, inverters and voltage regulators, replaces what Grumman characterizes as "a ton of vintage electronic components and wiring."

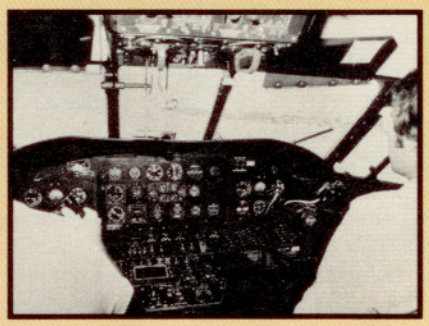
The standard avionics system is a Collins Pro-Line package, with dual VIR-30 navigation receivers and dual VHF-20 communications transceivers. Collins HF-220 radio can be added for long-distance oceanic trips like ours, and, of course, the omega and INS can be installed. Collins ALT-509 radar altimeter and TDR-90 transponder are included, along with PN-101 compass system, a 332-10 radio magnetic indicator, a DME-40 distance measuring equipment system and an ADF-60 automatic direction finder (the ADF on 112FB suffered a temporary interference problem from the installation of the long-range systems and worked only within 10 miles of a beacon).

Since we encountered no airborne weather problems, the RCA WeatherScout II radar was used mostly as a novelty, to track a ship at sea—the radar picked it up before we saw it.

Even with all of the sophisticated weather, navigation and communications equipment on board, the strings of lights on the first island of the Azores chain were a welcome sight when they appeared far below us in the darkness of the midnight ocean. Here, too, the availability of avgas determined our destination, and Santa Maria, the last island in the chain, was where we were headed.

The customs officials were gracious, despite the late hour, and we were

ALBATROSS



PHOTOGRAPHY COURTESY OF GRUMMAN AEROSPACE CORPORATION

The new panel is full of Collins avionics, and there is always the option of adding omega and INS for long ocean voyages.

shepherded through with no delay to the unique Hotel de Aeropuerto after a rather inexpensive stop at the airport bar. In fact, everywhere we went, customs exclaimed, in various languages, "Ah, private aircraft," and waved us through without a peek in a single bag—except in France, where we never encountered an official of any type.

We made a brief overnight stop in Lisbon, Portugal, where I gazed longingly at the Tagus River, where the Pan American Flying Clippers used to land. Instead of getting the hull wet, we touched down at Lisboa International, surrounded immediately by dozens of vehicles that ranged from fire trucks to jeeps to Volkswagen Beetles to a bus that could have transported half a 747 load of people to the terminal. The three relief-crew members felt quite conspicuous on the way to the terminal in the huge bus.

On the way to Paris the following day, we switched from long-range navigation to VORs and from high-frequency communication to VHF; but our route of flight took us off the coast of Spain, over the Bay of Biscay and out of range for contact. A Laker airliner was flying overhead, and offered to relay transmissions to Brest, France.

Paris was barely visible in the smog as we made our approach past the Eiffel Tower. If Lindbergh had encountered the reception we received at Le Bourget, he probably would have turned around and flown back to Long Island. We couldn't find anyone to direct us to a tiedown spot and taxied back and forth past silent policemen and the half-finished chalets being prepared for the air show. "Thirty-three hours across and 45 hours taxiing," muttered the usually calm, usually smiling Frank Steven, as we reversed direction once again to avoid an arm-waving Frenchman, the first person who seemed to have an inkling of what to do with us.

Finally, we were parked near the chalets, the long journey over. Jackson already was talking about preparations to show off the G-111 in a few days when the air show started, wondering aloud how he would be able to run up the radials on schedule when the Albatross was surrounded by other aircraft on static display.

Certification followed shortly after the crew's and the aircraft's return to the States, and the first production G-111 was on its way to the Far East, where it would be used to shuttle drilling-rig crews out of Singapore. Another G-111 was scheduled off the production line in August and a third in October. Six in all were in the works at press time, and Grumman had 57 Albatrosses gathered from all over the world, ready for transformation.

Some of them may end up with new certification as turboprops, with 1,645-shp Garrett TPE331-15UARs or the new General Electric or Pratt & Whitney turboprops of the same class. The turbo conversion will save about 2,500 pounds, and increase speed, payload and cruising altitude.

Grumman is looking at a water-bombing conversion also. The company figures that the G-111 could carry 10,000 pounds of water for firefighting expeditions.

So, after 30 years of hard flying, there will be no rest, no retirement for the sturdy old Albatross. N112 Flying Boat, our ocean cruiser, will start flying with Resorts' Chalk Airlines in December. I'll get in a water landing yet. □