

A KR-2 Built for



(Photo by Scott Hebron)

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AFTER HAVING READ all the articles of homebuilders, restorers, antiquers, etc. in *SPORT AVIATION* from 1960 to the present, it's hard to come up with something that hasn't already been covered. I read of all the exceptional feats that have been accomplished by homebuilders in their aircraft, i.e., around the world flights, longest distance in a straight line, etc. I envy those persons who have the knowledge, experience and resources to accomplish these goals. Accounts of these experiences are what is needed to encourage persons such as myself to succeed in attaining our own goals.

My experience began in the fall of 1975 when, after much consideration of the types of airplanes available to build, I cut the first wood for my KR-2.

I picked the KR-2 because it offered, for me, a basic wood construction combined with the then new composite

technology. I felt comfortable with the wood construction, the composite technology I could learn. Construction materials appeared economical compared to 4130 or aluminum. The VW power offered economic building and performance with good cruise potential. The 2 place KR offered extra room to carry baggage for long trips, such as flying to Oshkosh.

N514AJ (AJ? — initials of a girl friend of 30 years) is built to the KR plans except for modifications in areas that make inspection and service much easier. I also reinforced the upper and lower engine mounting areas. Cost a little extra weight but gives me piece of mind.

Without getting into extensive detail, the engine purchased was a used 1600cc dual port intake from a 1970 VW. It was completely rebuilt using new parts, after align boring, magnafluxing, grinding and balancing. Deck

Ease of Maintenance

heights were set on the 92.0 mm pistons and cylinders, the only non-stock VW parts used.

I am pleased with the performance through the 155 hours flown to date. Engine oil and cylinder head temperatures are all in the normal range. I started with an engine oil cooler that I built, but after a safely executed unscheduled landing caused by loss of all oil from a blown hose connection, the cooler was removed. Three quarts of oil sure can disappear quickly.

After removing the oil cooler, very little difference was noted in the oil temperature. It may have been an inefficient oil cooler, but I believe it is due to the extra attention paid in the pressurized cowling. Also, ram air is directed across the oil sump. This air enters directly over the air filter for the carb heat and Posac carburetor. Further attention was paid to the exit of hot air flow in that the area of air outlet is approximately twice that of the inlet area. The hot air exits in a relatively low pressure area at the sides, similar to the T-18 design.

I would comment at this point that the technical articles in past SPORT AVIATIONS have been invaluable to this first time builder. Whenever starting a new area, I would go to my index and pull out all the past issues that contained articles pertaining to that subject.

One idea taken from a Tony Bingelis article was to mount the engine cowling using piano hinges. This idea sounded great to me because I don't like the looks of screws along the cowling sides. Furthermore, because I wished to have the engine cooling air exit at the sides, I

would need to split the cowling vertically to make a neat appearing installation. To make a long story short, it worked out well after much effort getting the hinges to align while holding the cowl section in position in preparation for installing the hinge pin. The cowling is held securely in position with 7 hinge pins and 3 safety screws. This project consumed an entire winter, but then again, it's a great way to pass away that time of cold and snow.

