



The Hummel Bird



By J. Morry Hummel (EAA 8892)
509 E. Butler
Bryan, OH 43506

SINCE DISPLAYING MY modification of Gary Watson's Windwagon at Oshkosh '82, I have received requests for additional information from all over the world so, hopefully, this article will suffice.

I saw Gary Watson's new plane at Oshkosh in 1979 and was impressed with its simple construction, light weight and economy of operation. Its small size meant a low cost for materials, also, so it looked like the homebuilt for me. I had a background in aircraft metal work, which was probably one of the reasons the Windwagon appealed to me. I worked at Howard Aircraft in Chicago in 1939 and 1940 under Eskill Halquist, who was the craftsman who made the metal fairings for the Laird Super Solution nearly a decade earlier. From him I learned to form metal without the need for jigs and forms. I later worked for a time at Meyers Aircraft at Tecumseh, Michigan building OTWs . . . then went on to Columbus, Ohio to spend the World War II years in the experimental department at Curtiss Wright, making everything from fairings to cowings for the SO, SC, XB2C and XBT2C.

Everyone wants to know about the 2-cylinder VW engine. It was built according to Watson's drawings, although I also had purchased Dave Carr's drawings, which were the first for a 2-cylinder VW.

I began my conversion by purchasing a VW engine that had thrown a rod through the case on the flywheel end . . . for \$10.00! And I also bought some dual port heads from an engine that had swallowed a valve . . . for another ten bucks. After cleaning and a careful inspection, I found I had a low time engine that did not even require align boring of the case.

I sawed the case off and had the required pieces welded in prior to machining the rear of the case . . . after which the pulley end became the front of the engine. Next, a piece of 606T6 a quarter of an inch thick was cut to form the back cover of the case. It was drilled and tapped for $\frac{1}{4}$ x 20 screws. The mag is mounted on this rear cover plate.

The crank was magnafluxed to be sure I had a good one, then cut off as shown in the drawings. Afterwards a $\frac{1}{4}$ " projection was milled to drive the mag. I used a HAPI mag coupling . . . and found a two cylinder Fairbanks Morse tractor mag in a salvage yard for \$2.00 and had it rebuilt to like new condition for \$68.00.

The camshaft should be a higher lift job than stock and I recommend the HAPI camshaft which can be bought for about \$60.00. The timing gears are trimmed off $\frac{3}{16}$ " to make room for the flanged rear main bearing. Two are used — one in front, another at the rear.

Using the damaged dual port heads, I cut off the damaged areas and welded the good portions together to complete the shape to fit the valve cover. The cover, itself, was "sectioned" to size by cutting a slice out of the middle and welding the ends together. Same with the retainer spring.

I used a Monnett prop hub and spinner, however



(Photo by Ted Koston)

a tapered shaft and hub are nicer if you want to remove the hub for any reason.

In the induction system, I used a Bendix Zenith float type carb with a 25mm throttle plate opening. This might be too small, but Rex Taylor says it is adequate for my 900cc displacement. I used 92mm cylinders, but I think 88mm might have been sufficient — which would have eliminated the need to spend \$40.00 to have the heads and case bored to match.

The standard VW oil pump has plenty of volume for the two cylinders. My oil cooler is the commonly seen length of soft aluminum tubing wrapped around and epoxied to the outer section of the intake pipe. My oil temperature averages 180° to 190° . . . and an oil filter keeps the oil nice and clean.

This nice running little 2-cylinder VW engine can be built for three to four hundred dollars, depending on how much you scrounge.

I built my airframe like Gary Watson's, except for conventional gear and a closed canopy for winter flying. A number of items reduced the weight by about 30 pounds. I saved 1½ pounds by drilling lightening holes in the spar and ribs, and by using .016 skin on the outer panels of the leading edge and top skin, saved another 3½ pounds. I also used Dick Schreder's sailplane spar caps (7075T6) to save 15 more pounds, and, as a result of all this, the wing panels weigh just 18 pounds each. The tail spring and wheel assembly are all aluminum, which cut down some on weight. Anyway, the empty weight came out at 268 pounds. Most Windwagons run around 300 pounds.

A lot of people admired my wing root fairings at Oshkosh and although metal forming is my trade, I have to admit to being proud of them, myself. The front section is 3003 half hard aluminum hammered to shape using a ball peen hammer and a rag tied around a saw horse. The rear pieces are of .020 2024-T3 shaped on an air driven planishing hammer, using oil on both sides. This is not difficult if you have an eye for free hand.

The airframe can be built in only six to eight months . . . reasonably. I used AD rivets where possible because they are cheaper and lighter in weight. No special tools are needed, because Gary Watson has made everything quite simple. (If, however, anyone wants parts made, they may contact him or myself.) There is no mystery to building a metal airplane. For

instance, to form leading edge skins simply fold over on a carpet, place a board on top and step down on it to form the proper radius. No jig is used. It's so simple . . . and when you put in that last rivet, you are essentially ready to go flying.

