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KR-1 KR-2
N E W S L E T T E R

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Drove up to see Stu Robinson and the KR-3 this week-end. Work on the KR-3 is progressing slowly but steadily. The bottom hull was finished. The landing gear was off having some final machine work done.

Stu was at Joe Pfeiffer's hangar at Columbia Airport setting up a jig for the engine mount of the KR-3 and Joe was assisting with technical know-how. Joe's Corvair powered Parasol had a feature article in March Sport Aviation.

Stu has built a neat workshop for himself....high up in the mountains with nothing but an occasional deer to distract him. Anybody wanting to see the KR-3 will probably have to wait until it is finished since Stu's workshop is so far off the beaten path.

Stu also reported that while flying back from the Fla-Bob fly-in at Riverside, he lost a prop spinner on the KR-1. As the spinner separated it was hit by the prop and was thrown back at the canopy. The force of the spinner striking the 1/8" plexi-glass and the 140+ mph airspeed, completely wrecked the canopy. Stu wasn't hurt and made a safe landing but considers himself very lucky to escape injury.

As a result of this incident Stu is recommending all builders with intentions of using a foam spinner mounted with a single bolt give serious thought to using something else.

I am still using the foam spinner on the KR-2 I am currently building with Bob Stone. I am, however, using a different mounting arrangement and expect to forestall a situation such as greeted Stu. It's fairly simple and you'll find step by step directions in this issue.

I asked Stu about my idea on the foam spinner and he agreed it was much better than the current method of mounting and if you are going to use a foam spinner, mount it this way.

Is your KR flying yet? I'm sure some of you have completed your bird, so why not send me a picture of your pride and joy so I can put it in the newsletter. Also, Jack Cox, editor of Sport Aviation, is interested in putting photos of completed aircraft in the EAA magazine. Speaking of Sport Aviation, this month's issue had some very good tips on installing a trim tab. Several KR builders have written me asking for details of a trim tab system so these tips were most timely.

Most of you belong to the EAA already, as indicated by your letters, those of you who don't belong yet are missing out on a lot of good info. Tony Bingelis's designee corner is worth the membership fee in itself, not to mention all the other fine articles and pictures.

It's almost Oshkosh time again...anyway time to start making plans to be there if at all possible. You guys planning on flying your KR's, let Ken Rand or myself know your planned route. Maybe we can put you in touch with someone else heading in the same direction. Ken's address is on your plans, (Rand/Robinson) mine is at the top of this page.

The Corona Fly-in is coming up the first of May. It's our 2nd annual EAA Regional fly-in. If last year's fly-in is any indication, it ought to be a good one.

TIPS FROM OTHER BUILDERS.....Al Carter of Maine suggests checking with insulation (spray-in-place) companies for the liquid foam. He was able to get some free by scraping "empty" 55 gal. drums.

NOTE.....just completed foaming the KR-2 cowl. Liquid foam is great!
E.K.

THE V.W. ENGINE THRUST BEARING AND PROP HUB
by Wallace Mynatt

It seems that one of the most asked questions concerns the need for relocation of the thrust bearing in the VW for loads carried through the prop hub.

Let's start off by looking at a paragraph from an EAA "How-to" series book.

"One of the things that makes the VW useful in the air is that the other end of the crankshaft, the "back" end in a car, has double bearings spaced some inches apart. This serves just like the double bearings or single long bearing on the front end of an airplane engine, to stiffen and restrain the crankshaft against the twisting and shaking loads applied by the propeller. The blower pulley is removed and the crankshaft end ground to a 3-degree taper. A simple one-piece hub is then attached with a large bolt screwing into the end of the shaft. This simple method is well tried and works."

In light of this excerpt from the EAA Engine, Vol. I, etc., I would like to look at this problem constructively from two directions.

First of all you do not have to relocate the VW thrust bearing to have a dependable experimental aircraft engine.

At the same time we must realize that there are restrictions to anyone who chooses not to relocate or change the bearing set up in the VW engine.

The main restriction is the prop hub's length. If you choose to use one of the tapered or untapered prop hubs which are available, you should keep it short to avoid over-loads caused by increased leverage of a too long prop hub.