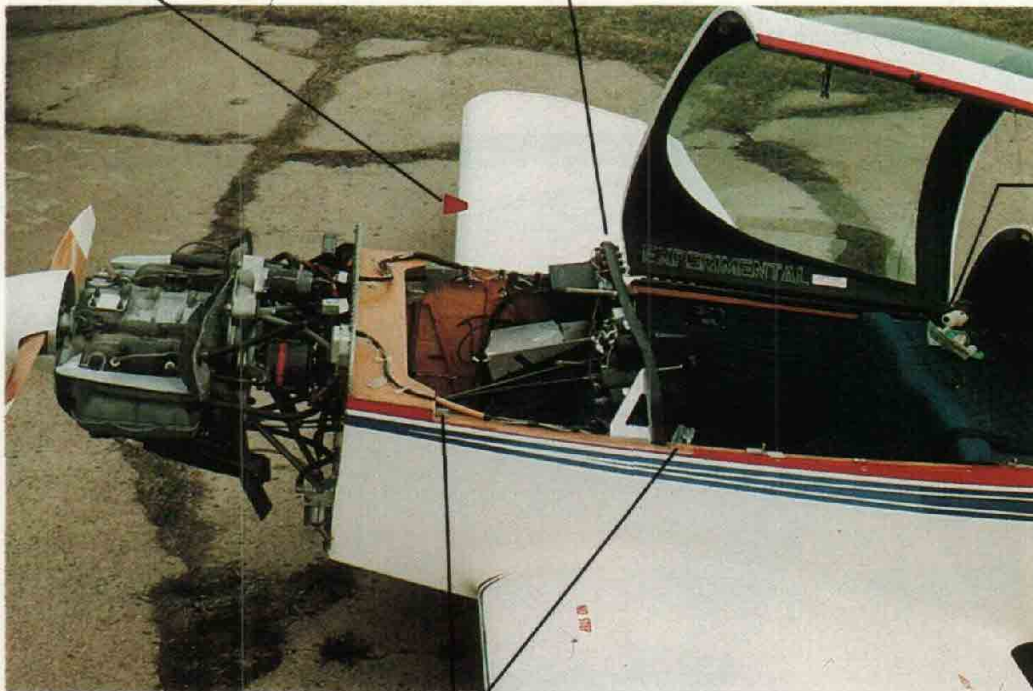
I started flying the airplane using a Ray Hegy 52x45 propeller. After 150 hours I decided to improve on the 125 mph cruise at 3400 rpm that the 52x45 was giving. I decided to whittle my own propeller just to see if I could do it. It turned out to be fun and another great way to spend cold winter evenings. I used Eric Clutton's fine booklet for the instructions on propeller fabrication.

My first attempt was to use a 52x50 but this proved to be too much pitch for my 1834cc engine; the take off performance was marginal. I repitched the same propeller to 48" and now feel I have the best I can do with my engine. The take off performance is good with a cruise speed of 138-144 mph at 3400 rpm. Best of all I was able to try two propellers at the amazing cost of \$25 total. Another advantage of EAA members sharing their knowledge.

Now everyone is saying, "How come so slow?". Well, these are honest figures with an empty weight of 578 lbs. and my homebuilt engine and propeller combination. I have calibrated my tachometer by strobing the propeller so I know this is accurate. I can only repeat what has been

Warning flag for pitot cover. Visible from cockpit.

Aluminum instrument panel retained by four bolts through longerons.

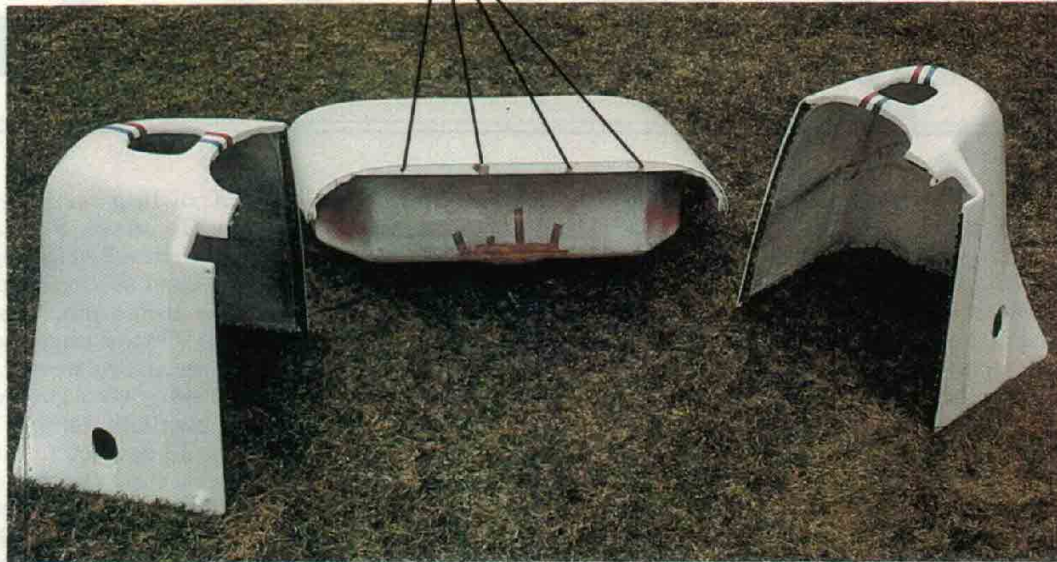


Navigator

Side attach points for front deck/fuel tank retention.

