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KR-1 KR-2
NEWSLETTER

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In a past issue of this newsletter I ran a survey to see who was building what, how far along their projects were, and how could I best help with the newsletter. Response was good I felt, with 15% of the builders taking time to send in the information requested. I was pleased to note that all replies considered the newsletter an invaluable aid to their KR-1 or KR-2 or whatever they were currently building and favored keeping the newsletter in the present format. A recent critical letter from a builder has popped the balloon of contentment that the survey constructed and has prompted me to take some space to clarify my position with Rand/Robinson. They do not employ me or re-imburse me in any fashion. The KR Newsletter is my own form of reaching as many builders as possible, to pass on information and to help builders with questions as they run in to rough spots. I am not an engineer, aeronautical or otherwise, so modifications sent in by builders like yourself require your personal judgement as to whether they should be included in your aircraft. Questions regarding the construction of a KR are answered based on experience gained thru working on my own KR-1 as well as an uncounted number of other KR's. Questions I can't answer, or am not sure of, are checked with the guys at R/R. Drawings I use in the newsletter are sent in from builders who wish to help the next guy. The drawings aren't always the best but they do what is intended; they get the idea across. I appreciate them and I thank the guys for making the effort.

There is one area I consider that could use some improvement....flight tests and pilot reports. The guys about to finish their birds want to know what to expect when they are ready for their first flight. If you have a KR-1 or KR-2 with a few hours on it, tell us about it. We're waiting to hear from you.

From Dan Diehl....."I wanted to write a letter and tell the other KR-2 builders how my plane flies. N4DD now has over 80 hrs. I started building it in Sept. of '75 and first flew it July 6, 1976. During this time I spent two months on another project (converting a VW Beetle into a pick-up truck). My KR-2 has a full electrical system including starter, generator, lights, Escort 110 radio, etc. (this I bought from Gilbert Duty, Rte 3 Box 427 Sanford, NC 27330) It's a neat little unit. The engine I built myself, it's a 2200cc with a 32mm posa carb. The prop is Bernard Warnke's latest. The cowl is one of my own. The plane is covered with 10 oz. glass cloth instead of dynel. The interior is complete with sound proofing, carpeting, rolled & pleat seat and side panel. Fuel tank capacity is 13.2 gal. Empty wt. is 522 lbs., top speed is 141 indicated. Stall is gentle at 40-41. Cruise is at 132-3 at 3200 rpm. Rate of climb is 1200 fpm with two aboard. The plane has been let down at 200 indicated. A true air speed on the day the 141 was done showed a TAS of 167. I have rolled the plane but that's all. I have gound looped it once, as a result of R/R tail wheel failure. I can get super-good tail-wheels for \$11.00 apiece for those interested. These will fit the R/R assembly. The gound loop resulted in a gear failure. No problem to fix but it knocked me out of a trip to Oshkosh. The plane has a glide ratio of 1-6 with two aboard. I have had my plane to 16,200 and still had 300 ft/min climb. The plane is very quick on the controls and very stable in rough air. The airplane is fun to fly as I still average one hour a day."

THE RAND/ROBINSON 3-BLADE PROPELLER
How to achieve optimum performance!

After looking around at the different props available, you have decided to buy an adjustable to get wider performance range. Now let's take advantage of the adjustable feature to best use the horsepower available in your engine.

As you open the packing crate of your new R/R 3-blade, you will find the plastic/fiberglass halves of the injection molded hub, three propeller blades, (current blades are made from laminated birch with epoxy/Dyneel covered tips) and three 4130 steel bands with allen head bolts.

Assembly: Close examination of the hub halves reveal each half to be almost identical, the key word being almost. On the outer rim of each half is a center punch mark. Make sure these marks are opposite each other when the halves are joined. Reason for this is both halves are assembled together when the bolt holes are drilled. Possible bolt or hub misalignment could occur if the punch marks are not properly located for assembly.