Don't despair. The short hub works very well but cost a little in the streamlining area up front. Also Monnett and others offer prop extensions which bolt on with no internal engine changes required.

On the other hand, companies like Revmaster offer an excellent engine with internal modifications made for the use of an extended prop hub.

The other problem encountered might be called the "stretch problem." The crank in its stock set up is secured for thrust loads on the number one bearing which is the front bearing while it is in the car, but when used in the airplane, the number one bearing becomes the last bearing to receive thrust loads. While the prop pulls from the number four bearing point the crank encounters pull forces along its full length.

This is one of the reasons you should have your crank magniflaxed for cracks. At the same time this rear location of the thrust bearing in aircraft use will be no problem if the engine is assembled correctly with parts of known high quality.

QUESTIONS & ANSWERS

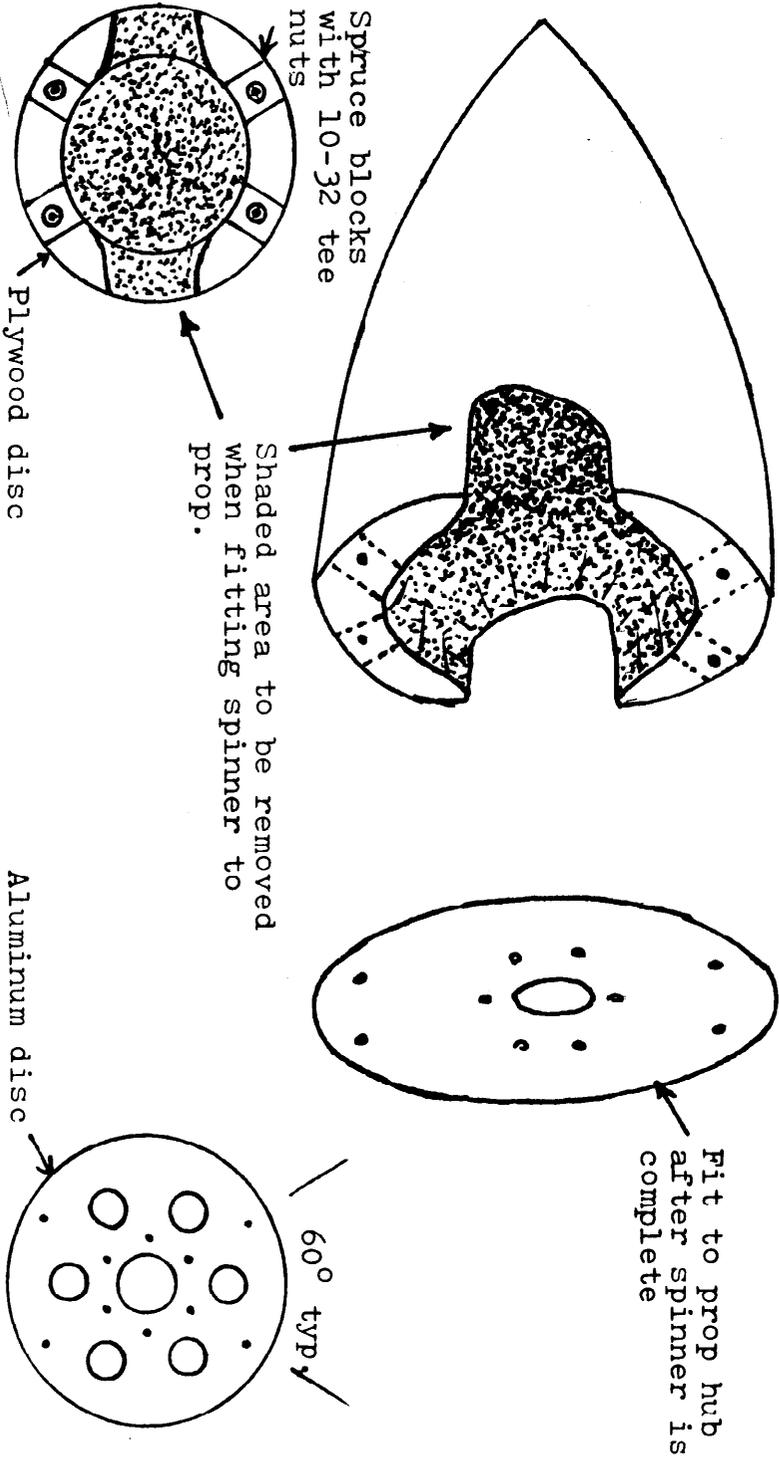
- Q. Is anyone using fixed gear in their KR-1 or KR-2?
A. I have not seen any myself but there are some being built. As soon as someone sends in pictures or drawings, I'll put it in.
Q. What is your opinion on the Gillespie "Design Review"? Are the modifications desirable or not?
A. I asked Ken and Stu about this. They feel most of the mods suggested are unnecessary, particularly the reinforcing of the horizontal and vertical stabilizer. I do know of one builder that reinforced his rudder spar and then found he had no room for the elevator control horn. As I said in the last issue, "modifications require careful thought."

