



Robert 'Bob' Barrows' Bearhawk Patrol debuts as first of its type in Africa

By Willie Bodenstein

Robert 'Bob' Barrows, an aircraft designer with 4,000 hours of flight time, almost exclusively in tailwheel aircraft, is no stranger to rugged, personally built aircraft. Bob, who is a mechanical engineer, is based in Virginia in the USA.

The Patrol easily gives the impression of being a Cub killer with its similarly shaped fuselage and STOL capabilities, but Robert never set off to design such an aircraft. The truth is that Bob had just finished another aircraft design and with an empty workshop and fresh ideas in his head, he began to build the Patrol. Bob has said, "I cannot design and build airplanes! I haven't finished one before I'm thinking about the next one, and something that I had been loosely studying for years was the group of aerofoils designed by Harry Riblett. They were very, very attractive to me. For one thing, they have low pitching moments so trim forces don't change that much with speed or load and the tail could be smaller." Riblett's aerofoil designs would form the foundation upon which all Barrows' Bearhawks would rely. Bob said, "When I was designing her, the slow speed numbers on the aerofoil looked really good, but that was all on paper. I didn't really know how good the aerofoil was until I started flying the Patrol and found I could fly her really deep into the stall and nothing would happen. For instance I worked hard trying to induce the so-called 'moose stall,' but I just couldn't make her stall. In fact, at 40mph, one can put her into at least a 60-degree bank and pull her around in a circle that can't be 50 feet across and not lose any altitude. It is an amazing aerofoil."

Originally implemented on the four-place Bearhawk, the optimised wing allowed Barrows to easily land on tricky runways, but the design of the four-place Bearhawk left Bob wanting for a middle seating position and improved visibility on both sides. From this concept, the Patrol began to design itself in Bob's head. The Patrol would use the same structural concepts from the four-place Bearhawk: metal wing with a rag and tube fuselage making for a quick design process. Bob decided on a fuselage eight inches wider than the Super Cub, 32 inches

in total to accommodate large men in snow gear. "I actually designed the airplane with 300 pound pilots in mind. With two 300 pound guys on board and using the more stringent utility category limits to which I always design, they can fill the fuel tanks (55 gallons) and still have room for 70 pounds of baggage and C of G is no problem. Flown to standard category limits, the loads would increase", says Barrows. The Patrol that Bob finished in 2002 was a two seat tandem high wing aircraft designed for comfort and endurance. A superbly built example would thirteen years later fly far away in South Africa.

Wayne Giles, an industrial refrigeration engineer by profession, lives on the Fly Inn Estate in Gauteng. Wayne has always had a passion for and a family interest in aviation. His grandfather served in the Royal Air Force (RAF) as a Spitfire squadron leader. Wayne's personal relationship with flying started in 1995 at the Durban Wings' Club and has flourished ever since. He currently has 1500 hours flight time with 1300 hours on tailwheel aircraft and 11 types on his licence. Besides the Bearhawk, Wayne is also the proud owner of an immaculate Cessna 180/185. One of Wayne's dreams has always been to build an aircraft with his own hands, something that would suit his needs. What he wanted was a two seat taildragger with a good range, respectable cruise speed, good carrying capacity and able to land on short unprepared bush strips. The only aircraft that came close to Wayne's specifications was the Bearhawk Patrol and Wayne placed an order for AviPro's quick build Patrol kit. Construction started in his workshop at Fly Inn Estate and took just eighteen months to complete. "The Patrol was a really satisfying build as it combined different construction methods. Fabric fuselage and control surfaces, aluminium wing, aluminium and fibreglass cowl with various fibreglass trimmings. As it was varied, the build never became

monotonous, with different construction challenges during the build process." Wayne said.

Retired SAA Captain Karl Jensen hangars his Cessna 170B across from Wayne's workshop and together they have been flying from Fly Inn field since 1998. Karl's career as a B747-400 Captain and test pilot with some 26,800 flying hours and position of Chairman for EAA's Johannesburg Chapter 322, made him Wayne's first port of call when considering his Patrol's test flights. The test flights were carried out over a number of days and once completed Karl reported as follows: "As ZU-BHP is the first of type in SA, I carried out an extensive testing programme to ensure that there were no surprises for anyone who builds or buys one in SA. ZU-BHP testing was a pleasure and on the advice of the SAAF's General Des Barker, the tests were flown to a carefully pre-determined plan. Wayne built his Bearhawk to an incredibly high standard with diligent attention to detail. The aircraft is fitted with a Superior IO-360 engine and an MT 3 bladed constant speed propeller. This is a wonderful match and the engine is turbine like in its smoothness of operation. The advanced EFIS is a delight and there are also regular modern RT (Round Thing) instruments. The new engine on ZU-BHP had to be run-in before serious flight testing that required power changes. I carried out the run-in in accordance with recommended practice. I had to do this in the early morning calm air as at high power settings, the speed would be well into the yellow arc in still air. The EFIS allowed close monitoring of the engine parameters that noticeably stabilised after about 11 hours when the piston rings had bedded.

This Bearhawk Patrol at Max gross of 2000 lbs (907 kg) stalls with full flap at IAS 35 knots (65 km/h) and a clean stall at 45 knots (84 km/h). The design is suitable for STOL operations and 'back country' flying from unprepared fields. The flight envelope of the patrol is quite remarkable. For cross country flying, 75 % power cruise is 130-135 knots (240-250 km/h) due to the clean design and the Riblett aerofoil section. The handling is crisp and during spin testing, the ailerons were effective. The stall, when it happens at ridiculously steep angles of attack results in a straight ahead sink with little tendency to drop a wing unless the aircraft is grossly mishandled. To induce a spin requires power on and abrupt control input. Recovery from a spin happens when the controls are simply released. Normal spin recovery of course makes regular flight resumption a cinch. The spacious interior dimensions can accommodate large pilots and passengers comfortably and the 210 litre fuel capacity permits a safe endurance of six hours and up to nine hours at minimum drag speed. With two large occupants and full fuel there is still room for about 50 kgs of baggage to be legally carried in the spacious cargo hold which has a conveniently large access door. If the aircraft is built with basic instrumentation, a legal payload of 485 kg is possible. There are a few four-seat Bearhawks in South Africa and I'm sure that there will be many more of the two-seater Patrols in the near future when discerning pilots meet up with this lovely aircraft.

This Bearhawk Patrol surprised me on every flight as one of the most benign taildraggers I've ever had the pleasure to fly. In spite of the gentle handling nature of the aircraft, the performance is scintillating in every respect. In my view, the LSA version as well as the regular Patrol will be superb taildragger trainers due to their robust construction and predictable handling characteristics." Consequently after Wayne's successful Bearhawk Patrol build, he has become the local importing agent for the aircraft kits. 📷



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