Some of the changes I made include making the front two bulkheads 2 inches higher to give more toe room . . . and another gallon of fuel. The seat bulkhead is 5 inches higher, which allows use of shoulder harness. The canopy and windshield frames are four pieces of ½" square 6061T6 for roll-over protection. KR wheels and individual brakes are used, their size making the use of grass runways feasible.

The plane is a pure joy to fly. I take off in two runway lights and land in 5 (2 on grass). This is good short field performance. In smooth air it flies hands off and is not overly sensitive. The rudder and fin were enlarged to permit better slips and crosswind landings. It can handle 20 mph crosswinds.

With full aft stick in a slow mush, you still have good aileron control. Stalls are clean. People who have flown my Windwagon say it is just right — and that I shouldn't change anything. They especially like the rate of climb. It is the easiest to fly of any plane I have flown and, obviously, I am quite pleased with it. I am planning a pressure cowl and hope to come up with a better prop, which should provide an increase in cruise speed.

I flew N3765H to Oshkosh this past summer, a distance from my home in Bryan, Ohio of 345 miles, in 3 hours and 30 minutes. This is a block-to-block ground speed of 97 mph and includes some headwinds, crosswinds and airport patterns. I used 6.8 gallons of 100LL. About 45 pounds of baggage was handled with ease — including a tent, sleeping bag, air mattress, food, thermos, tie downs, etc.

I have \$2400 in the airplane, including the engine, to give you an idea of the cost of building one yourself. If you want to build my version of the Windwagon, it is necessary for you to first buy the original plans for \$50.00 from the designer, Gary Watson, Rt. 1, Newcastle, TX 76372, phone 817/862-5615.

Then, you will need my modification drawings which I sell for \$20.00. My address is: J. Morry Hummel, 509 E. Butler, Bryan, OH 43506, phone 419/636-3390. I also have an informational brochure available for \$3.00.

SPECIFICATIONS HUMMEL BIRD — N3765H

Power	2-cylinder VW, about 25 hp at 3100 rpm
Empty Weight	268 pounds
Gross Weight	490 pounds
Wing Loading	9 lbs. per sq. ft.
Baggage	40 pounds
Take-Off	300 ft. pavement - 250 ft. grass
Landing	600 ft.
Stall Speed	45 mph, power off
Cruise Speed	105 mph at 1.8 gph
Top Speed	115 mph
Rate of Climb	700 fpm
Fuel Capacity	5.5 gallons - Regular leaded (auto) or 100LL
Economy Cruise	1.5 gph
Wing Detachment Time	20 min.



Hummel Bird UPDATE

SINCE THE ARTICLE entitled **The Hummel Bird** appeared in the December issue of *SPORT AVIATION*, the phones at PlaneStuff, Inc. and the home of Morry Hummel have been ringing with questions from confused people. What is the difference between the Hummel Bird and Morry Hummel's modified Windwagon, and why do their pictures look alike? Aren't they the same airplane? The following is an explanation that should unravel the confusion.

A few years ago Morry Hummel started building a Windwagon designed by Gary Watson. However, being the creative type craftsman that he is, he made several modifications as he proceeded with construction. This is the machine that received so much attention at Oshkosh '82.

Shortly after completion of his Windwagon project, Morry began considering further modifications that would improve the airplane. It was decided that this new airplane would be called the Hummel Bird and that plans and kits would be made available through PlaneStuff, Inc. of Fort Wayne, IN.

While the modified Windwagon is the prototype for the Hummel Bird, and they, therefore, look alike, the airplanes

are actually very different. The only common parts on the two aircraft are the spinner, wheels and canopy.

The powerplant on the Hummel Bird is a Revmaster R-800. This replaces the half Volkswagen previously used.

The airframe has also been extensively remodeled and strengthened. The bottom and side panels were straightened to make the fuselage easier to construct, and to accommodate larger pilots the cockpit area was increased to 22½ inches in width and 48 inches of leg room. This improvement resulted in an increase of 4 inches to the total overall length. The tail area has also been increased and a locking tail wheel was added to improve ground handling.

The airfoil has been replaced with a Schreder #3 which has a high lift to drag coefficient and a thicker cross section. This thicker wing section in combination with other modifications to the wing structure increased the yield strength to plus and minus 6 Gs. Flaps were also added to improve performance.

The Hummel Bird information packet (\$6), plans (\$125) and complete (\$5995) are available from PlaneStuff, Inc., P. O. Box 5460, Ft. Wayne, IN 46895. Partial kits are also available.