Lay one half of the hub on a flat surface and place a propeller blade flat side down in each of the semi-circle grooves provided. (Nothing critical here but it does help to have the holes in the base of the blades lined up with the holes in the hub.) Cover with the other half of the hub, align the punch marks, and install one propeller hub bolt thru each lobe of the hub. As on other props a thrust plate is necessary to distribute torque evenly, so be sure you have one installed. A 5" disc of .125 2024 T3 aluminum works best. Lightening holes are permissible.

After the prop bolts are in place (one thru each blade) remove the allen bolts from the 4130 steel bands and slip one band over each blade and into the groove provided around the hub and replace the allen bolts. Do not tighten the bolts. The bands should be positioned for ease of accessibility but to avoid any balance problems, make sure each band has the allen bolt at the same position around the hub.

Adjusting the prop: Mount the propeller on the engine with all bolts in place but not tight. You should be able to rotate blades easily. Set one blade about the middle of the adjustment range. Turn the prop until this blade is horizontal on the left side of the engine. Hold a straight-edge flat against the back of the blade $\frac{1}{2}$ " from the tip. The straight-edge should be long enough to reach the floor. Mark the straight-edge carefully along the leading edge of the blade and place a mark on the floor exactly where the straight-edge rests. Snug the allen head bolt just enough to hold the blade in place and then turn prop to the next blade. Use the mark on the straight-edge and the mark on the floor to set the blade at the exact same angle as the first, snug the allen bolt and repeat the procedure for the remaining blade. Re-check all three blades to be certain that blade angle has not changed then torque all bolts to proper tension. The 5/16" hub bolts should be 20 ft. lbs., allen bolts 8 ft. lbs. (Not all at once please; alternate until each bolt has correct torque.)

Start engine and check for max. rpm. Best cruise will be achieved with a static 2800 to 2900 rpm firewalled, (30" m.p. for turbo-charged engine.) Best climb performance will be achieved from a static 3100 to 3200 rpm. Fixed gear aircraft will find best all round performance in the latter range. If the mid-range blade angle does not let you obtain the desired rpm, and it probably won't, adjust the blades accordingly. More blade angle will give less max. rpm, less angle will give more rpm. Re-check torque on hub and band bolts after one hour of running time and every ten hours thereafter.

We have a couple of corrections on drawing that appeared in the newsletter. First is a dimensions correction on the continental A65/75 engine mount drawing in issue #13. Given dimension for mounting holes vertical to the engine was 14 9/16". It should be corrected to 11 9/16". The gear handle drawing sent in by Larry Zepp in issue #8 calls for 2024 aluminum. 2024 is not weldable so 6061 alum. should be used.

SAFTY NOTE: I'm sure many of you have heard of the unfortunate accident that took Cletus Brow & the "El Gringo". (The "El Gringo" was a foam/Dynel aircraft with steel tube fuselage & spars.) Cause of the accident was leading edge separation of one wing. Investigation showed that in trying for a super smooth finish, the dynel skin had been sanded almost completely thru at the steel tube spar. Don't let this happen to you! If you have an area that needs a lot of sanding use a filler such as "Featherfil" or a micro-balloon/epoxy putting to build up low areas. Finished product will be safer & will look better.

As long as we're on the subject of safety, I'll pass on another tip from Larry Zepp. Baffle your fuel tank(s) with foam. Special reticulated foam used as gas tank baffle (entire tank filled with foam) 1.4 lbs per cubic ft. displaces only 3% total fuel tank capacity. Will not stop fires but prevents explosion & fuel splash in event of crash. The foam is used in several US military aircraft & is mandatory equipment in race cars competing in NASCAR, Sports Car Club of America & the United States Auto Club sanctioned races. The foam is a product of Scott Paper Co. and is distributed by the Coated Fabrics Division of the Firestone Tire & Rubber Co. in Akron, OH...the Engineered Systems Division of Uniroyal Inc. in New York...the Aviation Products Division of the Goodyear Tire and Rubber Co. In Akron, OH. Made in 12" x 44" x 110" boards @ 60¢ per board foot.