**New Kr-1 price list inadvertently left off KR-1 shock mounts. They're still available....still \$15.00.

LET'S MAKE A SPINNER

There is really no need for anyone to go out and pay \$40.00 or \$50.00 for a spinner. You can make one very easily yourself using the foam and dynel method. Below is a step by step procedure to use to build a foam spinner for your aircraft.

1. Determine the size spinner you want. Usually the larger spinners are better (aero-dynamically). Mine is $9\frac{1}{4}$ " in diameter and 11" in length.
 2. Cut a disc from .090 aluminum same size as large diameter of spinner. Be sure this disc is perfectly round.
 3. Cut a disc from $\frac{3}{32}$ " A/C mahogany plywood same size as aluminum disc, lay out this disc in 60° sections to locate mounting blocks.
 4. Epoxy $\frac{1}{4}$ " x $1\frac{1}{2}$ " x $1\frac{1}{2}$ " spruce blocks 4 places to the $\frac{3}{32}$ " plywood. Be sure these blocks are evenly sized and spaced to avoid any balance problems. The new three blade props will need only three blocks.
 5. Match the plywood disc to the aluminum disc and bolt them together thru the center. Mark the two discs so you will be able to assemble them in this same position later.
 6. Drill the wood blocks with a $\frac{3}{16}$ " hole thru both discs. Then separate the discs and enlarge the holes in the wood disc to install 10-32 tee nuts in the wood block side.
 7. Drill $\frac{1}{4}$ " hole in the center of the aluminum disc and use a $\frac{1}{4}$ " bolt for an arbor. You'll probably need oversize washers to help keep everything square.
 8. Cut a 2" hole in center of the plywood disc.
 9. Put a sheet of wax paper between the wood and aluminum disc and assemble them together with $\frac{3}{16}$ " bolts in the tee nuts.
 10. Now you have the backbone of your spinner complete and you're ready to epoxy the foam in place. Use 2" or thicker foam to eliminate as many glue lines as possible.
 11. After the epoxy has cured, chuck the whole assy. in a drill press and sand the spinner to desired shape.
 12. Remove the aluminum disc and cover the spinner with a layer of dynel/epoxy. Keep laps in fabric opposite each other for balance. Cure, sand smooth and put another layer of dynel/epoxy on the spinner. Only one layer is necessary over the plywood. Be sure to keep tee nut threads free of epoxy. Small pieces of tape over each end does the trick.
 13. Cure at least 24 hrs., then re-attach the aluminum disc and make sure the spinner runs true in the drill press. A slight wobble can be corrected by sanding or shimming between the plywood and aluminum disc.
 14. Remove aluminum back plate, center the spinner on your propeller, and carefully remove whatever material necessary for a good fit around the blades. Now remove foam from inside of the spinner, evenly to keep everything balanced. Leave about $\frac{1}{2}$ " to 1" foam layer inside.
 15. Cover the inside of the spinner with one layer of dynel/epoxy.
 16. Fit aluminum back plate to your propeller hub and drill all necessary bolt holes. Be sure the prop, spinner, and back plate all line up.
- Your spinner is now complete and ready to install on your aircraft.



This should give you some idea of how your spinner should look.

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