For ease of removal, four screws retain aluminum seat back and bottom.

Attachment points through upper firewall for front deck/fuel tank.



Aluminum heat shields built into engine cowling around exhaust openings.

This photo shows how the engine cowling is split vertically and how upper, lower and front attaching hinge pins are located.

said many times previously, "Keep it light and don't always believe the advertised speeds."

In this time of high technology, one can still build just the complexity you desire. I chose simple and economical which matches my type of flying requirements. My KR was built for fun VFR flying and thus the flight instrumentation is only that required by the FAA. The engine and electrical functions, however, are completely monitored. The only addition is an Alpha 200 for communication and navigation assistance.

Finally, I would like to note that, without the foresight of the founders of EAA and the unselfish help I received from a number of members throughout my project, my airplane would not have been completed.

Last, but not least, the support and encouragement of my wife sure helped me over the rough spots. Thanks, A. J.

MISCELLANEOUS ITEMS

- Time to build — 3000 hours spread over 5 years.
- Cost to Build — Actual records were kept. Cost reflects economics of 1975 through 1980:

Building Supplies	\$1,431.02
Misc. Hardware	84.54
Engine Complete	1,469.65
Instruments & Misc.	911.66
Paint & Supplies	235.75
Shipping Costs	172.21
*Total	\$4,304.83

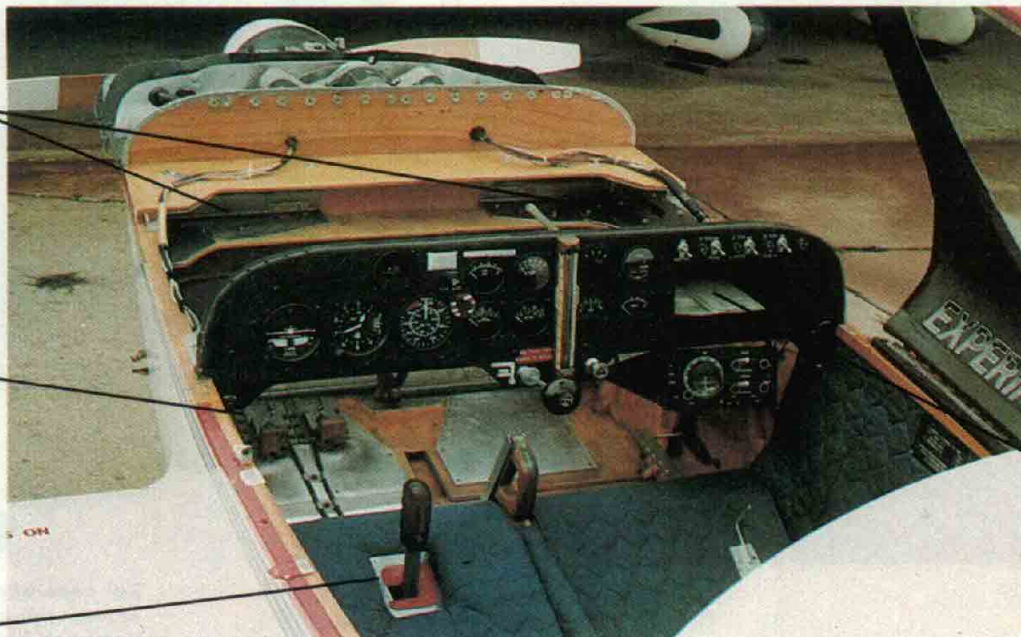
*Does not include radio gear or ELT

- 1st Flight — August 16, 1980
- Paint is Ditzler Acrylic Enamel with Delthane additive
- N514AJ won Champion Monoplane Award at the 1983 Michigan Regional Fly-In.

Upper engine mount reinforcement.

Heel operated brake pedals.

Control limit plate with control lock in place.



Glove Box (Formerly planned for radio).