RAND/ROBINSON UPDATE....Work on the KR-3 amphibian is progressing well. All design is finalized and foam work has begun on the outer wings.

The KR-3 resembles the Osprey 2 but will not have wing tip floats ala Taylor Coot. Revmaster 2100 will provide power.

R/R now has available the lightweight Bosch starter that has proved so successful on the KR-2. Price is a low \$35.00. The KR-1 engine is currently being fitted with the under 5 lb. starter & it looks as though only minor modifications to the original style engine mount will be necessary. There will be an article on how to install a starter on your KR as soon as the R/R installation is completed & tested. Maybe next issue. Progress is being made on the KR-1B. Right now it is being fitted with a larger main fuel tank then engine installation is next. The long GA(W)-2 wings using 1/2 span spoiler/flaps & tube actuated aileron controls. Completion date will be early next year.

BUY-SELL-TRADE

FOR SALE: KR-1 with 1200cc VW. Ready to fly. FAA pre-flight completed. \$2500.00 or make offer. Contact ELO ZINKE 2307 56th St. LUBBOCK, TX 79412 PH. 806-797-3032.

FOR SALE: KR-2 fuselage frame with plywood on bottom, horiz. stab. complete, rudder & elevator spars cut, all wood & foam needed to complete airframe...\$450.00. Contact BOB SCHUMAKER 403 MEADOW VIEW DR. HUNTSVILLE, AL 35802

FOR SALE: KR-2 fiberglass engine cowls complete with full-size firewall & engine air cooling baffle templates. The cowl comes in one piece so the builder can split it where he wishes. Instructions included on how to split and fasten together...\$125.00 Contact DAN DIEHL 4132 E. 72nd ST. TULSA, OK 74136 PH 918-492-5111.

Note Dan now has over 80 hrs on his KR-2 and has had no sign whatsoever of cowl fatigue or cracking. See his letter this issue.

QUESTIONS & ANSWERS

- Q. Should the wing attach fittings be plated? If so, what type of plating?
- A. Yes, some sort of protective coating should be used. Zinc Chromate is good and is easily applied.
- Q. Is there any information available on putting a KR on floats? I see a Japanese EAA member has a VP-1 on floats & see no reason a KR couldn't be a floatplane also.
- A. A successful floatplane will depend on enough power for take-off. A KR-1 with one of the larger VWs would probably perform satisfactorily.
- Q. Has anyone attempted to install a vacuum pump on the VW engine where the distributor was before conversion? How much vacuum is necessary to run a panel full of air type instruments?
- A. I haven't heard of such a vacuum pump but one could probably be fabricated using the VW distributor shaft. Amount of vacuum necessary will depend on your instruments but most will require 4 lbs minimum for safe operation.
- Q. My KR-2 plans list wing span as 20'8" and wing area as 78 sq. ft. In the last couple of weeks I have seen ads for the KR-2 listing wing span as 20'2" and wing area as 82 sq. ft. Which is correct?
- A. Look for new ad and pictures (actual wing area on KR-2 prototype is 80 sq. ft. with a 20'6" wing span.
- Q. What does one use to make sure the wing attach bolts stay put?
- A. Since these bolts are subject only to shear loads, a lock nut is sufficient.
- Q. How can I get in touch with builders in my area?
- A. Send me a SASE & the zip code of the areas around you. I'll send you what I have.
- Q. Could you please state in the newsletter that Grant Pascoe of 484 Burrin Ave. Winnipeg, Manitoba Canada R2V-1G4 would like to get in touch with any, mainly young, KR builders?
- A. Done, good luck.
- Q. How does one keep tabs on the amount of fuel left in the wing tanks? I believe the FAA requires a gauge for each tank.
- A. There are some certificated aircraft being flown without fuel gauges in the wing tanks, an Aeronca LC for instance. Like in the KR-2, fuel is pumped to the main tank before being routed to the engine. Aircraft using only wing tanks will have to be equipped with fuel gauges.

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